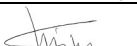




BELL MUNRO CONSULTING LTD.

Victoria Park Probation Centre

Hydraulic Calculations Condition Discharge Rev A - January 2023 (updated for 45% climate change)

	Initials	Signature	Date
Prepared by:	SJB		01 / 24
Checked by:	CM		01 / 24
Approved by:	CM		01 / 24

Bell Munro Consulting Ltd.
Consulting Civil and Structural Engineers
Turing House
5 Archway
Manchester
M15 5RL
Tel: 0161 209 8032
Fax: 0161 209 8033
E-Mail: consulting@bellmunro.co.uk
Ref: J7986

North Site

Results for critical storm by water level

No flooding

Bell Munro Consulting Ltd		Page 0
Turing House 5 Archway Manchester M15 5RL	Victoria Park North Site	
Date 09/01/2024 File SITE 3D MODEL.MDX	Designed by SJB Checked by CM	
XP Solutions Network 2020.1		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 2

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.370	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 2

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.137	4-8	0.042

Total Area Contributing (ha) = 0.179

Total Pipe Volume (m³) = 4.691

Network Design Table for Surface Network 2

« - 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	16.716	0.111	150.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	12.983	0.087	150.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	9.384	0.063	150.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	8.383	0.366	22.9	0.000	5.00	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	5.45	46.525	0.000	0.0	0.0	0.0	0.63	4.9	0.0
1.001	50.00	5.79	46.413	0.000	0.0	0.0	0.0	0.63	4.9	0.0
1.002	50.00	5.98	46.277	0.000	0.0	0.0	0.0	0.82	14.5	0.0
2.000	50.00	5.07	46.953	0.000	0.0	0.0	0.0	2.11	37.3	0.0

Bell Munro Consulting Ltd											Page 1	
Turing House 5 Archway Manchester M15 5RL						Victoria Park North Site						
Date 09/01/2024 File SITE 3D MODEL.MDX						Designed by SJB Checked by CM						
XP Solutions						Network 2020.1						
Network Design Table for Surface Network 2												
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	10.809	0.048	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
3.000	4.705	0.021	225.0	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit		
1.004	11.000	0.049	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
4.000	12.361	0.155	80.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit		
4.001	16.194	0.202	80.0	0.040	0.00	0.0	0.600	o	150	Pipe/Conduit		
4.002	4.122	0.052	80.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
4.003	24.122	0.302	80.0	0.055	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.005	17.434	0.077	225.0	0.084	0.00	0.0	0.600	o	225	Pipe/Conduit		
5.000	18.490	0.231	80.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit		
5.001	7.567	0.095	80.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
5.002	12.775	0.160	80.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit		
6.000	0.878	0.006	150.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit		
1.006	5.607	0.025	225.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.007	2.557	0.017	150.0	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)	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)		
1.003	50.00	6.19	46.169	0.000	0.0	0.0	0.0	0.87	34.5	0.0		
3.000	50.00	5.09	46.142	0.000	0.0	0.0	0.0	0.87	34.5	0.0		
1.004	50.00	6.40	46.121	0.000	0.0	0.0	0.0	0.87	34.5	0.0		
4.000	50.00	5.24	47.417	0.000	0.0	0.0	0.0	0.86	6.8	0.0		
4.001	50.00	5.48	47.213	0.040	0.0	0.0	0.0	1.12	19.9	5.4		
4.002	50.00	5.54	47.010	0.040	0.0	0.0	0.0	1.12	19.9	5.4		
4.003	50.00	5.82	46.884	0.095	0.0	0.0	0.0	1.46	58.2	12.8		
1.005	50.00	6.74	46.072	0.179	0.0	0.0	0.0	0.87	34.5	24.2		
5.000	50.00	5.36	47.416	0.000	0.0	0.0	0.0	0.86	6.8	0.0		
5.001	50.00	5.47	47.135	0.000	0.0	0.0	0.0	1.12	19.9	0.0		
5.002	50.00	5.66	47.040	0.000	0.0	0.0	0.0	1.12	19.9	0.0		
6.000	50.00	5.02	46.046	0.000	0.0	0.0	0.0	0.82	14.5	0.0		
1.006	50.00	6.84	45.995	0.179	0.0	0.0	0.0	0.87	34.5	24.2		
1.007	50.00	6.90	45.970	0.179	0.0	0.0	0.0	0.82	14.5	24.2		
©1982-2020 Innovyze												

Bell Munro Consulting Ltd		Page 3
Turing House 5 Archway Manchester M15 5RL	Victoria Park North Site	
Date 09/01/2024 File SITE 3D MODEL.MDX	Designed by SJB Checked by CM	
XP Solutions	Network 2020.1	

Online Controls for Surface Network 2

Hydro-Brake® Optimum Manhole: PS83, DS/PN: 1.007, Volume (m³): 1.7

Unit Reference	MD-SHE-0103-5000-1200-5000
Design Head (m)	1.200
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	103
Invert Level (m)	45.970
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	5.0
Flush-Flo™	0.354	5.0
Kick-Flo®	0.745	4.0
Mean Flow over Head Range	-	4.4

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	3.4	1.200	5.0	3.000	7.7	7.000	11.5
0.200	4.7	1.400	5.4	3.500	8.3	7.500	11.8
0.300	5.0	1.600	5.7	4.000	8.8	8.000	12.2
0.400	5.0	1.800	6.0	4.500	9.3	8.500	12.6
0.500	4.9	2.000	6.3	5.000	9.8	9.000	12.9
0.600	4.7	2.200	6.6	5.500	10.2	9.500	13.3
0.800	4.1	2.400	6.9	6.000	10.7		
1.000	4.6	2.600	7.2	6.500	11.1		

Bell Munro Consulting Ltd		Page 4
Turing House 5 Archway Manchester M15 5RL	Victoria Park North Site	
Date 09/01/2024	Designed by SJB	
File SITE 3D MODEL.MDX	Checked by CM	
XP Solutions		Network 2020.1

Storage Structures for Surface Network 2

Cellular Storage Manhole: PS71, DS/PN: 3.000

Invert Level (m) 46.142 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	144.0	144.0	0.500	0.0	163.2
0.400	144.0	163.2			

Bell Munro Consulting Ltd

Page 5

Turing House
5 Archway
Manchester M15 5RL

Date 09/01/2024
File SITE 3D MODEL.MDX

XP Solutions

Victoria Park
North Site

Designed by SJB
Checked by CM

Network 2020.1

Micro Drainage

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 0.000

Hot Start Level (mm) 0

Inlet Coefficient 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 Storage Structures 1

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.370

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 150.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status OFF

Inertia Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Period(s) (years) 100

Climate Change (%) 45

US/MH

PN

Name

Storm

Return

Climate

First (X)

First (Y)

First (Z)

Overflow

Water

Period

Change

Surcharge

Flood

Overflow

Act.

Level

(m)

1.000

PS66

120

Winter

100

+45%

100/15

Summer

47.057

1.001

PS67

120

Winter

100

+45%

100/15

Summer

47.057

1.002

PS68

120

Winter

100

+45%

100/15

Summer

47.058

2.000

PS69

120

Winter

100

+45%

47.058

1.003

PS70

120

Winter

100

+45%

100/15

Summer

47.058

3.000

PS71

120

Winter

100

+45%

100/15

Summer

47.058

1.004

PS72

120

Winter

100

+45%

100/15

Summer

47.058

4.000

PS73

15

Summer

100

+45%

100/15

Summer

47.935

4.001

PS74

15

Winter

100

+45%

100/15

Summer

47.933

4.002

PS75

15

Winter

100

+45%

100/15

Summer

47.703

4.003

PS76

15

Winter

100

+45%

100/15

Summer

47.601

1.005

PS77

15

Winter

100

+45%

100/15

Summer

47.306

5.000

PS78

15

Summer

100

+45%

47.416

5.001

PS79

15

Winter

100

+45%

47.247

5.002

PS80

15

Winter

100

+45%

100/15

Summer

47.287

6.000

PS81

15

Winter

100

+45%

100/15

Summer

47.289

1.006

PS82

15

Winter

100

+45%

100/15

Summer

47.289

1.007

PS83

15

Winter

100

+45%

100/15

Summer

47.282

1.008

C4

180

Winter

100

+45%

46.017

©1982-2020 Innovzye

Bell Munro Consulting Ltd		Page 6
Turing House 5 Archway Manchester M15 5RL	Victoria Park North Site	
Date 09/01/2024 File SITE 3D MODEL.MDX	Designed by SJB Checked by CM	
XP Solutions		Network 2020.1

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 2

PN	US/MH Name	Surcharged Flooded		Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m³)					
1.000	PS66	0.433	0.000	0.03		0.2	SURCHARGED	
1.001	PS67	0.544	0.000	0.28		1.3	SURCHARGED	
1.002	PS68	0.631	0.000	0.10		1.3	SURCHARGED	
2.000	PS69	-0.046	0.000	0.00		0.1	OK	
1.003	PS70	0.664	0.000	0.05		1.5	SURCHARGED	
3.000	PS71	0.691	0.000	1.08	121	26.7	SURCHARGED	
1.004	PS72	0.712	0.000	0.89		26.0	SURCHARGED	
4.000	PS73	0.418	0.000	0.19		1.2	SURCHARGED	
4.001	PS74	0.570	0.000	1.14		21.1	FLOOD RISK	
4.002	PS75	0.543	0.000	1.53		21.7	SURCHARGED	
4.003	PS76	0.493	0.000	0.95		50.8	SURCHARGED	
1.005	PS77	1.009	0.000	0.56		17.4	SURCHARGED	
5.000	PS78	-0.100	0.000	0.00		0.0	OK	
5.001	PS79	-0.038	0.000	0.03		0.5	OK	
5.002	PS80	0.097	0.000	0.16		2.8	SURCHARGED	
6.000	PS81	1.093	0.000	0.08		0.9	SURCHARGED	
1.006	PS82	1.070	0.000	0.50		13.0	SURCHARGED	
1.007	PS83	1.162	0.000	0.46		5.0	FLOOD RISK	
1.008	C4	-0.086	0.000	0.38		5.0	OK	

Technical Specification

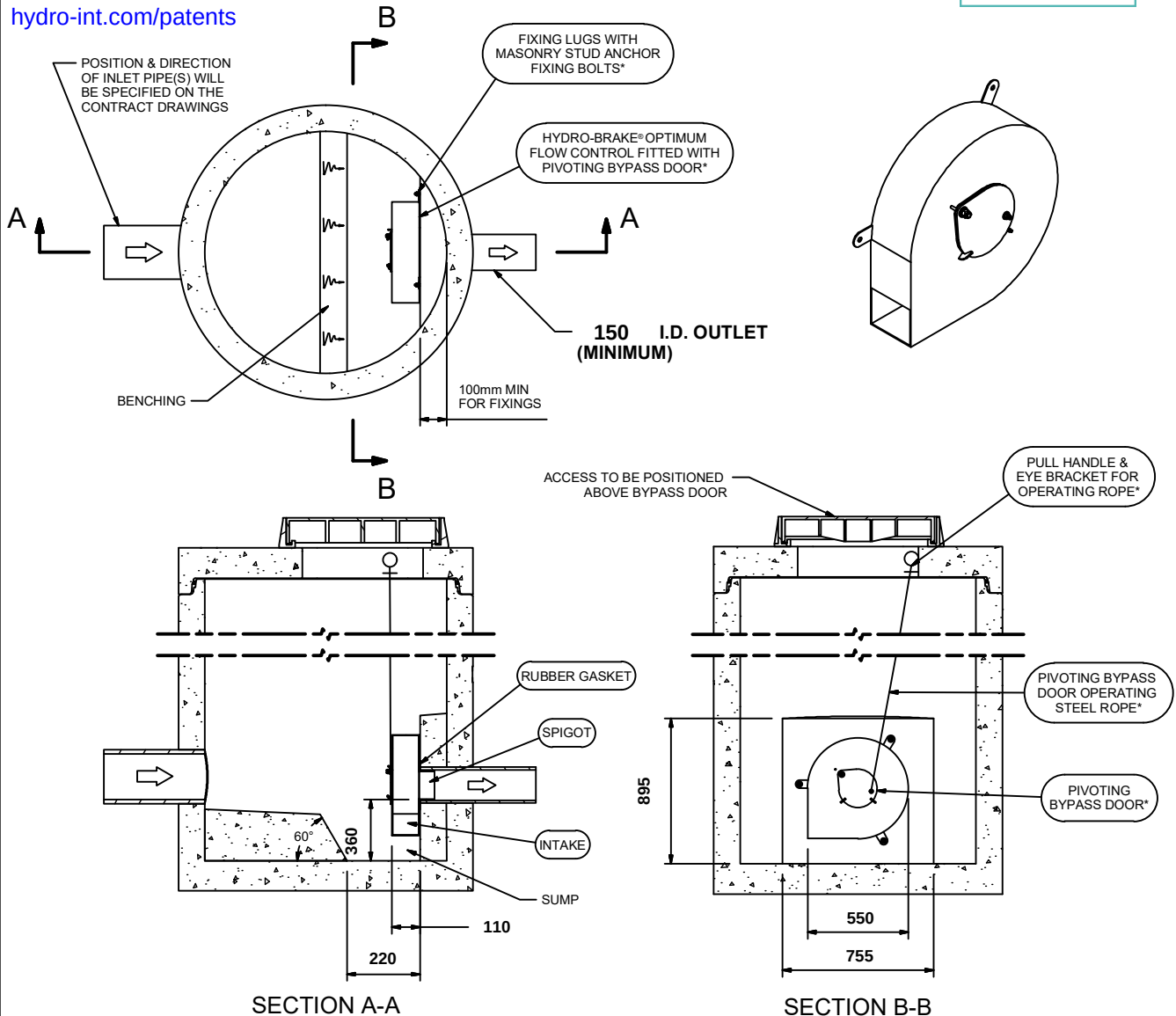
Control Point	Head (m)	Flow (l/s)
Primary Design	1.200	5.000
Flush-Flo™	0.354	4.998
Kick-Flo®	0.745	4.010
Mean Flow		4.368

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: 20 kg



hydro-int.com/patents



IMPORTANT:

○ LIMIT OF HYDRO INTERNATIONAL SUPPLY

THE DEVICE WILL BE HANDLED 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-0103-5000-1200-5000 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 11/08/2023 14:09

SITE Victoria Park

DESIGNER Simon Berry

REF J7986 N

SHE-0103-5000-1200-5000

Hydro-Brake® Optimum

© 2023

Hydro International Ltd • Unit 2, Rivermead Court • Kenn Business Park • Windmill Road • Kenn • Clevedon • BS21 6FT • Tel: 01275 878371 • www.hydro-int.com • Email: Enquiries@hydro-int.com

sberry@bellmunro.co.uk

South Site

Results for critical storm by water level

No flooding

Bell Munro Consulting Ltd		Page 0
Turing House 5 Archway Manchester M15 5RL	Victoria Park South Site	
Date 09/01/2024 File 1IN100.MDX	Designed by SJB Checked by CM	
XP Solutions Network 2020.1		

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Surface Network 1

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.370	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Surface Network 1

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.282	4-8	0.087

Total Area Contributing (ha) = 0.369

Total Pipe Volume (m³) = 64.394

Network Design Table for Surface Network 1

« - 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	22.583	0.282	80.0	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	12.204	0.153	80.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	19.010	0.238	80.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	2.450	0.031	80.0	0.000	5.00	0.0	0.600	o	100	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	5.33	46.765	0.000	0.0	0.0	0.0	1.12	19.9	0.0
1.001	50.00	5.52	46.483	0.000	0.0	0.0	0.0	1.12	19.9	0.0
1.002	50.00	5.73	46.255	0.000	0.0	0.0	0.0	1.46	58.2	0.0
2.000	50.00	5.05	46.874	0.000	0.0	0.0	0.0	0.86	6.8	0.0

Bell Munro Consulting Ltd		Page 4
Turing House 5 Archway Manchester M15 5RL	Victoria Park South Site	
Date 09/01/2024 File 1IN100.MDX	Designed by SJB Checked by CM	
XP Solutions Network 2020.1		
<u>Simulation Criteria for Surface Network 1</u> Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000 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 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> Rainfall Model FSR Profile Type Summer Return Period (years) 100 Cv (Summer) 0.750 Region England and Wales Cv (Winter) 0.840 M5-60 (mm) 18.000 Storm Duration (mins) 30 Ratio R 0.370		
©1982-2020 Innovyze		

Bell Munro Consulting Ltd		Page 5
Turing House 5 Archway Manchester M15 5RL	Victoria Park South Site	
Date 09/01/2024 File 1IN100.MDX	Designed by SJB Checked by CM	
XP Solutions		
Network 2020.1		

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S5, DS/PN: 1.008, Volume (m³): 26.3

Unit Reference	MD-SHE-0131-8900-1500-8900
Design Head (m)	1.500
Design Flow (l/s)	8.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	131
Invert Level (m)	44.877
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	8.9
Flush-Flo™	0.441	8.8
Kick-Flo®	0.926	7.1
Mean Flow over Head Range	-	7.7

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	4.7	1.200	8.0	3.000	12.3	7.000	18.5
0.200	8.0	1.400	8.6	3.500	13.3	7.500	19.1
0.300	8.6	1.600	9.2	4.000	14.1	8.000	19.7
0.400	8.8	1.800	9.7	4.500	14.9	8.500	20.3
0.500	8.8	2.000	10.2	5.000	15.7	9.000	20.8
0.600	8.7	2.200	10.6	5.500	16.4	9.500	21.4
0.800	8.1	2.400	11.1	6.000	17.1		
1.000	7.3	2.600	11.5	6.500	17.8		

Bell Munro Consulting Ltd		Page 6
Turing House 5 Archway Manchester M15 5RL	Victoria Park South Site	
Date 09/01/2024 File 1IN100.MDX	Designed by SJB Checked by CM	
XP Solutions	Network 2020.1	

Storage Structures for Surface Network 1

Cellular Storage Manhole: PS64, DS/PN: 13.000

Invert Level (m) 45.950 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	123.0	123.0	0.500	0.0	158.2
0.400	123.0	158.2			

Bell Munro Consulting Ltd

Page 7

Turing House
5 Archway
Manchester M15 5RL

Date 09/01/2024
File 1IN100.MDX

XP Solutions

Victoria Park
South Site

Designed by SJB
Checked by CM

Network 2020.1

Micro Drainage

Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 0.000

Hot Start Level (mm) 0

Inlet Coefficient 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 Storage Structures 1

Number of Online Controls 1

Number of Time/Area Diagrams 0

Number of Offline Controls 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR

Ratio R 0.368

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 150.0

Analysis Timestep 2.5 Second

Increment (Extended) DTS Status ON

DVD Status OFF

Inertia Status OFF

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Period(s) (years) 100

Climate Change (%) 45

US/MH

PN

Name

Storm

Return Period

Climate Change

First (X) Surcharge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level (m)

1.000

PS1

15 Summer

100

+45%

46.765

1.001

PS2

15 Summer

100

+45%

46.483

1.002

PS3

120 Winter

100

+45%

46.404

2.000

PS4

15 Summer

100

+45%

46.874

1.003

PS5

120 Winter

100

+45%

100/30 Summer

46.405

1.004

PS8

120 Winter

100

+45%

100/15 Winter

46.405

3.000

PS9

120 Winter

100

+45%

100/30 Summer

46.404

4.000

PS24

120 Winter

100

+45%

100/30 Winter

46.404

3.001

PS25

120 Winter

100

+45%

100/15 Winter

46.404

3.002

PS26

120 Winter

100

+45%

100/15 Winter

46.405

1.005

S1

120 Winter

100

+45%

100/15 Summer

46.405

5.000

PS27

120 Winter

100

+45%

100/30 Winter

46.404

6.000

PS28

120 Winter

100

+45%

100/15 Winter

46.404

5.001

PS35

120 Winter

100

+45%

100/15 Summer

46.404

5.002

PS36

120 Winter

100

+45%

100/15 Summer

46.405

7.000

PS37

120 Winter

100

+45%

100/60 Winter

46.404

5.003

PS38

120 Winter

100

+45%

100/15 Summer

46.405

5.004

PS39

120 Winter

100

+45%

100/15 Summer

46.405

8.000

PS40

15 Summer

100

+45%

46.804

©1982-2020 Innovzyze

Bell Munro Consulting Ltd										Page 9
Turing House 5 Archway Manchester M15 5RL					Victoria Park South Site					
Date 09/01/2024 File 1IN100.MDX					Designed by SJB Checked by CM					
XP Solutions					Network 2020.1					
Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1										
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Water	
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	Level	
									(m)	
8.001	PS41	15 Summer	100	+45%						46.551
1.006	S2	120 Winter	100	+45%	100/15 Summer					46.405
9.000	PS53	15 Summer	100	+45%						46.542
9.001	PS54	120 Winter	100	+45%						46.404
9.002	PS55	120 Winter	100	+45%						46.405
9.003	PS56	120 Winter	100	+45%	100/30 Winter					46.405
10.000	PS57	15 Summer	100	+45%						46.460
9.004	PS58	120 Winter	100	+45%	100/15 Winter					46.405
9.005	PS59	120 Winter	100	+45%	100/15 Winter					46.405
9.006	S3	120 Winter	100	+45%	100/15 Summer					46.405
1.007	S4	120 Winter	100	+45%	100/15 Summer					46.405
11.000	PS60	15 Summer	100	+45%						46.471
11.001	PS61	120 Winter	100	+45%	100/120 Winter					46.404
12.000	PS62	15 Summer	100	+45%						46.423
11.002	PS63	120 Winter	100	+45%	100/30 Winter					46.404
13.000	PS64	120 Winter	100	+45%	100/60 Winter					46.404
11.003	PS65	120 Winter	100	+45%	100/30 Winter					46.404
1.008	S5	120 Winter	100	+45%	100/15 Summer					46.405
1.009	C1	120 Winter	100	+45%						44.924
1.010	C2	120 Winter	100	+45%						44.726
	US/MH	Depth	Volume	Flow /	Overflow	Half Drain	Pipe		Level	
PN	Name	(m)	(m³)	Cap.	(l/s)	Time	Flow	Status	Exceeded	
						(mins)	(l/s)			
8.001	PS41	-0.150	0.000	0.00			0.0	OK		
1.006	S2	0.517	0.000	0.04			29.5	SURCHARGED		
9.000	PS53	-0.100	0.000	0.00			0.0	OK		
9.001	PS54	-0.043	0.000	0.01			0.0	OK		
9.002	PS55	-0.016	0.000	0.00			0.1	OK		
9.003	PS56	0.065	0.000	0.01			0.1	SURCHARGED		
10.000	PS57	-0.150	0.000	0.00			0.0	OK		
9.004	PS58	0.222	0.000	0.01			0.4	SURCHARGED		
9.005	PS59	0.285	0.000	0.01			0.4	SURCHARGED		
9.006	S3	0.529	0.000	0.03			15.8	SURCHARGED		
1.007	S4	0.570	0.000	0.08			56.7	SURCHARGED		
11.000	PS60	-0.150	0.000	0.00			0.0	OK		
11.001	PS61	0.003	0.000	0.01			0.1	SURCHARGED		
12.000	PS62	-0.150	0.000	0.00			0.0	OK		
11.002	PS63	0.141	0.000	0.01			0.3	SURCHARGED		
13.000	PS64	0.154	0.000	0.19		69	10.4	SURCHARGED		
11.003	PS65	0.168	0.000	0.15			9.3	SURCHARGED		
1.008	S5	1.378	0.000	0.82			8.9	SURCHARGED		
1.009	C1	-0.076	0.000	0.49			8.9	OK		
1.010	C2	-0.076	0.000	0.49			8.9	OK		
©1982-2020 Innovyze										

Technical Specification

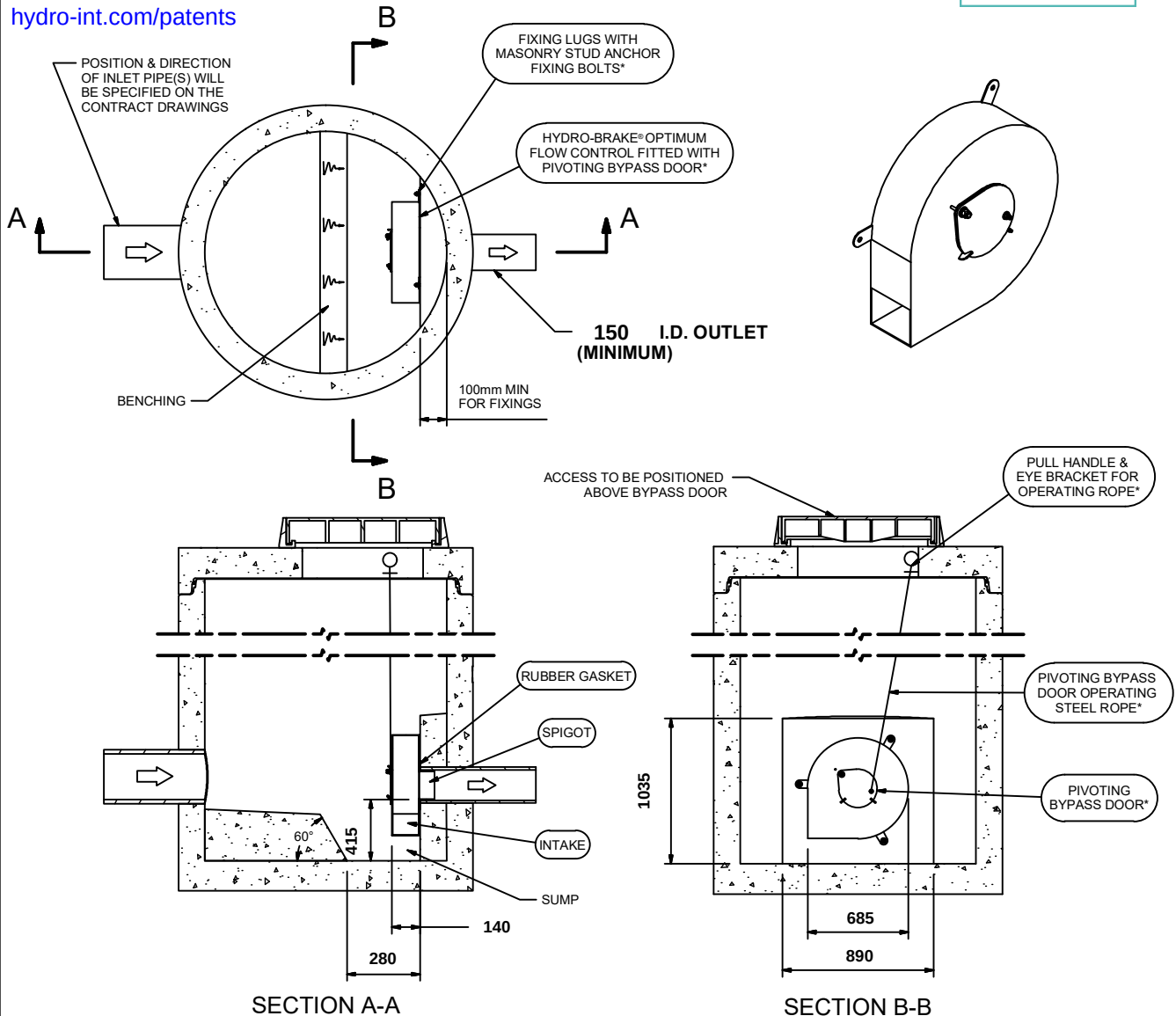
Control Point	Head (m)	Flow (l/s)
Primary Design	1.500	8.900
Flush-Flo™	0.441	8.847
Kick-Flo®	0.926	7.084
Mean Flow		7.739

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: 30 kg



hydro-int.com/patents



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-0131-8900-1500-8900 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 11/08/2023 14:12

SITE Victoria Park

DESIGNER Simon Berry

REF J7986 S

SHE-0131-8900-1500-8900

Hydro-Brake® Optimum