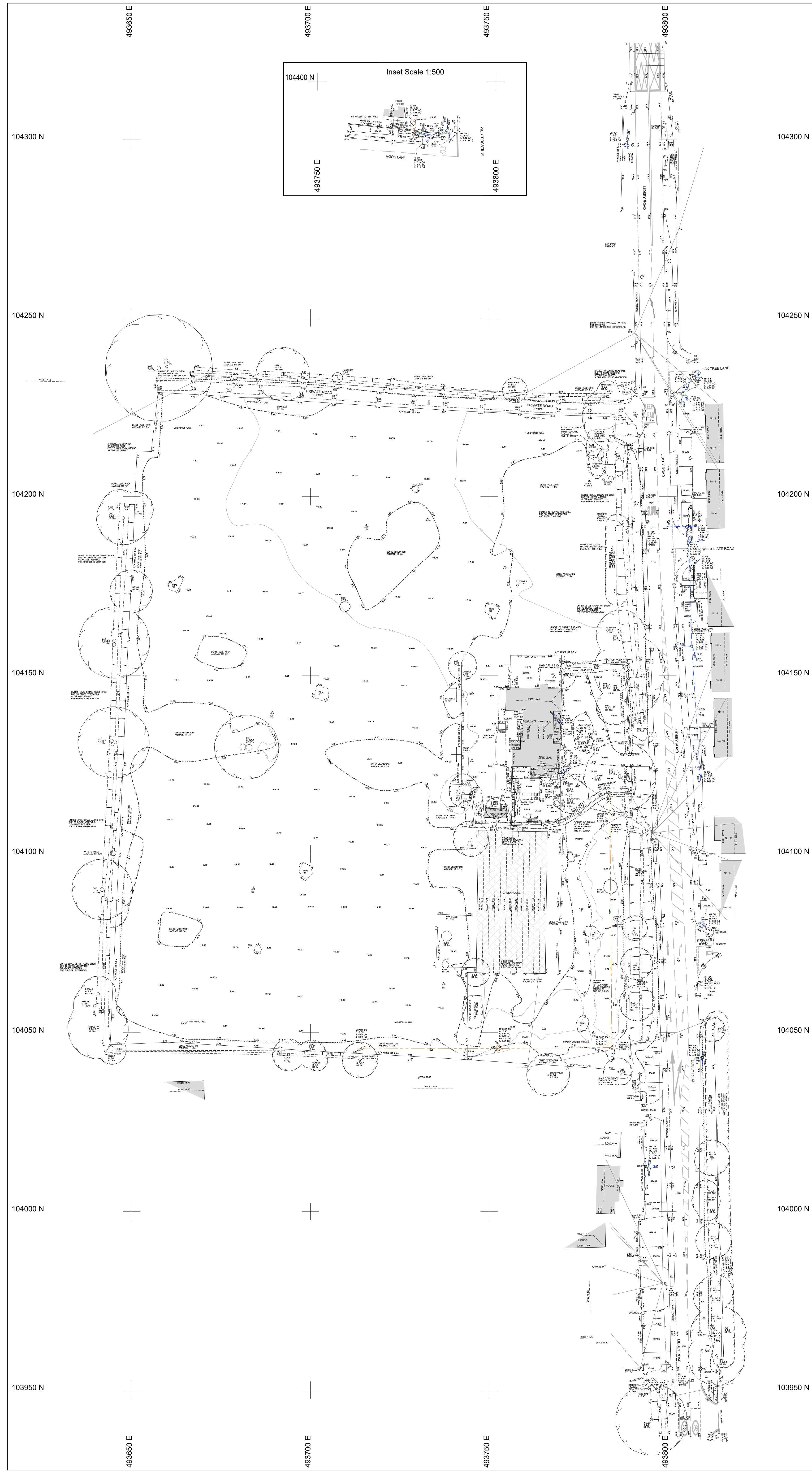




- Notes:
- GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR (0.99971) APPLIED.
 - DRAINAGE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHILST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION, IT SHOULD ALWAYS BE CHECKED IN AREAS THAT ARE CRITICAL TO THE FUTURE PROPOSAL.
 - ALL SEWERS ARE PRESUMED TO BE STRAIGHT BETWEEN CHAMBERS, WITH ROUTES /CONNECTIVITY OBTAINED USING ACOUSTIC METHODS ONLY. THESE ARE TO BE CONSIDERED ASSUMED AND SHOULD BE INVESTIGATED FURTHER IN CRITICAL AREAS.
 - TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.

Coordinate Table				
Station	Description	Easting	Northing	Level
J3	ROAD NAIL	493768.236	104149.535	8.860
J4	ROAD NAIL	493778.099	104147.921	8.899
J5	ROAD NAIL	493783.019	104134.628	8.805
S1	ROAD NAIL	493800.903	103978.083	8.838
S2	ROAD NAIL	493808.226	104099.716	8.405
S3	ROAD NAIL	493804.154	104173.396	8.130
S4	ROAD NAIL	493800.726	104226.417	8.227
S5	PEG	493715.660	104191.694	8.613
S6	PEG	493689.293	104139.466	9.275
S7	PEG	493684.033	104090.276	9.374
S8	PEG	493737.321	104063.621	9.196
S9	ROAD NAIL	493779.184	104049.861	8.963
S10	ROAD NAIL	493774.205	104073.335	9.015

TOPOGRAPHICAL KEY

SURVEY STATION

BANKING

HEDGE SPREADS

WOODLAND CANOPY

ARROW ON STEPS / RAMP

TREES

GATE

KERB CHANNEL

ROAD UNKERRIED

FOOTPATH

CHANGE IN SURFACE

FENCE

WALL

OVERHEAD ELECTRIC

OVERHEAD TELECOM

FOUL SEWER

SURFACE SEWER

P-TRAP

BACK DROP (EXTERNAL)

BACK DROP (INTERNAL)

BUILDING

OPEN SIDED BUILDING

OVERHANG / CANOPY

GLASSHOUSE

CONTOUR

SPOT LEVEL

SONAR LEVEL

BORE HOLE

TRIAL HOLE

5

TOP

BOTTOM

SPREAD & GIRTH SHOWN TO SCALE

ROAD UNKERRIED

FOOTPATH

CHANGE IN SURFACE

FENCE

WALL

OVERHEAD ELECTRIC

OVERHEAD TELECOM

FOUL SEWER

SURFACE SEWER

P-TRAP

BACK DROP (EXTERNAL)

BACK DROP (INTERNAL)

BUILDING

OPEN SIDED BUILDING

OVERHANG / CANOPY

GLASSHOUSE

CONTOUR

SPOT LEVEL

SONAR LEVEL

BORE HOLE

TRIAL HOLE

AIR CONDITIONING UNIT

AV

AVERAGE

BL

BELLISHA BEACON

BB

BOLLARD

BOLLARD LIGHT

BOL

BRICK

BS

BUS STOP

CR

CABLE RISER

CABLE TV COVER

CATV

CABLES TO GROUND

CP

CONTROL BOX

CB

COVER LEVEL

CROSSING CONTROL BUTTON

COB

DAMP PROOF COURSE

DPC

DRAINAGE CHANNEL

DK

DROP KERB

ELECTRICITY POLE

EP

EARTH ROD

ER

FIRE HYDRANT

FL

FOOTPATH

FW

FOUL WATER

GR

GAS RISER

OV

GAS VALVE

GULLY

HARD BED

HB

INSPECTION COVER

IC

INVERT LEVEL

IL

KERB OUTLET

KO

LAMP POST

LP

MANHOLE

MH

MARKER POST

MT

METER

NPV

NO PIPES VISIBLE

ORDNANCE SURVEY BENCH MARK

OSBM

P-TRAP

PT

POST

POST BOX

P BOX

RODDING EYE

RE

ROAD SIGN

RS

RAIN WATER PIPE

RWP

RETAINING WALL

RW

SOFT BED

SB

STOP COCK

SC

STREET NAME PLATE

SNP

STOP VALVE

SV

SOIL PIPE

SP

SOIL VENT PIPE

SVP

SURFACE WATER

SW

TACTILE PAVING

TAC

TELECOM POLE

TP

TELECOM INSPECTION COVER

TIC

TELEPHONE CALL BOX

TCL

TICKET MACHINE

TM

TOP OF WALL

TOW

TRAFFIC LIGHT

TL

TRAFFIC LIGHT COVER

TLC

THRESHOLD LEVEL

THL

UNABLE TO LOCATE

UTL

UNABLE TO RAISE

UTR

UNABLE TO SURVEY

UTS

VENT PIPE

VP

WATER LEVEL

WL

WATER METER

WM

WASH OUT

WO

WATER RISER

WR

WATER TAP

WT

GENERAL ABBREVIATIONS

IRON RAILINGS

IR

LARCH LAP FENCE

LL

POST AND RAIL FENCE

PR

POST AND WIRE FENCE

PW

WIRE MESH FENCE

WM

1

Manholes 7001, 7002, 7003, 7101 surveyed and 2 no. tree girths checked within property boundary.

MK

CP

NS

16/01/2020

Revision

Description

Surv. by

Check. by

Appr. by

Date

0m

5

10

15

20

25

30

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THAKEHAM

Lidsey Road

Woodgate

West Sussex

Topographical Survey

Scale

1:500

Sheet Size

A1

Sheet Number

1

Date

August 2019

Project Number

27568

Rev

1

Surveyed by

RG / JM

Checked by

AJ

Approved by

CP

Appendix J Calculations

RGP Design Limited		Page 1
2 West Barn Norton Lane Chichester PO20 3AF	Land at Lidsey Road, Woodgate Greenfield Run-Off	
Date 28/01/2020 File	Designed by SPB Checked by MJA	
Innovyze Source Control 2018.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	2.530	Urban	0.000
SAAR (mm)	764	Region Number	Region 7

Results l/s

QBAR Rural	9.5
QBAR Urban	9.5
Q100 years	30.4
Q1 year	8.1
Q30 years	21.6
Q100 years	30.4

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RGP Design Limited		Page 1
2 West Barn Norton Lane Chichester PO20 3AF	Land at Lidsey Road, Woodgate Greenfield Volume	
Date 28/01/2020 File	Designed by SPB Checked by MJA	
Innovyze Source Control 2018.1		

Greenfield Runoff Volume

FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	19.400
Ratio R	0.337
Areal Reduction Factor	1.00
Area (ha)	2.530
SAAR (mm)	764
CWI	113.258
Urban	0.000
SPR	37.000

Results

Percentage Runoff (%)	38.36
Greenfield Runoff Volume (m³)	631.983

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Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.400	Minimum Backdrop Height (m)	0.500
Ratio-R	0.333	Preferred Cover Depth (m)	0.800
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.076	5.00	9.800	1350	493658.343	104199.609	0.925
2	0.019	5.00	9.600	1200	493690.301	104204.721	0.850
3	0.063	5.00	9.600	1350	493690.412	104199.617	1.050
4	0.026	5.00	9.525	1350	493713.002	104199.819	1.050
5	0.074	5.00	9.525	1200	493729.387	104204.530	1.075
6	0.026	5.00	9.600	1350	493722.945	104196.895	1.350
7	0.026	5.00	9.800	1350	493727.725	104187.618	1.675
8	0.111	5.00	10.000	1350	493727.646	104157.287	1.925
9			9.600	1350	493738.972	104125.109	1.575
9_OUT			9.525	1350	493730.627	104118.311	1.525
10	0.040	5.00	10.000	1200	493658.975	104147.455	1.100
11	0.040	5.00	10.000	1200	493717.063	104147.455	1.500
12	0.040	5.00	9.750	1200	493697.079	104147.455	1.450
13	0.040	5.00	10.000	1200	493673.362	104075.128	0.850
14	0.040	5.00	9.800	1200	493671.906	104105.399	1.100
15			9.800	1200	493696.950	104121.110	1.600
15_OUT			9.700	1200	493713.471	104114.923	1.662
16		5.00	9.500	1200	493732.097	104106.511	1.500
17			9.500	1200	493745.090	104106.067	1.750
18			9.000	1200	493787.065	104104.634	1.300
18_OUT			9.000	1200	493792.791	104098.568	1.325
19	0.080	5.00	10.000	1200	493688.435	104074.568	1.425
20	0.080	5.00	9.750	1200	493721.976	104074.449	1.250
21	0.070	5.00	9.750	1200	493743.064	104073.717	0.850
22	0.038	5.00	9.750	1200	493733.072	104081.187	1.300
22_OUT			9.525	1200	493726.624	104091.333	1.487



Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	3	32.069	0.600	8.875	8.725	0.150	213.8	375	5.43	50.0
2.000	2	3	5.105	0.600	8.750	8.700	0.050	102.1	225	5.07	50.0
1.001	3	4	22.591	0.600	8.550	8.475	0.075	301.2	375	5.80	50.0
1.002	4	6	10.364	0.600	8.475	8.400	0.075	138.2	375	5.91	50.0
3.000	5	6	9.990	0.600	8.450	8.400	0.050	199.8	225	5.18	50.0
1.003	6	7	10.436	0.600	8.250	8.200	0.050	208.7	375	6.05	50.0
1.004	7	8	30.331	0.600	8.125	8.075	0.050	606.6	375	6.74	50.0
1.005	8	9	34.113	0.600	8.075	8.025	0.050	682.3	375	7.57	50.0
1.006	9	9_OUT	10.763	0.600	8.025	8.000	0.025	430.5	375	7.78	50.0
4.000	10	12	38.104	0.600	8.900	8.500	0.400	95.3	225	5.47	50.0
5.000	11	12	19.984	0.600	8.500	8.300	0.200	99.9	225	5.25	50.0
4.001	12	15	26.345	0.600	8.300	8.200	0.100	263.5	300	5.93	50.0
6.000	13	14	30.306	0.600	9.150	8.700	0.450	67.3	300	5.26	50.0
6.001	14	15	29.564	0.600	8.700	8.400	0.300	98.5	300	5.57	50.0
4.002	15	15_OUT	17.641	0.600	8.200	8.100	0.100	176.4	300	6.18	50.0
7.000	16	17	13.001	0.600	8.000	7.950	0.050	260.0	300	5.22	50.0
7.001	17	18	41.999	0.600	7.750	7.700	0.050	840.0	300	6.53	50.0
7.002	18	18_OUT	8.342	0.600	7.700	7.675	0.025	333.7	300	6.70	50.0
8.000	19	20	33.541	0.600	8.575	8.500	0.075	447.2	300	5.76	50.0
8.001	20	22	12.982	0.600	8.500	8.450	0.050	259.6	300	5.98	50.0
9.000	21	22	12.476	0.600	8.900	8.825	0.075	166.3	225	5.21	50.0
8.002	22	22_OUT	12.022	0.600	8.450	8.425	0.025	480.9	300	6.26	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.235	136.4	10.3	0.550	0.500	0.076	0.0	69	0.737
2.000	1.293	51.4	2.6	0.625	0.675	0.019	0.0	34	0.676
1.001	1.038	114.7	21.4	0.675	0.675	0.158	0.0	109	0.802
1.002	1.539	170.0	24.9	0.675	0.825	0.184	0.0	96	1.110
3.000	0.921	36.6	10.0	0.850	0.975	0.074	0.0	80	0.788
1.003	1.250	138.1	38.5	0.975	1.225	0.284	0.0	135	1.077
1.004	0.728	80.4	42.0	1.300	1.550	0.310	0.0	192	0.736
1.005	0.686	75.8	57.1	1.550	1.200	0.421	0.0	244	0.751
1.006	0.867	95.7	57.1	1.200	1.150	0.421	0.0	209	0.904
4.000	1.340	53.3	5.4	0.875	1.025	0.040	0.0	48	0.863
5.000	1.308	52.0	5.4	1.275	1.225	0.040	0.0	49	0.851
4.001	0.964	68.1	16.3	1.150	1.300	0.120	0.0	99	0.794
6.000	1.918	135.6	5.4	0.550	0.800	0.040	0.0	41	0.949
6.001	1.584	111.9	10.8	0.800	1.100	0.080	0.0	62	1.011
4.002	1.180	83.4	27.1	1.300	1.300	0.200	0.0	117	1.058
7.000	0.970	68.6	0.0	1.200	1.250	0.000	0.0	0	0.000
7.001	0.535	37.8	0.0	1.450	1.000	0.000	0.0	0	0.000
7.002	0.855	60.4	0.0	1.000	1.025	0.000	0.0	0	0.000
8.000	0.737	52.1	10.8	1.125	0.950	0.080	0.0	92	0.584
8.001	0.971	68.6	21.7	0.950	1.000	0.160	0.0	116	0.864
9.000	1.011	40.2	9.5	0.625	0.700	0.070	0.0	74	0.830
8.002	0.710	50.2	36.3	1.000	0.800	0.268	0.0	190	0.772



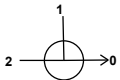
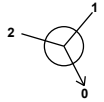
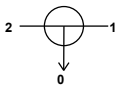
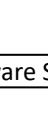
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	32.069	213.8	375	Circular	9.800	8.875	0.550	9.600	8.725	0.500
2.000	5.105	102.1	225	Circular	9.600	8.750	0.625	9.600	8.700	0.675
1.001	22.591	301.2	375	Circular	9.600	8.550	0.675	9.525	8.475	0.675
1.002	10.364	138.2	375	Circular	9.525	8.475	0.675	9.600	8.400	0.825
3.000	9.990	199.8	225	Circular	9.525	8.450	0.850	9.600	8.400	0.975
1.003	10.436	208.7	375	Circular	9.600	8.250	0.975	9.800	8.200	1.225
1.004	30.331	606.6	375	Circular	9.800	8.125	1.300	10.000	8.075	1.550
1.005	34.113	682.3	375	Circular	10.000	8.075	1.550	9.600	8.025	1.200
1.006	10.763	430.5	375	Circular	9.600	8.025	1.200	9.525	8.000	1.150
4.000	38.104	95.3	225	Circular	10.000	8.900	0.875	9.750	8.500	1.025
5.000	19.984	99.9	225	Circular	10.000	8.500	1.275	9.750	8.300	1.225
4.001	26.345	263.5	300	Circular	9.750	8.300	1.150	9.800	8.200	1.300
6.000	30.306	67.3	300	Circular	10.000	9.150	0.550	9.800	8.700	0.800
6.001	29.564	98.5	300	Circular	9.800	8.700	0.800	9.800	8.400	1.100
4.002	17.641	176.4	300	Circular	9.800	8.200	1.300	9.700	8.100	1.300
7.000	13.001	260.0	300	Circular	9.500	8.000	1.200	9.500	7.950	1.250
7.001	41.999	840.0	300	Circular	9.500	7.750	1.450	9.000	7.700	1.000
7.002	8.342	333.7	300	Circular	9.000	7.700	1.000	9.000	7.675	1.025
8.000	33.541	447.2	300	Circular	10.000	8.575	1.125	9.750	8.500	0.950
8.001	12.982	259.6	300	Circular	9.750	8.500	0.950	9.750	8.450	1.000
9.000	12.476	166.3	225	Circular	9.750	8.900	0.625	9.750	8.825	0.700
8.002	12.022	480.9	300	Circular	9.750	8.450	1.000	9.525	8.425	0.800

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
2.000	2	1200	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.001	3	1350	Manhole	Adoptable	4	1350	Manhole	Adoptable
1.002	4	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
3.000	5	1200	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.003	6	1350	Manhole	Adoptable	7	1350	Manhole	Adoptable
1.004	7	1350	Manhole	Adoptable	8	1350	Manhole	Adoptable
1.005	8	1350	Manhole	Adoptable	9	1350	Manhole	Adoptable
1.006	9	1350	Manhole	Adoptable	9_OUT	1350	Manhole	Adoptable
4.000	10	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
5.000	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
4.001	12	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
6.000	13	1200	Manhole	Adoptable	14	1200	Manhole	Adoptable
6.001	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
4.002	15	1200	Manhole	Adoptable	15_OUT	1200	Manhole	Adoptable
7.000	16	1200	Manhole	Adoptable	17	1200	Manhole	Adoptable
7.001	17	1200	Manhole	Adoptable	18	1200	Manhole	Adoptable
7.002	18	1200	Manhole	Adoptable	18_OUT	1200	Manhole	Adoptable
8.000	19	1200	Manhole	Adoptable	20	1200	Manhole	Adoptable
8.001	20	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
9.000	21	1200	Manhole	Adoptable	22	1200	Manhole	Adoptable
8.002	22	1200	Manhole	Adoptable	22_OUT	1200	Manhole	Adoptable

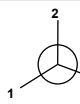
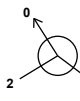


Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	493658.343	104199.609	9.800	0.925	1350		0	1.000	8.875 375
2	493690.301	104204.721	9.600	0.850	1200		0	2.000	8.750 225
3	493690.412	104199.617	9.600	1.050	1350		1 2	2.000 1.000	8.700 8.725 375
4	493713.002	104199.819	9.525	1.050	1350		1	1.001	8.550 375
5	493729.387	104204.530	9.525	1.075	1200		0	1.001	8.475 375
6	493722.945	104196.895	9.600	1.350	1350		1 2	3.000 1.002	8.450 8.400 375
7	493727.725	104187.618	9.800	1.675	1350		1	1.003	8.250 375
8	493727.646	104157.287	10.000	1.925	1350		1	1.004	8.200 375
9	493738.972	104125.109	9.600	1.575	1350		0	1.004	8.125 375
9_OUT	493730.627	104118.311	9.525	1.525	1350		1	1.005	8.075 375
10	493658.975	104147.455	10.000	1.100	1200		1	1.005	8.025 375
11	493717.063	104147.455	10.000	1.500	1200		0	1.006	8.000 375
12	493697.079	104147.455	9.750	1.450	1200		1 2	5.000 4.000	8.025 8.000 375
							0	1.006	8.000 375
							0	4.000	8.900 225
							0	5.000	8.500 225
							0	4.001	8.300 300



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
13	493673.362	104075.128	10.000	0.850	1200		0	6.000	9.150	300
14	493671.906	104105.399	9.800	1.100	1200		1	6.000	8.700	300
15	493696.950	104121.110	9.800	1.600	1200		1	6.001	8.400	300
						2	4.001	8.200	300	
						0	4.002	8.200	300	
15_OUT	493713.471	104114.923	9.700	1.662	1200		1	4.002	8.100	300
16	493732.097	104106.511	9.500	1.500	1200		0	7.000	8.000	300
17	493745.090	104106.067	9.500	1.750	1200		1	7.000	7.950	300
						0	7.001	7.750	300	
18	493787.065	104104.634	9.000	1.300	1200		1	7.001	7.700	300
						0	7.002	7.700	300	
18_OUT	493792.791	104098.568	9.000	1.325	1200		1	7.002	7.675	300
19	493688.435	104074.568	10.000	1.425	1200		0	8.000	8.575	300
20	493721.976	104074.449	9.750	1.250	1200		1	8.000	8.500	300
						0	8.001	8.500	300	
21	493743.064	104073.717	9.750	0.850	1200		0	9.000	8.900	225
22	493733.072	104081.187	9.750	1.300	1200		1	9.000	8.825	225
						2	8.001	8.450	300	
						0	8.002	8.450	300	
22_OUT	493726.624	104091.333	9.525	1.487	1200		1	8.002	8.425	300



Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	19.400	Additional Storage (m ³ /ha)	20.0
Ratio-R	0.333	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Node 17 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	7.750	Product Number	CTL-SHE-0095-5000-1700-5000
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node 15 OUT Online Orifice Control

Flap Valve	x	Invert Level (m)	8.038	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.300		

Node 9 OUT Online Orifice Control

Flap Valve	x	Invert Level (m)	8.000	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.375		

Node 22 OUT Online Orifice Control

Flap Valve	x	Invert Level (m)	8.038	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.300		

Node 16 Online Orifice Control

Flap Valve	x	Invert Level (m)	8.000	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.300		

Node 16 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	38.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	8.000	Main Channel Slope (1:X)	1000.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.025

Inlets

15_OUT | 22_OUT | 9_OUT



Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	307.0	0.0	1.500	650.1	0.0

Node 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.150	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.32	Length (m)	26.700		

Node 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.050	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.32	Length (m)	40.330		

Node 21 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.300	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.32	Length (m)	37.160		

Node 19 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.440	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.450
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.32	Length (m)	21.660		

Node 12 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.190	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.32	Length (m)	74.580		



Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	1	945	9.497	0.622	4.2	2.0140	0.0000	SURCHARGED
960 minute winter	2	930	9.499	0.749	2.6	18.3938	0.0000	FLOOD RISK
960 minute winter	3	930	9.498	0.948	8.3	2.6078	0.0000	FLOOD RISK
960 minute winter	4	930	9.499	1.024	8.9	2.0229	0.0000	FLOOD RISK
960 minute winter	5	930	9.497	1.047	4.8	35.6995	0.0000	FLOOD RISK
960 minute winter	6	915	9.495	1.245	14.1	2.3104	0.0000	FLOOD RISK
960 minute winter	7	930	9.498	1.373	15.5	2.4351	0.0000	SURCHARGED
960 minute winter	8	930	9.497	1.422	21.6	3.8396	0.0000	SURCHARGED
960 minute winter	9	930	9.498	1.473	21.4	2.1077	0.0000	FLOOD RISK
960 minute winter	9_OUT	930	9.501	1.501	21.3	2.1485	0.0000	OK
960 minute winter	10	930	9.500	0.600	2.2	1.1590	0.0000	SURCHARGED
960 minute winter	11	930	9.500	1.000	2.2	1.7181	0.0000	SURCHARGED
960 minute winter	12	930	9.500	1.200	7.2	41.1260	0.0000	FLOOD RISK
960 minute winter	13	945	9.500	0.350	2.2	0.7588	0.0000	SURCHARGED
960 minute winter	14	945	9.500	0.800	4.4	1.5447	0.0000	SURCHARGED
960 minute winter	15	930	9.500	1.300	10.0	1.4700	0.0000	SURCHARGED
960 minute winter	15_OUT	930	9.510	1.472	10.0	1.6644	0.0000	OK
960 minute winter	16	945	9.495	1.495	27.5	1.6913	0.0000	FLOOD RISK
960 minute winter	17	975	9.496	1.746	7.3	1.9743	0.0000	FLOOD RISK
960 minute winter	18	930	7.761	0.061	5.1	0.0684	0.0000	OK
960 minute winter	18_OUT	930	7.728	0.053	5.1	0.0000	0.0000	OK
15 minute winter	19	12	9.505	0.930	59.6	4.4501	0.0000	SURCHARGED
960 minute winter	20	930	9.500	1.000	8.9	2.5393	0.0000	FLOOD RISK
960 minute winter	21	945	9.500	0.600	4.8	14.6985	0.0000	FLOOD RISK
960 minute winter	22	930	9.501	1.051	14.4	1.8643	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	1	1.000	3	4.1	0.546	0.030	3.5371	
960 minute winter	2	2.000	3	-1.8	0.485	-0.036	0.2030	
960 minute winter	3	1.001	4	7.5	0.588	0.066	2.4917	
960 minute winter	4	1.002	6	8.8	0.718	0.052	1.1431	
960 minute winter	5	3.000	6	3.9	0.502	0.107	0.3973	
960 minute winter	6	1.003	7	14.0	0.571	0.102	1.1511	
960 minute winter	7	1.004	8	15.4	0.320	0.192	3.3454	
960 minute winter	8	1.005	9	21.4	0.372	0.283	3.7626	
960 minute winter	9	1.006	9_OUT	21.3	0.354	0.222	1.1871	
960 minute winter	9_OUT	Flow through pond	16	27.5	0.044	0.001	702.6334	
960 minute winter	10	4.000	12	2.2	0.589	0.041	1.5154	
960 minute winter	11	5.000	12	2.2	0.290	0.042	0.7948	
960 minute winter	12	4.001	15	7.5	0.395	0.111	1.8552	
960 minute winter	13	6.000	14	2.3	0.492	0.017	2.1341	
960 minute winter	14	6.001	15	4.1	0.644	0.036	2.0819	
960 minute winter	15	4.002	15_OUT	10.0	0.496	0.120	1.2423	
960 minute winter	15_OUT	Flow through pond	16	27.5	0.044	0.001	702.6334	
960 minute winter	16	7.000	17	7.3	0.530	0.106	0.9155	
960 minute winter	17	Hydro-Brake®	18	5.1				
960 minute winter	18	7.002	18_OUT	5.1	0.545	0.084	0.0773	321.9
15 minute winter	19	8.000	20	54.7	0.777	1.050	2.3619	
960 minute winter	20	8.001	22	8.7	0.426	0.126	0.9142	
960 minute winter	21	9.000	22	5.0	0.624	0.125	0.4962	
960 minute winter	22	8.002	22_OUT	14.2	0.623	0.282	0.8466	



Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	22_OUT	885	9.508	1.470	14.2	1.6622	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	22_OUT	Flow through pond	16	27.5	0.044	0.001	702.6334	



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.400	Minimum Backdrop Height (m)	0.500
Ratio-R	0.333	Preferred Cover Depth (m)	0.800
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.070	5.00	9.250	1350	493782.406	104143.299	1.500
2	0.070	5.00	8.800	1350	493771.993	104214.526	1.200
3			8.800	1350	493778.821	104214.168	1.300
3_OUT			8.700	1350	493786.449	104212.110	1.300

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	3	70.960	0.600	7.750	7.500	0.250	283.8	375	6.11	50.0
2.000	2	3	6.837	0.600	7.600	7.500	0.100	68.4	375	5.05	50.0
1.001	3	3_OUT	7.901	0.600	7.500	7.400	0.100	79.0	375	6.17	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.070	118.2	9.5	1.125	0.925	0.070	0.0	71	0.650
2.000	2.194	242.3	9.5	0.825	0.925	0.070	0.0	50	1.082
1.001	2.040	225.3	19.0	0.925	0.925	0.140	0.0	73	1.257

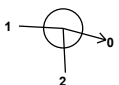
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	70.960	283.8	375	Circular	9.250	7.750	1.125	8.800	7.500	0.925
2.000	6.837	68.4	375	Circular	8.800	7.600	0.825	8.800	7.500	0.925
1.001	7.901	79.0	375	Circular	8.800	7.500	0.925	8.700	7.400	0.925

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
2.000	2	1350	Manhole	Adoptable	3	1350	Manhole	Adoptable
1.001	3	1350	Manhole	Adoptable	3_OUT	1350	Manhole	Adoptable



Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	493782.406	104143.299	9.250	1.500	1350		0	1.000	7.750	375
2	493771.993	104214.526	8.800	1.200	1350		0	2.000	7.600	375
3	493778.821	104214.168	8.800	1.300	1350		1	2.000	7.500	375
							2	1.000	7.500	375
							0	1.001	7.500	375
3_OUT	493786.449	104212.110	8.700	1.300	1350		1	1.001	7.400	375

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	19.400	Additional Storage (m³/ha)	20.0
Ratio-R	0.333	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x
Analysis Speed	Normal		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	40	10	0

Node 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	7.500	Product Number	CTL-SHE-0054-1500-1300-1500
Design Depth (m)	1.300	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.5	Min Node Diameter (mm)	1200

Node 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	8.240	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.450
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	1.00	Length (m)	41.660		

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	7.600
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	



Bright Plan Civils
2 West Barn
Norton Lane
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Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	20.0	0.0	0.400	20.0	0.0	0.401	0.0	0.0



Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 81.85%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	1	585	8.635	0.885	9.7	95.6853	0.0000	SURCHARGED
480 minute winter	2	464	8.636	1.036	6.6	10.4223	0.0000	FLOOD RISK
600 minute winter	3	585	8.635	1.135	6.6	1.6242	0.0000	FLOOD RISK
15 minute winter	3_OUT	1	7.400	0.000	1.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	1	1.000	3	-4.1	0.152	-0.035	7.8267	
480 minute winter	2	2.000	3	7.4	0.139	0.030	0.7541	
600 minute winter	3	Hydro-Brake®	3_OUT	1.4				63.4