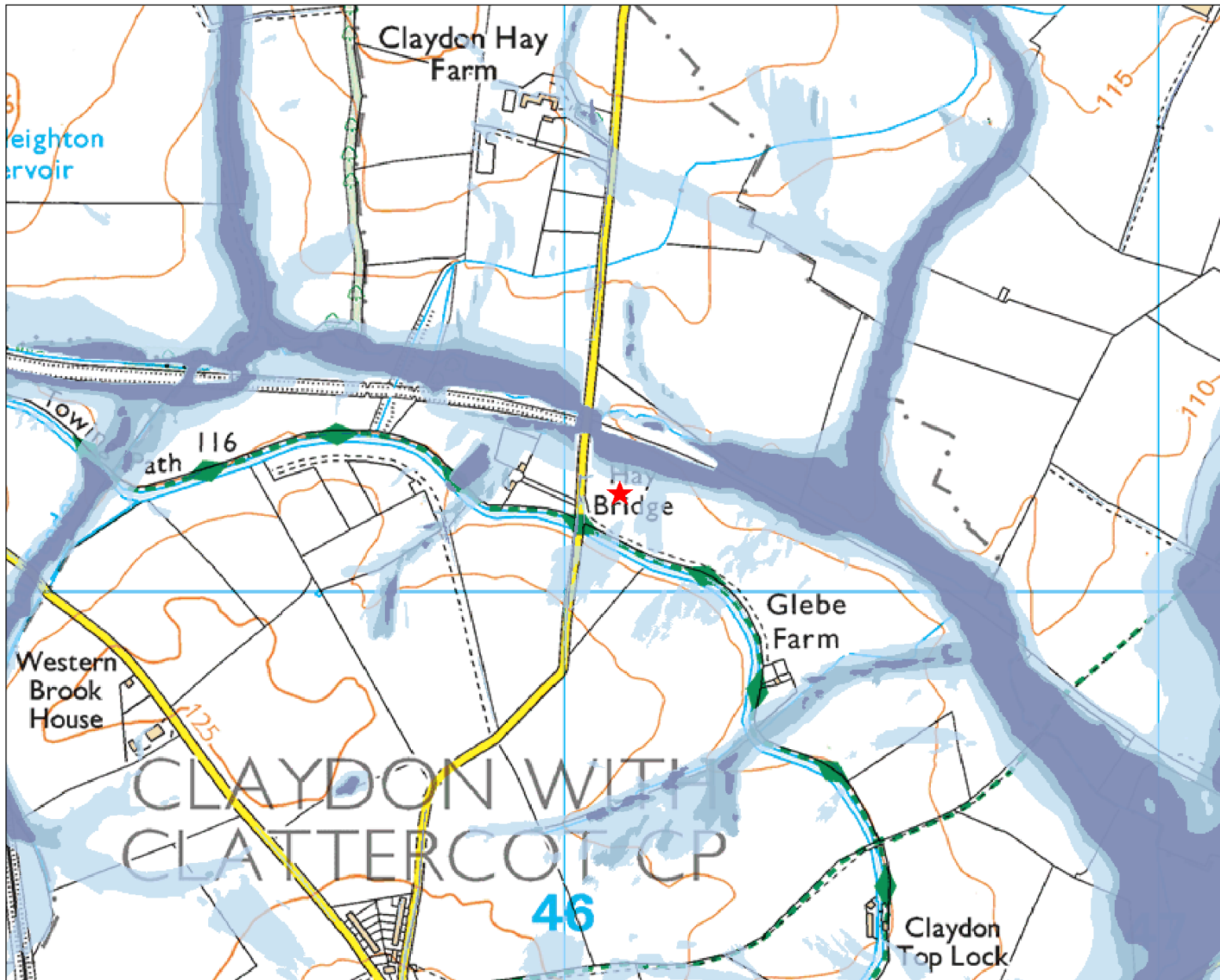




Appendix: F

EA SURFACE WATER FLOOD RISK MAP

Risk of flooding from Surface Water



Scale 1:10,001



Likelihood of flooding from Surface Water

- High
- Medium
- Low
- Very Low

Likelihood of flooding from Surface Water

- High: Greater than or equal to 1 in 30 (3.3%) chance in any given year
- Medium: Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year
- Low: Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
- Very Low: Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.



Appendix: G

MASTERPLAN OVERLAY WITH SURFACE WATER RISK MAP



KEY:

LIKELIHOOD OF FLOODING DUE TO SURFACE WATER

- HIGH
- MEDIUM
- LOW
- VERY LOW

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS:



Unit 23, The Maltings, Stanstead Abbots,
Hertfordshire, SG12 8HG
Tel: 01920 871777
www.eastp.co.uk

CLIENT:

ARCHITECT:

PROJECT:
CLAYDON MARINA
CHERWELL

TITLE:
EA SURFACE WATER
FLOOD RISK MAPPING OVERLAY

SCALE @ A2: 1:2000	DESIGN-DRAWN MC	DATE: 24/04/2018
PROJECT No: 1319	DRAWING No: SK03 REV C	



Appendix: H **CANAL AND RIVERS TRUST
CORRESPONDENCE**



Canal &
River Trust

Keeping people, nature & history connected

16th March 2017

Mrs E Elwood
emma.elwood@eastp.co.uk

Our Ref OX-067
Your Ref

Dear Mrs Elwood

RE: FLOOD RISK ASSESSMENT - Boddington Road, Claydon, OX17 1HB

Further to your email of 10th March, I have checked our records and have spoken to the supervisor responsible for this stretch of waterway and can confirm the following:

- At this location on the Oxford Canal, the Canal and River Trust is not aware of any records of overtopping from or breaches of this section of the waterway.

For further advice on flood risk assessments we have included some generic guidance (see appendix A).

Please note that we are unable to comment on the flood risk to individual properties or developments and interpretation of the information provided in this letter is your responsibility.

I suggest you consult the Environment Agency's website which gives the flood risk associated with the streams and rivers adjacent to the above property.

We trust this reply is satisfactory, however if you do require any further information please do not hesitate to contact the undersigned.

Yours sincerely

E J Kearsy
Principal Water Engineer – South

South East Waterways

Canal & River Trust First Floor North Station House 500 Elder Gate Milton Keynes MK9 1BB

T 0303 040 4040 **E** enquiries.southeast@canalrivertrust.org.uk www.canalrivertrust.org.uk

Patron: H.R.H. The Prince of Wales. Canal & River Trust, a charitable company limited by guarantee registered in England and Wales with company number 7807276 and registered charity number 1146792, registered office address First Floor North, Station House, 500 Elder Gate, Milton Keynes MK9 1BB

Appendix A - Guidance Note for Flood Risk Assessments

The main incidents of uncontrolled loss of water from our waterways are overtopping and breaching as a result of inundation from adjacent water courses, vandalism or structural failure.

The Canal and River Trust maintains water levels using reservoirs, feeders and boreholes, and thereafter manages the water by transferring it within the canal system. The level of the water in canals is normally determined predominantly by the level and size of weirs. Water levels in river navigations are affected by the flow in the river and will fluctuate more widely than canals.

When surface water enters our waterways, the level of the water rises. Eventually the water level will reach a point where it discharges from our waterways through control structures. Where the capacity of these control structures is exceeded, overtopping may result.


Breaches which may lead to flooding can occur on our waterways. There can be a number of causes for these including: culvert collapse, animal burrowing and overtopping. The Canal and River Trust operates a comprehensive asset management system which enables us to manage the risks of such events occurring.

Breaches occur on average at a rate of three per year over the whole of the Trust owned canal network (that's over 2,000 miles of canal).



Appendix: I

GREENFIELD RUNOFF RATES

EAS		Page 1
Unit 108 The Maltings Stanstead Abbotts Hertfordshire SG12 8HG		
Date 13/11/2017 14:32 File	Designed by Maz Checked by	
Micro Drainage	Source Control 2013.1.1	

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	700	Region Number	Region 4

Results l/s

QBAR Rural	4.4
QBAR Urban	4.4
Q100 years	11.3
Q1 year	3.6
Q30 years	8.6
Q100 years	11.3




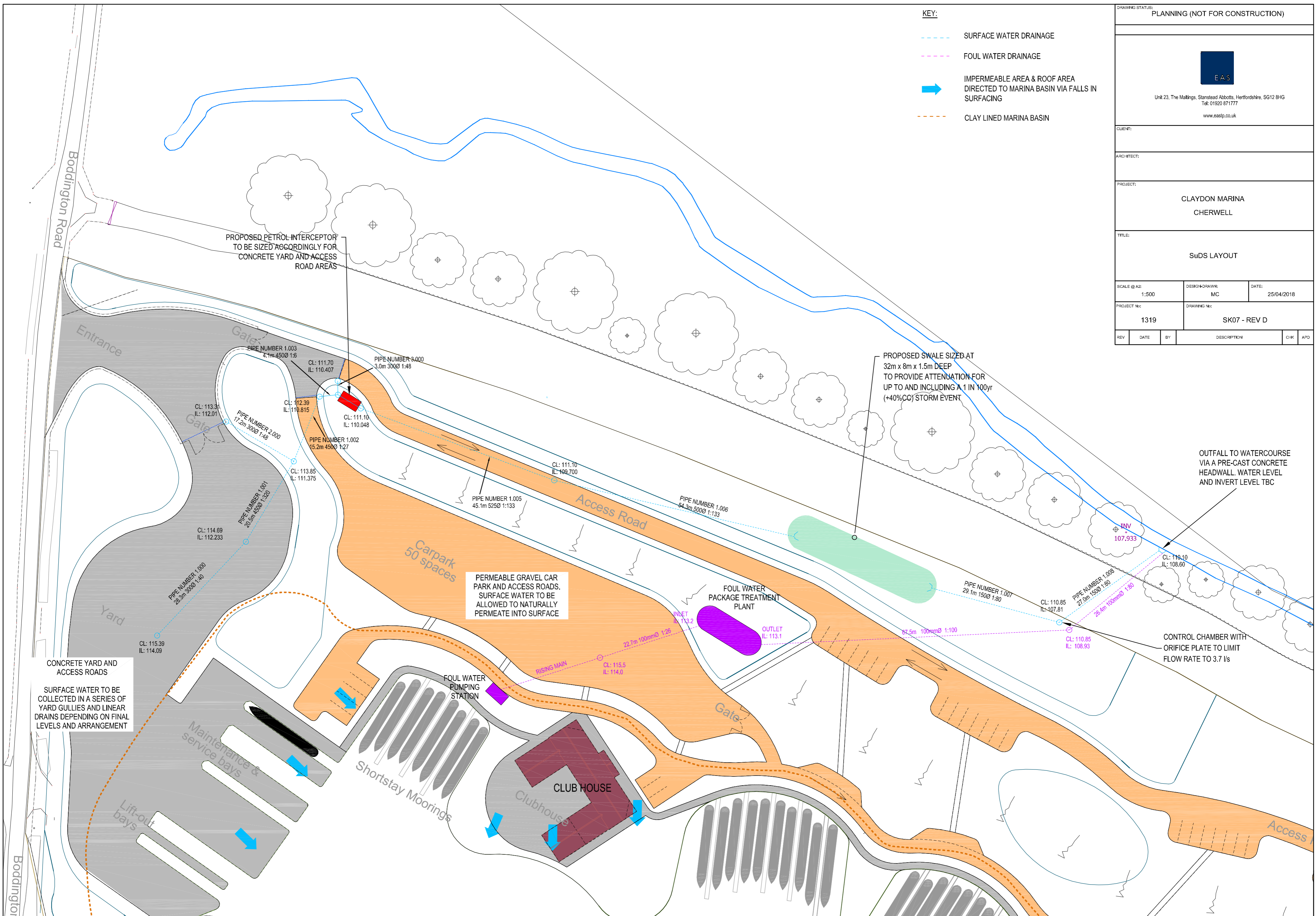
Appendix: J

PROPOSED SuDS LAYOUT

KEY:

- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- IMPERMEABLE AREA & ROOF AREA DIRECTED TO MARINA BASIN VIA FALLS IN SURFACING
- CLAY LINED MARINA BASIN

DRAWING STATUS: PLANNING (NOT FOR CONSTRUCTION)					
 Unit 23, The Mallings, Stanstead Abbots, Hertfordshire, SG12 8HG Tel: 01920 871777 www.easpl.co.uk					
CLIENT:					
ARCHITECT:					
PROJECT: CLAYDON MARINA CHERWELL					
TITLE: SuDS LAYOUT					
SCALE @ A2:	DESIGN-DRAWN:	DATE:			
1:500	MC	25/04/2018			
PROJECT No:	DRAWING No:				
1319	SK07 - REV D				
REV	DATE	BY	DESCRIPTION	CHK	APP



PROPOSED PETROL INTERCEPTOR TO BE SIZED ACCORDINGLY FOR CONCRETE YARD AND ACCESS ROAD AREAS

PROPOSED SWALE SIZED AT 32m x 8m x 1.5m DEEP TO PROVIDE ATTENUATION FOR UP TO AND INCLUDING A 1 IN 100yr (+40%CC) STORM EVENT

OUTFALL TO WATERCOURSE VIA A PRE-CAST CONCRETE HEADWALL. WATER LEVEL AND INVERT LEVEL TBC

PERMEABLE GRAVEL CARPARK AND ACCESS ROADS. SURFACE WATER TO BE ALLOWED TO NATURALLY PERMEATE INTO SURFACE

CONCRETE YARD AND ACCESS ROADS
SURFACE WATER TO BE COLLECTED IN A SERIES OF YARD GULLIES AND LINEAR DRAINS DEPENDING ON FINAL LEVELS AND ARRANGEMENT

CONTROL CHAMBER WITH ORIFICE PLATE TO LIMIT FLOW RATE TO 3.7 l/s

FOUL WATER PUMPING STATION

FOUL WATER PACKAGE TREATMENT PLANT

CLUB HOUSE

Shortstay Moorings

Maintenance & service bays

Lift-out bays

Boddington Road

Boddington

Entrance

Gate

Access Road

Carpark
50 spaces

Gate

Access

Yard

Gate

CL: 115.39
IL: 114.09

CL: 113.31
IL: 112.01

CL: 112.39
IL: 110.815

CL: 111.70
IL: 110.407

CL: 111.10
IL: 110.048

CL: 113.85
IL: 111.375

CL: 111.70
IL: 109.700

CL: 111.30
IL: 109.700

CL: 119.70
IL: 108.60

CL: 110.85
IL: 107.81

CL: 110.85
IL: 108.93

INV
107.933

INLET
IL: 113.2

OUTLET
IL: 113.1

CL: 115.5
IL: 114.0

CL: 110.85
IL: 107.81

CL: 110.85
IL: 108.93

PIPE NUMBER 1.003
4.1m 4500 1:6

PIPE NUMBER 3.000
3.0m 3000 1:48

PIPE NUMBER 2.000
17.2m 3000 1:48

PIPE NUMBER 1.002
15.2m 4500 1:27

PIPE NUMBER 1.005
45.1m 5250 1:133

PIPE NUMBER 1.006
64.3m 5000 1:133

PIPE NUMBER 1.001
20.3m 4500 1:320

PIPE NUMBER 1.000
28.2m 3000 1:40

22.7m 100mmØ 1:26

67.5m 100mmØ 1:100

26.4m 100mmØ 1:80



Appendix: K

WINDES CALCULATIONS

Unit 108 The Maltings
Stanstead Abbotts
Hertfordshire SG12 8HG

Date 10/05/2018 14:22
File SURFACE WATER DR...

Designed by Maz
Checked by



Micro Drainage

Network 2013.1.1

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)
1.000	28.300	0.700	40.4	0.060	5.00	0.0	0.600	o	300
1.001	20.500	0.064	320.3	0.060	0.00	0.0	0.600	o	450
2.000	17.200	0.360	47.8	0.060	4.00	0.0	0.600	o	300
1.002	15.200	0.560	27.1	0.000	0.00	0.0	0.600	o	450
1.003	4.100	0.746	5.5	0.060	0.00	0.0	0.600	o	450
3.000	3.000	0.063	47.6	0.060	4.00	0.0	0.600	o	300
1.004	5.800	0.021	276.2	0.000	0.00	0.0	0.600	o	450
1.005	45.100	0.339	133.0	0.000	0.00	0.0	0.600	o	500
1.006	54.300	0.408	133.0	0.000	0.00	0.0	0.600	o	500
1.007	29.100	0.364	79.9	0.000	0.00	0.0	0.600	o	150
1.008	27.000	0.337	80.1	0.000	0.00	0.0	0.600	o	150

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	114.090	0.060	0.0	2.48	175.3
1.001	112.233	0.120	0.0	1.13	179.8
2.000	112.010	0.060	0.0	2.28	161.2
1.002	111.375	0.180	0.0	3.91	622.5
1.003	110.815	0.240	0.0	8.72	1386.1
3.000	110.407	0.060	0.0	2.28	161.5
1.004	110.069	0.300	0.0	1.22	193.8
1.005	110.048	0.300	0.0	1.88	369.5
1.006	109.709	0.300	0.0	1.88	369.5
1.007	109.301	0.300	0.0	1.13	19.9
1.008	108.937	0.300	0.0	1.12	19.9

Unit 108 The Maltings
 Stanstead Abbotts
 Hertfordshire SG12 8HG



Date 10/05/2018 14:22
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Micro Drainage

Network 2013.1.1

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	300	7	115.390	114.090	1.000	Open Manhole	1200
1.001	o	450	14	114.690	112.233	2.007	Open Manhole	1800
2.000	o	300	15	113.310	112.010	1.000	Open Manhole	1200
1.002	o	450	16	113.850	111.375	2.025	Open Manhole	1800
1.003	o	450	17	112.390	110.815	1.125	Open Manhole	1800
3.000	o	300	18	111.700	110.407	0.993	Open Manhole	1200
1.004	o	450	19	111.700	110.069	1.181	Open Manhole	1800
1.005	o	500	20	111.100	110.048	0.552	Open Manhole	1800
1.006	o	500	21	111.100	109.709	0.891	Open Manhole	1800
1.007	o	150	22	110.800	109.301	1.349	Open Manhole	1050
1.008	o	150	23	110.500	108.937	1.413	Open Manhole	1050

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	28.300	40.4	14	114.690	113.390	1.000	Open Manhole	1800
1.001	20.500	320.3	16	113.850	112.169	1.231	Open Manhole	1800
2.000	17.200	47.8	16	113.850	111.650	1.900	Open Manhole	1800
1.002	15.200	27.1	17	112.390	110.815	1.125	Open Manhole	1800
1.003	4.100	5.5	19	111.700	110.069	1.181	Open Manhole	1800
3.000	3.000	47.6	19	111.700	110.344	1.056	Open Manhole	1800
1.004	5.800	276.2	20	111.100	110.048	0.602	Open Manhole	1800
1.005	45.100	133.0	21	111.100	109.709	0.891	Open Manhole	1800
1.006	54.300	133.0	22	110.800	109.301	0.999	Open Manhole	1050
1.007	29.100	79.9	23	110.500	108.937	1.413	Open Manhole	1050
1.008	27.000	80.1		110.200	108.600	1.450	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	-----------	--------

1.008		110.200	108.600	107.930	0	0
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Unit 108 The Maltings
 Stanstead Abbotts
 Hertfordshire SG12 8HG



Date 10/05/2018 14:22
 File SURFACE WATER DR...

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Micro Drainage

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Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	40.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Storm Duration (mins)	30
Ratio R	0.417		

EAS		Page 4
Unit 108 The Maltings Stanstead Abbotts Hertfordshire SG12 8HG		
Date 10/05/2018 14:22 File SURFACE WATER DR...	Designed by Maz Checked by	
Micro Drainage	Network 2013.1.1	

Online Controls for Storm

Orifice Manhole: 22, DS/PN: 1.007, Volume (m³): 11.7

Diameter (m) 0.038 Discharge Coefficient 0.600 Invert Level (m) 109.301

Unit 108 The Maltings
 Stanstead Abbotts
 Hertfordshire SG12 8HG



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Storage Structures for Storm

Swale Manhole: 22, DS/PN: 1.007

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

Infiltration Coefficient Base (m/hr)	0.00000	Length (m)	32.0
Infiltration Coefficient Side (m/hr)	0.00000	Side Slope (1:X)	2.2
Safety Factor	2.0	Slope (1:X)	1000.0
Porosity	1.00	Cap Volume Depth (m)	0.000
Invert Level (m)	109.300	Cap Infiltration Depth (m)	0.000
Base Width (m)	1.5	Include Swale Volume	Yes

EAS		Page 6
Unit 108 The Maltings Stanstead Abbotts Hertfordshire SG12 8HG		
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Micro Drainage		Network 2013.1.1

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 40.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.417
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 20.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 100
Climate Change (%) 40

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	100	+40%					
1.001	15 Winter	100	+40%					
2.000	15 Winter	100	+40%					
1.002	15 Winter	100	+40%					
1.003	15 Winter	100	+40%					
3.000	480 Winter	100	+40%	100/15 Summer				
1.004	480 Winter	100	+40%	100/15 Summer				
1.005	480 Winter	100	+40%	100/60 Winter				
1.006	480 Winter	100	+40%	100/15 Winter				
1.007	480 Winter	100	+40%	100/15 Summer				
1.008	480 Winter	100	+40%					

PN	US/MH Name	Water		Flooded		Pipe		Status
		Level (m)	Surch'd Depth (m)	Volume (m ³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	
1.000	7	114.210	-0.180	0.000	0.33	0.0	53.0	OK
1.001	14	112.526	-0.157	0.000	0.74	0.0	108.4	OK
2.000	15	112.144	-0.166	0.000	0.41	0.0	56.7	OK
1.002	16	111.571	-0.254	0.000	0.39	0.0	164.5	OK
1.003	17	111.029	-0.236	0.000	0.45	0.0	220.3	OK
3.000	18	110.784	0.077	0.000	0.09	0.0	5.6	SURCHARGED
1.004	19	110.784	0.265	0.000	0.24	0.0	27.8	SURCHARGED
1.005	20	110.783	0.235	0.000	0.08	0.0	27.3	SURCHARGED

Unit 108 The Maltings
 Stanstead Abbotts
 Hertfordshire SG12 8HG



Date 10/05/2018 14:22
 File SURFACE WATER DR...

Designed by Maz
 Checked by

Micro Drainage

Network 2013.1.1

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water		Flooded			Pipe		Status
		Level (m)	Surch'ed Depth (m)	Volume (m ³)	Flow / Cap.	O'flow (1/s)	Flow (1/s)		
1.006	21	110.782	0.573	0.000	0.08	0.0	25.5	SURCHARGED	
1.007	22	110.781	1.330	0.000	0.19	0.0	3.6	FLOOD RISK	
1.008	23	108.981	-0.106	0.000	0.19	0.0	3.6	OK	