WH179

August 2022

Anglia Square, Norwich

Proposed Surface Water Drainage Strategy Addendum Letter

Weston Homes

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4th August 2022

Dear Jack,

Anglia Square, Norwich, Norfolk : Hybrid (Part Full/Part Outline) Application (Ref. 22/00434/F) for comprehensive redevelopment of Anglia Square

This Addendum letter report has been prepared to be read in conjunction with the submitted Flood Risk Assessment RevA (FRA) and Proposed Surface Water Drainage Strategy RevA (SWDS) reports. It addresses outstanding comments received from the Lead Local Flood Authority Consultee regarding Brownfield Run-off Calculations and Carbon Impact Assessment relating to the proposed surface water drainage pumping stations proposed at the development site as follows:

2.1 The assessment of the greenfield and brownfield runoff rates and volumes are required to be calculated accurately using the FEH in accordance with the LLFA Developer Guidance requirements and presented clearly and consistently within technical reports.

2.4.3 Provide a current set of DG5 records from Anglian Water.

2.13 Undertake further assessment and consideration of the carbon impact of additional pumps operating on this site is recommended in accordance with Policy E8 of the Local Flood Risk Management Plan.

In response to point 2.1

The brownfield runoff rates calculated for the previously submitted FRA and SWDS report were based on FSR rainfall data applied to the Modified Rational Method. The rainfall intensity was taken from a modelled storm event using Windes Microdrainage and selecting the peak rainfall intensity for each storm event, 1:1yr, 1:30yr and 1:100yr. These runoff rates were presented to Anglian Water, who did not comment on the FSR rainfall data and the Modified Rational Method used to calculate the runoff rates. Anglian Water reviewed the data and stated that a maximum discharge rate of 242 l/s would be acceptable, which was based on 1:1yr storm event. The impermeable area used during the original calculations and discussions with Anglian Water have since been disputed by the Lead Local Flood Authority, who consider that some permeable areas should have been counted as impermeable – see below:

The LLFA reviewed the sewer catchments defined in Appendix F that support the calculations, the LLFA considers the assessment of the catchments is not suitable for use. For example, an above ground spoil heap is considered to be a permeable area, yet there is no assessment of what surface that spoil heap is sited on. A quick review of the Google Streetview maps indicates the spoil heap appears to have a high amount of rubble and demolition waste that is positioned right at the edge of the public pedestrian footway. As there is no positive drainage, the runoff from that spoil heap is likely to discharge to both the existing highway drainage within the carriageway alongside the road and the existing car parking area on the site. Therefore, it is not appropriate to consider this an undrained greenfield area. The next most significant area of greenfield landscaping is between the southern side of the Anglian Square complex and St Crispins Road. This greenfield area has a couple of slopes that direct surface water towards either the private access road (Cherry Lane) or towards the supporting wall of the flyover before being directed to the area of positive drainage under the flyover at Cherry Lane. Therefore again, while this area is green with some visible permeability in low significant rainfall events, it would likely discharge the surface water into the adjoining positive drainage system. The same principles could be easily applied to all the other areas marked up in green on the catchment plan in Appendix F. Therefore, the LLFA would disagree with the accuracy and use of this assessment. Again, further clarification on the brownfield runoff rates and the approach applied is required by the LLFA.

The sewer catchments in Appendix F of the previously submitted SWDS report have therefore been reassessed and the existing impermeable area draining to adopted sewers has been calculated as 3.918ha. See **Appendix A** of this letter which also shows existing drainage pipe sizes, cover and invert levels.

In the Annex to the comments from the Lead Local Flood Authority dated 26th May 2022, the LLFA state that FEH methods should be used in accordance with the LLFA Developer Guidance.

Section 24.5 in CIRIA SuDS Manual C753 discusses Peak Run-of Rates for Previously Developed Sites:

Runoff characteristics for a previously developed site can be estimated in a number of ways:

1 Any land that has been previously developed is likely to have had a system in place to drain surface water runoff from the site. This drainage system may or may not have included storage and flow control systems. Where any drainage system is still operational, peak flow rates at the outfall for the relevant return periods (usually 1:1 year, 1:30 year and 1:100 year) can be demonstrated by producing a simulation model that includes an accurate representation of the drainage system and site area contributions – thus allowing derivation of an appropriate head–discharge relationship at the outfall.

It is recognised that existing drainage systems will probably be overwhelmed for the 1:30 and 1:100 year events and therefore the actual rate of discharge from the site in such scenarios is likely to be increased by overland flow contributions or surcharging. However, these effects should not be accounted for, and the discharge limit should be based solely on the flow rate from the piped system (thus providing a conservative estimate).

As the topographical survey contains details of the existing drainage system, it is possible to produce a simulation model that includes an accurate representation of the drainage system and site area contributions – thus allowing derivation of an appropriate head-discharge relationship at the outfall.

SK03-B in **Appendix A** shows the existing drainage systems serving the site and their catchment areas. The site is split into 8no. catchments Areas. It is not possible to model a 1:1yr storm event with FEH data therefore, to ascertain what the equivalent 1:1yr outfall rate would be for an FEH storm, it is deemed appropriate to apply a percentage to the FEH calculated runoff.

This percentage shall be based on runoff rates for a 1:1yr and 1:2yr storm event generated using FSR rainfall data.

Example:

A FSR 1:1yr storm runoff is 20 l/s

A FSR 1:2yr storm runoff is 25 l/s

20 / 25 = 0.8

As such, the 1:1yr runoff rate is 80% of the 1:2yr runoff rate

If the FEH 1:2yr storm runoff is 23 l/s – the 1:1yr equivalent is 18.4 l/s.

WINDES Microdrainage was used to model each existing catchment using FEH data for a range of storm events. As described above, FSR data was used to generate runoff rates for 1:1yr and 1:2yr storm events as a means to calculate a 1:1yr FEH equivalent. The hydraulic model results are contained in **Appendix B** and are summarised below:

	Contributing Area (ha)	1:2 FEH	1:1 FSR	1:2 FSR	% 1:1 to 1:2 FSR	1:1 FEH Equivalent	1:30 FEH	1:100yr FEH
Area 1	0.239	32.3	29.1	33.6	86.6	27.97	56.5	60.3
Area 2	0.125	22.6	18.8	24.2	76.7	17.55	42.4	50.8
Area 3	0.170	26.6	22.1	28.4	77.8	20.70	63.8	80.7
Area 4	0.352	54.0	45.4	57.7	78.7	42.49	116.8	136.6
Area 5	0.251	40.0	33.1	42.9	77.2	30.86	108.5	139.7
Area 6	0.105	14.7	12.6	15.5	81.3	11.95	29.1	33.5
Area 7	1.197	170.9	143.1	182.4	78.5	134.07	394.3	478.8
Area 8	1.479	186.5	160.6	196.3	81.8	152.6	378.2	458.4
Total	3.918	**547.6**	**464.8**	**581.0**		**438.19**	**1189.6**	**1438.8**

The above table demonstrates that, using FEH Methods, the 1:1yr Brownfield Runoff Rate, draining to adopted sewers is **438.2 l/s.**

As discussed above, using alternative methods and based on a smaller impermeable area which was disputed by the LLFA, Anglian Water have confirmed acceptance of a maximum 242 l/s discharge rate for the proposed development site and assessed that their drainage network has adequate capacity to accept these flows.

The Anglian Water agreed 242 l/s is lower than the reassessed 1:1yr brownfield runoff rate of 438.2 l/s and as such the proposals allow for a reduced outfall to the calculated 1:1yr brownfield runoff rate.

The above assessment provides brownfield runoff rates using FEH methods in response to point 2.1 raised by the LLFA and shows that the proposals shall result in reduced peak runoff rates from the site for all storm events.

To clarify, the existing Brownfield Run-off Rate for the site in a 1:100yr storm is calculated as 1438.8 l/s. The proposed drainage strategy restricts run-off for a 1:100yr + 40% Climate Change Event to a maximum 242 l/s. It is clear that the proposals provide a significant betterment to the existing situation.

In response to point 2.4.3

Anglian Water were contacted to provide evidence of sewer flooding within the vicinity of the site. Due to data protection they were not able to provide information based on the postcode NR3, however have confirmed there were no records of flooding for foul water of surface water sewers. See email from Anglian Water contained in **Appendix C**.

In response to point 2.13

The following statement has been prepared in response to this comment:

In accordance with Policy E8 “Towards Net Zero” we have considered how the carbon emissions can be minimised for the drainage systems associated with the proposed development.

The primary objective of the design is for the systems to operate under gravity, thereby avoiding the need for pumps which generate carbon emissions from their operation.

Wherever possible and where cover and invert levels of receiving adopted sewers allow, surface water runoff from the development site is attenuated and restricted using gravity-type flow control devices, such as hydrobrakes or orifice plates.

Where the proposed drainage and storage devices cannot be shallower than the adopted sewer network, due to cover levels, length of drainage network, attenuation volumes and spatial constraints, it is necessary to pump restricted flows.

The use of surface water pumping stations to serve some catchments within the development site is unavoidable though is only proposed where necessary.

For the Full Planning Application areas (Blocks A, B, C, D, M, K/L and J3), the surface water drainage strategy has been developed to drain catchments by gravity wherever possible. Block B and Botolph Street catchments are drained into the adopted sewer network via a gravity Hydrobrake type device. Block D, Block C and Block A, M, K/l and J3 catchments will rely on a pumped outfall (3no. surface water pumps). The pump specifications for these three catchments is contained in **Appendix D**.

For the Outline Planning Application areas (Blocks E, F, H, G and J) there may be scope at a later design stage to reduce the areas flowing to pumping stations by splitting catchment areas into smaller areas, whereby some may be able to drain via gravity, however at this stage it is considered conservative to allow for these 4no. pumping stations.

Where pumps are necessary, their operational carbon emissions will be minimised through the following measures;-

- Minimised peak flow rate through attenuation and flow control devices to reduce the size of the pumps and hence their power demand.
- Pumps selected to maximise efficiency at the design duty to lower energy demand
- Pump operation controlled on levels within the chamber to ensure they only operate when required
- Appropriate electrical metering and links to the development control systems to allow monitoring of energy use.
- Regular cleaning and servicing to ensure the pumps are operating as efficiently as possible

The above Addendum letter report provides the remaining additional information in response to comments received from the LLFA and should be read in conjunction with Flood Risk Assessment RevA and Proposed Surface Water Drainage Strategy RevA reports.

If you have any questions or would like to discuss further, please do not hesitate to contact me on the number 01920 871777.

Yours Sincerely

Marianna Dyason

Associate Director

Appendix A

AREAS OF ADOPTED PUBLIC HIGHWAY: NOT INCLUDED IN THESE CALCULATIONS

AREA OF PERMEABLE SURFACE OR LANDSCAPING IT IS EXPECTED THAT SOME GREEN–FIELD RUNOFF WOULD OCCUR HOWEVER THESE RATES D SHALL NOT BE INCLUDED IN EXISTING RUN–OFF CALCULATIONS TO BE CONSERVATIVE.

AREA OF CAR PARK WHICH DRAINS TO PRIVATE DRAINAGE SYSTEM AND NOT INTO ANGLIAN WATER SEWERS.

AREA OF IMPERMEABLE SURFACE THAT DRAINS SURFACE WATER RUN–OFF TO EXISTING ANGLIAN WATER SURFACE WATER SEWERS (39,180m²)

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: FOR INFORMATION

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

CLIENT: WESTON HOMES

ARCHITECT:

PROJECT: ANGLIA SQUARE, NORWICH

TITLE: EXISTING IMPERMEABLE AREAS WHICH DRAIN SURFACE WATER TO ANGLIAN WATER SURFACE WATER SEWERS

SCALE @ A1:	DESIGN–DRAWN:	DATE:
1:500	MD	06.04.2017
PROJECT No: 3831	DRAWING No: SK01–B	

Appendix B

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.228	4-8	0.011

Total Area Contributing (ha) = 0.239

Total Pipe Volume (m³) = 2.073

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)	Section Type
1.000	23.300	0.291	80.1	0.040	3.00	0.0	0.600	o	150	Pipe/Conduit
1.001	21.000	0.292	71.9	0.040	0.00	0.0	0.600	o	150	Pipe/Conduit
2.000	18.000	0.225	80.0	0.040	3.00	0.0	0.600	o	150	Pipe/Conduit
2.001	22.000	0.275	80.0	0.040	0.00	0.0	0.600	o	150	Pipe/Conduit
3.000	23.000	0.287	80.1	0.040	3.00	0.0	0.600	o	150	Pipe/Conduit
1.002	10.000	0.125	80.0	0.039	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	4.545	0.040	0.0	1.12	19.9
1.001	4.254	0.080	0.0	1.19	21.0
2.000	4.492	0.040	0.0	1.12	19.9
2.001	4.267	0.080	0.0	1.12	19.9
3.000	4.249	0.040	0.0	1.12	19.9
1.002	3.887	0.239	0.0	1.12	19.9

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	5.510	0.965	Open Manhole	1200	1.000	4.545	150				
mh2	5.510	1.256	Open Manhole	1200	1.001	4.254	150	1.000	4.254	150	
mh3	5.510	1.018	Open Manhole	1200	2.000	4.492	150				
mh4	5.510	1.243	Open Manhole	1200	2.001	4.267	150	2.000	4.267	150	
mh5	5.510	1.261	Open Manhole	1200	3.000	4.249	150				
mh6	5.500	1.613	Open Manhole	1200	1.002	3.887	150	1.001	3.962	150	75
								2.001	3.992	150	105
								3.000	3.962	150	75
	5.500	1.738	Open Manhole	0		OUTFALL		1.002	3.762	150	

No coordinates have been specified, layout information cannot be produced.

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	150	mh1	5.510	4.545	0.815	Open Manhole	1200
1.001	o	150	mh2	5.510	4.254	1.106	Open Manhole	1200
2.000	o	150	mh3	5.510	4.492	0.868	Open Manhole	1200
2.001	o	150	mh4	5.510	4.267	1.093	Open Manhole	1200
3.000	o	150	mh5	5.510	4.249	1.111	Open Manhole	1200
1.002	o	150	mh6	5.500	3.887	1.463	Open Manhole	1200

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	23.300	80.1	mh2	5.510	4.254	1.106	Open Manhole	1200
1.001	21.000	71.9	mh6	5.500	3.962	1.388	Open Manhole	1200
2.000	18.000	80.0	mh4	5.510	4.267	1.093	Open Manhole	1200
2.001	22.000	80.0	mh6	5.500	3.992	1.358	Open Manhole	1200
3.000	23.000	80.1	mh6	5.500	3.962	1.388	Open Manhole	1200
1.002	10.000	80.0		5.500	3.762	1.588	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					4.615
1.001	mh2	15 Winter	2	+0%	2/15 Winter				4.417
2.000	mh3	15 Summer	2	+0%					4.563
2.001	mh4	15 Summer	2	+0%	2/15 Winter				4.401
3.000	mh5	15 Summer	2	+0%					4.340
1.002	mh6	15 Winter	2	+0%	2/15 Summer				4.326

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.080	0.000	0.41			7.8	OK	
1.001	mh2	0.013	0.000	0.60			11.9	SURCHARGED	
2.000	mh3	-0.079	0.000	0.42			7.9	OK	
2.001	mh4	-0.016	0.000	0.64			12.0	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	mh5	-0.059	0.000	0.41			7.8	OK	
1.002	mh6	0.289	0.000	1.83			32.3	SURCHARGED	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.405
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					4.608
1.001	mh2	15 Summer	1	+0%					4.335
2.000	mh3	15 Summer	1	+0%					4.556
2.001	mh4	15 Summer	1	+0%					4.351
3.000	mh5	15 Summer	1	+0%					4.312
1.002	mh6	15 Winter	1	+0%	1/15 Summer				4.251

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.087	0.000	0.34			6.5	OK	
1.001	mh2	-0.069	0.000	0.56			11.1	OK	
2.000	mh3	-0.086	0.000	0.35			6.5	OK	
2.001	mh4	-0.066	0.000	0.59			11.1	OK	
3.000	mh5	-0.087	0.000	0.34			6.5	OK	
1.002	mh6	0.214	0.000	1.64			29.1	SURCHARGED	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.405
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					4.618
1.001	mh2	15 Summer	2	+0%	2/15 Summer				4.435
2.000	mh3	15 Summer	2	+0%					4.566
2.001	mh4	15 Summer	2	+0%	2/15 Summer				4.437
3.000	mh5	15 Summer	2	+0%					4.367
1.002	mh6	15 Winter	2	+0%	2/15 Summer				4.358

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.077	0.000	0.44			8.4	OK	
1.001	mh2	0.031	0.000	0.63			12.4	SURCHARGED	
2.000	mh3	-0.076	0.000	0.45			8.4	OK	
2.001	mh4	0.020	0.000	0.67			12.5	SURCHARGED	
3.000	mh5	-0.032	0.000	0.44			8.3	OK	
1.002	mh6	0.321	0.000	1.90			33.6	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	30	+0%	30/15 Summer				5.385
1.001	mh2	15 Winter	30	+0%	30/15 Summer				5.438
2.000	mh3	15 Summer	30	+0%	30/15 Summer				5.386
2.001	mh4	15 Winter	30	+0%	30/15 Summer				5.449
3.000	mh5	15 Winter	30	+0%	30/15 Summer				5.259
1.002	mh6	15 Winter	30	+0%	30/15 Summer				5.189

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.690	0.000	0.63			11.9	FLOOD RISK	
1.001	mh2	1.034	0.000	0.94			18.6	FLOOD RISK	
2.000	mh3	0.744	0.000	0.62			11.5	FLOOD RISK	
2.001	mh4	1.032	0.000	0.99			18.7	FLOOD RISK	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
3.000	mh5	0.860	0.000	0.52			9.8	FLOOD RISK	
1.002	mh6	1.152	0.000	3.19			56.5	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	mh1	15 Winter	100	+0%	100/15 Summer	100/15 Winter		
1.001	mh2	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
2.000	mh3	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
2.001	mh4	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
3.000	mh5	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
1.002	mh6	15 Winter	100	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	mh1	5.512	0.817	1.827	1.00			18.8	FLOOD
1.001	mh2	5.511	1.107	0.755	1.08			21.4	FLOOD
2.000	mh3	5.513	0.871	3.364	1.02			18.9	FLOOD
2.001	mh4	5.511	1.094	0.813	1.18			22.2	FLOOD

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.000	mh5	5.510	1.111	0.375	0.79			14.8	FLOOD
1.002	mh6	5.385	1.348	0.000	3.41			60.3	FLOOD RISK

PN	US/MH Name	Level Exceeded
1.000	mh1	1
1.001	mh2	4
2.000	mh3	4
2.001	mh4	4
3.000	mh5	2
1.002	mh6	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.124	4-8	0.001

Total Area Contributing (ha) = 0.125

Total Pipe Volume (m³) = 0.725

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)	Section Type
1.000	19.000	0.320	59.4	0.042	3.00	0.0	0.600	o	150	Pipe/Conduit
2.000	12.000	0.380	31.6	0.042	3.00	0.0	0.600	o	150	Pipe/Conduit
1.001	10.000	0.250	40.0	0.041	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	3.220	0.042	0.0	1.31	23.1
2.000	3.280	0.042	0.0	1.80	31.8
1.001	2.900	0.125	0.0	1.60	28.2

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	4.060	0.840	Open Manhole	1200	1.000	3.220	150				
mh2	3.980	0.700	Open Manhole	1200	2.000	3.280	150				
mh3	4.000	1.100	Open Manhole	1200	1.001	2.900	150	1.000	2.900	150	
								2.000	2.900	150	
	5.500	2.850	Open Manhole	0		OUTFALL		1.001	2.650	150	

No coordinates have been specified, layout information cannot be produced.

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	150	mh1	4.060	3.220	0.690	Open Manhole	1200
2.000	o	150	mh2	3.980	3.280	0.550	Open Manhole	1200
1.001	o	150	mh3	4.000	2.900	0.950	Open Manhole	1200

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	19.000	59.4	mh3	4.000	2.900	0.950	Open Manhole	1200
2.000	12.000	31.6	mh3	4.000	2.900	0.950	Open Manhole	1200
1.001	10.000	40.0		5.500	2.650	2.700	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.287
2.000	mh2	15 Summer	2	+0%					3.337
1.001	mh3	15 Summer	2	+0%					3.013

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.083	0.000	0.39			8.5	OK	
2.000	mh2	-0.093	0.000	0.29			8.5	OK	
1.001	mh3	-0.037	0.000	0.90			22.6	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.406
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					3.280
2.000	mh2	15 Summer	1	+0%					3.331
1.001	mh3	15 Summer	1	+0%					2.999

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.090	0.000	0.32			7.0	OK	
2.000	mh2	-0.099	0.000	0.24			7.0	OK	
1.001	mh3	-0.051	0.000	0.75			18.8	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.406
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.289
2.000	mh2	15 Summer	2	+0%					3.339
1.001	mh3	15 Summer	2	+0%					3.019

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.081	0.000	0.42			9.1	OK	
2.000	mh2	-0.091	0.000	0.32			9.1	OK	
1.001	mh3	-0.031	0.000	0.96			24.2	OK	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Winter	30	+0%	30/15 Summer				3.649
2.000	mh2	15 Summer	30	+0%	30/15 Summer				3.605
1.001	mh3	15 Winter	30	+0%	30/15 Summer				3.512

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.279	0.000	0.64			13.8	SURCHARGED	
2.000	mh2	0.175	0.000	0.53			15.2	SURCHARGED	
1.001	mh3	0.462	0.000	1.69			42.4	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Winter	100	+0%	100/15 Summer				4.012
2.000	mh2	15 Winter	100	+0%	100/15 Summer				3.950
1.001	mh3	15 Winter	100	+0%	100/15 Summer				3.829

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.642	0.000	0.76			16.5	FLOOD RISK	
2.000	mh2	0.520	0.000	0.56			16.2	FLOOD RISK	
1.001	mh3	0.779	0.000	2.02			50.8	FLOOD RISK	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.158	4-8	0.012

Total Area Contributing (ha) = 0.170

Total Pipe Volume (m³) = 2.318

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)	Section Type
1.000	25.600	0.256	100.0	0.085	3.00	0.0	0.600	o	225	Pipe/Conduit
1.001	32.700	0.000	0.0	0.085	0.00	0.0	0.600	o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	3.156	0.085	0.0	1.31	52.0
1.001	2.900	0.170	0.0	0.00	0.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	5.000	1.844	Open Manhole	1200	1.000	3.156	225				
mh2	5.000	2.100	Open Manhole	1200	1.001	2.900	225	1.000	2.900	225	
	5.500	2.600	Open Manhole	0		OUTFALL		1.001	2.900	225	

No coordinates have been specified, layout information cannot be produced.

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	225	mh1	5.000	3.156	1.619	Open Manhole	1200
1.001	o	225	mh2	5.000	2.900	1.875	Open Manhole	1200

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	25.600	100.0	mh2	5.000	2.900	1.875	Open Manhole	1200
1.001	32.700	0.0		5.500	2.900	2.375	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.256
1.001	mh2	15 Winter	2	+0%	2/15 Summer				3.221

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.125	0.000	0.35			16.7	OK	
1.001	mh2	0.096	0.000	2.17			26.6	SURCHARGED	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					3.241
1.001	mh2	15 Winter	1	+0%	1/15 Summer				3.189

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.140	0.000	0.29			13.9	OK	
1.001	mh2	0.064	0.000	1.81			22.1	SURCHARGED	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.273
1.001	mh2	15 Winter	2	+0%	2/15 Summer				3.235

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.108	0.000	0.37			17.7	OK	
1.001	mh2	0.110	0.000	2.31			28.4	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	30	+0%	30/15 Summer				3.868
1.001	mh2	15 Winter	30	+0%	30/15 Summer				3.739

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.487	0.000	0.68			32.7	SURCHARGED	
1.001	mh2	0.614	0.000	5.21			63.8	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	100	+0%	100/15 Summer				4.307
1.001	mh2	15 Winter	100	+0%	100/15 Summer				4.111

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.926	0.000	0.85			40.7	SURCHARGED	
1.001	mh2	0.986	0.000	6.59			80.7	SURCHARGED	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.326	4-8	0.026

Total Area Contributing (ha) = 0.352

Total Pipe Volume (m³) = 3.660

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)	Section Type
1.000	8.700	0.200	43.5	0.058	3.00	0.0	0.600	o	150	Pipe/Conduit
1.001	10.300	0.140	73.6	0.059	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	40.500	0.690	58.7	0.088	0.00	0.0	0.600	o	225	Pipe/Conduit
2.000	35.000	0.380	92.1	0.059	3.00	0.0	0.600	o	150	Pipe/Conduit
1.003	15.500	0.155	100.0	0.088	0.00	0.0	0.600	o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	3.120	0.058	0.0	1.53	27.0
1.001	2.920	0.117	0.0	1.17	20.7
1.002	2.780	0.205	0.0	1.71	68.0
2.000	2.470	0.059	0.0	1.05	18.5
1.003	2.090	0.352	0.0	1.57	111.1

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	3.800	0.680	Open Manhole	1200	1.000	3.120	150				
mh2	3.920	1.000	Open Manhole	1200	1.001	2.920	150	1.000	2.920	150	
mh3	3.300	0.520	Open Manhole	1200	1.002	2.780	225	1.001	2.780	150	
mh4	3.640	1.170	Open Manhole	1200	2.000	2.470	150				
mh5	3.300	1.210	Open Manhole	1200	1.003	2.090	300	1.002	2.090	225	
								2.000	2.090	150	
	5.500	3.565	Open Manhole	0		OUTFALL		1.003	1.935	300	

No coordinates have been specified, layout information cannot be produced.

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	150	mh1	3.800	3.120	0.530	Open Manhole	1200
1.001	o	150	mh2	3.920	2.920	0.850	Open Manhole	1200
1.002	o	225	mh3	3.300	2.780	0.295	Open Manhole	1200
2.000	o	150	mh4	3.640	2.470	1.020	Open Manhole	1200
1.003	o	300	mh5	3.300	2.090	0.910	Open Manhole	1200

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	8.700	43.5	mh2	3.920	2.920	0.850	Open Manhole	1200
1.001	10.300	73.6	mh3	3.300	2.780	0.370	Open Manhole	1200
1.002	40.500	58.7	mh5	3.300	2.090	0.985	Open Manhole	1200
2.000	35.000	92.1	mh5	3.300	2.090	1.060	Open Manhole	1200
1.003	15.500	100.0		5.500	1.935	3.265	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.197
1.001	mh2	15 Summer	2	+0%					3.070
1.002	mh3	15 Winter	2	+0%					2.890
2.000	mh4	15 Summer	2	+0%					2.562
1.003	mh5	15 Winter	2	+0%					2.255

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.073	0.000	0.49			11.7	OK	
1.001	mh2	0.000	0.000	1.01			18.7	OK	
1.002	mh3	-0.115	0.000	0.48			31.0	OK	
2.000	mh4	-0.058	0.000	0.65			11.5	OK	
1.003	mh5	-0.135	0.000	0.58			54.0	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.405
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					3.189
1.001	mh2	15 Summer	1	+0%					3.031
1.002	mh3	15 Winter	1	+0%					2.880
2.000	mh4	15 Summer	1	+0%					2.552
1.003	mh5	15 Winter	1	+0%					2.239

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.081	0.000	0.41			9.7	OK	
1.001	mh2	-0.039	0.000	0.89			16.4	OK	
1.002	mh3	-0.125	0.000	0.41			26.2	OK	
2.000	mh4	-0.068	0.000	0.54			9.6	OK	
1.003	mh5	-0.151	0.000	0.49			45.4	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.405
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.200
1.001	mh2	15 Summer	2	+0%	2/15 Summer				3.091
1.002	mh3	15 Winter	2	+0%					2.896
2.000	mh4	15 Summer	2	+0%					2.567
1.003	mh5	15 Winter	2	+0%					2.262

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.070	0.000	0.53			12.5	OK	
1.001	mh2	0.021	0.000	1.08			20.0	SURCHARGED	
1.002	mh3	-0.109	0.000	0.52			33.4	OK	
2.000	mh4	-0.053	0.000	0.69			12.4	OK	
1.003	mh5	-0.128	0.000	0.62			57.7	OK	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Winter	30	+0%	30/15 Summer				3.777
1.001	mh2	15 Winter	30	+0%	30/15 Summer				3.684
1.002	mh3	15 Winter	30	+0%	30/15 Summer				3.161
2.000	mh4	15 Summer	30	+0%	30/15 Summer				3.041
1.003	mh5	15 Winter	30	+0%	30/15 Summer				2.466

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.507	0.000	0.71			16.8	FLOOD RISK	
1.001	mh2	0.614	0.000	1.92			35.6	FLOOD RISK	
1.002	mh3	0.156	0.000	1.00			64.7	FLOOD RISK	
2.000	mh4	0.421	0.000	1.19			21.2	SURCHARGED	
1.003	mh5	0.076	0.000	1.25			116.8	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	mh1	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
1.001	mh2	30 Summer	100	+0%	100/15 Summer			
1.002	mh3	15 Winter	100	+0%	100/15 Summer	100/15 Summer		
2.000	mh4	15 Winter	100	+0%	100/15 Summer			
1.003	mh5	15 Winter	100	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	mh1	3.804	0.534	3.547	1.25			29.7	FLOOD
1.001	mh2	3.774	0.704	0.000	2.00			37.1	FLOOD RISK
1.002	mh3	3.301	0.296	1.182	1.09			70.4	FLOOD
2.000	mh4	3.423	0.803	0.000	1.47			26.3	FLOOD RISK
1.003	mh5	2.562	0.172	0.000	1.46			136.6	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Level Exceeded
1.000	mh1	4
1.001	mh2	
1.002	mh3	2
2.000	mh4	
1.003	mh5	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.244	4-8	0.007

Total Area Contributing (ha) = 0.251

Total Pipe Volume (m³) = 17.670

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)	Section Type
1.000	34.000	0.340	100.0	0.083	3.00	0.0	0.600	o	225	Pipe/Conduit
1.001	25.600	1.100	23.3	0.084	0.00	0.0	0.600	o	675	Pipe/Conduit
1.002	20.000	0.200	100.0	0.084	0.00	0.0	0.600	o	675	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	1.930	0.083	0.0	1.31	52.0
1.001	1.140	0.167	0.0	5.45	1949.3
1.002	0.040	0.251	0.0	2.62	938.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	3.910	1.980	Open Manhole	1200	1.000	1.930	225				
mh2	3.740	2.600	Open Manhole	1800	1.001	1.140	675	1.000	1.590	225	
mh3	3.350	3.310	Open Manhole	1800	1.002	0.040	675	1.001	0.040	675	
	5.500	5.660	Open Manhole	0		OUTFALL		1.002	-0.160	675	

No coordinates have been specified, layout information cannot be produced.

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	225	mh1	3.910	1.930	1.755	Open Manhole	1200
1.001	o	675	mh2	3.740	1.140	1.925	Open Manhole	1800
1.002	o	675	mh3	3.350	0.040	2.635	Open Manhole	1800

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	34.000	100.0	mh2	3.740	1.590	1.925	Open Manhole	1800
1.001	25.600	23.3	mh3	3.350	0.040	2.635	Open Manhole	1800
1.002	20.000	100.0		5.500	-0.160	4.985	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					2.023
1.001	mh2	15 Summer	2	+0%					1.208
1.002	mh3	15 Summer	2	+0%					0.156

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.132	0.000	0.34			16.4	OK	
1.001	mh2	-0.607	0.000	0.02			28.5	OK	
1.002	mh3	-0.559	0.000	0.07			40.0	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.407
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					2.013
1.001	mh2	15 Summer	1	+0%					1.198
1.002	mh3	15 Summer	1	+0%					0.144

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.142	0.000	0.28			13.6	OK	
1.001	mh2	-0.617	0.000	0.02			23.7	OK	
1.002	mh3	-0.571	0.000	0.06			33.1	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.407
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					2.026
1.001	mh2	15 Summer	2	+0%					1.210
1.002	mh3	15 Summer	2	+0%					0.162

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.129	0.000	0.36			17.6	OK	
1.001	mh2	-0.605	0.000	0.02			30.4	OK	
1.002	mh3	-0.553	0.000	0.08			42.9	OK	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	30	+0%					2.085
1.001	mh2	15 Summer	30	+0%					1.243
1.002	mh3	15 Summer	30	+0%					0.240

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.070	0.000	0.76			37.4	OK	
1.001	mh2	-0.572	0.000	0.05			73.1	OK	
1.002	mh3	-0.475	0.000	0.19			108.5	OK	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	100	+0%	100/15 Summer				2.172
1.001	mh2	15 Summer	100	+0%					1.257
1.002	mh3	15 Summer	100	+0%					0.266

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.017	0.000	1.01			49.6	SURCHARGED	
1.001	mh2	-0.558	0.000	0.07			94.8	OK	
1.002	mh3	-0.449	0.000	0.25			139.7	OK	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.089	4-8	0.016

Total Area Contributing (ha) = 0.105

Total Pipe Volume (m^3) = 1.122

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)	Section Type
1.000	16.200	0.250	64.8	0.035	3.00	0.0	0.600	o	150	Pipe/Conduit
1.001	27.300	0.170	160.6	0.035	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	20.000	0.100	200.0	0.035	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	2.810	0.035	0.0	1.25	22.1
1.001	2.560	0.070	0.0	0.79	14.0
1.002	2.390	0.105	0.0	0.71	12.5

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	3.500	0.690	Open Manhole	1200	1.000	2.810	150				
mh2	3.560	1.000	Open Manhole	1200	1.001	2.560	150	1.000	2.560	150	
mh3	3.730	1.340	Open Manhole	1200	1.002	2.390	150	1.001	2.390	150	
	5.500	3.210	Open Manhole	0		OUTFALL		1.002	2.290	150	

No coordinates have been specified, layout information cannot be produced.

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	150	mh1	3.500	2.810	0.540	Open Manhole	1200
1.001	o	150	mh2	3.560	2.560	0.850	Open Manhole	1200
1.002	o	150	mh3	3.730	2.390	1.190	Open Manhole	1200

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	16.200	64.8	mh2	3.560	2.560	0.850	Open Manhole	1200
1.001	27.300	160.6	mh3	3.730	2.390	1.190	Open Manhole	1200
1.002	20.000	200.0		5.500	2.290	3.060	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					2.872
1.001	mh2	15 Summer	2	+0%					2.680
1.002	mh3	15 Winter	2	+0%	2/15 Summer				2.592

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.088	0.000	0.34			7.1	OK	
1.001	mh2	-0.030	0.000	0.83			11.1	OK	
1.002	mh3	0.052	0.000	1.25			14.7	SURCHARGED	

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 2
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					2.866
1.001	mh2	15 Summer	1	+0%	2/15 Winter				2.656
1.002	mh3	15 Winter	1	+0%	1/15 Summer				2.550

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.094	0.000	0.28			5.8	OK	
1.001	mh2	-0.054	0.000	0.71			9.5	OK	
1.002	mh3	0.010	0.000	1.07			12.6	SURCHARGED	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 2
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					2.875
1.001	mh2	15 Summer	2	+0%	2/15 Winter				2.702
1.002	mh3	15 Winter	2	+0%	1/15 Summer				2.609

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.085	0.000	0.37			7.6	OK	
1.001	mh2	-0.008	0.000	0.85			11.3	OK	
1.002	mh3	0.069	0.000	1.32			15.5	SURCHARGED	

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	30	+0%	30/15 Summer	100/15 Summer			3.374
1.001	mh2	15 Winter	30	+0%	30/15 Summer				3.401
1.002	mh3	15 Winter	30	+0%	30/15 Summer				3.064

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.414	0.000	0.55			11.2	FLOOD RISK	4
1.001	mh2	0.691	0.000	1.41			18.8	FLOOD RISK	
1.002	mh3	0.524	0.000	2.48			29.1	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Winter	100	+0%	30/15 Summer	100/15 Summer			3.502
1.001	mh2	15 Winter	100	+0%	30/15 Summer				3.523
1.002	mh3	15 Winter	100	+0%	30/15 Summer				3.272

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	0.542	2.314	0.85			17.5	FLOOD	4
1.001	mh2	0.813	0.000	1.58			21.1	FLOOD RISK	
1.002	mh3	0.732	0.000	2.85			33.5	SURCHARGED	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.980	4-8	0.217

Total Area Contributing (ha) = 1.197

Total Pipe Volume (m³) = 15.574

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)	Section Type
1.000	43.200	0.750	57.6	0.133	3.00	0.0	0.600	o	225	Pipe/Conduit
1.001	24.300	0.115	211.3	0.133	0.00	0.0	0.600	o	225	Pipe/Conduit
1.002	6.400	0.070	91.4	0.133	0.00	0.0	0.600	o	300	Pipe/Conduit
1.003	51.700	0.355	145.6	0.133	0.00	0.0	0.600	o	300	Pipe/Conduit
2.000	32.400	0.430	75.3	0.133	5.00	0.0	0.600	o	225	Pipe/Conduit
2.001	8.500	1.070	7.9	0.133	0.00	0.0	0.600	o	225	Pipe/Conduit
1.004	20.000	0.067	298.5	0.399	0.00	0.0	0.600	o	675	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	2.810	0.133	0.0	1.73	68.7
1.001	2.060	0.266	0.0	0.90	35.6
1.002	1.870	0.399	0.0	1.64	116.3
1.003	1.800	0.532	0.0	1.30	91.9
2.000	3.020	0.133	0.0	1.51	60.0
2.001	2.590	0.266	0.0	4.67	185.7
1.004	1.070	1.197	0.0	1.51	541.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	4.070	1.260	Open Manhole	1200	1.000	2.810	225				
mh2	3.540	1.480	Open Manhole	1200	1.001	2.060	225	1.000	2.060	225	
mh3	3.190	1.320	Open Manhole	1200	1.002	1.870	300	1.001	1.945	225	
mh4	2.900	1.100	Open Manhole	1200	1.003	1.800	300	1.002	1.800	300	
mh5	3.840	0.820	Open Manhole	1200	2.000	3.020	225				
mh6	3.890	1.300	Open Manhole	1200	2.001	2.590	225	2.000	2.590	225	
mh7	3.930	2.860	Open Manhole	1800	1.004	1.070	675	1.003	1.445	300	
								2.001	1.520	225	
	5.500	4.497	Open Manhole	0		OUTFALL		1.004	1.003	675	

No coordinates have been specified, layout information cannot be produced.

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	225	mh1	4.070	2.810	1.035	Open Manhole	1200
1.001	o	225	mh2	3.540	2.060	1.255	Open Manhole	1200
1.002	o	300	mh3	3.190	1.870	1.020	Open Manhole	1200
1.003	o	300	mh4	2.900	1.800	0.800	Open Manhole	1200
2.000	o	225	mh5	3.840	3.020	0.595	Open Manhole	1200
2.001	o	225	mh6	3.890	2.590	1.075	Open Manhole	1200
1.004	o	675	mh7	3.930	1.070	2.185	Open Manhole	1800

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	43.200	57.6	mh2	3.540	2.060	1.255	Open Manhole	1200
1.001	24.300	211.3	mh3	3.190	1.945	1.020	Open Manhole	1200
1.002	6.400	91.4	mh4	2.900	1.800	0.800	Open Manhole	1200
1.003	51.700	145.6	mh7	3.930	1.445	2.185	Open Manhole	1800
2.000	32.400	75.3	mh6	3.890	2.590	1.075	Open Manhole	1200
2.001	8.500	7.9	mh7	3.930	1.520	2.185	Open Manhole	1800
1.004	20.000	298.5		5.500	1.003	3.822	Open Manhole	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					2.913
1.001	mh2	15 Winter	2	+0%	2/15 Summer				2.356
1.002	mh3	15 Winter	2	+0%					2.095
1.003	mh4	15 Winter	2	+0%					2.025
2.000	mh5	15 Winter	2	+0%					3.119
2.001	mh6	15 Winter	2	+0%					2.672
1.004	mh7	15 Winter	2	+0%					1.384

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.122	0.000	0.40			26.0	OK	
1.001	mh2	0.071	0.000	1.29			42.2	SURCHARGED	
1.002	mh3	-0.075	0.000	0.91			60.5	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.003	mh4	-0.075	0.000	0.91			79.0	OK	
2.000	mh5	-0.126	0.000	0.39			22.1	OK	
2.001	mh6	-0.143	0.000	0.28			41.0	OK	
1.004	mh7	-0.361	0.000	0.43			170.9	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 2
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					2.902
1.001	mh2	15 Winter	1	+0%	1/15 Summer				2.293
1.002	mh3	15 Winter	1	+0%					2.065
1.003	mh4	15 Winter	1	+0%					1.996
2.000	mh5	15 Winter	1	+0%					3.109
2.001	mh6	15 Winter	1	+0%					2.664
1.004	mh7	15 Winter	1	+0%					1.352

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.133	0.000	0.33			21.5	OK	
1.001	mh2	0.008	0.000	1.06			34.7	SURCHARGED	
1.002	mh3	-0.105	0.000	0.75			50.0	OK	
1.003	mh4	-0.104	0.000	0.75			65.2	OK	
2.000	mh5	-0.136	0.000	0.32			18.3	OK	
2.001	mh6	-0.151	0.000	0.23			34.0	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.004	mh7	-0.393	0.000	0.36			143.1	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 2
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					2.917
1.001	mh2	15 Winter	2	+0%	1/15 Summer				2.383
1.002	mh3	15 Winter	2	+0%					2.107
1.003	mh4	15 Winter	2	+0%					2.036
2.000	mh5	15 Winter	2	+0%					3.123
2.001	mh6	15 Winter	2	+0%					2.675
1.004	mh7	15 Winter	2	+0%					1.396

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.118	0.000	0.42			27.8	OK	
1.001	mh2	0.098	0.000	1.38			45.1	SURCHARGED	
1.002	mh3	-0.063	0.000	0.98			64.6	OK	
1.003	mh4	-0.064	0.000	0.97			84.4	OK	
2.000	mh5	-0.122	0.000	0.42			23.6	OK	
2.001	mh6	-0.140	0.000	0.30			43.9	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.004	mh7	-0.349	0.000	0.46			182.4	OK	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	mh1	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
1.001	mh2	15 Winter	30	+0%	30/15 Summer	30/15 Summer		
1.002	mh3	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.003	mh4	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
2.000	mh5	15 Winter	30	+0%	100/15 Summer			
2.001	mh6	15 Winter	30	+0%				
1.004	mh7	15 Winter	30	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	mh1	3.772	0.737	0.000	0.64			42.2	FLOOD RISK
1.001	mh2	3.542	1.257	1.790	2.33			76.5	FLOOD
1.002	mh3	3.093	0.923	0.000	1.69			112.2	FLOOD RISK

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.003	mh4	2.896	0.796	0.000	1.78			154.1	FLOOD RISK
2.000	mh5	3.189	-0.056	0.000	0.89			50.2	OK
2.001	mh6	2.733	-0.082	0.000	0.71			103.7	OK
1.004	mh7	1.651	-0.094	0.000	1.00			394.3	OK

PN	US/MH Name	Level Exceeded
1.000	mh1	2
1.001	mh2	6
1.002	mh3	1
1.003	mh4	4
2.000	mh5	
2.001	mh6	
1.004	mh7	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	mh1	15 Winter	100	+0%	30/15 Summer	100/15 Summer		
1.001	mh2	15 Winter	100	+0%	30/15 Summer	30/15 Summer		
1.002	mh3	15 Winter	100	+0%	30/15 Summer	100/15 Summer		
1.003	mh4	15 Winter	100	+0%	30/15 Summer	100/15 Summer		
2.000	mh5	15 Winter	100	+0%	100/15 Summer			
2.001	mh6	15 Winter	100	+0%				
1.004	mh7	15 Winter	100	+0%	100/15 Summer			

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	mh1	4.071	1.036	1.085	0.83			54.5	FLOOD
1.001	mh2	3.552	1.267	11.843	2.84			93.0	FLOOD
1.002	mh3	3.190	1.020	0.022	1.99			132.0	FLOOD

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.003	mh4	2.906	0.806	5.883	1.82			157.6	FLOOD
2.000	mh5	3.348	0.103	0.000	1.11			62.7	SURCHARGED
2.001	mh6	2.758	-0.057	0.000	0.89			129.7	OK
1.004	mh7	1.798	0.053	0.000	1.21			478.8	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	mh1	2
1.001	mh2	6
1.002	mh3	1
1.003	mh4	4
2.000	mh5	
2.001	mh6	
1.004	mh7	

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.963	4-8	0.516

Total Area Contributing (ha) = 1.479

Total Pipe Volume (m³) = 21.222

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)	Section Type
1.000	41.600	0.735	56.6	0.123	3.00	0.0	0.600	o	225	Pipe/Conduit
2.000	17.900	0.015	1193.3	0.123	5.00	0.0	0.600	o	225	Pipe/Conduit
1.001	52.600	0.400	131.5	0.123	0.00	0.0	0.600	o	300	Pipe/Conduit
1.002	44.400	0.380	116.8	0.123	0.00	0.0	0.600	o	300	Pipe/Conduit
3.000	16.400	0.230	71.3	0.123	5.00	0.0	0.600	o	225	Pipe/Conduit
3.001	44.400	0.400	111.0	0.123	0.00	0.0	0.600	o	225	Pipe/Conduit
3.002	38.000	0.065	584.6	0.123	0.00	0.0	0.600	o	225	Pipe/Conduit
3.003	3.400	0.750	4.5	0.123	0.00	0.0	0.600	o	300	Pipe/Conduit
3.004	10.000	0.050	200.0	0.124	0.00	0.0	0.600	o	300	Pipe/Conduit
1.003	18.000	0.090	200.0	0.124	0.00	0.0	0.600	o	375	Pipe/Conduit
1.004	14.100	0.071	198.6	0.123	0.00	0.0	0.600	o	375	Pipe/Conduit
1.005	10.000	0.023	434.8	0.124	0.00	0.0	0.600	o	675	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	2.990	0.123	0.0	1.74	69.3
2.000	2.270	0.123	0.0	0.37	14.7
1.001	2.180	0.369	0.0	1.37	96.8
1.002	1.780	0.492	0.0	1.45	102.7
3.000	2.970	0.123	0.0	1.55	61.7
3.001	2.740	0.246	0.0	1.24	49.3
3.002	2.340	0.369	0.0	0.53	21.2
3.003	2.200	0.492	0.0	7.43	525.4
3.004	1.450	0.616	0.0	1.11	78.3
1.003	1.325	1.232	0.0	1.28	141.1
1.004	1.235	1.355	0.0	1.28	141.6
1.005	0.864	1.479	0.0	1.25	447.5

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
mh1	4.480	1.490	Open Manhole	1200	1.000	2.990	225				
mh2	4.190	1.920	Open Manhole	1200	2.000	2.270	225				
mh3	4.180	2.000	Open Manhole	1200	1.001	2.180	300	1.000	2.255	225	
								2.000	2.255	225	
mh4	4.520	2.740	Open Manhole	1200	1.002	1.780	300	1.001	1.780	300	
mh5	4.290	1.320	Open Manhole	1200	3.000	2.970	225				
mh6	4.310	1.570	Open Manhole	1200	3.001	2.740	225	3.000	2.740	225	
mh7	4.260	1.920	Open Manhole	1200	3.002	2.340	225	3.001	2.340	225	
mh8	4.160	1.960	Open Manhole	1200	3.003	2.200	300	3.002	2.275	225	
mh9	4.100	2.650	Open Manhole	1200	3.004	1.450	300	3.003	1.450	300	
mh10	4.100	2.775	Open Manhole	1500	1.003	1.325	375	1.002	1.400	300	
								3.004	1.400	300	
mh11	4.100	2.865	Open Manhole	1500	1.004	1.235	375	1.003	1.235	375	
mh12	4.840	3.976	Open Manhole	1800	1.005	0.864	675	1.004	1.164	375	
	5.500	4.659	Open Manhole	0		OUTFALL		1.005	0.841	675	

No coordinates have been specified, layout information cannot be produced.

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	225	mh1	4.480	2.990	1.265	Open Manhole	1200
2.000	o	225	mh2	4.190	2.270	1.695	Open Manhole	1200
1.001	o	300	mh3	4.180	2.180	1.700	Open Manhole	1200
1.002	o	300	mh4	4.520	1.780	2.440	Open Manhole	1200
3.000	o	225	mh5	4.290	2.970	1.095	Open Manhole	1200
3.001	o	225	mh6	4.310	2.740	1.345	Open Manhole	1200
3.002	o	225	mh7	4.260	2.340	1.695	Open Manhole	1200
3.003	o	300	mh8	4.160	2.200	1.660	Open Manhole	1200
3.004	o	300	mh9	4.100	1.450	2.350	Open Manhole	1200
1.003	o	375	mh10	4.100	1.325	2.400	Open Manhole	1500
1.004	o	375	mh11	4.100	1.235	2.490	Open Manhole	1500
1.005	o	675	mh12	4.840	0.864	3.301	Open Manhole	1800

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	41.600	56.6	mh3	4.180	2.255	1.700	Open Manhole	1200
2.000	17.900	1193.3	mh3	4.180	2.255	1.700	Open Manhole	1200
1.001	52.600	131.5	mh4	4.520	1.780	2.440	Open Manhole	1200
1.002	44.400	116.8	mh10	4.100	1.400	2.400	Open Manhole	1500
3.000	16.400	71.3	mh6	4.310	2.740	1.345	Open Manhole	1200
3.001	44.400	111.0	mh7	4.260	2.340	1.695	Open Manhole	1200
3.002	38.000	584.6	mh8	4.160	2.275	1.660	Open Manhole	1200
3.003	3.400	4.5	mh9	4.100	1.450	2.350	Open Manhole	1200
3.004	10.000	200.0	mh10	4.100	1.400	2.400	Open Manhole	1500
1.003	18.000	200.0	mh11	4.100	1.235	2.490	Open Manhole	1500
1.004	14.100	198.6	mh12	4.840	1.164	3.301	Open Manhole	1800
1.005	10.000	434.8		5.500	0.841	3.984	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)
1.005		5.500	0.841	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	21.000	Storm Duration (mins)	30
Ratio R	0.400		

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	2
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.088
2.000	mh2	15 Winter	2	+0%	2/15 Summer				2.511
1.001	mh3	15 Winter	2	+0%					2.359
1.002	mh4	15 Summer	2	+0%					2.014
3.000	mh5	15 Winter	2	+0%					3.072
3.001	mh6	15 Winter	2	+0%	2/15 Summer				3.039
3.002	mh7	15 Winter	2	+0%	2/15 Summer				2.854
3.003	mh8	15 Winter	2	+0%					2.309
3.004	mh9	15 Winter	2	+0%	2/15 Summer				1.976
1.003	mh10	15 Winter	2	+0%	2/15 Summer				1.882
1.004	mh11	15 Winter	2	+0%	2/15 Summer				1.716
1.005	mh12	15 Winter	2	+0%					1.335

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.127	0.000	0.36			23.9	OK	
2.000	mh2	0.016	0.000	2.03			20.3	SURCHARGED	
1.001	mh3	-0.121	0.000	0.65			59.4	OK	
1.002	mh4	-0.066	0.000	0.72			69.6	OK	
3.000	mh5	-0.123	0.000	0.38			20.7	OK	
3.001	mh6	0.074	0.000	0.69			32.7	SURCHARGED	
3.002	mh7	0.289	0.000	2.33			46.9	SURCHARGED	
3.003	mh8	-0.191	0.000	0.28			61.0	OK	
3.004	mh9	0.226	0.000	1.24			75.9	SURCHARGED	
1.003	mh10	0.182	0.000	1.36			157.9	SURCHARGED	
1.004	mh11	0.106	0.000	1.61			172.1	SURCHARGED	
1.005	mh12	-0.204	0.000	0.83			186.5	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 2
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	1	+0%					3.078
2.000	mh2	15 Winter	1	+0%	1/15 Summer				2.503
1.001	mh3	15 Winter	1	+0%					2.339
1.002	mh4	15 Winter	1	+0%	2/15 Winter				1.958
3.000	mh5	15 Winter	1	+0%					3.057
3.001	mh6	15 Winter	1	+0%	2/15 Summer				2.915
3.002	mh7	15 Winter	1	+0%	1/15 Summer				2.766
3.003	mh8	15 Winter	1	+0%					2.301
3.004	mh9	15 Winter	1	+0%	1/15 Summer				1.863
1.003	mh10	15 Winter	1	+0%	1/15 Summer				1.792
1.004	mh11	15 Winter	1	+0%	1/15 Summer				1.667
1.005	mh12	15 Winter	1	+0%					1.291

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.137	0.000	0.30			19.8	OK	

1 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	mh2	0.008	0.000	1.68			16.8	SURCHARGED	
1.001	mh3	-0.141	0.000	0.54			49.1	OK	
1.002	mh4	-0.122	0.000	0.64			62.0	OK	
3.000	mh5	-0.138	0.000	0.31			17.1	OK	
3.001	mh6	-0.050	0.000	0.62			29.3	OK	
3.002	mh7	0.201	0.000	2.04			41.1	SURCHARGED	
3.003	mh8	-0.199	0.000	0.25			53.4	OK	
3.004	mh9	0.113	0.000	1.07			65.4	SURCHARGED	
1.003	mh10	0.092	0.000	1.17			136.3	SURCHARGED	
1.004	mh11	0.057	0.000	1.39			148.6	SURCHARGED	
1.005	mh12	-0.248	0.000	0.72			160.6	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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 0.404
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
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 2
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	mh1	15 Summer	2	+0%					3.092
2.000	mh2	15 Winter	2	+0%	1/15 Summer				2.514
1.001	mh3	15 Winter	2	+0%					2.368
1.002	mh4	15 Winter	2	+0%	2/15 Winter				2.126
3.000	mh5	15 Winter	2	+0%					3.127
3.001	mh6	15 Winter	2	+0%	2/15 Summer				3.094
3.002	mh7	15 Winter	2	+0%	1/15 Summer				2.890
3.003	mh8	15 Winter	2	+0%					2.312
3.004	mh9	15 Winter	2	+0%	1/15 Summer				2.025
1.003	mh10	15 Winter	2	+0%	1/15 Summer				1.920
1.004	mh11	15 Winter	2	+0%	1/15 Summer				1.736
1.005	mh12	15 Winter	2	+0%					1.348

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	mh1	-0.123	0.000	0.39			25.6	OK	

2 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.000	mh2	0.019	0.000	2.17			21.8	SURCHARGED	
1.001	mh3	-0.112	0.000	0.69			63.5	OK	
1.002	mh4	0.046	0.000	0.73			70.6	SURCHARGED	
3.000	mh5	-0.068	0.000	0.40			22.1	OK	
3.001	mh6	0.129	0.000	0.71			33.6	SURCHARGED	
3.002	mh7	0.325	0.000	2.45			49.2	SURCHARGED	
3.003	mh8	-0.188	0.000	0.30			64.3	OK	
3.004	mh9	0.275	0.000	1.31			80.1	SURCHARGED	
1.003	mh10	0.220	0.000	1.43			166.1	SURCHARGED	
1.004	mh11	0.126	0.000	1.69			181.1	SURCHARGED	
1.005	mh12	-0.191	0.000	0.88			196.3	OK	

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	mh1	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
2.000	mh2	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
1.001	mh3	15 Winter	30	+0%	30/15 Summer	100/15 Summer		
1.002	mh4	15 Winter	30	+0%	30/15 Summer			
3.000	mh5	15 Winter	30	+0%	30/15 Summer	30/15 Summer		
3.001	mh6	15 Winter	30	+0%	30/15 Summer	30/15 Summer		
3.002	mh7	30 Winter	30	+0%	30/15 Summer	100/15 Summer		
3.003	mh8	15 Winter	30	+0%	30/15 Summer			
3.004	mh9	15 Winter	30	+0%	30/15 Summer			
1.003	mh10	15 Winter	30	+0%	30/15 Summer			
1.004	mh11	15 Winter	30	+0%	30/15 Summer			
1.005	mh12	15 Winter	30	+0%	100/15 Summer			

30 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	mh1	3.946	0.731	0.000	0.73			47.8	SURCHARGED
2.000	mh2	3.978	1.483	0.000	3.88			38.9	FLOOD RISK
1.001	mh3	4.042	1.562	0.000	1.06			96.5	FLOOD RISK
1.002	mh4	3.621	1.541	0.000	1.32			126.7	SURCHARGED
3.000	mh5	4.299	1.104	8.985	1.06			58.0	FLOOD
3.001	mh6	4.312	1.347	1.712	1.35			63.4	FLOOD
3.002	mh7	4.002	1.437	0.000	3.68			74.0	FLOOD RISK
3.003	mh8	3.496	0.996	0.000	0.49			107.1	SURCHARGED
3.004	mh9	3.309	1.559	0.000	2.37			145.2	SURCHARGED
1.003	mh10	2.961	1.261	0.000	2.63			306.6	SURCHARGED
1.004	mh11	2.328	0.718	0.000	3.19			341.7	SURCHARGED
1.005	mh12	1.539	0.000	0.000	1.69			378.2	OK

PN	US/MH Name	Level Exceeded
1.000	mh1	3
2.000	mh2	4
1.001	mh3	4
1.002	mh4	
3.000	mh5	10
3.001	mh6	8
3.002	mh7	4
3.003	mh8	
3.004	mh9	
1.003	mh10	
1.004	mh11	
1.005	mh12	

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 623065 309383 TG 23065 09383
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
1.000	mh1	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
2.000	mh2	15 Winter	100	+0%	30/15 Summer	100/15 Summer		
1.001	mh3	15 Winter	100	+0%	30/15 Summer	100/15 Summer		
1.002	mh4	15 Winter	100	+0%	30/15 Summer			
3.000	mh5	15 Winter	100	+0%	30/15 Summer	30/15 Summer		
3.001	mh6	15 Winter	100	+0%	30/15 Summer	30/15 Summer		
3.002	mh7	15 Winter	100	+0%	30/15 Summer	100/15 Summer		
3.003	mh8	15 Winter	100	+0%	30/15 Summer			
3.004	mh9	15 Winter	100	+0%	30/15 Summer			
1.003	mh10	15 Winter	100	+0%	30/15 Summer			
1.004	mh11	15 Winter	100	+0%	30/15 Summer			
1.005	mh12	15 Winter	100	+0%	100/15 Summer			

100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	mh1	4.481	1.266	0.559	0.74			48.5	FLOOD
2.000	mh2	4.202	1.707	11.849	8.37			84.0	FLOOD
1.001	mh3	4.186	1.706	5.993	1.22			111.7	FLOOD
1.002	mh4	4.098	2.018	0.000	1.41			135.2	SURCHARGED
3.000	mh5	4.310	1.115	19.939	1.20			65.7	FLOOD
3.001	mh6	4.318	1.353	7.998	1.40			65.8	FLOOD
3.002	mh7	4.265	1.700	5.438	4.01			80.5	FLOOD
3.003	mh8	4.038	1.538	0.000	0.51			109.7	FLOOD RISK
3.004	mh9	3.854	2.104	0.000	2.68			164.4	FLOOD RISK
1.003	mh10	3.419	1.719	0.000	2.98			347.1	SURCHARGED
1.004	mh11	2.615	1.005	0.000	3.75			402.3	SURCHARGED
1.005	mh12	1.551	0.012	0.000	2.05			458.4	SURCHARGED

PN	US/MH Name	Level Exceeded
1.000	mh1	3
2.000	mh2	4
1.001	mh3	4
1.002	mh4	
3.000	mh5	10
3.001	mh6	8
3.002	mh7	4
3.003	mh8	
3.004	mh9	
1.003	mh10	
1.004	mh11	
1.005	mh12	

Appendix C

Marianna Dyason

From: Marianna Dyason
Sent: 02 August 2022 17:17
To: Marianna Dyason
Subject: FW: Pre-planning enquiry follow up

From: Planning Liaison <planningliaison@anglianwater.co.uk>
Sent: 18 July 2022 14:37
To: James Cahuzac <james.cahuzac@eastp.co.uk>
Subject: RE: Pre-planning enquiry follow up

Good afternoon, James

I have checked this for you and we can confirm this includes the surface water sewers

Please do not hesitate to contact me if you require further assistance

Kind Regards
Sandra

Sandra Olim
Pre-Development Advisor
Team: 07929 786 955
Email: planningliaison@anglianwater.co.uk
Website: https://www.anglianwater.co.uk/developing/planning--capacity/

Anglian Water Services Limited
Thorpe Wood House, Thorpe Wood, Peterborough, Cambridgeshire, PE3 6WT

From: James Cahuzac <james.cahuzac@eastp.co.uk>
Sent: 15 July 2022 15:56
To: Planning Liaison <planningliaison@anglianwater.co.uk>
Subject: RE: Pre-planning enquiry follow up

Hi Sandra,

Thank you for confirming. Is this also the case for flooding from surface water sewers? Have there been any previous incidents of surface water sewer flooding in the local area?

Kind regards,
James

James Cahuzac
Civil Engineer
Unit 23, The Maltings, Roydon Road, Stanstead Abbotts, Hertfordshire, SG12 8HG
Tel: 01920 871777
Web: www.eastp.co.uk

TRANSPORT ASSESSMENT, TRAFFIC MODELLING, FLOOD RISK ASSESSMENT,
FLOOD MODELLING, DETAILED HIGHWAY AND DRAINAGE DESIGN.

From: Planning Liaison <planningliaison@anglianwater.co.uk>
Sent: 15 July 2022 14:18
To: James Cahuzac <james.cahuzac@eastp.co.uk>
Subject: RE: Pre-planning enquiry follow up

Good afternoon, James

Thank you for your email

Anglian Water is able to confirm that we have no records of flooding in the vicinity that can be attributed to capacity limitations in the public foul sewer system. It is possible that other flooding may have occurred that we do not have records of other organisations such as the Local Authority, Internal Drainage Board or the Environment Agency may have records.

Kind Regards

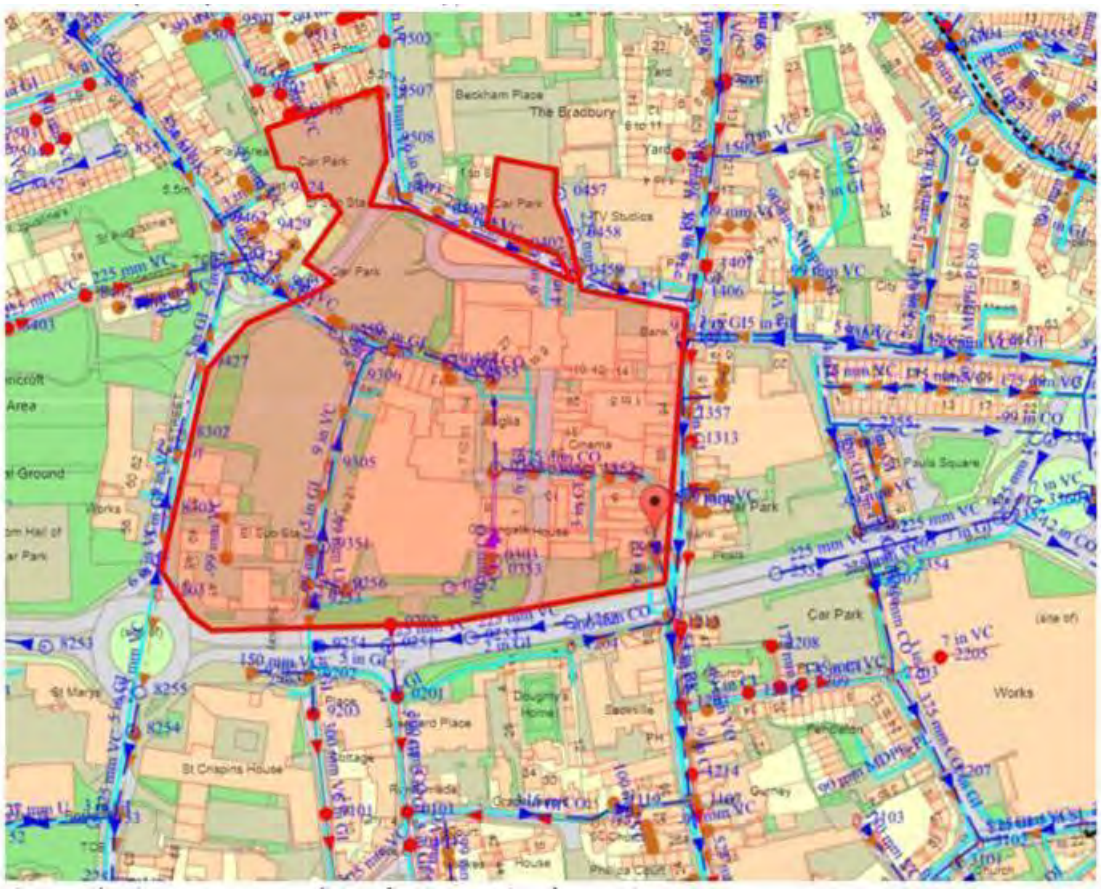
Sandra Olim
Pre-Development Advisor
Team: 07929 786 955
Email: planningliaison@anglianwater.co.uk
Website: https://www.anglianwater.co.uk/developing/planning--capacity/

Anglian Water Services Limited
Thorpe Wood House, Thorpe Wood, Peterborough, Cambridgeshire, PE3 6WT

From: James Cahuzac <james.cahuzac@eastp.co.uk>
Sent: 12 July 2022 11:05
To: Planning Liaison <planningliaison@anglianwater.co.uk>
Subject: Pre-planning enquiry follow up

Dear Sir/Madam,

I have a further query regarding a recent pre-planning enquiry logged with you, Inflow ref: PPE-0143339. We are concerned regarding the risk of sewer flooding in the local area and would appreciate if you could provide further information regarding any previous sewer flooding incidents within or nearby the area highlighted in red below. The grid reference for the site is TG2302009411.



Kind regards,
James

James Cahuzac
Civil Engineer
Unit 23, The Maltings, Roydon Road, Stanstead Abbotts, Hertfordshire, SG12 8HG
Tel: 01920 871777
Web: www.eastp.co.uk

Appendix D

Block C Pump

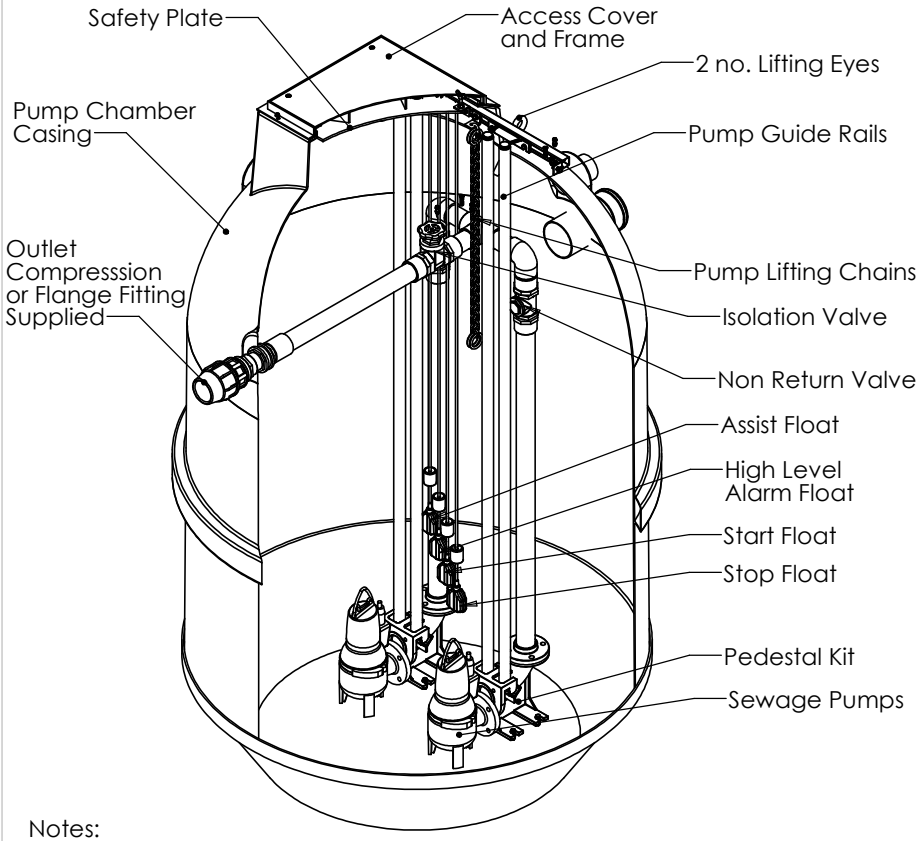
Reference:	PU1230TE
Fluid:	SW
No. of Pumps:	2
Pump Type:	AP.12.40
Impeller Design:	Semi Open
Level Controls:	Floats
Control Sequence:	Duty/Standby
Length of Cable:	10 metres
GRP Chamber Diameter:	1250mm
Depth of Chamber:	3000mm
Total Chamber Capacity:	3600ltrs
Inlet Depth:	2000mm
Inlet Connection:	110mm @ 180° **TBC**
Pump Outlet:	50mm Compression Fitting (50mm OD Black MDPE SDR-17 main by others)
Access Size:	600x1000 Pedestrian Duty Cover

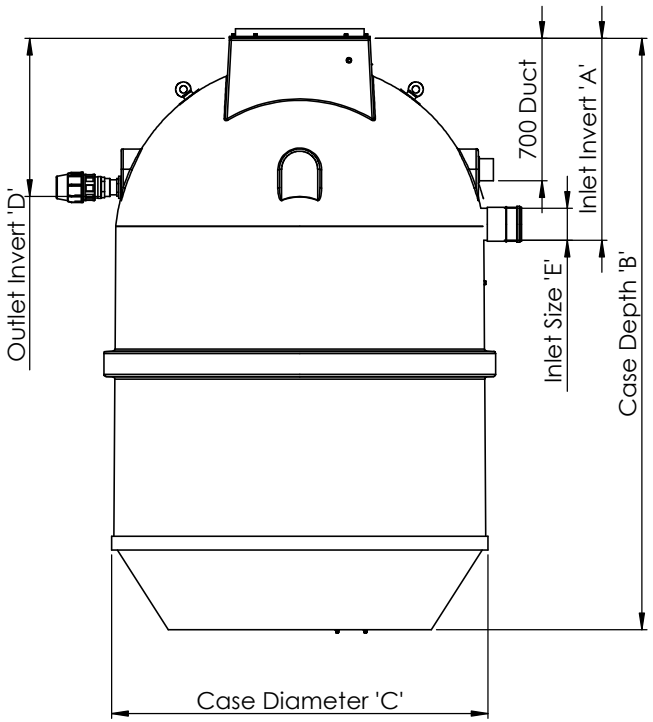
Block D Pump

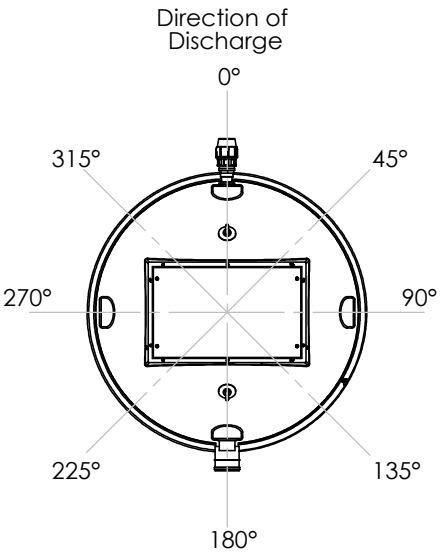
Reference:	PU1845TS
Fluid:	SW
No. of Pumps:	2
Pump Type:	SLV.80.80.11
Impeller Design:	Super Vortex
Level Controls:	Floats
Control Sequence:	Duty/Standby
Length of Cable:	10 metres
GRP Chamber Diameter:	1800mm
Depth of Chamber:	4500mm
Inlet Depth 1:	3500mm
Inlet Connection 1:	1no. 150mm @ 180° **TBC**
Pump Outlet:	90mm Compression Fitting (90mm OD SDR-11 Black MDPE main by others)
Access Size:	600x1000mm Pedestrian Duty Cover

Block A,M,KL, J3

Reference:	PU2645TS
Fluid:	SW
No. of Pumps:	2
Pump Type:	SL1.80.100.22
Impeller Design:	S Tube
Level Controls:	Floats
Control Sequence:	Duty/Assist
Length of Cable:	10 metres
GRP Chamber Diameter:	2600mm
Depth of Chamber:	4500mm
Inlet Depth 1:	3500mm
Inlet Connection 1:	1no. 300mm @ 180° **TBC**
Pump Outlet:	DN100 Ductile Iron (adaptor to suit 315mm OD SDR 17 by others)
Access Size:	900x1500 Pedestrian Duty Cover







Inlet Orientation
(Duct positioned @ 180°)

Notes:

- Pumpwell delivered with pumps & Floats not installed to avoid damage in transit.
- Pumps to be coupled to chains with shackles supplied on lifting chain which is connected to unistrut assembly.
- Read Operating and Installation guidelines before installing.

Alternate Standard Inverts Available:
Ø1.8 x 2.5m - 11, 12, 13, 14
Ø1.8 x 3.0m - 11, 12, 13, 14,16, 17, 18, 19
Ø1.8 x 3.5m - 11, 12, 13, 14,16, 17, 18, 19, 21, 22, 23, 24
Ø1.8 x 4.0m - 11, 12, 13, 14,16, 17, 18, 19, 21, 22, 23, 24, 26, 27, 28, 29
Ø1.8 x 4.5m - 11, 12, 13, 14,16, 17, 18, 19, 21, 22, 23, 24, 26, 27, 28, 29, 31, 32, 33, 34
Ø2.6 x 3.3m - 11, 12, 13, 14, 16, 17, 18, 19
Ø2.6 x 4.0m - 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 26, 27, 28, 29
Ø2.6 x 4.5m - 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 26, 27, 28, 29, 31, 32, 33, 34

Case Diamerer 'C'	Outlet Invert 'D'	Case Depth 'B'							Inlet Invert 'A'						Inlet Size 'E'
		20 (2.0m)	25 (2.5m)	30 (3.0m)	33 (3.3m)	35 (3.5m)	40 (4.0m)	45 (4.5m)	10 (1.0m)	15 (1.5m)	20 (2.0m)	25 (2.5m)	30 (3.0m)	35 (3.5m)	
18 (1.8m)	0.7m	o							o						110mm 160mm 200mm 225mm 250mm 315mm
			o						o	o					
				o					o	o	o				
						o			o	o	o	o			
							o		o	o	o	o	o		
								o	o	o	o	o	o	o	
2.6 (2.6m)	0.7m				o				o	o	o				
							o		o	o	o	o	o		
								o	o	o	o	o	o	o	

Please check with Kingspan Environmental that this drawing is the latest issue				
Issue	Date	Drawn by	Approved by	Description
03	29/05/18	WMD		CC1434 - HLA/Assist float changed position
02	24/04/18	WMD		CC1426 - Various Chamber Depths added
01	07/09/09	JMcM		Initial Release

Material : Various	Tolerance :
Finish :	Thickness : n/a
Weight : 327.01 Kg Kgs	Surface Area :

Drawing : DS1015

Twin Sewage Pump Chamber Sales Drawing

All dimensions in mm

Scale: Not to scale

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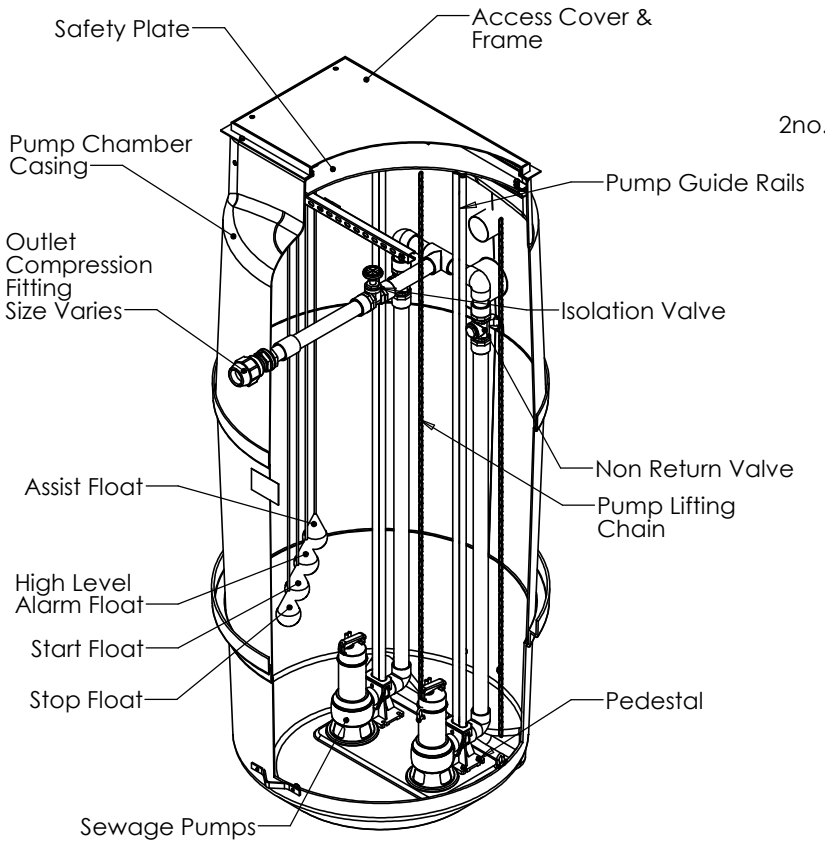
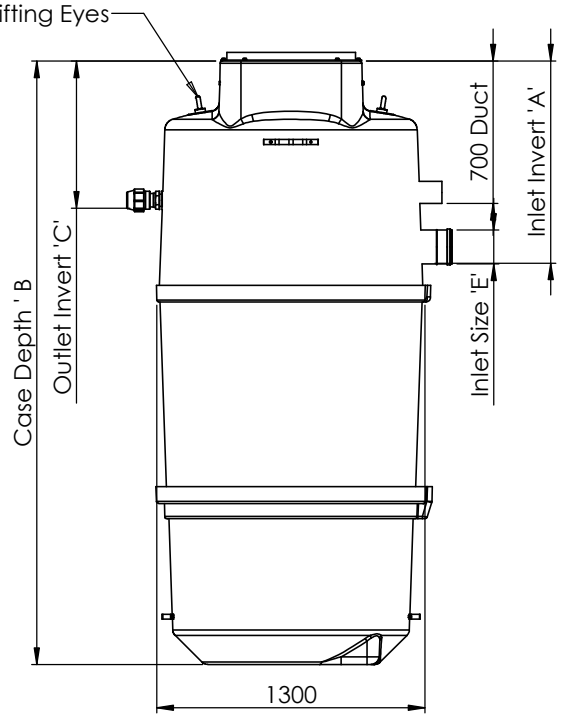
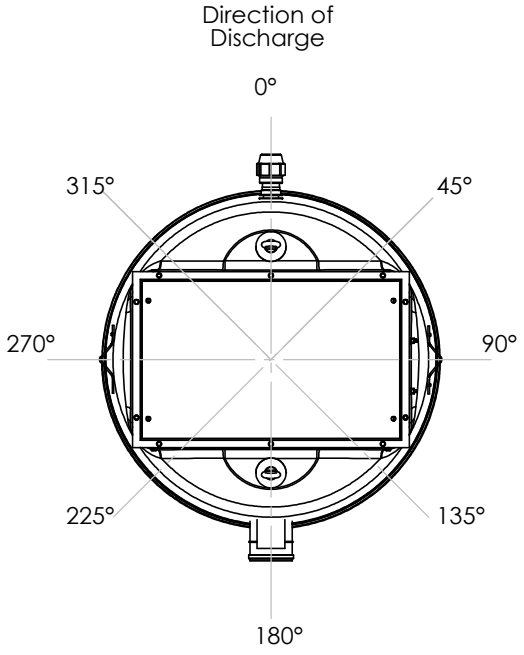
Kingspan Environmental







Inlet Orientation
(Duct positioned @ 180°)

REFER TO SHEET 2 FOR DIMENSIONS 'A', 'B', 'C' and 'E'

Notes:

- Pumpwell delivered with pumps & Floats not installed to avoid damage in transit.
- Pumps to be coupled to chains with shackles supplied on lifting chain which is connected to the unistrut assembly.
- Read Operating and Installation guideleines before installing.

Please check with Kingspan Environmental that this drawing is the latest issue

Issue	Date	Drawn by	Approved by	Description
04	25/05/18	WMD		CC1434 - HLA/Assist float changed position
03	06/03/18	WMD		CC1421 - Pump Chamber Depths added
02	07/08/17	WMD		CC1382 - Pump revision

Material : Various	Tolerance : +/-10 mm
Finish : n/a	Thickness : n/a
Weight : n/a Kgs	Surface Area : n/a

Drawing : DS1054P

Ø1.2m Twin Sewage Pump Chamber

All dimensions in mm

Scale: Not to scale

Y:\Drawing Data\02 - Sales Drawings\DS\DS - 10\DS1054P

Kingspan Environmental

STANDARD INVERTS

Case Diameter	Outlet Invert 'C'	Case Depth 'B'					Inlet Invert 'A' - Standard					Inlet Size 'E'
		20 (2.0m)	25 (2.5m)	30 (3.0m)	35 (3.5m)	40 (4.0m)	10 (1.0m)	15 (1.5m)	20 (2.0m)	25 (2.5m)	30 (3.0m)	
12 (1.3m)	0.7m	•					•					110mm 160mm
			•				•	•				
				•			•	•	•			
					•		•	•	•	•		
						•	•	•	•	•	•	

ALTERNATE STANDARD INVERTS

Case Diameter	Outlet Invert 'C'	Case Depth 'B'					Inlet Invert 'A' - Alternate Standard Inverts																			Inlet Size 'E'
		20 (2.0m)	25 (2.5m)	30 (3.0m)	35 (3.5m)	40 (4.0m)	09 (0.9m)	11 (1.1m)	12 (1.2m)	13 (1.3m)	14 (1.4m)	16 (1.6m)	17 (1.7m)	18 (1.8m)	19 (1.9m)	21 (2.1m)	22 (2.2m)	23 (2.3m)	24 (2.4m)	26 (2.6m)	27 (2.7m)	28 (2.8m)	29 (2.8m)	31 (2.8m)	32 (2.8m)	33 (2.8m)	
12 (1.3m)	0.7m	•					•	•	•	•																	110mm 160mm
			•				•	•	•	•	•	•	•	•													
				•			•	•	•	•	•	•	•	•	•	•	•	•									
					•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					
						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

Material :	Tolerance (unless stated) :	**Drawing : DS1054P**	Page 2 of 2
Finish :	Thickness :		
Weight :	Surface Area : m²	Ø1.2m Twin Sewage Pump Chamber	
Modelled By :			

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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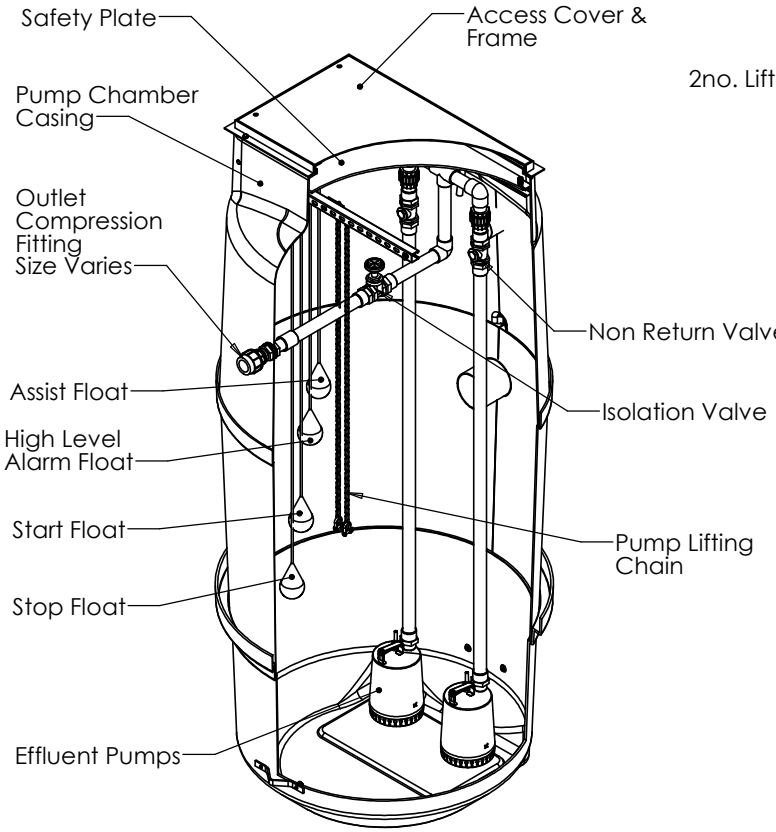

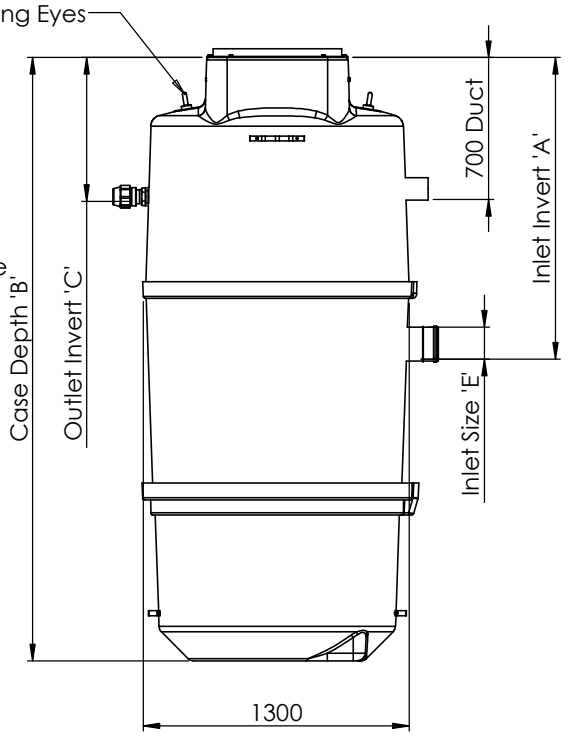

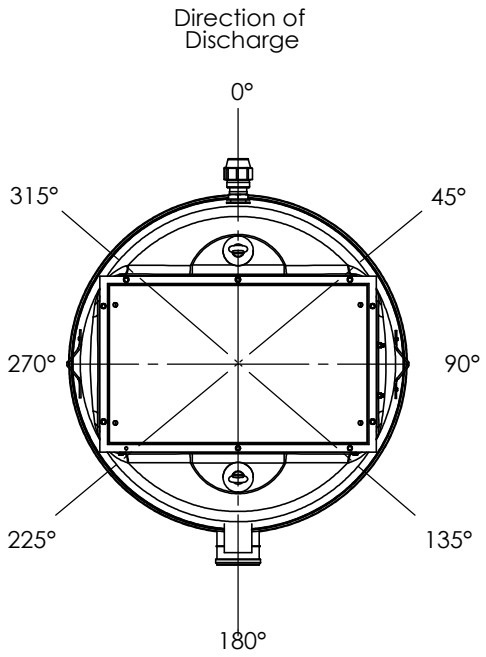

Inlet Orientation
(Duct positioned @ 180°)

REFER TO SHEET 2 FOR DIMENSIONS 'A', 'B', 'C' and 'E'

Notes:
- Pumpwell delivered with Pumps & Floats not installed to avoid damage in transit.
- Pumps to be coupled to chains with shackles supplied on lifting chain which is connected to the unistrut assembly.
- Read Operating and installation guidelines before installing.

Please check with Kingspan Environmental that this drawing is the latest issue

Issue	Date	Drawn by	Approved by	Description
04	25/05/18	WMD		CC1434 - HLA/Assist float changed position
03	06/03/18	WMD		CC1421 - Pump Chamber Depths added
02	07/08/17	WMD		CC1382 - Pump revision

Material : Various	Tolerance : +/-10 mm
Finish : n/a	Thickness : n/a
Weight : n/a Kgs	Surface Area : n/a

Drawing : DS1056P

Ø1.2m Twin Effluent Pump Chamber

All dimensions in mm

Scale: Not to scale

Y:\Drawing Data\02 - Sales Drawings\DS\DS - 10\DS1056P

Kingspan Environmental

STANDARD INVERTS

Case Diameter	Outlet Invert 'C'	Case Depth 'B'					Inlet Invert 'A' - Standard					Inlet Size 'E'
		20 (2.0m)	25 (2.5m)	30 (3.0m)	35 (3.5m)	40 (4.0m)	10 (1.0m)	15 (1.5m)	20 (2.0m)	25 (2.5m)	30 (3.0m)	
12 (1.3m)	0.7m	•					•					110mm 160mm
			•				•	•				
				•			•	•	•			
					•		•	•	•	•		
						•	•	•	•	•	•	

ALTERNATE STANDARD INVERTS

Case Diameter	Outlet Invert 'C'	Case Depth 'B'					Inlet Invert 'A' - Alternate Standard Inverts																			Inlet Size 'E'
		20 (2.0m)	25 (2.5m)	30 (3.0m)	35 (3.5m)	40 (4.0m)	09 (0.9m)	11 (1.1m)	12 (1.2m)	13 (1.3m)	14 (1.4m)	16 (1.6m)	17 (1.7m)	18 (1.8m)	19 (1.9m)	21 (2.1m)	22 (2.2m)	23 (2.3m)	24 (2.4m)	26 (2.6m)	27 (2.7m)	28 (2.8m)	29 (2.8m)	31 (2.8m)	32 (2.8m)	33 (2.8m)	
12 (1.3m)	0.7m	•					•	•	•	•																110mm 160mm
			•				•	•	•	•	•	•	•	•												
				•			•	•	•	•	•	•	•	•	•	•	•	•								
					•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				
						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Material :	Tolerance (unless stated) :	**Drawing : DS1056P**	Page 2 of 2
Finish :	Thickness :		
Weight :	Surface Area : m²	Ø1.2m Twin Effluent Chamber	
Modelled By :			

All Dimensions In mm | Scale: Do Not Scale | Third Angle Projection

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Kingspan Environmental