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MEC Development Technical Consultants

Doc Ref	24438-02-CALC-04
Sheet	1 of 14
Engineer	E. Mewies
Date	04/04/2022
Revision	-

DESIGN CALCULATIONS FRONT SHEET

SCHEME	PASTURE LANE, GADDESBY, LEICESTERSHIRE
CLIENT	CADEBY HOMES LTD
ASPECTS OF SCHEME TO BE DESIGNED	1. Surface Water Sewer design. 2. 1 in 2 year, 1 in 30 year and 1 in 100 year + 40% climate change design simulations. 3. Hydrobrake flow control details.
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	1. Wallingford Procedure. 2. Code for Adoption Agreements, OFWAT December 2020. 3. Sewerage Sector Guidance, Water UK. 4. Severn Trent additions/deletions to Code & Sewerage Sector Guidance. 5. CIRIA C753 (2015) The SuDS Manual.
NOTES	Calculations carried out using Micro Drainage software. Refer to design drawings 24438_02_020_01.2, _01.3 and _01.4 for surface water sewer layout details.

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 462750 313250 SK 62750 13250
Data Type	Catchment
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.057	4-8	0.141	8-12	0.004

Total Area Contributing (ha) = 0.202

Total Pipe Volume (m³) = 14.394

Network Design Table for Storm

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	8.177	0.082	99.7	0.038	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	17.270	0.173	99.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	25.005	0.250	100.0	0.075	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	21.553	0.127	169.7	0.037	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	7.726	0.045	171.7	0.052	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	11.681	0.029	402.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.006	6.324	0.028	225.9	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)
1.000	50.00	5.14	107.384	0.038	0.0	0.0	0.0	1.01	17.8	5.1
1.001	50.00	5.42	107.302	0.038	0.0	0.0	0.0	1.01	17.8	5.1
1.002	50.00	5.84	107.129	0.113	0.0	0.0	0.0	1.00	17.8	15.3
1.003	50.00	6.20	106.804	0.150	0.0	0.0	0.0	1.00	39.8	20.3
1.004	50.00	6.32	106.677	0.202	0.0	0.0	0.0	0.99	39.6	27.4
1.005	50.00	6.58	106.557	0.202	0.0	0.0	0.0	0.78	54.9	27.4
1.006	50.00	6.68	106.528	0.202	0.0	0.0	0.0	1.04	73.7	27.4

Network Design Table for Storm

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
1.007	73.192	2.166	33.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.008	73.192	2.920	25.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.009	73.429	4.362	16.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.010	53.491	2.132	25.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.011	5.000	0.050	100.0	0.000	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)
1.007	50.00	7.22	106.500	0.202	0.0	0.0	0.0	2.26	89.8	27.4
1.008	50.00	7.68	104.334	0.202	0.0	0.0	0.0	2.62	104.3	27.4
1.009	50.00	8.06	101.414	0.202	0.0	0.0	0.0	3.20	127.4	27.4
1.010	50.00	8.40	97.052	0.202	0.0	0.0	0.0	2.62	104.3	27.4
1.011	50.00	8.47	94.920	0.202	0.0	0.0	0.0	1.31	52.0	27.4

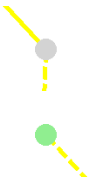
Manhole Schedules for Storm

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	108.434	1.050	Open Manhole	1200	1.000	107.384	150				
2	108.480	1.178	Open Manhole	1200	1.001	107.302	150	1.000	107.302	150	
3	108.663	1.534	Open Manhole	1200	1.002	107.129	150	1.001	107.129	150	
4	108.488	1.684	Open Manhole	1200	1.003	106.804	225	1.002	106.879	150	
5	108.145	1.468	Open Manhole	1200	1.004	106.677	225	1.003	106.677	225	
6	107.750	1.193	Open Manhole	1200	1.005	106.557	300	1.004	106.632	225	
7	107.750	1.222	Open Manhole	1200	1.006	106.528	300	1.005	106.528	300	
8	107.750	1.250	Open Manhole	1200	1.007	106.500	225	1.006	106.500	300	
9	105.684	1.350	Open Manhole	1200	1.008	104.334	225	1.007	104.334	225	
10	102.764	1.350	Open Manhole	1200	1.009	101.414	225	1.008	101.414	225	
11	98.402	1.350	Open Manhole	1200	1.010	97.052	225	1.009	97.052	225	
12	95.977	1.057	Open Manhole	1200	1.011	94.920	225	1.010	94.920	225	
13	95.558	0.688	Open Manhole	0		OUTFALL		1.011	94.870	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
1	469080.905	313571.517	469080.905	313571.517	Required	
2	469087.096	313576.859	469087.096	313576.859	Required	
3	469104.365	313577.080	469104.365	313577.080	Required	
4	469104.365	313602.086	469104.365	313602.086	Required	
5	469082.812	313602.086	469082.812	313602.086	Required	
6	469078.040	313608.162	469078.040	313608.162	Required	
7	469070.505	313617.087	469070.505	313617.087	Required	
8	469065.949	313621.473	469065.949	313621.473	Required	
9	469065.669	313694.664	469065.669	313694.664	Required	
10	469065.390	313767.855	469065.390	313767.855	Required	
11	469065.109	313841.284	469065.109	313841.284	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
12	469066.937	313894.743	469066.937	313894.743	Required	
13	469063.559	313898.429			No Entry	



PIPELINE SCHEDULES for Storm

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	108.434	107.384	0.900	Open Manhole	1200
1.001	o	150	2	108.480	107.302	1.028	Open Manhole	1200
1.002	o	150	3	108.663	107.129	1.384	Open Manhole	1200
1.003	o	225	4	108.488	106.804	1.459	Open Manhole	1200
1.004	o	225	5	108.145	106.677	1.243	Open Manhole	1200
1.005	o	300	6	107.750	106.557	0.893	Open Manhole	1200
1.006	o	300	7	107.750	106.528	0.922	Open Manhole	1200
1.007	o	225	8	107.750	106.500	1.025	Open Manhole	1200
1.008	o	225	9	105.684	104.334	1.125	Open Manhole	1200
1.009	o	225	10	102.764	101.414	1.125	Open Manhole	1200
1.010	o	225	11	98.402	97.052	1.125	Open Manhole	1200
1.011	o	225	12	95.977	94.920	0.832	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)
1.000	8.177	99.7	2	108.480	107.302	1.028	Open Manhole	1200
1.001	17.270	99.8	3	108.663	107.129	1.384	Open Manhole	1200
1.002	25.005	100.0	4	108.488	106.879	1.459	Open Manhole	1200
1.003	21.553	169.7	5	108.145	106.677	1.243	Open Manhole	1200
1.004	7.726	171.7	6	107.750	106.632	0.893	Open Manhole	1200
1.005	11.681	402.8	7	107.750	106.528	0.922	Open Manhole	1200
1.006	6.324	225.9	8	107.750	106.500	0.950	Open Manhole	1200
1.007	73.192	33.8	9	105.684	104.334	1.125	Open Manhole	1200
1.008	73.192	25.1	10	102.764	101.414	1.125	Open Manhole	1200
1.009	73.429	16.8	11	98.402	97.052	1.125	Open Manhole	1200
1.010	53.491	25.1	12	95.977	94.920	0.832	Open Manhole	1200
1.011	5.000	100.0	13	95.558	94.870	0.463	Open Manhole	0

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.038	0.038	0.038
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.075	0.075	0.075
1.003	-	-	100	0.037	0.037	0.037
1.004	-	-	100	0.052	0.052	0.052
1.005	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
1.010	-	-	100	0.000	0.000	0.000
1.011	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.202	0.202	0.202

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.011	13	95.558	94.870	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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 Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 1	Number of Storage Structures 1	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 462750 313250 SK 62750 13250	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: 8, DS/PN: 1.007, Volume (m³): 1.8

Unit Reference	MD-SHE-0076-2500-0950-2500
Design Head (m)	0.950
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	76
Invert Level (m)	106.500
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.950	2.5	Kick-Flo®	0.594	2.0
Flush-Flo™	0.285	2.5	Mean Flow over Head Range	-	2.2

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)
0.100	2.1	0.800	2.3	2.000	3.5	4.000	4.9	7.000	6.3
0.200	2.4	1.000	2.6	2.200	3.7	4.500	5.1	7.500	6.5
0.300	2.5	1.200	2.8	2.400	3.8	5.000	5.4	8.000	6.7
0.400	2.4	1.400	3.0	2.600	4.0	5.500	5.6	8.500	6.9
0.500	2.3	1.600	3.2	3.000	4.2	6.000	5.9	9.000	7.1
0.600	2.0	1.800	3.4	3.500	4.6	6.500	6.1	9.500	7.3

Storage Structures for Storm

Tank or Pond Manhole: 8, DS/PN: 1.007

Invert Level (m) 106.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	58.0	0.300	99.0	0.600	150.0	0.900	209.0	1.200	277.0
0.100	71.0	0.400	115.0	0.700	168.0	1.000	230.0	1.250	289.0
0.200	85.0	0.500	132.0	0.800	188.0	1.100	253.0		

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location GB 462750 313250 SK 62750 13250		Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

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)
1.000	1	15 Winter	2	+0%	30/15 Summer	100/15 Summer			107.452	-0.082
1.001	2	15 Winter	2	+0%	30/15 Summer	100/15 Summer			107.367	-0.085
1.002	3	15 Winter	2	+0%	30/15 Summer	100/15 Summer			107.252	-0.027
1.003	4	15 Winter	2	+0%	30/15 Summer				106.931	-0.098
1.004	5	15 Winter	2	+0%	30/15 Summer				106.854	-0.048
1.005	6	180 Winter	2	+0%	30/15 Summer				106.761	-0.096
1.006	7	180 Winter	2	+0%	30/15 Winter				106.759	-0.069
1.007	8	180 Winter	2	+0%	2/60 Winter				106.758	0.033
1.008	9	180 Winter	2	+0%					104.358	-0.201
1.009	10	180 Winter	2	+0%					101.435	-0.204
1.010	11	180 Winter	2	+0%					97.076	-0.201
1.011	12	180 Winter	2	+0%					94.962	-0.183

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.41			6.4	OK	6
1.001	2	0.000	0.39			6.4	OK	4
1.002	3	0.000	1.00			16.8	OK	2
1.003	4	0.000	0.60			21.7	OK	
1.004	5	0.000	0.96			28.8	OK	
1.005	6	0.000	0.22			8.5	OK	
1.006	7	0.000	0.16			8.2	OK	
1.007	8	0.000	0.03			2.5	SURCHARGED	
1.008	9	0.000	0.02			2.5	OK	
1.009	10	0.000	0.02			2.5	OK	
1.010	11	0.000	0.02			2.5	OK	
1.011	12	0.000	0.08			2.5	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 462750 313250 SK 62750 13250	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

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)
1.000	1	15 Winter	30	+0%	30/15 Summer	100/15 Summer			108.012	0.478
1.001	2	15 Winter	30	+0%	30/15 Summer	100/15 Summer			107.970	0.518
1.002	3	15 Winter	30	+0%	30/15 Summer	100/15 Summer			107.928	0.649
1.003	4	15 Winter	30	+0%	30/15 Summer				107.183	0.154
1.004	5	15 Winter	30	+0%	30/15 Summer				107.032	0.130
1.005	6	180 Winter	30	+0%	30/15 Summer				107.018	0.161
1.006	7	180 Winter	30	+0%	30/15 Winter				107.016	0.188
1.007	8	180 Winter	30	+0%	2/60 Winter				107.015	0.290
1.008	9	15 Summer	30	+0%					104.358	-0.201
1.009	10	600 Summer	30	+0%					101.435	-0.204
1.010	11	1440 Summer	30	+0%					97.076	-0.201
1.011	12	1440 Summer	30	+0%					94.962	-0.183

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.000	0.70			10.9	SURCHARGED	6
1.001	2	0.000	0.79			13.1	SURCHARGED	4
1.002	3	0.000	1.71			28.9	SURCHARGED	2
1.003	4	0.000	1.09			39.6	SURCHARGED	
1.004	5	0.000	1.86			55.7	SURCHARGED	
1.005	6	0.000	0.42			16.0	SURCHARGED	
1.006	7	0.000	0.30			15.6	SURCHARGED	
1.007	8	0.000	0.03			2.5	SURCHARGED	
1.008	9	0.000	0.02			2.5	OK	
1.009	10	0.000	0.02			2.5	OK	
1.010	11	0.000	0.02			2.5	OK	
1.011	12	0.000	0.08			2.5	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Catchment
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 462750 313250 SK 62750 13250	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

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)
1.000	1	15 Winter	100	+40%	30/15 Summer	100/15 Summer			108.442	0.908
1.001	2	15 Winter	100	+40%	30/15 Summer	100/15 Summer			108.481	1.029
1.002	3	15 Winter	100	+40%	30/15 Summer	100/15 Summer			108.664	1.385
1.003	4	15 Winter	100	+40%	30/15 Summer				107.764	0.735
1.004	5	15 Winter	100	+40%	30/15 Summer				107.453	0.551
1.005	6	360 Winter	100	+40%	30/15 Summer				107.430	0.573
1.006	7	360 Winter	100	+40%	30/15 Winter				107.428	0.600
1.007	8	360 Winter	100	+40%	2/60 Winter				107.427	0.702
1.008	9	600 Summer	100	+40%					104.358	-0.201
1.009	10	720 Summer	100	+40%					101.435	-0.204
1.010	11	960 Summer	100	+40%					97.076	-0.201
1.011	12	720 Winter	100	+40%					94.962	-0.183

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	7.662	1.68			26.1	FLOOD	6
1.001	2	1.630	1.57			26.1	FLOOD	4
1.002	3	0.283	1.97			33.3	FLOOD	2
1.003	4	0.000	1.55			56.2	SURCHARGED	
1.004	5	0.000	2.98			89.1	SURCHARGED	
1.005	6	0.000	0.50			19.1	SURCHARGED	
1.006	7	0.000	0.37			19.0	SURCHARGED	
1.007	8	0.000	0.03			2.5	SURCHARGED	
1.008	9	0.000	0.02			2.5	OK	
1.009	10	0.000	0.02			2.5	OK	
1.010	11	0.000	0.02			2.5	OK	
1.011	12	0.000	0.08			2.5	OK	

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	0.950	2.500
Flush-Flo™	0.285	2.494
Kick-Flo®	0.594	2.020
Mean Flow		2.189

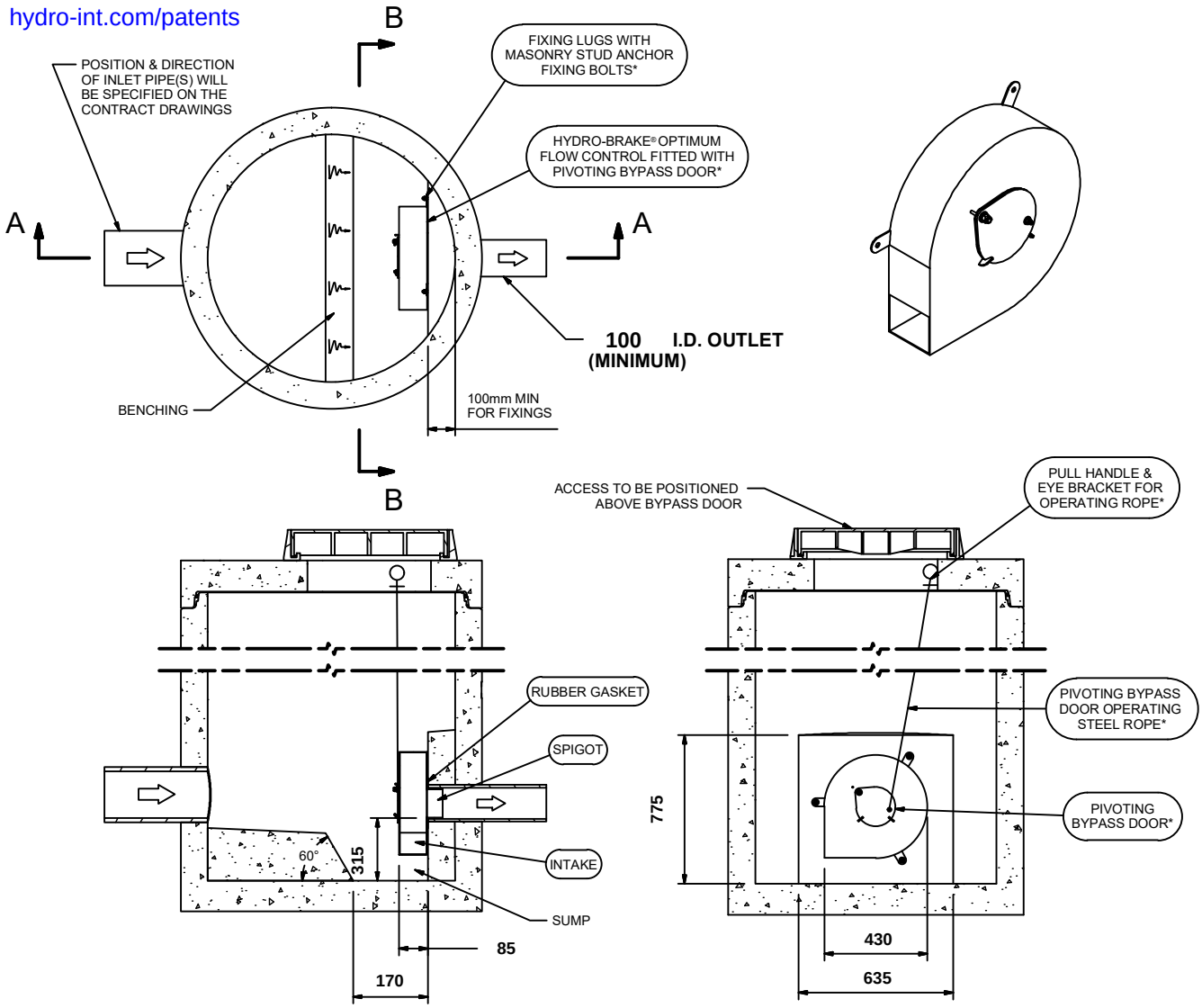
Hydro-Brake® Optimum Flow Control including:

- 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
- Indicative Weight: 85 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

WRC Approved PT/329/0412

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: (oval) 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-0076-2500-0950-2500 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	4/4/2022 2:27 PM
SITE	Pasture Lane, Gaddesby
DESIGNER	Eddie Mewies
REF	24438 / 20_21_4073

SHE-0076-2500-0950-2500
Hydro-Brake® Optimum

eddie.mewies@m-ec.co.uk

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	0.950	2.500
Flush-Flo	0.285	2.494
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BBA APPROVAL INSPECTION TESTING CERTIFICATION
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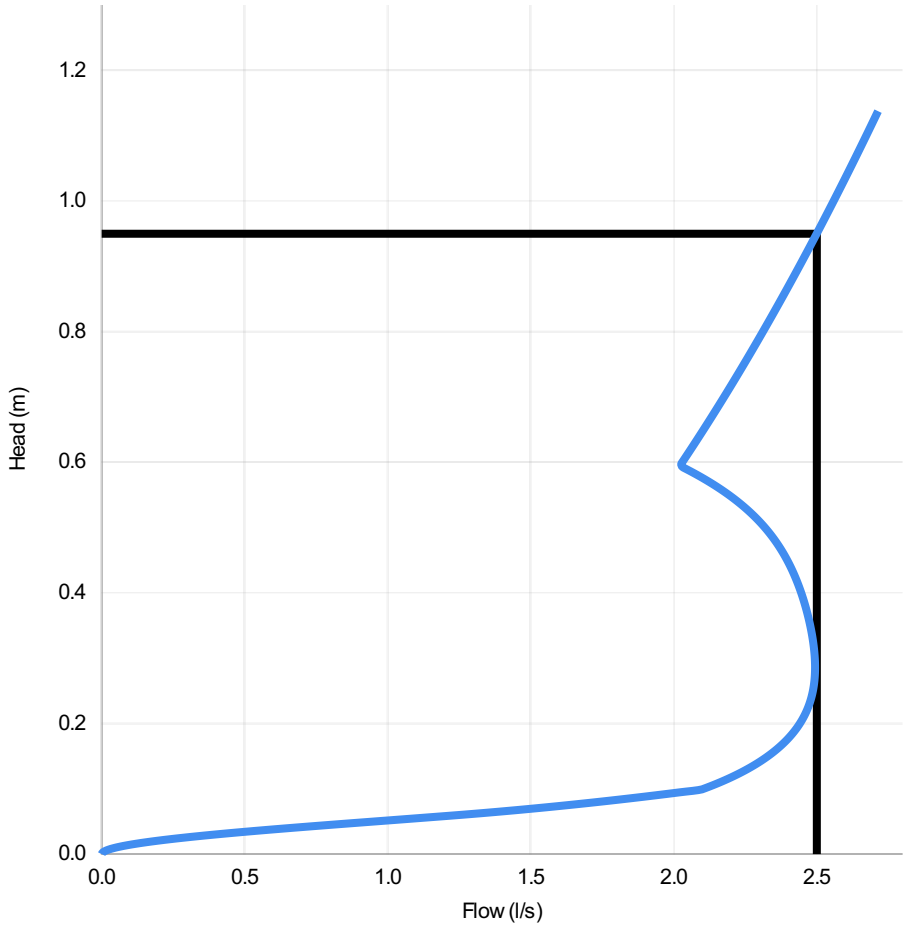

Head (m)	Flow (l/s)
0.000	0.000
0.033	0.463
0.066	1.403
0.098	2.093
0.131	2.261
0.164	2.369
0.197	2.435
0.229	2.473
0.262	2.491
0.295	2.493
0.328	2.486
0.360	2.472
0.393	2.451
0.426	2.423
0.459	2.386
0.491	2.335
0.524	2.265
0.557	2.170
0.590	2.043
0.622	2.063
0.655	2.112
0.688	2.159
0.721	2.205
0.753	2.249
0.786	2.293
0.819	2.336
0.852	2.378
0.884	2.419
0.917	2.460
0.950	2.499

DESIGN ADVICE

The head/flow characteristics of this SHE-0076-2500-0950-2500 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	04/04/2022 14:27
Site	Pasture Lane, Gaddesby
DESIGNER	Eddie Mewies
Ref	24438 / 20_21_4073

SHE-0076-2500-0950-2500

Hydro-Brake Optimum®