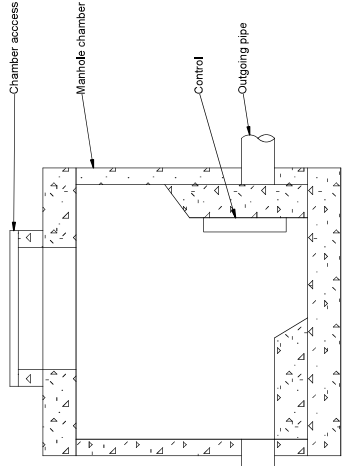
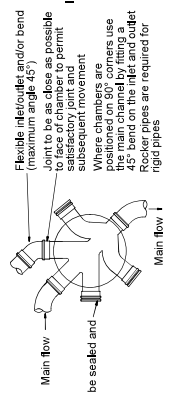


Notes:

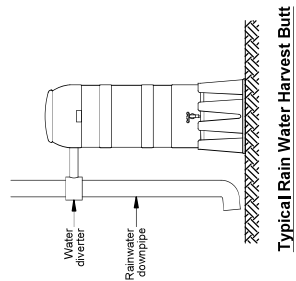
- Do not scale from this drawing.
- All dimensions are in meters unless otherwise stated.
- This drawing to be read in conjunction with all other relevant drawings and documents.
- Design and Construction Guidance, current British standards and building regulations and other relevant standards.
- Exact locations of rain water downpipes and sumps to be confirmed by the architect.
- Contractor to confirm locations of existing services prior to commencement on site and any specialist drainage components such as attenuation tank and flow control to be designed and installed as per manufacturers instructions.
- Cover levels to be confirmed by landscape architect. Cover levels and invert levels are in meters unless otherwise stated. If cover levels change from assumed then drainage channels to have rodding access, sump and grated cover. Linear drains to manufacturer design.
- Final manhole cover pipes to be 1000 with minimum fall of 1:100 unless otherwise stated.
- Access chamber cover class A15 for garden and patio, B125 for driveway, C250 for car parks, D400 for roads or small private car parks.
- Design is for planning purposes only and not for construction. Design should be confirmed prior to construction to ensure all assumed information should be verified.
- Design should be reviewed in light of any additional information or on validation or otherwise of any assumptions.



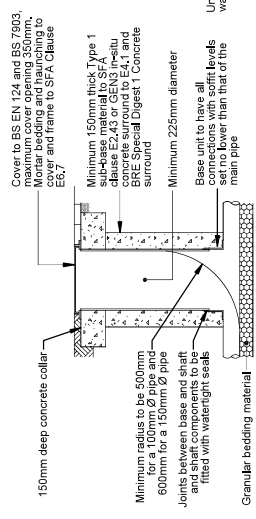
Typical control chamber
(Design to be specified by manufacturer)



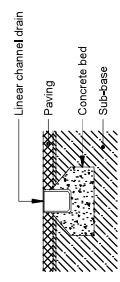
Typical base layout of Type 3 chambers



Typical Rain Water Harvest Butt



Typical Inspection Chamber
(Driveways, paved areas)



Typical linear drain

Rev:	Date:	Detail:	Drawn:	Checked:
1	11.01.25	Initial Issue	DS	WW
Client: Cherry Tree Developments Limited				
Project: Britannia Road				
Drawing Title: Cross Sections				
Drawn By:	Checked By:	Date:	Status:	Scale:
DS	WW	Jan 2025	Preliminary	As shown
Drawn No:	Drawing No:	Issue:	P01	
77823_102				

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.010	5.00	107.550	600	410821.587	415791.593	0.750
2	0.006	5.00	107.340	600	410827.596	415780.392	0.825
3	0.008	5.00	107.550	600	410833.040	415797.784	0.750
4	0.006	5.00	107.230	600	410839.264	415786.926	0.825
5	0.008	5.00	107.550	600	410835.838	415798.647	0.750
6	0.006	5.00	107.200	600	410842.116	415788.513	0.825
7	0.011	5.00	107.330	600	410846.821	415808.737	0.750
8	0.006	5.00	107.050	600	410853.918	415795.216	0.825
9	0.011	5.00	107.330	600	410849.024	415809.482	0.750
10	0.006	5.00	107.000	600	410856.746	415796.789	0.825
11	0.010	5.00	107.180	600	410861.079	415816.476	0.750
12	0.007	5.00	106.850	600	410867.894	415803.010	0.825
13	0.010	5.00	107.180	600	410863.728	415817.607	0.750
14	0.007	5.00	106.800	600	410871.495	415805.034	0.825
15	0.010	5.00	106.920	600	410875.812	415824.692	0.750
16	0.009	5.00	106.600	600	410883.044	415811.493	1.300
17	0.009	5.00	106.670	600	410883.313	415827.579	0.750
18	0.007	5.00	106.360	1200	410890.753	415815.750	1.800
18_OUT			106.060	600	410895.456	415811.582	1.800

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	12.711	0.600	106.800	106.590	0.210	60.5	150	5.16	47.0
1.001	2	4	13.373	0.600	106.515	106.405	0.110	121.6	225	5.35	46.3
2.000	3	4	12.515	0.600	106.800	106.480	0.320	39.1	150	5.13	47.2
1.002	4	6	3.264	0.600	106.405	106.375	0.030	108.8	225	5.40	46.1
3.000	5	6	11.921	0.600	106.800	106.450	0.350	34.1	150	5.11	47.2
1.003	6	8	13.573	0.600	106.375	106.225	0.150	90.5	225	5.56	45.5
4.000	7	8	15.270	0.600	106.580	106.300	0.280	54.5	150	5.19	47.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.295	22.9	1.3	0.600	0.600	0.010	0.0	24	0.702
1.001	1.184	47.1	2.0	0.600	0.600	0.016	0.0	31	0.588
2.000	1.614	28.5	1.0	0.600	0.600	0.008	0.0	20	0.766
1.002	1.253	49.8	3.8	0.600	0.600	0.030	0.0	42	0.744
3.000	1.730	30.6	1.0	0.600	0.600	0.008	0.0	19	0.806
1.003	1.375	54.7	5.4	0.600	0.600	0.044	0.0	48	0.886
4.000	1.365	24.1	1.4	0.600	0.600	0.011	0.0	24	0.740

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.004	8	10	3.236	0.600	106.225	106.175	0.050	64.7	225	5.59	45.4
5.000	9	10	14.857	0.600	106.580	106.250	0.330	45.0	150	5.16	47.0
1.005	10	12	12.766	0.600	106.175	106.025	0.150	85.1	225	5.74	44.8
6.000	11	12	15.092	0.600	106.430	106.100	0.330	45.7	150	5.17	47.0
1.006	12	14	4.131	0.600	106.025	105.975	0.050	82.6	225	5.79	44.6
7.000	13	14	14.779	0.600	106.430	106.050	0.380	38.9	150	5.15	47.1
1.007	14	16	13.232	0.600	105.975	105.375	0.600	22.1	225	5.87	44.3
8.000	15	16	15.050	0.600	106.170	105.375	0.795	18.9	150	5.11	47.3
1.008	16	18	8.806	0.600	105.300	104.800	0.500	17.6	225	5.92	44.1
9.000	17	18	13.974	0.600	105.920	104.560	1.360	10.3	150	5.07	47.4
1.009	18	18_OUT	6.284	0.600	104.560	104.260	0.300	20.9	225	5.95	44.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.004	1.628	64.7	7.5	0.600	0.600	0.061	0.0	51	1.094
5.000	1.503	26.6	1.4	0.600	0.600	0.011	0.0	23	0.791
1.005	1.418	56.4	9.5	0.600	0.600	0.078	0.0	62	1.058
6.000	1.492	26.4	1.3	0.600	0.600	0.010	0.0	23	0.773
1.006	1.439	57.2	11.5	0.600	0.600	0.095	0.0	68	1.130
7.000	1.618	28.6	1.3	0.600	0.600	0.010	0.0	21	0.811
1.007	2.798	111.2	13.4	0.600	1.000	0.112	0.0	52	1.901
8.000	2.325	41.1	1.3	0.600	1.075	0.010	0.0	18	1.042
1.008	3.132	124.5	15.7	1.075	1.335	0.131	0.0	53	2.149
9.000	3.161	55.9	1.2	0.600	1.650	0.009	0.0	15	1.263
1.009	2.871	114.2	17.5	1.575	1.575	0.147	0.0	59	2.094

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	✓	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	45	0	0

Node 18 Online Hydro-Brake® Control

Flap Valve	x	Objective (HE)	Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	104.560	Product Number	CTL-SHE-0079-3000-1200-3000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.0	Min Node Diameter (mm)	1200

Node 18 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	104.560
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	312

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	64.0	0.0	1.200	64.0	0.0	1.201	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 97.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	106.824	0.024	1.3	0.0134	0.0000	OK
15 minute winter	2	10	106.547	0.032	2.1	0.0135	0.0000	OK
15 minute winter	3	10	106.819	0.019	1.0	0.0095	0.0000	OK
15 minute winter	4	11	106.451	0.046	3.8	0.0197	0.0000	OK
15 minute winter	5	10	106.819	0.019	1.0	0.0092	0.0000	OK
15 minute winter	6	11	106.423	0.048	5.4	0.0205	0.0000	OK
15 minute winter	7	10	106.605	0.025	1.4	0.0142	0.0000	OK
15 minute winter	8	11	106.285	0.060	7.4	0.0256	0.0000	OK
15 minute winter	9	10	106.604	0.023	1.4	0.0135	0.0000	OK
15 minute winter	10	11	106.240	0.065	9.6	0.0278	0.0000	OK
15 minute winter	11	10	106.453	0.023	1.3	0.0125	0.0000	OK
15 minute winter	12	11	106.102	0.077	11.7	0.0348	0.0000	OK
15 minute winter	13	10	106.452	0.022	1.3	0.0120	0.0000	OK
15 minute winter	14	11	106.031	0.056	13.8	0.0253	0.0000	OK
15 minute winter	15	10	106.188	0.018	1.3	0.0101	0.0000	OK
15 minute winter	16	11	105.359	0.058	16.2	0.0246	0.0000	OK
15 minute winter	17	11	105.935	0.015	1.1	0.0077	0.0000	OK
180 minute winter	18	124	104.747	0.187	5.7	11.5657	0.0000	OK
15 minute summer	18_OUT	1	104.260	0.000	2.3	0.0000	0.0000	OK

Link Event (Velocity)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	1.3	0.689	0.055	0.0232	
15 minute winter	2	1.001	4	2.0	0.441	0.043	0.0614	
15 minute winter	3	2.000	4	1.0	0.743	0.034	0.0162	
15 minute winter	4	1.002	6	3.7	0.615	0.074	0.0196	
15 minute winter	5	3.000	6	1.0	0.780	0.032	0.0148	
15 minute winter	6	1.003	8	5.4	0.742	0.099	0.0992	
15 minute winter	7	4.000	8	1.4	0.732	0.056	0.0283	
15 minute winter	8	1.004	10	7.5	0.841	0.116	0.0290	
15 minute winter	9	5.000	10	1.4	0.784	0.051	0.0258	
15 minute winter	10	1.005	12	9.6	0.901	0.171	0.1368	
15 minute winter	11	6.000	12	1.3	0.762	0.048	0.0249	
15 minute winter	12	1.006	14	11.7	1.203	0.205	0.0406	
15 minute winter	13	7.000	14	1.3	0.808	0.044	0.0231	
15 minute winter	14	1.007	16	13.8	1.862	0.124	0.0983	
15 minute winter	15	8.000	16	1.3	1.043	0.031	0.0183	
15 minute winter	16	1.008	18	16.2	2.075	0.130	0.0687	
15 minute winter	17	9.000	18	1.1	1.272	0.020	0.0986	
180 minute winter	18	Hydro-Brake®	18_OUT	2.7				25.8

Results for 30 year Critical Storm Duration. Lowest mass balance: 97.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	106.839	0.039	3.2	0.0213	0.0000	OK
15 minute winter	2	10	106.564	0.049	5.0	0.0210	0.0000	OK
15 minute winter	3	10	106.831	0.031	2.6	0.0154	0.0000	OK
15 minute winter	4	10	106.484	0.079	9.4	0.0338	0.0000	OK
15 minute winter	5	10	106.830	0.030	2.6	0.0149	0.0000	OK
15 minute winter	6	10	106.456	0.081	13.7	0.0345	0.0000	OK
15 minute winter	7	10	106.619	0.039	3.5	0.0226	0.0000	OK
15 minute winter	8	11	106.332	0.107	18.9	0.0459	0.0000	OK
15 minute winter	9	10	106.618	0.037	3.5	0.0216	0.0000	OK
15 minute winter	10	11	106.288	0.113	24.1	0.0482	0.0000	OK
15 minute winter	11	10	106.465	0.035	3.2	0.0193	0.0000	OK
15 minute winter	12	11	106.156	0.131	29.4	0.0592	0.0000	OK
15 minute winter	13	10	106.464	0.034	3.2	0.0189	0.0000	OK
15 minute winter	14	11	106.068	0.093	34.7	0.0421	0.0000	OK
15 minute winter	15	10	106.199	0.029	3.2	0.0158	0.0000	OK
15 minute winter	16	11	105.399	0.099	40.6	0.0417	0.0000	OK
15 minute winter	17	10	105.943	0.023	2.9	0.0121	0.0000	OK
240 minute winter	18	184	105.075	0.515	10.3	31.9374	0.0000	SURCHARGED
15 minute summer	18_OUT	1	104.260	0.000	2.9	0.0000	0.0000	OK

Link Event (Velocity)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	3.1	0.893	0.137	0.0447	
15 minute winter	2	1.001	4	5.0	0.536	0.106	0.1258	
15 minute winter	3	2.000	4	2.5	0.985	0.089	0.0324	
15 minute winter	4	1.002	6	9.3	0.741	0.186	0.0411	
15 minute winter	5	3.000	6	2.6	1.035	0.083	0.0294	
15 minute winter	6	1.003	8	13.7	0.874	0.250	0.2127	
15 minute winter	7	4.000	8	3.4	0.954	0.143	0.0550	
15 minute winter	8	1.004	10	19.0	0.986	0.293	0.0623	
15 minute winter	9	5.000	10	3.4	1.021	0.130	0.0502	
15 minute winter	10	1.005	12	24.3	1.109	0.431	0.2797	
30 minute summer	11	6.000	12	2.8	0.921	0.106	0.0584	
15 minute winter	12	1.006	14	29.6	1.500	0.517	0.0815	
15 minute winter	13	7.000	14	3.1	1.051	0.110	0.0442	
15 minute winter	14	1.007	16	34.8	2.365	0.313	0.1949	
15 minute winter	15	8.000	16	3.2	1.361	0.077	0.0349	
15 minute winter	16	1.008	18	40.6	2.605	0.326	0.1374	
15 minute winter	17	9.000	18	2.9	1.421	0.051	0.1346	
240 minute winter	18	Hydro-Brake®	18_OUT	2.9				58.1

Results for 100 year Critical Storm Duration. Lowest mass balance: 97.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	106.844	0.044	4.0	0.0239	0.0000	OK
15 minute winter	2	10	106.570	0.055	6.3	0.0236	0.0000	OK
15 minute winter	3	10	106.835	0.035	3.2	0.0172	0.0000	OK
15 minute winter	4	10	106.496	0.091	11.8	0.0390	0.0000	OK
15 minute winter	5	10	106.834	0.034	3.2	0.0166	0.0000	OK
15 minute winter	6	10	106.468	0.093	17.2	0.0396	0.0000	OK
15 minute winter	7	10	106.624	0.044	4.4	0.0251	0.0000	OK
15 minute winter	8	11	106.351	0.126	23.9	0.0540	0.0000	OK
15 minute winter	9	10	106.621	0.041	4.4	0.0237	0.0000	OK
15 minute winter	10	11	106.307	0.132	30.4	0.0565	0.0000	OK
15 minute winter	11	10	106.469	0.039	4.0	0.0216	0.0000	OK
15 minute winter	12	11	106.177	0.151	37.1	0.0685	0.0000	OK
15 minute winter	13	10	106.469	0.039	4.0	0.0213	0.0000	OK
15 minute winter	14	11	106.082	0.107	43.8	0.0484	0.0000	OK
15 minute winter	15	10	106.202	0.032	4.0	0.0173	0.0000	OK
15 minute winter	16	11	105.415	0.115	51.2	0.0483	0.0000	OK
15 minute winter	17	10	105.946	0.026	3.6	0.0135	0.0000	OK
180 minute winter	18	172	105.287	0.727	15.5	45.0939	0.0000	SURCHARGED
15 minute summer	18_OUT	1	104.260	0.000	2.9	0.0000	0.0000	OK

Link Event (Velocity)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	3.9	0.952	0.172	0.0527	
15 minute winter	2	1.001	4	6.3	0.562	0.134	0.1512	
15 minute winter	3	2.000	4	3.2	1.046	0.110	0.0377	
15 minute winter	4	1.002	6	11.7	0.772	0.235	0.0497	
15 minute winter	5	3.000	6	3.2	1.100	0.103	0.0342	
15 minute winter	6	1.003	8	17.1	0.899	0.314	0.2592	
15 minute winter	7	4.000	8	4.4	0.993	0.182	0.0721	
15 minute winter	8	1.004	10	23.9	1.014	0.369	0.0762	
15 minute summer	9	5.000	10	4.2	1.025	0.157	0.0688	
15 minute winter	10	1.005	12	30.6	1.161	0.542	0.3358	
15 minute summer	11	6.000	12	3.8	0.941	0.144	0.0901	
15 minute winter	12	1.006	14	37.3	1.579	0.651	0.0972	
15 minute winter	13	7.000	14	3.9	1.120	0.138	0.0521	
15 minute winter	14	1.007	16	43.9	2.499	0.395	0.2327	
15 minute winter	15	8.000	16	4.0	1.419	0.097	0.0478	
15 minute winter	16	1.008	18	51.3	2.742	0.412	0.1646	
15 minute summer	17	9.000	18	3.4	1.469	0.061	0.1363	
180 minute winter	18	Hydro-Brake®	18_OUT	2.9				61.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 97.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	1	10	106.853	0.053	5.8	0.0293	0.0000	OK
15 minute winter	2	10	106.582	0.067	9.2	0.0286	0.0000	OK
15 minute winter	3	10	106.842	0.042	4.7	0.0210	0.0000	OK
15 minute winter	4	10	106.521	0.116	17.3	0.0495	0.0000	OK
15 minute winter	5	10	106.841	0.041	4.7	0.0203	0.0000	OK
15 minute winter	6	10	106.490	0.115	25.3	0.0493	0.0000	OK
15 minute winter	7	10	106.633	0.052	6.4	0.0302	0.0000	OK
15 minute winter	8	11	106.395	0.170	34.9	0.0726	0.0000	OK
15 minute winter	9	10	106.630	0.050	6.4	0.0287	0.0000	OK
15 minute winter	10	11	106.352	0.177	44.1	0.0756	0.0000	OK
15 minute winter	11	10	106.478	0.048	5.8	0.0261	0.0000	OK
15 minute winter	12	11	106.223	0.198	53.7	0.0896	0.0000	OK
15 minute winter	13	10	106.476	0.046	5.8	0.0251	0.0000	OK
15 minute winter	14	11	106.111	0.136	63.3	0.0616	0.0000	OK
15 minute winter	15	10	106.208	0.038	5.8	0.0209	0.0000	OK
480 minute winter	16	360	105.714	0.414	10.6	0.1743	0.0000	SURCHARGED
15 minute winter	17	10	105.951	0.031	5.2	0.0162	0.0000	OK
480 minute winter	18	360	105.714	1.154	11.9	71.5345	0.0000	SURCHARGED
15 minute summer	18_OUT	1	104.260	0.000	2.9	0.0000	0.0000	OK

Link Event (Velocity)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	1	1.000	2	5.7	1.051	0.250	0.0693	
15 minute winter	2	1.001	4	9.2	0.607	0.194	0.2033	
15 minute winter	3	2.000	4	4.6	1.164	0.163	0.0498	
15 minute winter	4	1.002	6	17.1	0.839	0.343	0.0669	
15 minute winter	5	3.000	6	4.7	1.215	0.153	0.0458	
15 minute winter	6	1.003	8	25.0	0.954	0.458	0.3545	
15 minute summer	7	4.000	8	6.1	1.006	0.251	0.1209	
15 minute winter	8	1.004	10	34.7	1.058	0.536	0.1061	
15 minute summer	9	5.000	10	6.1	1.054	0.228	0.1224	
15 minute winter	10	1.005	12	44.4	1.256	0.787	0.4500	
30 minute summer	11	6.000	12	5.2	0.918	0.197	0.1374	
15 minute winter	12	1.006	14	54.0	1.705	0.943	0.1285	
15 minute summer	13	7.000	14	5.5	1.193	0.192	0.0771	
15 minute winter	14	1.007	16	63.5	2.706	0.571	0.3103	
15 minute summer	15	8.000	16	5.5	1.450	0.133	0.0838	
15 minute winter	16	1.008	18	74.1	2.948	0.595	0.2571	
15 minute winter	17	9.000	18	5.2	1.648	0.093	0.1412	
480 minute winter	18	Hydro-Brake®	18_OUT	2.9				104.6