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Project
Catalyst Bicester,
Wendlebury Rd, Bicester.
for Albion Land.

Project No.
S1358

Sheet No.
HD1

Drawing No.

Rev.
0

Section
Highway Surface Water
Drainage Design

By
P.A.B.

Date
Feb 2020

Checked

Date

Calculations

PROPOSED DEVELOPMENT
CATALYST BICESTER
WENDLEBURY ROAD, BICESTER
FOR
ALBION LAND

HIGHWAY SURFACE WATER DRAINAGE DESIGN

1.0 INTRODUCTION


The following calculations are prepared to justify the design of below-ground surface water drainage to serve the new roundabout and re-ordered highway layout to create access to a development site off Wendlebury Road, Bicester.

It is proposed to discharge surface water from the highway to an existing ditch due west of the roundabout via a new outfall manhole constructed in land to the south of the Vendee link road.

The drainage shall be attenuated to provide a peak discharge rate of 5 l/sec to the ditch for design storms of 30 year and 100 year return periods. An Hydrobrake flow control shall be fitted in the outfall manhole; surface water will back-up into two shallow swales. To cater for flows in excess of the design parameters a 225mm diameter overflow pipe is to be fitted in the outfall manhole at an invert level of 64.750.

 <p>Bailey Johnson Hayes Grange House, John Dalton Street Manchester. M2 6FW Tel: 0161 279 7777 Fax: 0161 236 3552 Web: www.bjh.co.uk</p>	Project	Catalyst Bicester, Wendlebury Rd, Bicester. for Albion Land.	Project No. S1358	Sheet No. HD2
	Section	Highway Surface Water Drainage Design	Drawing No.	Rev. 0
			By P.A.B.	Date Feb 2020
			Checked	Date

Calculations
<p><u>2.0 DESIGN</u></p> <p>2.1 Drainage Design Drawings</p> <p>The attached BJH drawings S1358-HDD01, and HDD02 illustrate the design allowance for drained site areas, pipe design references and lengths, and the layout of principal below-ground drainage runs respectively. Drainage arrangements for the existing section of Wendlebury Road to the north of the section to be reconstructed are unclear: the road falls gently towards the south, therefore the design conservatively includes provision for receiving drainage from the whole of that area which totals 2247m².</p> <p>2.2 Drainage Design</p> <p>Drainage design is undertaken using Windes software and FEH rainfall. Total area = 0.69ha.</p> <p>By inspection of the results output the critical storm is a 360 minute event: therefore storms are modelled for each of 30 year, 100 year, and 100 year +40%CC return periods up to 480 minute duration.</p> <p>2.2.1 Simulation 30yr Winter Storms</p> <p>Microdrainage pages 1-6 include complete details of the network i.e. online controls, overflow, and storage provisions for a 15 minute winter design storm. The water level in Swale 2 at HW5 is 64.392; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 7 illustrates results only for a 30 minute winter design storm. The water level in Swale 2 at HW5 is 64.435; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 8 illustrates results only for a 60 minute winter design storm. The water level in Swale 2 at HW5 is 64.475; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 9 illustrates results only for a 120 minute winter design storm. The water level in Swale 2 at HW5 is 64.516; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 10 illustrates results only for a 180 minute winter design storm. The water level in Swale 2 at HW5 is 64.529; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 11 illustrates results only for a 240 minute winter design storm. The water level in Swale 2 at HW5 is 64.533; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 12 illustrates results only for a 360 minute winter design storm. The water level in Swale 2 at HW5 is 64.528; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 13 illustrates results only for a 480 minute winter design storm. The water level in Swale 2 at HW5 is 64.515; discharge to outfall is 5 l/sec; the overflow is inactive.</p>

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			Drawing No.	Rev. 0
	Section	Highway Surface Water Drainage Design	By P.A.B.	Date Feb 2020
			Checked	Date

Calculations
<p>2.2.2 Simulation 100yr Winter Storms</p> <p>Microdrainage page 14 illustrates results only for a 15 minute winter design storm. The water level in Swale 2 at HW5 is 64.517; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 15 illustrates results only for a 30 minute winter design storm. The water level in Swale 2 at HW5 is 64.570; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 16 illustrates results only for a 60 minute winter design storm. The water level in Swale 2 at HW5 is 64.621; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 17 illustrates results only for a 120 minute winter design storm. The water level in Swale 2 at HW5 is 64.667; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 18 illustrates results only for a 180 minute winter design storm. The water level in Swale 2 at HW5 is 64.687; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 19 illustrates results only for a 240 minute winter design storm. The water level in Swale 2 at HW5 is 64.696; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 20 illustrates results only for a 360 minute winter design storm. The water level in Swale 2 at HW5 is 64.697; discharge to outfall is 5 l/sec; the overflow is inactive.</p> <p>Microdrainage page 21 illustrates results only for a 480 minute winter design storm. The water level in Swale 2 at HW5 is 64.686; discharge to outfall is 5 l/sec; the overflow is inactive.</p>
<p>2.2.2 Simulation 100yr+40%CC Winter Storms</p> <p>Microdrainage page 22 illustrates results only for a 15 minute winter design storm. The water level in Swale 2 at HW5 is 64.657; discharge to outfall is 5 l/sec; the overflow rate is 0.4 l/sec.</p> <p>Microdrainage page 23 illustrates results only for a 30 minute winter design storm. The water level in Swale 2 at HW5 is 64.723; discharge to outfall is 5 l/sec; the overflow rate is 0.7 l/sec.</p> <p>Microdrainage page 24 illustrates results only for a 60 minute winter design storm. The water level in Swale 2 at HW5 is 64.785; discharge to outfall is 5 l/sec; the overflow rate is 7.1 l/sec.</p> <p>Microdrainage page 25 illustrates results only for a 120 minute winter design storm. The water level in Swale 2 at HW5 is 64.808; discharge to outfall is 5.3 l/sec; the overflow rate is 18.1 l/sec.</p> <p>Microdrainage page 26 illustrates results only for a 180 minute winter design storm. The water level in Swale 2 at HW5 is 64.811; discharge to outfall is 5.3 l/sec; the overflow rate is 20.1 l/sec.</p>



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Project

Catalyst Bicester,
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for Albion Land.

Project No.

S1358

Sheet No.

HD4

Drawing No.

Rev.

0

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Highway Surface Water
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Calculations

Microdrainage page 27 illustrates results only for a 240 minute winter design storm. The water level in Swale 2 at HW5 is 64.813; discharge to outfall is 5.3 l/sec; the overflow rate is 21.2 l/sec.

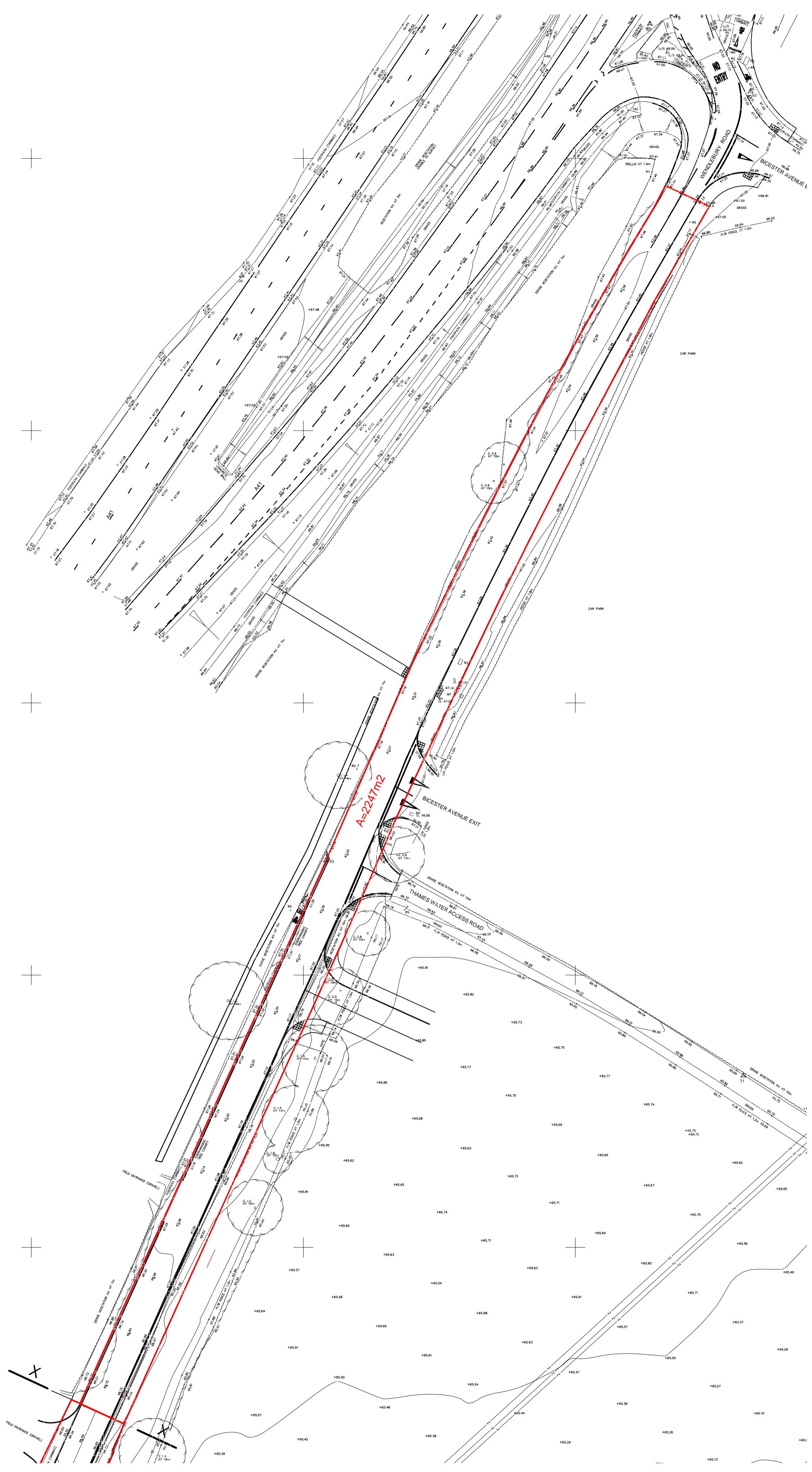
Microdrainage page 28 illustrates results only for a 360 minute winter design storm. The water level in Swale 2 at HW5 is 64.811; discharge to outfall is 5.3 l/sec; the overflow rate is 20.0 l/sec.

Microdrainage page 29 illustrates results only for a 480 minute winter design storm. The water level in Swale 2 at HW5 is 64.807; discharge to outfall is 5 l/sec; the overflow rate is 17.7 l/sec.

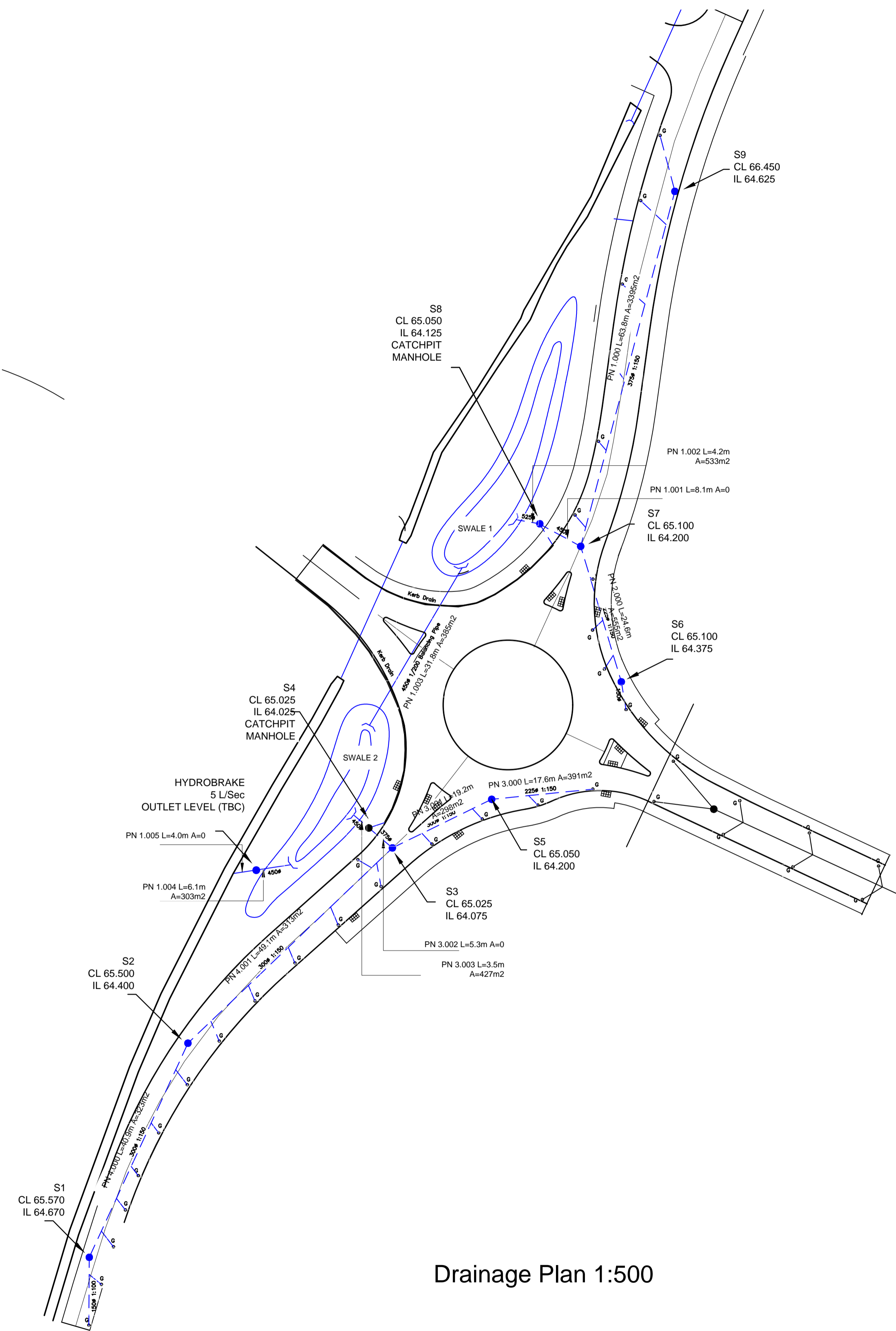
BAILEY JOHNSON HAYES DRAWINGS

S1358-HDD01 – Drained Areas

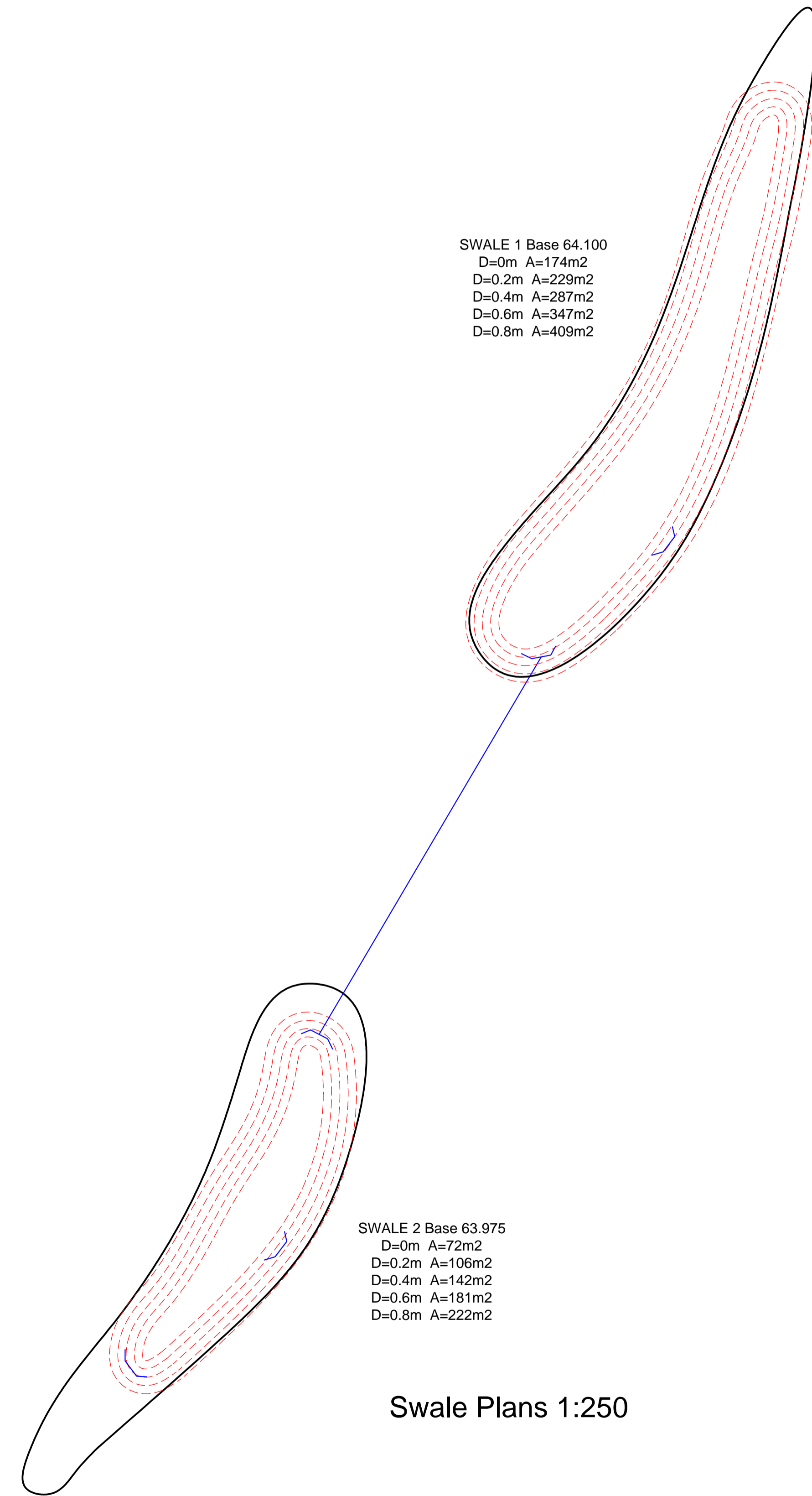
S1358-HDD02 – SW Drainage Plan & drainage
design refs



Rev	Date	Revision Description
Revision Schedule		
INFORMATION		
CATALYST BICESTER WENDLEBURY ROAD.		
Client:- Albion Land plc		
Highway Drainage Design Drained Areas		
BAILEY JOHNSON HAYES Consulting Engineers		
<small>MANCHESTER: Grange House, John Dalton Street Tel 0161 279 7777 Fax 0161 236 3552 ST ALBANS: Phoenix House, 63 Campfield Road, Tel 01727 841172 Fax 01727 841085</small>		
Scale	1:500 at A1	Project Ref.
Date	00.00.00	Drawing No.
Dm	BJH	Chkd
		BJH
		S1358
		HDD-01
		Rev.



Drainage Plan 1:500



Swale Plans 1:250


Rev	Date	Revision Description
Revision Schedule		
INFORMATION		
CATALYST BICESTER WENDLEBURY ROAD.		
Client:- Albion Land plc		
Highway Drainage Key Plan and Swales		
BAILEY JOHNSON HAYES Consulting Engineers		
<small>MANCHESTER: Grange House, John Dalton Street Tel 0161 279 7777 Fax 0161 236 3552 ST ALBANS: Phoenix House, 63 Campfield Road, Tel 01727 841172 Fax 01727 841085</small>		
Scale	As noted at A1	Project Ref.
Date	00.00.00	Drawing No.
Dm	BJH	Chkd
	BJH	
		S1358
		HDD-02
		Rev.
		.

MICRODRAINAGE CALCULATIONS

Pages 1-13 – 30 year storms 15min – 480min

Pages 14-21 – 100 year storms 15min – 480min

Pages 22-29 – 100 year +40% storms 15min –
480min


Bailey Johnson Hayes		Page 1
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:06 File 30yr 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)	Section Type
* 1.000	63.800	0.425	150.1	0.339	5.00	0.600	o	375	Pipe/Conduit
2.000	24.600	0.175	140.6	0.055	5.00	0.600	o	225	Pipe/Conduit
* 1.001	8.100	0.075	108.0	0.000	0.00	0.600	o	450	Pipe/Conduit
* 1.002	4.200	0.025	168.0	0.053	0.00	0.600	o	525	Pipe/Conduit
1.003	31.800	0.075	424.0	0.038	0.00	0.600	o	450	Pipe/Conduit
3.000	17.600	0.120	146.7	0.039	5.00	0.600	o	150	Pipe/Conduit
3.001	19.200	0.125	153.6	0.029	0.00	0.600	o	300	Pipe/Conduit
4.000	40.900	0.270	151.5	0.032	5.00	0.600	o	300	Pipe/Conduit
4.001	49.100	0.325	151.1	0.031	0.00	0.600	o	300	Pipe/Conduit
3.002	5.300	0.050	106.0	0.000	0.00	0.600	o	375	Pipe/Conduit
3.003	3.500	0.050	70.0	0.043	0.00	0.600	o	450	Pipe/Conduit
1.004	6.100	0.025	244.0	0.030	0.00	0.600	o	450	Pipe/Conduit
1.005	4.000	0.025	160.0	0.000	0.00	0.600	o	300	Pipe/Conduit

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
* 1.000	S9	66.450	64.625	1.450	65.100	64.200	0.525		1200
2.000	S6	65.100	64.375	0.500	65.100	64.200	0.675		1200
* 1.001	S7	65.100	64.200	0.450	65.050	64.125	0.475		1350
* 1.002	S8	65.050	64.125	0.400	65.000	64.100	0.375		1350
1.003	HW2	65.000	64.050	0.500	65.700	63.975	1.275		1350
3.000	G1	64.850	64.320	0.380	65.050	64.200	0.700		1200
3.001	S5	65.050	64.200	0.550	65.025	64.075	0.650		1200
4.000	S1	65.570	64.670	0.600	65.500	64.400	0.800		1200
4.001	S2	65.500	64.400	0.800	65.025	64.075	0.650		1200
3.002	S3	65.025	64.075	0.575	65.025	64.025	0.625		1350
3.003	S4	65.025	64.025	0.550	65.700	63.975	1.275		1350
1.004	HW5	65.700	63.900	1.350	65.700	63.875	1.375		1350
1.005	S10	65.700	63.875	1.525	65.700	63.850	1.550	Hydro-Brake®	1350

Bailey Johnson Hayes		Page 2
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:06 File 30yr 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage	Network 2017.1	

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	Ditch	65.700	63.850	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	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	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	1	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	1999
Site Location	457700 221050 SP 57700 21050
C (1km)	-0.022
D1 (1km)	0.321
D2 (1km)	0.324
D3 (1km)	0.251
E (1km)	0.288
F (1km)	2.477
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	15

Bailey Johnson Hayes		Page 3
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:06 File 30yr 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage	Network 2017.1	

Online Controls for Storm


Hydro-Brake® Optimum Manhole: S10, DS/PN: 1.005, Volume (m³): 3.4

Unit Reference	MD-SHE-0108-5000-0825-5000
Design Head (m)	0.825
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	108
Invert Level (m)	63.875
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.825	5.0
Flush-Flo™	0.247	5.0
Kick-Flo®	0.548	4.1
Mean Flow over Head Range	-	4.3

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	3.7	1.200	5.9	3.000	9.1	7.000	13.7
0.200	5.0	1.400	6.4	3.500	9.8	7.500	14.2
0.300	5.0	1.600	6.8	4.000	10.5	8.000	14.6
0.400	4.8	1.800	7.2	4.500	11.1	8.500	15.0
0.500	4.5	2.000	7.6	5.000	11.7	9.000	15.4
0.600	4.3	2.200	7.9	5.500	12.2	9.500	15.9
0.800	4.9	2.400	8.2	6.000	12.7		
1.000	5.5	2.600	8.6	6.500	13.2		

Bailey Johnson Hayes		Page 4
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:06 File 30yr 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage	Network 2017.1	

Offline Controls for Storm

Pipe Manhole: S10, DS/PN: 1.005, Loop to PN: None

Diameter (m)	0.225	Roughness k (mm)	0.600
Section Type	Pipe/Conduit	Entry Loss Coefficient	0.500
Slope (1:X)	3.0	Coefficient of Contraction	0.600
Length (m)	3.000	Upstream Invert Level (m)	64.750

Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:06 File 30yr 15 min.MDX	Designed by P.A.B. Checked by	

Micro Drainage	Network 2017.1
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Storage Structures for Storm

Tank or Pond Manhole: HW2, DS/PN: 1.003


Invert Level (m) 64.100

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	174.0	0.400	287.0	0.800	409.0
0.200	229.0	0.600	347.0		

Tank or Pond Manhole: HW5, DS/PN: 1.004

Invert Level (m) 63.975


Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	72.0	0.400	142.0	0.800	222.0
0.200	106.0	0.600	181.0		

Bailey Johnson Hayes		Page 6
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:06 File 30yr 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

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

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.903	-0.097	0.000	0.87	133.1	OK
2.000	S6	64.620	0.020	0.000	0.49	19.8	SURCHARGED
1.001	S7	64.561	-0.089	0.000	0.89	150.8	OK
1.002	S8	64.520	-0.130	0.000	0.91	167.4	OK
1.003	HW2	64.396	-0.104	0.000	0.39	52.2	OK
3.000	G1	64.491	0.021	0.000	1.10	15.0	SURCHARGED
3.001	S5	64.393	-0.107	0.000	0.34	26.1	OK
4.000	S1	64.749	-0.221	0.000	0.15	12.6	OK
4.001	S2	64.513	-0.187	0.000	0.29	25.0	OK
3.002	S3	64.393	-0.057	0.000	0.47	50.9	OK
3.003	S4	64.392	-0.083	0.000	0.39	66.2	OK
1.004	HW5	64.392	0.042	0.000	0.06	8.0	SURCHARGED
1.005	S10	64.417	0.242	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 7
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:07 File 30yr 30 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

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

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.841	-0.159	0.000	0.62	95.5	OK
2.000	S6	64.503	-0.097	0.000	0.38	15.1	OK
1.001	S7	64.468	-0.182	0.000	0.65	110.6	OK
1.002	S8	64.442	-0.208	0.000	0.67	124.6	OK
1.003	HW2	64.440	-0.060	0.000	0.27	36.3	OK
3.000	G1	64.441	-0.029	0.000	0.81	11.1	OK
3.001	S5	64.435	-0.065	0.000	0.25	19.1	OK
4.000	S1	64.736	-0.234	0.000	0.11	9.1	OK
4.001	S2	64.493	-0.207	0.000	0.21	17.8	OK
3.002	S3	64.435	-0.015	0.000	0.30	32.4	OK
3.003	S4	64.435	-0.040	0.000	0.25	43.0	OK
1.004	HW5	64.435	0.085	0.000	0.06	7.2	SURCHARGED
1.005	S10	64.461	0.286	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 8
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:08 File 30yr 60 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 60 minute 30 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.789	-0.211	0.000	0.39	60.2	OK
2.000	S6	64.488	-0.112	0.000	0.24	9.8	OK
1.001	S7	64.486	-0.164	0.000	0.41	70.1	OK
1.002	S8	64.484	-0.166	0.000	0.43	79.5	OK
1.003	HW2	64.484	-0.016	0.000	0.15	19.8	OK
3.000	G1	64.482	0.012	0.000	0.51	6.9	SURCHARGED
3.001	S5	64.478	-0.022	0.000	0.15	11.6	OK
4.000	S1	64.721	-0.249	0.000	0.07	5.7	OK
4.001	S2	64.479	-0.221	0.000	0.13	11.2	OK
3.002	S3	64.476	0.026	0.000	0.17	18.4	SURCHARGED
3.003	S4	64.475	0.000	0.000	0.15	24.9	SURCHARGED
1.004	HW5	64.475	0.125	0.000	0.05	6.1	SURCHARGED
1.005	S10	64.502	0.327	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 9
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:09 File 30yr 120 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 120 minute 30 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.749	-0.251	0.000	0.24	36.6	OK
2.000	S6	64.520	-0.080	0.000	0.15	5.9	OK
1.001	S7	64.518	-0.132	0.000	0.25	41.6	OK
1.002	S8	64.518	-0.132	0.000	0.25	46.6	OK
1.003	HW2	64.517	0.017	0.000	0.08	11.3	SURCHARGED
3.000	G1	64.519	0.049	0.000	0.31	4.2	SURCHARGED
3.001	S5	64.516	0.016	0.000	0.09	6.8	SURCHARGED
4.000	S1	64.709	-0.261	0.000	0.04	3.5	OK
4.001	S2	64.517	-0.183	0.000	0.08	6.8	OK
3.002	S3	64.516	0.066	0.000	0.10	11.0	SURCHARGED
3.003	S4	64.516	0.041	0.000	0.09	15.0	SURCHARGED
1.004	HW5	64.516	0.166	0.000	0.04	5.5	SURCHARGED
1.005	S10	64.521	0.346	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 10
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:10 File 30yr 180 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

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

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.731	-0.269	0.000	0.18	27.3	OK
2.000	S6	64.533	-0.067	0.000	0.11	4.4	OK
1.001	S7	64.532	-0.118	0.000	0.18	30.9	OK
1.002	S8	64.532	-0.118	0.000	0.19	34.5	OK
1.003	HW2	64.531	0.031	0.000	0.08	10.7	SURCHARGED
3.000	G1	64.532	0.062	0.000	0.23	3.1	SURCHARGED
3.001	S5	64.531	0.031	0.000	0.06	5.0	SURCHARGED
4.000	S1	64.704	-0.266	0.000	0.03	2.6	OK
4.001	S2	64.530	-0.170	0.000	0.06	5.1	OK
3.002	S3	64.530	0.080	0.000	0.08	8.3	SURCHARGED
3.003	S4	64.529	0.054	0.000	0.07	11.3	SURCHARGED
1.004	HW5	64.529	0.179	0.000	0.04	5.3	SURCHARGED
1.005	S10	64.520	0.345	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 11
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:11 File 30yr 240 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 240 minute 30 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.719	-0.281	0.000	0.14	22.1	OK
2.000	S6	64.537	-0.063	0.000	0.09	3.6	OK
1.001	S7	64.536	-0.114	0.000	0.15	24.8	OK
1.002	S8	64.535	-0.115	0.000	0.15	27.7	OK
1.003	HW2	64.535	0.035	0.000	0.06	8.1	SURCHARGED
3.000	G1	64.536	0.066	0.000	0.18	2.5	SURCHARGED
3.001	S5	64.535	0.035	0.000	0.05	4.0	SURCHARGED
4.000	S1	64.702	-0.268	0.000	0.02	2.1	OK
4.001	S2	64.534	-0.166	0.000	0.05	4.1	OK
3.002	S3	64.534	0.084	0.000	0.06	6.7	SURCHARGED
3.003	S4	64.533	0.058	0.000	0.05	9.2	SURCHARGED
1.004	HW5	64.533	0.183	0.000	0.04	5.3	SURCHARGED
1.005	S10	64.523	0.348	0.000	0.09	0.0	5.0 SURCHARGED

Bailey Johnson Hayes		Page 12
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:12 File 30yr 360 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 360 minute 30 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.706	-0.294	0.000	0.11	16.3	OK
2.000	S6	64.531	-0.069	0.000	0.07	2.6	OK
1.001	S7	64.530	-0.120	0.000	0.11	18.3	OK
1.002	S8	64.530	-0.120	0.000	0.11	20.4	OK
1.003	HW2	64.530	0.030	0.000	0.05	6.4	SURCHARGED
3.000	G1	64.530	0.060	0.000	0.14	1.9	SURCHARGED
3.001	S5	64.529	0.029	0.000	0.04	3.0	SURCHARGED
4.000	S1	64.696	-0.274	0.000	0.02	1.5	OK
4.001	S2	64.529	-0.171	0.000	0.04	3.0	OK
3.002	S3	64.529	0.079	0.000	0.05	5.0	SURCHARGED
3.003	S4	64.528	0.053	0.000	0.04	6.8	SURCHARGED
1.004	HW5	64.528	0.178	0.000	0.04	5.2	SURCHARGED
1.005	S10	64.494	0.319	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 13
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:12 File 30yr 480 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 480 minute 30 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.698	-0.302	0.000	0.09	13.1	OK
2.000	S6	64.518	-0.082	0.000	0.05	2.1	OK
1.001	S7	64.517	-0.133	0.000	0.09	14.7	OK
1.002	S8	64.516	-0.134	0.000	0.09	16.5	OK
1.003	HW2	64.516	0.016	0.000	0.05	6.2	SURCHARGED
3.000	G1	64.516	0.046	0.000	0.11	1.5	SURCHARGED
3.001	S5	64.515	0.015	0.000	0.03	2.4	SURCHARGED
4.000	S1	64.691	-0.279	0.000	0.01	1.2	OK
4.001	S2	64.515	-0.185	0.000	0.03	2.4	OK
3.002	S3	64.515	0.065	0.000	0.04	4.1	SURCHARGED
3.003	S4	64.515	0.040	0.000	0.03	5.5	SURCHARGED
1.004	HW5	64.515	0.165	0.000	0.04	5.2	SURCHARGED
1.005	S10	64.532	0.357	0.000	0.09	0.0	5.0 SURCHARGED

Bailey Johnson Hayes		Page 14
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:14 File 100yr 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 15 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	65.449	0.449	0.000	1.20	183.5	SURCHARGED
2.000	S6	64.901	0.301	0.000	0.69	27.8	FLOOD RISK
1.001	S7	64.798	0.148	0.000	1.27	214.6	SURCHARGED
1.002	S8	64.650	0.000	0.000	1.28	236.6	OK
1.003	HW2	64.520	0.020	0.000	0.39	52.1	SURCHARGED
3.000	G1	64.662	0.192	0.000	1.56	21.3	FLOOD RISK
3.001	S5	64.544	0.044	0.000	0.47	36.8	SURCHARGED
4.000	S1	64.767	-0.203	0.000	0.22	18.6	OK
4.001	S2	64.548	-0.152	0.000	0.43	36.7	OK
3.002	S3	64.534	0.084	0.000	0.62	66.5	SURCHARGED
3.003	S4	64.529	0.054	0.000	0.54	91.5	SURCHARGED
1.004	HW5	64.517	0.167	0.000	0.09	10.6	SURCHARGED
1.005	S10	64.558	0.383	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 15
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:15 File 100yr 30 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 30 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.925	-0.075	0.000	0.89	137.2	OK
2.000	S6	64.643	0.043	0.000	0.54	21.6	SURCHARGED
1.001	S7	64.610	-0.040	0.000	0.93	157.8	OK
1.002	S8	64.579	-0.071	0.000	0.96	177.3	OK
1.003	HW2	64.572	0.072	0.000	0.29	39.8	SURCHARGED
3.000	G1	64.634	0.164	0.000	1.09	14.9	FLOOD RISK
3.001	S5	64.604	0.104	0.000	0.32	25.0	SURCHARGED
4.000	S1	64.749	-0.221	0.000	0.16	13.1	OK
4.001	S2	64.609	-0.091	0.000	0.30	25.6	OK
3.002	S3	64.594	0.144	0.000	0.37	39.5	SURCHARGED
3.003	S4	64.589	0.114	0.000	0.32	54.7	SURCHARGED
1.004	HW5	64.570	0.220	0.000	0.09	10.7	SURCHARGED
1.005	S10	64.585	0.410	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 16
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:16 File 100yr 60 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 60 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.827	-0.173	0.000	0.56	85.4	OK
2.000	S6	64.672	0.072	0.000	0.34	13.7	SURCHARGED
1.001	S7	64.664	0.014	0.000	0.58	98.4	SURCHARGED
1.002	S8	64.650	0.000	0.000	0.60	111.4	OK
1.003	HW2	64.624	0.124	0.000	0.19	25.2	SURCHARGED
3.000	G1	64.642	0.172	0.000	0.66	9.0	FLOOD RISK
3.001	S5	64.622	0.122	0.000	0.19	14.8	SURCHARGED
4.000	S1	64.732	-0.238	0.000	0.10	8.1	OK
4.001	S2	64.622	-0.078	0.000	0.18	15.7	OK
3.002	S3	64.621	0.171	0.000	0.22	23.7	SURCHARGED
3.003	S4	64.621	0.146	0.000	0.20	33.4	SURCHARGED
1.004	HW5	64.621	0.271	0.000	0.05	6.2	SURCHARGED
1.005	S10	64.643	0.468	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 17
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:17 File 100yr 120 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

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

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.774	-0.226	0.000	0.33	51.0	OK
2.000	S6	64.702	0.102	0.000	0.20	8.0	SURCHARGED
1.001	S7	64.694	0.044	0.000	0.33	55.4	SURCHARGED
1.002	S8	64.670	0.020	0.000	0.34	62.3	SURCHARGED
1.003	HW2	64.669	0.169	0.000	0.10	13.6	SURCHARGED
3.000	G1	64.671	0.201	0.000	0.40	5.4	FLOOD RISK
3.001	S5	64.669	0.169	0.000	0.12	9.3	SURCHARGED
4.000	S1	64.716	-0.254	0.000	0.06	4.8	OK
4.001	S2	64.668	-0.032	0.000	0.11	9.2	OK
3.002	S3	64.668	0.218	0.000	0.17	17.7	SURCHARGED
3.003	S4	64.667	0.192	0.000	0.14	23.4	SURCHARGED
1.004	HW5	64.667	0.317	0.000	0.04	5.6	SURCHARGED
1.005	S10	64.688	0.513	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 18
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:18 File 100yr 180 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 180 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.751	-0.249	0.000	0.25	37.7	OK
2.000	S6	64.692	0.092	0.000	0.15	5.9	SURCHARGED
1.001	S7	64.690	0.040	0.000	0.24	40.7	SURCHARGED
1.002	S8	64.689	0.039	0.000	0.25	45.8	SURCHARGED
1.003	HW2	64.689	0.189	0.000	0.09	12.0	SURCHARGED
3.000	G1	64.690	0.220	0.000	0.29	3.9	FLOOD RISK
3.001	S5	64.689	0.189	0.000	0.09	6.8	SURCHARGED
4.000	S1	64.710	-0.260	0.000	0.04	3.6	OK
4.001	S2	64.688	-0.012	0.000	0.08	6.8	OK
3.002	S3	64.688	0.238	0.000	0.12	13.0	SURCHARGED
3.003	S4	64.688	0.213	0.000	0.10	17.4	SURCHARGED
1.004	HW5	64.687	0.337	0.000	0.04	5.5	SURCHARGED
1.005	S10	64.712	0.537	0.000	0.09	0.0 5.0	SURCHARGED

Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road
Date 19/02/2020 14:18 File 100yr 240 min.MDX	Designed by P.A.B. Checked by




Micro Drainage Network 2017.1

Summary of Results for 240 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.738	-0.262	0.000	0.20	30.2	OK
2.000	S6	64.700	0.100	0.000	0.12	4.7	SURCHARGED
1.001	S7	64.699	0.049	0.000	0.19	32.5	SURCHARGED
1.002	S8	64.698	0.048	0.000	0.20	36.6	SURCHARGED
1.003	HW2	64.697	0.197	0.000	0.07	9.1	SURCHARGED
3.000	G1	64.699	0.229	0.000	0.23	3.1	FLOOD RISK
3.001	S5	64.697	0.197	0.000	0.07	5.4	SURCHARGED
4.000	S1	64.706	-0.264	0.000	0.03	2.8	OK
4.001	S2	64.697	-0.003	0.000	0.06	5.5	OK
3.002	S3	64.696	0.246	0.000	0.09	9.6	SURCHARGED
3.003	S4	64.696	0.221	0.000	0.08	13.0	SURCHARGED
1.004	HW5	64.696	0.346	0.000	0.04	5.4	SURCHARGED
1.005	S10	64.723	0.548	0.000	0.09	0.0 5.0	SURCHARGED

Bailey Johnson Hayes		Page 20
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:19 File 100yr 360 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 360 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.719	-0.281	0.000	0.14	22.0	OK
2.000	S6	64.700	0.100	0.000	0.08	3.4	SURCHARGED
1.001	S7	64.699	0.049	0.000	0.14	23.8	SURCHARGED
1.002	S8	64.699	0.049	0.000	0.14	26.8	SURCHARGED
1.003	HW2	64.698	0.198	0.000	0.07	9.4	SURCHARGED
3.000	G1	64.699	0.229	0.000	0.17	2.3	FLOOD RISK
3.001	S5	64.697	0.197	0.000	0.05	4.0	SURCHARGED
4.000	S1	64.702	-0.268	0.000	0.02	2.1	OK
4.001	S2	64.698	-0.002	0.000	0.05	4.0	OK
3.002	S3	64.697	0.247	0.000	0.07	7.1	SURCHARGED
3.003	S4	64.697	0.222	0.000	0.06	9.7	SURCHARGED
1.004	HW5	64.697	0.347	0.000	0.04	5.3	SURCHARGED
1.005	S10	64.686	0.511	0.000	0.09	0.0	5.0 SURCHARGED

Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road
Date 19/02/2020 14:20 File 100yr 480 min.MDX	Designed by P.A.B. Checked by




Micro Drainage Network 2017.1

Summary of Results for 480 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.709	-0.291	0.000	0.11	17.6	OK
2.000	S6	64.690	0.090	0.000	0.07	2.7	SURCHARGED
1.001	S7	64.689	0.039	0.000	0.11	19.1	SURCHARGED
1.002	S8	64.689	0.039	0.000	0.12	21.5	SURCHARGED
1.003	HW2	64.688	0.188	0.000	0.06	7.9	SURCHARGED
3.000	G1	64.689	0.219	0.000	0.13	1.8	FLOOD RISK
3.001	S5	64.688	0.188	0.000	0.04	3.2	SURCHARGED
4.000	S1	64.698	-0.272	0.000	0.02	1.7	OK
4.001	S2	64.687	-0.013	0.000	0.04	3.2	OK
3.002	S3	64.687	0.237	0.000	0.05	5.6	SURCHARGED
3.003	S4	64.686	0.211	0.000	0.05	7.6	SURCHARGED
1.004	HW5	64.686	0.336	0.000	0.04	5.1	SURCHARGED
1.005	S10	64.690	0.515	0.000	0.09	0.0	5.0 SURCHARGED

Bailey Johnson Hayes		Page 22
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:21 File 100yr+40% 15 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 15 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	66.308	1.308	0.000	1.68	257.1	FLOOD RISK
2.000	S6	65.099	0.499	0.000	1.02	41.2	FLOOD RISK
1.001	S7	65.036	0.386	0.000	1.68	284.5	FLOOD RISK
1.002	S8	64.779	0.129	0.000	1.71	316.3	FLOOD RISK
1.003	HW2	64.658	0.158	0.000	0.47	63.6	SURCHARGED
3.000	G1	64.851	0.381	1.236	1.86	25.4	FLOOD
3.001	S5	64.736	0.236	0.000	0.63	48.5	SURCHARGED
4.000	S1	64.786	-0.184	0.000	0.31	26.0	OK
4.001	S2	64.729	0.029	0.000	0.61	51.5	SURCHARGED
3.002	S3	64.719	0.269	0.000	0.81	86.9	SURCHARGED
3.003	S4	64.658	0.183	0.000	0.72	121.6	SURCHARGED
1.004	HW5	64.657	0.307	0.000	0.12	15.5	SURCHARGED
1.005	S10	64.767	0.592	0.000	0.09	0.4 5.0	SURCHARGED

Bailey Johnson Hayes		Page 23
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:22 File 100yr+40% 30 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 30 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	65.468	0.468	0.000	1.23	188.1	SURCHARGED
2.000	S6	64.902	0.302	0.000	0.75	30.3	FLOOD RISK
1.001	S7	64.801	0.151	0.000	1.28	217.0	FLOOD RISK
1.002	S8	64.725	0.075	0.000	1.32	244.0	SURCHARGED
1.003	HW2	64.725	0.225	0.000	0.37	50.4	FLOOD RISK
3.000	G1	64.851	0.381	1.154	1.33	18.1	FLOOD
3.001	S5	64.819	0.319	0.000	0.41	31.7	FLOOD RISK
4.000	S1	64.832	-0.138	0.000	0.22	18.4	OK
4.001	S2	64.823	0.123	0.000	0.41	35.0	SURCHARGED
3.002	S3	64.807	0.357	0.000	0.48	51.4	FLOOD RISK
3.003	S4	64.778	0.303	0.000	0.44	73.9	FLOOD RISK
1.004	HW5	64.723	0.373	0.000	0.14	17.2	SURCHARGED
1.005	S10	64.747	0.572	0.000	0.09	0.7	5.0 SURCHARGED

Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road
Date 19/02/2020 14:23 File 100yr+40% 60 min.MDX	Designed by P.A.B. Checked by




Micro Drainage Network 2017.1

Summary of Results for 60 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.905	-0.095	0.000	0.78	119.6	OK
2.000	S6	64.865	0.265	0.000	0.46	18.7	FLOOD RISK
1.001	S7	64.856	0.206	0.000	0.78	132.4	FLOOD RISK
1.002	S8	64.790	0.140	0.000	0.81	149.9	FLOOD RISK
1.003	HW2	64.789	0.289	0.000	0.23	31.6	FLOOD RISK
3.000	G1	64.851	0.381	1.054	0.84	11.5	FLOOD
3.001	S5	64.835	0.335	0.000	0.26	20.1	FLOOD RISK
4.000	S1	64.854	-0.116	0.000	0.13	11.2	OK
4.001	S2	64.845	0.145	0.000	0.23	19.9	SURCHARGED
3.002	S3	64.825	0.375	0.000	0.33	35.8	FLOOD RISK
3.003	S4	64.798	0.323	0.000	0.28	48.2	FLOOD RISK
1.004	HW5	64.785	0.435	0.000	0.10	12.3	SURCHARGED
1.005	S10	64.782	0.607	0.000	0.10	7.1 5.2	SURCHARGED

Bailey Johnson Hayes		Page 25
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:24 File 100yr+40% 120 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

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

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.953	-0.047	0.000	0.47	71.4	OK
2.000	S6	64.900	0.300	0.000	0.26	10.4	FLOOD RISK
1.001	S7	64.892	0.242	0.000	0.44	74.2	FLOOD RISK
1.002	S8	64.817	0.167	0.000	0.45	83.9	FLOOD RISK
1.003	HW2	64.815	0.315	0.000	0.13	17.0	FLOOD RISK
3.000	G1	64.819	0.349	0.000	0.54	7.3	FLOOD RISK
3.001	S5	64.812	0.312	0.000	0.17	12.9	FLOOD RISK
4.000	S1	64.815	-0.155	0.000	0.08	6.7	OK
4.001	S2	64.813	0.113	0.000	0.13	11.2	SURCHARGED
3.002	S3	64.810	0.360	0.000	0.21	22.2	FLOOD RISK
3.003	S4	64.809	0.334	0.000	0.18	30.1	FLOOD RISK
1.004	HW5	64.808	0.458	0.000	0.19	23.4	SURCHARGED
1.005	S10	64.803	0.628	0.000	0.10	18.1 5.3	SURCHARGED

Bailey Johnson Hayes		Page 26
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:24 File 100yr+40% 180 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage	Network 2017.1	

Summary of Results for 180 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.952	-0.048	0.000	0.34	52.8	OK
2.000	S6	64.907	0.307	0.000	0.19	7.8	FLOOD RISK
1.001	S7	64.898	0.248	0.000	0.33	55.5	FLOOD RISK
1.002	S8	64.821	0.171	0.000	0.34	62.7	FLOOD RISK
1.003	HW2	64.819	0.319	0.000	0.13	18.2	FLOOD RISK
3.000	G1	64.823	0.353	0.000	0.42	5.7	FLOOD RISK
3.001	S5	64.816	0.316	0.000	0.13	9.9	FLOOD RISK
4.000	S1	64.818	-0.152	0.000	0.06	5.0	OK
4.001	S2	64.817	0.117	0.000	0.11	9.0	SURCHARGED
3.002	S3	64.813	0.363	0.000	0.17	18.0	FLOOD RISK
3.003	S4	64.812	0.337	0.000	0.14	24.2	FLOOD RISK
1.004	HW5	64.811	0.461	0.000	0.20	25.4	SURCHARGED
1.005	S10	64.806	0.631	0.000	0.10	20.1	5.3 SURCHARGED

Bailey Johnson Hayes		Page 27
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:25 File 100yr+40% 240 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 240 minute 100 year Winter (Storm)

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


PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.946	-0.054	0.000	0.27	42.1	OK
2.000	S6	64.903	0.303	0.000	0.16	6.4	FLOOD RISK
1.001	S7	64.895	0.245	0.000	0.27	46.1	FLOOD RISK
1.002	S8	64.823	0.173	0.000	0.28	52.2	FLOOD RISK
1.003	HW2	64.821	0.321	0.000	0.14	18.8	FLOOD RISK
3.000	G1	64.825	0.355	0.000	0.32	4.4	FLOOD RISK
3.001	S5	64.818	0.318	0.000	0.10	7.8	FLOOD RISK
4.000	S1	64.821	-0.149	0.000	0.05	4.0	OK
4.001	S2	64.819	0.119	0.000	0.08	7.0	SURCHARGED
3.002	S3	64.815	0.365	0.000	0.13	13.7	FLOOD RISK
3.003	S4	64.813	0.338	0.000	0.11	18.7	FLOOD RISK
1.004	HW5	64.813	0.463	0.000	0.21	26.4	SURCHARGED
1.005	S10	64.808	0.633	0.000	0.10	21.2	5.3 SURCHARGED

Bailey Johnson Hayes		Page 28
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:26 File 100yr+40% 360 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage		Network 2017.1

Summary of Results for 360 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe		Status
					Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S9	64.893	-0.107	0.000	0.20	30.6	OK
2.000	S6	64.866	0.266	0.000	0.12	4.8	FLOOD RISK
1.001	S7	64.857	0.207	0.000	0.20	34.2	FLOOD RISK
1.002	S8	64.821	0.171	0.000	0.21	38.8	FLOOD RISK
1.003	HW2	64.819	0.319	0.000	0.13	17.9	FLOOD RISK
3.000	G1	64.823	0.353	0.000	0.24	3.2	FLOOD RISK
3.001	S5	64.816	0.316	0.000	0.07	5.7	FLOOD RISK
4.000	S1	64.818	-0.152	0.000	0.03	2.9	OK
4.001	S2	64.817	0.117	0.000	0.06	5.1	SURCHARGED
3.002	S3	64.813	0.363	0.000	0.10	10.2	FLOOD RISK
3.003	S4	64.811	0.336	0.000	0.08	13.9	FLOOD RISK
1.004	HW5	64.811	0.461	0.000	0.20	25.3	SURCHARGED
1.005	S10	64.806	0.631	0.000	0.10	20.0	5.3 SURCHARGED

Bailey Johnson Hayes		Page 29
Grange House John Dalton St Manchester M2 6FW	Highway drainage S278 Works Wendlebury Road	
Date 19/02/2020 14:28 File 100yr+40% 480 min.MDX	Designed by P.A.B. Checked by	
Micro Drainage	Network 2017.1	

Summary of Results for 480 minute 100 year Winter (Storm)

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Pipe Flow (l/s)	Status
1.000	S9	64.831	-0.169	0.000	0.16	24.5	OK
2.000	S6	64.824	0.224	0.000	0.09	3.7	FLOOD RISK
1.001	S7	64.819	0.169	0.000	0.16	26.4	FLOOD RISK
1.002	S8	64.816	0.166	0.000	0.16	30.1	FLOOD RISK
1.003	HW2	64.814	0.314	0.000	0.12	16.2	FLOOD RISK
3.000	G1	64.818	0.348	0.000	0.19	2.6	FLOOD RISK
3.001	S5	64.811	0.311	0.000	0.06	4.5	FLOOD RISK
4.000	S1	64.814	-0.156	0.000	0.03	2.3	OK
4.001	S2	64.812	0.112	0.000	0.05	4.0	SURCHARGED
3.002	S3	64.809	0.359	0.000	0.08	8.1	FLOOD RISK
3.003	S4	64.808	0.333	0.000	0.07	11.1	FLOOD RISK
1.004	HW5	64.807	0.457	0.000	0.18	23.0	SURCHARGED
1.005	S10	64.803	0.628	0.000	0.10	17.7	5.3 SURCHARGED