



Section Inspection - 23/02/2019 - manhole 4X

Section 4	Inspection 4	Date 23/02/19	Time 15:11	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR MANHOLE 4X
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	MANHOLE 4
Road:	367 Wilmslow Road	Inspected Length:	7.43 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	7.43 m	Downstream Node:	MANHOLE 3
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:65 Position [m] Code Observation MPEG Photo Grade

Depth: m
Manhole 3



0.00

WL

Water level, 0% of the vertical dimension

0.00

MH

Start node type, manhole, reference number: Manhole 3

00:00:00

7.43

MHF

Finish node type, manhole, reference number: manhole 4:
internal manhole

00:00:43

manhole 4
Depth: m

Structural Defects

Construction Features

Service & Operational Observations

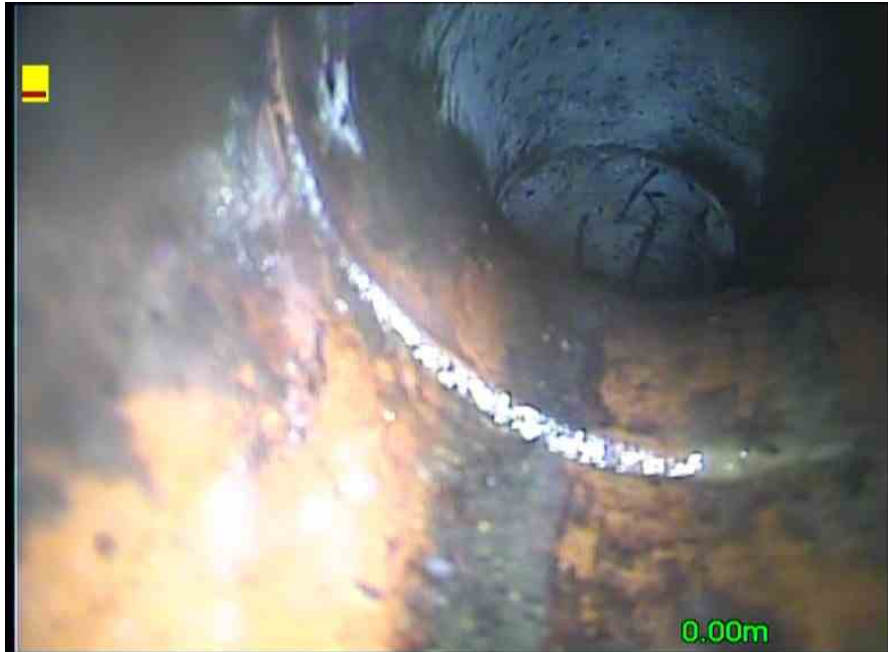
Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



Section Pictures - 23/02/2019 - manhole 4X

Section 4	Inspection Direction Upstream	PLR MANHOLE 4X	Client's Job Ref	Contractor's Job Ref
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, 0.00 m
Water level, 0% of the vertical dimension

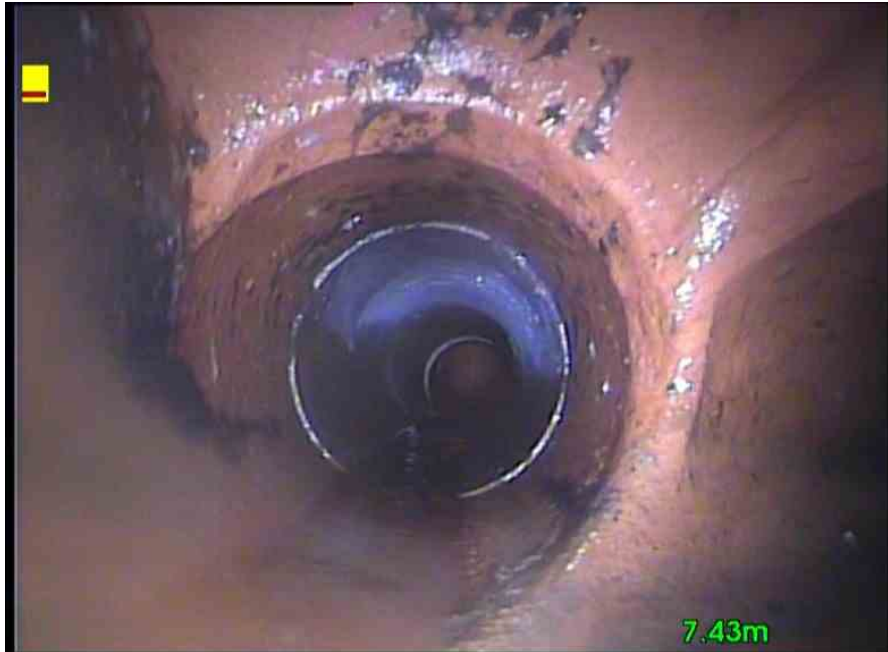


, 00:00:00, 0.00 m
Start node type, manhole, reference number: Manhole 3



Section Pictures - 23/02/2019 - manhole 4X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
4	Upstream	MANHOLE 4X		



, 00:00:43, 7.43 m
Finish node type, manhole, reference number: manhole 4, internal manhole



Section Inspection - 23/02/2019 - SVPX

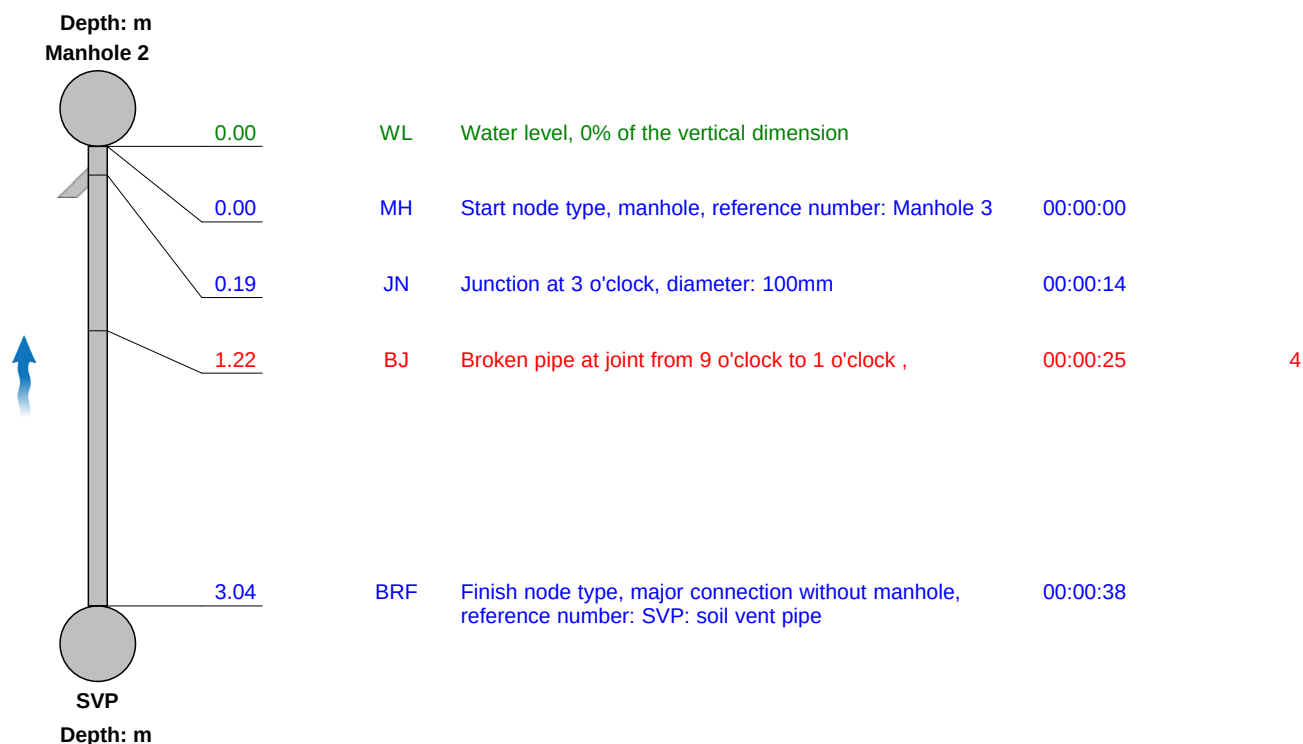
Section 5	Inspection 5	Date 23/02/19	Time 15:20	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR SVPX
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	SVP
Road:	367 Wilmslow Road	Inspected Length:	3.04 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	3.04 m	Downstream Node:	MANHOLE 2
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Vitrified clay pipe (i.e. all clayware)		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50 Position [m] Code Observation MPEG Photo Grade



Structural Defects					Construction Features				
Service & Operational Observations					Miscellaneous Features				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
1	80.0	26.3	80.0	4.0	0	0.0	0.0	0.0	1.0

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	SVPX		



, 0.00 m
 Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
 Start node type, manhole, reference number: Manhole 3

Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	SVPX		



, 00:00:14, 0.19 m
 Junction at 3 o'clock, diameter: 100mm



, 00:00:25, 1.22 m
 Broken pipe at joint from 9 o'clock to 1 o'clock ,



Section Pictures - 23/02/2019 - SVPX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
5	Upstream	SVPX		



, 00:00:38, 3.04 m
Finish node type, major connection without manhole, reference number: SVP, soil vent pipe



Section Inspection - 23/02/2019 - Manhole 3X

Section 6	Inspection 6	Date 23/02/19	Time 15:42	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR MANHOLE 3X
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Downstream	Upstream Node:	MANHOLE 3
Road:	367 Wilmslow Road	Inspected Length:	9.98 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	9.98 m	Downstream Node:	MANHOLE 2
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:87	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m Manhole 3 Manhole 2 Depth: m						
	0.00	WL	Water level, 0% of the vertical dimension			
	0.00	MH	Start node type, manhole, reference number: Manhole 3	00:00:00		
	4.49	CC	Crack, circumferential from 8 o'clock to 3 o'clock	00:00:50		2
	6.49	CC	Crack, circumferential from 12 o'clock to 4 o'clock	00:01:10		2
	9.98	MHF	Finish node type, manhole, reference number: Manhole 2	00:02:02		

Structural Defects					Construction Features				
Service & Operational Observations					Miscellaneous Features				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
2	10.0	2.0	20.0	2.0	0	0.0	0.0	0.0	1.0



Section Pictures - 23/02/2019 - Manhole 3X

Section 6	Inspection Direction Downstream	PLR MANHOLE 3X	Client's Job Ref	Contractor's Job Ref
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, 0.00 m
Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
Start node type, manhole, reference number: Manhole 3

Section Pictures - 23/02/2019 - Manhole 3X

Section 6	Inspection Direction Downstream	PLR MANHOLE 3X	Client's Job Ref	Contractor's Job Ref
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, 00:00:50, 4.49 m
 Crack, circumferential from 8 o'clock to 3 o'clock



, 00:01:10, 6.49 m
 Crack, circumferential from 12 o'clock to 4 o'clock



Section Pictures - 23/02/2019 - Manhole 3X

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
6	Downstream	MANHOLE 3X		



, 00:01:10, 6.49 m
Crack, circumferential from 12 o'clock to 4 o'clock



Section Inspection - 23/02/2019 - SwgX

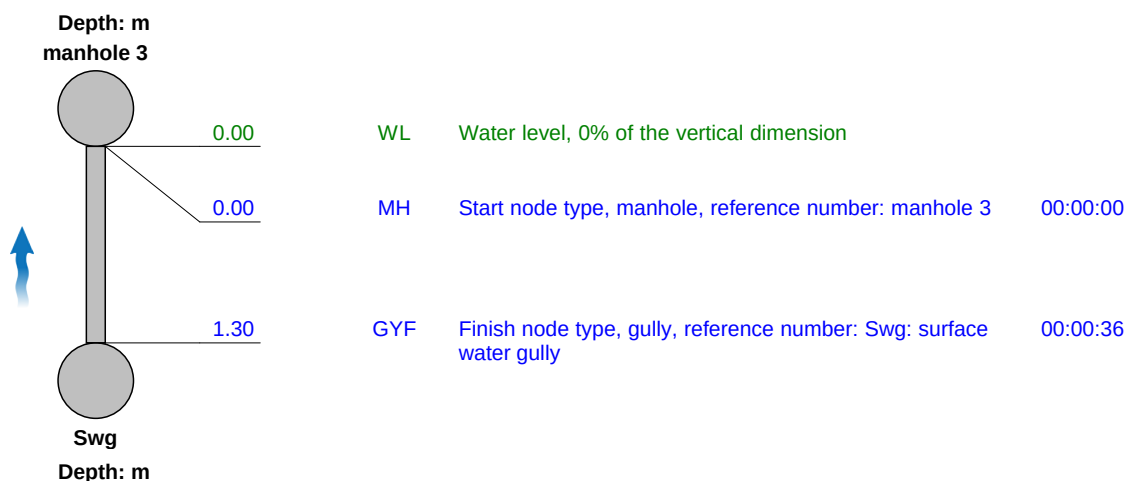
Section 7	Inspection 7	Date 23/02/19	Time 15:57	Client's Job Ref Not Specified	Weather No Rain Or Snow	Pre Cleaned N	PLR SWGX
Operator Not Specified		Vehicle Not Specified		Camera Not Specified	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Manchester	Inspection Direction:	Upstream	Upstream Node:	SWG
Road:	367 Wilmslow Road	Inspected Length:	1.30 m	Upstream Pipe Depth:	
Location:	Gardens	Total Length:	1.30 m	Downstream Node:	MANHOLE 3
Surface Type:		Joint Length:	0.00 m	Downstream Pipe Depth:	
Use:	Foul	Pipe Shape:	Circular		
Type of Pipe:	Gravity drain/sewer	Dia/Height:	100 mm	Width:	100 mm
Year Constructed:		Pipe Material:	Polyvinyl chloride		
Flow Control:	No flow control	Lining Type:	No Lining		
Inspection Purpose:	Routine inspection of condition	Lining Material:	No Lining		

Comments:

Recommendations:

Scale: 1:50 Position [m] Code Observation MPEG Photo Grade



Structural Defects

Construction Features

Service & Operational Observations

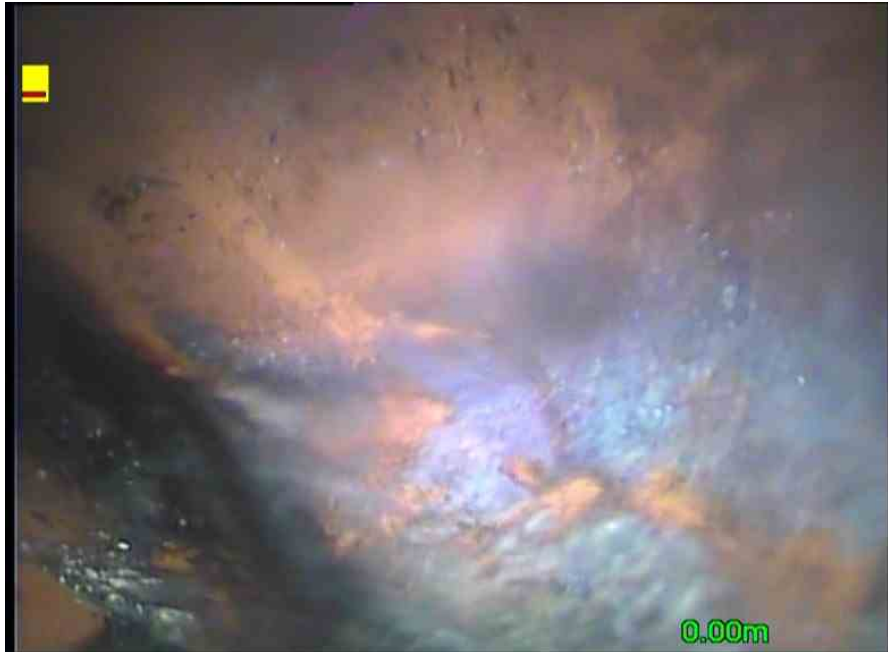
Miscellaneous Features

STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

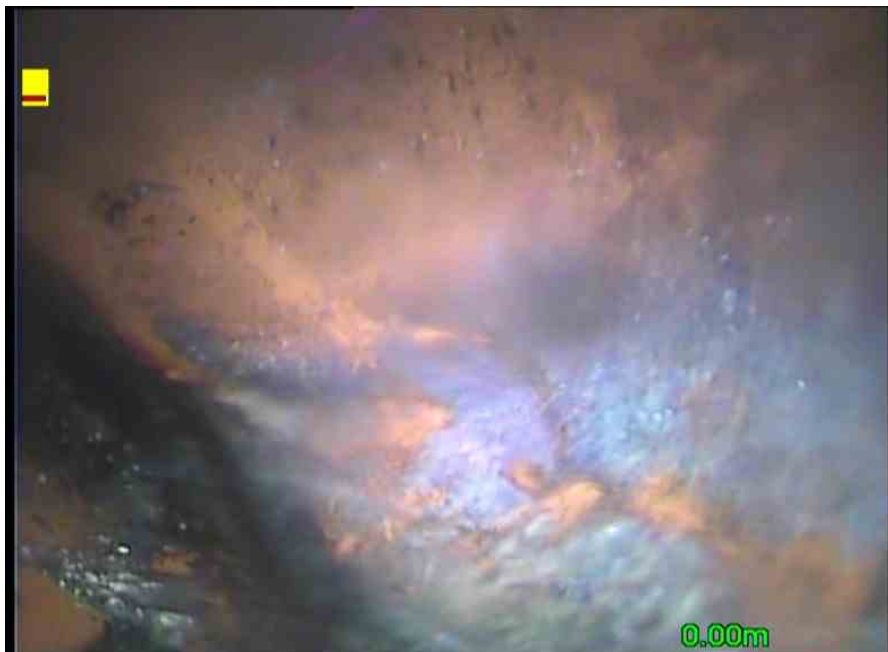


Section Pictures - 23/02/2019 - SwgX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
7	Upstream	SWGX		



, 0.00 m
Water level, 0% of the vertical dimension



, 00:00:00, 0.00 m
Start node type, manhole, reference number: manhole 3



Section Pictures - 23/02/2019 - SwgX

Section	Inspection Direction	PLR	Client's Job Ref	Contractor's Job Ref
7	Upstream	SWGX		



, 00:00:36, 1.30 m
Finish node type, gully, reference number: Swg, surface water gully

Our Ref: YE6723

28th February 2019

Phlorum Limited,
Unit 12,
Hunns Mere Way,
Brighton,
East Sussex,
BN2 6AH

Ref: 169-367 Wilmslow Road, Manchester.

We thank you for your request to undertake permeability testing at the above-mentioned site and take pleasure in enclosing the results of this work. The investigation was undertaken on the 26th February 2019 in accordance with your instruction to proceed. This letter describes the work undertaken, presents the data obtained and discusses the results of the tests.

Geology

An examination of the available British Geological Survey data of the area for the site has been examined and indicates that the site is underlain by Till superficial deposits. Underlying this, solid geology deposits are noted as the Chester Formation, which comprise variable sandstones with occasional conglomerates.

Fieldworks

The programme of this investigation included the excavation of One trial pit, with One test undertaken in the pit. The locations of soakaway tests were positioned where access was achievable and where water could be pumped. Operatives on site were instructed by the representative on site, that one trial pit in the location selected would be sufficient. Due to the very low soakage encountered within the first test, it was deemed that further testing was not required. Weather on the day was good, with no precipitation.

During this work, the soils encountered were logged in general accordance with BS 5930: 1990, as amended in 2007, and full descriptions are given on the borehole records, which are also appended to this letter.

Soakaway Tests

During the soakaway test the water failed to achieve a fall from 75% to 25% of the effective depth of the storage volume. The results obtained from the soakaway tests are summarised below:

Table 1: Soakaway Test Results

TP	Soakage Area Dimensions (m)	Depth (m)	Soil Description (Base of TP)	Infiltration Rate (m/sec)	Drainage Characteristics
TP01 Test 1	2.40 x 0.80	2.125m	Grey mottled brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is	Unable to reliably determine	N/A

			fine to medium, angular to sub-rounded of mixed lithology.	soil infiltration rate.	
--	--	--	--	-------------------------	--

Discussion

The soils encountered the trial pit were found to be sandy gravelly Clays, considered likely to be representative of Till superficial deposits. The tests did not achieve a drop between 25% and 75% of the storage volume of the pit and therefore could provide us with an infiltration rate. In this instance, it is considered that soakaways could not be utilised at this site.

References

Building Research Establishment (BRE) Digest 365, *Soakaway Design*, September 1991.

British Standards Institution (1999) BS5930: *Code of practice for site investigations*, B.S.I., London.

British Standards Institution (2007), Amendment No 1, BS5930: *Code of practice for site investigations*, B.S.I., London.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For and on behalf of

YourEnvironment

Yours Faithfully,



Daniel Speight BSc(Hons)

Graduate Engineer

Enc.

Appendix A: Site Investigation Plan

Appendix B: Trial Pit Logs

Appendix C: Soakaway Test Results

Appendix D: Photographs

APPENDIX A: Site Investigation Plan



APPENDIX B: Trial Pit Logs



Project Name: 169-367 Wilmslow Road

Project No.
YE6723

Co-ords: -
Level:

Date
26/02/2019

Location: Manchester, M14 6AH

Dimensions
(m):

Scale
1:25

Client: Phlorum Limited.

Depth

0.80

Logged
RE

[illegible]

Remarks:

Stability:

APPENDIX C: Soakaway Test Results

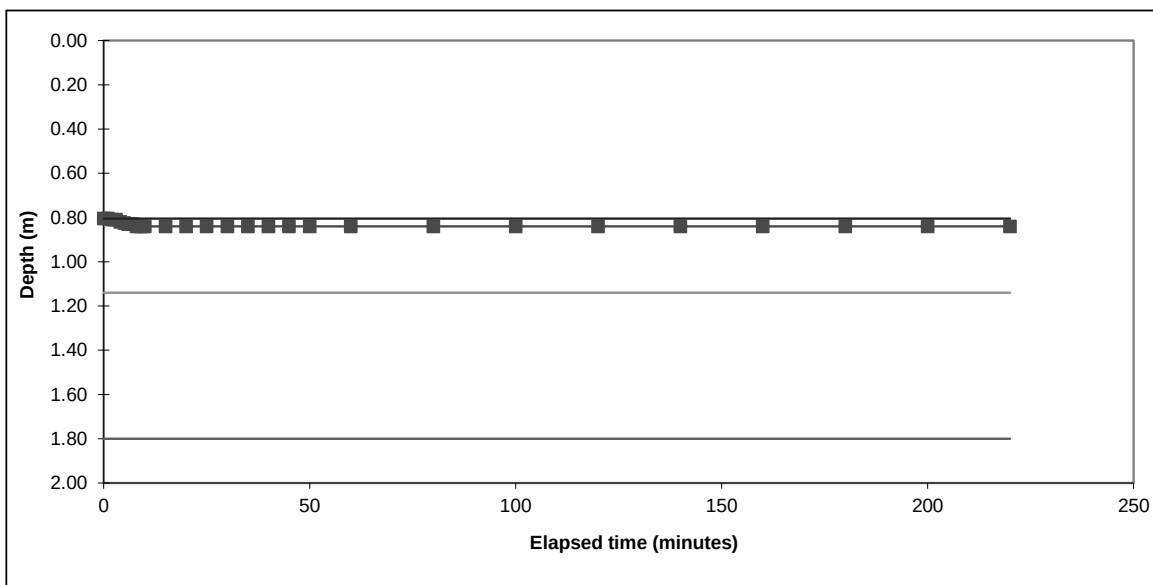


Your Environment

Soakaway Test

Trial Pit No:	TP01	Test No:	1	Date:	26/02/2019
Length (m):	2.400	Datum Height:		0.00 m agl	
Width (m):	0.80	Granular infill:	None		
Depth (m):	2.13	Porosity of infill:	0	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.805	30	0.840
1	0.805	35	0.840
2	0.810	40	0.840
3	0.810	45	0.840
4	0.820	50	0.840
5	0.825	60	0.840
6	0.830	80	0.840
7	0.830	100	0.840
8	0.840	120	0.840
9	0.840	140	0.840
10	0.840	160	0.840
15	0.840	180	0.840
20	0.840	200	0.840
25	0.840	220	0.840



Start water depth for analysis (mbgl):	0.81		
75% effective depth (mbgl):	1.14	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.47		
25% effective depth (mbgl):	1.80	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	2.13		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):		6.11	
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks	Results processed following BRE 365 (2007).

Client:	Phlorum Limited.	YE6723
Site:	Wilmslow Road , Manchester	

APPENDIX D: Photographs



A.



B.



C.



D.



Your Environment

- A. Showing trial pit.
- B. Showing trial pit.
- C. Showing trial pit.
- D. Site boundary.



Your Environment

E.



F.



G.



H.



*Your*Environment

E. Plant used - JCB 3CX

F. Vegetation on Site.

G. Vegetation on Site

H. Plant used - JCB 3CX



*Your*Environment

I.



J.



*Your*Environment

I. Vegetation on Site

J. Vegetation on Site

K. Vegetation on Site

L. Vegetation on Site

K.



L.



*Your*Environment

M.



N.



O.



P.



*Your*Environment

M. Vegetation on Site

N. Vegetation on Site

O. On site fencing.

P. On site fencing



*Your*Environment

Q.



R.



S.



T.



Your Environment

Q. Vegetation on Site

R. Trial pit infilled

S. Vegetation on Site

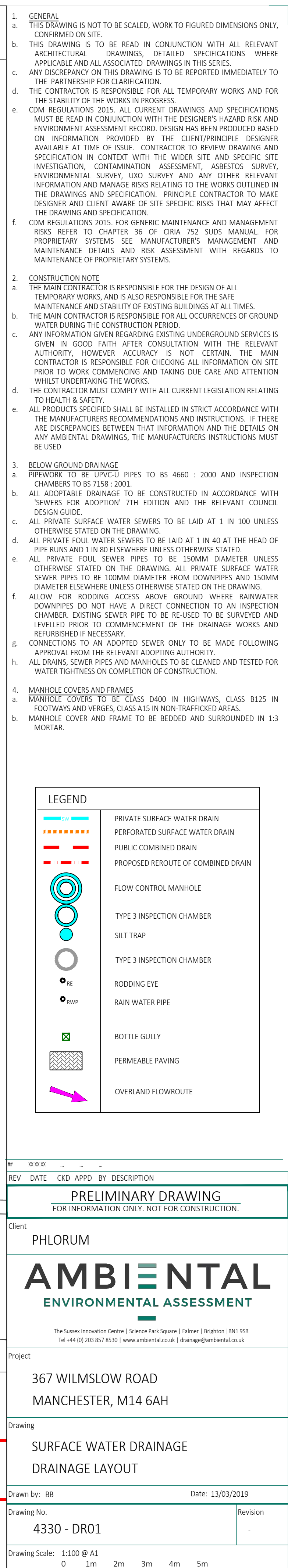
T. Trial pit infilled.



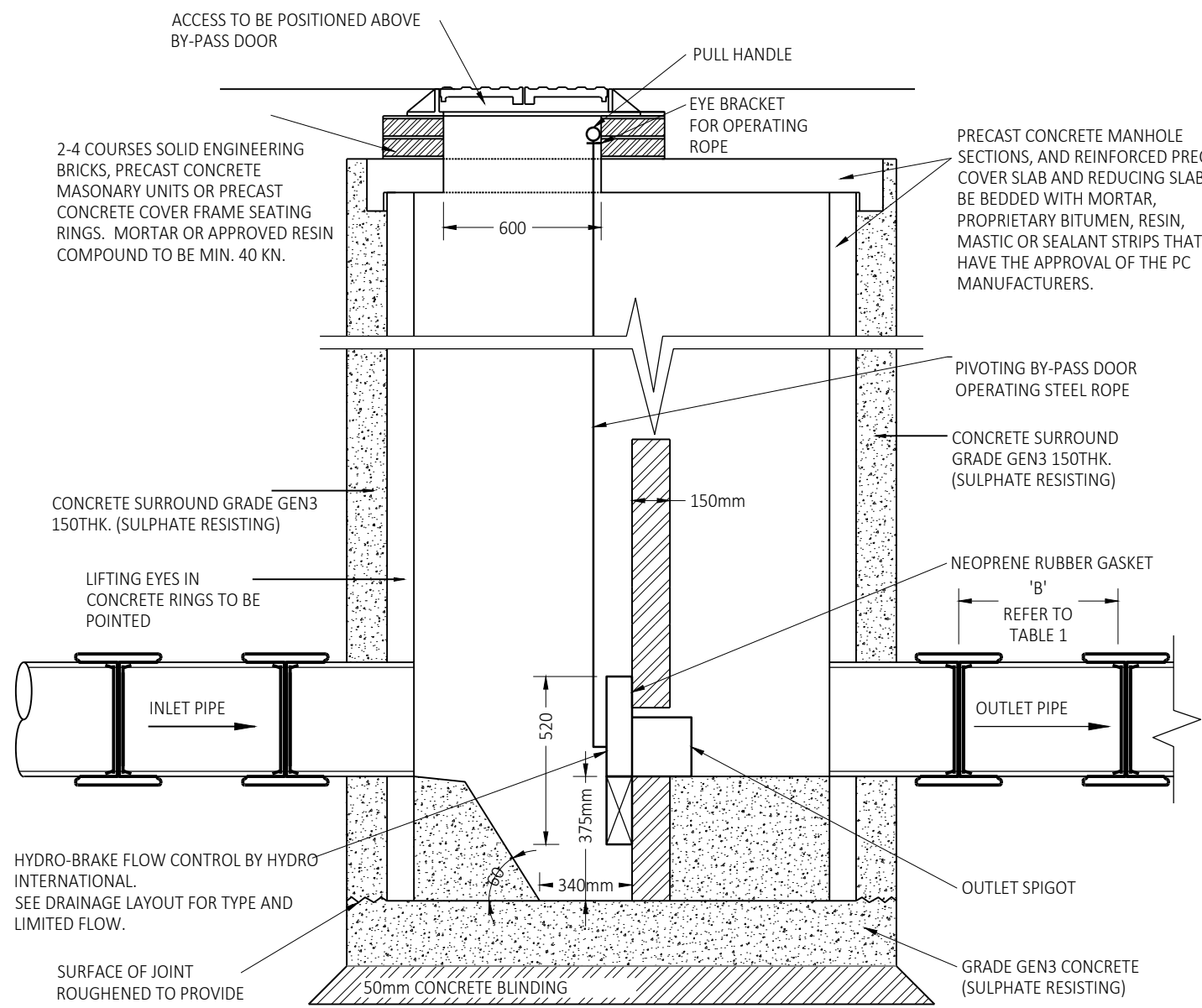
Your Environment

Appendix 2

Drainage Strategy Plans

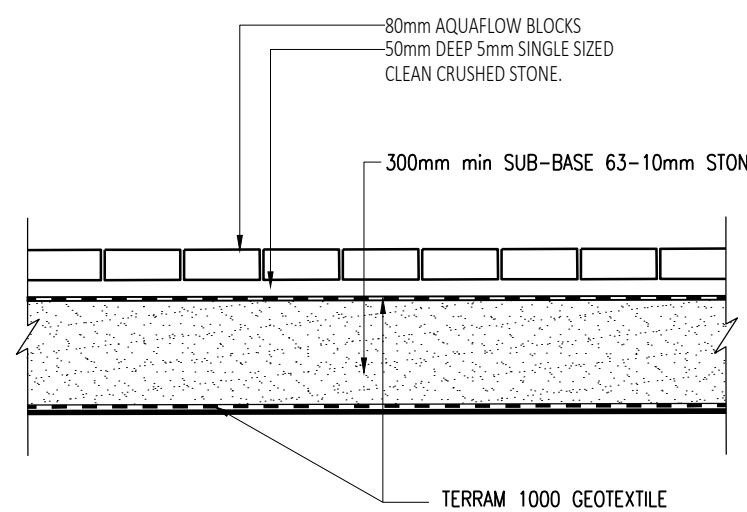


Drawing No: \PROJECTS\4330_Philorum_MilnslowRoad\Drawings\4330_DRO1_recover.dwg



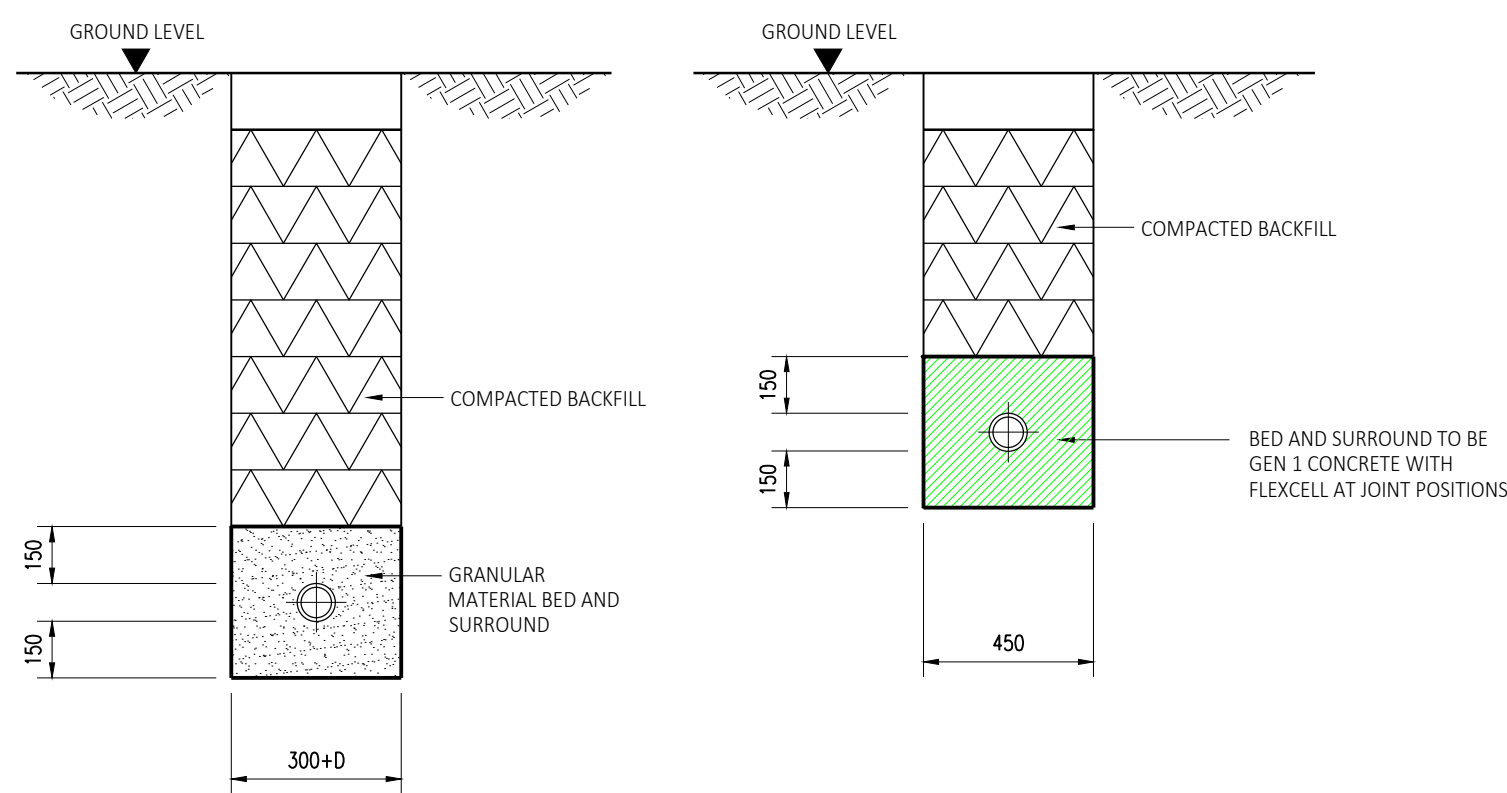
MANHOLE CONTROL (HYDRODBRAKE) SECTION

N.T.S.



PERMEABLE PAVEMENT TYPICAL DETAIL.

(1:20)



GRANULAR BEDDING DETAIL FOR NON-FLEXIBLE PIPES.

(WHERE COVER >600mm)

(1:20)

CONCRETE BEDDING DETAIL FOR NON-FLEXIBLE PIPES.

(WHERE COVER <600mm)

(1:20)

NOTE
ALL BACKFILLING AND REINSTATEMENT WITHIN ROADS AND STREETS TO BE IN ACCORDANCE WITH THE HIGHWAY AUTHORITY AND HAUC SPECIFICATION.

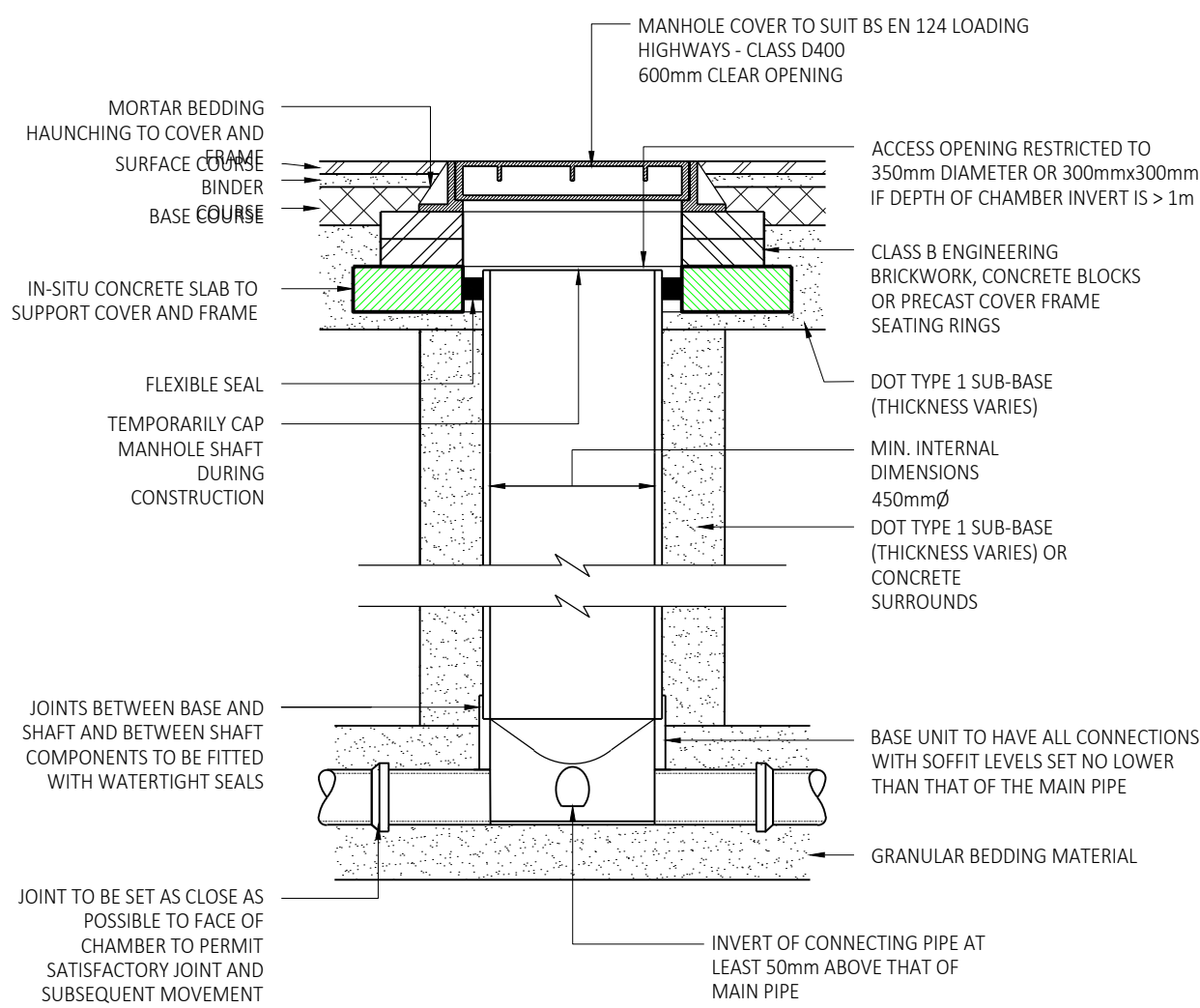
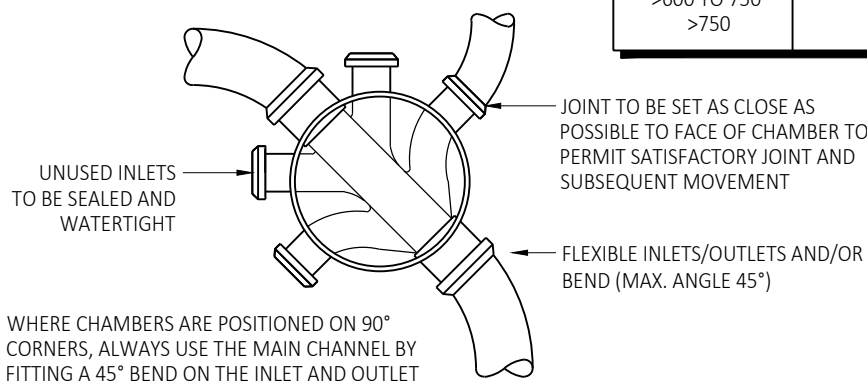


TABLE 1

NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH OF ROCKER PIPE (m)
150 TO 400	0.6
>400 TO 750	1.0
>750	1.2

ALTERNATIVE BASE INVERT LAYOUTS
ALL CONNECTIONS TO BE MIN. SOFFIT TO SOFFIT

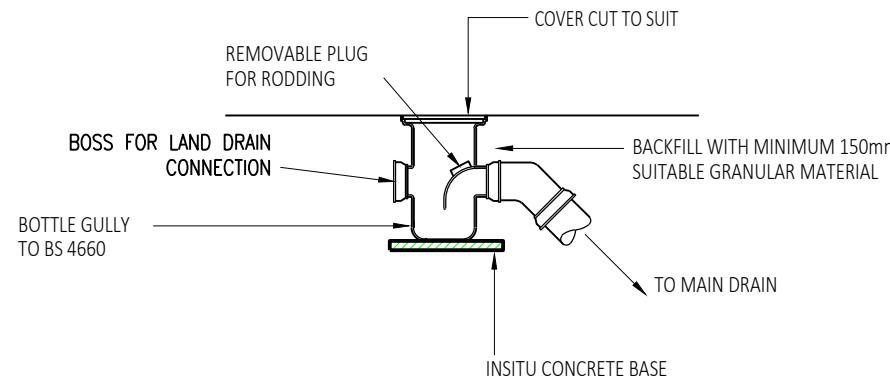


WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS, ALWAYS USE THE MAIN CHANNEL BY FITTING A 45° BEND ON THE INLET AND OUTLET

TYPE 3 ACCESS CHAMBER - FLEXIBLE MATERIAL.

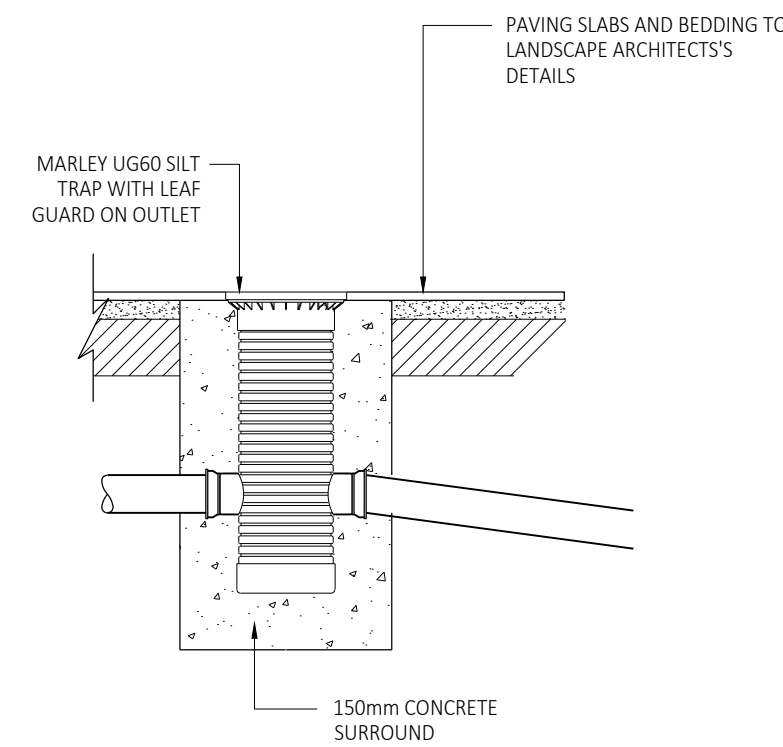
(SUBJECT TO VEHICLE LOADING,
MAX. DEPTH 3m, NON-ENTRY)

(1:20)



BOTTLE GULLY CONNECTION.

(1:20)



MARLEY WATERLOC TYPE UG60 SILT TRAP

(1:20)

- GENERAL
a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.
b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
e. CDM REGULATIONS 2015. ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, LIDAR SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.
f. CDM REGULATIONS 2015. FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL FOR PROPRIETARY SYSTEMS. SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.
- CONSTRUCTION NOTE
a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY AMBIENTAL DRAWINGS, THE MANUFACTURERS INSTRUCTIONS MUST BE USED.
- BELOW GROUND DRAINAGE
a. PIPEWORK TO BE UPVC U PIPES TO BS 4660 : 2000 AND INSPECTION CHAMBERS TO BS 7158 : 2001.
b. ALL ADAPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 7TH EDITION AND THE RELEVANT COUNCIL DESIGN GUIDE.
c. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.
d. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
e. ALL PRIVATE FOUL SEWER PIPES TO BE 150MM DIAMETER UNLESS OTHERWISE STATED ON THE DRAWING. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100MM DIAMETER FROM DOWNPIPES AND 150MM DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.
f. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELLED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
g. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.
h. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.
- MANHOLE COVERS AND FRAMES
a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.
b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

XX.XX.XX					
REV	DATE	CKD	APPD	BY	DESCRIPTION
PRELIMINARY DRAWING FOR INFORMATION ONLY. NOT FOR CONSTRUCTION.					
Client PHLORUM					
Project 367 WILMSLOW ROAD MANCHESTER, M14 6AH					
Drawing SURFACE WATER DRAINAGE STANDARD DETAILS					
Drawn by: BB				Date: 14/03/2019	
Drawing No. 4330 - DRO2				Revision -	
Drawing Scale: 1:20 @ A1 0 200 400 600 800 1000mm					

Appendix 3

Calculations

AEA - Ambient		Page 1
Science Park Square Brighton East Sussex	367 Wilmslow Road Greenfield rates	
Date 14/03/2019 10:26 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	
ICP SUDS Mean Annual Flood Input Return Period (years) 100 Soil 0.300 Area (ha) 0.063 Urban 0.000 SAAR (mm) 839 Region Number Region 10 Results 1/s QBAR Rural 0.1 QBAR Urban 0.1 Q100 years 0.3 Q1 year 0.1 Q30 years 0.2 Q100 years 0.3		
©1982-2018 Innovyze		

AEA - Ambiental				Page 1	
Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:1 year event			
Date 14/03/2019 10:41 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.109	0.109	8.2	0.2	O K
30 min Summer	38.103	0.103	7.1	0.2	O K
60 min Summer	38.086	0.086	5.2	0.1	O K
120 min Summer	38.071	0.071	3.5	0.1	O K
180 min Summer	38.062	0.062	2.8	0.1	O K
240 min Summer	38.056	0.056	2.3	0.1	O K
360 min Summer	38.049	0.049	1.7	0.1	O K
480 min Summer	38.045	0.045	1.5	0.1	O K
600 min Summer	38.041	0.041	1.2	0.0	O K
720 min Summer	38.038	0.038	1.1	0.0	O K
960 min Summer	38.035	0.035	0.9	0.0	O K
1440 min Summer	38.029	0.029	0.7	0.0	O K
2160 min Summer	38.024	0.024	0.5	0.0	O K
2880 min Summer	38.022	0.022	0.4	0.0	O K
4320 min Summer	38.019	0.019	0.3	0.0	O K
5760 min Summer	38.017	0.017	0.3	0.0	O K
7200 min Summer	38.016	0.016	0.2	0.0	O K
8640 min Summer	38.016	0.016	0.2	0.0	O K
10080 min Summer	38.015	0.015	0.2	0.0	O K
15 min Winter	38.109	0.109	8.2	0.2	O K
30 min Winter	38.094	0.094	6.1	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	27.046	0.0	3.2	10	
30 min Summer	17.779	0.0	4.2	17	
60 min Summer	11.376	0.0	5.4	32	
120 min Summer	7.155	0.0	6.8	62	
180 min Summer	5.432	0.0	7.7	92	
240 min Summer	4.463	0.0	8.4	122	
360 min Summer	3.382	0.0	9.6	182	
480 min Summer	2.760	0.0	10.4	240	
600 min Summer	2.356	0.0	11.1	306	
720 min Summer	2.071	0.0	11.7	358	
960 min Summer	1.690	0.0	12.8	484	
1440 min Summer	1.269	0.0	14.4	716	
2160 min Summer	0.954	0.0	16.2	1068	
2880 min Summer	0.779	0.0	17.7	1456	
4320 min Summer	0.584	0.0	19.9	2184	
5760 min Summer	0.477	0.0	21.6	2896	
7200 min Summer	0.408	0.0	23.1	3608	
8640 min Summer	0.359	0.0	24.4	4304	
10080 min Summer	0.322	0.0	25.6	4968	
15 min Winter	27.046	0.0	3.6	10	
30 min Winter	17.779	0.0	4.7	17	
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Science Park Square		367 Wilmslow Road			
Brighton		Existing rates			
East Sussex		1:1 year event			
Date 14/03/2019 10:41		Designed by BB			
File 4330_EXISTING.SRCX		Checked by MN			
Innovyze		Source Control 2018.1			
<u>Summary of Results for 1 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.076	0.076	4.1	0.1	O K
120 min Winter	38.061	0.061	2.7	0.1	O K
180 min Winter	38.053	0.053	2.0	0.1	O K
240 min Winter	38.049	0.049	1.7	0.1	O K
360 min Winter	38.042	0.042	1.3	0.0	O K
480 min Winter	38.037	0.037	1.0	0.0	O K
600 min Winter	38.035	0.035	0.9	0.0	O K
720 min Winter	38.032	0.032	0.8	0.0	O K
960 min Winter	38.028	0.028	0.6	0.0	O K
1440 min Winter	38.024	0.024	0.5	0.0	O K
2160 min Winter	38.020	0.020	0.4	0.0	O K
2880 min Winter	38.019	0.019	0.3	0.0	O K
4320 min Winter	38.016	0.016	0.2	0.0	O K
5760 min Winter	38.015	0.015	0.2	0.0	O K
7200 min Winter	38.014	0.014	0.2	0.0	O K
8640 min Winter	38.014	0.014	0.1	0.0	O K
10080 min Winter	38.013	0.013	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	11.376	0.0	6.0	32	
120 min Winter	7.155	0.0	7.6	62	
180 min Winter	5.432	0.0	8.6	90	
240 min Winter	4.463	0.0	9.4	120	
360 min Winter	3.382	0.0	10.7	182	
480 min Winter	2.760	0.0	11.7	236	
600 min Winter	2.356	0.0	12.5	302	
720 min Winter	2.071	0.0	13.2	368	
960 min Winter	1.690	0.0	14.3	484	
1440 min Winter	1.269	0.0	16.1	724	
2160 min Winter	0.954	0.0	18.2	1120	
2880 min Winter	0.779	0.0	19.8	1408	
4320 min Winter	0.584	0.0	22.3	2084	
5760 min Winter	0.477	0.0	24.2	2848	
7200 min Winter	0.408	0.0	25.9	3696	
8640 min Winter	0.359	0.0	27.3	4320	
10080 min Winter	0.322	0.0	28.6	5152	
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Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:1 year event	
Date 14/03/2019 10:41 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.063

Time (mins)	Area
From:	To: (ha)

0	4	0.063
---	---	-------

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To: (ha)

0	4	0.000
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AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:1 year event	
Date 14/03/2019 10:41 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze	Source Control 2018.1	
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225Length (m) 10.000 Slope (1:X) 80.000Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225Entry Loss Coefficient 0.500 Slope (1:X) 80.0Coefficient of Contraction 0.600 Length (m) 10.000Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:30 year event			
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.184	0.184	20.4	0.4	O K
30 min Summer	38.166	0.166	17.5	0.3	O K
60 min Summer	38.133	0.133	12.7	0.2	O K
120 min Summer	38.110	0.110	8.4	0.2	O K
180 min Summer	38.097	0.097	6.4	0.2	O K
240 min Summer	38.087	0.087	5.3	0.1	O K
360 min Summer	38.074	0.074	3.9	0.1	O K
480 min Summer	38.067	0.067	3.1	0.1	O K
600 min Summer	38.061	0.061	2.7	0.1	O K
720 min Summer	38.056	0.056	2.3	0.1	O K
960 min Summer	38.051	0.051	1.9	0.1	O K
1440 min Summer	38.043	0.043	1.4	0.1	O K
2160 min Summer	38.037	0.037	1.0	0.0	O K
2880 min Summer	38.033	0.033	0.8	0.0	O K
4320 min Summer	38.027	0.027	0.6	0.0	O K
5760 min Summer	38.024	0.024	0.5	0.0	O K
7200 min Summer	38.021	0.021	0.4	0.0	O K
8640 min Summer	38.020	0.020	0.4	0.0	O K
10080 min Summer	38.019	0.019	0.3	0.0	O K
15 min Winter	38.184	0.184	20.3	0.4	O K
30 min Winter	38.150	0.150	15.2	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	66.174	0.0	7.8	10	
30 min Summer	43.695	0.0	10.3	17	
60 min Summer	27.653	0.0	13.1	32	
120 min Summer	17.016	0.0	16.1	62	
180 min Summer	12.680	0.0	18.0	92	
240 min Summer	10.248	0.0	19.4	122	
360 min Summer	7.545	0.0	21.4	184	
480 min Summer	6.072	0.0	23.0	242	
600 min Summer	5.128	0.0	24.2	306	
720 min Summer	4.465	0.0	25.3	358	
960 min Summer	3.586	0.0	27.1	480	
1440 min Summer	2.630	0.0	29.8	734	
2160 min Summer	1.926	0.0	32.8	1092	
2880 min Summer	1.543	0.0	35.0	1416	
4320 min Summer	1.128	0.0	38.4	2192	
5760 min Summer	0.902	0.0	40.9	2888	
7200 min Summer	0.758	0.0	43.0	3616	
8640 min Summer	0.658	0.0	44.8	4296	
10080 min Summer	0.583	0.0	46.3	5040	
15 min Winter	66.174	0.0	8.8	10	
30 min Winter	43.695	0.0	11.6	17	
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Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:30 year event			
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
<u>Summary of Results for 30 year Return Period</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.119	0.119	10.0	0.2	O K
120 min Winter	38.096	0.096	6.3	0.1	O K
180 min Winter	38.081	0.081	4.7	0.1	O K
240 min Winter	38.074	0.074	3.9	0.1	O K
360 min Winter	38.063	0.063	2.8	0.1	O K
480 min Winter	38.056	0.056	2.3	0.1	O K
600 min Winter	38.051	0.051	1.9	0.1	O K
720 min Winter	38.049	0.049	1.7	0.1	O K
960 min Winter	38.043	0.043	1.4	0.1	O K
1440 min Winter	38.037	0.037	1.0	0.0	O K
2160 min Winter	38.031	0.031	0.7	0.0	O K
2880 min Winter	38.027	0.027	0.6	0.0	O K
4320 min Winter	38.022	0.022	0.4	0.0	O K
5760 min Winter	38.020	0.020	0.3	0.0	O K
7200 min Winter	38.019	0.019	0.3	0.0	O K
8640 min Winter	38.017	0.017	0.3	0.0	O K
10080 min Winter	38.017	0.017	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	27.653	0.0	14.6	32	
120 min Winter	17.016	0.0	18.0	60	
180 min Winter	12.680	0.0	20.1	88	
240 min Winter	10.248	0.0	21.7	118	
360 min Winter	7.545	0.0	24.0	184	
480 min Winter	6.072	0.0	25.7	244	
600 min Winter	5.128	0.0	27.1	290	
720 min Winter	4.465	0.0	28.4	368	
960 min Winter	3.586	0.0	30.4	476	
1440 min Winter	2.630	0.0	33.4	732	
2160 min Winter	1.926	0.0	36.7	1092	
2880 min Winter	1.543	0.0	39.2	1436	
4320 min Winter	1.128	0.0	43.0	2144	
5760 min Winter	0.902	0.0	45.8	2744	
7200 min Winter	0.758	0.0	48.2	3640	
8640 min Winter	0.658	0.0	50.1	4400	
10080 min Winter	0.583	0.0	51.9	5392	
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AEA - Ambiantal		Page 3																																				
Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:30 year event																																					
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX	Designed by BB Checked by MN																																					
Innovyze		Source Control 2018.1																																				
<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>30</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.369</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+0</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.063 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.063</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.000 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.000</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	30	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	18.000	Shortest Storm (mins)	15	Ratio R	0.369	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins)	Area	From:	To: (ha)	0	4 0.063	Time (mins)	Area	From:	To: (ha)	0	4 0.000
Rainfall Model	FSR	Winter Storms	Yes																																			
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From:	To: (ha)																																					
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From:	To: (ha)																																					
0	4 0.000																																					
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Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:30 year event	
Date 14/03/2019 10:40 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225 Length (m) 10.000 Slope (1:X) 80.000 Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225 Entry Loss Coefficient 0.500 Slope (1:X) 80.0 Coefficient of Contraction 0.600 Length (m) 10.000 Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:100 year event			
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.213	0.213	26.1	0.5	O K
30 min Summer	38.198	0.198	23.0	0.4	O K
60 min Summer	38.160	0.160	16.6	0.3	O K
120 min Summer	38.124	0.124	11.1	0.2	O K
180 min Summer	38.111	0.111	8.5	0.2	O K
240 min Summer	38.101	0.101	6.9	0.2	O K
360 min Summer	38.084	0.084	5.0	0.1	O K
480 min Summer	38.076	0.076	4.1	0.1	O K
600 min Summer	38.070	0.070	3.4	0.1	O K
720 min Summer	38.065	0.065	3.0	0.1	O K
960 min Summer	38.057	0.057	2.4	0.1	O K
1440 min Summer	38.049	0.049	1.7	0.1	O K
2160 min Summer	38.042	0.042	1.3	0.0	O K
2880 min Summer	38.037	0.037	1.0	0.0	O K
4320 min Summer	38.031	0.031	0.7	0.0	O K
5760 min Summer	38.027	0.027	0.6	0.0	O K
7200 min Summer	38.025	0.025	0.5	0.0	O K
8640 min Summer	38.022	0.022	0.4	0.0	O K
10080 min Summer	38.021	0.021	0.4	0.0	O K
15 min Winter	38.213	0.213	26.1	0.5	O K
30 min Winter	38.181	0.181	19.8	0.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	85.460	0.0	10.1	10	
30 min Summer	56.977	0.0	13.5	17	
60 min Summer	36.294	0.0	17.1	32	
120 min Summer	22.382	0.0	21.2	62	
180 min Summer	16.654	0.0	23.6	92	
240 min Summer	13.425	0.0	25.4	122	
360 min Summer	9.818	0.0	27.8	184	
480 min Summer	7.870	0.0	29.7	244	
600 min Summer	6.624	0.0	31.3	306	
720 min Summer	5.750	0.0	32.6	362	
960 min Summer	4.597	0.0	34.8	476	
1440 min Summer	3.347	0.0	38.0	722	
2160 min Summer	2.432	0.0	41.4	1092	
2880 min Summer	1.937	0.0	43.9	1428	
4320 min Summer	1.403	0.0	47.7	2140	
5760 min Summer	1.115	0.0	50.6	2856	
7200 min Summer	0.932	0.0	52.9	3560	
8640 min Summer	0.805	0.0	54.8	4352	
10080 min Summer	0.711	0.0	56.4	5024	
15 min Winter	85.460	0.0	11.3	10	
30 min Winter	56.977	0.0	15.1	17	
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Science Park Square Brighton East Sussex		367 Wilmslow Road Existing rates 1:100 year event			
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.137	0.137	13.3	0.3	O K
120 min Winter	38.109	0.109	8.2	0.2	O K
180 min Winter	38.095	0.095	6.2	0.1	O K
240 min Winter	38.084	0.084	5.0	0.1	O K
360 min Winter	38.072	0.072	3.7	0.1	O K
480 min Winter	38.064	0.064	2.9	0.1	O K
600 min Winter	38.059	0.059	2.5	0.1	O K
720 min Winter	38.054	0.054	2.1	0.1	O K
960 min Winter	38.049	0.049	1.7	0.1	O K
1440 min Winter	38.041	0.041	1.3	0.0	O K
2160 min Winter	38.036	0.036	0.9	0.0	O K
2880 min Winter	38.031	0.031	0.7	0.0	O K
4320 min Winter	38.025	0.025	0.5	0.0	O K
5760 min Winter	38.022	0.022	0.4	0.0	O K
7200 min Winter	38.020	0.020	0.4	0.0	O K
8640 min Winter	38.019	0.019	0.3	0.0	O K
10080 min Winter	38.018	0.018	0.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	36.294	0.0	19.2	32	
120 min Winter	22.382	0.0	23.7	60	
180 min Winter	16.654	0.0	26.4	92	
240 min Winter	13.425	0.0	28.4	122	
360 min Winter	9.818	0.0	31.2	182	
480 min Winter	7.870	0.0	33.3	246	
600 min Winter	6.624	0.0	35.1	306	
720 min Winter	5.750	0.0	36.5	358	
960 min Winter	4.597	0.0	38.9	494	
1440 min Winter	3.347	0.0	42.5	712	
2160 min Winter	2.432	0.0	46.3	1068	
2880 min Winter	1.937	0.0	49.2	1444	
4320 min Winter	1.403	0.0	53.5	2180	
5760 min Winter	1.115	0.0	56.7	2968	
7200 min Winter	0.932	0.0	59.2	3696	
8640 min Winter	0.805	0.0	61.4	4792	
10080 min Winter	0.711	0.0	63.2	5056	
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Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:100 year event	
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.063

Time (mins)		Area
From:	To:	(ha)
0	4	0.063

Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

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AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Existing rates 1:100 year event	
Date 14/03/2019 10:37 File 4330_EXISTING.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225 Length (m) 10.000 Slope (1:X) 80.000 Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225 Entry Loss Coefficient 0.500 Slope (1:X) 80.0 Coefficient of Contraction 0.600 Length (m) 10.000 Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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AEA - Ambiental					Page 1
Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:1 year event			
Date 14/03/2019 10:36 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.104	0.104	7.2	0.2	O K
30 min Summer	38.095	0.095	6.2	0.1	O K
60 min Summer	38.080	0.080	4.5	0.1	O K
120 min Summer	38.066	0.066	3.1	0.1	O K
180 min Summer	38.058	0.058	2.4	0.1	O K
240 min Summer	38.052	0.052	2.0	0.1	O K
360 min Summer	38.046	0.046	1.5	0.1	O K
480 min Summer	38.041	0.041	1.3	0.0	O K
600 min Summer	38.038	0.038	1.1	0.0	O K
720 min Summer	38.036	0.036	0.9	0.0	O K
960 min Summer	38.032	0.032	0.8	0.0	O K
1440 min Summer	38.027	0.027	0.6	0.0	O K
2160 min Summer	38.022	0.022	0.4	0.0	O K
2880 min Summer	38.020	0.020	0.4	0.0	O K
4320 min Summer	38.018	0.018	0.3	0.0	O K
5760 min Summer	38.017	0.017	0.2	0.0	O K
7200 min Summer	38.016	0.016	0.2	0.0	O K
8640 min Summer	38.015	0.015	0.2	0.0	O K
10080 min Summer	38.014	0.014	0.2	0.0	O K
15 min Winter	38.104	0.104	7.2	0.2	O K
30 min Winter	38.088	0.088	5.4	0.1	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	27.046	0.0	2.8	10	
30 min Summer	17.779	0.0	3.7	17	
60 min Summer	11.376	0.0	4.7	32	
120 min Summer	7.155	0.0	5.9	62	
180 min Summer	5.432	0.0	6.7	92	
240 min Summer	4.463	0.0	7.4	122	
360 min Summer	3.382	0.0	8.4	184	
480 min Summer	2.760	0.0	9.1	244	
600 min Summer	2.356	0.0	9.7	302	
720 min Summer	2.071	0.0	10.3	360	
960 min Summer	1.690	0.0	11.2	490	
1440 min Summer	1.269	0.0	12.6	728	
2160 min Summer	0.954	0.0	14.2	1092	
2880 min Summer	0.779	0.0	15.4	1464	
4320 min Summer	0.584	0.0	17.4	2184	
5760 min Summer	0.477	0.0	18.9	2928	
7200 min Summer	0.408	0.0	20.2	3744	
8640 min Summer	0.359	0.0	21.3	4272	
10080 min Summer	0.322	0.0	22.3	5112	
15 min Winter	27.046	0.0	3.1	10	
30 min Winter	17.779	0.0	4.1	17	
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AEA - Ambiental				Page 2	
Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:1 year event			
Date 14/03/2019 10:36 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 1 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.072	0.072	3.7	0.1	O K
120 min Winter	38.057	0.057	2.3	0.1	O K
180 min Winter	38.050	0.050	1.8	0.1	O K
240 min Winter	38.045	0.045	1.5	0.1	O K
360 min Winter	38.039	0.039	1.1	0.0	O K
480 min Winter	38.035	0.035	0.9	0.0	O K
600 min Winter	38.032	0.032	0.8	0.0	O K
720 min Winter	38.030	0.030	0.7	0.0	O K
960 min Winter	38.026	0.026	0.6	0.0	O K
1440 min Winter	38.022	0.022	0.4	0.0	O K
2160 min Winter	38.019	0.019	0.3	0.0	O K
2880 min Winter	38.017	0.017	0.3	0.0	O K
4320 min Winter	38.016	0.016	0.2	0.0	O K
5760 min Winter	38.015	0.015	0.2	0.0	O K
7200 min Winter	38.014	0.014	0.1	0.0	O K
8640 min Winter	38.013	0.013	0.1	0.0	O K
10080 min Winter	38.012	0.012	0.1	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	11.376	0.0	5.3	32	
120 min Winter	7.155	0.0	6.6	60	
180 min Winter	5.432	0.0	7.5	92	
240 min Winter	4.463	0.0	8.2	122	
360 min Winter	3.382	0.0	9.4	182	
480 min Winter	2.760	0.0	10.2	234	
600 min Winter	2.356	0.0	10.9	304	
720 min Winter	2.071	0.0	11.5	364	
960 min Winter	1.690	0.0	12.5	480	
1440 min Winter	1.269	0.0	14.1	710	
2160 min Winter	0.954	0.0	15.9	1144	
2880 min Winter	0.779	0.0	17.3	1356	
4320 min Winter	0.584	0.0	19.4	2016	
5760 min Winter	0.477	0.0	21.2	2768	
7200 min Winter	0.408	0.0	22.6	3808	
8640 min Winter	0.359	0.0	23.9	4440	
10080 min Winter	0.322	0.0	25.0	4984	
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AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:1 year event	
Date 14/03/2019 10:36 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225 Length (m) 10.000 Slope (1:X) 80.000 Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225 Entry Loss Coefficient 0.500 Slope (1:X) 80.0 Coefficient of Contraction 0.600 Length (m) 10.000 Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:30 year event			
Date 14/03/2019 10:35 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.167	0.167	17.6	0.4	O K
30 min Summer	38.150	0.150	15.2	0.3	O K
60 min Summer	38.124	0.124	11.1	0.2	O K
120 min Summer	38.105	0.105	7.4	0.2	O K
180 min Summer	38.090	0.090	5.6	0.1	O K
240 min Summer	38.081	0.081	4.6	0.1	O K
360 min Summer	38.070	0.070	3.4	0.1	O K
480 min Summer	38.062	0.062	2.7	0.1	O K
600 min Summer	38.057	0.057	2.3	0.1	O K
720 min Summer	38.053	0.053	2.0	0.1	O K
960 min Summer	38.048	0.048	1.6	0.1	O K
1440 min Summer	38.040	0.040	1.2	0.0	O K
2160 min Summer	38.035	0.035	0.9	0.0	O K
2880 min Summer	38.030	0.030	0.7	0.0	O K
4320 min Summer	38.025	0.025	0.5	0.0	O K
5760 min Summer	38.022	0.022	0.4	0.0	O K
7200 min Summer	38.020	0.020	0.4	0.0	O K
8640 min Summer	38.019	0.019	0.3	0.0	O K
10080 min Summer	38.018	0.018	0.3	0.0	O K
15 min Winter	38.167	0.167	17.6	0.3	O K
30 min Winter	38.136	0.136	13.2	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	66.174	0.0	6.8	10	
30 min Summer	43.695	0.0	9.0	17	
60 min Summer	27.653	0.0	11.4	32	
120 min Summer	17.016	0.0	14.0	62	
180 min Summer	12.680	0.0	15.7	92	
240 min Summer	10.248	0.0	16.9	122	
360 min Summer	7.545	0.0	18.7	182	
480 min Summer	6.072	0.0	20.0	244	
600 min Summer	5.128	0.0	21.2	302	
720 min Summer	4.465	0.0	22.1	360	
960 min Summer	3.586	0.0	23.7	490	
1440 min Summer	2.630	0.0	26.0	712	
2160 min Summer	1.926	0.0	28.6	1084	
2880 min Summer	1.543	0.0	30.6	1444	
4320 min Summer	1.128	0.0	33.5	2176	
5760 min Summer	0.902	0.0	35.7	2912	
7200 min Summer	0.758	0.0	37.5	3616	
8640 min Summer	0.658	0.0	39.1	4272	
10080 min Summer	0.583	0.0	40.4	5208	
15 min Winter	66.174	0.0	7.6	10	
30 min Winter	43.695	0.0	10.1	17	
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:30 year event			
Date 14/03/2019 10:35 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 30 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.112	0.112	8.8	0.2	O K
120 min Winter	38.089	0.089	5.5	0.1	O K
180 min Winter	38.076	0.076	4.1	0.1	O K
240 min Winter	38.069	0.069	3.4	0.1	O K
360 min Winter	38.058	0.058	2.5	0.1	O K
480 min Winter	38.052	0.052	2.0	0.1	O K
600 min Winter	38.048	0.048	1.7	0.1	O K
720 min Winter	38.045	0.045	1.5	0.1	O K
960 min Winter	38.040	0.040	1.2	0.0	O K
1440 min Winter	38.035	0.035	0.9	0.0	O K
2160 min Winter	38.028	0.028	0.6	0.0	O K
2880 min Winter	38.025	0.025	0.5	0.0	O K
4320 min Winter	38.021	0.021	0.4	0.0	O K
5760 min Winter	38.019	0.019	0.3	0.0	O K
7200 min Winter	38.018	0.018	0.3	0.0	O K
8640 min Winter	38.017	0.017	0.2	0.0	O K
10080 min Winter	38.016	0.016	0.2	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	27.653	0.0	12.8	32	
120 min Winter	17.016	0.0	15.7	62	
180 min Winter	12.680	0.0	17.6	92	
240 min Winter	10.248	0.0	18.9	122	
360 min Winter	7.545	0.0	20.9	182	
480 min Winter	6.072	0.0	22.4	246	
600 min Winter	5.128	0.0	23.7	298	
720 min Winter	4.465	0.0	24.8	356	
960 min Winter	3.586	0.0	26.5	474	
1440 min Winter	2.630	0.0	29.2	726	
2160 min Winter	1.926	0.0	32.0	1088	
2880 min Winter	1.543	0.0	34.2	1412	
4320 min Winter	1.128	0.0	37.5	2196	
5760 min Winter	0.902	0.0	40.0	2880	
7200 min Winter	0.758	0.0	42.0	3592	
8640 min Winter	0.658	0.0	43.8	4336	
10080 min Winter	0.583	0.0	45.3	4936	
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:30 year event	
Date 14/03/2019 10:35 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225 Length (m) 10.000 Slope (1:X) 80.000 Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225 Entry Loss Coefficient 0.500 Slope (1:X) 80.0 Coefficient of Contraction 0.600 Length (m) 10.000 Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:100 year event			
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	38.197	0.197	22.8	0.4	O K
30 min Summer	38.182	0.182	19.9	0.4	O K
60 min Summer	38.145	0.145	14.5	0.3	O K
120 min Summer	38.117	0.117	9.7	0.2	O K
180 min Summer	38.105	0.105	7.4	0.2	O K
240 min Summer	38.094	0.094	6.1	0.1	O K
360 min Summer	38.079	0.079	4.4	0.1	O K
480 min Summer	38.071	0.071	3.6	0.1	O K
600 min Summer	38.065	0.065	3.0	0.1	O K
720 min Summer	38.060	0.060	2.6	0.1	O K
960 min Summer	38.054	0.054	2.1	0.1	O K
1440 min Summer	38.046	0.046	1.5	0.1	O K
2160 min Summer	38.039	0.039	1.1	0.0	O K
2880 min Summer	38.035	0.035	0.9	0.0	O K
4320 min Summer	38.028	0.028	0.6	0.0	O K
5760 min Summer	38.025	0.025	0.5	0.0	O K
7200 min Summer	38.022	0.022	0.4	0.0	O K
8640 min Summer	38.021	0.021	0.4	0.0	O K
10080 min Summer	38.020	0.020	0.3	0.0	O K
15 min Winter	38.197	0.197	22.8	0.4	O K
30 min Winter	38.164	0.164	17.2	0.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	85.460	0.0	8.8	10	
30 min Summer	56.977	0.0	11.8	17	
60 min Summer	36.294	0.0	15.0	32	
120 min Summer	22.382	0.0	18.5	62	
180 min Summer	16.654	0.0	20.6	92	
240 min Summer	13.425	0.0	22.2	122	
360 min Summer	9.818	0.0	24.3	184	
480 min Summer	7.870	0.0	26.0	244	
600 min Summer	6.624	0.0	27.3	306	
720 min Summer	5.750	0.0	28.5	358	
960 min Summer	4.597	0.0	30.3	478	
1440 min Summer	3.347	0.0	33.1	724	
2160 min Summer	2.432	0.0	36.1	1076	
2880 min Summer	1.937	0.0	38.4	1440	
4320 min Summer	1.403	0.0	41.7	2124	
5760 min Summer	1.115	0.0	44.2	2904	
7200 min Summer	0.932	0.0	46.2	3568	
8640 min Summer	0.805	0.0	47.8	4248	
10080 min Summer	0.711	0.0	49.3	4960	
15 min Winter	85.460	0.0	9.9	10	
30 min Winter	56.977	0.0	13.2	17	
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Science Park Square Brighton East Sussex		367 Wilmslow Road Proposed drained as existing 1:100 year event			
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...		Designed by BB Checked by MN			
Innovyze		Source Control 2018.1			
Summary of Results for 100 year Return Period					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	38.127	0.127	11.6	0.2	O K
120 min Winter	38.104	0.104	7.2	0.2	O K
180 min Winter	38.088	0.088	5.4	0.1	O K
240 min Winter	38.079	0.079	4.4	0.1	O K
360 min Winter	38.068	0.068	3.2	0.1	O K
480 min Winter	38.060	0.060	2.6	0.1	O K
600 min Winter	38.055	0.055	2.2	0.1	O K
720 min Winter	38.051	0.051	1.9	0.1	O K
960 min Winter	38.046	0.046	1.5	0.1	O K
1440 min Winter	38.039	0.039	1.1	0.0	O K
2160 min Winter	38.033	0.033	0.8	0.0	O K
2880 min Winter	38.028	0.028	0.6	0.0	O K
4320 min Winter	38.023	0.023	0.5	0.0	O K
5760 min Winter	38.021	0.021	0.4	0.0	O K
7200 min Winter	38.019	0.019	0.3	0.0	O K
8640 min Winter	38.018	0.018	0.3	0.0	O K
10080 min Winter	38.017	0.017	0.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	36.294	0.0	16.8	32	
120 min Winter	22.382	0.0	20.7	62	
180 min Winter	16.654	0.0	23.1	90	
240 min Winter	13.425	0.0	24.8	118	
360 min Winter	9.818	0.0	27.2	182	
480 min Winter	7.870	0.0	29.1	238	
600 min Winter	6.624	0.0	30.6	304	
720 min Winter	5.750	0.0	31.9	358	
960 min Winter	4.597	0.0	34.0	486	
1440 min Winter	3.347	0.0	37.1	730	
2160 min Winter	2.432	0.0	40.5	1076	
2880 min Winter	1.937	0.0	43.0	1416	
4320 min Winter	1.403	0.0	46.7	2076	
5760 min Winter	1.115	0.0	49.5	3024	
7200 min Winter	0.932	0.0	51.7	3504	
8640 min Winter	0.805	0.0	53.6	4296	
10080 min Winter	0.711	0.0	55.2	5088	
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:100 year event	
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.055

Time (mins)		Area
From:	To:	(ha)
0	4	0.055

Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed drained as existing 1:100 year event	
Date 14/03/2019 10:34 File 4330_PROPOSED_UNATTENUA...	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		
Model Details Storage is Online Cover Level (m) 38.900 Pipe Structure Diameter (m) 0.225 Length (m) 10.000 Slope (1:X) 80.000 Invert Level (m) 38.000 Pipe Outflow Control Diameter (m) 0.225 Entry Loss Coefficient 0.500 Slope (1:X) 80.0 Coefficient of Contraction 0.600 Length (m) 10.000 Upstream Invert Level (m) 38.000 Roughness k (mm) 0.600		
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AEA - Ambienta

Science Park Square

Brighton

East Sussex

367 Wilmslow Road

Proposed attenuated

1:1 year event

Date 14/03/2019 10:31

File 4330_PP.SRCX

Designed by BB

Checked by MN

Innovyze

Source Control 2018.1

Page 1



Summary of Results for 1 year Return Period (+40%)

Half Drain Time : 43 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	38.476	0.026	0.0	1.0	1.0	2.4	O K
30 min Summer	38.485	0.035	0.0	1.0	1.0	3.2	O K
60 min Summer	38.493	0.043	0.0	1.0	1.0	3.9	O K
120 min Summer	38.496	0.046	0.0	1.0	1.0	4.2	O K
180 min Summer	38.493	0.043	0.0	1.0	1.0	4.0	O K
240 min Summer	38.490	0.040	0.0	1.0	1.0	3.7	O K
360 min Summer	38.483	0.033	0.0	1.0	1.0	3.0	O K
480 min Summer	38.475	0.025	0.0	1.0	1.0	2.3	O K
600 min Summer	38.469	0.019	0.0	1.0	1.0	1.7	O K
720 min Summer	38.463	0.013	0.0	1.0	1.0	1.2	O K
960 min Summer	38.455	0.005	0.0	1.0	1.0	0.5	O K
1440 min Summer	38.450	0.000	0.0	0.9	0.9	0.0	O K
2160 min Summer	38.450	0.000	0.0	0.7	0.7	0.0	O K
2880 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K
4320 min Summer	38.450	0.000	0.0	0.4	0.4	0.0	O K
5760 min Summer	38.450	0.000	0.0	0.3	0.3	0.0	O K
7200 min Summer	38.450	0.000	0.0	0.3	0.3	0.0	O K
8640 min Summer	38.450	0.000	0.0	0.2	0.2	0.0	O K
10080 min Summer	38.450	0.000	0.0	0.2	0.2	0.0	O K
15 min Winter	38.481	0.031	0.0	1.0	1.0	2.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	37.865	0.0	2.9	17
30 min Summer	24.891	0.0	4.3	31
60 min Summer	15.926	0.0	5.9	50
120 min Summer	10.018	0.0	7.8	84
180 min Summer	7.605	0.0	9.1	118
240 min Summer	6.248	0.0	10.1	154
360 min Summer	4.735	0.0	11.6	220
480 min Summer	3.864	0.0	12.7	282
600 min Summer	3.299	0.0	13.7	342
720 min Summer	2.900	0.0	14.4	398
960 min Summer	2.366	0.0	15.7	510
1440 min Summer	1.776	0.0	17.7	0
2160 min Summer	1.335	0.0	19.8	0
2880 min Summer	1.090	0.0	21.4	0
4320 min Summer	0.818	0.0	23.5	0
5760 min Summer	0.668	0.0	25.1	0
7200 min Summer	0.571	0.0	26.3	0
8640 min Summer	0.502	0.0	27.1	0
10080 min Summer	0.451	0.0	27.8	0
15 min Winter	37.865	0.0	3.4	17

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<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>1</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.369</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.063 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.063</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.000 <table> <tr> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To: (ha)</th> </tr> <tr> <td>0</td> <td>4 0.000</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	1	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	18.000	Shortest Storm (mins)	15	Ratio R	0.369	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	From:	To: (ha)	0	4 0.063	Time (mins)	Area	From:	To: (ha)	0	4 0.000
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Model Details Storage is Online Cover Level (m) 38.900 Porous Car Park Structure Infiltration Coefficient Base (m/hr)0.00000 Membrane Percolation (mm/hr)1000 Max Percolation (l/s)85.2 Safety Factor2.0 Porosity0.30 Invert Level (m)38.450 Width (m)7.0 Length (m)43.8 Slope (1:X)0.0 Depression Storage (mm)5 Evaporation (mm/day)3 Membrane Depth (m)150 Hydro-Brake® Optimum Outflow Control Unit ReferenceMD-SHE-0053-1000-0550-1000 Design Head (m)0.550 Design Flow (l/s)1.0 Flush-Flo™Calculated ObjectiveMinimise upstream storage ApplicationSurface Sump AvailableYes Diameter (mm)53 Invert Level (m)38.200 Minimum Outlet Pipe Diameter (mm)75 Suggested Manhole Diameter (mm)1200 Control Points Head (m)Flow (l/s) Design Point (Calculated)0.5501.0 Flush-Flo™0.1661.0 Kick-Flo®0.3580.8 Mean Flow over Head Range-0.9 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><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>1.0</td><td>1.200</td><td>1.4</td><td>3.000</td><td>2.2</td><td>7.000</td><td>3.2</td></tr><tr><td>0.200</td><td>1.0</td><td>1.400</td><td>1.5</td><td>3.500</td><td>2.3</td><td>7.500</td><td>3.3</td></tr><tr><td>0.300</td><td>0.9</td><td>1.600</td><td>1.6</td><td>4.000</td><td>2.5</td><td>8.000</td><td>3.4</td></tr><tr><td>0.400</td><td>0.9</td><td>1.800</td><td>1.7</td><td>4.500</td><td>2.6</td><td>8.500</td><td>3.5</td></tr><tr><td>0.500</td><td>1.0</td><td>2.000</td><td>1.8</td><td>5.000</td><td>2.7</td><td>9.000</td><td>3.6</td></tr><tr><td>0.600</td><td>1.0</td><td>2.200</td><td>1.9</td><td>5.500</td><td>2.8</td><td>9.500</td><td>3.7</td></tr><tr><td>0.800</td><td>1.2</td><td>2.400</td><td>1.9</td><td>6.000</td><td>3.0</td><td></td><td></td></tr><tr><td>1.000</td><td>1.3</td><td>2.600</td><td>2.0</td><td>6.500</td><td>3.1</td><td></td><td></td></tr></table> ©1982-2018 Innovyze			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	1.0	1.200	1.4	3.000	2.2	7.000	3.2	0.200	1.0	1.400	1.5	3.500	2.3	7.500	3.3	0.300	0.9	1.600	1.6	4.000	2.5	8.000	3.4	0.400	0.9	1.800	1.7	4.500	2.6	8.500	3.5	0.500	1.0	2.000	1.8	5.000	2.7	9.000	3.6	0.600	1.0	2.200	1.9	5.500	2.8	9.500	3.7	0.800	1.2	2.400	1.9	6.000	3.0			1.000	1.3	2.600	2.0	6.500	3.1		
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Summary of Results for 30 year Return Period (+40%) Half Drain Time : 171 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (1/s)</th><th>Max Control (1/s)</th><th>Max Σ Outflow (1/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>38.545</td><td>0.095</td><td>0.0</td><td>1.0</td><td>1.0</td><td>8.7</td><td>O K</td></tr><tr><td>30 min Summer</td><td>38.576</td><td>0.126</td><td>0.0</td><td>1.0</td><td>1.0</td><td>11.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>38.604</td><td>0.154</td><td>0.0</td><td>1.0</td><td>1.0</td><td>14.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>38.619</td><td>0.169</td><td>0.0</td><td>1.0</td><td>1.0</td><td>15.5</td><td>O K</td></tr><tr><td>180 min Summer</td><td>38.618</td><td>0.168</td><td>0.0</td><td>1.0</td><td>1.0</td><td>15.5</td><td>O K</td></tr><tr><td>240 min Summer</td><td>38.614</td><td>0.164</td><td>0.0</td><td>1.0</td><td>1.0</td><td>15.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>38.605</td><td>0.155</td><td>0.0</td><td>1.0</td><td>1.0</td><td>14.3</td><td>O K</td></tr><tr><td>480 min Summer</td><td>38.596</td><td>0.146</td><td>0.0</td><td>1.0</td><td>1.0</td><td>13.4</td><td>O K</td></tr><tr><td>600 min Summer</td><td>38.587</td><td>0.137</td><td>0.0</td><td>1.0</td><td>1.0</td><td>12.6</td><td>O K</td></tr><tr><td>720 min Summer</td><td>38.577</td><td>0.127</td><td>0.0</td><td>1.0</td><td>1.0</td><td>11.7</td><td>O K</td></tr><tr><td>960 min Summer</td><td>38.557</td><td>0.107</td><td>0.0</td><td>1.0</td><td>1.0</td><td>9.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>38.518</td><td>0.068</td><td>0.0</td><td>1.0</td><td>1.0</td><td>6.3</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>38.477</td><td>0.027</td><td>0.0</td><td>1.0</td><td>1.0</td><td>2.5</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>38.456</td><td>0.006</td><td>0.0</td><td>1.0</td><td>1.0</td><td>0.6</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.8</td><td>0.8</td><td>0.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.6</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.4</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>38.559</td><td>0.109</td><td>0.0</td><td>1.0</td><td>1.0</td><td>10.0</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>92.644</td><td>0.0</td><td>9.3</td><td>18</td></tr><tr><td>30 min Summer</td><td>61.173</td><td>0.0</td><td>12.9</td><td>33</td></tr><tr><td>60 min Summer</td><td>38.715</td><td>0.0</td><td>16.7</td><td>62</td></tr><tr><td>120 min Summer</td><td>23.822</td><td>0.0</td><td>20.8</td><td>120</td></tr><tr><td>180 min Summer</td><td>17.752</td><td>0.0</td><td>23.5</td><td>160</td></tr><tr><td>240 min Summer</td><td>14.347</td><td>0.0</td><td>25.4</td><td>192</td></tr><tr><td>360 min Summer</td><td>10.563</td><td>0.0</td><td>28.2</td><td>256</td></tr><tr><td>480 min Summer</td><td>8.501</td><td>0.0</td><td>30.3</td><td>326</td></tr><tr><td>600 min Summer</td><td>7.179</td><td>0.0</td><td>32.0</td><td>394</td></tr><tr><td>720 min Summer</td><td>6.250</td><td>0.0</td><td>33.4</td><td>462</td></tr><tr><td>960 min Summer</td><td>5.020</td><td>0.0</td><td>35.7</td><td>598</td></tr><tr><td>1440 min Summer</td><td>3.682</td><td>0.0</td><td>39.3</td><td>838</td></tr><tr><td>2160 min Summer</td><td>2.696</td><td>0.0</td><td>42.9</td><td>1188</td></tr><tr><td>2880 min Summer</td><td>2.160</td><td>0.0</td><td>45.6</td><td>1500</td></tr><tr><td>4320 min Summer</td><td>1.579</td><td>0.0</td><td>49.4</td><td>0</td></tr><tr><td>5760 min Summer</td><td>1.263</td><td>0.0</td><td>52.1</td><td>0</td></tr><tr><td>7200 min Summer</td><td>1.062</td><td>0.0</td><td>54.1</td><td>0</td></tr><tr><td>8640 min Summer</td><td>0.921</td><td>0.0</td><td>55.6</td><td>0</td></tr><tr><td>10080 min Summer</td><td>0.817</td><td>0.0</td><td>56.9</td><td>0</td></tr><tr><td>15 min Winter</td><td>92.644</td><td>0.0</td><td>10.7</td><td>18</td></tr></table>			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	38.545	0.095	0.0	1.0	1.0	8.7	O K	30 min Summer	38.576	0.126	0.0	1.0	1.0	11.6	O K	60 min Summer	38.604	0.154	0.0	1.0	1.0	14.1	O K	120 min Summer	38.619	0.169	0.0	1.0	1.0	15.5	O K	180 min Summer	38.618	0.168	0.0	1.0	1.0	15.5	O K	240 min Summer	38.614	0.164	0.0	1.0	1.0	15.1	O K	360 min Summer	38.605	0.155	0.0	1.0	1.0	14.3	O K	480 min Summer	38.596	0.146	0.0	1.0	1.0	13.4	O K	600 min Summer	38.587	0.137	0.0	1.0	1.0	12.6	O K	720 min Summer	38.577	0.127	0.0	1.0	1.0	11.7	O K	960 min Summer	38.557	0.107	0.0	1.0	1.0	9.9	O K	1440 min Summer	38.518	0.068	0.0	1.0	1.0	6.3	O K	2160 min Summer	38.477	0.027	0.0	1.0	1.0	2.5	O K	2880 min Summer	38.456	0.006	0.0	1.0	1.0	0.6	O K	4320 min Summer	38.450	0.000	0.0	0.8	0.8	0.0	O K	5760 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K	7200 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K	8640 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K	10080 min Summer	38.450	0.000	0.0	0.4	0.4	0.0	O K	15 min Winter	38.559	0.109	0.0	1.0	1.0	10.0	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	92.644	0.0	9.3	18	30 min Summer	61.173	0.0	12.9	33	60 min Summer	38.715	0.0	16.7	62	120 min Summer	23.822	0.0	20.8	120	180 min 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8640 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K																																																																																																																																																																																																																																																																												
10080 min Summer	38.450	0.000	0.0	0.4	0.4	0.0	O K																																																																																																																																																																																																																																																																												
15 min Winter	38.559	0.109	0.0	1.0	1.0	10.0	O K																																																																																																																																																																																																																																																																												
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																															
15 min Summer	92.644	0.0	9.3	18																																																																																																																																																																																																																																																																															
30 min Summer	61.173	0.0	12.9	33																																																																																																																																																																																																																																																																															
60 min Summer	38.715	0.0	16.7	62																																																																																																																																																																																																																																																																															
120 min Summer	23.822	0.0	20.8	120																																																																																																																																																																																																																																																																															
180 min Summer	17.752	0.0	23.5	160																																																																																																																																																																																																																																																																															
240 min Summer	14.347	0.0	25.4	192																																																																																																																																																																																																																																																																															
360 min Summer	10.563	0.0	28.2	256																																																																																																																																																																																																																																																																															
480 min Summer	8.501	0.0	30.3	326																																																																																																																																																																																																																																																																															
600 min Summer	7.179	0.0	32.0	394																																																																																																																																																																																																																																																																															
720 min Summer	6.250	0.0	33.4	462																																																																																																																																																																																																																																																																															
960 min Summer	5.020	0.0	35.7	598																																																																																																																																																																																																																																																																															
1440 min Summer	3.682	0.0	39.3	838																																																																																																																																																																																																																																																																															
2160 min Summer	2.696	0.0	42.9	1188																																																																																																																																																																																																																																																																															
2880 min Summer	2.160	0.0	45.6	1500																																																																																																																																																																																																																																																																															
4320 min Summer	1.579	0.0	49.4	0																																																																																																																																																																																																																																																																															
5760 min Summer	1.263	0.0	52.1	0																																																																																																																																																																																																																																																																															
7200 min Summer	1.062	0.0	54.1	0																																																																																																																																																																																																																																																																															
8640 min Summer	0.921	0.0	55.6	0																																																																																																																																																																																																																																																																															
10080 min Summer	0.817	0.0	56.9	0																																																																																																																																																																																																																																																																															
15 min Winter	92.644	0.0	10.7	18																																																																																																																																																																																																																																																																															
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AEA - Ambient		Page 2					
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:30 year event						
Date 14/03/2019 10:28 File 4330_PP.SRCX	Designed by BB Checked by MN						
Innovyze	Source Control 2018.1						
<u>Summary of Results for 30 year Return Period (+40%)</u>							
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	38.595	0.145	0.0	1.0	1.0	13.3	O K
60 min Winter	38.626	0.176	0.0	1.0	1.0	16.2	O K
120 min Winter	38.648	0.198	0.0	1.0	1.0	18.2	O K
180 min Winter	38.650	0.200	0.0	1.0	1.0	18.4	O K
240 min Winter	38.644	0.194	0.0	1.0	1.0	17.8	O K
360 min Winter	38.632	0.182	0.0	1.0	1.0	16.7	O K
480 min Winter	38.618	0.168	0.0	1.0	1.0	15.5	O K
600 min Winter	38.604	0.154	0.0	1.0	1.0	14.1	O K
720 min Winter	38.588	0.138	0.0	1.0	1.0	12.7	O K
960 min Winter	38.557	0.107	0.0	1.0	1.0	9.8	O K
1440 min Winter	38.497	0.047	0.0	1.0	1.0	4.3	O K
2160 min Winter	38.451	0.001	0.0	1.0	1.0	0.1	O K
2880 min Winter	38.450	0.000	0.0	0.8	0.8	0.0	O K
4320 min Winter	38.450	0.000	0.0	0.6	0.6	0.0	O K
5760 min Winter	38.450	0.000	0.0	0.5	0.5	0.0	O K
7200 min Winter	38.450	0.000	0.0	0.4	0.4	0.0	O K
8640 min Winter	38.450	0.000	0.0	0.3	0.3	0.0	O K
10080 min Winter	38.450	0.000	0.0	0.3	0.3	0.0	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)			
30 min Winter	61.173	0.0	14.6	32			
60 min Winter	38.715	0.0	18.8	60			
120 min Winter	23.822	0.0	23.5	118			
180 min Winter	17.752	0.0	26.5	172			
240 min Winter	14.347	0.0	28.6	220			
360 min Winter	10.563	0.0	31.7	276			
480 min Winter	8.501	0.0	34.1	352			
600 min Winter	7.179	0.0	36.0	428			
720 min Winter	6.250	0.0	37.7	504			
960 min Winter	5.020	0.0	40.3	646			
1440 min Winter	3.682	0.0	44.2	880			
2160 min Winter	2.696	0.0	48.5	1124			
2880 min Winter	2.160	0.0	51.5	0			
4320 min Winter	1.579	0.0	55.9	0			
5760 min Winter	1.263	0.0	59.0	0			
7200 min Winter	1.062	0.0	61.4	0			
8640 min Winter	0.921	0.0	63.2	0			
10080 min Winter	0.817	0.0	64.7	0			
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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:30 year event	
Date 14/03/2019 10:28 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		

Model Details

Storage is Online Cover Level (m) 38.900

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.8
Max Percolation (l/s)	85.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	38.450	Membrane Depth (m)	150

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1000-0550-1000
Design Head (m)	0.550
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	38.200
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.550	1.0
Flush-Flo™	0.166	1.0
Kick-Flo®	0.358	0.8
Mean Flow over Head Range	-	0.9

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	1.0	1.200	1.4	3.000	2.2	7.000	3.2
0.200	1.0	1.400	1.5	3.500	2.3	7.500	3.3
0.300	0.9	1.600	1.6	4.000	2.5	8.000	3.4
0.400	0.9	1.800	1.7	4.500	2.6	8.500	3.5
0.500	1.0	2.000	1.8	5.000	2.7	9.000	3.6
0.600	1.0	2.200	1.9	5.500	2.8	9.500	3.7
0.800	1.2	2.400	1.9	6.000	3.0		
1.000	1.3	2.600	2.0	6.500	3.1		

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Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:100 year event																																																																																																																																																																																																																																																																																		
Date 14/03/2019 10:26 File 4330_PP.SRCX	Designed by BB Checked by MN																																																																																																																																																																																																																																																																																		
Innovyze	Source Control 2018.1																																																																																																																																																																																																																																																																																		
Summary of Results for 100 year Return Period (+40%) Half Drain Time : 242 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Control (l/s)</th><th>Max Σ Outflow (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>38.579</td><td>0.129</td><td>0.0</td><td>1.0</td><td>1.0</td><td>11.9</td><td>O K</td></tr><tr><td>30 min Summer</td><td>38.623</td><td>0.173</td><td>0.0</td><td>1.0</td><td>1.0</td><td>15.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>38.663</td><td>0.213</td><td>0.0</td><td>1.0</td><td>1.0</td><td>19.6</td><td>O K</td></tr><tr><td>120 min Summer</td><td>38.691</td><td>0.241</td><td>0.0</td><td>1.0</td><td>1.0</td><td>22.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>38.695</td><td>0.245</td><td>0.0</td><td>1.0</td><td>1.0</td><td>22.5</td><td>O K</td></tr><tr><td>240 min Summer</td><td>38.691</td><td>0.241</td><td>0.0</td><td>1.0</td><td>1.0</td><td>22.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>38.678</td><td>0.228</td><td>0.0</td><td>1.0</td><td>1.0</td><td>21.0</td><td>O K</td></tr><tr><td>480 min Summer</td><td>38.668</td><td>0.218</td><td>0.0</td><td>1.0</td><td>1.0</td><td>20.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>38.659</td><td>0.209</td><td>0.0</td><td>1.0</td><td>1.0</td><td>19.2</td><td>O K</td></tr><tr><td>720 min Summer</td><td>38.648</td><td>0.198</td><td>0.0</td><td>1.0</td><td>1.0</td><td>18.3</td><td>O K</td></tr><tr><td>960 min Summer</td><td>38.628</td><td>0.178</td><td>0.0</td><td>1.0</td><td>1.0</td><td>16.4</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>38.589</td><td>0.139</td><td>0.0</td><td>1.0</td><td>1.0</td><td>12.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>38.531</td><td>0.081</td><td>0.0</td><td>1.0</td><td>1.0</td><td>7.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>38.488</td><td>0.038</td><td>0.0</td><td>1.0</td><td>1.0</td><td>3.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>38.451</td><td>0.001</td><td>0.0</td><td>1.0</td><td>1.0</td><td>0.1</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.8</td><td>0.8</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.7</td><td>0.7</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.6</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>38.450</td><td>0.000</td><td>0.0</td><td>0.5</td><td>0.5</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>38.597</td><td>0.147</td><td>0.0</td><td>1.0</td><td>1.0</td><td>13.5</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>119.643</td><td>0.0</td><td>12.5</td><td>18</td></tr><tr><td>30 min Summer</td><td>79.768</td><td>0.0</td><td>17.3</td><td>33</td></tr><tr><td>60 min Summer</td><td>50.812</td><td>0.0</td><td>22.4</td><td>62</td></tr><tr><td>120 min Summer</td><td>31.335</td><td>0.0</td><td>28.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>23.316</td><td>0.0</td><td>31.3</td><td>180</td></tr><tr><td>240 min Summer</td><td>18.795</td><td>0.0</td><td>33.8</td><td>210</td></tr><tr><td>360 min Summer</td><td>13.745</td><td>0.0</td><td>37.1</td><td>272</td></tr><tr><td>480 min Summer</td><td>11.018</td><td>0.0</td><td>39.8</td><td>338</td></tr><tr><td>600 min Summer</td><td>9.273</td><td>0.0</td><td>41.8</td><td>408</td></tr><tr><td>720 min Summer</td><td>8.051</td><td>0.0</td><td>43.7</td><td>478</td></tr><tr><td>960 min Summer</td><td>6.436</td><td>0.0</td><td>46.5</td><td>616</td></tr><tr><td>1440 min Summer</td><td>4.686</td><td>0.0</td><td>50.6</td><td>882</td></tr><tr><td>2160 min Summer</td><td>3.405</td><td>0.0</td><td>54.9</td><td>1252</td></tr><tr><td>2880 min Summer</td><td>2.712</td><td>0.0</td><td>58.1</td><td>1584</td></tr><tr><td>4320 min Summer</td><td>1.965</td><td>0.0</td><td>62.5</td><td>2204</td></tr><tr><td>5760 min Summer</td><td>1.561</td><td>0.0</td><td>65.6</td><td>0</td></tr><tr><td>7200 min Summer</td><td>1.305</td><td>0.0</td><td>67.9</td><td>0</td></tr><tr><td>8640 min Summer</td><td>1.127</td><td>0.0</td><td>69.7</td><td>0</td></tr><tr><td>10080 min Summer</td><td>0.996</td><td>0.0</td><td>71.1</td><td>0</td></tr><tr><td>15 min Winter</td><td>119.643</td><td>0.0</td><td>14.2</td><td>18</td></tr></table>			Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status	15 min Summer	38.579	0.129	0.0	1.0	1.0	11.9	O K	30 min Summer	38.623	0.173	0.0	1.0	1.0	15.9	O K	60 min Summer	38.663	0.213	0.0	1.0	1.0	19.6	O K	120 min Summer	38.691	0.241	0.0	1.0	1.0	22.2	O K	180 min Summer	38.695	0.245	0.0	1.0	1.0	22.5	O K	240 min Summer	38.691	0.241	0.0	1.0	1.0	22.1	O K	360 min Summer	38.678	0.228	0.0	1.0	1.0	21.0	O K	480 min Summer	38.668	0.218	0.0	1.0	1.0	20.1	O K	600 min Summer	38.659	0.209	0.0	1.0	1.0	19.2	O K	720 min Summer	38.648	0.198	0.0	1.0	1.0	18.3	O K	960 min Summer	38.628	0.178	0.0	1.0	1.0	16.4	O K	1440 min Summer	38.589	0.139	0.0	1.0	1.0	12.8	O K	2160 min Summer	38.531	0.081	0.0	1.0	1.0	7.4	O K	2880 min Summer	38.488	0.038	0.0	1.0	1.0	3.5	O K	4320 min Summer	38.451	0.001	0.0	1.0	1.0	0.1	O K	5760 min Summer	38.450	0.000	0.0	0.8	0.8	0.0	O K	7200 min Summer	38.450	0.000	0.0	0.7	0.7	0.0	O K	8640 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K	10080 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K	15 min Winter	38.597	0.147	0.0	1.0	1.0	13.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	15 min Summer	119.643	0.0	12.5	18	30 min Summer	79.768	0.0	17.3	33	60 min Summer	50.812	0.0	22.4	62	120 min Summer	31.335	0.0	28.0	122	180 min Summer	23.316	0.0	31.3	180	240 min Summer	18.795	0.0	33.8	210	360 min Summer	13.745	0.0	37.1	272	480 min Summer	11.018	0.0	39.8	338	600 min Summer	9.273	0.0	41.8	408	720 min Summer	8.051	0.0	43.7	478	960 min Summer	6.436	0.0	46.5	616	1440 min Summer	4.686	0.0	50.6	882	2160 min Summer	3.405	0.0	54.9	1252	2880 min Summer	2.712	0.0	58.1	1584	4320 min Summer	1.965	0.0	62.5	2204	5760 min Summer	1.561	0.0	65.6	0	7200 min Summer	1.305	0.0	67.9	0	8640 min Summer	1.127	0.0	69.7	0	10080 min Summer	0.996	0.0	71.1	0	15 min Winter	119.643	0.0	14.2	18
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																																																																												
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1440 min Summer	38.589	0.139	0.0	1.0	1.0	12.8	O K																																																																																																																																																																																																																																																																												
2160 min Summer	38.531	0.081	0.0	1.0	1.0	7.4	O K																																																																																																																																																																																																																																																																												
2880 min Summer	38.488	0.038	0.0	1.0	1.0	3.5	O K																																																																																																																																																																																																																																																																												
4320 min Summer	38.451	0.001	0.0	1.0	1.0	0.1	O K																																																																																																																																																																																																																																																																												
5760 min Summer	38.450	0.000	0.0	0.8	0.8	0.0	O K																																																																																																																																																																																																																																																																												
7200 min Summer	38.450	0.000	0.0	0.7	0.7	0.0	O K																																																																																																																																																																																																																																																																												
8640 min Summer	38.450	0.000	0.0	0.6	0.6	0.0	O K																																																																																																																																																																																																																																																																												
10080 min Summer	38.450	0.000	0.0	0.5	0.5	0.0	O K																																																																																																																																																																																																																																																																												
15 min Winter	38.597	0.147	0.0	1.0	1.0	13.5	O K																																																																																																																																																																																																																																																																												
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																																																																															
15 min Summer	119.643	0.0	12.5	18																																																																																																																																																																																																																																																																															
30 min Summer	79.768	0.0	17.3	33																																																																																																																																																																																																																																																																															
60 min Summer	50.812	0.0	22.4	62																																																																																																																																																																																																																																																																															
120 min Summer	31.335	0.0	28.0	122																																																																																																																																																																																																																																																																															
180 min Summer	23.316	0.0	31.3	180																																																																																																																																																																																																																																																																															
240 min Summer	18.795	0.0	33.8	210																																																																																																																																																																																																																																																																															
360 min Summer	13.745	0.0	37.1	272																																																																																																																																																																																																																																																																															
480 min Summer	11.018	0.0	39.8	338																																																																																																																																																																																																																																																																															
600 min Summer	9.273	0.0	41.8	408																																																																																																																																																																																																																																																																															
720 min Summer	8.051	0.0	43.7	478																																																																																																																																																																																																																																																																															
960 min Summer	6.436	0.0	46.5	616																																																																																																																																																																																																																																																																															
1440 min Summer	4.686	0.0	50.6	882																																																																																																																																																																																																																																																																															
2160 min Summer	3.405	0.0	54.9	1252																																																																																																																																																																																																																																																																															
2880 min Summer	2.712	0.0	58.1	1584																																																																																																																																																																																																																																																																															
4320 min Summer	1.965	0.0	62.5	2204																																																																																																																																																																																																																																																																															
5760 min Summer	1.561	0.0	65.6	0																																																																																																																																																																																																																																																																															
7200 min Summer	1.305	0.0	67.9	0																																																																																																																																																																																																																																																																															
8640 min Summer	1.127	0.0	69.7	0																																																																																																																																																																																																																																																																															
10080 min Summer	0.996	0.0	71.1	0																																																																																																																																																																																																																																																																															
15 min Winter	119.643	0.0	14.2	18																																																																																																																																																																																																																																																																															
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AEA - Ambiantal		Page 3
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:100 year event	
Date 14/03/2019 10:26 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze		Source Control 2018.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.369	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.063

Time (mins)	Area
From:	To: (ha)
0	4 0.063

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To: (ha)
0	4 0.000

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AEA - Ambient		Page 4
Science Park Square Brighton East Sussex	367 Wilmslow Road Proposed attenuated 1:100 year event	
Date 14/03/2019 10:26 File 4330_PP.SRCX	Designed by BB Checked by MN	
Innovyze Source Control 2018.1		

Model Details

Storage is Online Cover Level (m) 38.900

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	43.8
Max Percolation (l/s)	85.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	38.450	Membrane Depth (m)	150

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0053-1000-0550-1000
Design Head (m)	0.550
Design Flow (l/s)	1.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	53
Invert Level (m)	38.200
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.550	1.0
Flush-Flo™	0.166	1.0
Kick-Flo®	0.358	0.8
Mean Flow over Head Range	-	0.9

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	1.0	1.200	1.4	3.000	2.2	7.000	3.2
0.200	1.0	1.400	1.5	3.500	2.3	7.500	3.3
0.300	0.9	1.600	1.6	4.000	2.5	8.000	3.4
0.400	0.9	1.800	1.7	4.500	2.6	8.500	3.5
0.500	1.0	2.000	1.8	5.000	2.7	9.000	3.6
0.600	1.0	2.200	1.9	5.500	2.8	9.500	3.7
0.800	1.2	2.400	1.9	6.000	3.0		
1.000	1.3	2.600	2.0	6.500	3.1		

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Appendix 4

General Requirements Maintenance

GENERAL MAINTENANCE MAINTENANCE	
Maintenance activities comprise Regular Maintenance Occasional Tasks Remedial Work	Frequency
Generally Litter Collect all litter or other debris and remove from site at each site visit. Avoid use of weedkillers and pesticides to prevent chemical pollution Avoid de-icing agents wherever possible to allow bio-remediation of pollutants in permeable surfaces. Protect all permeable, porous and infiltration surfaces from silt, sand, mulch and other fine particles.	Monthly
REGULAR MAINTENANCE	
LITTER MANAGEMENT	
Pick up all litter in SuDS and Landscape areas and remove from site	monthly
GRASS MAINTENANCE – all cuttings to wildlife piles	

Mow all grass verges, paths and amenity at 35-50mm with 75mm max. Leaving grass in situ	As required or monthly
Mow all dry swales, dry SuDS basins and margins to low flow channels and other SuDS features at 100mm with 150mm max. Cut wet swales or basins annually as wildflower areas	4-8 visits as required Annually
Wildflower areas strimmed to 50mm in Sept or at end of school holidays Or Wildflower areas strimmed to 50mm on 3 year rotation 30% each year	1 visit annually 1 Visit Annually
Inspect monthly, remove silt from slab aprons and debris. Strim 1m round for access	12 visits monthly
HARD SURFACES	
Sweep all paving regularly. Sweep and suction brush permeable paving in autumn after leaf fall.	1 visit
PERMEABLE AND POROUS SURFACES	
Regular Maintenance	Frequency
Cleaning	
Brush regularly and remove sweepings from all hard surfaces	Monthly

Occasional Tasks	Frequency
Permeable Pavements. Brush and vacuum surface once a year to prevent silt blockage and enhance design life.	Annually
Remedial Work	Frequency
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise Client of possible need for reinstatement of top layers or specialist cleaning. Recent experience suggests jet washing and suction cleaning will substantially reinstate pavement to 90% efficiency.	As required
OVERFLOWS AND FLOOD ROUTES	
Regular Maintenance	Frequency
Overflows. Jet pipes leading from overflow structures annually and check running water through the overflow. Check free flow at next SUDS feature inlet to basin or chamber.	Annually
Overflows. Remove any accumulated grass cuttings or other debris on top of grass weirs or stone filled baskets overflows.	Monthly
Flood Routes. Make visual inspection. Check route is not blocked by new fences, walls, soil or other rubbish. Remove as necessary.	Monthly
Remedial	Frequency
Overflows. If overflow is not clear then dismantle structure and reassemble to design detail.	

	As required
PLANTING AND EXISTING VEGETATION	
Regular Maintenance	Frequency
Grass maintenance	
Amenity Grass - Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. All cuttings to remain in situ 16 visits	
Rough grass – Mow at 75-100mm but not to exceed 150mm All cuttings to wildlife piles 4 - 8 visits	
Wildflower areas strimmed to 50mm in Sept-Oct or Wildflower areas strimmed to 50mm July and Sept or Wildflower areas strimmed to 50mm on 3 year rotation 30% each year All cuttings to wildlife piles 1 visit	
Ornamental tree & shrub planting. Weed all shrub beds as detailed spec as necessary. Cut back planting from lights, paths and visibility sight lines in late autumn and as necessary. Cut hedges slightly tapered back from base with flat top at specified height. 4 visits	

Do not mulch planting adjacent to permeable/ porous paving surfaces. Remove stakes and ties from trees when no longer needed for support and within 3 years of planting. Protect from strimmer damage and remove competitive growth until well established.	
Native trees & shrub planting. Prune to shape in year 1. Protect trees from strimmer damage and remove competitive growth until well established. Remove stakes and ties from trees when no longer needed for support and within 3 years from planting.	1 visit
Existing trees Check existing trees for safety.	1 visit
Remedial	Frequency
Replace trees and shrubs which fail in the first five years after planting. Carry out tree surgery as necessary.	As Required



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