

Column: 6m Valmont or ALC aluminium with planted root
Lantern: Post top mounted Urbis Ampera Mini LED lantern with 8 LEDs
AMPERA MINI - 5118 - 8 LED - NW 4000K - 500mA - 14.2W
Tilt: 0 degrees (no tilt)
Other: Integral driver, NEMA socket

Manhole S30
MD-SHE-0243-3270-1220-3270
Head 1.22m Flow 32.7l/s

Manhole S63
MD-SHE-0182-1700-1200-1700
Head 1.20m Flow 17l/s

Manhole S5
SXH172
Head 2.20m Flow 25.0l/s

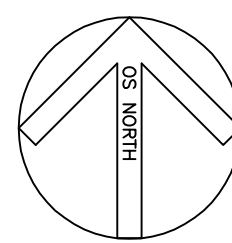
FL 79.10**
Floor levels taken from 'Mill Hill
3rd phase site plan.DXF

FL 79.10
Floor levels based on new design
subject to part M check and
private drainage design.

LEVEL- Related to Ordnance Survey by connection to the OS Active Network by G.P.S

GRID- Related to Ordnance Survey using One Point Localisation on Station S1. Orientation as OS Grid North.

FLOOR LEVELS ARE PRELIMINARY



A. Storage revised to D1800mm, high vertical alignment	22-5-17
B. Main sewer network revised, Tubisader storage added, FW and effluent relocated, TW sewers revised, floor levels added, Skeletal private drainage added, rising main RW and effluent relocated	8-8-17
C. S85 hydrobrake revised	8-8-17
D. Foul water pump station revised position	4-9-17
E. Revised for section 104/38 submission	15-12-17
F. Revisions to 85-102 revised and updated for section 104 & 38 submission	18-4-19
G. Indicative layout added for northern part of the development. Existing and proposed sewer routes added following meeting with the Council	17-10-19
H. Full redesign in line with Alpha Design No1	17-10-19
I. Private drainage added, storage tank No1 volume and position added	11-11-19
K. Details/revisions for section 104 submission	28-11-19
L. Revised following UU comment 28-11-19	2-12-19
M. Posing clarified	16-7-20
N. UU referenced	8-8-20
P. Full finalised sewer layout	14-8-21
Q. Surface water storage basin	25-8-21
R. Holes 13-14	11-10-21
R. Forbay added to basin	16-12-21
S. Street lighting added	16-12-21
T. Sewer 102 increased to D525, impermeable cover to true ories	22-2-22



R.A.B.
ENGINEERING
DESIGN LTD

12 BERRY HOLME CLOSE
SHEFFIELD S35 1AB
TEL.(0114)2464871

High Grange Developments Ltd

Mill Hill, Cleator Moor
Engineering Layout 15-64 & 80-133
Impermeable areas

DRAWN BY rab

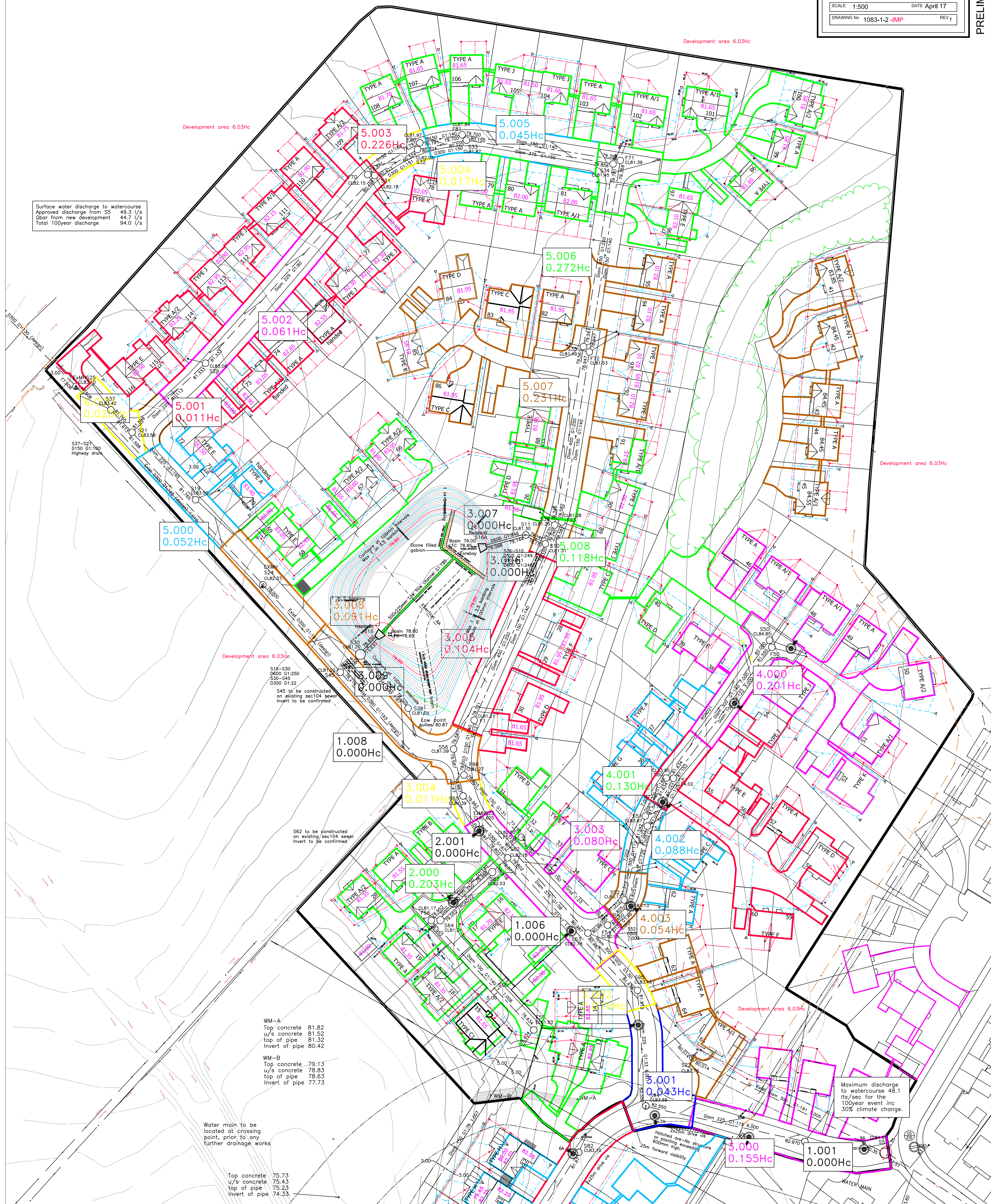
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DRAWING No 108

DATE April 17

REV T

PRELIMINARY ONLY



Technical Specification

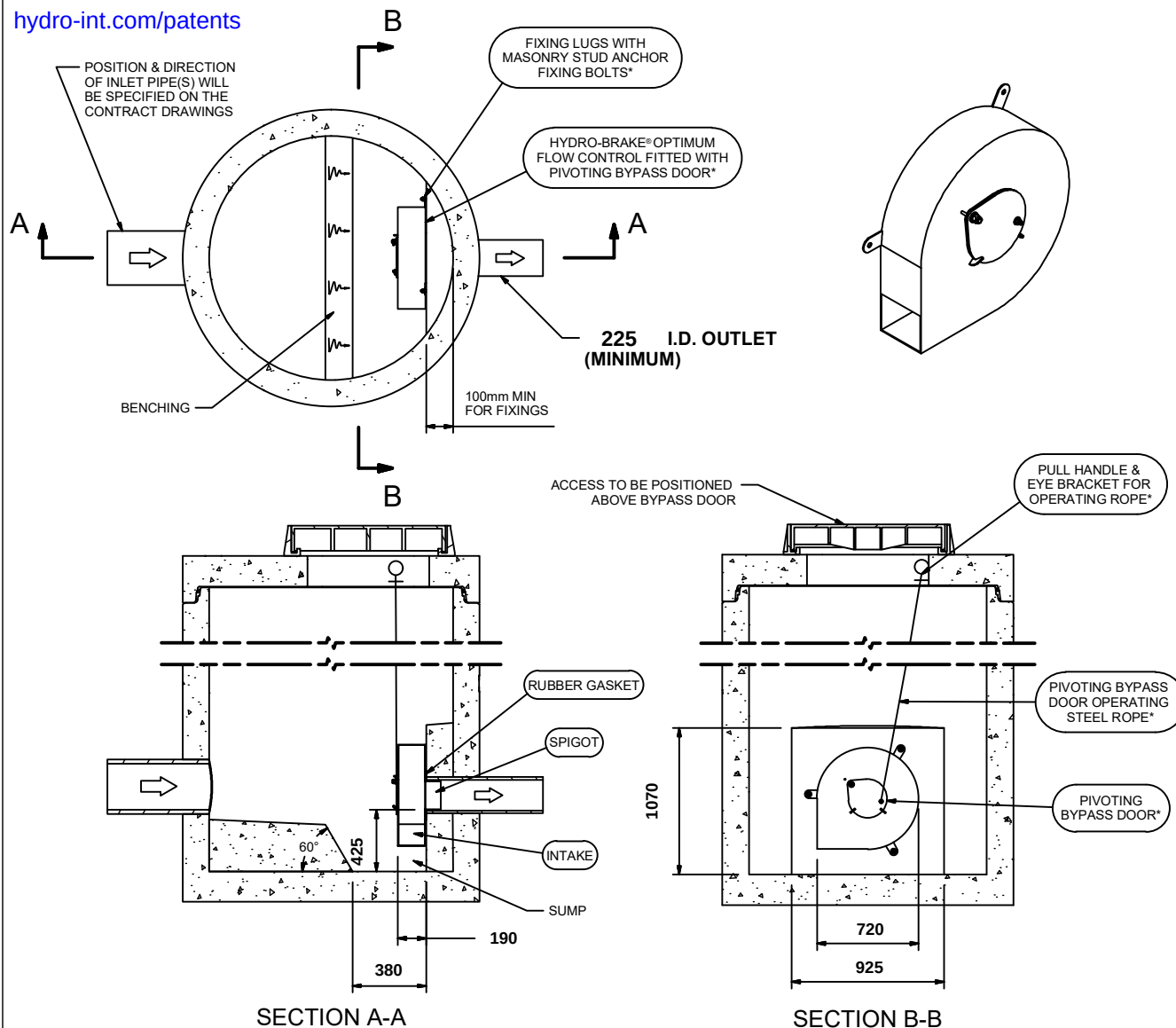
Control Point	Head (m)	Flow (l/s)
Primary Design	1.200	17.000
Flush-Flo™	0.368	16.987
Kick-Flo®	0.814	14.144
Mean Flow		14.562

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet



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IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW
 CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE



The head/flow characteristics of this SHE-0182-1700-1200-1700 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International®

DATE 9/20/2021 8:53 AM

SITE mill hill

DESIGNER richard bland

REF 5.001

SHE-0182-1700-1200-1700

Hydro-Brake® Optimum

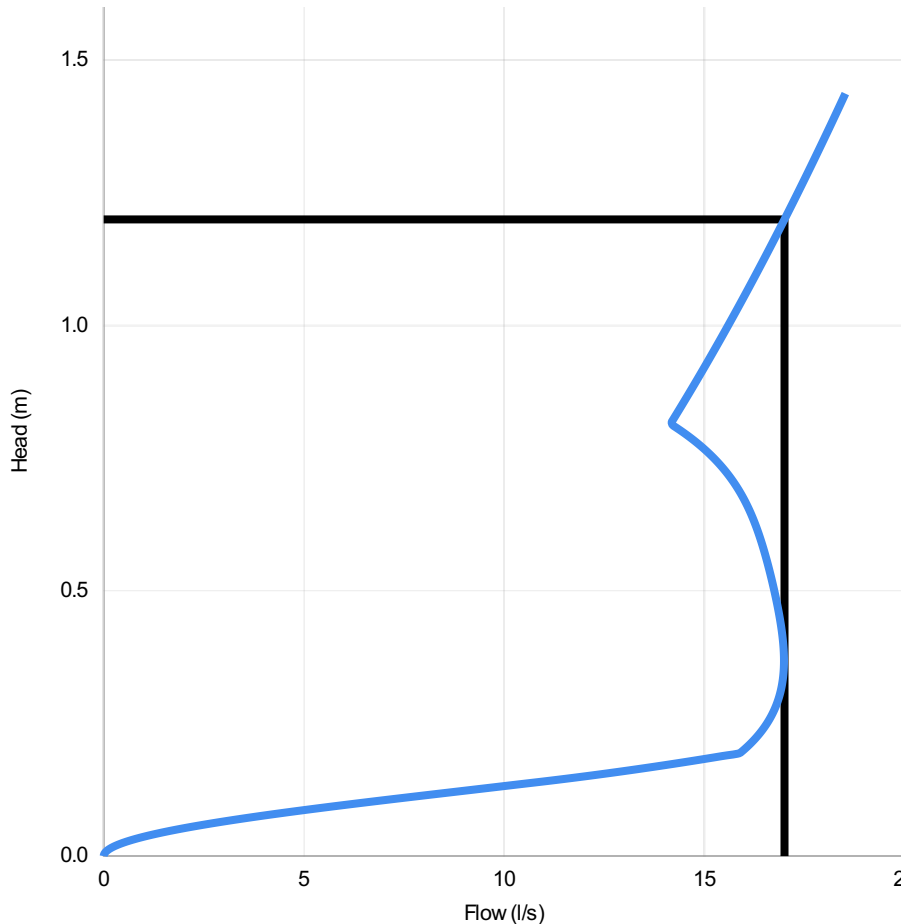
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.200	17.000
Flush-Flo	0.368	16.987
Kick-Flo®	0.814	14.144
Mean Flow		14.562



PT/329/0412

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Head (m)	Flow (l/s)
0.000	0.000
0.041	1.268
0.083	4.603
0.124	9.109
0.166	13.480
0.207	16.080
0.248	16.546
0.290	16.820
0.331	16.954
0.372	16.987
0.414	16.949
0.455	16.867
0.497	16.756
0.538	16.625
0.579	16.475
0.621	16.293
0.662	16.059
0.703	15.742
0.745	15.302
0.786	14.693
0.828	14.258
0.869	14.590
0.910	14.915
0.952	15.231
0.993	15.541
1.034	15.844
1.076	16.141
1.117	16.433
1.159	16.719
1.200	16.999

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Hydro
International

DATE 20/09/2021 08:53

Site mill hill

DESIGNER richard bland

Ref 5.001

SHE-0182-1700-1200-1700

Hydro-Brake Optimum®

Technical Specification

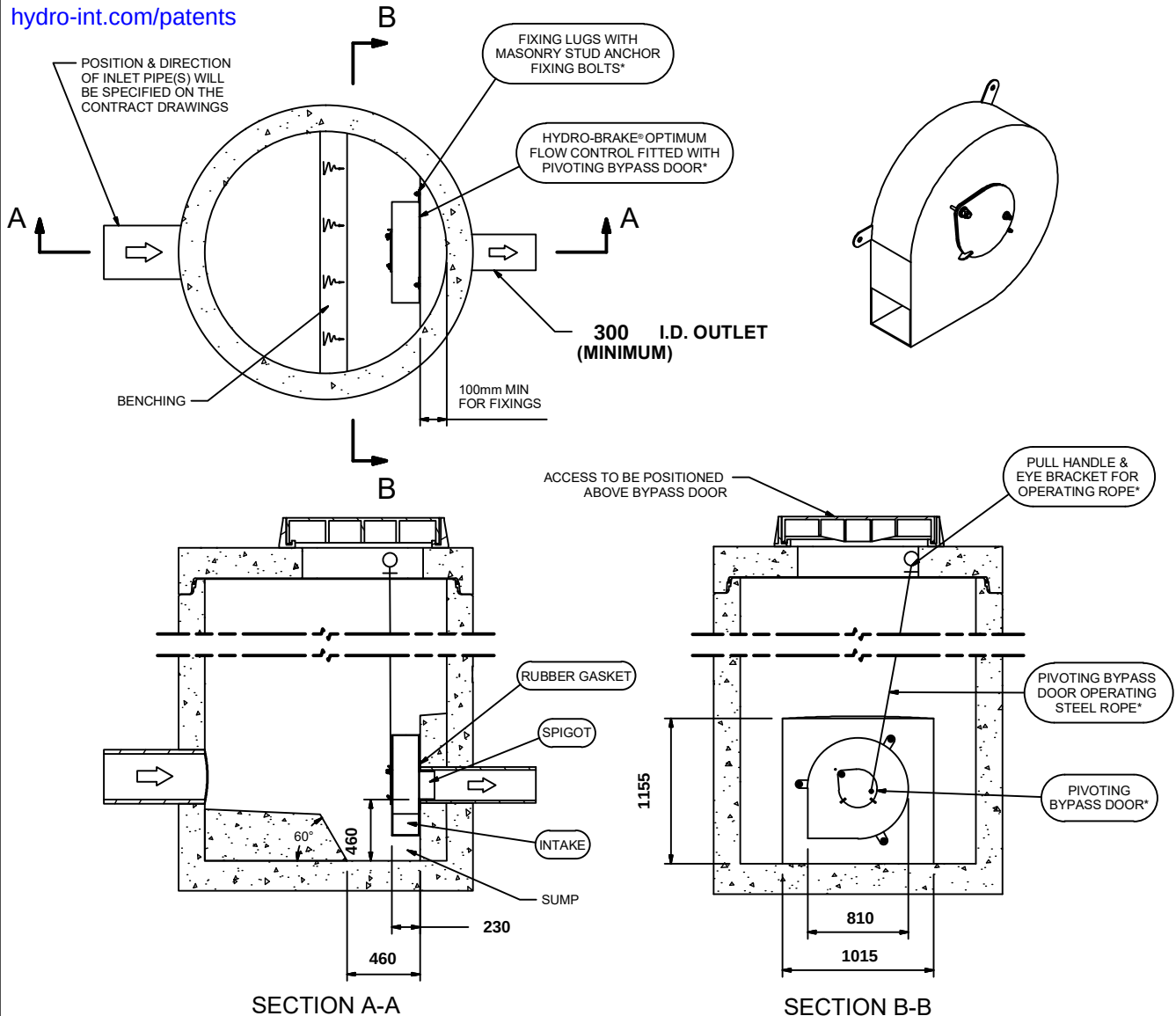
Control Point	Head (m)	Flow (l/s)
Primary Design	1.220	27.000
Flush-Flo™	0.397	26.964
Kick-Flo®	0.859	22.842
Mean Flow		22.848

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet



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 CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

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DESIGN ADVICE



The head/flow characteristics of this SHE-0223-2700-1220-2700 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
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Hydro
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DATE 2/22/2022 4:38 PM

SITE

DESIGNER richard bland

REF highgrange

SHE-0223-2700-1220-2700

Hydro-Brake® Optimum

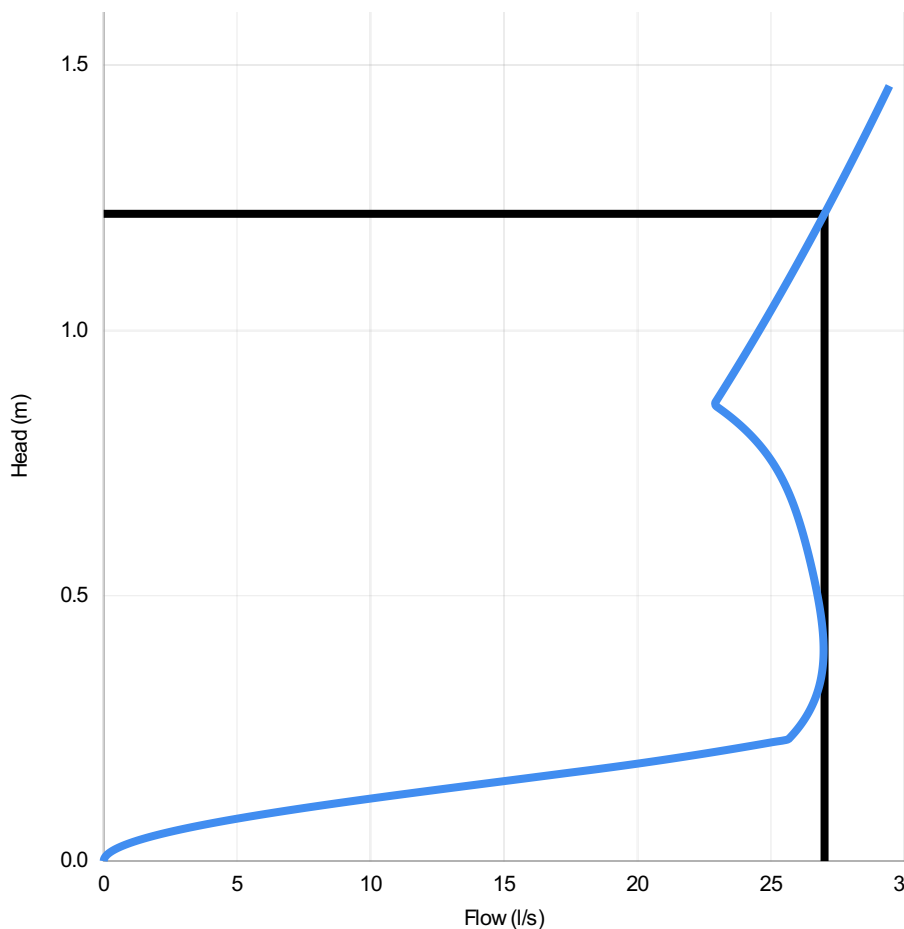
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.220	27.000
Flush-Flo	0.397	26.964
Kick-Flo®	0.859	22.842
Mean Flow		22.848



PT/329/0412

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Head (m)	Flow (l/s)
0.000	0.000
0.042	1.478
0.084	5.482
0.126	11.232
0.168	17.702
0.210	23.440
0.252	26.039
0.294	26.547
0.337	26.833
0.379	26.952
0.421	26.950
0.463	26.863
0.505	26.722
0.547	26.545
0.589	26.342
0.631	26.109
0.673	25.828
0.715	25.465
0.757	24.975
0.799	24.300
0.841	23.372
0.883	23.146
0.926	23.664
0.968	24.171
1.010	24.666
1.052	25.151
1.094	25.626
1.136	26.091
1.178	26.549
1.220	26.997

DESIGN ADVICE



The head/flow characteristics of this SHE-0223-2700-1220-2700 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

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Hydro
International

DATE 22/02/2022 16:38

Site

DESIGNER richard bland

Ref highgrange

SHE-0223-2700-1220-2700

Hydro-Brake Optimum®

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12 Berry Holm Close Sheffield S35 1AB	Highgrange developments New development only 50% additional flow	
Date 22/02/2022 16:14 File New development only 22...	Designed by RAB Checked by	
XP Solutions	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for NETWORK1 FULL SYSTEM 11-8-21.SWS

- Indicates pipe length does not match coordinates
« - Indicates pipe capacity < flow

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
1.000	81.127	1.212	66.9	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	21.035	0.084	250.4	0.166	5.00	0.0	0.600	o	1050	Pipe/Conduit	
2.001	6.172	0.041	150.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	13.735	0.205	67.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	60.548	0.371	163.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	48.450	0.420	115.4	0.155	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	34.444	1.037	33.2	0.043	0.00	0.0	0.600	o	225	Pipe/Conduit	
3.002	22.530	0.451	50.0	0.016	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.000	51.221	0.366	139.9	0.201	5.00	0.0	0.600	o	300	Pipe/Conduit	
4.001	12.898	0.092	140.2	0.130	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	25.684	0.230	111.7	0.088	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	14.656	0.325	45.1	0.054	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.003	55.115	0.950	58.0	0.080	0.00	0.0	0.600	o	375	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	33.70	5.70	80.014	0.000	0.0	0.0	0.0	1.92	136.0	0.0
2.000	35.00	5.16	79.052	0.166	0.0	0.0	7.9	2.17	1881.8	23.6
2.001	34.76	5.26	78.918	0.166	0.0	0.0	7.9	1.06	42.3	23.6
1.001	33.43	5.82	78.802	0.166	0.0	0.0	7.9	1.92	136.0	23.6
1.002	31.69	6.64	78.587	0.166	0.0	0.0	7.9	1.23	86.9	23.6
3.000	33.79	5.66	82.970	0.155	0.0	0.0	7.1	1.22	48.4	21.3
3.001	33.22	5.92	82.550	0.198	0.0	0.0	8.9	2.28	90.6	26.7
3.002	32.84	6.08	81.438	0.214	0.0	0.0	9.5	2.23	157.6	28.6
4.000	33.84	5.64	82.000	0.201	0.0	0.0	9.2	1.33	93.8	27.6
4.001	33.46	5.81	81.634	0.331	0.0	0.0	15.0	1.33	93.7	45.0
4.002	32.83	6.09	81.542	0.419	0.0	0.0	18.6	1.49	105.1	55.9
4.003	32.60	6.20	81.312	0.473	0.0	0.0	20.9	2.35	165.9	62.6
3.003	31.81	6.58	80.912	0.767	0.0	0.0	33.0	2.38	263.2	99.1

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12 Berry Holm Close Sheffield S35 1AB	Highgrange developments New development only 50% additional flow	
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XP Solutions	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for NETWORK1 FULL SYSTEM 11-8-21.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	Auto Design
3.004	14.238	0.300	47.5	0.011	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.005	66.860	0.267	250.4	0.104	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.000	27.494	0.167	164.6	0.052	5.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	9.200	0.092	100.0	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	29.995	0.265	113.2	0.011	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.002	75.108	0.835	89.9	0.061	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.003	14.904	0.099	150.5	0.226	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.004	14.821	0.099	149.7	0.017	0.00	0.0	0.600	o	300	Pipe/Conduit	
5.005	44.158	0.294	150.2	0.045	0.00	0.0	0.600	o	375	Pipe/Conduit	
5.006	55.019	0.220	250.1	0.272	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.007	53.724	0.215	249.9	0.231	0.00	0.0	0.600	o	450	Pipe/Conduit	
5.008	6.219	0.025	248.8	0.118	0.00	0.0	0.600	o	525	Pipe/Conduit	
3.006	6.398	0.026	246.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.007	11.124#	0.044	252.8	0.091	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.008	5.010#	0.020	249.5	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
3.009	8.035	0.364	22.1	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)
3.004	31.65	6.66	79.887	0.778	0.0	0.0	33.3	2.96	470.3	100.0
3.005	30.03	7.53	79.587	0.882	0.0	0.0	35.9	1.28	203.6	107.6
5.000	34.29	5.45	81.765	0.052	0.0	0.0	2.4	1.02	40.4	7.2
6.000	35.02	5.15	81.765	0.020	0.0	0.0	0.9	1.00	17.8	2.8
5.001	33.34	5.86	81.598	0.083	0.0	0.0	3.7	1.23	48.8	11.2
5.002	31.45	6.77	81.333	0.144	0.0	0.0	6.1	1.38	54.8	18.4
5.003	31.07	6.96	80.423	0.370	0.0	0.0	15.6	1.28	90.4	46.7
5.004	30.71	7.15	80.324	0.387	0.0	0.0	16.1	1.28	90.7	48.3
5.005	29.83	7.65	80.150	0.432	0.0	0.0	17.5	1.48	163.0	52.4
5.006	28.67	8.37	79.781	0.704	0.0	0.0	27.3	1.28	203.7	82.0
5.007	27.64	9.07	79.561	0.935	0.0	0.0	35.0	1.28	203.8	105.0
5.008	27.54	9.14	79.271	1.053	0.0	0.0	39.3	1.42	306.4	117.8
3.006	27.44	9.21	79.170	1.935	0.0	0.0	71.9	1.55	437.7	215.7
3.007	27.28	9.33	79.144	2.026	0.0	0.0	74.8	1.53	431.7	224.5
3.008	27.20	9.38	78.650	2.026	0.0	0.0	74.8	1.54	434.6	224.5
3.009	27.15	9.42	78.580	2.026	0.0	0.0	74.8	3.36	237.6	224.5

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XP Solutions	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for NETWORK1 FULL SYSTEM 11-8-21.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	Auto Design
1.003	34.722	0.216	160.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.004	81.040	0.492	164.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.005	41.776	0.321	130.1	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	32.586	2.778	11.7	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.007	32.586	3.977	8.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	49.999	0.500	100.0	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)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.003	26.54	9.89	78.216	2.192	0.0	0.0	78.8	1.24	87.5«	236.3
1.004	25.22	11.00	78.000	2.192	0.0	0.0	78.8	1.22	86.4«	236.3
1.005	24.67	11.50	77.508	2.192	0.0	0.0	78.8	1.38	97.3«	236.3
1.006	24.54	11.62	77.187	2.192	0.0	0.0	78.8	4.62	326.2	236.3
1.007	24.44	11.72	74.409	2.192	0.0	0.0	78.8	5.52	390.5	236.3
1.008	23.91	12.25	70.432	2.192	0.0	0.0	78.8	1.57	111.1«	236.3

Simulation Criteria for NETWORK1 FULL SYSTEM 11-8-21.SWS

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	50.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

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)	16.000	Storm Duration (mins)	15
Ratio R	0.261		

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XP Solutions	Network 2019.1	

Online Controls for NETWORK1 FULL SYSTEM 11-8-21.SWS

Hydro-Brake® Optimum Manhole: 63, DS/PN: 2.001, Volume (m³): 27.3

Unit Reference	MD-SHE-0182-1700-1200-1700
Design Head (m)	1.200
Design Flow (l/s)	17.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	182
Invert Level (m)	78.918
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	17.0
Flush-Flo™	0.368	17.0
Kick-Flo®	0.814	14.1
Mean Flow over Head Range	-	14.6

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)
0.100	6.4	1.200	17.0	3.000	26.3	7.000	39.6
0.200	16.0	1.400	18.3	3.500	28.3	7.500	40.9
0.300	16.9	1.600	19.5	4.000	30.2	8.000	42.2
0.400	17.0	1.800	20.6	4.500	32.0	8.500	43.5
0.500	16.7	2.000	21.7	5.000	33.7	9.000	44.7
0.600	16.4	2.200	22.7	5.500	35.2	9.500	45.9
0.800	14.4	2.400	23.7	6.000	36.8		
1.000	15.6	2.600	24.6	6.500	38.2		

Hydro-Brake® Optimum Manhole: 30, DS/PN: 3.009, Volume (m³): 8.6

Unit Reference	MD-SHE-0223-2700-1220-2700
Design Head (m)	1.220
Design Flow (l/s)	27.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	223
Invert Level (m)	78.580
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

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Hydro-Brake® Optimum Manhole: 30, DS/PN: 3.009, Volume (m³): 8.6

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.220	27.0
Flush-Flo™	0.397	27.0
Kick-Flo®	0.859	22.8
Mean Flow over Head Range	-	22.8

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	7.5	1.200	26.8	3.000	41.6	7.000	62.7
0.200	22.2	1.400	28.8	3.500	44.8	7.500	64.8
0.300	26.6	1.600	30.7	4.000	47.8	8.000	66.9
0.400	27.0	1.800	32.5	4.500	50.6	8.500	68.9
0.500	26.7	2.000	34.2	5.000	53.2	9.000	70.8
0.600	26.3	2.200	35.8	5.500	55.8	9.500	72.7
0.800	24.3	2.400	37.3	6.000	58.2		
1.000	24.6	2.600	38.8	6.500	60.5		

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Storage Structures for NETWORK1 FULL SYSTEM 11-8-21.SWS

Tank or Pond Manhole: 16, DS/PN: 3.008

Invert Level (m) 78.800

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	17.0	0.700	1189.0	1.400	1365.0	2.100	1365.0
0.100	396.0	0.800	1246.0	1.500	1365.0	2.200	1365.0
0.200	924.0	0.900	1305.0	1.600	1365.0	2.300	1365.0
0.300	974.0	1.000	1365.0	1.700	1365.0	2.400	1365.0
0.400	1026.0	1.100	1365.0	1.800	1365.0	2.500	1365.0
0.500	1080.0	1.200	1365.0	1.900	1365.0		
0.600	1133.0	1.300	1365.0	2.000	1365.0		

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12 Berry Holm Close Sheffield S35 1AB	Highgrange developments New development only 50% additional flow	
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Summary of Results for 30 minute 100 year Winter (NETWORK1 FULL SYSTEM
11-8-21.SWS)

Margin for Flood Risk Warning (mm) 200.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status OFF

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (1/s)	Flow (1/s)			
1.000	22	80.014	-0.300	0.000	0.00		0.0		OK	
2.000	64	80.320	0.218	0.000	0.05		57.4		SURCHARGED	
2.001	63	80.319	1.176	0.000	0.61		18.3		SURCHARGED	
1.001	62	78.883	-0.219	0.000	0.16		18.3		OK	
1.002	23	78.682	-0.205	0.000	0.22		18.2		OK	
3.000	80	83.436	0.241	0.000	1.25		57.7		SURCHARGED	
3.001	94	82.783	0.008	0.000	0.85		72.9		SURCHARGED	
3.002	95	82.186	0.448	0.000	0.53		74.3		SURCHARGED	
4.000	50	83.238	0.938	0.000	0.77		68.2		SURCHARGED	
4.001	60	83.021	1.087	0.000	1.44		109.7		SURCHARGED	
4.002	51	82.829	0.987	0.000	1.45		136.4		SURCHARGED	
4.003	52	82.373	0.761	0.000	1.09		150.3		SURCHARGED	
3.003	53	82.000	0.713	0.000	0.98		241.3		SURCHARGED	
3.004	55	81.085	0.748	0.000	0.79		242.8		SURCHARGED	
3.005	56	80.902	0.865	0.000	1.41		267.2		FLOOD RISK	
5.000	19	82.441	0.451	0.000	0.51		19.0		SURCHARGED	
6.000	37	82.422	0.507	0.000	0.52		8.1		SURCHARGED	
5.001	21	82.403	0.580	0.000	0.67		30.5		SURCHARGED	
5.002	29	82.334	0.776	0.000	0.85		45.4		SURCHARGED	
5.003	31	81.925	1.202	0.000	1.42		107.2		SURCHARGED	
5.004	32	81.727	1.103	0.000	1.47		111.7		SURCHARGED	
5.005	33	81.516	0.991	0.000	0.84		125.2		SURCHARGED	
5.006	34	81.314	1.083	0.000	1.13		210.3		FLOOD RISK	
5.007	35	81.023	1.012	0.000	1.51		281.8		SURCHARGED	
5.008	36	80.530	0.734	0.000	1.82		316.9		SURCHARGED	
3.006	10	80.361	0.591	0.000	2.42		574.1		SURCHARGED	
3.007	11	80.031	0.287	0.000	2.13		597.9		SURCHARGED	
3.008	16	79.441	0.191	0.000	0.28		59.5		SURCHARGED	
3.009	30	79.581	0.701	0.000	0.18		26.9		SURCHARGED	
1.003	45	78.374	-0.142	0.000	0.54		43.7		OK	
1.004	24	78.154	-0.146	0.000	0.52		43.5		OK	
1.005	25	77.654	-0.154	0.000	0.48		43.5		OK	
1.006	26	77.263	-0.224	0.000	0.15		43.5		OK	
1.007	10000	74.478	-0.231	0.000	0.12		43.5		OK	
1.008	28	70.566	-0.166	0.000	0.42		43.5		OK	

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XP Solutions	Network 2019.1	

Summary of Results for 120 minute 100 year Winter (NETWORK1 FULL SYSTEM
11-8-21.SWS)

Margin for Flood Risk Warning (mm) 200.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status OFF

PN	US/MH Name	Water	Surcharged	Flooded	Pipe		Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (1/s)	
1.000	22	80.014	-0.300	0.000	0.00	0.0	OK
2.000	64	79.941	-0.161	0.000	0.02	28.8	OK
2.001	63	79.929	0.786	0.000	0.57	16.9	SURCHARGED
1.001	62	78.879	-0.223	0.000	0.15	16.9	OK
1.002	23	78.679	-0.208	0.000	0.20	16.9	OK
3.000	80	83.097	-0.098	0.000	0.61	28.3	OK
3.001	94	82.652	-0.123	0.000	0.42	36.2	OK
3.002	95	81.546	-0.192	0.000	0.28	39.1	OK
4.000	50	82.135	-0.165	0.000	0.42	36.7	OK
4.001	60	81.838	-0.096	0.000	0.80	60.5	OK
4.002	51	81.749	-0.093	0.000	0.81	76.6	OK
4.003	52	81.484	-0.128	0.000	0.62	86.4	OK
3.003	53	81.116	-0.171	0.000	0.57	140.1	OK
3.004	55	80.101	-0.236	0.000	0.46	142.1	OK
3.005	56	80.048	0.011	0.000	0.84	158.9	SURCHARGED
5.000	19	81.842	-0.148	0.000	0.25	9.5	OK
6.000	37	81.814	-0.101	0.000	0.23	3.7	OK
5.001	21	81.687	-0.136	0.000	0.33	15.2	OK
5.002	29	81.445	-0.113	0.000	0.49	26.3	OK
5.003	31	80.644	-0.079	0.000	0.89	67.7	OK
5.004	32	80.552	-0.072	0.000	0.93	70.8	OK
5.005	33	80.344	-0.181	0.000	0.53	78.9	OK
5.006	34	80.156	-0.075	0.000	0.67	125.2	OK
5.007	35	80.054	0.043	0.000	0.88	164.7	SURCHARGED
5.008	36	79.883	0.087	0.000	1.06	185.2	SURCHARGED
3.006	10	79.855	0.085	0.000	1.44	343.0	SURCHARGED
3.007	11	79.800	0.056	0.000	1.28	358.7	SURCHARGED
3.008	16	79.704	0.454	0.000	0.15	33.0	SURCHARGED
3.009	30	79.710	0.830	0.000	0.18	26.9	SURCHARGED
1.003	45	78.371	-0.145	0.000	0.53	42.6	OK
1.004	24	78.152	-0.148	0.000	0.51	42.5	OK
1.005	25	77.653	-0.155	0.000	0.47	42.6	OK
1.006	26	77.262	-0.225	0.000	0.14	42.6	OK
1.007	10000	74.478	-0.231	0.000	0.12	42.6	OK
1.008	28	70.565	-0.167	0.000	0.41	42.6	OK

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Summary of Results for 180 minute 100 year Winter (NETWORK1 FULL SYSTEM
11-8-21.SWS)

Margin for Flood Risk Warning (mm) 200.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status OFF

PN	US/MH Name	Water	Surcharged	Flooded	Pipe		Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (1/s)	
1.000	22	80.014	-0.300	0.000	0.00	0.0	OK
2.000	64	79.584	-0.518	0.000	0.02	23.0	OK
2.001	63	79.580	0.437	0.000	0.57	16.9	SURCHARGED
1.001	62	78.879	-0.223	0.000	0.15	16.9	OK
1.002	23	78.679	-0.208	0.000	0.20	16.9	OK
3.000	80	83.080	-0.115	0.000	0.48	22.2	OK
3.001	94	82.639	-0.136	0.000	0.33	28.4	OK
3.002	95	81.533	-0.205	0.000	0.22	30.6	OK
4.000	50	82.118	-0.182	0.000	0.33	28.8	OK
4.001	60	81.806	-0.128	0.000	0.62	47.4	OK
4.002	51	81.717	-0.125	0.000	0.64	60.0	OK
4.003	52	81.460	-0.152	0.000	0.49	67.7	OK
3.003	53	81.088	-0.199	0.000	0.45	109.6	OK
3.004	55	80.074	-0.263	0.000	0.36	111.2	OK
3.005	56	79.898	-0.139	0.000	0.66	125.6	OK
5.000	19	81.833	-0.157	0.000	0.20	7.5	OK
6.000	37	81.808	-0.107	0.000	0.18	2.9	OK
5.001	21	81.676	-0.147	0.000	0.26	11.9	OK
5.002	29	81.430	-0.128	0.000	0.39	20.6	OK
5.003	31	80.609	-0.114	0.000	0.70	53.0	OK
5.004	32	80.515	-0.109	0.000	0.73	55.4	OK
5.005	33	80.318	-0.207	0.000	0.41	61.7	OK
5.006	34	80.017	-0.214	0.000	0.54	100.4	OK
5.007	35	79.908	-0.103	0.000	0.71	132.9	OK
5.008	36	79.798	0.002	0.000	0.86	149.6	SURCHARGED
3.006	10	79.779	0.009	0.000	1.16	275.2	SURCHARGED
3.007	11	79.770	0.026	0.000	1.03	288.0	SURCHARGED
3.008	16	79.765	0.515	0.000	0.17	36.3	SURCHARGED
3.009	30	79.771	0.891	0.000	0.18	26.9	SURCHARGED
1.003	45	78.371	-0.145	0.000	0.53	42.5	OK
1.004	24	78.152	-0.148	0.000	0.51	42.4	OK
1.005	25	77.652	-0.156	0.000	0.47	42.4	OK
1.006	26	77.262	-0.225	0.000	0.14	42.4	OK
1.007	10000	74.477	-0.232	0.000	0.12	42.4	OK
1.008	28	70.565	-0.167	0.000	0.41	42.4	OK

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Summary of Results for 240 minute 100 year Winter (NETWORK1 FULL SYSTEM
11-8-21.SWS)

Margin for Flood Risk Warning (mm) 200.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status OFF

PN	US/MH Name	Water		Surcharged		Flooded		Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (1/s)	Flow (1/s)		
1.000	22	80.014	-0.300	0.000	0.00		0.0	OK	
2.000	64	79.316	-0.786	0.000	0.02		19.3	OK	
2.001	63	79.313	0.170	0.000	0.57		16.9	SURCHARGED	
1.001	62	78.879	-0.223	0.000	0.15		16.9	OK	
1.002	23	78.679	-0.208	0.000	0.20		16.9	OK	
3.000	80	83.068	-0.127	0.000	0.40		18.4	OK	
3.001	94	82.630	-0.145	0.000	0.28		23.5	OK	
3.002	95	81.524	-0.214	0.000	0.18		25.3	OK	
4.000	50	82.105	-0.195	0.000	0.27		23.8	OK	
4.001	60	81.787	-0.147	0.000	0.52		39.2	OK	
4.002	51	81.697	-0.145	0.000	0.53		49.6	OK	
4.003	52	81.444	-0.168	0.000	0.40		56.0	OK	
3.003	53	81.070	-0.217	0.000	0.37		90.8	OK	
3.004	55	80.055	-0.282	0.000	0.30		92.1	OK	
3.005	56	79.826	-0.211	0.000	0.55		104.3	OK	
5.000	19	81.826	-0.164	0.000	0.16		6.2	OK	
6.000	37	81.804	-0.111	0.000	0.15		2.4	OK	
5.001	21	81.669	-0.154	0.000	0.22		9.8	OK	
5.002	29	81.420	-0.138	0.000	0.32		17.0	OK	
5.003	31	80.587	-0.136	0.000	0.58		43.8	OK	
5.004	32	80.492	-0.132	0.000	0.60		45.9	OK	
5.005	33	80.301	-0.224	0.000	0.34		51.2	OK	
5.006	34	79.991	-0.240	0.000	0.45		83.4	OK	
5.007	35	79.851	-0.160	0.000	0.59		110.6	OK	
5.008	36	79.802	0.006	0.000	0.71		124.1	SURCHARGED	
3.006	10	79.799	0.029	0.000	0.96		228.0	SURCHARGED	
3.007	11	79.796	0.052	0.000	0.85		238.7	SURCHARGED	
3.008	16	79.792	0.542	0.000	0.14		29.9	SURCHARGED	
3.009	30	79.795	0.915	0.000	0.18		26.9	SURCHARGED	
1.003	45	78.371	-0.145	0.000	0.52		42.0	OK	
1.004	24	78.151	-0.149	0.000	0.50		42.0	OK	
1.005	25	77.651	-0.157	0.000	0.46		42.0	OK	
1.006	26	77.261	-0.226	0.000	0.14		42.0	OK	
1.007	10000	74.477	-0.232	0.000	0.12		42.0	OK	
1.008	28	70.564	-0.168	0.000	0.40		42.0	OK	

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Summary of Results for 360 minute 100 year Winter (NETWORK1 FULL SYSTEM
11-8-21.SWS)

Margin for Flood Risk Warning (mm) 200.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status OFF

PN	US/MH Name	Water		Surcharged		Flooded		Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (1/s)	Flow (1/s)		
1.000	22	80.014	-0.300	0.000	0.00		0.0	OK	
2.000	64	79.136	-0.966	0.000	0.01		14.9	OK	
2.001	63	79.099	-0.044	0.000	0.50		14.9	OK	
1.001	62	78.874	-0.228	0.000	0.13		14.9	OK	
1.002	23	78.672	-0.215	0.000	0.18		14.8	OK	
3.000	80	83.054	-0.141	0.000	0.30		13.9	OK	
3.001	94	82.619	-0.156	0.000	0.21		17.7	OK	
3.002	95	81.512	-0.226	0.000	0.14		19.2	OK	
4.000	50	82.091	-0.209	0.000	0.20		18.0	OK	
4.001	60	81.764	-0.170	0.000	0.39		29.6	OK	
4.002	51	81.673	-0.169	0.000	0.40		37.5	OK	
4.003	52	81.425	-0.187	0.000	0.31		42.3	OK	
3.003	53	81.047	-0.240	0.000	0.28		68.7	OK	
3.004	55	80.031	-0.306	0.000	0.23		69.6	OK	
3.005	56	79.818	-0.219	0.000	0.42		78.9	OK	
5.000	19	81.817	-0.173	0.000	0.12		4.7	OK	
6.000	37	81.799	-0.116	0.000	0.11		1.8	OK	
5.001	21	81.658	-0.165	0.000	0.16		7.4	OK	
5.002	29	81.408	-0.150	0.000	0.24		12.9	OK	
5.003	31	80.561	-0.162	0.000	0.44		33.1	OK	
5.004	32	80.466	-0.158	0.000	0.46		34.6	OK	
5.005	33	80.279	-0.246	0.000	0.26		38.7	OK	
5.006	34	79.961	-0.270	0.000	0.34		63.0	OK	
5.007	35	79.851	-0.160	0.000	0.45		83.7	OK	
5.008	36	79.806	0.010	0.000	0.54		94.2	SURCHARGED	
3.006	10	79.804	0.034	0.000	0.73		173.1	SURCHARGED	
3.007	11	79.801	0.057	0.000	0.65		181.2	SURCHARGED	
3.008	16	79.797	0.547	0.000	0.14		30.9	SURCHARGED	
3.009	30	79.796	0.916	0.000	0.18		26.9	SURCHARGED	
1.003	45	78.365	-0.151	0.000	0.49		39.6	OK	
1.004	24	78.146	-0.154	0.000	0.48		39.6	OK	
1.005	25	77.646	-0.162	0.000	0.44		39.6	OK	
1.006	26	77.259	-0.228	0.000	0.13		39.6	OK	
1.007	10000	74.475	-0.234	0.000	0.11		39.6	OK	
1.008	28	70.559	-0.173	0.000	0.38		39.6	OK	

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XP Solutions	Network 2019.1	

Summary of Results for 480 minute 100 year Winter (NETWORK1 FULL SYSTEM
11-8-21.SWS)

Margin for Flood Risk Warning (mm) 200.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status OFF

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (1/s)	Pipe	Status
							Flow (1/s)	
1.000	22	80.014	-0.300	0.000	0.00		0.0	OK
2.000	64	79.115	-0.987	0.000	0.01		12.2	OK
2.001	63	79.070	-0.073	0.000	0.41		12.2	OK
1.001	62	78.867	-0.235	0.000	0.11		12.2	OK
1.002	23	78.663	-0.224	0.000	0.15		12.2	OK
3.000	80	83.045	-0.150	0.000	0.25		11.4	OK
3.001	94	82.612	-0.163	0.000	0.17		14.5	OK
3.002	95	81.505	-0.233	0.000	0.11		15.7	OK
4.000	50	82.082	-0.218	0.000	0.17		14.7	OK
4.001	60	81.750	-0.184	0.000	0.32		24.3	OK
4.002	51	81.660	-0.182	0.000	0.33		30.7	OK
4.003	52	81.413	-0.199	0.000	0.25		34.7	OK
3.003	53	81.033	-0.254	0.000	0.23		56.2	OK
3.004	55	80.017	-0.320	0.000	0.18		57.0	OK
3.005	56	79.818	-0.219	0.000	0.34		64.7	OK
5.000	19	81.813	-0.177	0.000	0.10		3.8	OK
6.000	37	81.796	-0.119	0.000	0.09		1.5	OK
5.001	21	81.652	-0.171	0.000	0.13		6.1	OK
5.002	29	81.401	-0.157	0.000	0.20		10.6	OK
5.003	31	80.547	-0.176	0.000	0.36		27.1	OK
5.004	32	80.451	-0.173	0.000	0.37		28.4	OK
5.005	33	80.266	-0.259	0.000	0.21		31.7	OK
5.006	34	79.941	-0.290	0.000	0.28		51.6	OK
5.007	35	79.851	-0.160	0.000	0.37		68.5	OK
5.008	36	79.796	0.000	0.000	0.44		77.2	OK
3.006	10	79.791	0.021	0.000	0.60		141.9	SURCHARGED
3.007	11	79.789	0.045	0.000	0.53		148.4	SURCHARGED
3.008	16	79.785	0.535	0.000	0.13		28.0	SURCHARGED
3.009	30	79.786	0.906	0.000	0.18		26.9	SURCHARGED
1.003	45	78.358	-0.158	0.000	0.46		36.6	OK
1.004	24	78.139	-0.161	0.000	0.44		36.6	OK
1.005	25	77.640	-0.168	0.000	0.40		36.6	OK
1.006	26	77.257	-0.230	0.000	0.12		36.6	OK
1.007	10000	74.473	-0.236	0.000	0.10		36.6	OK
1.008	28	70.554	-0.178	0.000	0.35		36.6	OK