

Surface Water Drainage Calculations

For a site referred to as

Manchester Communication Academy,
Science Block

Undertaken on behalf of

Lancaster Maloney Martin Ltd.

WML Job No: 11258

Document No: 11258-WML-SC-XX-CA-C-0001

Date: March 2025

Project No. & Name:	11258 – MCA – Science Block	Status:	Prepared by:	Rev:	Date:
Document Ref:	11258-WML-SC-XX-CA-C-0001	Preliminary	Daniel Baker	P02	March 2025

General Notes

1. The calculations within this document have been undertaken using MicroDrainage Software version 2020.
2. This document is to be read in conjunction with the following documents;
 - a. 11258-WML-SC-XX-DR-C-1001 – Proposed Drainage GA

Summary of Results

1. The following summary demonstrates that the outgoing flow rates for the new development works do not exceed the maximum allowable flow rate of 1.7 l/s as outlined on the Proposed Drainage GA 11258-WML-SC-XX-DR-C-1001.

Proposed Site Runoff Rate – Manhole S7 (l/s)
1: 1.6
30: 1.5
100+45%: 1.7

Existing Greenfield Runoff Rates

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 19/03/2024 15:22 File	Designed by DBaker Checked by	
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Source Control 2020.1.3		
ICP SUDS Mean Annual Flood Input Return Period (years)1Soil0.450 Area (ha) 0.100Urban0.400 SAAR (mm)864Region NumberRegion 10 Results1/s QBAR Rural0.6 QBAR Urban1.0 Q1 year0.8 Q1 year0.8 Q30 years1.5 Q100 years1.7		
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Proposed Surface Water Network Calculation

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Stanley Green Business Park
Earl Rd, Cheadle Hulme, SK8 6QL

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Page 1



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Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)

1

PIMP (%)

100

M5-60 (mm)

18.000

Add Flow / Climate Change (%)

0

Ratio R

0.360

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

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
S1.000	28.000	0.350	80.0	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	28.991	0.350	82.8	0.023	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	28.000	0.350	80.0	0.020	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	1.850	0.100	18.5	0.029	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	35.000	1.000	35.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S3.000	8.000	0.050	160.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	5.609	0.275	20.4	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)
S1.000	45.24	5.41	64.350	0.020	0.0	0.0	0.0	1.12	19.9	2.4
S1.001	43.72	5.85	64.000	0.042	0.0	0.0	0.0	1.11	19.5	5.0
S2.000	45.24	5.41	64.650	0.020	0.0	0.0	0.0	1.12	19.9	2.4
S1.002	43.67	5.87	63.650	0.091	0.0	0.0	0.0	2.35	41.6	10.8
S1.003	42.56	6.21	63.000	0.091	0.0	0.0	0.0	1.71	30.2	10.8
S3.000	46.39	5.11	62.050	0.000	0.0	0.0	0.0	1.24	87.7	0.0
S1.004	42.48	6.23	61.850	0.091	0.0	0.0	0.0	3.50	247.2	10.8

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WML Consulting Ltd		Page 2
No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 12/02/2025 10:58	Designed by DBaker	
File 11258 - Surface Water 0...	Checked by	
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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	65.410	1.060	Open Manhole	600	S1.000	64.350	150				
S2	65.380	1.380	Open Manhole	600	S1.001	64.000	150	S1.000	64.000	150	
S3	65.410	0.760	Open Manhole	600	S2.000	64.650	150				
S4	65.390	1.740	Open Manhole	600	S1.002	63.650	150	S1.001	63.650	150	
								S2.000	64.300	150	650
S5	65.360	2.360	Open Manhole	600	S1.003	63.000	150	S1.002	63.550	150	550
S-TANK	63.450	1.400	Junction		S3.000	62.050	300				
S6	63.750	1.900	Open Manhole	1500	S1.004	61.850	300	S1.003	62.000	150	
								S3.000	62.000	300	150
S	63.710	2.135	Open Manhole	0		OUTFALL		S1.004	61.575	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	385760.704	400726.863	385760.704	400726.863	Required	
S2	385733.758	400734.472	385733.758	400734.472	Required	
S3	385752.825	400698.963	385752.825	400698.963	Required	
S4	385725.879	400706.573	385725.879	400706.573	Required	
S5	385725.376	400704.792	385725.376	400704.792	Required	
S-TANK	385761.233	400702.979			No Entry	
S6	385759.059	400695.280	385759.059	400695.280	Required	
S	385760.693	400689.914			No Entry	

WML Consulting Ltd		Page 3
No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 12/02/2025 10:58 File 11258 - Surface Water 0...	Designed by DBaker Checked by	
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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)
S1.000	o	150	S1	65.410	64.350	0.910	Open Manhole	600
S1.001	o	150	S2	65.380	64.000	1.230	Open Manhole	600
S2.000	o	150	S3	65.410	64.650	0.610	Open Manhole	600
S1.002	o	150	S4	65.390	63.650	1.590	Open Manhole	600
S1.003	o	150	S5	65.360	63.000	2.210	Open Manhole	600
S3.000	o	300	S-TANK	63.450	62.050	1.100	Junction	
S1.004	o	300	S6	63.750	61.850	1.600	Open Manhole	1500

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)
S1.000	28.000	80.0	S2	65.380	64.000	1.230	Open Manhole	600
S1.001	28.991	82.8	S4	65.390	63.650	1.590	Open Manhole	600
S2.000	28.000	80.0	S4	65.390	64.300	0.940	Open Manhole	600
S1.002	1.850	18.5	S5	65.360	63.550	1.660	Open Manhole	600
S1.003	35.000	35.0	S6	63.750	62.000	1.600	Open Manhole	1500
S3.000	8.000	160.0	S6	63.750	62.000	1.450	Open Manhole	1500
S1.004	5.609	20.4	S	63.710	61.575	1.835	Open Manhole	0

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)
S1.004	S	63.710	61.575	0.000	0	0

WML Consulting Ltd		Page 4
No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 12/02/2025 10:58 File 11258 - Surface Water 0...		
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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 12/02/2025 10:58 File 11258 - Surface Water 0...		
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S6, DS/PN: S1.004, Volume (m³): 4.5

Unit Reference	MD-SHE-0062-1700-1000-1700
Design Head (m)	1.000
Design Flow (l/s)	1.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	62
Invert Level (m)	61.850
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	1.7
Flush-Flo™	0.270	1.6
Kick-Flo®	0.549	1.3
Mean Flow over Head Range	-	1.4

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	1.4	1.200	1.8	3.000	2.8	7.000	4.2
0.200	1.6	1.400	2.0	3.500	3.0	7.500	4.3
0.300	1.6	1.600	2.1	4.000	3.2	8.000	4.4
0.400	1.5	1.800	2.2	4.500	3.4	8.500	4.6
0.500	1.4	2.000	2.3	5.000	3.6	9.000	4.7
0.600	1.3	2.200	2.4	5.500	3.7	9.500	4.8
0.800	1.5	2.400	2.5	6.000	3.9		
1.000	1.7	2.600	2.6	6.500	4.0		

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WML Consulting Ltd		Page 6
No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 12/02/2025 10:58 File 11258 - Surface Water 0...		
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Storage Structures for Storm

Cellular Storage Manhole: S-TANK, DS/PN: S3.000

Invert Level (m) 62.050 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	60.0	60.0	2.600	0.0	87.9
0.200	60.0	66.2	2.800	0.0	87.9
0.400	60.0	72.4	3.000	0.0	87.9
0.600	60.0	78.6	3.200	0.0	87.9
0.800	60.0	84.8	3.400	0.0	87.9
1.000	0.0	87.9	3.600	0.0	87.9
1.200	0.0	87.9	3.800	0.0	87.9
1.400	0.0	87.9	4.000	0.0	87.9
1.600	0.0	87.9	4.200	0.0	87.9
1.800	0.0	87.9	4.400	0.0	87.9
2.000	0.0	87.9	4.600	0.0	87.9
2.200	0.0	87.9	4.800	0.0	87.9
2.400	0.0	87.9	5.000	0.0	87.9

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Page 7

No. 8 Oak Green
Stanley Green Business Park
Earl Rd, Cheadle Hulme, SK8 6QL

Date 12/02/2025 10:58
File 11258 - Surface Water 0...

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Micro
Drainage

1 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 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 0.360

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5

Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 45

Water

Level

US/MH

Return Climate

First (X)

First (Y)

First (Z)

Overflow

Water

PN

Name

Storm

Period

Change

Surcharge

Flood

Overflow

Act.

(m)

S1.000

S1

15 Winter

1

+0%

100/15

Summer

64.385

S1.001

S2

15 Winter

1

+0%

100/15

Summer

64.051

S2.000

S3

15 Winter

1

+0%

64.685

S1.002

S4

15 Winter

1

+0%

30/15

Summer

63.726

S1.003

S5

15 Winter

1

+0%

30/15

Summer

63.060

S3.000

S-TANK

60 Winter

1

+0%

100/15

Summer

62.115

S1.004

S6

15 Winter

1

+0%

1/15

Summer

62.193

Surcharged Flooded

Half Drain Pipe

US/MH

Depth

Volume

Flow / Overflow

Time

Flow

Level

PN

Name

(m)

(m³)

Cap.

(l/s)

(mins)

(l/s)

Status

Exceeded

S1.000

S1

-0.115

0.000

0.12

2.3

OK

S1.001

S2

-0.099

0.000

0.25

4.7

OK

S2.000

S3

-0.115

0.000

0.12

2.3

OK

S1.002

S4

-0.074

0.000

0.50

9.9

OK

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Page 9

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Stanley Green Business Park
Earl Rd, Cheadle Hulme, SK8 6QL

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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 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 0.360

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 45

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	30	+0%	100/15 Summer				64.407
S1.001	S2	15 Winter	30	+0%	100/15 Summer				64.092
S2.000	S3	15 Winter	30	+0%					64.707
S1.002	S4	15 Winter	30	+0%	30/15 Summer				63.887
S1.003	S5	15 Winter	30	+0%	30/15 Summer				63.201
S3.000	S-TANK	120 Winter	30	+0%	100/15 Summer				62.305
S1.004	S6	15 Winter	30	+0%	1/15 Summer				62.352

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.093	0.000	0.30			5.7	OK	
S1.001	S2	-0.058	0.000	0.67			12.5	OK	
S2.000	S3	-0.093	0.000	0.30			5.7	OK	
S1.002	S4	0.087	0.000	1.36			27.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm																																																										
<table><tr><th colspan="2"></th><th colspan="3">Surcharged Flooded</th><th>Half Drain</th><th>Pipe</th><th colspan="2"></th></tr><tr><th>PN</th><th>US/MH Name</th><th>Depth (m)</th><th>Volume (m³)</th><th>Flow / Cap.</th><th>Overflow (l/s)</th><th>Time (mins)</th><th>Flow (l/s)</th><th>Status</th><th>Level Exceeded</th></tr><tr><td>S1.003</td><td>S5</td><td>0.051</td><td>0.000</td><td>0.92</td><td></td><td></td><td>26.8</td><td>SURCHARGED</td><td></td></tr><tr><td>S3.000</td><td>S-TANK</td><td>-0.045</td><td>0.000</td><td>0.02</td><td></td><td>97</td><td>1.4</td><td>OK*</td><td></td></tr><tr><td>S1.004</td><td>S6</td><td>0.202</td><td>0.000</td><td>0.01</td><td></td><td></td><td>1.5</td><td>SURCHARGED</td><td></td></tr></table>												Surcharged Flooded			Half Drain	Pipe			PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded	S1.003	S5	0.051	0.000	0.92			26.8	SURCHARGED		S3.000	S-TANK	-0.045	0.000	0.02		97	1.4	OK*		S1.004	S6	0.202	0.000	0.01			1.5	SURCHARGED	
		Surcharged Flooded			Half Drain	Pipe																																																				
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded																																																	
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Page 11

No. 8 Oak Green
Stanley Green Business Park
Earl Rd, Cheadle Hulme, SK8 6QL

Date 12/02/2025 10:58
File 11258 - Surface Water 0...

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Micro Drainage

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall ModelFSRRatio R 0.360
Region England and Wales Cv (Summer) 0.750
M5-60 (mm)18.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS StatusOFF
DVD StatusON
Inertia StatusON

Profile(s)Summer and Winter
Duration(s) (mins)15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)1, 30, 100
Climate Change (%)0, 0, 45

WARNING: Half Drain Time has not been calculated as the structure is too full.

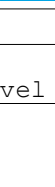
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	100	+45%	100/15 Summer				65.021
S1.001	S2	15 Winter	100	+45%	100/15 Summer				64.948
S2.000	S3	15 Winter	100	+45%					64.732
S1.002	S4	15 Winter	100	+45%	30/15 Summer				64.597
S1.003	S5	15 Winter	100	+45%	30/15 Summer				64.191
S3.000	S-TANK	180 Winter	100	+45%	100/15 Summer				62.703
S1.004	S6	180 Winter	100	+45%	1/15 Summer				62.703

PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflooded (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.521	0.000	0.48			9.1	SURCHARGED	

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL									
Date 12/02/2025 10:58 File 11258 - Surface Water 0...			Designed by DBaker Checked by						
Innovyze			Network 2020.1.3						
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
PN	US/MH Name	Depth (m)	Surcharged Volume (m³)	Flooded Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.001	S2	0.798	0.000	0.97			18.2	SURCHARGED	
S2.000	S3	-0.068	0.000	0.57			10.8	OK	
S1.002	S4	0.797	0.000	1.99			39.3	SURCHARGED	
S1.003	S5	1.041	0.000	1.35			39.3	SURCHARGED	
S3.000	S-TANK	0.353	0.000	0.02			1.5	SURCHARGED*	
S1.004	S6	0.553	0.000	0.01			1.6	SURCHARGED	
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Exceedance Storm Simulations

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
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Innovyze	Network 2020.1.3	

200 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 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	0.360
Region England and Wales Cv (Summer)	0.750		
M5-60 (mm)	18.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	200, 500, 1000
Climate Change (%)	0, 0, 0

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	200	+0%	500/15 Summer			
S1.001	S2	15 Winter	200	+0%	200/15 Summer			
S2.000	S3	15 Winter	200	+0%	1000/15 Summer			
S1.002	S4	15 Winter	200	+0%	200/15 Summer			
S1.003	S5	15 Winter	200	+0%	200/15 Summer			
S3.000	S-TANK	120 Winter	200	+0%	200/30 Summer			
S1.004	S6	120 Winter	200	+0%	200/15 Summer			

PN	US/MH Name	Water Surcharged Flooded			Half Drain Pipe		Status
		Level (m)	Depth (m)	Volume Flow / Cap. (m³)	Time (mins)	Flow (l/s)	
S1.000	S1	64.456	-0.044	0.000 0.45		8.6	OK

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL									
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Innovyze				Network 2020.1.3					
<u>500 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>									
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 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		0.360			
Region England and Wales Cv (Summer)		M5-60 (mm)		18.000 Cv (Winter)		0.840			
Margin for Flood Risk Warning (mm)						300.0			
Analysis Timestep		2.5 Second Increment (Extended)							
DTS Status				OFF					
DVD Status				ON					
Inertia Status				ON					
Profile(s)				Summer and Winter					
Duration(s) (mins)		15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080							
Return Period(s) (years)		200, 500, 1000							
Climate Change (%)		0, 0, 0							
WARNING: Half Drain Time has not been calculated as the structure is too full.									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	
S1.000	S1	15 Winter	500	+0%	500/15	Summer			
S1.001	S2	15 Winter	500	+0%	200/15	Summer			
S2.000	S3	15 Winter	500	+0%	1000/15	Summer			
S1.002	S4	15 Winter	500	+0%	200/15	Summer			
S1.003	S5	15 Winter	500	+0%	200/15	Summer			
S3.000	S-TANK	180 Winter	500	+0%	200/30	Summer			
S1.004	S6	180 Winter	500	+0%	200/15	Summer			
PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	64.944	0.444	0.000	0.48			9.1	SURCHARGED
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Page 5

No. 8 Oak Green
Stanley Green Business Park
Earl Rd, Cheadle Hulme, SK8 6QL

Date 31/03/2025 15:37
File 11258 - Surface Water 0...

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Micro
Drainage

1000 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 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 0.360

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 200, 500, 1000

Climate Change (%) 0, 0, 0

WARNING: Half Drain Time has not been calculated as the structure is too full.

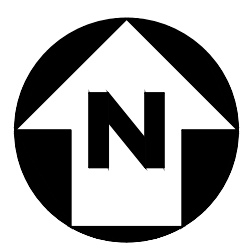
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	1000	+0%	500/15 Summer			
S1.001	S2	15 Winter	1000	+0%	200/15 Summer			
S2.000	S3	15 Winter	1000	+0%	1000/15 Summer			
S1.002	S4	15 Winter	1000	+0%	200/15 Summer			
S1.003	S5	15 Winter	1000	+0%	200/15 Summer			
S3.000	S-TANK	180 Winter	1000	+0%	200/30 Summer			
S1.004	S6	180 Winter	1000	+0%	200/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	65.371	0.871	0.000	0.53	10.0	FLOOD RISK

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[illegible]

Exceedance Flow Route Plan



LEGEND

- EXISTING MAJOR CONTOUR (0.5m INTERVAL)
- EXISTING MINOR CONTOUR (0.1m INTERVAL)
- PROPOSED MAJOR CONTOUR (0.5m INTERVAL)
- PROPOSED MINOR CONTOUR (0.1m INTERVAL)
- PROPOSED RETAINING STRUCTURE

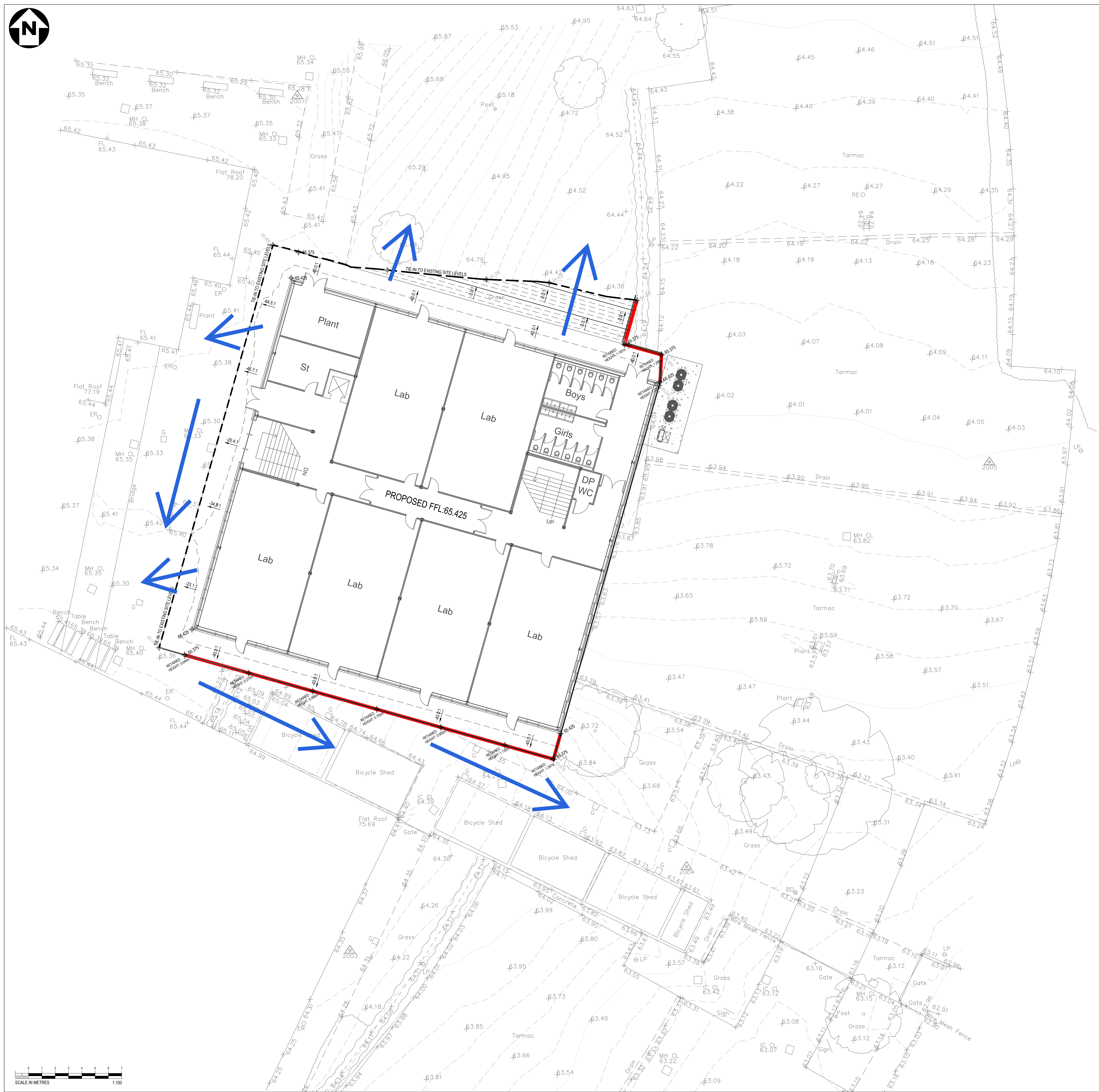
GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING WORK TO FIGURED DIMENSIONS ONLY.

NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING IS ALLOWED WITHOUT PRIOR PERMISSION IN WRITING.

ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.

THE CONTRACTOR SHALL INCORPORATE ALL THE REQUIREMENTS OF THE PRE-TENDER STAGE HEALTH AND SAFETY PLAN.



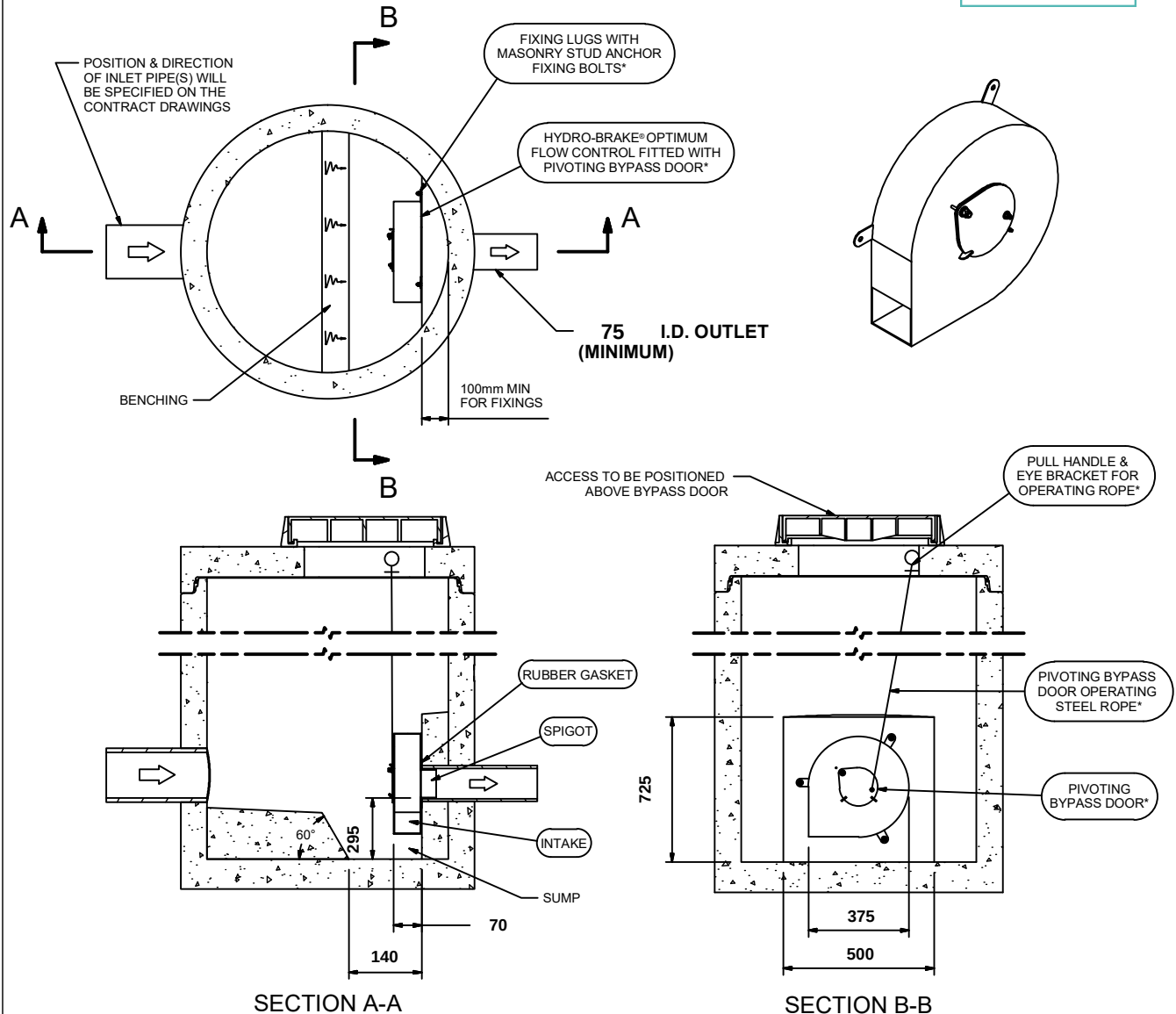
Hydrobrake Characteristics & Specifications

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.000	1.700
Flush-Flo™	0.270	1.591
Kick-Flo®	0.549	1.295
Mean Flow		1.433

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: 10 kg



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-0062-1700-1000-1700 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.

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International**
A CRH COMPANY

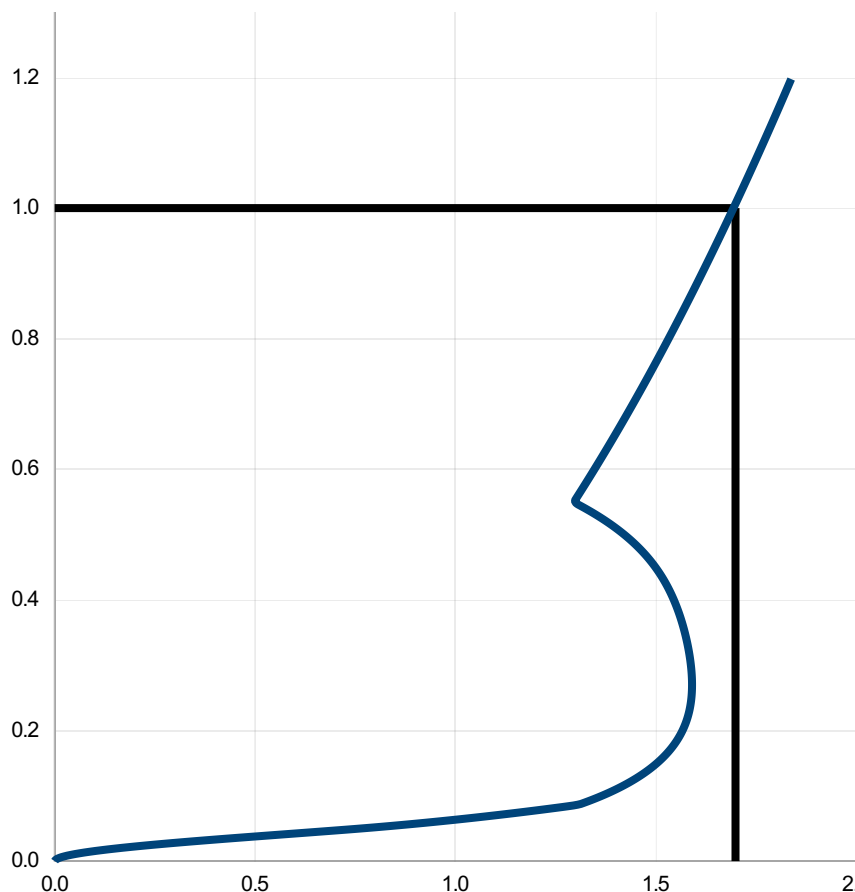
DATE	31/03/2025 15:18	SHE-0062-1700-1000-1700 Hydro-Brake® Optimum
SITE	MCA - Science Block	
DESIGNER	Dan Baker	
REF	11258	

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.000	1.700
Flush-Flo™	0.270	1.591
Kick-Flo®	0.549	1.295
Mean Flow		1.433



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.034	0.431
0.069	1.084
0.103	1.379
0.138	1.479
0.172	1.539
0.207	1.573
0.241	1.588
0.276	1.591
0.310	1.586
0.345	1.575
0.379	1.559
0.414	1.536
0.448	1.502
0.483	1.454
0.517	1.385
0.552	1.299
0.586	1.334
0.621	1.368
0.655	1.402
0.690	1.434
0.724	1.466
0.759	1.497
0.793	1.527
0.828	1.556
0.862	1.585
0.897	1.613
0.931	1.641
0.966	1.668
1.000	1.695

DESIGN ADVICE



The head/flow characteristics of this SHE-0062-1700-1000-1700 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.

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DATE	31/03/2025 15:18
Site	MCA - Science Block
DESIGNER	Dan Baker
Ref	11258

SHE-0062-1700-1000-1700
Hydro-Brake® Optimum