

TECHNICAL NOTE

Job Name: Station Hill, Temporary Car Park
Job No: 332611381
Note No: TN001 Rev P04
Date: May 2024
Prepared By: Said Bangura / James Scobie
Subject: **Proposed Surface Water Drainage Strategy**

1. Introduction

- 1.1. This technical note describes the surface water drainage strategy for a proposed temporary car park located on the Station Hill development, Reading. This car park will be constructed and used in the temporary situation prior to the construction of Phase 3 of the development.
- 1.2. Planning permission for the Station Hill Development has been approved and details of the surface water drainage are contained within the Waterman Flood Risk Assessment (Doc Ref: WIE14788-100-R-14-3-1_FRA). The proposed drainage strategy for this temporary car park has been designed to replicate the approved drainage strategy for the final scheme.

2. Approved Station Hill Drainage Strategy

- 2.1. Phase 3 of the Station Hill development is split between buildings AB, C and D. The approved drainage design for the Station Hill development is for surface water to be attenuated through on-site SuDS to a controlled discharge rate to the 1 in 100 year +40% allowance for climate change event. Surface water from Buildings AB (17.8l/s) and C (5l/s) is attenuated to a combined restricted rate of 22.8l/s which outfalls into the Thames Water surface water sewer in Station Road via manhole 281F. Surface water from building D is attenuated to a restricted rate of 15.7l/s which outfalls to the Thames Water surface water sewer in Garrard Street via manhole 3655.

3. Proposed Surface Water Drainage Strategy

- 3.1. The drainage strategy for the proposed temporary car park will mimic the approved Station Hill drainage strategy. The temporary car park covers approximately 4% of Building AB and 95% of Building C, therefore surface water from the development draining north to manhole 281F is restricted to 5.5l/s for the 1 in 100 year +40%CC event. The temporary car park covers approximately 73% of Building D, therefore surface water draining south to manhole 3655 is restricted to 11.4l/s for the 1 in 100 year +40%CC event.
- 3.2. The temporary car park will be surfaced with a permeable finish and a permeable subbase beneath. Surface water will permeate through the surface into a permeable subbase with a 30% void ratio which will act as a store to attenuate the water. Water from the subbase will be collected through a perforated pipe and controlled through flow control manholes. Surface water will then be discharged to the surrounding Thames Water network.
- 3.3. The proposed drainage network for the site is split between a northern and southern drainage network. The northern catchment discharges water north into Thames Water manhole 281F in Station Road. The southern catchment discharges water north into Thames Water manhole 3655 in Garrard Street to manhole 3655. To maximise the utilisation of the porous subbase a check dam has been incorporated into the southern network.
- 3.4. The network has been sized to contain the 1 in 30 year return period event without flooding. For the 1 in 100 year event with a +40% allowance for climate change, there is approximately 2.3m³ of flooding which will be contained within the car park.

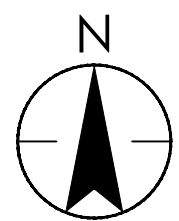
TECHNICAL NOTE

- 3.5. Attached to this technical note is Stantec Drawing 332611381-2001-SK001 which shows the proposed surface water drainage design for the temporary car park. Also attached are MicroDrainage calculations which simulate the network.
- 3.6. The scheme incorporates SuDS in the form of permeable surfacing which is considered an efficient means of managing surface water runoff close to source. The geomembrane and subsurface layers provide filtration benefits.
- 3.7. After the temporary car park is no longer in use, Phase 3 of the Station Hill Development will be built in its location as per the planning application.

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
332611381/2001/TN001	P01	28.03.2024	STB	JPS	JPS/PJG	SE
332611381/2001/TN001	P02	10.04.2024	STB	JPS	JPS/PJG	SE
332611381/2001/TN001	P03	24.04.2024	STB	JPS	JPS/PJG	SE
332611381/2001/TN001	P04	08.05.2024	STB	JPS	JPS/PJG	SE

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- ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT CONTRACT DRAWINGS, CONSTRUCTION DETAILS AND SPECIFICATIONS.

KEY:

- RED LINE BOUNDARY
- TEMPORARY CAR PARK BOUNDARY
- CATCHMENT BOUNDARY
- THAMES WATER SURFACE WATER SEWER AND MANHOLE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER CATCHPIT
- PROPOSED FLOW CONTROL MANHOLE
- PROPOSED PERFORATED DRAIN
- PROPOSED CHECK DAM WITHIN PERMEABLE PAVING
- DIRECTION OF SURFACE WATER FLOWS WITHIN SUBBASE
- FLOODING CONTROLLED ONSITE FOR 1 IN 100 YEAR + 40% CLIMATE CHANGE EVENT
- PROPOSED PERMEABLE SURFACING
 - SURFACE COURSE: 35mm ULTISUDS (10mm)
 - BINDER COURSE: 115mm ULTISUDS (32mm)
 - SUBBASE: 280mm PERMEABLE SUBBASE (TYPE 3) (THICKNESS DEPENDENT ON CBR)
 - IMPERMEABLE GEO-MEMBRANE

PO4 SITE LAYOUT UPDATED	JR	JPS	2024.05.08
PO3 DRAINAGE AMENDED	STB	JPS	2024.04.24
PO2 SITE LAYOUT UPDATED	JR	JPS	2024.04.10
PO1 FIRST ISSUE	STB	JPS	2024.03.28
Issued/Revision	By	Appd	YYYY.MM.DD
	STB	JPS	2024.05.08
	Dwn.	Dsgn.	Chkd.

Issue Status

S2 - FOR INFORMATION

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Client/Project Logo

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SH READING MASTER LLP

STATION HILL, READING

PHASE 3, TEMPORARY CAR PARK

Title

PROPOSED SURFACE WATER DRAINAGE LAYOUT

Project No.	332110835	A1 Scale	1:250
Revision	P04	Drawing No.	332611381 / 2001 / SK001

D

C

B

A

Path: S:\05\054\2024\05.08.15\1521 PM by: JPS\001.dgn
C:\Program Files\Autodesk\AutoCAD 2024\AutoCAD.exe -temp: c:\temp\design\temp\332611381_2001_14031

PEDESTRIAN ACCESS

EMERGENCY ACCESS

DISCHARGE TO THAMES WATER
MANHOLE 281F
CL: 39.30m
IL: 36.39m

FLOW CONTROL
MANHOLE LIMITING
DISCHARGE TO A
RATE OF 5.5l/s

NORTHERN CATCHMENT AREA
1,926m²

PHASE 3: OUTLINE
APPLICATION

SOUTHERN CATCHMENT AREA
3,609m²

THE TIN SITE

32 PARKING SPACES

PROPOSED HOARDING

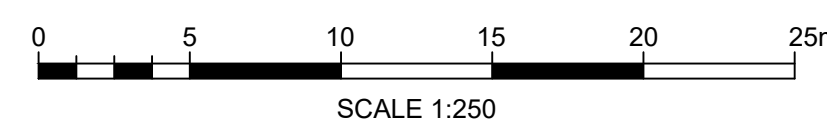
18 PARKING SPACES

NO ENTRY

DISCHARGE TO THAMES WATER
MANHOLE 3655
CL: 38.96m
IL: 37.43m

FLOW CONTROL
MANHOLE LIMITING
DISCHARGE TO A
RATE OF 11.4l/s

PEDESTRIAN ACCESS



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Source Control 2020.1

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 115 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	9.802	0.232	0.0	5.5	5.5	35.5	Flood Risk
30 min Summer	9.838	0.268	0.0	5.5	5.5	47.4	Flood Risk
60 min Summer	9.863	0.293	0.0	5.5	5.5	56.8	Flood Risk
120 min Summer	9.873	0.303	0.0	5.5	5.5	60.4	Flood Risk
180 min Summer	9.870	0.300	0.0	5.5	5.5	59.4	Flood Risk
240 min Summer	9.864	0.294	0.0	5.5	5.5	57.1	Flood Risk
360 min Summer	9.849	0.279	0.0	5.5	5.5	51.3	Flood Risk
480 min Summer	9.833	0.263	0.0	5.5	5.5	45.7	Flood Risk
600 min Summer	9.817	0.247	0.0	5.5	5.5	40.3	Flood Risk
720 min Summer	9.801	0.231	0.0	5.5	5.5	35.3	Flood Risk
960 min Summer	9.771	0.201	0.0	5.5	5.5	26.6	Flood Risk
1440 min Summer	9.721	0.151	0.0	5.5	5.5	15.0	Flood Risk
2160 min Summer	9.684	0.114	0.0	4.8	4.8	8.6	O K
2880 min Summer	9.667	0.097	0.0	4.0	4.0	6.2	O K
4320 min Summer	9.649	0.079	0.0	2.9	2.9	4.1	O K
5760 min Summer	9.638	0.068	0.0	2.3	2.3	3.1	O K
7200 min Summer	9.631	0.061	0.0	1.9	1.9	2.5	O K
8640 min Summer	9.626	0.056	0.0	1.7	1.7	2.1	O K
10080 min Summer	9.622	0.052	0.0	1.5	1.5	1.8	O K
15 min Winter	9.819	0.249	0.0	5.5	5.5	41.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	129.843	0.0	40.6	24
30 min Summer	85.337	0.0	55.3	37
60 min Summer	53.483	0.0	70.9	64
120 min Summer	32.428	0.0	87.2	108
180 min Summer	23.896	0.0	96.9	140
240 min Summer	19.136	0.0	103.8	172
360 min Summer	13.890	0.0	113.3	240
480 min Summer	11.074	0.0	120.6	306
600 min Summer	9.283	0.0	126.4	372
720 min Summer	8.033	0.0	131.3	434
960 min Summer	6.389	0.0	139.1	554
1440 min Summer	4.620	0.0	150.4	780
2160 min Summer	3.335	0.0	161.8	1112
2880 min Summer	2.644	0.0	169.8	1472
4320 min Summer	1.904	0.0	180.7	2204
5760 min Summer	1.506	0.0	187.8	2896
7200 min Summer	1.256	0.0	192.8	3632
8640 min Summer	1.082	0.0	196.4	4368
10080 min Summer	0.953	0.0	198.9	5120
15 min Winter	129.843	0.0	46.2	24

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	9.858	0.288	0.0	5.5	5.5	54.6	Flood Risk
60 min Winter	9.887	0.317	0.0	5.5	5.5	65.7	Flood Risk
120 min Winter	9.900	0.330	0.0	5.5	5.5	70.7	Flood Risk
180 min Winter	9.895	0.325	0.0	5.5	5.5	68.9	Flood Risk
240 min Winter	9.887	0.317	0.0	5.5	5.5	65.7	Flood Risk
360 min Winter	9.864	0.294	0.0	5.5	5.5	57.1	Flood Risk
480 min Winter	9.841	0.271	0.0	5.5	5.5	48.3	Flood Risk
600 min Winter	9.816	0.246	0.0	5.5	5.5	40.0	Flood Risk
720 min Winter	9.792	0.222	0.0	5.5	5.5	32.4	Flood Risk
960 min Winter	9.745	0.175	0.0	5.5	5.5	20.2	Flood Risk
1440 min Winter	9.689	0.119	0.0	5.0	5.0	9.3	O K
2160 min Winter	9.662	0.092	0.0	3.7	3.7	5.6	O K
2880 min Winter	9.649	0.079	0.0	3.0	3.0	4.1	O K
4320 min Winter	9.635	0.065	0.0	2.1	2.1	2.7	O K
5760 min Winter	9.626	0.056	0.0	1.7	1.7	2.1	O K
7200 min Winter	9.621	0.051	0.0	1.4	1.4	1.7	O K
8640 min Winter	9.617	0.047	0.0	1.2	1.2	1.4	O K
10080 min Winter	9.613	0.043	0.0	1.0	1.0	1.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	85.337	0.0	62.7	37
60 min Winter	53.483	0.0	80.2	64
120 min Winter	32.428	0.0	98.5	118
180 min Winter	23.896	0.0	109.4	150
240 min Winter	19.136	0.0	117.1	188
360 min Winter	13.890	0.0	127.8	262
480 min Winter	11.074	0.0	136.0	332
600 min Winter	9.283	0.0	142.6	398
720 min Winter	8.033	0.0	148.0	460
960 min Winter	6.389	0.0	156.9	572
1440 min Winter	4.620	0.0	169.6	768
2160 min Winter	3.335	0.0	182.7	1108
2880 min Winter	2.644	0.0	191.9	1468
4320 min Winter	1.904	0.0	204.6	2196
5760 min Winter	1.506	0.0	213.1	2856
7200 min Winter	1.256	0.0	219.2	3608
8640 min Winter	1.082	0.0	223.7	4352
10080 min Winter	0.953	0.0	227.1	5136

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Model Details

Storage is Online Cover Level (m) 10.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	55.0
Membrane Percolation (mm/hr)	1000	Length (m)	23.0
Max Percolation (l/s)	351.4	Slope (1:X)	80.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.570	Cap Volume Depth (m)	0.380

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0117-5500-0500-5500
Design Head (m)	0.500
Design Flow (l/s)	5.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	117
Invert Level (m)	9.570
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.500	5.5
Flush-Flo™	0.184	5.5
Kick-Flo®	0.374	4.8
Mean Flow over Head Range	-	4.5

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	4.1	1.200	8.3	3.000	12.8	7.000	19.2
0.200	5.5	1.400	8.9	3.500	13.7	7.500	19.9
0.300	5.3	1.600	9.5	4.000	14.7	8.000	20.6
0.400	5.0	1.800	10.0	4.500	15.5	8.500	21.2
0.500	5.5	2.000	10.5	5.000	16.3	9.000	21.8
0.600	6.0	2.200	11.0	5.500	17.0	9.500	22.4
0.800	6.8	2.400	11.5	6.000	17.8		
1.000	7.6	2.600	11.9	6.500	18.5		

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Station Hill

Temporary Car Park

Southern Network

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 98 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (1/s)	Max Control (1/s)	Max Σ Outflow (1/s)	Max Volume (m³)	Status
15 min Summer	9.869	0.299	0.0	11.4	11.4	61.2	Flood Risk
30 min Summer	9.918	0.348	0.0	11.4	11.4	83.0	Flood Risk
60 min Summer	9.955	0.385	0.0	11.4	11.4	101.2	Flood Risk
120 min Summer	9.973	0.403	0.0	11.4	11.4	110.6	Flood Risk
180 min Summer	9.975	0.405	0.0	11.4	11.4	111.7	Flood Risk
240 min Summer	9.971	0.401	0.0	11.4	11.4	109.7	Flood Risk
360 min Summer	9.955	0.385	0.0	11.4	11.4	101.4	Flood Risk
480 min Summer	9.937	0.367	0.0	11.4	11.4	92.1	Flood Risk
600 min Summer	9.918	0.348	0.0	11.4	11.4	82.6	Flood Risk
720 min Summer	9.898	0.328	0.0	11.4	11.4	73.8	Flood Risk
960 min Summer	9.863	0.293	0.0	11.4	11.4	58.9	Flood Risk
1440 min Summer	9.814	0.244	0.0	11.1	11.1	40.8	Flood Risk
2160 min Summer	9.783	0.213	0.0	8.8	8.8	31.1	Flood Risk
2880 min Summer	9.766	0.196	0.0	7.3	7.3	26.3	Flood Risk
4320 min Summer	9.746	0.176	0.0	5.4	5.4	21.2	Flood Risk
5760 min Summer	9.734	0.164	0.0	4.3	4.3	18.3	Flood Risk
7200 min Summer	9.725	0.155	0.0	3.5	3.5	16.5	Flood Risk
8640 min Summer	9.719	0.149	0.0	3.1	3.1	15.2	Flood Risk
10080 min Summer	9.714	0.144	0.0	2.7	2.7	14.3	Flood Risk
15 min Winter	9.893	0.323	0.0	11.4	11.4	71.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	129.843	0.0	64.7	23
30 min Summer	85.337	0.0	92.2	36
60 min Summer	53.483	0.0	121.4	62
120 min Summer	32.428	0.0	151.7	102
180 min Summer	23.896	0.0	169.8	134
240 min Summer	19.136	0.0	182.5	168
360 min Summer	13.890	0.0	200.0	236
480 min Summer	11.074	0.0	213.3	302
600 min Summer	9.283	0.0	223.8	364
720 min Summer	8.033	0.0	232.5	426
960 min Summer	6.389	0.0	246.5	544
1440 min Summer	4.620	0.0	266.2	766
2160 min Summer	3.335	0.0	285.7	1124
2880 min Summer	2.644	0.0	298.7	1476
4320 min Summer	1.904	0.0	315.1	2208
5760 min Summer	1.506	0.0	324.6	2936
7200 min Summer	1.256	0.0	330.0	3672
8640 min Summer	1.082	0.0	332.7	4400
10080 min Summer	0.953	0.0	333.5	5136
15 min Winter	129.843	0.0	75.3	24

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Station Hill

Temporary Car Park

Southern Network

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Micro Drainage

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	9.945	0.375	0.0	11.4	11.4	96.4	Flood Risk
60 min Winter	9.986	0.416	0.0	11.4	11.4	117.6	Flood Risk
120 min Winter	10.002	0.432	0.0	11.4	11.4	128.2	FLOOD
180 min Winter	10.002	0.432	0.0	11.4	11.4	127.3	FLOOD
240 min Winter	9.997	0.427	0.0	11.4	11.4	123.0	Flood Risk
360 min Winter	9.970	0.400	0.0	11.4	11.4	109.1	Flood Risk
480 min Winter	9.941	0.371	0.0	11.4	11.4	94.0	Flood Risk
600 min Winter	9.911	0.341	0.0	11.4	11.4	79.4	Flood Risk
720 min Winter	9.882	0.312	0.0	11.4	11.4	66.4	Flood Risk
960 min Winter	9.832	0.262	0.0	11.2	11.2	46.9	Flood Risk
1440 min Winter	9.789	0.219	0.0	9.3	9.3	32.7	Flood Risk
2160 min Winter	9.762	0.192	0.0	6.9	6.9	25.1	Flood Risk
2880 min Winter	9.747	0.177	0.0	5.5	5.5	21.3	Flood Risk
4320 min Winter	9.730	0.160	0.0	3.9	3.9	17.4	Flood Risk
5760 min Winter	9.720	0.150	0.0	3.1	3.1	15.3	Flood Risk
7200 min Winter	9.713	0.143	0.0	2.6	2.6	13.9	Flood Risk
8640 min Winter	9.708	0.138	0.0	2.2	2.2	12.9	Flood Risk
10080 min Winter	9.704	0.134	0.0	1.9	1.9	12.2	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	85.337	0.0	106.1	37
60 min Winter	53.483	0.0	138.8	64
120 min Winter	32.428	2.3	172.8	116
180 min Winter	23.896	1.7	193.1	146
240 min Winter	19.136	0.0	207.3	184
360 min Winter	13.890	0.0	227.0	256
480 min Winter	11.074	0.0	242.1	324
600 min Winter	9.283	0.0	254.0	388
720 min Winter	8.033	0.0	263.9	448
960 min Winter	6.389	0.0	279.7	554
1440 min Winter	4.620	0.0	302.3	770
2160 min Winter	3.335	0.0	324.8	1124
2880 min Winter	2.644	0.0	340.2	1476
4320 min Winter	1.904	0.0	360.0	2204
5760 min Winter	1.506	0.0	372.3	2928
7200 min Winter	1.256	0.0	379.8	3624
8640 min Winter	1.082	0.0	384.5	4392
10080 min Winter	0.953	0.0	387.1	5136

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Stantec UK Ltd		Page 3
Caversham Bridge House	Station Hill	
Waterman Place	Temporary Car Park	
Reading, RG1 8DN	Southern Network	
Date 12/04/2024	Designed by STB	
File Southern Network.SRCX	Checked by JPS	
Innovyze	Source Control 2020.1	

Stantec UK Ltd		Page 4																																																																																																																																																								
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Model Details Storage is Online Cover Level (m) 10.000 Porous Car Park Structure <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>57.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>64.5</td></tr><tr><td>Max Percolation (l/s)</td><td>1021.3</td><td>Slope (1:X)</td><td>80.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>9.570</td><td>Cap Volume Depth (m)</td><td>0.380</td></tr></table> Hydro-Brake® Optimum Outflow Control <table><tr><td>Unit Reference</td><td colspan="3">MD-SHE-0161-1140-0500-1140</td></tr><tr><td>Design Head (m)</td><td colspan="3">0.500</td></tr><tr><td>Design Flow (l/s)</td><td colspan="3">11.4</td></tr><tr><td>Flush-Flo™</td><td colspan="3">Calculated</td></tr><tr><td>Objective</td><td colspan="3">Minimise upstream storage</td></tr><tr><td>Application</td><td colspan="3">Surface</td></tr><tr><td>Sump Available</td><td colspan="3">Yes</td></tr><tr><td>Diameter (mm)</td><td colspan="3">161</td></tr><tr><td>Invert Level (m)</td><td colspan="3">9.650</td></tr><tr><td>Minimum Outlet Pipe Diameter (mm)</td><td colspan="3">225</td></tr><tr><td>Suggested Manhole Diameter (mm)</td><td colspan="3">1200</td></tr></table> Control PointsHead (m)Flow (l/s) <table><tr><td>Design Point (Calculated)</td><td>0.500</td><td>11.4</td></tr><tr><td>Flush-Flo™</td><td>0.236</td><td>11.4</td></tr><tr><td>Kick-Flo®</td><td>0.402</td><td>10.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>8.9</td></tr></table> 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 <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>5.8</td><td>1.200</td><td>17.2</td><td>3.000</td><td>26.8</td><td>7.000</td><td>40.3</td></tr><tr><td>0.200</td><td>11.3</td><td>1.400</td><td>18.6</td><td>3.500</td><td>28.8</td><td>7.500</td><td>41.7</td></tr><tr><td>0.300</td><td>11.2</td><td>1.600</td><td>19.8</td><td>4.000</td><td>30.7</td><td>8.000</td><td>43.1</td></tr><tr><td>0.400</td><td>10.3</td><td>1.800</td><td>20.9</td><td>4.500</td><td>32.5</td><td>8.500</td><td>44.4</td></tr><tr><td>0.500</td><td>11.4</td><td>2.000</td><td>22.0</td><td>5.000</td><td>34.2</td><td>9.000</td><td>45.7</td></tr><tr><td>0.600</td><td>12.4</td><td>2.200</td><td>23.0</td><td>5.500</td><td>35.6</td><td>9.500</td><td>47.0</td></tr><tr><td>0.800</td><td>14.2</td><td>2.400</td><td>24.0</td><td>6.000</td><td>37.3</td><td></td><td></td></tr><tr><td>1.000</td><td>15.8</td><td>2.600</td><td>25.0</td><td>6.500</td><td>38.8</td><td></td><td></td></tr></table>			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	57.0	Membrane Percolation (mm/hr)	1000	Length (m)	64.5	Max Percolation (l/s)	1021.3	Slope (1:X)	80.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	9.570	Cap Volume Depth (m)	0.380	Unit Reference	MD-SHE-0161-1140-0500-1140			Design Head (m)	0.500			Design Flow (l/s)	11.4			Flush-Flo™	Calculated			Objective	Minimise upstream storage			Application	Surface			Sump Available	Yes			Diameter (mm)	161			Invert Level (m)	9.650			Minimum Outlet Pipe Diameter (mm)	225			Suggested Manhole Diameter (mm)	1200			Design Point (Calculated)	0.500	11.4	Flush-Flo™	0.236	11.4	Kick-Flo®	0.402	10.3	Mean Flow over Head Range	-	8.9	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	5.8	1.200	17.2	3.000	26.8	7.000	40.3	0.200	11.3	1.400	18.6	3.500	28.8	7.500	41.7	0.300	11.2	1.600	19.8	4.000	30.7	8.000	43.1	0.400	10.3	1.800	20.9	4.500	32.5	8.500	44.4	0.500	11.4	2.000	22.0	5.000	34.2	9.000	45.7	0.600	12.4	2.200	23.0	5.500	35.6	9.500	47.0	0.800	14.2	2.400	24.0	6.000	37.3			1.000	15.8	2.600	25.0	6.500	38.8		
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