

Technical Specification

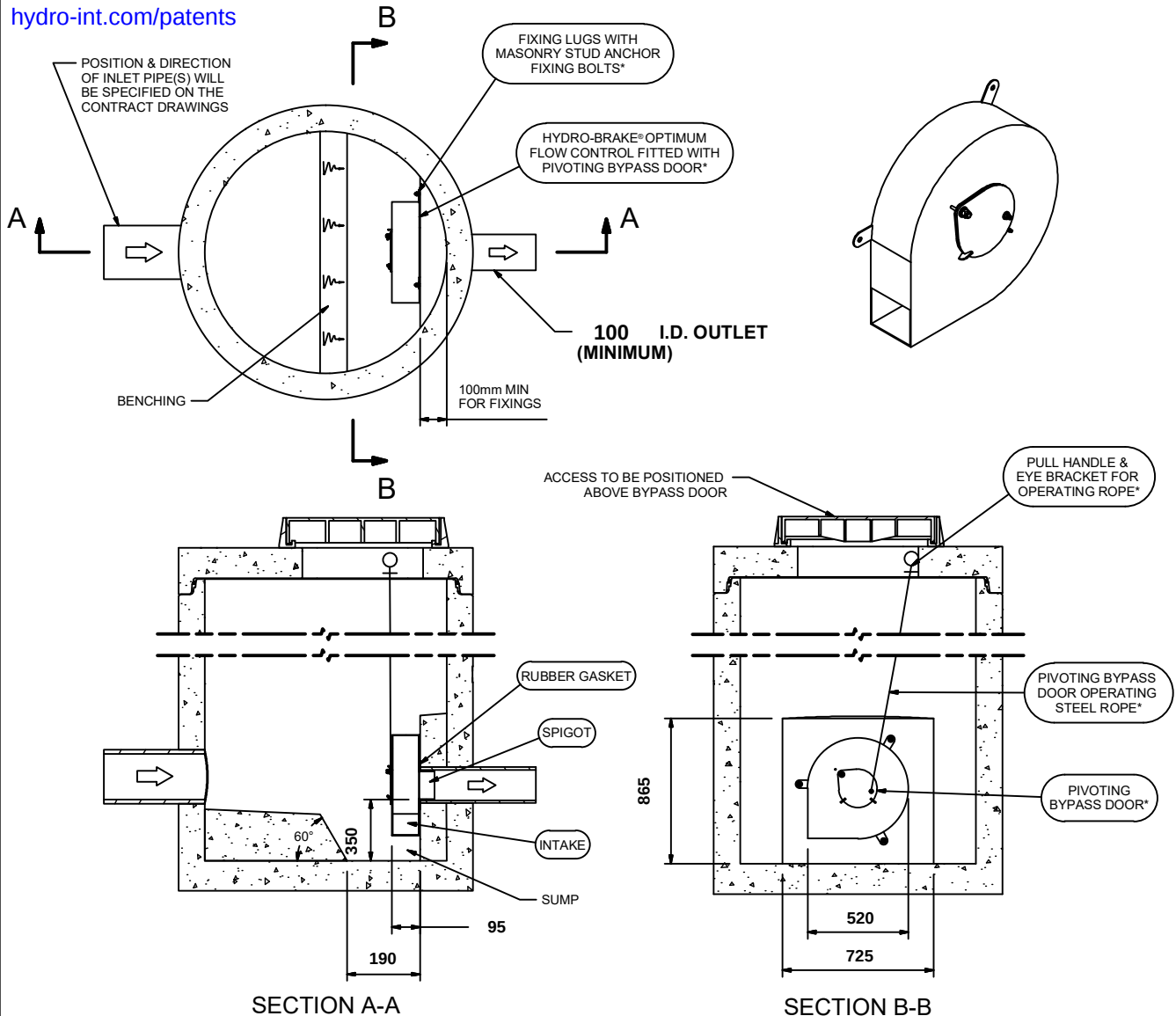
Control Point	Head (m)	Flow (l/s)
Primary Design	1.250	3.500
Flush-Flo™	0.372	3.461
Kick-Flo®	0.759	2.779
Mean Flow		3.052

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-0085-3500-1250-3500 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 3/16/2021 8:32 AM

SITE Oxspring

DESIGNER richard bland

REF

SHE-0085-3500-1250-3500

Hydro-Brake® Optimum

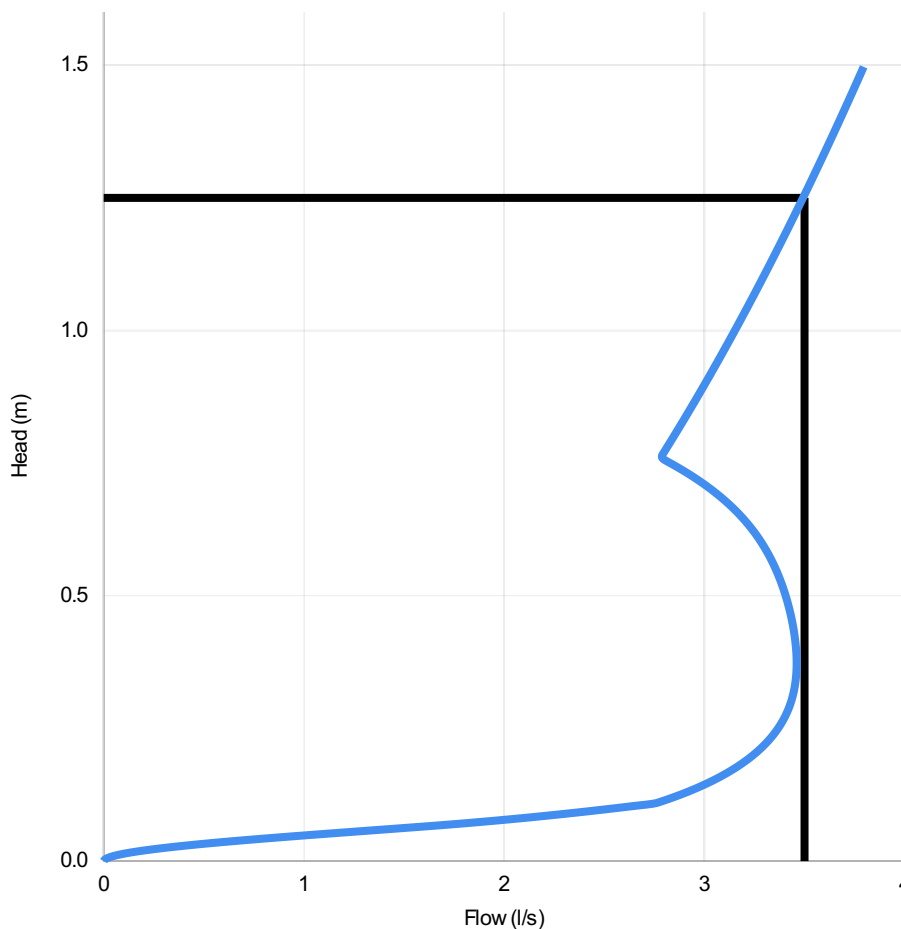
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.250	3.500
Flush-Flo	0.372	3.461
Kick-Flo®	0.759	2.779
Mean Flow		3.052



PT/329/0412

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Head (m)	Flow (l/s)
0.000	0.000
0.043	0.821
0.086	2.229
0.129	2.908
0.172	3.141
0.216	3.290
0.259	3.382
0.302	3.434
0.345	3.457
0.388	3.460
0.431	3.448
0.474	3.425
0.517	3.391
0.560	3.344
0.603	3.280
0.647	3.191
0.690	3.071
0.733	2.908
0.776	2.807
0.819	2.877
0.862	2.945
0.905	3.011
0.948	3.076
0.991	3.140
1.034	3.201
1.078	3.262
1.121	3.321
1.164	3.379
1.207	3.436
1.250	3.492

DESIGN ADVICE



The head/flow characteristics of this SHE-0085-3500-1250-3500 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 16/03/2021 08:32

Site Oxspring

DESIGNER richard bland

Ref

SHE-0085-3500-1250-3500

Hydro-Brake Optimum®

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:11 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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STORM SEWER DESIGN by the Modified Rational Method

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	15.700	0.350	44.9	0.007	4.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	18.500	0.150	123.3	0.083	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	34.600	0.275	125.8	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	7.000	0.050	140.0	0.029	0.00	0.0	0.600	[]	-7	Pipe/Conduit	
1.004	6.400	0.550	11.6	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	27.140	1.206	22.5	0.000	0.00	0.0	0.600	o	150	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)
1.000	50.00	4.23	176.850	0.007	0.0	0.0	0.3	1.15	9.1	1.2
1.001	50.00	4.57	176.450	0.090	0.0	0.0	3.7	0.90	16.0	15.8
1.002	50.00	5.06	176.225	0.106	0.0	0.0	4.3	1.16	46.3	18.7
1.003	50.00	5.09	175.200	0.135	0.0	0.0	5.5	4.38	36811.1	23.8
1.004	50.00	5.13	175.150	0.135	0.0	0.0	5.5	2.97	52.5	23.8
1.005	50.00	5.34	174.600	0.135	0.0	0.0	5.5	2.13	37.7	23.8

Conduit Sections for Storm

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \ / open channel, oo dual pipe, ooo triple pipe, O egg.

Section numbers < 0 are taken from user conduit table

Section Number	Conduit Type	Major Dimn. (mm)	Minor Dimn. (mm)	Side Slope (Deg)	Corner Splay (mm)	4*Hyd Radius (m)	XSect Area (m²)
-7	[]	7000	1200	90.0		2.049	8.400

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)
1.005		174.300	173.394	0.000	0	0

RAB Engineering Design Ltd		Page 3
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:11 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: E, DS/PN: 1.004, Volume (m³): 48.6

Unit Reference	MD-SHE-0085-3500-1250-3500
Design Head (m)	1.250
Design Flow (l/s)	3.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	85
Invert Level (m)	175.150
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.250	3.5
Flush-Flo™	0.372	3.5
Kick-Flo®	0.759	2.8
Mean Flow over Head Range	-	3.1

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	2.6	1.200	3.4	3.000	5.2	7.000	7.8
0.200	3.2	1.400	3.7	3.500	5.6	7.500	8.1
0.300	3.4	1.600	3.9	4.000	6.0	8.000	8.3
0.400	3.5	1.800	4.1	4.500	6.3	8.500	8.6
0.500	3.4	2.000	4.3	5.000	6.7	9.000	8.8
0.600	3.3	2.200	4.5	5.500	7.0	9.500	9.0
0.800	2.8	2.400	4.7	6.000	7.3		
1.000	3.2	2.600	4.9	6.500	7.5		

RAB Engineering Design Ltd		Page 4
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:11 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 15 minute 1 year Winter (Storm)

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

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
1.000	A	176.875	-0.075	0.000	0.14		1.2	OK
1.001	B	176.556	-0.044	0.000	0.83		12.4	OK
1.002	C	176.315	-0.135	0.000	0.34		14.7	OK
1.003	D	175.445	-0.955	0.000	0.00		17.6	OK
1.004	E	175.445	0.145	0.000	0.07		3.2	SURCHARGED
1.005	F	174.630	-0.120	0.000	0.09		3.2	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB		
Date 16/03/2021 08:08 File OXSPRING SW 15-3-21.MDX	Designed by Tom Checked by	
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Summary of Results for 30 minute 1 year Winter (Storm)

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

		Water	Surcharged	Flooded		Pipe	
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	Status
1.000	A	176.872	-0.078	0.000	0.11	0.9	OK
1.001	B	176.545	-0.055	0.000	0.72	10.7	OK
1.002	C	176.308	-0.142	0.000	0.29	12.7	OK
1.003	D	175.481	-0.919	0.000	0.00	15.5	OK
1.004	E	175.482	0.182	0.000	0.07	3.1	SURCHARGED
1.005	F	174.630	-0.120	0.000	0.09	3.1	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:12 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 60 minute 1 year Winter (Storm)

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

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
1.000	A	176.868	-0.082	0.000	0.07		0.6	OK
1.001	B	176.527	-0.073	0.000	0.52		7.8	OK
1.002	C	176.295	-0.155	0.000	0.21		9.2	OK
1.003	D	175.495	-0.905	0.000	0.00		11.4	OK
1.004	E	175.495	0.195	0.000	0.07		3.2	SURCHARGED
1.005	F	174.630	-0.120	0.000	0.09		3.2	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:12 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 120 minute 1 year Winter (Storm)

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

		Water	Surcharged	Flooded		Pipe	
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	Status
1.000	A	176.864	-0.086	0.000	0.05	0.4	OK
1.001	B	176.511	-0.089	0.000	0.35	5.3	OK
1.002	C	176.281	-0.169	0.000	0.14	6.2	OK
1.003	D	175.475	-0.925	0.000	0.00	7.7	OK
1.004	E	175.475	0.175	0.000	0.07	3.1	SURCHARGED
1.005	F	174.630	-0.120	0.000	0.09	3.1	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:13 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
XP Solutions	Network 2019.1	

Summary of Results for 15 minute 30 year Winter (Storm)

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

		Water	Surcharged	Flooded		Pipe	
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	Status
1.000	A	177.092	0.142	0.000	0.34	3.0	FLOOD RISK
1.001	B	177.051	0.451	1.001	2.01	30.1	FLOOD
1.002	C	176.384	-0.066	0.000	0.84	36.6	OK
1.003	D	175.786	-0.614	0.000	0.00	46.7	OK
1.004	E	175.786	0.486	0.000	0.08	3.3	SURCHARGED
1.005	F	174.631	-0.119	0.000	0.09	3.3	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:14 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 30 minute 30 year Winter (Storm)

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

		Water	Surcharged	Flooded		Pipe	
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	Status
1.000	A	177.017	0.067	0.000	0.28	2.4	FLOOD RISK
1.001	B	176.996	0.396	0.000	1.91	28.6	FLOOD RISK
1.002	C	176.374	-0.076	0.000	0.77	33.4	OK
1.003	D	175.937	-0.463	0.000	0.00	40.7	OK
1.004	E	175.937	0.637	0.000	0.08	3.3	SURCHARGED
1.005	F	174.631	-0.119	0.000	0.09	3.3	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:15 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 60 minute 30 year Winter (Storm)

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

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
1.000	A	176.878	-0.072	0.000	0.18		1.5	OK
1.001	B	176.705	0.105	0.000	1.30		19.4	SURCHARGED
1.002	C	176.342	-0.108	0.000	0.53		22.9	OK
1.003	D	176.050	-0.350	0.000	0.00		28.0	OK
1.004	E	176.050	0.750	0.000	0.08		3.3	SURCHARGED
1.005	F	174.631	-0.119	0.000	0.09		3.3	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:16 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 120 minute 30 year Winter (Storm)

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

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
1.000	A	176.872	-0.078	0.000	0.11		1.0	OK
1.001	B	176.555	-0.045	0.000	0.83		12.4	OK
1.002	C	176.315	-0.135	0.000	0.34		14.6	OK
1.003	D	176.081	-0.319	0.000	0.00		18.0	OK
1.004	E	176.081	0.781	0.000	0.08		3.3	SURCHARGED
1.005	F	174.631	-0.119	0.000	0.09		3.3	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:16 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
XP Solutions	Network 2019.1	

Summary of Results for 180 minute 30 year Winter (Storm)

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

		Water	Surcharged	Flooded		Pipe	
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	Status
1.000	A	176.870	-0.080	0.000	0.09	0.7	OK
1.001	B	176.537	-0.063	0.000	0.63	9.5	OK
1.002	C	176.302	-0.148	0.000	0.26	11.1	OK
1.003	D	176.058	-0.342	0.000	0.00	13.7	OK
1.004	E	176.058	0.758	0.000	0.08	3.3	SURCHARGED
1.005	F	174.631	-0.119	0.000	0.09	3.3	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:17 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 60 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
1.000	A	176.898	-0.052	0.000	0.23		2.0	OK
1.001	B	176.878	0.278	0.000	1.69		25.3	FLOOD RISK
1.002	C	176.362	-0.088	0.000	0.68		29.8	OK
1.003	D	176.327	-0.073	0.000	0.00		36.3	OK
1.004	E	176.327	1.027	0.000	0.08		3.4	FLOOD RISK
1.005	F	174.631	-0.119	0.000	0.09		3.4	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:19 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
XP Solutions		Network 2019.1

Summary of Results for 120 minute 100 year Winter (Storm)

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

		Water	Surcharged	Flooded		Pipe	
	US/MH	Level	Depth	Volume	Flow / Overflow	Flow	
PN	Name	(m)	(m)	(m³)	Cap.	(l/s)	Status
1.000	A	176.875	-0.075	0.000	0.15	1.3	OK
1.001	B	176.621	0.021	0.000	1.09	16.3	SURCHARGED
1.002	C	176.446	-0.004	0.000	0.44	19.2	OK
1.003	D	176.437	0.037	0.000	0.00	23.4	SURCHARGED
1.004	E	176.437	1.137	0.000	0.08	3.5	FLOOD RISK
1.005	F	174.631	-0.119	0.000	0.10	3.5	OK

RAB Engineering Design Ltd		Page 1
12 Berry Holm Close Sheffield S35 1AB	Roughbitchworth Lane Oxspring Max 3.5 l/s	
Date 16/03/2021 08:19 File OXSPRING SW 15-3-21.MDX	Designed by RAB Checked by	
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Summary of Results for 180 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water	Surcharged	Flooded			Pipe	Status
		Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
1.000	A	176.872	-0.078	0.000	0.11		1.0	OK
1.001	B	176.555	-0.045	0.000	0.83		12.4	OK
1.002	C	176.416	-0.034	0.000	0.33		14.6	OK
1.003	D	176.408	0.008	0.000	0.00		17.8	SURCHARGED
1.004	E	176.409	1.109	0.000	0.08		3.5	FLOOD RISK
1.005	F	174.631	-0.119	0.000	0.10		3.5	OK