M60/M62/M66 Simister Island Interchange

TR010064

ENVIRONMENTAL STATEMENT APPENDICES

APPENDIX 13.7 DRAINAGE STRATEGY REPORT

APFP Regulation 5(2)(a)

Planning Act 2008

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M60/M62/M66 Simister Island Interchange

Development Consent Order 202[ ]

ENVIRONMENTAL STATEMENT APPENDICES
APPENDIX 13.7 DRAINAGE STRATEGY REPORT

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1 Introduction

1.1 Purpose of Report

1.1.1 This document presents the drainage design strategy which supports the application for the M60/M62/M66 Simister Island Interchange (the 'Scheme').

1.1.2 The following design elements make up the overall drainage design, this report will establish the key aspects of each element with respect to the Scheme and the strategy in approaching the preliminary design:

- Drainage design criteria
- Existing Drainage Catchments
- New Drainage Catchments
- Drainage Collection
- Drainage Conveyance
- Sustainable Drainage Systems (SuDS) Design.

1.1.3 The development of the drainage design informs the assessment undertaken in Appendix 13.2 Water Quality Assessment Report (WQAR) of the Environmental Statement Appendices (TR010064/APP/6.3).

1.1.4 This document forms an appendix to the Chapter 13: Road Drainage and the Water Environment of the Environmental Statement (TR010064/APP/6.1).

1.2 The Scheme

Context

1.2.1 The location of the Scheme is shown in Figure 2.2 Scheme design of the Environmental Statement Figures (TR010064/APP/6.2). The Order Limits fall within the administrative boundary of Bury Metropolitan Borough Council (BMBC) and is close to Rochdale Borough Council, Salford City Council and Manchester City Council.

1.2.2 The Scheme comprises improvements to the M60 Junction (J)18 interchange (also known as Simister Island) and also widening of the M60 to five lanes between J17 and J18 to improve the traffic flow on the M60. Figure 2.2 Scheme design of the Environmental Statement Figures (TR010064/APP/6.2) shows the location of the different elements of the Scheme that are described below (see Chapter 2: The Scheme of the Environmental Statement (TR010064/APP/6.1) for further details):

- Widening of the existing M60 northbound to M60 westbound link road from one lane to two lanes;

- Construction of a new loop road (the 'Northern Loop') providing a free flow link from the M60 eastbound to M60 southbound;
- Widening of the M60 southbound through J18 from two lanes to four lanes;
- Realignment of the M66 southbound slip road to M60 J18 to accommodate the Northern Loop structure and realignment of the left turn to the M62 eastbound;
- Conversion of the hard shoulder along the existing four-lane carriageway between M60 J17 to J18 into a running lane (both sides); and
- Construction of a new hard shoulder on the M60 between J17 and J18 in the existing verge (both sides).

1.3 Scope Summary

1.3.1 The scope of the drainage design involves creating an appropriate and comprehensive drainage plan that adheres to the Design Manual of Roads and Bridges (DMRB) as well as local and national standards. This design aims to ensure the feasibility of the Scheme and establish a strategy for the Scheme's life cycle including the provision of new drainage system for the new additional paved areas with consideration being given to the following:

- The drainage system entails collection, conveyance, water quality and water quantity;
- The system shall discharge into existing outlets where available. When not available the hierarchy of discharge described in Section 2 of this document will be followed;
- The existing drainage system shall be used where possible to make the Scheme more sustainable; and
- Climate change allowances should be considered and implemented to the whole Scheme.

1.3.2 DMRB requires an integrated drainage design that considers three main components, as shown in Figure 1-1:

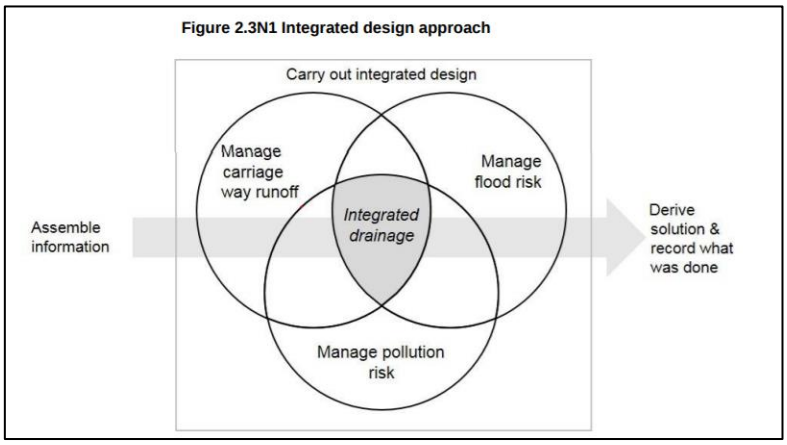

Figure 1-1 The process of integrated drainage design, excerpt from CG 501 Design of Highway Drainage Systems (National Highways, 2022)

1.3.3 It is mandatory to consider how runoff is drained from the carriageway as well as how flood risk (water quantity) to downstream receptors is not exacerbated and how pollution risk (water quality) is managed.

1.3.4 Water quality of discharged will require review based on the new and existing drainage system especially where the impermeable area would be increased.

1.3.5 Reuse of the existing drainage system will be subject to level of information available at the time, reuse will need to consider the impact of climate change across the whole Scheme as well as any increases in impermeable area.

1.4 Baseline Information

1.4.1 The data used in this document has been received from surveys carried out for the purposes of the Scheme design, as well as a desktop survey study based on information from Strategic Flood Risk Assessment for Greater Manchester (JBA Consulting, 2010), Bury Council Preliminary Flood Risk (JBA Consulting, 2011), United Utilities sewer records, the Environment Agency, and the Highways Agency Drainage Data Management (HADDMS).

2 Design Criteria

2.1 Design Parameters

2.1.1 The parameters that have been established through discussions internally with the Applicant, Lead Local Flood Authority (LLFA) (Bury City Council), and the Environment Agency are detailed in the sections below. These parameters are derived from DMRB CG 501 (National Highways, 2022).

Discharge hierarchy

2.1.2 In accordance with DMRB CG 501, where feasible, surface water runoff should be discharged according to the following hierarchy order:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain, or another drainage system; and
- To a combined sewer.

Return Period

2.1.3 In accordance with DMRB CG 501, for road runoff within drainage systems, the following return period design criteria has been applied:

- No surcharge during the 1 in 1-year (plus climate change) return period rainfall event. DMRB CG 501 specifies 1 in 1-year return period; however, Flood Estimation Handbook (FEH) 2013 data is restricted to a minimum 1 in 2-year event. Therefore, if a surcharge is present in the 1 in 2-year event, the 1 in 1-year using Flood Studies Report (FSR) data shall be used for checking the “No surcharge” condition.
- No out of manhole flooding for the highway drainage system during the 1 in 5-year return period rainfall event; and
- Controlled flooding during the 1 in 100-year (plus climate change) exceedance event whereby flows should be maintained within the carriageway and directed towards a low flood risk zone. DMRB CG 501 includes the 1 in 100-year plus climate change event; but also requires sensitivity testing to be carried out. The sensitivity testing is being conducted to understand the range of impacts between the climate change risk scenarios.

Climate Change

2.1.4 In accordance with DMRB CG 501, a climate change allowance of 20% is to be applied together with a sensitivity test which considers a 40% climate change uplift in peak rainfall intensity. However, based on the

latest Environment Agency guidance (Environment Agency, 2022) , a 30% climate change figure should be applied for the area in which the Scheme is located.

2.1.5 Therefore, both climate change allowances (30% for design and 40% for sensitivity test) have been applied to the assessments of the drainage design and the assessment of the exceedance flow in a 100-year return period event.

Rainfall Data

2.1.6 FEH data sources has been employed as standard calculation method. However, to align with DMRB CG 501 (as mentioned in section 2.1.3), the FSR method has also been utilized for simulation and modelling purposes.

Greenfield runoff

2.1.7 Greenfield runoff for a new drainage catchment has been calculated using the method described by the UKSuDS website (IH124).

Discharge limits

2.1.8 Where the design reuses an existing outfall or to connect to the existing network, the discharge rate has been established from the current drainage network modelled in MicroDrainage up to the outfall or connection point. The discharge rate is calculated for the 1 in 1, 1 in 5, 1 in 30 and 1 in 100-year return period events and limited by the equivalent return period in the existing network. The existing discharge rate is based on there being no climate change applied.

2.1.9 Where the discharge is to a new outfall, the discharge has been limited to the greenfield runoff rate or 2l/s/ha (following recommendations from the Construction Industry Research and Information Association (CIRIA) C753 The SuDS Manual (CIRIA, 2015), whichever is higher.

2.1.10 In both cases, as recommended in the Sewerage Sector Guidance Appendix C (Water UK, 2021), a flow control device will be installed which will have a minimum clear opening of 100mm which may result in increased discharge rates but removes the increased risk of blockage which would allow flows to be uncontrolled or increase the flood risk.

Attenuation

2.1.11 To restrict flows at outfalls to the agreed rate, the design includes attenuation features. Methods of attenuation include the use of ponds, oversized pipes, filter trenches, or swales, as appropriate to the location. Notably, oversized pipes and filter trenches would be provided as part of the drainage system to meet the 1 in 5-year “no flooding plus climate change event. Swales, and ponds will be sized to contain a 1 in 100-year storm plus climate change.

Levels of Permeability

2.1.12 The levels of permeability of the various surfaces of which the Scheme is comprised, are detailed below in Table 2-1.

Table 2-1 Levels of Permeability

Areas[1]	Level of Permeability
Paved areas (carriageway, footways, cycleways etc.)	0%
Plan areas of earthworks side slopes (cutting & embankment)	70%
Verges	70%
Meadows & agricultural land	90%

Pipe Velocities

2.1.13 The minimum pipe velocity for carrier and filter drains will be 0.75m/s[2], the maximum full bore pipe velocity[3] will be 5m/s and the maximum discharge velocity, to a watercourse, will be 2.5m/s.

2.1.14 The design pipe hydraulic roughness coefficient (ks) for carrier drains and filter drains shall be 0.6mm and 1.5mm respectively (as stated in DMRB CD 523 (National Highways, 2021a)). The Mannings roughness coefficient 'n' shall be obtained from CIRIA C753 (CIRIA, 2015) where swales are required with a range in value of between 0.05 and 0.35.

Water Quality

2.1.15 The design of any treatment solutions will be based upon DMRB CD 532 (National Highways, 2021b) and CIRIA C753 (CIRIA, 2015). Details of the water quality assessment from routine runoff can be found in Appendix 13.2: WQAR of the Environmental Statement Appendices (TR010064/APP/6.3).

2.1.16 Any ponds would be designed to be permanently wet in order to function as retention basins and achieve the desired treatment efficiencies in accordance with DMRB CG 501. The ponds would be lined due to their location upon Principal Aquifer and/or peat or high organic matter deposits. The use of sediment forebays and the use of check dams can

[1] Level of permeability is based on runoff of coefficient as set out in DMRB CD 521 (National Highways, 2021c) for verges, cuttings and embankments. As meadow areas are flatter, it is not appropriate to use DMRB CD 521 and this value is based on engineering judgement after consulting different specialised sources.

[2] Value obtained from Sewerage Sector Guidance Appendix C.

[3] Value based on designers' criteria and manufacturers recommendations.

help with the treatment of the water. These inclusions will be investigated further during detailed design.

2.1.17 A spillage risk assessment included in the Appendix 13.2: WQAR of the Environmental Statement Appendices (TR010064/APP/6.3), demonstrates that the risk of an accidental spillage causing pollution is within acceptable limits. As per common practice and good design, penstocks will be provided at outfalls after the ponds.

3 Existing Drainage

3.1 Introduction

3.1.1 A review of the existing catchment areas and its drainage systems has been carried out with the findings summarised below. The source of information was based upon CCTV survey information as well as as-built drawings from HADDMS and its database.

3.1.2 Figure 3-1 summarises the location and extents of each catchment providing the outfall location as well.

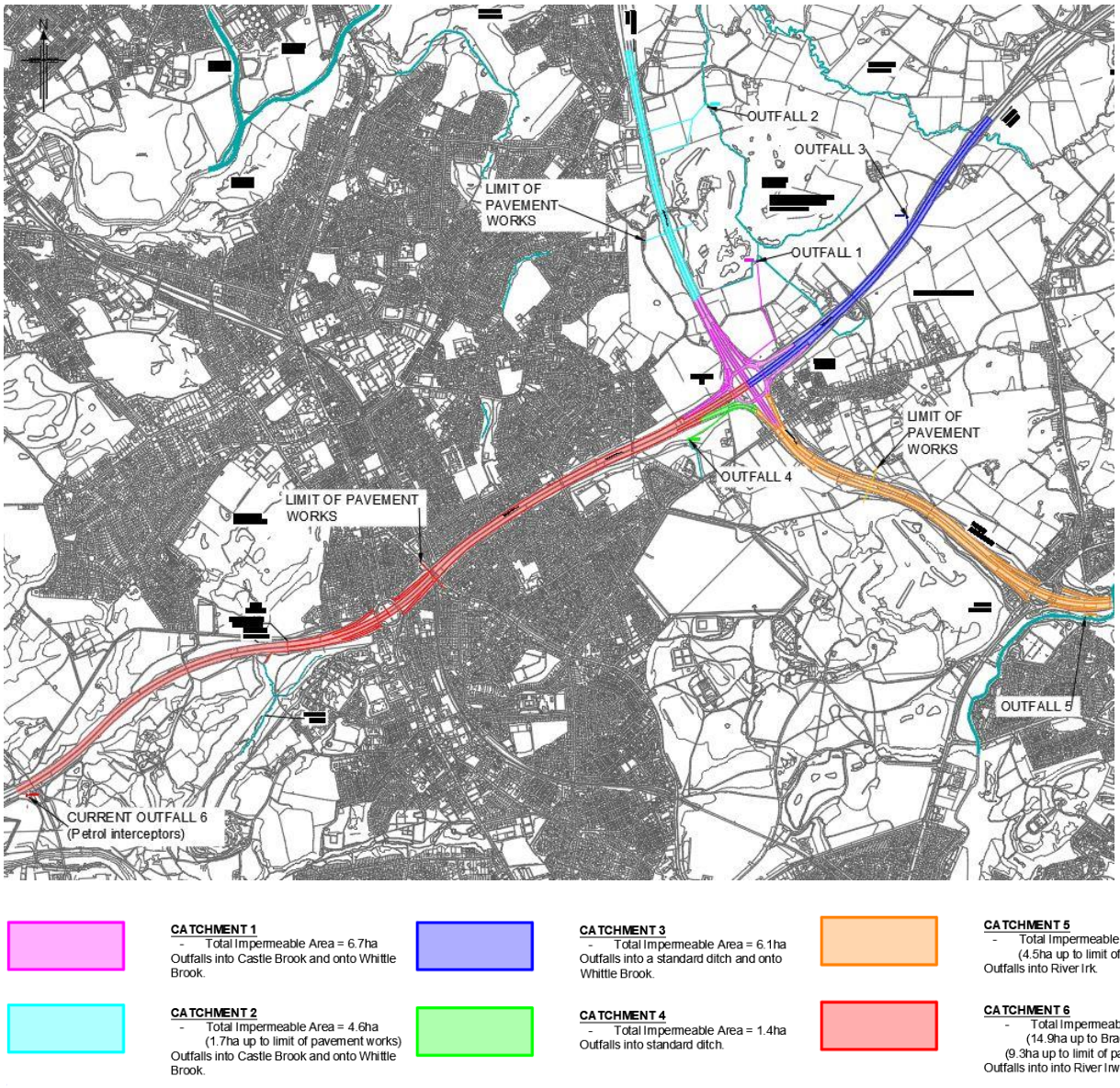

Figure 3-1 Existing Catchments

3.2 Catchment 1

3.2.1 Catchment 1 is 278m long with the high point situated on the M62 west of Junction 18 and the low point situated within the Simister Island Junction and comprises of a number of sections.

M62 J18 southbound merge

3.2.2 The head of the highway drainage system was found to be a manhole with a Combined Filter Drain (CFD) situated within an area between the M62 mainline and M62 westbound diverge. This section of the slip road is in cutting and the road profile is superelevated with the carriageway falling from south to north towards the CFD for approximately 200m. At that point, a cross-carriageway drain has been assumed due to the change in crossfall i.e. superelevated from north to south towards the verge. The highway drainage continues as Surface Water Channels (SWC) up to the middle of the slip road where it joins another branch, coming from the M60 southbound merge, before finally connecting to the filter drain situated within the central island of the Junction18 circulatory.

M60 eastbound to M66 northbound link

3.2.3 The head of the highway drainage system was found to be a chamber with a carrier pipe situated within the M60 eastbound verge. The M60 eastbound diverge falls towards the verge and the existing surface water collection is via intermittently spaced kerb inlets. Since the full extent of the run is unknown, based on information available, it is assumed to continue up to the middle of the M60 slip road where it changes direction towards the Simister Island Junction and joins another filter drain coming from the soft area between the M60 eastbound diverge and the M62 mainline. The two converging pipes continue as a CFD circling around the western M62 underbridge abutment within the circulatory to finally connect to another filter drain situated within the central island of the Junction18 circulatory.

M66 mainline and M66 southbound to M62 eastbound link

3.2.4 Commencing on the M66 southbound verge, the head of the highways drainage system runs south for approximately 82m where it joins a cross carriageway pipe coming from the M66 mainline central reserve. The converging pipes continue as a single carrier pipe for another 52m towards a low point close to the diversion of the M66 southbound diverge slip road. At this point it joins with another 220m long carrier pipe coming from a high point within the M66 southbound diverge verge and running against the driving direction. This section of the M66 mainline and M66 southbound diverge is superelevated towards the near side the kerb line and the existing surface water collection system is via gullies for all the described drainage network.

3.2.5 The highway drain converging at the low point within the verge of the M66 southbound diverge crosses the slip road to continue south along the M66

southbound verge. A second branch runs parallel along the M66 central reserve. Both branches cover a length of approximately 215m before joining in the M66 central reserve and discharge into a penstock chamber immediately prior to the northern most overbridge that support the circulatory carriageway of Junction 18. The outgoing carrier pipe at this penstock chamber connects to a second penstock chamber situated within the verge of the M62 eastbound merge slip road. At this chamber it joins another main carrier pipe placed within the verge of the M62 eastbound merge and conveys water from all the eastern side of the slip road up to the end. The outgoing pipe at the second penstock chamber continues north-east of Junction 18, under Egypt Lane and outfalls into a ditch on the boundary of Pike Fold golf course. This ditch eventually outfalls into Castle Brook.

3.2.6 The M66 southbound diverge to M62 eastbound merge link is superelevated towards the near side verge and the existing surface water collection is via kerb inlets. The M66 mainline which is also superelevated with the carriageway falling from west to east has a collection system based on kerbs and gullies. The entire length of drainage is in cutting.

M66/M60 mainline (South of the northern most overbridge that supports the circulatory)

3.2.7 The highway carrier drain commences north of Simister Lane overbridge and runs north. The M66/M60 mainline system comprise two main pipes running parallel along the M66/M60 mainline verges for approximately 335m until they connect via cross carriageway pipes to a penstock chamber situated within the verge of the M62 eastbound merge slip road. This penstock chamber already mentioned in the previous section is placed just northeast of the northern most overbridge of the Simister Island circulatory. Between the northern most, and southern most overbridges that support the circulatory carriageway of Junction 18, the circulatory network incorporates a kerb and gully system that connects to filter drains located within the soft area inside of the circulatory. These filter drains go down along the earthwork slopes on the eastern and western sides of the circulatory and parallel to these northern most and southern most overbridges until they connect with the M66 mainline drainage system.

3.2.8 The M60 mainline road profile is balanced with a series of gullies providing edge collection. The entire length of drainage is in cutting.

3.3 Catchment 2

3.3.1 The full existing catchment 2 is divided into two sections (south and north) which converge at the low point localised approximately at the midpoint of the catchment, at Unsworth Academy location, where it then outfalls into Castle Brook.

3.3.2 Only part of the southern half of the catchment is affected by the Scheme. It runs from south to north. It commences at the M66 southbound verge as

a carrier pipe and extends for 44m before joining, via a manhole, a second branch that starts in the M66 central reserve 95m upstream of this chamber. From this point, the drainage collection system layout shows two branches running parallel towards the north: as a linear channel running adjacent to the kerb line along the M66 southbound verge and as kerb and gullies or linear channels along the M66 central reserve. Pipes cross the carriageway intermittently to discharge the carrier pipes from the M66 central reserve to the branch along the M66 southbound verge up to the extent of our works immediately before the gantry (M66/M60-SB-0006). The highways section is superelevated with the carriageway falling from west to east and the total length for the catchment impacted by the Scheme is approximately 450m with most of them being in cutting.

3.3.3 Beyond the extents of the Scheme, the existing drainage network continues towards the north where it connects to the northern section and discharges into Castle Brook.

3.3.4 According to the as-built drawings available from HADDMS, there are filter drains situated at the top and toe of the embankment along the M66. The filter drains at the top of the embankment drain any natural external catchments and feed into the M66 highway drainage system. The filter drain along the M66 northbound verge serves the toe of the embankment. The M66 embankment filter drains, and M66 central reserve drainage system are connected via carrier pipes along the embankments and cross carriageway drains respectively to the most eastern pipe run of the network. This arrangement occurs at regular intervals for most of the catchment length as previously mentioned.

3.3.5 The northern half of the catchment, outside the extents of the works, runs from north to south and commences approximately at Castle Road crossing. It runs for 450m until it reaches the low point at Unsworth Academy where it meets the southern catchment section and both sections outfall into Castle Brook.

3.4 Catchment 3

3.4.1 There are no works impacting the drainage in catchment 3.

3.5 Catchment 4

3.5.1 The head of the drainage system commences within the M60 J18 westbound merge slip road and comprises most of the length of this M60 northbound to M60 westbound link and merge to M60 westbound as well as most of the length of the M60 northbound diverge. The highway drainage system starts close to the M60 westbound merging point. It runs along the M60 westbound verge against the traffic direction for approximately 100m as a carrier pipe before facing south towards the adjacent field southwest of the Junction18 circulatory carriageway. At this location it connects to an existing chamber placed in the field. From the information available a second conveyance system consisting of a CFD and coming from the midpoint of the link closer to the M60 northbound

diverging point connects into the same chamber. The combined flow continues from this chamber located at a low point for another 298m via a carrier drain situated within the field just southwest of the Junction18 circulatory, immediately before discharging into an existing open ditch. This ditch appears to be culverted and diverted under the M60 mainline next to the Haweswater Aqueduct.

3.5.2 The carriageway is superelevated towards the M60 westbound slip road verge. The existing surface water collection along the M60 northbound to M60 westbound link road is via kerb and gullies and filter drains. The conveyance system comprises mainly carrier pipes.

3.6 Catchment 5

3.6.1 Catchment 5 covers the M60 mainline south of Junction 18 towards Junction 19. The head of the run commences midway of the M62 westbound to M60 southbound link with the carriageway superelevated towards a SWC in the near side verge. The SWC continues south along the verge of the M60 southbound merge and, before reaching the merging point, it joins the central reserve drainage via a cross carriageway carrier pipe. The head of the M60 central reserve drainage system starts south of the Simister Lane overbridge and comprises two more incoming pipes. The first one comes from the M60 northbound diverge slip road (which drains a partial section of this slip road and it is superelevated falling towards the near side verge.) The second incoming cross carrier pipe conveys flows from the Combined Kerb drainage (CKD) collection system running along the M60 southbound verge against the traffic direction. This M60 southbound section of the road is superelevated falling towards the near side verge and spans for 285m just before joining the head of the run at M60 central reserve chamber.

3.6.2 Based on the available information, the M60 central reserve pipeline runs south for approximately 570m, collecting runoff from the M60 northbound carriageway via SWC until it discharges into a manhole, situated within the M60 central reserve in line with Parkwood Cottages location that establishes the limit of this catchment. The manhole has an incoming cross carriageway drain which adds flows from a second SWC running along the M60 southbound verge for approximately 230m. It also takes in a filter drain that serves the M60 embankments on the eastern side of the road. From this chamber, flows from the M60 central reserve continue across the carriageway towards the M60 northbound verge where it is linked with another incoming filter drain that serves the toe of the M60 embankment along the western side of the road. All of the M60 mainline is superelevated with the carriageways falling from west to east. The catchment terminates at this location in line with the extents of the Scheme. However, the highway network continues to the south towards M60 J19.

3.7 Catchment 6

3.7.1 Existing catchment 6 comprises the M62/M60 highway between Junction 18 to the crossing with River Irwell. It commences at the M62 higher central section of the Simister Island circulatory. It drains west for the whole length of the catchment which is approximately 4400m (2800m up to Bradley Brook crossing). However, the extent of the Scheme ends just to the west of Bury Old Road overbridge reducing the approximate length for the catchment to 1900m. The M62/M60 highway cross section is superelevated with the carriageway falling from south to north up to Haweswater Aqueduct. The remaining catchment up to the outfall is balanced.

3.7.2 The runoff from the M62 eastbound carriageway is collected via kerb and gullies from the start of the catchment up to the diverging point of the M60 eastbound diverge where it changes mainly to a small SWC up to the end of the catchment (west of Bury Old Road overbridge). The collection system for the M62/M60 westbound carriageway is via kerb and gullies within the M62/M60 central reserve up to Haweswater Aqueduct. From this location up to the end of the catchment, the M60 westbound carriageway is collected mainly via a small SWC along the M60 westbound verge.

3.7.3 Each collection system has associated a pipeline running underneath to convey the runoff. This way, for the superelevated section (up to Haweswater Aqueduct), the conveyance system comprises a main pipeline along the M62/M60 eastbound verge in which the pipeline from the M62/M60 central reserve discharges regularly via cross carriageways pipes. For the balanced section, to the east of Haweswater Aqueduct and up to the end of the catchment, the main pipeline along the M60 eastbound verge receives flow from the pipeline within the M60 westbound verge via cross carriageways. This arrangement with the main pipeline within the M60 eastbound verge is maintained from the start of the catchment up to Sandgate Road overbridge. West of this location, the pipeline within the M60 central reserve becomes the main pipeline receiving runoff intermittently via cross carriageway pipes from both branches along the M60 verges.

3.7.4 The M62/M60 mainline is on embankment up to Sandgate Road, where it runs in a shallow cutting. Combined surface and subsurface filter drains are provided as collection features for the M62/M60 earthworks and within the M62/M60 central reserve to drain the soft areas.

3.7.5 In summary, small SWC and filter drains for the M62/M60 earthworks and soft areas in the M62/M60 central reserve are the most commonly used drainage collection features along the M62 & M60 mainline CKD is used for the kerb edges on bridge abutments, along road edges for overbridges or at junction locations with other local roads.

3.7.6 Based on the latest site information, the existing drainage network outfalls to the River Irwell. The outfall location of catchment 6, is therefore located

after “Outwood trail” pedestrian overbridge. The existing drainage network includes a group of petrol interceptors (Figure 3-2).

3.7.7 A previously identified outfall which discharges to Bradley Brook was capped (Figure 3-3) at some point in the past and then reconnected to the existing drainage network on the M60.

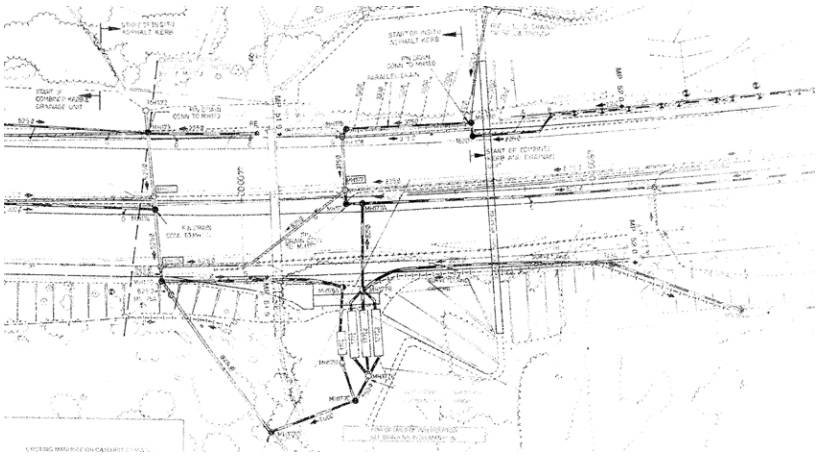

Figure 3-2 Petrol interceptors after Outwood trail

Figure 3-3 Bradley Brook outfall capped

3.8 Existing Outfalls

3.8.1 A summary of the existing outfall details based on HADDMS information is shown in Table 3-1.

Table 3-1 Existing Outfall Details

Catchment Reference	Outfall Easting	Outfall Northing	Impermeable Area (ha)
1	382836	406494	6.7
2	382605	407406	4.6
3	NOT AFFECTED BY THE SCHEME		
4	382519	405640	1.4
5	384599	404715	10.3
6	379046	403780	21.8
Total			44.8

3.9 Main Constraints / Issues

3.9.1 A number of limitations were encountered when working on the drainage design and therefore assumptions have been made in a number of the design assumptions as a worst-case scenario. It is expected that some of these matters will be resolved as part of future detailed design development. Some of the limitations are as follows:

- Limited CCTV survey data due to asset access restriction and therefore unable to validate the condition and connectivity of the entire existing system.
- Difference between HADDMS information between as-builts and uploaded data.
- Pending drainage survey (i.e. catchment 5) could have an impact on the assumed existing drainage network.
- Deep pipes assumed may require to be replaced will be subject to an appropriate risk assessment (i.e. catchment 5).
- Presence of existing penstocks and interceptors at two locations: within the verge, adjacent to M66 southbound diverge slip road and within the verge of the M66 southbound carriageway, immediately before the first over bridge of the circulatory carriageway. The CCTV information received for these assets is incomplete and therefore the

structural viability and serviceability are unknown. For the purposes of this assessment, it has been assumed that these assets will be retained subject to further investigation at a future design phase.

- Limited groundwater information regarding groundwater levels as the results were still pending by the time the preliminary design was finalised[4].

3.10 Flood Risk Assessment

3.10.1 Full details of the flood risk assessment to support the Scheme can be found in Appendix 13.6: Flood Risk Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

3.11 Historical Flooding

Bury Council Preliminary Flood Risk Assessment (PFRA)

3.11.1 JBA Consulting conducted a PFRA in May 2011 on behalf of Bury Council. The PFRA is a high-level inspection which utilises readily available flood data to locate areas where there is a risk of flooding from ordinary watercourses, surface water runoff, groundwater, and canals.

3.11.2 As part of the PFRA process, historical flooding incidents were collected from several key flood risk stakeholders as well as from internal sources which have informed the surface water flood risk throughout the Scheme. Annex D1 shows the known flooding hotspots. A review of the PFRA cites the following:

- 40 recorded incidents of highway flooding – identified by Bury Council; and
- 49 recorded fluvial flooding incidents – identified by the Environment Agency.

Bury Council Strategic Flood Risk Assessment (SFRA)

3.11.3 JBA Consulting completed a SFRA in November 2009 on behalf of Bury Council. The primary objective of this SFRA was to enable the local planning authority to take flood risk into account when making land use allocations and determining planning applications.

[4] *The drainage design presented for the Application is based on limited groundwater data which was available at the time. As with the groundwater assessment presented in Appendix 13.4: Groundwater assessment report of the Environmental Statement Appendices (TR010064/APP/6.3), limitations are identified due to there only being limited groundwater level data available at the time of writing. Monitoring is ongoing, but the preliminary results are not believed to affect the findings of the studies. The detailed design phase will consider all information including updated surveys and design development.*

3.11.4 The SFRA provides information on historical and strategically assessed flood risks within Bury Council boundary. A review of the SFRA indicates that no reservoir flood risk assessment has been undertaken.

HADDMS Historical Flood Records

3.11.5 HADDMS flooding records were reviewed and the records indicate incidents of surface water flooding with flood hotspot risk ranging from 'Moderate to Highest'. The flooding hotspots fall within the vicinity of the Scheme Furthermore, HADDMS records also indicate a short section of the M66 where flooding risk has been addressed through some form of improvement. Information in regards HADDMS historical Flood records is included in Annex D of this document.

3.12 Hydrogeology

3.12.1 An assessment of the Environment Agency groundwater maps reveal the superficial deposits across the site are related to secondary (undifferentiated) aquifers. These aquifers are assigned in cases where it is not possible to attribute a rock type and therefore are not assigned into either category A[5] or B[6]. In most cases, this means that the layer in question has previously been designated as both "minor" and "non-aquifer" in different locations owing to the variable characteristics of the rock type.

3.12.2 Aquifer information is available from the Environment Agency's 'Groundwater' maps and the British Geological Society (BGS) website, groundwater source protection zones, aquifer types, and soil. The Environmental Agency groundwater maps indicate that there are no groundwater source protection zones near the Scheme; however, the groundwater vulnerability maps suggest that the Scheme lies within a medium-high vulnerability zone.

3.12.3 Full details of the groundwater assessment to support the Scheme can be found in Appendix 13.4: Groundwater Assessment Report of the Environmental Statement Appendices (TR010064/APP/6.3), and Environmental Statement Appendix 13.5: Groundwater Dependent Terrestrial Ecosystems (GWDTE) Assessment of the Environmental Statement Appendices (TR010064/APP/6.3).

3.13 Soils

3.13.1 Soil information retrieved from the Soil Map of England and Wales suggested that the entire site consists of freely draining slightly acid sandy soils. Surface water runoff from highways carries a high pollutant load

[5] Secondary A aquifers comprise permeable layers that can support local water supplies and may form and important source of base flow to rivers.

[6] Secondary B aquifers are mainly lower permeability layers that may store and yield limited amount of groundwater through characteristics like thin cracks and opening or eroded layers.

which includes silts and grits, litter and debris, organic and inorganic pollutants, other nutrients (phosphates and nitrates), salts, heavy metals, oils and hydrocarbons. The Soil Map indicates the soil to be particularly vulnerable to leaching of nitrate and pesticides to groundwater.

3.13.2 The north western part of catchment 1, in the vicinity of the northern loop, is generally underlain by alluvial deposits comprising soft clay, loose sand and peaty clays. South and west of this (under the M66 and M62) catchment 1 is generally underlain by firm clays and medium dense sand. There is a high risk that the placement of pond(s) within this area could adversely affect the groundwater. This could occur if the appropriate mitigation measures (i.e. lining measures) are not undertaken if required.

3.14 Pollution Assessment

3.14.1 Surface water quality assessments for routine runoff have been undertaken for the existing situation as the design has progressed using the Highways England Water Risk Assessment Tool (HEWRAT).

3.14.2 This tool was developed from a collaborative research programme undertaken by the Highways England (now National Highways) and the Environment Agency. The toxicity thresholds determined through the research programme, and which are used by the tool, have been designed to prevent adverse ecological effects in the receiving water. Equally, in artificial and heavily modified water bodies, the thresholds have been designed to prevent adverse effects on ecological potential. The thresholds have been developed with the Environment Agency and are consistent with the requirements of the Water Framework Directive.

3.14.3 For the existing situation, no treatment measures have been identified. Table 3-2 shows the HEWRAT results at Step 2 (Tier 1) pre-mitigation for the existing situation. Within the table, a traffic light system has been used to aid interpretation as follows:

- green shading indicates a HEWRAT ‘pass’; and
- red shading indicates HEWRAT ‘fail’.

3.14.4 Further details regarding the existing situation are presented in the Appendix 13.2: WQAR of the Environmental Statement Appendices (TR010064/APP/6.3).

Table 3-2 HEWRAT Step 2 Tier 1 assessment results for the existing situation

Outfall (assessment location)	Annual average concentration soluble*		Sediments (Chronic impact)	Soluble acute impacts (no. of exceedances per year)			
	Cu (ug/l) (EQS = 1)	Zn (ug/l) (EQS = 10.9)		RST 24 hours**		RST 6 hours***	
				Cu	Zn	Cu	Zn

1	1.31	7.02	Pass	4.8	5.9	1.1	2.0
2	0.83	4.46	Pass	2.4	3.2	0.3	1.2
4	0.24	1.33	Pass	0.2	0.4	0.0	0.1
5	0.10	0.56	Pass	0.0	0.1	0.0	0.0
6	0.01	0.08	Pass	0.00	0.00	0.00	0.00

* EQS values are now based upon bioavailable values for Copper of 1µg/l and 10.9µg/l for Zinc (excluding ambient background concentration for copper). These are default values within HEWRAT.

** The RST24 allowable exceedance is 2 per year for copper and zinc.

*** The RST6 allowable exceedance is 1 per year for copper and zinc.

Assessments presented above have assumed zero permeable area.

4 Scheme Drainage

4.1 Design Guides

4.1.1 The design has been prepared in accordance with DMRB standards and any relevant Eurocodes / British Standards. The versions of standards and advice notes stated have been adopted as these were the latest available at the time the design was initiated. The key DMRB design standards to be utilised are DMRB Volume 4.2 (Geotechnics and Drainage – Drainage):

- CG 502: The Certification of Drainage Design
- CD 524: Edge of Pavement Details
- CG 501: Design of Highway Drainage Systems
- CD 526: Spacing of Road Gullies; and
- CD 533: Determination of Pipe and Bedding Combinations for Drainage Works.
- CD 532 Vegetated Drainage Systems
- CIRIA C753
- CIRIA C689F
- CIRIA R156
- Design Manual for Road and Bridges: Volume 11 Section 3 - Part 10 - LA113 - Road drainage and the water environment
- Manual of Contract Documents for Highway Works: Volume 1 Series 0200
- Manual of Contract Documents for Highway Works: Volume 1 Series 0500
- Manual of Contract Documents for Highway Works: Volume 1 Series 2500
- Manual of Contract Documents for Highway Works: Volume 2 Series NG 0200
- Manual of Contract Documents for Highway Works: Volume 2 Series NG 0500
- Manual of Contract Documents for Highway Works: Volume 2 Series NG 2500

- Manual of Contract Documents for Highway Works: Volume 3 Section 1 B Series
- Manual of Contract Documents for Highway Works: Volume 3 Section 1 F Series
- Methods for the removal of surface water from trunk roads', CR76 Contractor Report 76
- National Water Council, The Wallingford Procedure, 'Design and analysis of urban storm drainage – Volume 1, Principles, methods and practice'
- The drainage capacity of BS road gullies and a method for estimating their spacing', CR2 Contractor Report 2
- Thomas Telford. HR Wallingford and Barr D I H. 'Tables for the hydraulic design of pipes, sewers and channels'
- Design Manual for Road and Bridges: Volume 4 Section 2 - All Content
- Sewerage Sector Guidance Appendix C.

4.2 Design Methodology

4.2.1 Following elements were considered during the development of the drainage design:

- Desk Study and Site Visits
  - Review existing data: HADDMS, Topo survey (create 3D surface), stats drawings, geotechnical data, survey data; and
  - Site visits to confirm missing information; hazard identification.
- Solution Development
  - Confirm drainage philosophy i.e., collection, conveyance, discharge options;
  - External interim buildability consultation with the LLFA and Environment Agency; and
  - Designer's Risk Assessment.
- Preliminary Design
  - Calculations (attenuation pond sizing calculations);
  - MicroDrainage network models; and

- Structural pipe design if required (cover requirements, pipe material and pipe bedding material).

- Produce Design Package
  - Survey Scope;
  - Existing Models – CA and M2;
  - New Models – CA, M3, M2 and SH; and
  - Outline Drainage Strategy.

4.3 Scheme Drainage

4.3.1 Due to the lack of drainage survey data, as referred to in section 3.9 of this document, some assumptions on pipe inverts, pipe cover depths, drainage alignment and outfall inverts have been made.

4.3.2 For the most part, the Scheme involves modifications of the existing highway alignment as well as new paved areas. The general strategy is that the drainage of highway runoff is to follow the existing arrangement and must only be adjusted to suit the new pavement locations; before continuing to attenuate and ultimately discharge at the watercourse or existing highways drainage network. Attenuation storage is to be provided within pollution containment ponds, carrier drains and manholes or a combination of all three measures.

4.3.3 A summary of the outfalls is included in Table 4-1.

Table 4-1 Scheme Outfall Details

Catchment Reference		**Outfall Easting**	**Outfall Northing**	**Outfall class**	**Impermeable catchment Area (ha)**	**Permeable catchment Area (ha)**
Catchment 1	Outfall 1A + 1B	382879	406583	New	8.3	6.9
	Outfall 1B	382724	406458	New		
Catchment 2	Outfall 2	382536	407328	Existing	1.8	1.0
Catchment 3	Outfall 3	NOT AFFECTED BY THE SCHEME				
Catchment 4	Outfall 4	382519	405640	Existing	5.4	6.6
Catchment 5	Outfall 5	383568	405345	Existing	4.6	3.8
Catchment 6	Outfall 6	381165	404919	Existing	7.4	1.0
Catchment 7	Outfall 7	382433	405796	New	1.5	1.5
Total					**29**	**21**

4.3.4 A summary of the Scheme catchment location and arrangement is included in Figure 4-1. It should be noted that the location of the ponds and their shape is only indicative as part of the preliminary design and further development will be carried out at detailed design when more information is available.

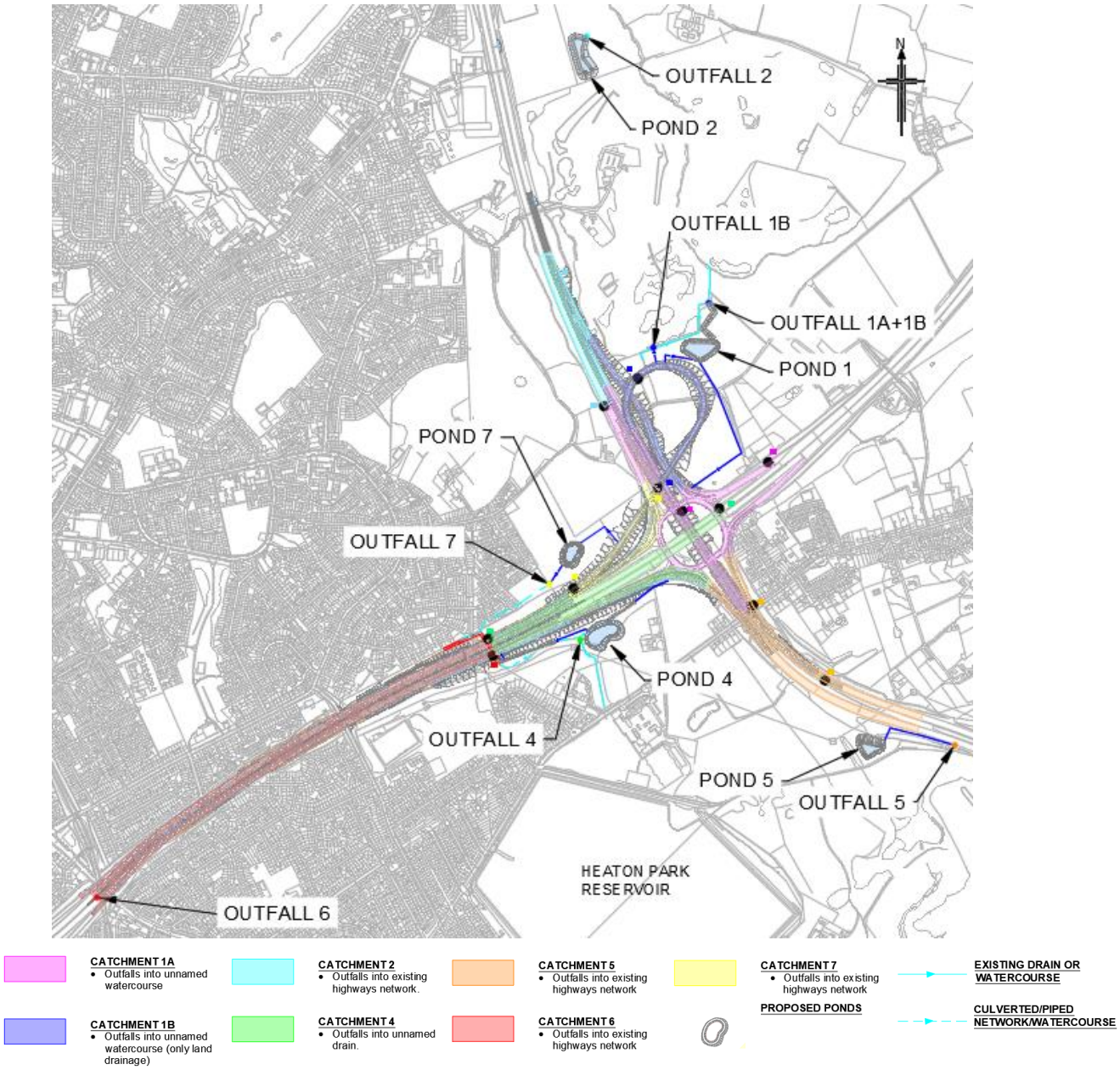

Figure 4-1 New Catchments

4.3.5 As mentioned previously, the historical flooding shows that currently there are a number of flooding hotspots throughout the Order Limits. The existing drainage network has been modelled with as much detail as possible and it presents flooding issues for 1 in 5-year return period rainfall for catchment 6 and catchment 4. In addition, surcharge is

presented for rainfall events of 1 in 1-year return period in all the catchments.

4.3.6 In conclusion, the existing network is neither designed to or performing in accordance with current standards and therefore it is foreseen that only a reduced section of the current network will be retained as part of the new drainage design. This is considered due to the required catchments being larger in terms of paved areas than the existing and the new design including for the required allowances for climate change.

Catchment 1A and Catchment 1B

4.3.7 For catchment 1 the drainage layout has been split into catchments 1A and 1B.

4.3.8 Catchment 1A is shown as magenta in Figure 4-1. This catchment, although quite similar to the existing catchment 1 described in section 3, has a few distinct differences. Towards the M60 eastbound diverge slip road, some catchment sections have been removed and some lengths of the conveyance system have been abandoned as the new drainage network 7 (shown as yellow in Figure 4-1) will take the runoff from these sections via its new pipe network.

4.3.9 A section of the existing M66 southbound diverge slip road will be replaced by the M66 southbound to M62 eastbound link which will be part of catchment 1B (shown as dark blue in Figure 4-1). The design has been adapted to increase the size of carrier drainpipes in the centre of the Junction 18 circulatory to remove bottlenecks and allow for proper attenuation within the system. The Scheme would also move or seal, if possible, those existing chambers that will end up in the new carriageway as a result of the Scheme. Those chambers will be relocated within both verges for ease of access and maintenance. As a consequence of this relocation, and in order to use as much of the existing network as possible, a number of carrier drain bends would be installed in order to connect the existing drains underneath the carriageway to the relocated chambers. The current collection features affected by the Scheme will be replaced by new ones following the drainage collection process stated previously in this document.

4.3.10 Catchment 1B includes part of the new loop geometry providing a free-flow link from the M60 eastbound to M60 southbound (clockwise), including part of the new Pike Fold viaduct over the M66 southbound diverge link. The split between catchments 1B and 7 is the high point of the new viaduct over the M66.

4.3.11 The collection features for this catchment will follow the drainage collection process stated previously in this document.

4.3.12 Drainage for catchment 1B has been split into two separate types:

- Road run-off: potentially contaminated runoff outfalling to an attenuation pond, followed by a swale before discharge into Castle Brook.

- Land drainage (cut and fill): uncontaminated runoff outfalling directly to Castle Brook tributary without treatment/attenuation.

4.3.13 To accommodate the runoff from the additional impermeable area for catchments 1A and 1B, an attenuation pond would be provided within the field just northeast of junction 18. In addition to this, a swale will be constructed immediately after the pond to provide additional water quality treatment which will then connect to the outfall into the Castle Brook tributary, situated north of Egypt Lane and south of Pike Fold Golf Course.

4.3.14 In order to safeguard against the environmental risk to ground water posed by the presence of high organic matter, the pond will be lined. The pond will also serve both catchment 1A and catchment 1B for treatment of highway run-off. Once the run-off is treated and attenuated in the pond, a vortex flow control will limit the discharge rate before is discharged to Castle Brook tributary via a swale.

Catchment 2

4.3.15 The existing drainage system along the mainline commences at the northern edge of catchment 1 on the M66 as described in Section 3.3 of this document.

4.3.16 The drainage would be an upgrade of the existing drainage arrangement. The network has been upsized where necessary to accommodate the additional impermeable area and climate change allowance. It will also convey the extra runoff generated by the widening of the M66 road on the southbound side, where new highway is added for the new M66 southbound diverge and link road, where it connects with catchment 1B. The widening continues to the north until the end of the catchment, immediately before the gantry, where the pipeline connects to the existing M66 drainage network. As the new M66 southbound to M62 eastbound link connects directly to the existing road, new drainage pipelines would be provided along the southbound side connecting to the existing network. The new drainage system will consist of a combination of carrier and filter drains, draining both the road and the earthworks slopes. The collection features for this catchment will follow the drainage collection process stated in Section 5 of this document. Due to lack of available space in the area and the small increase in impermeable area, oversized pipes will be used to attenuate highway run-off. The outflow will be controlled using a vortex flow control before discharging to the existing drainage system.

4.3.17 Aiming to increase the water quality discharging from catchment 2, a new pond, close to the natural outfall into Castle Brook, would be provided. The pond has been designed to provide water quality treatment from road runoff which is currently failing Environmental Quality Standards (EQS) thresholds under the existing situation. It is not required to provide any attenuation as the purpose of the design is to provide attenuation within the extents of pavement works which can be achieved by oversized pipes. In case the pond was to be used for attenuation purposes, it would be necessary to increase its volume to attenuate not only the section affected

by the highways works but all the south catchment leading to the pond, including the additional climate change allowance. Consequently, the size of the pond required would be far greater by comparison to the current requirements leading to an increase landtake requirement. The new pond will treat not only the part of catchment 2 directly affected by the Scheme as shown in Figure 4-1; but it will also treat the remainder of catchment 2 that discharges into Castle Brook.

Catchment 3

4.3.18 Not affected by the Scheme.

Catchment 4

4.3.19 Catchment 4 comprises the existing catchment 4 described previously and part of the existing catchment 6. It extends from the start of existing catchment 6 at the high point on the M60/M62 above Junction 18 westwards up to where the Haweswater Aqueduct passes beneath the M60. Catchment 4 also includes a section of the M60 northbound to M60 westbound link and merge to M60 westbound as well as a section of the M60 northbound diverge.

4.3.20 The drainage network is an upgrade of the existing drainage arrangement. The mainline of the M62/M60 is superelevated with the carriageway falling towards the M62/M60 eastbound nearside kerb, new surface water collection features would be provided along the M62/M60 eastbound verge and M62/M60 central reserve and tied back in with the catchment 4 drainage.

4.3.21 In order to provide attenuation and water treatment, the entire catchment will be diverted via swales to an attenuation pond situated at a natural low point within the field (located immediately southwest of M60 J18 circulatory carriageway) just before discharging into an existing unnamed drain via a vortex flow control device. This existing unnamed drain northwards under the M60 in a culvert and connects to another culvert that runs under the residential area to the north of the M60. To keep the discharge rates as per the existing and avoid any impact in this existing culvert, the discharge rate of catchments 4 and 7 have been designed not to exceed the discharge rate of the existing catchment 4.

4.3.22 The discharge point would be into an existing National Highways asset, which then connects to an existing United Utilities asset that is culverted below the M60 motorway. United Utilities have records that the asset is a public sewer, however desk top studies have shown that the drainage is likely a culverted watercourse for Parr Brook. United Utilities have confirmed that their records may be incorrect and the assets may be a culverted watercourse carrying Parr Brook. In the case that the drainage is a public sewer, United Utilities have accepted that the connection is acceptable. However, they have raised that in the case the drainage is a culverted watercourse, then permission must be granted from the riparian owner, Bury City Council. Conversations with all stakeholders are ongoing

to confirm acceptance from riparian owners. See Annex E of this document.

4.3.23 Although the collection features for the Scheme will be fully designed at the detailed design stage, it is important to mention in this report the existence of a specific section with wide carriageways. The M60 J18 EB diverge comprises a hardshoulder, a diverge nose, 2 running lanes, a ghost island and 3 more running lanes. A combined cross-sectional width well in excess of 30m. This presents a challenge in terms of surface water flow paths. To reduce the flow path length the use of longitudinal drainage within the nosing at the diverge or within the ghost island will be considered as part of detail design development along with a detailed review of the long fall and cross fall options to minimise flow paths and drain the highway efficiently.

Catchment 5

4.3.24 Catchment 5 comprises the existing catchment 5 described previously. The drainage would be an upgrade of the existing drainage arrangement.

4.3.25 Catchment 5 includes the section of M60 south of J18 commencing at Simister Lane bridge and running south for 570 m. It also includes a section of the M60 southbound merge slip road (150m) and a length of the M60 northbound diverge slip road (200m).

4.3.26 The drainage system would include upgrades along verges and central reserve to account for the new impermeable areas from the Scheme. The collection features for this catchment will follow the drainage collection process stated in Section 5 of this document. The drainage improvement works extend beyond the limits of the highway improvement works to ensure that the new attenuation pond works as designed.

4.3.27 The entire catchment will outfall into a new attenuation pond situated at a natural low point within the field located southwest of the M60 in line with Parkwood cottages and upstream of the connection point to the existing drainage system. The pond is an offline solution using the same pipe as inlet and outlet. In order to control the discharge rate as per the existing, a vortex flow control device would be provided.

Catchment 6

4.3.28 The drainage for catchment 6 consists in an upgrade of part of the existing drainage arrangement described previously in Section 3.7 of this document.

4.3.29 Catchment 6 comprises the widening works on the M60 between Haweswater Aqueduct and Junction 17. Catchment 6 commences at the Haweswater Aqueduct which separates it from catchment 4 and catchment 7 and will continue south-west towards the first over bridge (Bury Old Road) at Whitefield Interchange. Catchment 6 ties into the larger existing catchment 6 to the west of Bury Old Road overbridge. The existing catchment 6 then continues to the west of J17.

4.3.30 The M60 highway geometry would vary from balanced to super-elevated and to collect the surface water runoff of the M60 eastbound and M60 westbound carriageways new drainage features would be provided following the collection process stated in section 5 of this document. These collection features will discharge at regular intervals to carrier drains located below them. The intention is to retain as much of the existing network as possible.

4.3.31 The M60 corridor runs across very congested residential areas which is in very close proximity to the highway boundary. There is insufficient area to provide more sustainable attenuation features such as attenuation ponds, swales, or ditches, making them finally not feasible for this catchment.

4.3.32 Investigations were undertaken to determine flood risk impacts from potentially discharging into Bradley Brook (legacy outfall mentioned previously), with the intention being to use the land between the M60 and Whitefield Golf Course, north of the M60 for attenuation and treatment purposes. It was concluded that re-opening the former Bradley Brook outfall is not an option since at present the stream has no capacity for any additional discharge. As such, oversized pipes (up to 1200mm diameter at some locations) will be the method used to attenuate runoff as an in-line storage solution.

4.3.33 To avoid clashes with gantries or overbridges foundations, some of the main pipelines running within the M60 central reserve would be diverted just underneath lane 5 and include some localised bends.

4.3.34 The discharge rate would not exceed the existing discharge rate of existing catchment 6 to the River Irwell and would be controlled by the use of a number of flow controls (orifices) along certain locations of the network.

Catchment 7

4.3.35 Catchment 7 consists of the new paved area for the new M60 eastbound diverge and link road to the M60 southbound, up to the highpoint on the new Pike Fold viaduct located above the M66 northbound slip road. Catchment 7 also includes the paved areas for the M60 eastbound to M66 northbound link.

4.3.36 Similar to the other catchments, the highway runoff will be collected via a new collection system, following the drainage collection process stated in Section 5 of this document, before discharging to a new attenuation pond located northwest of Junction 18. In order to keep the discharge rates as per the existing, the combination of both discharge rates for catchments 4 and 7 will not exceed the discharge rate of the existing catchment 4. Therefore, a vortex flow control providing the minimum discharge rate will be included downstream of the new attenuation pond for catchment 7, before the outfall into an existing manhole located on the northern side of the M60. As per catchment 4, this then connects and outfalls to a believed United Utilities asset. As mentioned in catchment 4, in the case that the

drainage is a public sewer, United Utilities have accepted the new connection is acceptable.

4.3.37 As per specified for catchment 4, consultations with United Utilities have been held and agreement in principle has been obtained on the basis that the outfall does not discharge at a higher rate than existing.

4.3.38 The M60 eastbound diverge slip road embankments are drained via a combination of filter drains and combined carrier and filter drain systems. The runoff from these embankments would be conveyed and discharged into the new pond. In order to safeguard against the environmental risk to ground water posed by the presence of peat, the pond would be lined.

5 Drainage Collection

5.1 Overview

5.1.1 This section of the document discusses the capture and collection systems which would be utilised as part of the drainage network design associated with the Scheme. The capture and collection systems developed conform to the principles and requirements described in DMRB CG 501.

5.1.2 Further information of each of the systems is described in the following sections.

5.2 Kerb and gullies

5.2.1 Kerbs would only be provided at structures which due to restrictions will be CKD, if design changes are made to introduce kerbs then the requirements under DMRB CG 501 will be reviewed.

5.3 Combined Kerb Drain and Bridge Deck Units

5.3.1 Combined kerb drains will be designed to meet the requirements of the DMRB and based on the manufacturer's specification. The extent of the combined kerb drains would be coordinated with the highway alignment detailed design.

5.3.2 The use of combined kerb drainage would be provided at bridges, areas with shallow outlets, and where space for outlets and other collection feature is restricted.

5.4 Combined Filter Drain

5.4.1 Combined Filter Drains (CFD) would be implemented in superelevated and balanced road sections in cutting. The following design criteria would be considered:

- Combined filter carrier drain would be used as edge collection system/conveyance system and a chamber would be required at every 150m.
- Minimum filter drain size would be 150mm dia. and maximum would be 300mm dia. Minimum cover to filter drains would be maintained 0.6m.
- Carrier drain would have a minimum clearance of 300mm i.e., from invert of filter drain to soffit of carrier drain). Minimum cover depth of carrier drains would be maintained as 1.2m if possible.
- Filter drains and carrier pipes would be placed at an offset of 1m from the edge of the hard strip.

5.5 Surface Water Channel and Slot Drains

5.5.1 Surface Water Channels (SWC) would be implemented either within the verge or central reserve. The following design criteria would be taken into consideration for SWC located within the verge:

- Chamber spacing would be provided as per the calculated SWC outlet spacing requirements;
- Maximum outlet/chamber spacing would be limited to 150m;
- Only carrier drains would be used in such cases; and
- Where new drainage pipes would be provided at SWC locations, pipes are to be placed below the centre line of the channel.

5.5.2 Where the SWC would be located within the central reserve, the following design criteria shall be considered:

- Where there is adequate space available for SWC:
  - Chamber spacing would follow actual SWC outlet spacing. Maximum spacing to be limited to 150m.
  - Carrier drain would be placed preferably below the centre line of the channel.
  - It should be noted that all the values above would be subject to adjustments which would be developed during detailed design.
- Where there is insufficient space for SWC, slot drains or similar solutions would be implemented as set out in DMRB:
  - Slot drains would not be modelled; only carrier drains would be modelled with maximum chamber spacing at 150m.
  - Carrier drain would be placed preferably below the centre line of the slot drain.
  - It should be noted that all the values above would be subject to adjustments which would be developed during detailed design.

6 Drainage Conveyance

6.1.1 The conveyance system consists of carrier drains, filter drains and combined carrier and filter drains. The combined carrier and filter drain system would be limited in pipe size, where the filter drain would be limited to 300mm diameter, and the carrier drain would be limited to 900mm dia. It should be noted that as an exception and for attenuation purposes only, some sections of catchment 6 include 1200mm diameter pipes.

6.1.2 Where possible, the existing system would be retained but this would be subject to condition and compliance with required design criteria as detailed in Section 2 of this document, when it is not proportional or sustainable to upgrade the drainage system, a departure from standard would be developed. Existing pipes may also need to be replaced to provide online attenuation.

6.1.3 Based on the information provided, the following pipes would be replaced:

- The defective pipes with either structural grade of category 4 (major defects) or 5 (not fit for purpose or unsafe) or service grade with category 4 (performance severely reduced) or category 5 (blocked or unsafe condition).;
- The pipes that would be required to be upsized due to capacity issues; and
- The pipes in which there is no information at all and therefore its condition is unknown[7].

6.1.4 The information provided for catchment 5 is especially poor and therefore the whole system of this catchment has been assumed would be replaced.

[7] In the subsequent stages of the design process, as additional information about the existing network is acquired during both design and construction, there will be a reassessment of the pipes to ascertain the feasibility of their retention.

7 Water Quality

7.1.1 Assessment of potential water quality impacts arising from routine runoff from the Scheme upon watercourses receiving highway runoff has been undertaken in accordance with DMRB LA 113 (Highways England, 2020). HEWRAT assessments have been completed which consider both long and short-term pollution impacts.

7.1.2 Assessment of the design has been undertaken for the Environmental Statement as of September 2023. The full details of the HEWRAT assessments are documented in the Appendix 13.2 WQAR of the Environmental Statement Appendices (TR010064/APP/6.3).

7.1.3 Embedded mitigation provides treatment for soluble and sediment-bound pollutants with a focus upon providing treatment using vegetative sustainable urban drainage systems. The extent of removal of pollutants provided by the various treatment solutions considered has been based upon the criteria in DMRB CG501 (Table 8.6.4N3). The treatment solutions identified for the design include a combination of swales and ponds. The overall treatment efficiencies for each outfall in the design is outlined in Table 7-1. Additionally, Table 7-2 presents the “Step 3” (post-mitigation) HEWRAT results for the design. All outfalls pass the HEWRAT for both soluble and sediment-bound pollutants at Step 3 with embedded mitigation.

Table 7-1 Calculated treatment efficiencies for each outfall in the Scheme for the embedded mitigation.

Outfall Reference	Embedded Mitigation	Overall Treatment Efficiency (%)		
		Copper (Cu)	Zinc (Zn)	Sediment-bound pollutants
1 (1A+1B)	1 x Attenuation Pond + 1x Swale	70	65	92
2	1 x Pond (treatment)	40	30	60
4	2 x Swale + 1 x Attenuation Pond	66	60	86
5	1 x Attenuation Pond	19	14	28
6	None	0	0	0
7	1 x Retention Pond	40	30	60
4+7	2 x Swale (Outfall 4) + 1x Attenuation Pond for each catchment	50	42	70

Table 7-2 HEWRAT Step 3 (post-mitigations) results

Outfall Reference	Annual average concentration soluble*		Sediments (Chronic impact)	Soluble acute impacts (no. of exceedances per year)			
	Cu (ug/l) (EQS = 1)	Zn (ug/l) (EQS = 10.9)		RST 24 hours**		RST 6 hours***	
				Cu	Zn	Cu	Zn
1 (1A+1B)	0.45	2.78	Pass	0.20	0.80	0.00	0.10
2	0.49	3.09	Pass	0.60	1.70	0.10	0.20
4	0.27	1.70	Pass	0.10	0.30	0.00	0.00
5	0.08	0.48	Pass	0.00	0.10	0.00	0.00
6	0.01	0.08	Pass	0.00	0.00	0.00	0.00
7	0.09	0.39	Pass	0.00	0.00	0.00	0.00
4+7 (Cumulative Assessment)	0.49	0.57	Pass	0.30	1.60	0.10	0.20

* EQS values are now based upon bioavailable values for copper of 1µg/l and 10.9µg/l for Zinc (excluding ambient background concentration for copper). These are default values within HEWRAT.

** The RST24 allowable exceedance is 2 per year for copper and zinc.

*** The RST6 allowable exceedance is 1 per year for copper and zinc.

Assessments presented above have assumed zero permeable area.

8 Water Quantity

8.1 Overview

8.1.1 The attenuation system would be designed based on the allowable discharge maintained up to the 1 in 100 years return period, with uplift of 30% for climate change applied.

8.1.2 Online pipes would be provided at locations where the existing and new built and natural environment restrict the opportunities for nature-based solutions.

8.1.3 Due to the nature of the Scheme and site the preferred nature-based solution has been attenuation ponds. These are to be based on the requirements of the SuDS Manual as detailed in Figure 22.2 of the CIRIA SuDS Manual (C753) (CIRIA, 2015).

8.1.4 Attenuation ponds provide both attenuation, and treatment opportunities. Treatment arrangements for each pond should ensure the requirements of the SuDS Manual in respect of treating the first flush are complied with.

8.2 Attenuation volume and treatment volume

8.2.1 Table 8-1 summarises the attenuation and treatment volumes required as well as attenuation systems to be provided for each catchment area. It should be noted that the treatment volume is to be added on top of the attenuation volume. Figures 23.4 and 23.6 included in CIRIA SuDS Manual (C753) show the typical arrangement of a pond including treatment and attenuation.

Table 8-1 Attenuation and treatment volumes

Catchment Reference	Imp. Area (ha)	Volume for attenuation in pond (approx.) (m^3)	Volume for treatment (m^3)	Attenuation System	Attenuation Pond depth (m)	Treatment pond depth (m)	Max water depth (m)
1A	8.3	3200	1300	Pond	1.2	0.5	1.7
1B							
2	4.6[8]	N/A	700	Oversized pipes	N/A[9]	0.5	0.5
3	NOT AFFECTED BY THE SCHEME						

[8] Catchment area to be treated. Catchment area within limit of works indicated in Figure 4-1.

[9] Pond for catchment 2 is only required for treatment purposes.

Catchment Reference	Imp. Area (ha)	Volume for attenuation in pond (approx.) (m^3)	Volume for treatment (m^3)	Attenuation System	Attenuation Pond depth (m)	Treatment pond depth (m)	Max water depth (m)
4	5.4	2600	810	Pond	0.9	0.5	1.4
5	4.6	900	690	Pond	0.9	0.5	1.4
6	7.4	N/A	N/A	Oversized pipes	N/A	N/A	N/A
7	1.5	1300	160	Pond	0.9	0.5	1.4

8.3 Peak flow control

8.3.1 An assessment of the peak flow controls has been undertaken to demonstrate that there is no increase in the discharge rate compared to the existing discharge rates at each outfall. This has been summarised in Table 8-2.

Table 8-2 Peak flow control

Catchment Reference	Max allowable discharge rate (l/s)				New discharge rate (l/s)				Betterment			
	1 in 1	1 in 5	1 in 30	1 in 100	1 in 1	1 in 5	1 in 30	1 in 100	1 in 1	1 in 5	1 in 30	1 in 100
1A	378.9	583.9	861.1	1114.5	68	140	267.9	421.8	82%	76%	69%	62%
1B												
2	135.0	179.7	270.1	329.7	133.5	134.5	201.5	206.8	1%	25%	24%	37%
3	NOT AFFECTED BY THE SCHEME											
4	77.8	117.5	184.9	214.2	45.2	60.3	96.6	137.8	42%	49%	48%	36%
5	186.6	245.9	337.8	398.0	181	195.2	324	389.9	3%	21%	4%	2%
6	389.1	520.1	722.6	864.9	308.5	404.5	493.7	538.5	21%	22%	32%	38%
7	21.6*	29.6*	42.2*	51.7*	4.6	4.7	4.7	4.7	79%	84%	89%	91%

Catchment Reference	Max allowable discharge rate (l/s)				New discharge rate (l/s)				Betterment			
	1 in 1	1 in 5	1 in 30	1 in 100	1 in 1	1 in 5	1 in 30	1 in 100	1 in 1	1 in 5	1 in 30	1 in 100
*Values shown are greenfield runoff rate. As stated in 4.3.21 and 4.3.36, the combination of catchment 4 and 7 should be limited to the existing discharge rate of catchment 4. Therefore, catchment 7 has been attenuated as much as possible. **Min discharge rate achieved is 4.7l/s based on 2.1.8												

8.4 Sensitivity test

8.4.1 As required in CG 501, a sensitivity test to 40% uplift in peak rainfall intensity would be undertaken to assess the range of impact between climate change scenarios. Therefore, a comparison for each catchment for 30% climate change and 40% climate change has been undertaken. This has been summarized in Table 8-3.

Table 8-3 Sensitivity test

Location	Event	Catchment 1	Catchment 2	Catchment 4	Catchment 5	Catchment 6	Catchment 7
Road	1 in 1 + 30% CC	Surcharge in 12 pipes (12 existing)	54 mm surcharge depth at flow control	No surcharge	No surcharge	Surcharge in 5 pipes (5 existing)	No surcharge
	1 in 1 + 40% CC	Surcharge in 12 pipes (12 existing)	104 mm surcharge depth at flow control	Surcharge in 1 pipe, swale	Surcharge in 1 pipe	Surcharge in 6 pipes (5 existing)	Surcharge in 1 pipe
	1 in 5 +30% CC	No flood	No flood	No flood	No flood	No flood	No flood
	1 in 5 +40% CC	Flood contained within Highways Boundary (HB) = 3m^3	No flood	No flood	No flood	No flood	No flood
	1 in 30 + 30% CC	Flood contained within HB = 59 m^3	No flood	Flood contained within HB = 75m^3	No flood	Flood contained within HB = 3m^3	No flood

	1 in 30 + 40% CC	Flood contained within HB = 75m^3	Flood contained within HB = 17 m^3	Flood contained within HB = 78m^3	No flood	Flood contained within HB = 140m3	No flood
	1 in 100 + 30%CC	Flood contained within HB = 158m^3	Flood contained within HB = 134m^3	Flood contained within HB = 105m^3	Flood contained within HB =22m^3	Flood contained within HB = 681m^3	Flood contained within HB = 6m^3
	1 in 100 + 40%CC	Flood contained within HB = 159m^3	Flood contained within HB = 190m^3	Flood contained within HB = 302m^3	Flood mostly contained within HB =70m^3. Some flooding outside of the HB at the southeast of the catchment	Total flood volume = 994m^3. Contained within the HB	Flood contained within HB = 15m^3.
Pond	1 in 100 + 40% CC	Water level inside freeboard	N/A	Water level inside freeboard	Water level inside freeboard	N/A	Water inside freeboard

8.4.2 The sensitivity test indicates that the 40% climate change scenario does not result in a substantial impact on the performance of the new drainage network. There are a number of pipes that would surcharge for the 1 in 1-year return period event and some marginal flooding for 1 in 5-year return period event. For the 1 in 100-year return period event, all of the additional volume produced as a result of the increase in climate change is contained within the freeboard of the ponds and the increase of volume in the highway is kept inside the highways boundary. Where there is flooding outside of the Highways Boundary this would not impact any properties.

9 Maintenance and Operation

9.1 Overview

9.1.1 Under the Highways Act 1980 Section 36, the highways network is maintainable at public expense as it is a highway constructed by a highway authority. The administration who are, for the time being, the highway authority is under a duty to maintain the highway. In particular, a highway authority is under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice.

9.1.2 The adopting ownership of the catchments is stated in Table 9-1.

Table 9-1 Adopting Ownership

Catchment Ref.	Adopting Ownership
1A/B	The Applicant
2	The Applicant
3	Not affected by the Scheme
4	The Applicant
5	The Applicant
6	The Applicant
7	The Applicant

9.2 Operation and Maintenance

9.2.1 As part of the Highways Authority responsibility, it would be required to maintain the following drainage apparatus:

- Edge collection system i.e., gullies, combined drainage kerbs, linear channels or surface water channels;
- Conveyance system i.e., pipes, manholes, catchpits or headwalls;
- Attenuation pipes;
- Attenuation devices i.e., vortex flow control, orifices, etc.; and
- Attenuation assets. i.e., Swales, ponds, etc.

9.2.2 Maintenance activities should be based on the Asset Delivery Asset Maintenance Requirements document[10], including but not limited to the following:

- Regular Maintenance:
  - Remove litter (including leaf litter) and debris from surfaces, access chambers and inlets / outlets;
  - Inspect edge collection surface, gullies, inlet/outlets, pipework, control systems, banksides for blockages, clogging, standing water and structural damage;
  - Remove sediment from edge collection details, gullies and catchpits, sediment forebay;
  - Inspection of interceptors;
  - Inspect water bodies for water quality issues;
  - Check mechanical devices; vortex flow control, penstocks; and
  - Grass cutting of attenuation basin and swales.
- Occasional Maintenance:
  - Remove or control tree roots, where they are encroaching underground apparatus, using recommended methods BS 3998:2010;
  - Clear pipework of blockages;
  - Inlets, outlets and flow control structures, these are particularly critical to the effectiveness of the system; and
  - Dredging of attenuation basin, swales and ditches.

9.2.3 The effective and sympathetic maintenance of the system would take account of the wildlife supported by the habitat provided.

9.3 Drainage Sump Structures

Cleaning

9.3.1 Accumulation of silt and other material in the sumps would be removed at intervals established by experience. Factors such as the weather (winter de-icing / salting on approach roads) and the effectiveness of gully traps influence the rate of accumulation. Adopted procedures would be implemented following any spillage incident.

[10] Refer specifically to Appendix E/A, section E/A4.3 Asset Type 0500.

9.3.2 Inspection would normally only be possible for exposed parts of the structure. Such areas should be visually inspected as part of the normal structural inspection regime outlined in DMRB CS 450 BD 63/17.

9.3.3 A surface inspection should be made, during every scheduled pumping equipment maintenance operation, to identify any accumulation of silt and obvious defects to the sump lining. Such defects might include joint sealant failure, spalling or cracking.

9.3.4 During Principal Inspections, the sump should be emptied to enable close examination of submerged elements.

Acronyms and Abbreviations

Abbreviation	Term
AEP	Annual Exceedance Probability
SFRA	Strategic Flood Risk Assessment
CIRIA	Construction Industry Research and Information Association
EA	Environment Agency
LLFA	Lead Local Flood Authority
LTP	Local Transport Plan
NGR	National Grid Reference
SuDS	Sustainable Drainage Systems
UU	United Utilities
NH	National Highways
NPPF	National Planning Policy Framework
NN NPS	National Networks National Policy Statement
DMRB	Design Manual for Roads and Bridges
FEH	Flood Estimation Handbook
FSR	Flood Studies Report
AStGWF	Areas Susceptible to Groundwater Flooding
PFRA	Preliminary Flood Risk Assessment
CFD	Combined Filter Drain
SWC	Surface Water Channel
CKD	Combined Kerb Drainage
HAWRAT	Highways Agency Water Risk Assessment Tool.
HADDMS	Highways Agency Drainage Data Management (Now National Highways)
FRA	Flood Risk Assessment
ERA	Emergency Refugee Areas
HB	Highways Boundary

References

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National Highways (2021a). Design Manual for Roads and Bridges, CD 523 Determination of pipe roughness and assessment of sediment deposition to aid pipeline design. Revision 1.1.

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Annex A Correspondence with LLFA and Environment Agency

Pearce, Andy

From: Whittingham, Sylvi [redacted]
Sent: 28 June 2021 17:05
To: Ares-Grondona, Patricia
Subject: [EXTERNAL] FW: M60/M62/M66 Simister Island Interchange scheme. Drainage strategy

Hi Patricia, thank you for your email(s) dated (17 and 25 June 2021)

For your information, if any new connections are required to “main river”, a flood risk activity permit may be required to construct the outfall. Anything other than uncontaminated surface water would require a discharge consent/permit.

I hope this helps.

Please do not hesitate to contact me should you have any further queries.

Kind Regards
Sylvia

From: Ares-Grondona, Patricia [redacted]
Sent: 25 June 2021 11:21
To: Whittingham, Sylvia [redacted]
Subject: RE: M60/M62/M66 Simister Island Interchange scheme. Drainage strategy

Sylvia,
Just one more thing. I checked again and it seems Parr Brook is connected to River Roch.

Hope this helps.

Regards,
Patricia

Patricia | Jacobs | Drainage Engineer
Contact [redacted] MS Teams
5 First S

From: Ares-Grondona, Patricia
Sent: 25 June 2021 10:55
To: Whittingham, Sylvia [redacted]
Subject: RE: M60/M62/ trategy

Hi Sylvia,
Thanks for our call earlier.
As discussed over the phone, I have circled in red in the image below the location where we will need to discharge/connect the surface water drain system for the new proposed loop.

The approximate coordinates for the discharge point are:
X: 382232.34
Y: 405660.11

Please, let me know if you need any other information from us.

Regards,
Patricia

Patrici[redacted]rainage Engineer
Contac[redacted]or MS Teams
5 First Street | Manchester, M15 4GU | UK

From: Whittingham, Sylvia <[redacted]
Sent: 22 June 2021 17:03
To: Ares-Grondona, Patricia [redacted]
Subject: [EXTERNAL] RE: M60/M62/M66 Simister Island Interchange scheme. Drainage strategy

Hi Patricia, yes we do use MS Teams.

Thanks
Sylvia

From: Ares-Grondona, Patricia [redacted]
Sent: 22 June 2021 16:56
To: Whittingham, Sylvia [redacted]
Subject: RE: M60/M62/M66 Simister Island Interchange scheme. Drainage strategy

Afternoon Sylvia,
Thanks for coming back to me so promptly.

Do you use by any chance Microsoft Teams? Since we started the lockdown I am working from home and don't have an office number currently. If not, I will call you with my personal mobile.

Regards,
Patricia

Patricia Ares-Grondona, MEng | Jacobs | Senior Drainage Engineer
Contact: [redacted] r MS Teams
5 First St

From: Whittingham, Sylvia [redacted]
Sent: 22 June 2021 15:16
To: Ares-Grondona, Patricia [redacted]
Subject: [EXTERNAL] FW: M60/M62/M66 Simister Island Interchange scheme. Drainage strategy

Good afternoon Patricia,

Thank you for your email.

Patricia, are you able to give me call when you're free to discuss your enquiry?

I look forward to hearing from you.

Kind regards

Sylvia Whittingham
Sustainable Places Advisor
(Greater Manchester, Merseyside and Cheshire Area)

Email [redacted]
Team Email: [redacted]

Environment Agency
Richard Fairclough House| Knutsford Road | Latchford | Warrington | WA4 1HT
Direct [redacted] Mobile: [redacted]

Does Your Proposal Have Environmental Issues or Opportunities? Speak To Us Early!

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From: Ares-Grondona, Patricia [mailt [redacted]
Sent: 17 June 2021 14:49
To: GMMC Asset Performance [redacted]; PSO_Warrington [redacted]
FW: M60/M62/M66 Simister Island Interchange scheme. Drainage strategy

Good afternoon,
I am part of the team that is currently undertaking the preliminary design for the M60/M62/M66 Simister Island Interchange scheme. We are currently developing the drainage strategy for this project and I was given these emails as starting contact point to discuss our approach with the Environmental Agency.
Could you please give me a specific contact details so we can discuss the drainage strategy directly with the appropriate person?

I will await for your response.
Have a nice day.
Kind regards,
Patricia

Patricia [redacted]ainage Engineer
Contact: [redacted]r MS Teams
5 First Street | Manchester, M15 4GU | UK

Meeting Minutes

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United Kingdom
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Subject	M60 SIMISTER DRAINAGE MEETING WITH BURY COUNCIL 03/08/2021		
Project	M60/M62/M66 Simister Island Interchange		
Project No.	B36601F0	**File**	HE548642-JAC-GEN-SII_MLT-MI-C-0005.docx
Prepared by	P. DE LA TORRE	**Phone No.**	
Location	MS Teams Meeting	**Date/Time**	24/10/23
Participants	Patricia Ares-Grondona Richard Broughton Helen Dagg Pable De la Torre Phil Emison Fainos Muzondo (TA) Sam O'Kane Richard Pickup Jonathan Price Andrew Southgate (Bury Council) Emily Wilkes Paul Williams (TA)		
Copies to		**Apologies**	

Notes		Action
1	**Drainage Strategy Overview** • JP presented proposed drainage strategy and described emerging preliminary design. • Timescale for the DCO application is likely to be early 2022 with statutory public consultation towards the end of 2021 • Drainage networks modelled in microdrainage using FEH. • PAG added that for the 1 in 1 year return period that FSR was being used. • AS was happy with the modelling approach	
2	**Discharge Rate Discussion**	

Notes		Action
	• AS confirmed he is the contact for the LLFA, he agreed with the approach and did not have any views on the discharge rates proposed. • AS would look at this in detail when the design had been developed further, but was happy with the principles as discussed and presented.	
3	**Known LLFA Issues** • AS advised that there was an emerging issue NW of J18, where the EA are investigating. • In addition there is another known issue area NE of Jn 18. AS to send on details to Richard Pickup and Richard Broughton. • For the proposed pond location north of M60, AS did not have any immediate concerns but he did note that runoff occasionally floods motorway. • AS preference is that the existing situation is not made worse and improvements are made where possible	AS
4	**AOB** • AS would prefer regular updates/meetings as the scheme progresses	

Annex B Existing Catchment MicroDrainage Reports

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Existing Catchment - 1A

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	0
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Existing Catchment - 1A

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.357 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status OFF
Analysis Timestep Fine DVD 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	ASTD8206_6904A	15 Winter	1	+0%					97.324	-0.226	0.000	0.14			23.7
1.001	ASTD8206_6709A	15 Winter	1	+0%					95.786	-0.196	0.000	0.26			23.7
2.000	ASTD8206_6512B	15 Summer	1	+0%					96.736	-0.150	0.000	0.00			0.0
1.002	ASTD8206_6809A	15 Winter	1	+0%					95.713	-0.065	0.000	0.85			23.7
1.003	ASTD8206_6910A	15 Winter	1	+0%					95.641	-0.089	0.000	0.65			43.3
3.000	ASTD8206_6809A_1	15 Winter	1	+0%					95.648	-0.130	0.000	0.04			0.9
3.001	ASTD8206_6220A	15 Winter	1	+0%					93.546	-0.289	0.000	0.01			0.9
1.004	ASTD8206_6321A	15 Winter	1	+0%					93.431	-0.178	0.000	0.35			44.3
4.000	ASTD8206_6324A	15 Summer	1	+0%					93.357	0.000	0.000	1.29			8.8
1.005	ASTD8206_6422A	15 Winter	1	+0%					93.121	-0.188	0.000	0.30			53.9
5.000	ASTD8206_6034A	15 Summer	1	+0%					92.849	0.000	0.000	0.97			17.6

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
1.000	ASTD8206_6904A	OK	
1.001	ASTD8206_6709A	OK	
2.000	ASTD8206_6512B	OK	
1.002	ASTD8206_6809A	OK	
1.003	ASTD8206_6910A	OK	
3.000	ASTD8206_6809A_1	OK*	
3.001	ASTD8206_6220A	OK	
1.004	ASTD8206_6321A	OK	
4.000	ASTD8206_6324A	SURCHARGED*	
1.005	ASTD8206_6422A	OK	
5.000	ASTD8206_6034A	SURCHARGED*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
5.001	EXDN01-01	15 Winter	1	+0%					91.958	-0.041	0.000	0.87			17.9
6.000	ASTD8206_6030B	15 Winter	1	+0%					92.976	-0.026	0.000	1.00			13.6
6.001	ASTD8206_6226A	15 Winter	1	+0%					92.577	-0.169	0.000	0.14			13.5
5.002	ASTD8206_6427A	15 Winter	1	+0%					91.867	-0.023	0.000	0.84			39.5
7.000	ASTD8206_7216A	15 Winter	1	+0%					94.401	-0.055	0.000	0.69			20.2
7.001	EXDN01-02	15 Winter	1	+0%					92.182	-0.074	0.000	0.51			20.2
8.000	ASTD8206_6331A	15 Winter	1	+0%					92.066	-0.106	0.000	0.18			1.3
9.000	ASTD8206_7315C	15 Summer	1	+0%					95.101	-0.150	0.000	0.00			0.0
8.001	ASTD8206_6823A	15 Winter	1	+0%					91.837	-0.125	0.000	0.07			1.3
10.000	ASTD8206_6427B	15 Winter	1	+0%					92.349	-0.136	0.000	0.02			0.4
10.001	EXDN01-03	15 Winter	1	+0%					91.800	-0.135	0.000	0.02			0.4
5.003	ASTD8206_6723A	15 Winter	1	+0%					91.793	-0.064	0.000	1.00			56.3
11.000	ASTD8206_Pipe B	15 Winter	1	+0%					91.996	-0.195	0.000	0.04			2.9
1.006	ASTD8206_6622A	15 Winter	1	+0%					91.672	-0.156	0.000	0.72			117.4
12.000	ASTD8206_6422A_1	15 Winter	1	+0%					93.270	-0.039	0.000	0.88			18.1
13.000	ASTD8206_6912A	15 Summer	1	+0%					93.082	-0.225	0.000	0.00			0.0
12.001	ASTD8206_7013B	15 Winter	1	+0%					91.821	-0.154	0.000	0.21			18.2
1.007	ASTD8206_7114A	15 Winter	1	+0%					91.289	-0.282	0.000	0.54			154.1
14.000	ASTD8206_7013B_1	15 Winter	1	+0%					92.946	-0.117	0.000	0.41			17.5
15.000	ASTD8206_7999A_1	15 Winter	1	+0%					92.302	-0.098	0.000	0.26			3.1
16.000	ASTD8206_7700A	15 Winter	1	+0%					92.178	-0.081	0.000	0.42			3.1
16.001	ASTD8206_7502A	15 Winter	1	+0%					92.115	-0.106	0.000	0.55			8.3
14.001	ASTD8206_7703A	15 Winter	1	+0%					92.046	-0.148	0.000	0.25			28.8
17.000	ASTD8206_8592B	15 Summer	1	+0%					92.457	0.000	0.000	1.16			19.0
18.000	ASTD8205_9091A_1	15 Winter	1	+0%					100.242	-0.121	0.000	0.08			2.4
18.001	ASTD8206_8201B	15 Winter	1	+0%					95.731	-0.132	0.000	0.04			2.4
19.000	ASTD8205_9676C	15 Winter	1	+0%					96.101	-0.134	0.000	0.33			24.7
19.001	ASTD8205_9085A	15 Winter	1	+0%					93.608	-0.145	0.000	0.52			28.5
19.002	ASTD8205_8985A	15 Winter	1	+0%					93.582	-0.144	0.000	0.70			28.3
20.000	ASTD8205_9474C	15 Winter	1	+0%					96.061	-0.116	0.000	0.47			35.1
19.003	ASTD8205_8884A	15 Winter	1	+0%					93.444	-0.261	0.000	0.20			70.3
21.000	ASTD8206_7900A	15 Winter	1	+0%	1/15 Summer				98.546	0.596	0.000	0.61			11.0
22.000	EXDN01	15 Winter	1	+0%					104.553	-0.190	0.000	0.06			4.9

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
5.001	EXDN01-01	OK*	
6.000	ASTD8206_6030B	OK*	
6.001	ASTD8206_6226A	OK	
5.002	ASTD8206_6427A	OK	
7.000	ASTD8206_7216A	OK	
7.001	EXDN01-02	OK*	
8.000	ASTD8206_6331A	OK*	
9.000	ASTD8206_7315C	OK*	
8.001	ASTD8206_6823A	OK	
10.000	ASTD8206_6427B	OK*	
10.001	EXDN01-03	OK*	
5.003	ASTD8206_6723A	OK	
11.000	ASTD8206_Pipe B	OK*	
1.006	ASTD8206_6622A	OK	
12.000	ASTD8206_6422A_1	OK*	
13.000	ASTD8206_6912A	OK	
12.001	ASTD8206_7013B	OK	
1.007	ASTD8206_7114A	OK	
14.000	ASTD8206_7013B_1	OK*	
15.000	ASTD8206_7999A_1	OK*	
16.000	ASTD8206_7700A	OK*	
16.001	ASTD8206_7502A	OK	
14.001	ASTD8206_7703A	OK	
17.000	ASTD8206_8592B	SURCHARGED*	
18.000	ASTD8205_9091A_1	OK*	
18.001	ASTD8206_8201B	OK	
19.000	ASTD8205_9676C	OK*	
19.001	ASTD8205_9085A	OK	
19.002	ASTD8205_8985A	OK	
20.000	ASTD8205_9474C	OK	
19.003	ASTD8205_8884A	OK	
21.000	ASTD8206_7900A	SURCHARGED	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
22.000	EXDN01	OK*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
22.001	EXMH01	15 Winter	1	+0%					98.967	-0.184	0.000	0.08			4.9
21.001	ASTD8206_8501A	15 Winter	1	+0%	1/15 Summer				98.500	1.192	0.000	1.25			27.9
23.000	ASTD8206_1314A	15 Winter	1	+0%					105.105	-0.118	0.000	0.10			2.6
23.001	ASTD8206_0809C	15 Winter	1	+0%					103.226	-0.194	0.000	0.05			2.6
23.002	ASTD8206_9901C	15 Winter	1	+0%	1/15 Summer				101.587	0.006	0.000	1.60			25.2
23.003	ASTD8306_0000B	15 Winter	1	+0%					101.401	-0.151	0.000	0.24			29.4
23.004	ASTD8205_9899A	15 Winter	1	+0%					100.228	-0.129	0.000	0.37			34.8
23.005	ASTD8205_9596A	15 Winter	1	+0%	1/15 Summer				98.925	0.171	0.000	0.62			39.5
24.000	ASTD8205_9486C	15 Winter	1	+0%					99.104	-0.126	0.000	0.06			0.7
25.000	ASTD8205_0177B	15 Winter	1	+0%					104.696	-0.132	0.000	0.04			0.9
25.001	ASTD8205_9488A	15 Winter	1	+0%					101.716	-0.144	0.000	0.01			0.9
26.000	ASTD8205_9388E	15 Summer	1	+0%					99.222	-0.150	0.000	0.00			0.0
24.001	EXDN01-04	15 Winter	1	+0%					99.029	-0.120	0.000	0.09			1.5
24.002	ASTD8205_9489A	15 Winter	1	+0%					98.962	-0.106	0.000	0.19			1.5
24.003	ASTD8205_9491A	15 Winter	1	+0%					98.874	-0.146	0.000	0.27			18.6
23.006	ASTD8205_9494A	15 Winter	1	+0%	1/15 Summer				98.780	0.369	0.000	2.63			56.8
21.002	ASTD8205_9193A	15 Winter	1	+0%	1/15 Summer				98.149	1.046	0.000	3.97			86.0
21.003	ASTD8205_9190B	15 Winter	1	+0%					96.941	-0.091	0.000	0.93			85.7
21.004	ASTD8205_9091A	15 Winter	1	+0%					96.685	-0.287	0.000	0.13			85.7
21.005	ASTD8205_8789A	60 Winter	1	+0%	1/60 Winter				93.076	0.000	0.000	1.37			72.7
21.006	ASTD8205_8688A	15 Winter	1	+0%					92.821	-0.229	0.000	0.32			88.9
27.000	ATSD8205_5278A	15 Winter	1	+0%					102.933	-0.152	0.000	0.22			16.0
27.001	ATSD8205_6285B	15 Winter	1	+0%					100.436	-0.109	0.000	0.52			35.5
27.002	ATSD8205_6588A	15 Winter	1	+0%					99.572	-0.097	0.000	0.61			34.9
27.003	ATSD8205_7191A	15 Winter	1	+0%	1/15 Summer				98.908	0.115	0.000	1.14			38.6
28.000	ATSD8205_5675A	15 Winter	1	+0%					105.093	-0.115	0.000	0.11			1.7
28.001	EXDN01-05	15 Winter	1	+0%					103.967	-0.103	0.000	0.21			5.1
28.002	EXDN01-06	15 Winter	1	+0%					101.616	-0.102	0.000	0.22			6.6
28.003	EXDN01-07	15 Winter	1	+0%					100.799	-0.076	0.000	0.48			6.4
28.004	EXDN01-08	15 Winter	1	+0%					100.466	-0.069	0.000	0.57			6.6
29.000	EXDN01	15 Winter	1	+0%					103.182	-0.113	0.000	0.13			2.4
29.001	EXDN01	15 Winter	1	+0%					101.921	-0.104	0.000	0.20			4.0
29.002	EXDN01	15 Winter	1	+0%					100.974	-0.089	0.000	0.34			5.9

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
22.001	EXMH01	OK	
21.001	ASTD8206_8501A	SURCHARGED	
23.000	ASTD8206_1314A	OK*	
23.001	ASTD8206_0809C	OK*	
23.002	ASTD8206_9901C	SURCHARGED	
23.003	ASTD8306_0000B	OK	
23.004	ASTD8205_9899A	OK	
23.005	ASTD8205_9596A	SURCHARGED	
24.000	ASTD8205_9486C	OK	
25.000	ASTD8205_0177B	OK*	
25.001	ASTD8205_9488A	OK	
26.000	ASTD8205_9388E	OK	
24.001	EXDN01-04	OK*	
24.002	ASTD8205_9489A	OK	
24.003	ASTD8205_9491A	OK	
23.006	ASTD8205_9494A	SURCHARGED	
21.002	ASTD8205_9193A	SURCHARGED	
21.003	ASTD8205_9190B	OK	
21.004	ASTD8205_9091A	OK	
21.005	ASTD8205_8789A	SURCHARGED	
21.006	ASTD8205_8688A	OK	
27.000	ATSD8205_5278A	OK	
27.001	ATSD8205_6285B	OK	
27.002	ATSD8205_6588A	OK	
27.003	ATSD8205_7191A	SURCHARGED	
28.000	ATSD8205_5675A	OK	
28.001	EXDN01-05	OK	
28.002	EXDN01-06	OK*	
28.003	EXDN01-07	OK*	
28.004	EXDN01-08	OK	
29.000	EXDN01	OK*	
29.001	EXDN01	OK*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
29.002	EXDN01	OK*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
29.003	EXDN01	15 Winter	1	+0%					100.334	-0.078	0.000	0.47			6.2
27.004	ATSD8205_7390A	15 Winter	1	+0%	1/15 Summer				98.799	0.105	0.000	1.01			49.2
30.000	ATSD8205_7799A	15 Summer	1	+0%					98.800	0.000	0.000	1.28			14.0
31.000	ATSD8205_7590C	15 Winter	1	+0%	1/15 Summer				98.568	0.048	0.000	0.13			1.4
32.000	EXRE01-01	15 Winter	1	+0%					100.400	-0.100	0.000	0.24			5.1
32.001	EXDN01-09	15 Winter	1	+0%					99.546	-0.082	0.000	0.41			8.0
32.002	EXDN01-10	15 Winter	1	+0%					98.597	-0.085	0.000	0.36			8.0
27.005	ATSD8205_7591C	15 Winter	1	+0%	1/15 Summer				98.570	0.105	0.000	1.19			76.4
33.000	ASTD8205_9190B_1	15 Winter	1	+0%					99.554	-0.235	0.000	0.10			11.9
33.001	EXDN01-11	15 Winter	1	+0%					98.400	-0.208	0.000	0.20			20.8
27.006	EXMH01-01	15 Winter	1	+0%					98.198	-0.012	0.000	1.00			80.9
27.007	ASTD8205_8386A	30 Winter	1	+0%					97.832	-0.296	0.000	0.10			80.9
19.004	ASTD8205_8588A	30 Winter	1	+0%					91.623	-0.367	0.000	0.43			222.1
34.000	ASTD8205_8386A_1	15 Winter	1	+0%					100.193	-0.102	0.000	0.22			5.4
34.001	ATSD8205_7697A	15 Winter	1	+0%					97.026	-0.124	0.000	0.07			5.8
19.005	ATSD8205_7898A	30 Winter	1	+0%					91.493	-0.241	0.000	0.88			219.1
35.000	EXDN01-11	15 Summer	1	+0%					91.954	-0.225	0.000	0.00			0.0
19.006	ATSD8205_7999A	30 Winter	1	+0%					91.459	-0.254	0.000	0.86			219.4
17.001	ATSD8205_8000B	30 Winter	1	+0%					91.215	-0.479	0.000	0.28			236.4
1.008	ATSD8205_7703B	30 Winter	1	+0%					90.855	-0.543	0.000	0.35			383.8
36.000	ATSD8306_0413A	15 Winter	1	+0%					104.205	-0.157	0.000	0.20			14.0
36.001	ATSD8206_9810A	15 Winter	1	+0%					102.806	-0.148	0.000	0.25			25.3
36.002	ATSD8206_9206A	15 Winter	1	+0%					100.134	-0.137	0.000	0.33			41.8
36.003	ATSD8206_8705A	15 Winter	1	+0%					95.269	-0.111	0.000	0.50			47.1
36.004	ATSD8206_8505A	15 Winter	1	+0%	1/15 Summer				94.788	0.057	0.000	1.37			49.7
36.005	ATSD8206_8405A	15 Winter	1	+0%					94.538	-0.117	0.000	0.68			52.0
37.000	ATSD8206_7613A	15 Summer	1	+0%					95.830	-0.150	0.000	0.00			0.0
1.009	ATSD8206_8206A	30 Winter	1	+0%					90.761	-0.529	0.000	0.49			413.3
1.010	ATSD8206_8408A	30 Winter	1	+0%					90.617	-0.625	0.000	0.34			401.4
1.011	ATSD8206_8408E	30 Winter	1	+0%					90.294	-0.646	0.000	0.31			384.1
1.012	ATSD8206_8408F	30 Winter	1	+0%					89.792	-0.772	0.000	0.16			378.4

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
29.003	EXDN01	OK*	
27.004	ATSD8205_7390A	SURCHARGED	
30.000	ATSD8205_7799A	SURCHARGED*	
31.000	ATSD8205_7590C	SURCHARGED	
32.000	EXRE01-01	OK	
32.001	EXDN01-09	OK*	
32.002	EXDN01-10	OK*	
27.005	ATSD8205_7591C	SURCHARGED	
33.000	ASTD8205_9190B_1	OK	
33.001	EXDN01-11	OK	
27.006	EXMH01-01	OK	
27.007	ASTD8205_8386A	OK	
19.004	ASTD8205_8588A	OK	
34.000	ASTD8205_8386A_1	OK*	
34.001	ATSD8205_7697A	OK	
19.005	ATSD8205_7898A	OK	
35.000	EXDN01-11	OK*	
19.006	ATSD8205_7999A	OK	
17.001	ATSD8205_8000B	OK	
1.008	ATSD8205_7703B	OK	
36.000	ATSD8306_0413A	OK	
36.001	ATSD8206_9810A	OK	
36.002	ATSD8206_9206A	OK	
36.003	ATSD8206_8705A	OK	
36.004	ATSD8206_8505A	SURCHARGED	
36.005	ATSD8206_8405A	OK	
37.000	ATSD8206_7613A	OK*	
1.009	ATSD8206_8206A	OK	
1.010	ATSD8206_8408A	OK	
1.011	ATSD8206_8408E	OK	
1.012	ATSD8206_8408F	OK	

Simulation Criteria for Existing Catchment - 1A

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	ASTD8206_6904A	15 Winter	5	+0%	100/15 Summer				97.347	-0.203	0.000	0.23			38.9
1.001	ASTD8206_6709A	15 Winter	5	+0%	30/15 Summer				95.898	-0.084	0.000	0.44			39.3
2.000	ASTD8206_6512B	15 Summer	5	+0%	30/15 Summer				96.736	-0.150	0.000	0.00			0.0
1.002	ASTD8206_6809A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			95.885	0.107	0.000	1.47			40.8
1.003	ASTD8206_6910A	15 Winter	5	+0%	5/15 Winter	30/15 Winter			95.792	0.062	0.000	1.01			67.5
3.000	ASTD8206_6809A_1	15 Winter	5	+0%					95.654	-0.124	0.000	0.07			1.5
3.001	ASTD8206_6220A	15 Winter	5	+0%					93.553	-0.282	0.000	0.01			1.5
1.004	ASTD8206_6321A	15 Winter	5	+0%					93.466	-0.143	0.000	0.54			68.6
4.000	ASTD8206_6324A	15 Summer	5	+0%					93.357	0.000	0.000	2.09			14.3

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
1.000	ASTD8206_6904A	OK	
1.001	ASTD8206_6709A	OK	
2.000	ASTD8206_6512B	OK	
1.002	ASTD8206_6809A	SURCHARGED	5
1.003	ASTD8206_6910A	SURCHARGED	8
3.000	ASTD8206_6809A_1	OK*	
3.001	ASTD8206_6220A	OK	
1.004	ASTD8206_6321A	OK	
4.000	ASTD8206_6324A	SURCHARGED*	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.005	ASTD8206_6422A	15 Winter	5	+0%					93.154	-0.155	0.000	0.47			84.6
5.000	ASTD8206_6034A	15 Summer	5	+0%					92.849	0.000	0.000	1.21			21.9
5.001	EXDN01-01	15 Summer	5	+0%					91.999	0.000	0.000	1.10			22.7
6.000	ASTD8206_6030B	15 Summer	5	+0%					93.002	0.000	0.000	1.41			19.2
6.001	ASTD8206_6226A	15 Winter	5	+0%	100/15 Summer				92.591	-0.155	0.000	0.21			19.8
5.002	ASTD8206_6427A	15 Winter	5	+0%	5/15 Summer				92.071	0.181	0.000	1.15			54.0
7.000	ASTD8206_7216A	15 Winter	5	+0%	5/15 Summer	30/15 Winter			94.578	0.122	0.000	1.02			29.7
7.001	EXDN01-02	15 Winter	5	+0%					92.204	-0.052	0.000	0.75			29.7
8.000	ASTD8206_6331A	15 Winter	5	+0%					92.079	-0.093	0.000	0.30			2.2
9.000	ASTD8206_7315C	15 Summer	5	+0%					95.101	-0.150	0.000	0.00			0.0
8.001	ASTD8206_6823A	15 Winter	5	+0%	30/15 Summer				91.926	-0.036	0.000	0.23			4.5
10.000	ASTD8206_6427B	15 Winter	5	+0%					92.352	-0.133	0.000	0.03			0.6
10.001	EXDN01-03	15 Winter	5	+0%					91.921	-0.014	0.000	0.08			1.4
5.003	ASTD8206_6723A	15 Winter	5	+0%	5/15 Summer				91.923	0.066	0.000	1.46			82.4
11.000	ASTD8206_Pipe B	15 Winter	5	+0%					92.005	-0.186	0.000	0.07			4.7
1.006	ASTD8206_6622A	15 Winter	5	+0%	5/15 Summer				91.881	0.053	0.000	1.10			178.6
12.000	ASTD8206_6422A_1	15 Summer	5	+0%					93.309	0.000	0.000	1.11			22.9
13.000	ASTD8206_6912A	15 Summer	5	+0%					93.082	-0.225	0.000	0.00			0.0
12.001	ASTD8206_7013B	15 Winter	5	+0%					91.830	-0.145	0.000	0.27			23.3
1.007	ASTD8206_7114A	15 Winter	5	+0%	30/15 Winter				91.393	-0.178	0.000	0.80			229.4
14.000	ASTD8206_7013B_1	15 Winter	5	+0%					92.987	-0.076	0.000	0.67			28.8
15.000	ASTD8206_7999A_1	15 Winter	5	+0%					92.318	-0.082	0.000	0.41			4.9
16.000	ASTD8206_7700A	15 Winter	5	+0%					92.203	-0.056	0.000	0.69			5.2
16.001	ASTD8206_7502A	15 Winter	5	+0%	30/15 Summer				92.163	-0.058	0.000	0.89			13.6
14.001	ASTD8206_7703A	15 Winter	5	+0%					92.070	-0.124	0.000	0.41			47.2
17.000	ASTD8206_8592B	15 Summer	5	+0%					92.457	0.000	0.000	1.50			24.7
18.000	ASTD8205_9091A_1	15 Winter	5	+0%					100.249	-0.114	0.000	0.13			3.9
18.001	ASTD8206_8201B	15 Winter	5	+0%					95.736	-0.127	0.000	0.06			3.9
19.000	ASTD8205_9676C	15 Winter	5	+0%					96.131	-0.104	0.000	0.53			40.2
19.001	ASTD8205_9085A	15 Winter	5	+0%	30/15 Summer				93.753	0.000	0.000	0.81			44.5
19.002	ASTD8205_8985A	15 Winter	5	+0%	30/15 Summer				93.726	0.000	0.000	1.05			42.6
20.000	ASTD8205_9474C	15 Winter	5	+0%	30/15 Summer	100/15 Summer			96.102	-0.075	0.000	0.77			57.6
19.003	ASTD8205_8884A	15 Winter	5	+0%					93.474	-0.231	0.000	0.31			111.1

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
1.005	ASTD8206_6422A	OK	
5.000	ASTD8206_6034A	SURCHARGED*	
5.001	EXDN01-01	SURCHARGED*	
6.000	ASTD8206_6030B	SURCHARGED*	
6.001	ASTD8206_6226A	OK	
5.002	ASTD8206_6427A	SURCHARGED	
7.000	ASTD8206_7216A	SURCHARGED	6
7.001	EXDN01-02	OK*	
8.000	ASTD8206_6331A	OK*	
9.000	ASTD8206_7315C	OK*	
8.001	ASTD8206_6823A	OK	
10.000	ASTD8206_6427B	OK*	
10.001	EXDN01-03	OK*	
5.003	ASTD8206_6723A	SURCHARGED	
11.000	ASTD8206_Pipe B	OK*	
1.006	ASTD8206_6622A	SURCHARGED	
12.000	ASTD8206_6422A_1	SURCHARGED*	
13.000	ASTD8206_6912A	OK	
12.001	ASTD8206_7013B	OK	
1.007	ASTD8206_7114A	OK	
14.000	ASTD8206_7013B_1	OK*	
15.000	ASTD8206_7999A_1	OK*	
16.000	ASTD8206_7700A	OK*	
16.001	ASTD8206_7502A	OK	
14.001	ASTD8206_7703A	OK	
17.000	ASTD8206_8592B	SURCHARGED*	
18.000	ASTD8205_9091A_1	OK*	
18.001	ASTD8206_8201B	OK	
19.000	ASTD8205_9676C	OK*	
19.001	ASTD8205_9085A	OK	
19.002	ASTD8205_8985A	OK	
20.000	ASTD8205_9474C	OK	3

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
19.003	ASTD8205_8884A	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
21.000	ASTD8206_7900A	30 Winter	5	+0%	5/15 Summer	30/15 Summer			99.821	1.871	0.000	0.61			10.9
22.000	EXDN01	15 Winter	5	+0%					104.565	-0.178	0.000	0.10			8.1
22.001	EXMH01	30 Winter	5	+0%	5/15 Summer				99.703	0.552	0.000	0.16			10.1
21.001	ASTD8206_8501A	30 Winter	5	+0%	5/15 Summer	30/15 Summer			99.685	2.377	0.000	1.87			41.8
23.000	ASTD8206_1314A	15 Winter	5	+0%					105.114	-0.109	0.000	0.17			4.4
23.001	ASTD8206_0809C	15 Winter	5	+0%					103.236	-0.184	0.000	0.08			4.3
23.002	ASTD8206_9901C	15 Winter	5	+0%	5/15 Summer	100/15 Summer			101.657	0.076	0.000	2.56			40.3
23.003	ASTD8306_0000B	15 Winter	5	+0%	30/15 Summer				101.424	-0.128	0.000	0.38			47.0
23.004	ASTD8205_9899A	15 Winter	5	+0%	30/15 Summer	100/15 Summer			100.260	-0.097	0.000	0.61			56.8
23.005	ASTD8205_9596A	15 Winter	5	+0%	5/15 Summer	30/15 Summer			99.788	1.034	0.000	0.93			59.2
24.000	ASTD8205_9486C	15 Winter	5	+0%	5/15 Summer				99.507	0.277	0.000	0.25			3.0
25.000	ASTD8205_0177B	15 Winter	5	+0%					104.701	-0.127	0.000	0.06			1.4
25.001	ASTD8205_9488A	15 Winter	5	+0%					101.721	-0.139	0.000	0.02			1.4
26.000	ASTD8205_9388E	15 Winter	5	+0%	5/15 Winter				99.505	0.133	0.000	0.07			2.1
24.001	EXDN01-04	15 Winter	5	+0%	5/15 Summer				99.504	0.355	0.000	0.53			8.9
24.002	ASTD8205_9489A	15 Winter	5	+0%	5/15 Summer				99.508	0.440	0.000	1.52			11.7
24.003	ASTD8205_9491A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			99.534	0.514	0.000	0.38			26.4
23.006	ASTD8205_9494A	15 Winter	5	+0%	5/15 Summer	30/15 Summer			99.506	1.095	0.000	3.22			69.7
21.002	ASTD8205_9193A	15 Winter	5	+0%	5/15 Summer				98.932	1.829	0.000	5.13			111.3
21.003	ASTD8205_9190B	15 Winter	5	+0%	5/15 Summer				97.040	0.008	0.000	1.20			111.1
21.004	ASTD8205_9091A	15 Winter	5	+0%					96.698	-0.274	0.000	0.16			111.2
21.005	ASTD8205_8789A	15 Winter	5	+0%	5/15 Summer				93.121	0.045	0.000	2.20			116.3
21.006	ASTD8205_8688A	30 Winter	5	+0%					92.845	-0.205	0.000	0.42			117.0
27.000	ATSD8205_5278A	15 Winter	5	+0%	100/15 Summer				102.956	-0.129	0.000	0.35			26.3
27.001	ATSD8205_6285B	15 Winter	5	+0%	30/15 Summer	30/15 Winter			100.503	-0.042	0.000	0.85			58.3
27.002	ATSD8205_6588A	15 Winter	5	+0%	5/15 Summer	30/15 Summer			100.151	0.482	0.000	0.84			48.4
27.003	ATSD8205_7191A	15 Winter	5	+0%	5/15 Summer	30/15 Summer			99.706	0.913	0.000	1.46			49.4
28.000	ATSD8205_5675A	15 Winter	5	+0%					105.103	-0.105	0.000	0.19			2.8
28.001	EXDN01-05	15 Winter	5	+0%					103.982	-0.088	0.000	0.34			8.4
28.002	EXDN01-06	15 Winter	5	+0%					101.630	-0.088	0.000	0.36			10.8
28.003	EXDN01-07	15 Winter	5	+0%					100.828	-0.047	0.000	0.79			10.5
28.004	EXDN01-08	15 Winter	5	+0%	30/15 Summer				100.499	-0.036	0.000	0.93			10.9
29.000	EXDN01	15 Winter	5	+0%					103.193	-0.102	0.000	0.22			3.9

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
21.000	ASTD8206_7900A	FLOOD RISK	18
22.000	EXDN01	OK*	
22.001	EXMH01	SURCHARGED	
21.001	ASTD8206_8501A	FLOOD RISK	18
23.000	ASTD8206_1314A	OK*	
23.001	ASTD8206_0809C	OK*	
23.002	ASTD8206_9901C	SURCHARGED	4
23.003	ASTD8306_0000B	OK	
23.004	ASTD8205_9899A	OK	4
23.005	ASTD8205_9596A	FLOOD RISK	16
24.000	ASTD8205_9486C	SURCHARGED	
25.000	ASTD8205_0177B	OK*	
25.001	ASTD8205_9488A	OK	
26.000	ASTD8205_9388E	SURCHARGED	
24.001	EXDN01-04	SURCHARGED*	
24.002	ASTD8205_9489A	SURCHARGED	
24.003	ASTD8205_9491A	SURCHARGED	4
23.006	ASTD8205_9494A	SURCHARGED	15
21.002	ASTD8205_9193A	SURCHARGED	
21.003	ASTD8205_9190B	SURCHARGED	
21.004	ASTD8205_9091A	OK	
21.005	ASTD8205_8789A	SURCHARGED	
21.006	ASTD8205_8688A	OK	
27.000	ATSD8205_5278A	OK	
27.001	ATSD8205_6285B	OK	7
27.002	ATSD8205_6588A	SURCHARGED	10
27.003	ATSD8205_7191A	FLOOD RISK	15
28.000	ATSD8205_5675A	OK	
28.001	EXDN01-05	OK	
28.002	EXDN01-06	OK*	
28.003	EXDN01-07	OK*	
28.004	EXDN01-08	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
29.000	EXDN01	OK*	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
29.001	EXDN01	15 Winter	5	+0%					101.935	-0.090	0.000	0.33			6.7
29.002	EXDN01	15 Winter	5	+0%					100.994	-0.069	0.000	0.55			9.8
29.003	EXDN01	15 Winter	5	+0%					100.361	-0.051	0.000	0.77			10.2
27.004	ATSD8205_7390A	15 Winter	5	+0%	5/15 Summer				99.496	0.802	0.000	1.42			69.0
30.000	ATSD8205_7799A	15 Summer	5	+0%					98.800	0.000	0.000	1.62			17.8
31.000	ATSD8205_7590C	15 Winter	5	+0%	5/15 Summer				99.035	0.515	0.000	0.18			1.9
32.000	EXRE01-01	15 Winter	5	+0%	30/15 Winter				100.415	-0.085	0.000	0.39			8.4
32.001	EXDN01-09	15 Winter	5	+0%					99.571	-0.057	0.000	0.68			13.2
32.002	EXDN01-10	15 Summer	5	+0%					98.682	0.000	0.000	0.50			11.3
27.005	ATSD8205_7591C	15 Winter	5	+0%	5/15 Summer	100/15 Summer			99.037	0.572	0.000	1.66			106.9
33.000	ASTD8205_9190B_1	15 Winter	5	+0%					99.573	-0.216	0.000	0.17			19.5
33.001	EXDN01-11	15 Winter	5	+0%	100/15 Summer				98.428	-0.180	0.000	0.33			34.1
27.006	EXMH01-01	15 Winter	5	+0%	5/15 Summer				98.299	0.089	0.000	1.50			121.5
27.007	ASTD8205_8386A	15 Winter	5	+0%					97.849	-0.279	0.000	0.15			121.7
19.004	ASTD8205_8588A	30 Winter	5	+0%	30/15 Winter				91.749	-0.241	0.000	0.64			325.6
34.000	ASTD8205_8386A_1	15 Winter	5	+0%					100.208	-0.087	0.000	0.36			8.8
34.001	ATSD8205_7697A	15 Winter	5	+0%					97.034	-0.116	0.000	0.12			9.5
19.005	ATSD8205_7898A	30 Winter	5	+0%	30/15 Summer				91.644	-0.090	0.000	1.26			313.1
35.000	EXDN01-11	15 Summer	5	+0%					91.954	-0.225	0.000	0.00			0.0
19.006	ATSD8205_7999A	30 Winter	5	+0%	100/15 Summer				91.562	-0.151	0.000	1.22			313.1
17.001	ATSD8205_8000B	30 Winter	5	+0%					91.277	-0.417	0.000	0.41			342.1
1.008	ATSD8205_7703B	30 Winter	5	+0%	100/15 Winter				91.010	-0.388	0.000	0.53			579.1
36.000	ATSD8306_0413A	15 Winter	5	+0%					104.226	-0.136	0.000	0.32			23.0
36.001	ATSD8206_9810A	15 Winter	5	+0%	100/15 Summer				102.831	-0.123	0.000	0.42			41.6
36.002	ATSD8206_9206A	15 Winter	5	+0%	30/15 Summer				100.164	-0.107	0.000	0.53			68.7
36.003	ATSD8206_8705A	15 Winter	5	+0%	5/15 Winter	100/15 Summer			95.476	0.096	0.000	0.81			75.7
36.004	ATSD8206_8505A	15 Winter	5	+0%	5/15 Summer				95.041	0.310	0.000	2.21			80.0
36.005	ATSD8206_8405A	15 Winter	5	+0%	5/15 Summer				94.668	0.013	0.000	1.10			83.3
37.000	ATSD8206_7613A	15 Summer	5	+0%					95.830	-0.150	0.000	0.00			0.0
1.009	ATSD8206_8206A	30 Winter	5	+0%	100/15 Winter				90.919	-0.371	0.000	0.75			625.8
1.010	ATSD8206_8408A	30 Winter	5	+0%					90.731	-0.511	0.000	0.51			611.1
1.011	ATSD8206_8408E	30 Winter	5	+0%					90.405	-0.535	0.000	0.47			590.8
1.012	ATSD8206_8408F	30 Winter	5	+0%					89.864	-0.700	0.000	0.24			583.9

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
29.001	EXDN01	OK*	
29.002	EXDN01	OK*	
29.003	EXDN01	OK*	
27.004	ATSD8205_7390A	SURCHARGED	
30.000	ATSD8205_7799A	SURCHARGED*	
31.000	ATSD8205_7590C	SURCHARGED	
32.000	EXRE01-01	OK	
32.001	EXDN01-09	OK*	
32.002	EXDN01-10	SURCHARGED*	
27.005	ATSD8205_7591C	SURCHARGED	5
33.000	ASTD8205_9190B_1	OK	
33.001	EXDN01-11	OK	
27.006	EXMH01-01	SURCHARGED	
27.007	ASTD8205_8386A	OK	
19.004	ASTD8205_8588A	OK	
34.000	ASTD8205_8386A_1	OK*	
34.001	ATSD8205_7697A	OK	
19.005	ATSD8205_7898A	OK	
35.000	EXDN01-11	OK*	
19.006	ATSD8205_7999A	OK	
17.001	ATSD8205_8000B	OK	
1.008	ATSD8205_7703B	OK	
36.000	ATSD8306_0413A	OK	
36.001	ATSD8206_9810A	OK	
36.002	ATSD8206_9206A	OK	
36.003	ATSD8206_8705A	SURCHARGED	3
36.004	ATSD8206_8505A	SURCHARGED	
36.005	ATSD8206_8405A	SURCHARGED	
37.000	ATSD8206_7613A	OK*	
1.009	ATSD8206_8206A	OK	
1.010	ATSD8206_8408A	OK	
1.011	ATSD8206_8408E	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 1A

PN	US/MH Name	Status	Level Exceeded
1.012	ATSD8206_8408F	OK	

Simulation Criteria for Existing catchment 02

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.800	Cv (Summer)	0.750
Return Period (years)	1	Ratio R	0.314	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Summer	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.359 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status OFF
Analysis Timestep Fine DVD 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	ATSD8206_6030A	15 Summer	1	+0%					93.252	-0.150	0.000	0.00			0.0	OK
1.001	ATSD8206_5638A	15 Winter	1	+0%					92.455	-0.108	0.000	0.52			20.5	OK
2.000	ATSD8206_5935C	15 Winter	1	+0%					92.754	-0.138	0.000	0.02			0.3	OK
1.002	ATSD8206_5739A	15 Winter	1	+0%					92.405	-0.046	0.000	0.99			29.6	OK
1.003	EBMH7	15 Winter	1	+0%					92.177	-0.237	0.000	0.26			29.3	OK
3.000	ATSD8206_4845A	15 Winter	1	+0%					98.767	-0.133	0.000	0.03			0.9	OK*
4.000	ATSD8206_4455B	15 Winter	1	+0%					99.120	-0.128	0.000	0.05			1.3	OK*
3.001	ATSD8206_4749A	15 Winter	1	+0%					97.282	-0.134	0.000	0.03			2.2	OK
5.000	ATSD8206_5437B	15 Winter	1	+0%					93.861	-0.098	0.000	0.26			4.2	OK*
3.002	ATSD8206_4950A	15 Winter	1	+0%					92.381	-0.170	0.000	0.14			6.4	OK
6.000	ATSD8206_5539A	15 Summer	1	+0%					93.132	-0.225	0.000	0.00			0.0	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Level Exceeded
1.000	ATSD8206_6030A	
1.001	ATSD8206_5638A	
2.000	ATSD8206_5935C	
1.002	ATSD8206_5739A	
1.003	EBMH7	
3.000	ATSD8206_4845A	
4.000	ATSD8206_4455B	
3.001	ATSD8206_4749A	
5.000	ATSD8206_5437B	
3.002	ATSD8206_4950A	
6.000	ATSD8206_5539A	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
3.003	ATSD8206_5050A	15 Winter	1	+0%					92.308	-0.066	0.000	0.83			29.4
3.004	ATSD8206_5151A	15 Winter	1	+0%					92.150	-0.131	0.000	0.37			29.5
1.004	EBMH6	15 Winter	1	+0%					91.824	-0.130	0.000	0.72			80.5
7.000	ATSD8206_4455A	15 Winter	1	+0%					99.097	-0.146	0.000	0.01			0.3
8.000	ATSD8206_4262A	15 Winter	1	+0%					97.469	-0.130	0.000	0.04			0.9
7.001	ATSD8206_4457A	15 Winter	1	+0%					96.575	-0.140	0.000	0.01			1.2
9.000	ATSD8206_4850A	15 Winter	1	+0%					93.252	-0.102	0.000	0.23			3.8
7.002	ATSD8206_4558A	15 Winter	1	+0%					92.190	-0.171	0.000	0.13			5.0
10.000	ATSD8206_4954B	15 Summer	1	+0%					92.662	-0.150	0.000	0.00			0.0
7.003	ATSD8206_4758A	15 Winter	1	+0%					92.140	-0.113	0.000	0.49			18.3
7.004	ATSD8206_4859A	15 Winter	1	+0%					91.991	-0.159	0.000	0.19			18.3
1.005	ATSD8206_4959A	15 Winter	1	+0%					91.562	-0.108	0.000	0.82			110.0
1.006	EBMH3	15 Winter	1	+0%	1/15 Winter				91.195	0.020	0.000	1.31			107.2
11.000	ATSD8206_4558B	15 Winter	1	+0%					93.045	-0.099	0.000	0.25			4.5
11.001	ATSD8206_4167A	15 Winter	1	+0%					91.655	-0.187	0.000	0.07			4.5
12.000	ATSD8206_4660C	15 Summer	1	+0%					92.310	-0.150	0.000	0.00			0.0
13.000	ATSD8206_4368C	15 Summer	1	+0%					91.839	-0.150	0.000	0.00			0.0
11.002	ATSD8206_4368A	15 Winter	1	+0%					91.337	-0.136	0.000	0.33			22.5
1.007	ATSD8206_4468D	15 Winter	1	+0%					91.028	-0.132	0.000	0.76			131.7

PN	US/MH Name	Status	Level Exceeded
3.003	ATSD8206_5050A	OK	
3.004	ATSD8206_5151A	OK	
1.004	EBMH6	OK	
7.000	ATSD8206_4455A	OK*	
8.000	ATSD8206_4262A	OK*	
7.001	ATSD8206_4457A	OK	
9.000	ATSD8206_4850A	OK*	
7.002	ATSD8206_4558A	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
10.000	ATSD8206_4954B	OK	
7.003	ATSD8206_4758A	OK	
7.004	ATSD8206_4859A	OK	
1.005	ATSD8206_4959A	OK	
1.006	EBMH3	SURCHARGED	
11.000	ATSD8206_4558B	OK*	
11.001	ATSD8206_4167A	OK	
12.000	ATSD8206_4660C	OK	
13.000	ATSD8206_4368C	OK	
11.002	ATSD8206_4368A	OK	
1.007	ATSD8206_4468D	OK	

Simulation Criteria for Existing catchment 02

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.800	Cv (Summer)	0.750
Return Period (years)	1	Ratio R	0.314	Cv (Winter)	0.840
Region	England and Wales	Profile Type	Summer	Storm Duration (mins)	30

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	ATSD8206_6030A	15 Summer	5	+0%	30/15 Summer				93.252	-0.150	0.000	0.00			0.0
1.001	ATSD8206_5638A	15 Winter	5	+0%	5/15 Summer	100/15 Winter			92.594	0.031	0.000	0.83			32.7
2.000	ATSD8206_5935C	15 Winter	5	+0%	30/15 Summer	100/15 Summer			92.758	-0.134	0.000	0.03			0.5
1.002	ATSD8206_5739A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			92.515	0.064	0.000	1.56			46.6
1.003	EBMH7	15 Winter	5	+0%	30/15 Summer				92.219	-0.195	0.000	0.41			47.0
3.000	ATSD8206_4845A	15 Winter	5	+0%					98.771	-0.129	0.000	0.05			1.4
4.000	ATSD8206_4455B	15 Winter	5	+0%					99.127	-0.121	0.000	0.08			2.2
3.001	ATSD8206_4749A	15 Winter	5	+0%					97.286	-0.130	0.000	0.04			3.6
5.000	ATSD8206_5437B	15 Winter	5	+0%					93.877	-0.082	0.000	0.41			6.6
3.002	ATSD8206_4950A	15 Winter	5	+0%	30/15 Summer				92.453	-0.098	0.000	0.23			10.6

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
1.000	ATSD8206_6030A	OK	
1.001	ATSD8206_5638A	SURCHARGED	1
2.000	ATSD8206_5935C	OK	5
1.002	ATSD8206_5739A	SURCHARGED	4
1.003	EBMH7	OK	
3.000	ATSD8206_4845A	OK*	
4.000	ATSD8206_4455B	OK*	
3.001	ATSD8206_4749A	OK	
5.000	ATSD8206_5437B	OK*	
3.002	ATSD8206_4950A	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
6.000	ATSD8206_5539A	15 Summer	5	+0%	30/15 Winter				93.132	-0.225	0.000	0.00			0.0
3.003	ATSD8206_5050A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			92.434	0.060	0.000	1.32			46.9
3.004	ATSD8206_5151A	15 Winter	5	+0%	30/15 Summer	100/15 Summer			92.180	-0.101	0.000	0.58			46.7
1.004	EBMH6	15 Winter	5	+0%	5/15 Summer	100/15 Summer			92.100	0.146	0.000	0.93			103.3
7.000	ATSD8206_4455A	15 Winter	5	+0%					99.100	-0.143	0.000	0.01			0.5
8.000	ATSD8206_4262A	15 Winter	5	+0%					97.475	-0.124	0.000	0.07			1.4
7.001	ATSD8206_4457A	15 Winter	5	+0%					96.580	-0.135	0.000	0.02			1.9
9.000	ATSD8206_4850A	15 Winter	5	+0%					93.267	-0.087	0.000	0.37			6.2
7.002	ATSD8206_4558A	15 Winter	5	+0%	30/15 Summer				92.213	-0.148	0.000	0.22			8.2
10.000	ATSD8206_4954B	15 Summer	5	+0%	30/15 Winter				92.662	-0.150	0.000	0.00			0.0
7.003	ATSD8206_4758A	15 Winter	5	+0%	30/15 Summer				92.183	-0.070	0.000	0.80			29.9
7.004	ATSD8206_4859A	15 Winter	5	+0%	30/15 Summer	100/15 Summer			92.011	-0.139	0.000	0.31			30.0
1.005	ATSD8206_4959A	15 Winter	5	+0%	5/15 Summer				91.860	0.189	0.000	1.06			142.1
1.006	EBMH3	15 Winter	5	+0%	5/15 Summer				91.290	0.115	0.000	1.77			144.8
11.000	ATSD8206_4558B	15 Winter	5	+0%					93.061	-0.083	0.000	0.41			7.3
11.001	ATSD8206_4167A	15 Winter	5	+0%	100/15 Summer				91.666	-0.176	0.000	0.11			7.3
12.000	ATSD8206_4660C	15 Summer	5	+0%					92.310	-0.150	0.000	0.00			0.0
13.000	ATSD8206_4368C	15 Summer	5	+0%	100/15 Summer				91.839	-0.150	0.000	0.00			0.0
11.002	ATSD8206_4368A	15 Winter	5	+0%	30/15 Summer				91.366	-0.107	0.000	0.54			36.9
1.007	ATSD8206_4468D	30 Winter	5	+0%	5/30 Winter				91.164	0.004	0.000	1.04			179.7

PN	US/MH Name	Status	Level Exceeded
6.000	ATSD8206_5539A	OK	
3.003	ATSD8206_5050A	SURCHARGED	4
3.004	ATSD8206_5151A	OK	6
1.004	EBMH6	SURCHARGED	5
7.000	ATSD8206_4455A	OK*	
8.000	ATSD8206_4262A	OK*	
7.001	ATSD8206_4457A	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
9.000	ATSD8206_4850A	OK*	
7.002	ATSD8206_4558A	OK	
10.000	ATSD8206_4954B	OK	
7.003	ATSD8206_4758A	OK	
7.004	ATSD8206_4859A	OK	5
1.005	ATSD8206_4959A	SURCHARGED	
1.006	EBMH3	SURCHARGED	
11.000	ATSD8206_4558B	OK*	
11.001	ATSD8206_4167A	OK	
12.000	ATSD8206_4660C	OK	
13.000	ATSD8206_4368C	OK	
11.002	ATSD8206_4368A	OK	
1.007	ATSD8206_4468D	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	ATSD8206_6030A	15 Winter	30	+0%	30/15 Summer				93.644	0.242	0.000	0.11			1.7
1.001	ATSD8206_5638A	15 Winter	30	+0%	5/15 Summer	100/15 Winter			93.695	1.132	0.000	1.37			53.6
2.000	ATSD8206_5935C	15 Winter	30	+0%	30/15 Summer	100/15 Summer			93.577	0.685	0.000	0.22			3.7
1.002	ATSD8206_5739A	15 Winter	30	+0%	5/15 Summer	100/15 Summer			93.604	1.153	0.000	2.51			75.1
1.003	EBMH7	15 Winter	30	+0%	30/15 Summer				93.492	1.079	0.000	0.53			59.7
3.000	ATSD8206_4845A	15 Winter	30	+0%					98.778	-0.122	0.000	0.08			2.4
4.000	ATSD8206_4455B	15 Winter	30	+0%					99.136	-0.112	0.000	0.14			3.7
3.001	ATSD8206_4749A	15 Winter	30	+0%					97.292	-0.124	0.000	0.07			6.1
5.000	ATSD8206_5437B	30 Summer	30	+0%					93.959	0.000	0.000	0.63			10.1
3.002	ATSD8206_4950A	30 Winter	30	+0%	30/15 Summer				93.689	1.138	0.000	0.44			20.5

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
1.000	ATSD8206_6030A	SURCHARGED	
1.001	ATSD8206_5638A	SURCHARGED	1
2.000	ATSD8206_5935C	SURCHARGED	5
1.002	ATSD8206_5739A	SURCHARGED	4
1.003	EBMH7	SURCHARGED	
3.000	ATSD8206_4845A	OK*	
4.000	ATSD8206_4455B	OK*	
3.001	ATSD8206_4749A	OK	
5.000	ATSD8206_5437B	SURCHARGED*	
3.002	ATSD8206_4950A	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
6.000	ATSD8206_5539A	30 Winter	30	+0%	30/15 Winter				93.660	0.303	0.000	0.04			1.9
3.003	ATSD8206_5050A	30 Winter	30	+0%	5/15 Summer	100/15 Summer			93.661	1.287	0.000	1.71			60.5
3.004	ATSD8206_5151A	30 Winter	30	+0%	30/15 Summer	100/15 Summer			93.494	1.213	0.000	0.64			51.4
1.004	EBMH6	15 Winter	30	+0%	5/15 Summer	100/15 Summer			93.401	1.446	0.000	1.28			142.0
7.000	ATSD8206_4455A	15 Winter	30	+0%					99.105	-0.138	0.000	0.02			0.9
8.000	ATSD8206_4262A	15 Winter	30	+0%					97.483	-0.116	0.000	0.12			2.4
7.001	ATSD8206_4457A	15 Winter	30	+0%					96.584	-0.131	0.000	0.04			3.2
9.000	ATSD8206_4850A	15 Winter	30	+0%					93.354	0.000	0.000	0.61			10.3
7.002	ATSD8206_4558A	30 Winter	30	+0%	30/15 Summer				93.061	0.700	0.000	0.43			16.2
10.000	ATSD8206_4954B	30 Winter	30	+0%	30/15 Winter				93.036	0.224	0.000	0.10			1.8
7.003	ATSD8206_4758A	30 Winter	30	+0%	30/15 Summer				93.038	0.786	0.000	1.05			39.4
7.004	ATSD8206_4859A	30 Winter	30	+0%	30/15 Summer	100/15 Summer			92.966	0.816	0.000	0.37			35.7
1.005	ATSD8206_4959A	30 Winter	30	+0%	5/15 Summer				92.935	1.265	0.000	1.50			201.0
1.006	EBMH3	30 Winter	30	+0%	5/15 Summer				91.787	0.611	0.000	2.47			202.1
11.000	ATSD8206_4558B	15 Winter	30	+0%					93.086	-0.058	0.000	0.70			12.3
11.001	ATSD8206_4167A	15 Winter	30	+0%	100/15 Summer				91.707	-0.135	0.000	0.19			12.6
12.000	ATSD8206_4660C	15 Summer	30	+0%					92.310	-0.150	0.000	0.00			0.0
13.000	ATSD8206_4368C	15 Summer	30	+0%	100/15 Summer				91.839	-0.150	0.000	0.00			0.0
11.002	ATSD8206_4368A	15 Winter	30	+0%	30/15 Summer				91.685	0.212	0.000	0.92			63.1
1.007	ATSD8206_4468D	15 Winter	30	+0%	5/30 Winter				91.537	0.377	0.000	1.56			270.1

PN	US/MH Name	Status	Level Exceeded
6.000	ATSD8206_5539A	SURCHARGED	
3.003	ATSD8206_5050A	SURCHARGED	4
3.004	ATSD8206_5151A	SURCHARGED	6
1.004	EBMH6	SURCHARGED	5
7.000	ATSD8206_4455A	OK*	
8.000	ATSD8206_4262A	OK*	
7.001	ATSD8206_4457A	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
9.000	ATSD8206_4850A	SURCHARGED*	
7.002	ATSD8206_4558A	SURCHARGED	
10.000	ATSD8206_4954B	SURCHARGED	
7.003	ATSD8206_4758A	SURCHARGED	
7.004	ATSD8206_4859A	SURCHARGED	5
1.005	ATSD8206_4959A	SURCHARGED	
1.006	EBMH3	SURCHARGED	
11.000	ATSD8206_4558B	OK*	
11.001	ATSD8206_4167A	OK	
12.000	ATSD8206_4660C	OK	
13.000	ATSD8206_4368C	OK	
11.002	ATSD8206_4368A	SURCHARGED	
1.007	ATSD8206_4468D	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	ATSD8206_6030A	15 Winter	100	+0%	30/15 Summer				94.416	1.014	0.000	0.20			3.2
1.001	ATSD8206_5638A	15 Winter	100	+0%	5/15 Summer	100/15 Winter			94.500	1.937	0.210	1.66			65.2
2.000	ATSD8206_5935C	30 Winter	100	+0%	30/15 Summer	100/15 Summer			94.094	1.202	1.848	0.66			11.3
1.002	ATSD8206_5739A	15 Winter	100	+0%	5/15 Summer	100/15 Summer			94.162	1.711	3.614	2.50			74.7
1.003	EBMH7	15 Summer	100	+0%	30/15 Summer				94.002	1.588	0.000	0.56			63.2
3.000	ATSD8206_4845A	15 Winter	100	+0%					98.783	-0.117	0.000	0.11			3.2
4.000	ATSD8206_4455B	15 Winter	100	+0%					99.142	-0.106	0.000	0.19			4.9
3.001	ATSD8206_4749A	15 Winter	100	+0%					97.297	-0.119	0.000	0.09			8.1
5.000	ATSD8206_5437B	15 Summer	100	+0%					93.959	0.000	0.000	0.74			11.8
3.002	ATSD8206_4950A	30 Winter	100	+0%	30/15 Summer				94.274	1.723	0.000	0.64			29.8

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
1.000	ATSD8206_6030A	FLOOD RISK	
1.001	ATSD8206_5638A	FLOOD	1
2.000	ATSD8206_5935C	FLOOD	5
1.002	ATSD8206_5739A	FLOOD	4
1.003	EBMH7	FLOOD RISK	
3.000	ATSD8206_4845A	OK*	
4.000	ATSD8206_4455B	OK*	
3.001	ATSD8206_4749A	OK	
5.000	ATSD8206_5437B	SURCHARGED*	
3.002	ATSD8206_4950A	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
6.000	ATSD8206_5539A	15 Winter	100	+0%	30/15 Winter				94.241	0.884	0.000	0.09			4.0
3.003	ATSD8206_5050A	15 Winter	100	+0%	5/15 Summer	100/15 Summer			94.241	1.867	1.840	2.09			74.1
3.004	ATSD8206_5151A	30 Winter	100	+0%	30/15 Summer	100/15 Summer			93.849	1.568	23.139	1.41			113.1
1.004	EBMH6	30 Winter	100	+0%	5/15 Summer	100/15 Summer			93.823	1.868	6.882	1.40			155.6
7.000	ATSD8206_4455A	15 Winter	100	+0%					99.108	-0.135	0.000	0.02			1.1
8.000	ATSD8206_4262A	15 Winter	100	+0%					97.489	-0.110	0.000	0.16			3.2
7.001	ATSD8206_4457A	15 Winter	100	+0%					96.586	-0.129	0.000	0.05			4.3
9.000	ATSD8206_4850A	15 Summer	100	+0%					93.354	0.000	0.000	0.76			12.8
7.002	ATSD8206_4558A	15 Winter	100	+0%	30/15 Summer				93.643	1.282	0.000	0.63			23.5
10.000	ATSD8206_4954B	30 Winter	100	+0%	30/15 Winter				93.614	0.802	0.000	0.16			2.9
7.003	ATSD8206_4758A	15 Winter	100	+0%	30/15 Summer				93.627	1.374	0.000	1.29			48.2
7.004	ATSD8206_4859A	30 Winter	100	+0%	30/15 Summer	100/15 Summer			93.435	1.284	6.727	0.58			56.8
1.005	ATSD8206_4959A	15 Winter	100	+0%	5/15 Summer				93.464	1.794	0.000	1.66			221.5
1.006	EBMH3	30 Winter	100	+0%	5/15 Summer				92.140	0.965	0.000	2.75			225.1
11.000	ATSD8206_4558B	15 Winter	100	+0%					93.144	0.000	0.000	0.92			16.4
11.001	ATSD8206_4167A	15 Winter	100	+0%	100/15 Summer				92.188	0.346	0.000	0.32			21.7
12.000	ATSD8206_4660C	15 Summer	100	+0%					92.310	-0.150	0.000	0.00			0.0
13.000	ATSD8206_4368C	15 Winter	100	+0%	100/15 Summer				92.158	0.169	0.000	0.07			2.6
11.002	ATSD8206_4368A	15 Winter	100	+0%	30/15 Summer				92.160	0.687	0.000	1.08			74.2
1.007	ATSD8206_4468D	15 Winter	100	+0%	5/30 Winter				91.858	0.698	0.000	1.90			329.7

PN	US/MH Name	Status	Level Exceeded
6.000	ATSD8206_5539A	FLOOD RISK	
3.003	ATSD8206_5050A	FLOOD	4
3.004	ATSD8206_5151A	FLOOD	6
1.004	EBMH6	FLOOD	5
7.000	ATSD8206_4455A	OK*	
8.000	ATSD8206_4262A	OK*	
7.001	ATSD8206_4457A	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing catchment 02

PN	US/MH Name	Status	Level Exceeded
9.000	ATSD8206_4850A	SURCHARGED*	
7.002	ATSD8206_4558A	SURCHARGED	
10.000	ATSD8206_4954B	SURCHARGED	
7.003	ATSD8206_4758A	FLOOD RISK	
7.004	ATSD8206_4859A	FLOOD	5
1.005	ATSD8206_4959A	FLOOD RISK	
1.006	EBMH3	SURCHARGED	
11.000	ATSD8206_4558B	SURCHARGED*	
11.001	ATSD8206_4167A	SURCHARGED	
12.000	ATSD8206_4660C	OK	
13.000	ATSD8206_4368C	SURCHARGED	
11.002	ATSD8206_4368A	SURCHARGED	
1.007	ATSD8206_4468D	SURCHARGED	

Simulation Criteria for Existing Cathment - 04

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.359 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DTS Status ON Inertia Status OFF
Analysis Timestep Fine DVD 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH TOPO 1.0	15 Winter	1	+0%					98.772	-0.089	0.000	0.35			17.8
2.000	ATSD8205_7580A	15 Winter	1	+0%	1/15 Winter				98.860	0.036	0.000	1.11			34.3
2.001	ATSD8205_7981A	15 Winter	1	+0%					98.457	-0.166	0.000	0.16			34.2
1.001	ATSD8205_8081A	15 Winter	1	+0%					95.395	-0.305	0.000	0.23			51.0
3.000	ATSD8205_6376A	15 Winter	1	+0%					103.536	-0.172	0.000	0.13			13.7
3.001	ATSD8205_7179A	15 Winter	1	+0%					99.069	-0.193	0.000	0.05			13.9
4.000	GNATSD8205_8081A	30 Winter	1	+0%	1/15 Summer				99.396	0.233	0.000	1.20			15.0
1.002	ATSD8205_7278A	15 Winter	1	+0%					94.932	-0.311	0.000	0.21			71.0
1.003	UNKATSD8205_6472A	15 Winter	1	+0%					94.312	-0.312	0.000	0.21			70.8
5.000	GNATSD8205_7278A	30 Winter	1	+0%					99.346	-0.095	0.000	0.29			8.2
1.004	ATSD8205_6472A	15 Winter	1	+0%					93.577	-0.282	0.000	0.29			76.0

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	MH TOPO 1.0	OK	
2.000	ATSD8205_7580A	SURCHARGED	
2.001	ATSD8205_7981A	OK	
1.001	ATSD8205_8081A	OK	
3.000	ATSD8205_6376A	OK	
3.001	ATSD8205_7179A	OK	
4.000	GNATSD8205_8081A	SURCHARGED	
1.002	ATSD8205_7278A	OK	
1.003	UNKATSD8205_6472A	OK	
5.000	GNATSD8205_7278A	OK	
1.004	ATSD8205_6472A	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
6.000	GNATSD8205_6472A	30 Winter	1	+0%					95.999	-0.040	0.000	0.85			16.5	OK

PN	US/MH Name	Level Exceeded
6.000	GNATSD8205_6472A	

Simulation Criteria for Existing Cathment - 04

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH TOPO 1.0	15 Winter	5	+0%	100/15 Summer				98.793	-0.068	0.000	0.58			29.3
2.000	ATSD8205_7580A	15 Winter	5	+0%	5/15 Summer	30/15 Winter			99.203	0.379	0.000	1.76			54.3
2.001	ATSD8205_7981A	15 Winter	5	+0%					98.474	-0.149	0.000	0.25			54.4
1.001	ATSD8205_8081A	15 Winter	5	+0%					95.437	-0.263	0.000	0.36			80.9
3.000	ATSD8205_6376A	15 Winter	5	+0%					103.553	-0.155	0.000	0.21			22.5
3.001	ATSD8205_7179A	15 Winter	5	+0%					99.080	-0.182	0.000	0.08			22.7
4.000	GNATSD8205_8081A	30 Winter	5	+0%	5/15 Summer	5/15 Summer			99.767	0.604	3.703	1.46			18.2
1.002	ATSD8205_7278A	30 Winter	5	+0%					94.965	-0.278	0.000	0.31			106.3
1.003	UNKATSD8205_6472A	30 Winter	5	+0%					94.345	-0.279	0.000	0.31			106.4
5.000	GNATSD8205_7278A	30 Winter	5	+0%	100/30 Winter				99.363	-0.078	0.000	0.47			13.4

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	MH TOPO 1.0	OK	
2.000	ATSD8205_7580A	SURCHARGED	8
2.001	ATSD8205_7981A	OK	
1.001	ATSD8205_8081A	OK	
3.000	ATSD8205_6376A	OK	
3.001	ATSD8205_7179A	OK	
4.000	GNATSD8205_8081A	FLOOD	27
1.002	ATSD8205_7278A	OK	
1.003	UNKATSD8205_6472A	OK	
5.000	GNATSD8205_7278A	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.004	ATSD8205_6472A	30 Winter	5	+0%					93.623	-0.236	0.000	0.45			117.5
6.000	GNATSD8205_6472A	30 Winter	5	+0%	5/15 Summer	30/15 Summer			96.486	0.447	0.000	1.08			20.9

PN	US/MH Name	Status	Level Exceeded
1.004	ATSD8205_6472A	OK	
6.000	GNATSD8205_6472A	FLOOD RISK	17

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH TOPO 1.0	15 Winter	30	+0%	100/15 Summer				98.829	-0.032	0.000	0.97			49.3
2.000	ATSD8205_7580A	15 Winter	30	+0%	5/15 Summer	30/15 Winter			100.026	1.202	0.411	2.76			85.2
2.001	ATSD8205_7981A	15 Winter	30	+0%					98.495	-0.128	0.000	0.39			85.2
1.001	ATSD8205_8081A	15 Winter	30	+0%					95.496	-0.204	0.000	0.57			129.3
3.000	ATSD8205_6376A	15 Winter	30	+0%					103.575	-0.133	0.000	0.35			37.9
3.001	ATSD8205_7179A	15 Winter	30	+0%					99.093	-0.169	0.000	0.14			38.3
4.000	GNATSD8205_8081A	30 Winter	30	+0%	5/15 Summer	5/15 Summer			99.786	0.623	23.076	1.47			18.3
1.002	ATSD8205_7278A	30 Winter	30	+0%					95.015	-0.228	0.000	0.49			165.9
1.003	UNKATSD8205_6472A	30 Winter	30	+0%					94.394	-0.230	0.000	0.48			165.7
5.000	GNATSD8205_7278A	30 Winter	30	+0%	100/30 Winter				99.394	-0.047	0.000	0.81			22.9

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	MH TOPO 1.0	OK	
2.000	ATSD8205_7580A	FLOOD	8
2.001	ATSD8205_7981A	OK	
1.001	ATSD8205_8081A	OK	
3.000	ATSD8205_6376A	OK	
3.001	ATSD8205_7179A	OK	
4.000	GNATSD8205_8081A	FLOOD	27
1.002	ATSD8205_7278A	OK	
1.003	UNKATSD8205_6472A	OK	
5.000	GNATSD8205_7278A	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.004	ATSD8205_6472A	30 Winter	30	+0%					93.694	-0.165	0.000	0.71			184.9
6.000	GNATSD8205_6472A	30 Winter	30	+0%	5/15 Summer	30/15 Summer			96.653	0.614	14.458	1.12			21.6

PN	US/MH Name	Status	Level Exceeded
1.004	ATSD8205_6472A	OK	
6.000	GNATSD8205_6472A	FLOOD	17

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH TOPO 1.0	15 Winter	100	+0%	100/15 Summer				99.619	0.758	0.000	1.11			56.4
2.000	ATSD8205_7580A	30 Winter	100	+0%	5/15 Summer	30/15 Winter			100.040	1.216	14.256	2.79			86.0
2.001	ATSD8205_7981A	30 Winter	100	+0%					98.495	-0.128	0.000	0.39			86.0
1.001	ATSD8205_8081A	15 Winter	100	+0%					95.509	-0.191	0.000	0.63			142.0
3.000	ATSD8205_6376A	15 Winter	100	+0%					103.592	-0.116	0.000	0.46			50.5
3.001	ATSD8205_7179A	15 Winter	100	+0%					99.102	-0.160	0.000	0.18			50.9
4.000	GNATSD8205_8081A	60 Winter	100	+0%	5/15 Summer	5/15 Summer			99.806	0.643	43.320	1.48			18.5
1.002	ATSD8205_7278A	15 Winter	100	+0%					95.035	-0.208	0.000	0.57			191.3
1.003	UNKATSD8205_6472A	15 Winter	100	+0%					94.414	-0.210	0.000	0.55			189.5
5.000	GNATSD8205_7278A	30 Winter	100	+0%	100/30 Winter				99.560	0.119	0.000	1.02			28.8

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	MH TOPO 1.0	SURCHARGED	
2.000	ATSD8205_7580A	FLOOD	8
2.001	ATSD8205_7981A	OK	
1.001	ATSD8205_8081A	OK	
3.000	ATSD8205_6376A	OK	
3.001	ATSD8205_7179A	OK	
4.000	GNATSD8205_8081A	FLOOD	27
1.002	ATSD8205_7278A	OK	
1.003	UNKATSD8205_6472A	OK	
5.000	GNATSD8205_7278A	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Cathment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.004	ATSD8205_6472A	30 Winter	100	+0%					93.727	-0.132	0.000	0.83			214.2
6.000	GNATSD8205_6472A	30 Winter	100	+0%	5/15 Summer	30/15 Summer			96.669	0.630	29.870	1.13			21.7

PN	US/MH Name	Status	Level Exceeded
1.004	ATSD8205_6472A	OK	
6.000	GNATSD8205_6472A	FLOOD	17

Simulation Criteria for Existing Catchment - 05

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.358 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status ON
Analysis Timestep 2.5 Second Increment (Extended) Inertia Status ON
DTS 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
EX1.000	MH01-001	15 Winter	1	+0%					99.645	-0.055	0.000	0.41			4.7	OK
EX1.001	MH01-002	15 Winter	1	+0%					98.543	-0.037	0.000	0.70			7.0	OK
EX2.000	MH02-001	15 Winter	1	+0%					98.856	-0.114	0.000	0.13			4.5	OK
EX1.002	MH01-003	15 Winter	1	+0%	1/15 Summer				98.006	0.139	0.000	1.03			26.0	SURCHARGED
EX1.003	MH01-004	15 Winter	1	+0%	1/15 Summer				96.699	0.049	0.000	1.11			26.8	SURCHARGED
EX1.004	MH01-005	15 Winter	1	+0%					96.212	-0.188	0.000	0.30			41.4	OK
EX3.000	MH02-001	15 Winter	1	+0%					95.558	-0.152	0.000	0.47			35.9	OK
EX4.000	MH04-001	15 Winter	1	+0%	1/15 Summer				101.906	0.868	0.000	1.32			20.5	SURCHARGED
EX5.000	MH05-001	15 Winter	1	+0%					105.219	-0.131	0.000	0.04			1.4	OK*
EX5.001	MH05-002	15 Winter	1	+0%					99.856	-0.123	0.000	0.07			1.4	OK*

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Level Exceeded
EX1.000	MH01-001	
EX1.001	MH01-002	
EX2.000	MH02-001	
EX1.002	MH01-003	
EX1.003	MH01-004	
EX1.004	MH01-005	
EX3.000	MH02-001	
EX4.000	MH04-001	
EX5.000	MH05-001	
EX5.001	MH05-002	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
EX4.001	MH04-002	15 Winter	1	+0%					99.697	-0.189	0.000	0.28			44.0	OK
EX4.002	MH04-003	15 Winter	1	+0%					96.962	-0.175	0.000	0.36			51.1	OK
EX1.005	MH01-006	15 Winter	1	+0%					95.358	-0.232	0.000	0.47			130.7	OK
EX1.006	MH01-007	15 Winter	1	+0%					95.214	-0.078	0.000	0.65			123.2	OK
EX1.007	MH01-008	15 Winter	1	+0%					95.180	0.000	0.000	0.99			131.5	OK
EX1.008	MH01-009	15 Winter	1	+0%	1/15 Winter				95.072	0.012	0.000	1.01			137.6	SURCHARGED
EX1.009	MH01-010	30 Winter	1	+0%					94.850	-0.026	0.000	0.99			134.6	OK
EX1.010	MH01-011	30 Winter	1	+0%					94.683	-0.026	0.000	1.00			134.7	OK
EX1.011	MH01-012	30 Winter	1	+0%					94.522	-0.029	0.000	0.99			131.6	OK
EX1.012	MH01-013	30 Winter	1	+0%					94.414	-0.010	0.000	0.97			130.0	OK
EX1.013	MH01-014	60 Winter	1	+0%	1/30 Winter				94.307	0.019	0.000	0.41			131.2	SURCHARGED
EX6.000	MH06-001	15 Winter	1	+0%					100.303	-0.097	0.000	0.23			2.8	OK*
EX6.001	MH06-002	30 Winter	1	+0%					99.377	-0.089	0.000	0.33			4.1	OK
EX6.002	MH06-003	15 Winter	1	+0%					98.872	-0.076	0.000	0.45			13.1	OK
EX7.000	MH07-001	15 Winter	1	+0%					97.556	-0.095	0.000	0.28			6.3	OK*
EX6.003	MH06-004	60 Winter	1	+0%	1/15 Summer				94.221	0.689	0.000	0.50			13.1	FLOOD RISK
EX8.000	MH08-001	15 Winter	1	+0%	1/15 Summer				99.369	0.719	0.000	0.87			21.8	SURCHARGED
EX8.001	MH08-002	15 Winter	1	+0%	1/15 Summer				97.769	1.720	0.000	1.43			32.5	SURCHARGED
EX6.004	MH06-005	60 Winter	1	+0%	1/15 Summer				94.202	0.720	0.000	0.69			40.4	SURCHARGED
EX1.014	MH01-015	60 Winter	1	+0%	1/15 Summer				94.123	0.750	0.000	3.35			152.2	SURCHARGED
EX9.000	MH09-001	15 Winter	1	+0%					100.354	-0.127	0.000	0.05			1.0	OK
EX9.001	MH09-002	15 Winter	1	+0%					97.993	-0.090	0.000	0.30			6.3	OK
EX9.002	MH09-003	15 Winter	1	+0%					96.123	-0.071	0.000	0.54			12.2	OK
EX1.015	MH01-016	60 Summer	1	+0%					93.300	0.000	0.000	1.34			149.2	OK
EX10.000	MH10-001	15 Winter	1	+0%					104.453	-0.097	0.000	0.27			6.4	OK*
EX11.000	MH11-001	15 Summer	1	+0%					97.080	0.000	0.000	1.50			11.8	SURCHARGED*
EX11.001	MH11-002	15 Summer	1	+0%					97.001	0.000	0.000	1.06			8.3	SURCHARGED*
EX11.002	MH11-003	15 Winter	1	+0%	1/15 Winter				96.725	0.001	0.000	1.02			7.9	SURCHARGED
EX10.001	MH10-002	30 Winter	1	+0%					96.385	-0.124	0.000	0.40			16.4	OK
EX10.002	MH10-003	30 Winter	1	+0%					95.502	-0.123	0.000	0.40			21.6	OK
EX12.000	MH12-001	15 Winter	1	+0%					95.636	-0.122	0.000	0.08			1.5	OK*
EX10.003	MH10-004	30 Winter	1	+0%					93.313	-0.125	0.000	0.41			22.9	OK
EX1.016	MH01-017	60 Winter	1	+0%					93.091	-0.188	0.000	0.73			182.8	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Level Exceeded
EX4.001	MH04-002	
EX4.002	MH04-003	
EX1.005	MH01-006	
EX1.006	MH01-007	
EX1.007	MH01-008	
EX1.008	MH01-009	
EX1.009	MH01-010	
EX1.010	MH01-011	
EX1.011	MH01-012	
EX1.012	MH01-013	
EX1.013	MH01-014	
EX6.000	MH06-001	
EX6.001	MH06-002	
EX6.002	MH06-003	
EX7.000	MH07-001	
EX6.003	MH06-004	
EX8.000	MH08-001	
EX8.001	MH08-002	
EX6.004	MH06-005	
EX1.014	MH01-015	
EX9.000	MH09-001	
EX9.001	MH09-002	
EX9.002	MH09-003	
EX1.015	MH01-016	
EX10.000	MH10-001	
EX11.000	MH11-001	
EX11.001	MH11-002	
EX11.002	MH11-003	
EX10.001	MH10-002	
EX10.002	MH10-003	
EX12.000	MH12-001	
EX10.003	MH10-004	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Level Exceeded
EX1.016	MH01-017	

Simulation Criteria for Existing Catchment - 05

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
EX1.000	MH01-001	15 Winter	5	+0%	30/15 Summer	100/15 Winter			99.661	-0.039	0.000	0.67			7.7
EX1.001	MH01-002	15 Winter	5	+0%	5/15 Summer	100/15 Summer			99.278	0.698	0.000	0.82			8.1
EX2.000	MH02-001	15 Winter	5	+0%	30/15 Summer				98.931	-0.039	0.000	0.21			7.5
EX1.002	MH01-003	15 Winter	5	+0%	5/15 Summer	30/15 Summer			98.911	1.044	0.000	1.29			32.5
EX1.003	MH01-004	30 Winter	5	+0%	5/15 Summer	30/15 Summer			96.893	0.243	0.000	1.33			32.2
EX1.004	MH01-005	30 Winter	5	+0%	5/30 Winter	30/15 Winter			96.557	0.157	0.000	0.38			52.6
EX3.000	MH02-001	30 Winter	5	+0%	5/15 Summer	30/15 Winter			96.484	0.774	0.000	0.61			46.6
EX4.000	MH04-001	15 Winter	5	+0%	5/15 Summer	5/15 Summer			102.245	1.207	6.920	1.43			22.2
EX5.000	MH05-001	15 Winter	5	+0%					105.225	-0.125	0.000	0.07			2.3

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX1.000	MH01-001	OK	3
EX1.001	MH01-002	SURCHARGED	5
EX2.000	MH02-001	OK	
EX1.002	MH01-003	SURCHARGED	14
EX1.003	MH01-004	SURCHARGED	16
EX1.004	MH01-005	SURCHARGED	13
EX3.000	MH02-001	SURCHARGED	13
EX4.000	MH04-001	FLOOD	26
EX5.000	MH05-001	OK*	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
EX5.001	MH05-002	15 Winter	5	+0%					99.864	-0.115	0.000	0.12			2.3
EX4.001	MH04-002	15 Winter	5	+0%	100/15 Summer				99.723	-0.163	0.000	0.41			64.0
EX4.002	MH04-003	15 Winter	5	+0%	30/15 Summer	30/15 Winter			96.995	-0.142	0.000	0.54			75.8
EX1.005	MH01-006	30 Winter	5	+0%	5/15 Summer				96.467	0.877	0.000	0.55			151.7
EX1.006	MH01-007	30 Winter	5	+0%	5/15 Summer				96.306	1.014	0.000	0.79			148.6
EX1.007	MH01-008	30 Winter	5	+0%	5/15 Summer				96.194	1.014	0.000	1.20			158.5
EX1.008	MH01-009	30 Winter	5	+0%	5/15 Summer				96.124	1.064	0.000	1.33			181.4
EX1.009	MH01-010	30 Winter	5	+0%	5/15 Summer				95.971	1.095	0.000	1.40			189.6
EX1.010	MH01-011	30 Winter	5	+0%	5/15 Summer				95.757	1.048	0.000	1.46			197.1
EX1.011	MH01-012	30 Winter	5	+0%	5/15 Summer				95.498	0.947	0.000	1.42			188.3
EX1.012	MH01-013	30 Winter	5	+0%	5/15 Summer				95.260	0.836	0.000	1.42			190.3
EX1.013	MH01-014	30 Winter	5	+0%	5/15 Summer				94.985	0.697	0.000	0.61			195.5
EX6.000	MH06-001	15 Winter	5	+0%					100.320	-0.080	0.000	0.39			4.6
EX6.001	MH06-002	30 Winter	5	+0%	30/15 Summer	100/15 Winter			99.397	-0.069	0.000	0.55			6.8
EX6.002	MH06-003	15 Winter	5	+0%	30/15 Summer	100/15 Winter			98.900	-0.048	0.000	0.74			21.4
EX7.000	MH07-001	15 Winter	5	+0%					97.574	-0.077	0.000	0.45			10.3
EX6.003	MH06-004	60 Winter	5	+0%	5/15 Summer	5/15 Summer			94.471	0.939	38.632	1.90			49.8
EX8.000	MH08-001	15 Winter	5	+0%	5/15 Summer	30/15 Summer			101.718	3.068	0.000	0.94			23.5
EX8.001	MH08-002	15 Winter	5	+0%	5/15 Summer	30/15 Summer			99.879	3.830	0.000	1.83			41.4
EX6.004	MH06-005	30 Winter	5	+0%	5/15 Summer				94.615	1.133	0.000	1.10			64.2
EX1.014	MH01-015	30 Winter	5	+0%	5/15 Summer				94.639	1.266	0.000	4.27			193.9
EX9.000	MH09-001	15 Winter	5	+0%					100.362	-0.119	0.000	0.08			1.7
EX9.001	MH09-002	15 Winter	5	+0%	30/15 Summer				98.013	-0.070	0.000	0.49			10.4
EX9.002	MH09-003	15 Winter	5	+0%	30/15 Summer				96.155	-0.039	0.000	0.88			20.1
EX1.015	MH01-016	30 Winter	5	+0%	30/15 Summer				93.300	0.000	0.000	1.80			201.1
EX10.000	MH10-001	15 Winter	5	+0%					104.470	-0.080	0.000	0.44			10.4
EX11.000	MH11-001	15 Summer	5	+0%					97.080	0.000	0.000	1.90			14.9
EX11.001	MH11-002	15 Summer	5	+0%					97.001	0.000	0.000	1.48			11.6
EX11.002	MH11-003	30 Winter	5	+0%	5/15 Summer				96.854	0.130	0.000	1.26			9.8
EX10.001	MH10-002	30 Winter	5	+0%	100/15 Summer				96.411	-0.098	0.000	0.58			23.8
EX10.002	MH10-003	30 Winter	5	+0%	30/15 Summer				95.534	-0.091	0.000	0.62			33.8
EX12.000	MH12-001	15 Winter	5	+0%					95.644	-0.114	0.000	0.13			2.4
EX10.003	MH10-004	30 Winter	5	+0%	30/15 Summer				93.344	-0.094	0.000	0.64			36.0

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX5.001	MH05-002	OK*	
EX4.001	MH04-002	OK	
EX4.002	MH04-003	OK	11
EX1.005	MH01-006	SURCHARGED	
EX1.006	MH01-007	SURCHARGED	
EX1.007	MH01-008	SURCHARGED	
EX1.008	MH01-009	SURCHARGED	
EX1.009	MH01-010	SURCHARGED	
EX1.010	MH01-011	SURCHARGED	
EX1.011	MH01-012	SURCHARGED	
EX1.012	MH01-013	SURCHARGED	
EX1.013	MH01-014	SURCHARGED	
EX6.000	MH06-001	OK*	
EX6.001	MH06-002	OK	3
EX6.002	MH06-003	OK	1
EX7.000	MH07-001	OK*	
EX6.003	MH06-004	FLOOD	34
EX8.000	MH08-001	SURCHARGED	17
EX8.001	MH08-002	SURCHARGED	14
EX6.004	MH06-005	SURCHARGED	
EX1.014	MH01-015	SURCHARGED	
EX9.000	MH09-001	OK	
EX9.001	MH09-002	OK	
EX9.002	MH09-003	OK	
EX1.015	MH01-016	OK	
EX10.000	MH10-001	OK*	
EX11.000	MH11-001	SURCHARGED*	
EX11.001	MH11-002	SURCHARGED*	
EX11.002	MH11-003	SURCHARGED	
EX10.001	MH10-002	OK	
EX10.002	MH10-003	OK	
EX12.000	MH12-001	OK*	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX10.003	MH10-004	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
EX1.016	MH01-017	60 Winter	5	+0%	30/15 Summer				93.185	-0.094	0.000	0.99			247.0	OK

PN	US/MH Name	Level Exceeded
EX1.016	MH01-017	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
EX1.000	MH01-001	15 Winter	30	+0%	30/15 Summer	100/15 Winter			100.551	0.851	0.000	0.76			8.7
EX1.001	MH01-002	15 Winter	30	+0%	5/15 Summer	100/15 Summer			100.346	1.766	0.000	0.88			8.8
EX2.000	MH02-001	15 Winter	30	+0%	30/15 Summer				99.975	1.005	0.000	0.37			13.0
EX1.002	MH01-003	15 Winter	30	+0%	5/15 Summer	30/15 Summer			99.783	1.916	6.870	1.43			36.1
EX1.003	MH01-004	60 Winter	30	+0%	5/15 Summer	30/15 Summer			97.917	1.267	23.463	2.45			59.5
EX1.004	MH01-005	30 Winter	30	+0%	5/30 Winter	30/15 Winter			97.874	1.474	47.494	0.83			115.4
EX3.000	MH02-001	30 Winter	30	+0%	5/15 Summer	30/15 Winter			98.192	2.482	14.950	0.99			75.9
EX4.000	MH04-001	30 Winter	30	+0%	5/15 Summer	5/15 Summer			102.268	1.230	30.459	1.44			22.3
EX5.000	MH05-001	15 Winter	30	+0%					105.233	-0.117	0.000	0.11			3.9

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX1.000	MH01-001	FLOOD RISK	3
EX1.001	MH01-002	FLOOD RISK	5
EX2.000	MH02-001	SURCHARGED	
EX1.002	MH01-003	FLOOD	14
EX1.003	MH01-004	FLOOD	16
EX1.004	MH01-005	FLOOD	13
EX3.000	MH02-001	FLOOD	13
EX4.000	MH04-001	FLOOD	26
EX5.000	MH05-001	OK*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
EX5.001	MH05-002	15 Winter	30	+0%					99.875	-0.104	0.000	0.21			3.9
EX4.001	MH04-002	15 Winter	30	+0%	100/15 Summer				99.788	-0.098	0.000	0.74			114.3
EX4.002	MH04-003	30 Winter	30	+0%	30/15 Summer	30/15 Winter			98.343	1.206	5.995	0.74			103.9
EX1.005	MH01-006	30 Winter	30	+0%	5/15 Summer				98.265	2.675	0.000	0.80			220.6
EX1.006	MH01-007	30 Winter	30	+0%	5/15 Summer				98.291	2.999	0.000	1.18			222.8
EX1.007	MH01-008	30 Winter	30	+0%	5/15 Summer				98.293	3.113	0.000	1.64			216.9
EX1.008	MH01-009	30 Winter	30	+0%	5/15 Summer				98.287	3.227	0.000	1.59			216.1
EX1.009	MH01-010	30 Winter	30	+0%	5/15 Summer				98.202	3.326	0.000	1.82			246.8
EX1.010	MH01-011	30 Winter	30	+0%	5/15 Summer				97.904	3.195	0.000	2.03			273.1
EX1.011	MH01-012	30 Winter	30	+0%	5/15 Summer				97.418	2.867	0.000	1.95			258.8
EX1.012	MH01-013	30 Winter	30	+0%	5/15 Summer				96.988	2.564	0.000	2.03			271.8
EX1.013	MH01-014	30 Winter	30	+0%	5/15 Summer				96.413	2.125	0.000	0.89			286.1
EX6.000	MH06-001	15 Winter	30	+0%					100.352	-0.048	0.000	0.65			7.7
EX6.001	MH06-002	15 Winter	30	+0%	30/15 Summer	100/15 Winter			99.858	0.392	0.000	1.07			13.3
EX6.002	MH06-003	15 Winter	30	+0%	30/15 Summer	100/15 Winter			99.753	0.805	0.000	0.97			28.1
EX7.000	MH07-001	15 Winter	30	+0%					97.604	-0.047	0.000	0.76			17.4
EX6.003	MH06-004	60 Winter	30	+0%	5/15 Summer	5/15 Summer			94.619	1.087	186.758	3.01			78.8
EX8.000	MH08-001	30 Winter	30	+0%	5/15 Summer	30/15 Summer			102.200	3.550	21.378	1.26			31.4
EX8.001	MH08-002	30 Winter	30	+0%	5/15 Summer	30/15 Summer			101.510	5.461	5.118	2.01			45.5
EX6.004	MH06-005	30 Winter	30	+0%	5/15 Summer				95.481	1.999	0.000	0.97			56.9
EX1.014	MH01-015	30 Winter	30	+0%	5/15 Summer				95.666	2.293	0.000	5.10			231.9
EX9.000	MH09-001	15 Winter	30	+0%					100.371	-0.110	0.000	0.13			2.8
EX9.001	MH09-002	15 Winter	30	+0%	30/15 Summer				98.396	0.313	0.000	0.80			16.9
EX9.002	MH09-003	15 Winter	30	+0%	30/15 Summer				97.286	1.092	0.000	1.23			28.0
EX1.015	MH01-016	30 Winter	30	+0%	30/15 Summer				93.739	0.439	0.000	2.32			258.9
EX10.000	MH10-001	15 Winter	30	+0%					104.497	-0.053	0.000	0.75			17.6
EX11.000	MH11-001	15 Summer	30	+0%					97.080	0.000	0.000	2.64			20.6
EX11.001	MH11-002	15 Summer	30	+0%					97.001	0.000	0.000	2.08			16.3
EX11.002	MH11-003	30 Winter	30	+0%	5/15 Summer				97.433	0.709	0.000	1.97			15.2
EX10.001	MH10-002	30 Winter	30	+0%	100/15 Summer				96.451	-0.058	0.000	0.85			35.2
EX10.002	MH10-003	30 Winter	30	+0%	30/15 Summer				95.785	0.160	0.000	0.95			51.3
EX12.000	MH12-001	15 Winter	30	+0%					95.656	-0.102	0.000	0.22			4.1
EX10.003	MH10-004	30 Winter	30	+0%	30/15 Summer				93.775	0.337	0.000	1.00			56.0

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX5.001	MH05-002	OK*	
EX4.001	MH04-002	OK	
EX4.002	MH04-003	FLOOD	11
EX1.005	MH01-006	SURCHARGED	
EX1.006	MH01-007	SURCHARGED	
EX1.007	MH01-008	SURCHARGED	
EX1.008	MH01-009	SURCHARGED	
EX1.009	MH01-010	SURCHARGED	
EX1.010	MH01-011	SURCHARGED	
EX1.011	MH01-012	SURCHARGED	
EX1.012	MH01-013	SURCHARGED	
EX1.013	MH01-014	SURCHARGED	
EX6.000	MH06-001	OK*	
EX6.001	MH06-002	SURCHARGED	3
EX6.002	MH06-003	SURCHARGED	1
EX7.000	MH07-001	OK*	
EX6.003	MH06-004	FLOOD	34
EX8.000	MH08-001	FLOOD	17
EX8.001	MH08-002	FLOOD	14
EX6.004	MH06-005	SURCHARGED	
EX1.014	MH01-015	SURCHARGED	
EX9.000	MH09-001	OK	
EX9.001	MH09-002	SURCHARGED	
EX9.002	MH09-003	SURCHARGED	
EX1.015	MH01-016	SURCHARGED	
EX10.000	MH10-001	OK*	
EX11.000	MH11-001	SURCHARGED*	
EX11.001	MH11-002	SURCHARGED*	
EX11.002	MH11-003	SURCHARGED	
EX10.001	MH10-002	OK	
EX10.002	MH10-003	SURCHARGED	
EX12.000	MH12-001	OK*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX10.003	MH10-004	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
EX1.016	MH01-017	30 Winter	30	+0%	30/15 Summer				93.628	0.349	0.000	1.36			337.7	SURCHARGED

PN	US/MH Name	Level Exceeded
EX1.016	MH01-017	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
EX1.000	MH01-001	30 Winter	100	+0%	30/15 Summer	100/15 Winter			100.560	0.860	2.638	0.69			7.9
EX1.001	MH01-002	15 Winter	100	+0%	5/15 Summer	100/15 Summer			100.421	1.841	0.386	0.94			9.4
EX2.000	MH02-001	15 Winter	100	+0%	30/15 Summer				100.055	1.085	0.000	0.48			17.1
EX1.002	MH01-003	30 Winter	100	+0%	5/15 Summer	30/15 Summer			99.796	1.929	19.086	1.38			34.6
EX1.003	MH01-004	60 Winter	100	+0%	5/15 Summer	30/15 Summer			97.949	1.299	54.561	2.48			60.2
EX1.004	MH01-005	60 Winter	100	+0%	5/30 Winter	30/15 Winter			97.909	1.509	81.824	0.93			130.3
EX3.000	MH02-001	30 Winter	100	+0%	5/15 Summer	30/15 Winter			98.239	2.529	61.732	1.01			77.4
EX4.000	MH04-001	60 Winter	100	+0%	5/15 Summer	5/15 Summer			102.292	1.254	53.658	1.45			22.4
EX5.000	MH05-001	15 Winter	100	+0%					105.239	-0.111	0.000	0.15			5.2

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX1.000	MH01-001	FLOOD	3
EX1.001	MH01-002	FLOOD	5
EX2.000	MH02-001	SURCHARGED	
EX1.002	MH01-003	FLOOD	14
EX1.003	MH01-004	FLOOD	16
EX1.004	MH01-005	FLOOD	13
EX3.000	MH02-001	FLOOD	13
EX4.000	MH04-001	FLOOD	26
EX5.000	MH05-001	OK*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
EX5.001	MH05-002	15 Summer	100	+0%					99.979	0.000	0.000	0.41			7.8
EX4.001	MH04-002	15 Winter	100	+0%	100/15 Summer				100.156	0.270	0.000	0.86			132.5
EX4.002	MH04-003	30 Winter	100	+0%	30/15 Summer	30/15 Winter			98.400	1.263	62.722	0.89			125.5
EX1.005	MH01-006	30 Winter	100	+0%	5/15 Summer				98.555	2.965	0.000	1.01			280.7
EX1.006	MH01-007	30 Winter	100	+0%	5/15 Summer				98.851	3.559	0.000	1.49			280.1
EX1.007	MH01-008	30 Winter	100	+0%	5/15 Summer				99.082	3.902	0.000	2.04			269.8
EX1.008	MH01-009	30 Winter	100	+0%	5/15 Summer				99.398	4.338	0.000	1.87			254.5
EX1.009	MH01-010	30 Winter	100	+0%	5/15 Summer				99.468	4.592	0.000	1.94			263.1
EX1.010	MH01-011	30 Winter	100	+0%	5/15 Summer				99.392	4.683	0.000	2.25			303.0
EX1.011	MH01-012	30 Winter	100	+0%	5/15 Summer				98.919	4.368	0.000	2.12			281.8
EX1.012	MH01-013	30 Winter	100	+0%	5/15 Summer				98.454	4.030	0.000	2.32			309.3
EX1.013	MH01-014	30 Winter	100	+0%	5/15 Summer				97.692	3.404	0.000	1.06			338.0
EX6.000	MH06-001	15 Summer	100	+0%					100.400	0.000	0.000	0.76			9.0
EX6.001	MH06-002	15 Winter	100	+0%	30/15 Summer	100/15 Winter			100.523	1.057	1.025	1.36			17.0
EX6.002	MH06-003	15 Winter	100	+0%	30/15 Summer	100/15 Winter			100.532	1.584	0.257	1.04			30.0
EX7.000	MH07-001	15 Summer	100	+0%					97.651	0.000	0.000	0.87			20.0
EX6.003	MH06-004	120 Winter	100	+0%	5/15 Summer	5/15 Summer			94.735	1.203	303.260	3.11			81.6
EX8.000	MH08-001	60 Winter	100	+0%	5/15 Summer	30/15 Summer			102.221	3.571	41.623	1.27			31.8
EX8.001	MH08-002	30 Winter	100	+0%	5/15 Summer	30/15 Summer			101.522	5.473	16.718	2.05			46.6
EX6.004	MH06-005	30 Winter	100	+0%	5/15 Summer				96.230	2.748	0.000	0.94			54.8
EX1.014	MH01-015	30 Winter	100	+0%	5/15 Summer				96.641	3.268	0.000	5.82			264.7
EX9.000	MH09-001	15 Winter	100	+0%					100.378	-0.103	0.000	0.18			3.7
EX9.001	MH09-002	15 Winter	100	+0%	30/15 Summer				99.282	1.199	0.000	0.81			17.0
EX9.002	MH09-003	15 Winter	100	+0%	30/15 Summer				98.128	1.934	0.000	1.38			31.3
EX1.015	MH01-016	30 Winter	100	+0%	30/15 Summer				94.111	0.811	0.000	2.66			296.7
EX10.000	MH10-001	15 Winter	100	+0%					104.520	-0.030	0.000	1.00			23.4
EX11.000	MH11-001	15 Summer	100	+0%					97.080	0.000	0.000	3.26			25.5
EX11.001	MH11-002	15 Summer	100	+0%					97.001	0.000	0.000	2.43			19.0
EX11.002	MH11-003	30 Winter	100	+0%	5/15 Summer				98.500	1.776	0.000	2.40			18.5
EX10.001	MH10-002	30 Winter	100	+0%	100/15 Summer				97.479	0.970	0.000	1.05			43.2
EX10.002	MH10-003	30 Winter	100	+0%	30/15 Summer				96.506	0.881	0.000	1.06			57.6
EX12.000	MH12-001	15 Winter	100	+0%					95.664	-0.094	0.000	0.30			5.4
EX10.003	MH10-004	30 Winter	100	+0%	30/15 Summer				94.132	0.694	0.000	1.19			67.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX5.001	MH05-002	SURCHARGED*	
EX4.001	MH04-002	SURCHARGED	
EX4.002	MH04-003	FLOOD	11
EX1.005	MH01-006	SURCHARGED	
EX1.006	MH01-007	SURCHARGED	
EX1.007	MH01-008	SURCHARGED	
EX1.008	MH01-009	SURCHARGED	
EX1.009	MH01-010	SURCHARGED	
EX1.010	MH01-011	SURCHARGED	
EX1.011	MH01-012	SURCHARGED	
EX1.012	MH01-013	SURCHARGED	
EX1.013	MH01-014	SURCHARGED	
EX6.000	MH06-001	SURCHARGED*	
EX6.001	MH06-002	FLOOD	3
EX6.002	MH06-003	FLOOD	1
EX7.000	MH07-001	SURCHARGED*	
EX6.003	MH06-004	FLOOD	34
EX8.000	MH08-001	FLOOD	17
EX8.001	MH08-002	FLOOD	14
EX6.004	MH06-005	SURCHARGED	
EX1.014	MH01-015	SURCHARGED	
EX9.000	MH09-001	OK	
EX9.001	MH09-002	SURCHARGED	
EX9.002	MH09-003	SURCHARGED	
EX1.015	MH01-016	SURCHARGED	
EX10.000	MH10-001	OK*	
EX11.000	MH11-001	SURCHARGED*	
EX11.001	MH11-002	SURCHARGED*	
EX11.002	MH11-003	SURCHARGED	
EX10.001	MH10-002	SURCHARGED	
EX10.002	MH10-003	SURCHARGED	
EX12.000	MH12-001	OK*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Status	Level Exceeded
EX10.003	MH10-004	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
EX1.016	MH01-017	30 Winter	100	+0%	30/15 Summer				93.968	0.689	0.000	1.61			399.7	SURCHARGED

PN	US/MH Name	Level Exceeded
EX1.016	MH01-017	

Simulation Criteria for Existing Catchment - 06

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.314 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
64.000	ATSD8205_7389B	15 Winter	1	+0%					105.786	-0.112	0.000	0.64		
64.001	ATSD8205_6080A	15 Winter	1	+0%					103.865	-0.107	0.000	0.71		
64.002	ATSD8205_5075C	15 Winter	1	+0%					102.099	-0.096	0.000	0.79		
64.003	ATSD8205_4976A	15 Winter	1	+0%					101.746	-0.175	0.000	0.55		
64.004	ATSD8205_4674A	15 Winter	1	+0%					101.410	-0.123	0.000	0.62		
64.005	ATSD8205_4272A	15 Winter	1	+0%	1/15 Summer				101.266	0.140	0.000	1.41		
65.000	ATSD8205_7487B	15 Summer	1	+0%					105.263	-0.300	0.000	0.00		
66.000	GNATSD8205_7487B	15 Winter	1	+0%					106.900	-0.116	0.000	0.48		
65.001	ATSD8205_6079A	15 Winter	1	+0%					104.054	-0.219	0.000	0.16		
67.000	ATSD8205_5071C	15 Summer	1	+0%					103.893	-0.225	0.000	0.00		
67.001	ATSD8205_5071A	15 Winter	1	+0%					102.739	-0.200	0.000	0.03		
68.000	GNATSD8205_6079A	15 Winter	1	+0%					105.366	-0.120	0.000	0.45		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
64.000	ATSD8205_7389B	77.6	OK	
64.001	ATSD8205_6080A	95.1	OK	
64.002	ATSD8205_5075C	111.5	OK	
64.003	ATSD8205_4976A	111.7	OK	
64.004	ATSD8205_4674A	118.2	OK	
64.005	ATSD8205_4272A	124.9	SURCHARGED	
65.000	ATSD8205_7487B	0.0	OK	
66.000	GNATSD8205_7487B	21.2	OK	
65.001	ATSD8205_6079A	20.9	OK	
67.000	ATSD8205_5071C	0.0	OK	
67.001	ATSD8205_5071A	1.7	OK	
68.000	GNATSD8205_6079A	23.5	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
65.002	ATSD8205_4973A	15 Winter	1	+0%					102.290	-0.176	0.000	0.35		
69.000	GNATSD8205_4973A	15 Winter	1	+0%					103.664	-0.088	0.000	0.68		
65.003	ATSD8205_3465B	15 Winter	1	+0%	1/15 Winter				100.166	0.014	0.000	1.11		
64.006	ATSD8205_3367B	15 Winter	1	+0%					99.683	-0.534	0.000	0.18		
64.007	ATSD8205_2664B	15 Winter	1	+0%					98.857	-0.502	0.000	0.24		
70.000	ATSD8205_3164B	15 Summer	1	+0%					99.715	-0.225	0.000	0.00		
71.000	ATSD8205_3465A	15 Winter	1	+0%					101.568	-0.059	0.000	0.89		
70.001	ATSD8205_1858B	30 Winter	1	+0%					98.676	-0.175	0.000	0.25		
64.008	ATSD8205_1860A	30 Winter	1	+0%	1/15 Summer				98.646	0.190	0.000	1.31		
64.009	ATSD8205_1057A	30 Winter	1	+0%					97.994	-0.306	0.000	0.48		
72.000	ATSD8205_2257A	15 Summer	1	+0%					100.371	-0.225	0.000	0.00		
72.001	ATSD8205_2056B	15 Summer	1	+0%					100.284	-0.225	0.000	0.00		
72.002	ATSD8205_1152B	15 Winter	1	+0%					99.120	-0.197	0.000	0.24		
72.003	ATSD8205_0348A	15 Winter	1	+0%					98.659	-0.222	0.000	0.15		
73.000	GNATSD8205_1858B	15 Winter	1	+0%					100.374	-0.194	0.000	0.05		
72.004	ATSD8205_0250A	30 Winter	1	+0%					97.464	-0.137	0.000	0.44		
64.010	ATSD8205_0152B	30 Winter	1	+0%					97.451	-0.230	0.000	0.70		
64.011	ATSD8105_9448A	30 Winter	1	+0%					97.129	-0.282	0.000	0.55		
74.000	ATSD8105_8541A	15 Winter	1	+0%					98.111	-0.142	0.000	0.01		
75.000	ATSD8205_0250B	15 Winter	1	+0%					98.913	-0.197	0.000	0.04		
74.001	ATSD8105_8742A	15 Winter	1	+0%					97.327	-0.208	0.000	0.02		
64.012	ATSD8105_8644A	30 Winter	1	+0%					96.670	-0.265	0.000	0.60		
76.000	ATSD8105_9946B	15 Winter	1	+0%					98.724	-0.154	0.000	0.21		
76.001	ATSD8105_9544A	15 Winter	1	+0%					98.269	-0.215	0.000	0.17		
76.002	ATSD8105_9142A	15 Winter	1	+0%					97.751	-0.205	0.000	0.21		
77.000	ATSD8105_8832A	15 Winter	1	+0%					98.742	-0.191	0.000	0.28		
77.001	ATSD8105_8538A	15 Winter	1	+0%					98.202	-0.244	0.000	0.08		
76.003	ATSD8105_8539A	15 Winter	1	+0%					96.674	-0.037	0.000	1.00		
78.000	ATSD8105_8541A	15 Winter	1	+0%					98.105	-0.142	0.000	0.01		
64.013	ATSD8105_8340A	60 Winter	1	+0%					96.449	-0.263	0.000	0.60		
79.000	ATSD8105_8544A	15 Summer	1	+0%					97.629	-0.300	0.000	0.00		
79.001	ATSD8105_7840A	15 Winter	1	+0%					97.111	-0.200	0.000	0.24		
79.002	ATSD8105_7337A	15 Winter	1	+0%					96.772	-0.193	0.000	0.27		
79.003	ATSD8105_6934B	15 Winter	1	+0%					96.130	-0.172	0.000	0.37		
80.000	ATSD8105_8036B	15 Summer	1	+0%					97.884	-0.300	0.000	0.00		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
65.002	ATSD8205_4973A	43.9	OK	
69.000	GNATSD8205_4973A	34.4	OK	
65.003	ATSD8205_3465B	77.7	SURCHARGED	
64.006	ATSD8205_3367B	209.8	OK	
64.007	ATSD8205_2664B	213.2	OK	
70.000	ATSD8205_3164B	0.0	OK	
71.000	ATSD8205_3465A	32.2	OK	
70.001	ATSD8205_1858B	31.8	OK	
64.008	ATSD8205_1860A	228.7	SURCHARGED	
64.009	ATSD8205_1057A	232.0	OK	
72.000	ATSD8205_2257A	0.0	OK	
72.001	ATSD8205_2056B	0.0	OK	
72.002	ATSD8205_1152B	18.1	OK	
72.003	ATSD8205_0348A	34.4	OK	
73.000	GNATSD8205_1858B	1.4	OK	
72.004	ATSD8205_0250A	31.7	OK	
64.010	ATSD8205_0152B	246.3	OK	
64.011	ATSD8105_9448A	248.2	OK	
74.000	ATSD8105_8541A	0.1	OK	
75.000	ATSD8205_0250B	1.1	OK	
74.001	ATSD8105_8742A	1.3	OK	
64.012	ATSD8105_8644A	251.2	OK	
76.000	ATSD8105_9946B	10.5	OK	
76.001	ATSD8105_9544A	18.9	OK	
76.002	ATSD8105_9142A	29.6	OK	
77.000	ATSD8105_8832A	25.6	OK	
77.001	ATSD8105_8538A	25.6	OK	
76.003	ATSD8105_8539A	67.8	OK	
78.000	ATSD8105_8541A	0.1	OK	
64.013	ATSD8105_8340A	265.5	OK	
79.000	ATSD8105_8544A	0.0	OK	
79.001	ATSD8105_7840A	19.0	OK	
79.002	ATSD8105_7337A	32.5	OK	
79.003	ATSD8105_6934B	43.2	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
80.000	ATSD8105_8036B	0.0	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
80.001	ATSD8105_7734A	15 Winter	1	+0%					97.460	-0.215	0.000	0.17		
80.002	ATSD8105_7131B	15 Winter	1	+0%					96.506	-0.214	0.000	0.18		
81.000	GNATSD8105_8340A	15 Winter	1	+0%					98.658	-0.116	0.000	0.11		
64.014	ATSD8105_7033A	60 Winter	1	+0%					95.852	-0.150	0.000	0.92		
64.015	UNCHMH2	60 Winter	1	+0%					95.729	-0.158	0.000	0.89		
82.000	ATSD8105_6427B	15 Winter	1	+0%					95.794	-0.128	0.000	0.38		
83.000	GNATSD8105_7033A	15 Winter	1	+0%					97.992	-0.127	0.000	0.06		
64.016	ATSD8105_6328B	60 Winter	1	+0%					95.574	-0.175	0.000	0.84		
64.017	EXUNCH1	60 Winter	1	+0%					95.327	-0.183	0.000	0.82		
84.000	ATSD8105_6834C	15 Summer	1	+0%					96.000	-0.225	0.000	0.00		
84.001	ATSD8105_5727A	15 Winter	1	+0%					95.471	-0.075	0.000	0.69		
84.002	ATSD8105_4821C	30 Winter	1	+0%	1/15 Winter				95.030	0.033	0.000	0.87		
85.000	GNATSD8105_7131B	15 Summer	1	+0%					97.266	-0.150	0.000	0.00		
85.001	ATSD8105_6427C	15 Winter	1	+0%					96.818	-0.103	0.000	0.21		
85.002	ATSD8105_5018A	15 Winter	1	+0%					95.828	-0.213	0.000	0.18		
86.000	GNATSD8105_6328B	15 Winter	1	+0%					97.662	-0.116	0.000	0.12		
64.018	ATSD8105_4919A	60 Winter	1	+0%					94.966	-0.220	0.000	0.72		
87.000	GNATSD8105_4919A	15 Winter	1	+0%					96.878	-0.055	0.000	0.72		
64.019	ATSD8105_4517B	60 Winter	1	+0%					94.584	-0.381	0.000	0.39		
88.000	GNATSD8105_4517B	30 Winter	1	+0%	1/15 Summer				97.314	0.578	0.000	1.36		
89.000	ATSD8105_4917D	15 Summer	1	+0%					95.903	-0.300	0.000	0.00		
89.001	ATSD8105_4111A	15 Winter	1	+0%					95.048	-0.205	0.000	0.21		
89.002	ATSD8105_3506B	15 Winter	1	+0%					94.254	-0.207	0.000	0.21		
64.020	ATSD8105_3308B	60 Winter	1	+0%					93.328	-0.311	0.000	0.56		
90.000	ATSD8104_2096C	15 Summer	1	+0%					94.465	-0.150	0.000	0.00		
91.000	GNATSD8105_3308B	30 Winter	1	+0%	1/15 Summer				96.600	0.548	0.000	1.34		
92.000	GNATSD8104_2096C	15 Summer	1	+0%					94.930	-0.150	0.000	0.00		
64.021	ATSD8104_2298C	60 Winter	1	+0%					92.605	-0.281	0.000	0.64		
93.000	ATSD8105_3305C	15 Summer	1	+0%					94.612	-0.225	0.000	0.00		
94.000	ATSD8104_1890A	15 Summer	1	+0%					94.311	-0.150	0.000	0.00		
95.000	GNATSD8105_3305C	30 Winter	1	+0%	1/15 Summer	1/15 Summer			96.042	0.605	4.989	1.42		
96.000	GNATSD8104_1890A	15 Summer	1	+0%					94.911	-0.150	0.000	0.00		
64.022	ATSD8104_2194A	60 Winter	1	+0%					92.296	-0.382	0.000	0.48		
97.000	ATSD8104_1894D	15 Summer	1	+0%					94.330	-0.150	0.000	0.00		
98.000	ATSD8104_1897A	15 Winter	1	+0%					96.801	-0.211	0.000	0.01		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
80.001	ATSD8105_7734A	21.8	OK	
80.002	ATSD8105_7131B	37.6	OK	
81.000	GNATSD8105_8340A	1.1	OK	
64.014	ATSD8105_7033A	298.8	OK	
64.015	UNCHMH2	299.1	OK	
82.000	ATSD8105_6427B	17.4	OK	
83.000	GNATSD8105_7033A	0.6	OK	
64.016	ATSD8105_6328B	302.2	OK	
64.017	EXUNCH1	300.8	OK	
84.000	ATSD8105_6834C	0.0	OK	
84.001	ATSD8105_5727A	24.7	OK	
84.002	ATSD8105_4821C	37.3	SURCHARGED	
85.000	GNATSD8105_7131B	0.0	OK	
85.001	ATSD8105_6427C	2.8	OK	
85.002	ATSD8105_5018A	35.6	OK	
86.000	GNATSD8105_6328B	1.3	OK	
64.018	ATSD8105_4919A	327.0	OK	
87.000	GNATSD8105_4919A	7.4	OK	
64.019	ATSD8105_4517B	328.9	OK	
88.000	GNATSD8105_4517B	14.1	FLOOD RISK	
89.000	ATSD8105_4917D	0.0	OK	
89.001	ATSD8105_4111A	22.4	OK	
89.002	ATSD8105_3506B	40.5	OK	
64.020	ATSD8105_3308B	351.3	OK	
90.000	ATSD8104_2096C	0.0	OK	
91.000	GNATSD8105_3308B	13.9	FLOOD RISK	
92.000	GNATSD8104_2096C	0.0	OK	
64.021	ATSD8104_2298C	365.2	OK	
93.000	ATSD8105_3305C	0.0	OK	
94.000	ATSD8104_1890A	0.0	OK	
95.000	GNATSD8105_3305C	13.3	FLOOD	7
96.000	GNATSD8104_1890A	0.0	OK	
64.022	ATSD8104_2194A	382.3	OK	
97.000	ATSD8104_1894D	0.0	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
98.000	ATSD8104_1897A	1.2	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
99.000	ATSD8105_3814A	15 Winter	1	+0%					96.136	-0.186	0.000	0.06			2.2
98.001	ATSD8105_2201D	15 Winter	1	+0%					94.752	-0.186	0.000	0.07			3.3
98.002	ATSD8104_1898A	15 Winter	1	+0%					94.265	-0.143	0.000	0.28			9.9
100.000	ATSD8104_1192A	15 Summer	1	+0%					95.437	-0.150	0.000	0.00			0.0
101.000	ATSD8104_1797A	15 Winter	1	+0%					94.336	-0.072	0.000	0.53			6.9
98.003	ATSD8104_1493B	15 Winter	1	+0%					93.882	-0.167	0.000	0.15			21.0
102.000	ATSD8104_1688A	15 Summer	1	+0%					94.134	-0.150	0.000	0.00			0.0
102.001	ATSD8104_1790B	15 Winter	1	+0%					92.987	-0.207	0.000	0.02			2.2
64.023	ATSD8104_1591A	60 Winter	1	+0%					91.923	-0.358	0.000	0.54			389.1

PN	US/MH Name	Status	Level Exceeded
99.000	ATSD8105_3814A	OK	
98.001	ATSD8105_2201D	OK	
98.002	ATSD8104_1898A	OK	
100.000	ATSD8104_1192A	OK	
101.000	ATSD8104_1797A	OK	
98.003	ATSD8104_1493B	OK	
102.000	ATSD8104_1688A	OK	
102.001	ATSD8104_1790B	OK	
64.023	ATSD8104_1591A	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 0.750
Site Location	GB 382877 406385 SD 82877 06385		Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)
64.000	ATSD8205_7389B	15 Winter	5	+0%	5/15 Summer	30/15 Summer			106.033	0.135	0.000	0.97	
64.001	ATSD8205_6080A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			104.244	0.272	0.000	1.01	
64.002	ATSD8205_5075C	15 Winter	5	+0%	5/15 Summer				102.474	0.279	0.000	1.08	
64.003	ATSD8205_4976A	15 Winter	5	+0%	5/15 Summer				102.101	0.180	0.000	0.76	
64.004	ATSD8205_4674A	15 Winter	5	+0%	5/15 Summer				101.878	0.345	0.000	0.86	
64.005	ATSD8205_4272A	15 Winter	5	+0%	5/15 Summer				101.588	0.462	0.000	2.00	
65.000	ATSD8205_7487B	15 Summer	5	+0%					105.263	-0.300	0.000	0.00	
66.000	GNATSD8205_7487B	15 Winter	5	+0%	30/15 Summer	100/15 Summer			106.941	-0.075	0.000	0.78	
65.001	ATSD8205_6079A	15 Winter	5	+0%					104.079	-0.194	0.000	0.27	
67.000	ATSD8205_5071C	15 Summer	5	+0%					103.893	-0.225	0.000	0.00	
67.001	ATSD8205_5071A	15 Winter	5	+0%	100/15 Summer				102.744	-0.195	0.000	0.04	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
64.000	ATSD8205_7389B		118.4	SURCHARGED	10
64.001	ATSD8205_6080A		135.7	SURCHARGED	5
64.002	ATSD8205_5075C		153.0	SURCHARGED	
64.003	ATSD8205_4976A		153.0	SURCHARGED	
64.004	ATSD8205_4674A		164.0	SURCHARGED	
64.005	ATSD8205_4272A		176.9	SURCHARGED	
65.000	ATSD8205_7487B		0.0	OK	
66.000	GNATSD8205_7487B		34.7	OK	4
65.001	ATSD8205_6079A		34.3	OK	
67.000	ATSD8205_5071C		0.0	OK	
67.001	ATSD8205_5071A		2.8	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)
68.000	GNATSD8205_6079A	15 Winter	5	+0%	30/15 Summer	100/15 Winter			105.405	-0.081	0.000	0.74	
65.002	ATSD8205_4973A	15 Winter	5	+0%	30/30 Winter				102.331	-0.135	0.000	0.57	
69.000	GNATSD8205_4973A	15 Winter	5	+0%	5/15 Winter	30/15 Summer			103.827	0.075	0.000	1.02	
65.003	ATSD8205_3465B	15 Winter	5	+0%	5/15 Summer				100.392	0.240	0.000	1.76	
64.006	ATSD8205_3367B	15 Winter	5	+0%	30/30 Summer				99.732	-0.485	0.000	0.27	
64.007	ATSD8205_2664B	30 Winter	5	+0%	30/15 Summer				99.292	-0.067	0.000	0.33	
70.000	ATSD8205_3164B	15 Summer	5	+0%	30/30 Summer				99.715	-0.225	0.000	0.00	
71.000	ATSD8205_3465A	15 Winter	5	+0%	5/15 Summer	30/15 Summer			101.995	0.368	0.000	1.16	
70.001	ATSD8205_1858B	30 Winter	5	+0%	5/15 Summer				99.259	0.408	0.000	0.34	
64.008	ATSD8205_1860A	30 Winter	5	+0%	5/15 Summer	30/60 Winter			99.134	0.678	0.000	1.84	
64.009	ATSD8205_1057A	30 Winter	5	+0%	30/30 Summer				98.064	-0.236	0.000	0.68	
72.000	ATSD8205_2257A	15 Summer	5	+0%					100.371	-0.225	0.000	0.00	
72.001	ATSD8205_2056B	15 Summer	5	+0%					100.284	-0.225	0.000	0.00	
72.002	ATSD8205_1152B	15 Winter	5	+0%	100/15 Summer				99.153	-0.164	0.000	0.39	
72.003	ATSD8205_0348A	15 Winter	5	+0%	30/30 Winter				98.682	-0.199	0.000	0.25	
73.000	GNATSD8205_1858B	15 Winter	5	+0%					100.384	-0.184	0.000	0.08	
72.004	ATSD8205_0250A	30 Winter	5	+0%	5/30 Winter				97.633	0.032	0.000	0.71	
64.010	ATSD8205_0152B	30 Winter	5	+0%	30/15 Summer	100/60 Winter			97.554	-0.127	0.000	0.98	
64.011	ATSD8105_9448A	30 Winter	5	+0%	30/15 Summer	100/60 Winter			97.209	-0.202	0.000	0.77	
74.000	ATSD8105_8541A	15 Winter	5	+0%	30/60 Winter				98.117	-0.136	0.000	0.02	
75.000	ATSD8205_0250B	15 Winter	5	+0%	100/30 Winter				98.921	-0.189	0.000	0.06	
74.001	ATSD8105_8742A	15 Winter	5	+0%	30/30 Summer				97.334	-0.201	0.000	0.03	
64.012	ATSD8105_8644A	30 Winter	5	+0%	30/15 Summer	100/60 Winter			96.827	-0.108	0.000	0.84	
76.000	ATSD8105_9946B	15 Winter	5	+0%	100/15 Winter				98.746	-0.132	0.000	0.35	
76.001	ATSD8105_9544A	15 Winter	5	+0%	100/15 Summer				98.294	-0.190	0.000	0.29	
76.002	ATSD8105_9142A	15 Winter	5	+0%	30/30 Winter				97.780	-0.176	0.000	0.35	
77.000	ATSD8105_8832A	15 Winter	5	+0%	100/15 Winter				98.778	-0.155	0.000	0.45	
77.001	ATSD8105_8538A	15 Winter	5	+0%	100/15 Winter				98.217	-0.229	0.000	0.13	
76.003	ATSD8105_8539A	15 Winter	5	+0%	5/15 Summer	100/30 Winter			96.871	0.160	0.000	1.67	
78.000	ATSD8105_8541A	15 Winter	5	+0%	100/15 Winter				98.110	-0.137	0.000	0.02	
64.013	ATSD8105_8340A	30 Winter	5	+0%	30/15 Summer				96.670	-0.042	0.000	0.83	
79.000	ATSD8105_8544A	15 Summer	5	+0%	100/30 Winter				97.629	-0.300	0.000	0.00	
79.001	ATSD8105_7840A	15 Winter	5	+0%	30/60 Winter				97.142	-0.169	0.000	0.38	
79.002	ATSD8105_7337A	15 Winter	5	+0%	30/30 Winter				96.807	-0.158	0.000	0.45	
79.003	ATSD8105_6934B	60 Winter	5	+0%	30/15 Summer	100/60 Winter			96.208	-0.094	0.000	0.39	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
68.000	GNATSD8205_6079A		38.5	OK	3
65.002	ATSD8205_4973A		71.9	OK	
69.000	GNATSD8205_4973A		51.3	SURCHARGED	12
65.003	ATSD8205_3465B		122.8	SURCHARGED	
64.006	ATSD8205_3367B		309.6	OK	
64.007	ATSD8205_2664B		300.6	OK	
70.000	ATSD8205_3164B		0.0	OK	
71.000	ATSD8205_3465A		42.0	FLOOD RISK	14
70.001	ATSD8205_1858B		43.4	SURCHARGED	
64.008	ATSD8205_1860A		322.2	SURCHARGED	8
64.009	ATSD8205_1057A		326.7	OK	
72.000	ATSD8205_2257A		0.0	OK	
72.001	ATSD8205_2056B		0.0	OK	
72.002	ATSD8205_1152B		29.7	OK	
72.003	ATSD8205_0348A		56.4	OK	
73.000	GNATSD8205_1858B		2.3	OK	
72.004	ATSD8205_0250A		50.5	SURCHARGED	
64.010	ATSD8205_0152B		346.2	OK	1
64.011	ATSD8105_9448A		348.9	OK	1
74.000	ATSD8105_8541A		0.2	OK	
75.000	ATSD8205_0250B		1.9	OK	
74.001	ATSD8105_8742A		2.1	OK	
64.012	ATSD8105_8644A		354.7	OK	1
76.000	ATSD8105_9946B		17.2	OK	
76.001	ATSD8105_9544A		31.0	OK	
76.002	ATSD8105_9142A		48.5	OK	
77.000	ATSD8105_8832A		41.9	OK	
77.001	ATSD8105_8538A		41.9	OK	
76.003	ATSD8105_8539A		113.3	SURCHARGED	3
78.000	ATSD8105_8541A		0.2	OK	
64.013	ATSD8105_8340A		367.8	OK	
79.000	ATSD8105_8544A		0.0	OK	
79.001	ATSD8105_7840A		31.1	OK	
79.002	ATSD8105_7337A		53.1	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
79.003	ATSD8105_6934B		44.7	OK	1

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)
80.000	ATSD8105_8036B	15 Summer	5	+0%	100/60 Winter				97.884	-0.300	0.000	0.00	
80.001	ATSD8105_7734A	15 Winter	5	+0%	100/30 Summer				97.485	-0.190	0.000	0.29	
80.002	ATSD8105_7131B	15 Winter	5	+0%	30/15 Winter				96.532	-0.188	0.000	0.30	
81.000	GNATSD8105_8340A	15 Winter	5	+0%					98.668	-0.106	0.000	0.19	
64.014	ATSD8105_7033A	60 Winter	5	+0%	5/15 Winter				96.190	0.188	0.000	1.22	
64.015	UNCHMH2	60 Winter	5	+0%	5/15 Winter				96.023	0.136	0.000	1.18	
82.000	ATSD8105_6427B	60 Winter	5	+0%	30/15 Summer				95.843	-0.079	0.000	0.33	
83.000	GNATSD8105_7033A	15 Winter	5	+0%					97.999	-0.120	0.000	0.09	
64.016	ATSD8105_6328B	60 Winter	5	+0%	5/30 Summer				95.833	0.084	0.000	1.11	
64.017	EXUNCH1	30 Winter	5	+0%	5/30 Winter				95.538	0.028	0.000	1.08	
84.000	ATSD8105_6834C	15 Summer	5	+0%	30/15 Summer				96.000	-0.225	0.000	0.00	
84.001	ATSD8105_5727A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			95.715	0.169	0.000	0.91	
84.002	ATSD8105_4821C	30 Winter	5	+0%	5/15 Summer				95.274	0.277	0.000	1.25	
85.000	GNATSD8105_7131B	15 Summer	5	+0%					97.266	-0.150	0.000	0.00	
85.001	ATSD8105_6427C	15 Winter	5	+0%					96.833	-0.088	0.000	0.27	
85.002	ATSD8105_5018A	15 Winter	5	+0%	100/60 Winter				95.855	-0.186	0.000	0.30	
86.000	GNATSD8105_6328B	15 Winter	5	+0%					97.672	-0.106	0.000	0.19	
64.018	ATSD8105_4919A	60 Winter	5	+0%	30/15 Summer				95.053	-0.133	0.000	0.96	
87.000	GNATSD8105_4919A	15 Winter	5	+0%	5/15 Summer	100/15 Summer			96.990	0.057	0.000	1.15	
64.019	ATSD8105_4517B	60 Winter	5	+0%	100/30 Winter				94.638	-0.327	0.000	0.52	
88.000	GNATSD8105_4517B	30 Winter	5	+0%	5/15 Summer	5/15 Summer			97.346	0.610	9.779	1.38	
89.000	ATSD8105_4917D	15 Summer	5	+0%					95.903	-0.300	0.000	0.00	
89.001	ATSD8105_4111A	15 Winter	5	+0%					95.078	-0.175	0.000	0.35	
89.002	ATSD8105_3506B	15 Winter	5	+0%					94.283	-0.178	0.000	0.34	
64.020	ATSD8105_3308B	60 Winter	5	+0%	30/30 Winter				93.403	-0.236	0.000	0.75	
90.000	ATSD8104_2096C	15 Summer	5	+0%					94.465	-0.150	0.000	0.00	
91.000	GNATSD8105_3308B	30 Winter	5	+0%	5/15 Summer	5/15 Summer			96.661	0.609	8.894	1.38	
92.000	GNATSD8104_2096C	15 Summer	5	+0%					94.930	-0.150	0.000	0.00	
64.021	ATSD8104_2298C	60 Winter	5	+0%	30/30 Summer				92.691	-0.195	0.000	0.85	
93.000	ATSD8105_3305C	15 Summer	5	+0%					94.612	-0.225	0.000	0.00	
94.000	ATSD8104_1890A	15 Summer	5	+0%					94.311	-0.150	0.000	0.00	
95.000	GNATSD8105_3305C	30 Winter	5	+0%	5/15 Summer	5/15 Summer			96.059	0.622	21.593	1.43	
96.000	GNATSD8104_1890A	15 Summer	5	+0%					94.911	-0.150	0.000	0.00	
64.022	ATSD8104_2194A	60 Winter	5	+0%	100/60 Winter				92.365	-0.313	0.000	0.64	
97.000	ATSD8104_1894D	15 Summer	5	+0%					94.330	-0.150	0.000	0.00	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
80.000	ATSD8105_8036B		0.0	OK	
80.001	ATSD8105_7734A		35.8	OK	
80.002	ATSD8105_7131B		61.7	OK	
81.000	GNATSD8105_8340A		1.9	OK	
64.014	ATSD8105_7033A		398.7	SURCHARGED	
64.015	UNCHMH2		395.4	SURCHARGED	
82.000	ATSD8105_6427B		15.1	OK	
83.000	GNATSD8105_7033A		0.9	OK	
64.016	ATSD8105_6328B		398.5	SURCHARGED	
64.017	EXUNCH1		395.7	SURCHARGED	
84.000	ATSD8105_6834C		0.0	OK	
84.001	ATSD8105_5727A		32.8	SURCHARGED	6
84.002	ATSD8105_4821C		53.8	SURCHARGED	
85.000	GNATSD8105_7131B		0.0	OK	
85.001	ATSD8105_6427C		3.5	OK	
85.002	ATSD8105_5018A		59.2	OK	
86.000	GNATSD8105_6328B		2.1	OK	
64.018	ATSD8105_4919A		433.2	OK	
87.000	GNATSD8105_4919A		11.8	SURCHARGED	5
64.019	ATSD8105_4517B		437.7	OK	
88.000	GNATSD8105_4517B		14.3	FLOOD	38
89.000	ATSD8105_4917D		0.0	OK	
89.001	ATSD8105_4111A		36.8	OK	
89.002	ATSD8105_3506B		66.3	OK	
64.020	ATSD8105_3308B		466.2	OK	
90.000	ATSD8104_2096C		0.0	OK	
91.000	GNATSD8105_3308B		14.2	FLOOD	38
92.000	GNATSD8104_2096C		0.0	OK	
64.021	ATSD8104_2298C		483.8	OK	
93.000	ATSD8105_3305C		0.0	OK	
94.000	ATSD8104_1890A		0.0	OK	
95.000	GNATSD8105_3305C		13.4	FLOOD	53
96.000	GNATSD8104_1890A		0.0	OK	
64.022	ATSD8104_2194A		505.5	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
97.000	ATSD8104_1894D		0.0	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
98.000	ATSD8104_1897A	15 Winter	5	+0%					96.810	-0.202	0.000	0.02		
99.000	ATSD8105_3814A	15 Winter	5	+0%					96.147	-0.175	0.000	0.10		
98.001	ATSD8105_2201D	15 Winter	5	+0%					94.764	-0.174	0.000	0.12		
98.002	ATSD8104_1898A	15 Winter	5	+0%	100/15 Summer				94.291	-0.117	0.000	0.46		
100.000	ATSD8104_1192A	15 Summer	5	+0%					95.437	-0.150	0.000	0.00		
101.000	ATSD8104_1797A	15 Winter	5	+0%	30/15 Summer				94.366	-0.042	0.000	0.87		
98.003	ATSD8104_1493B	15 Winter	5	+0%					93.900	-0.149	0.000	0.25		
102.000	ATSD8104_1688A	15 Summer	5	+0%					94.134	-0.150	0.000	0.00		
102.001	ATSD8104_1790B	15 Winter	5	+0%					92.994	-0.200	0.000	0.03		
64.023	ATSD8104_1591A	60 Winter	5	+0%	100/30 Winter				92.003	-0.278	0.000	0.72		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
98.000	ATSD8104_1897A	2.0	OK	
99.000	ATSD8105_3814A	3.6	OK	
98.001	ATSD8105_2201D	5.4	OK	
98.002	ATSD8104_1898A	16.1	OK	
100.000	ATSD8104_1192A	0.0	OK	
101.000	ATSD8104_1797A	11.3	OK	
98.003	ATSD8104_1493B	34.3	OK	
102.000	ATSD8104_1688A	0.0	OK	
102.001	ATSD8104_1790B	3.7	OK	
64.023	ATSD8104_1591A	520.1	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 0.750
Site Location	GB 382877 406385 SD 82877 06385		Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)
64.000	ATSD8205_7389B	15 Winter	30	+0%	5/15 Summer	30/15 Summer			107.111	1.213	13.056	1.03	
64.001	ATSD8205_6080A	15 Winter	30	+0%	5/15 Summer	100/15 Summer			105.446	1.474	0.000	1.12	
64.002	ATSD8205_5075C	15 Winter	30	+0%	5/15 Summer				103.307	1.112	0.000	1.28	
64.003	ATSD8205_4976A	15 Winter	30	+0%	5/15 Summer				102.792	0.871	0.000	0.90	
64.004	ATSD8205_4674A	15 Winter	30	+0%	5/15 Summer				102.489	0.956	0.000	1.07	
64.005	ATSD8205_4272A	15 Winter	30	+0%	5/15 Summer				102.052	0.926	0.000	2.61	
65.000	ATSD8205_7487B	15 Summer	30	+0%					105.263	-0.300	0.000	0.00	
66.000	GNATSD8205_7487B	15 Winter	30	+0%	30/15 Summer	100/15 Summer			107.429	0.413	0.000	1.13	
65.001	ATSD8205_6079A	15 Winter	30	+0%					104.103	-0.170	0.000	0.39	
67.000	ATSD8205_5071C	15 Summer	30	+0%					103.893	-0.225	0.000	0.00	
67.001	ATSD8205_5071A	30 Winter	30	+0%	100/15 Summer				102.831	-0.108	0.000	0.07	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
64.000	ATSD8205_7389B		124.8	FLOOD	10
64.001	ATSD8205_6080A		150.7	SURCHARGED	5
64.002	ATSD8205_5075C		181.8	SURCHARGED	
64.003	ATSD8205_4976A		182.9	SURCHARGED	
64.004	ATSD8205_4674A		202.8	SURCHARGED	
64.005	ATSD8205_4272A		231.2	SURCHARGED	
65.000	ATSD8205_7487B		0.0	OK	
66.000	GNATSD8205_7487B		50.1	FLOOD RISK	4
65.001	ATSD8205_6079A		49.8	OK	
67.000	ATSD8205_5071C		0.0	OK	
67.001	ATSD8205_5071A		4.5	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)
68.000	GNATSD8205_6079A	15 Winter	30	+0%	30/15 Summer	100/15 Winter			105.800	0.314	0.000	1.09	
65.002	ATSD8205_4973A	30 Winter	30	+0%	30/30 Winter				102.833	0.367	0.000	0.80	
69.000	GNATSD8205_4973A	30 Winter	30	+0%	5/15 Winter	30/15 Summer			104.361	0.609	9.329	1.14	
65.003	ATSD8205_3465B	30 Winter	30	+0%	5/15 Summer				101.635	1.483	0.000	2.15	
64.006	ATSD8205_3367B	60 Winter	30	+0%	30/30 Summer				101.156	0.939	0.000	0.32	
64.007	ATSD8205_2664B	60 Winter	30	+0%	30/15 Summer				100.905	1.546	0.000	0.38	
70.000	ATSD8205_3164B	60 Winter	30	+0%	30/30 Summer				100.844	0.904	0.000	0.07	
71.000	ATSD8205_3465A	30 Winter	30	+0%	5/15 Summer	30/15 Summer			102.242	0.615	15.322	1.26	
70.001	ATSD8205_1858B	60 Winter	30	+0%	5/15 Summer				100.845	1.994	0.000	0.46	
64.008	ATSD8205_1860A	60 Winter	30	+0%	5/15 Summer	30/60 Winter			100.710	2.254	4.361	2.14	
64.009	ATSD8205_1057A	60 Winter	30	+0%	30/30 Summer				99.456	1.156	0.000	0.79	
72.000	ATSD8205_2257A	15 Summer	30	+0%					100.371	-0.225	0.000	0.00	
72.001	ATSD8205_2056B	15 Summer	30	+0%					100.284	-0.225	0.000	0.00	
72.002	ATSD8205_1152B	15 Winter	30	+0%	100/15 Summer				99.238	-0.079	0.000	0.82	
72.003	ATSD8205_0348A	60 Winter	30	+0%	30/30 Winter				99.194	0.313	0.000	0.28	
73.000	GNATSD8205_1858B	15 Winter	30	+0%					100.396	-0.172	0.000	0.13	
72.004	ATSD8205_0250A	60 Winter	30	+0%	5/30 Winter				99.168	1.567	0.000	0.90	
64.010	ATSD8205_0152B	60 Winter	30	+0%	30/15 Summer	100/60 Winter			99.103	1.422	0.000	1.18	
64.011	ATSD8105_9448A	60 Winter	30	+0%	30/15 Summer	100/60 Winter			98.776	1.365	0.000	0.94	
74.000	ATSD8105_8541A	60 Winter	30	+0%	30/60 Winter				98.365	0.112	0.000	0.02	
75.000	ATSD8205_0250B	15 Winter	30	+0%	100/30 Winter				98.933	-0.177	0.000	0.10	
74.001	ATSD8105_8742A	60 Winter	30	+0%	30/30 Summer				98.364	0.829	0.000	0.07	
64.012	ATSD8105_8644A	60 Winter	30	+0%	30/15 Summer	100/60 Winter			98.362	1.427	0.000	1.04	
76.000	ATSD8105_9946B	15 Winter	30	+0%	100/15 Winter				98.780	-0.098	0.000	0.59	
76.001	ATSD8105_9544A	15 Winter	30	+0%	100/15 Summer				98.342	-0.142	0.000	0.52	
76.002	ATSD8105_9142A	60 Winter	30	+0%	30/30 Winter				98.250	0.294	0.000	0.37	
77.000	ATSD8105_8832A	15 Winter	30	+0%	100/15 Winter				98.835	-0.098	0.000	0.76	
77.001	ATSD8105_8538A	15 Winter	30	+0%	100/15 Winter				98.241	-0.205	0.000	0.22	
76.003	ATSD8105_8539A	60 Winter	30	+0%	5/15 Summer	100/30 Winter			98.215	1.504	0.000	1.52	
78.000	ATSD8105_8541A	60 Winter	30	+0%	100/15 Winter				98.126	-0.121	0.000	0.02	
64.013	ATSD8105_8340A	60 Winter	30	+0%	30/15 Summer				98.126	1.414	0.000	1.08	
79.000	ATSD8105_8544A	15 Summer	30	+0%	100/30 Winter				97.629	-0.300	0.000	0.00	
79.001	ATSD8105_7840A	60 Winter	30	+0%	30/60 Winter				97.423	0.112	0.000	0.43	
79.002	ATSD8105_7337A	60 Winter	30	+0%	30/30 Winter				97.404	0.439	0.000	0.50	
79.003	ATSD8105_6934B	60 Winter	30	+0%	30/15 Summer	100/60 Winter			97.370	1.068	0.000	0.58	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
68.000	GNATSD8205_6079A		56.9	FLOOD RISK	3
65.002	ATSD8205_4973A		101.6	SURCHARGED	
69.000	GNATSD8205_4973A		57.2	FLOOD	12
65.003	ATSD8205_3465B		149.6	SURCHARGED	
64.006	ATSD8205_3367B		370.2	SURCHARGED	
64.007	ATSD8205_2664B		338.4	FLOOD RISK	
70.000	ATSD8205_3164B		3.2	SURCHARGED	
71.000	ATSD8205_3465A		45.5	FLOOD	14
70.001	ATSD8205_1858B		58.3	SURCHARGED	
64.008	ATSD8205_1860A		375.4	FLOOD	8
64.009	ATSD8205_1057A		382.3	SURCHARGED	
72.000	ATSD8205_2257A		0.0	OK	
72.001	ATSD8205_2056B		0.0	OK	
72.002	ATSD8205_1152B		61.8	OK	
72.003	ATSD8205_0348A		63.6	SURCHARGED	
73.000	GNATSD8205_1858B		4.0	OK	
72.004	ATSD8205_0250A		64.1	SURCHARGED	
64.010	ATSD8205_0152B		417.0	SURCHARGED	1
64.011	ATSD8105_9448A		424.5	SURCHARGED	1
74.000	ATSD8105_8541A		0.3	SURCHARGED	
75.000	ATSD8205_0250B		3.1	OK	
74.001	ATSD8105_8742A		5.8	SURCHARGED	
64.012	ATSD8105_8644A		437.7	SURCHARGED	1
76.000	ATSD8105_9946B		29.0	OK	
76.001	ATSD8105_9544A		56.5	OK	
76.002	ATSD8105_9142A		51.5	SURCHARGED	
77.000	ATSD8105_8832A		70.6	OK	
77.001	ATSD8105_8538A		70.7	OK	
76.003	ATSD8105_8539A		103.2	SURCHARGED	3
78.000	ATSD8105_8541A		0.3	OK	
64.013	ATSD8105_8340A		477.1	SURCHARGED	
79.000	ATSD8105_8544A		0.0	OK	
79.001	ATSD8105_7840A		34.4	SURCHARGED	
79.002	ATSD8105_7337A		59.2	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
79.003	ATSD8105_6934B		66.9	SURCHARGED	1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)
80.000	ATSD8105_8036B	15 Summer	30	+0%	100/60 Winter				97.884	-0.300	0.000	0.00	
80.001	ATSD8105_7734A	15 Winter	30	+0%	100/30 Summer				97.545	-0.130	0.000	0.60	
80.002	ATSD8105_7131B	60 Winter	30	+0%	30/15 Winter				97.320	0.600	0.000	0.32	
81.000	GNATSD8105_8340A	15 Winter	30	+0%					98.682	-0.092	0.000	0.32	
64.014	ATSD8105_7033A	60 Winter	30	+0%	5/15 Winter				97.293	1.291	0.000	1.63	
64.015	UNCHMH2	60 Winter	30	+0%	5/15 Winter				96.987	1.100	0.000	1.59	
82.000	ATSD8105_6427B	60 Winter	30	+0%	30/15 Summer				96.659	0.737	0.000	0.53	
83.000	GNATSD8105_7033A	15 Winter	30	+0%					98.008	-0.111	0.000	0.15	
64.016	ATSD8105_6328B	60 Winter	30	+0%	5/30 Summer				96.638	0.889	0.000	1.52	
64.017	EXUNCH1	60 Winter	30	+0%	5/30 Winter				96.086	0.576	0.000	1.48	
84.000	ATSD8105_6834C	15 Winter	30	+0%	30/15 Summer				97.394	1.169	0.000	0.10	
84.001	ATSD8105_5727A	15 Winter	30	+0%	5/15 Summer	100/15 Summer			97.410	1.864	0.000	1.46	
84.002	ATSD8105_4821C	15 Winter	30	+0%	5/15 Summer				96.092	1.095	0.000	2.34	
85.000	GNATSD8105_7131B	15 Summer	30	+0%					97.266	-0.150	0.000	0.00	
85.001	ATSD8105_6427C	15 Winter	30	+0%					96.868	-0.053	0.000	0.53	
85.002	ATSD8105_5018A	15 Winter	30	+0%	100/60 Winter				95.917	-0.124	0.000	0.64	
86.000	GNATSD8105_6328B	15 Winter	30	+0%					97.687	-0.091	0.000	0.32	
64.018	ATSD8105_4919A	60 Winter	30	+0%	30/15 Summer				95.376	0.190	0.000	1.37	
87.000	GNATSD8105_4919A	15 Winter	30	+0%	5/15 Summer	100/15 Summer			97.401	0.468	0.000	1.84	
64.019	ATSD8105_4517B	60 Winter	30	+0%	100/30 Winter				94.730	-0.235	0.000	0.75	
88.000	GNATSD8105_4517B	60 Winter	30	+0%	5/15 Summer	5/15 Summer			97.369	0.633	32.815	1.39	
89.000	ATSD8105_4917D	15 Summer	30	+0%					95.903	-0.300	0.000	0.00	
89.001	ATSD8105_4111A	15 Winter	30	+0%					95.151	-0.102	0.000	0.72	
89.002	ATSD8105_3506B	15 Winter	30	+0%					94.354	-0.107	0.000	0.72	
64.020	ATSD8105_3308B	60 Winter	30	+0%	30/30 Winter				93.807	0.168	0.000	1.07	
90.000	ATSD8104_2096C	15 Summer	30	+0%					94.465	-0.150	0.000	0.00	
91.000	GNATSD8105_3308B	60 Winter	30	+0%	5/15 Summer	5/15 Summer			96.683	0.631	30.522	1.39	
92.000	GNATSD8104_2096C	15 Summer	30	+0%					94.930	-0.150	0.000	0.00	
64.021	ATSD8104_2298C	60 Winter	30	+0%	30/30 Summer				92.946	0.060	0.000	1.20	
93.000	ATSD8105_3305C	15 Summer	30	+0%					94.612	-0.225	0.000	0.00	
94.000	ATSD8104_1890A	15 Summer	30	+0%					94.311	-0.150	0.000	0.00	
95.000	GNATSD8105_3305C	60 Winter	30	+0%	5/15 Summer	5/15 Summer			96.099	0.662	62.376	1.45	
96.000	GNATSD8104_1890A	15 Summer	30	+0%					94.911	-0.150	0.000	0.00	
64.022	ATSD8104_2194A	60 Winter	30	+0%	100/60 Winter				92.481	-0.197	0.000	0.89	
97.000	ATSD8104_1894D	15 Summer	30	+0%					94.330	-0.150	0.000	0.00	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
80.000	ATSD8105_8036B		0.0	OK	
80.001	ATSD8105_7734A		75.2	OK	
80.002	ATSD8105_7131B		67.6	SURCHARGED	
81.000	GNATSD8105_8340A		3.1	OK	
64.014	ATSD8105_7033A		533.0	SURCHARGED	
64.015	UNCHMH2		532.5	SURCHARGED	
82.000	ATSD8105_6427B		24.3	SURCHARGED	
83.000	GNATSD8105_7033A		1.5	OK	
64.016	ATSD8105_6328B		543.3	SURCHARGED	
64.017	EXUNCH1		542.2	SURCHARGED	
84.000	ATSD8105_6834C		3.7	SURCHARGED	
84.001	ATSD8105_5727A		52.6	FLOOD RISK	6
84.002	ATSD8105_4821C		100.9	SURCHARGED	
85.000	GNATSD8105_7131B		0.0	OK	
85.001	ATSD8105_6427C		6.9	OK	
85.002	ATSD8105_5018A		126.4	OK	
86.000	GNATSD8105_6328B		3.5	OK	
64.018	ATSD8105_4919A		618.3	SURCHARGED	
87.000	GNATSD8105_4919A		18.9	FLOOD RISK	5
64.019	ATSD8105_4517B		629.8	OK	
88.000	GNATSD8105_4517B		14.4	FLOOD	38
89.000	ATSD8105_4917D		0.0	OK	
89.001	ATSD8105_4111A		76.0	OK	
89.002	ATSD8105_3506B		138.5	OK	
64.020	ATSD8105_3308B		665.8	SURCHARGED	
90.000	ATSD8104_2096C		0.0	OK	
91.000	GNATSD8105_3308B		14.3	FLOOD	38
92.000	GNATSD8104_2096C		0.0	OK	
64.021	ATSD8104_2298C		684.2	SURCHARGED	
93.000	ATSD8105_3305C		0.0	OK	
94.000	ATSD8104_1890A		0.0	OK	
95.000	GNATSD8105_3305C		13.6	FLOOD	53
96.000	GNATSD8104_1890A		0.0	OK	
64.022	ATSD8104_2194A		706.9	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
97.000	ATSD8104_1894D		0.0	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
98.000	ATSD8104_1897A	15 Winter	30	+0%					96.815	-0.197	0.000	0.04		
99.000	ATSD8105_3814A	15 Winter	30	+0%					96.163	-0.159	0.000	0.17		
98.001	ATSD8105_2201D	15 Winter	30	+0%					94.780	-0.158	0.000	0.19		
98.002	ATSD8104_1898A	15 Winter	30	+0%	100/15 Summer				94.352	-0.056	0.000	0.90		
100.000	ATSD8104_1192A	15 Summer	30	+0%					95.437	-0.150	0.000	0.00		
101.000	ATSD8104_1797A	15 Winter	30	+0%	30/15 Summer				94.772	0.364	0.000	1.42		
98.003	ATSD8104_1493B	15 Winter	30	+0%					93.930	-0.119	0.000	0.44		
102.000	ATSD8104_1688A	15 Summer	30	+0%					94.134	-0.150	0.000	0.00		
102.001	ATSD8104_1790B	15 Winter	30	+0%					93.004	-0.190	0.000	0.06		
64.023	ATSD8104_1591A	60 Winter	30	+0%	100/30 Winter				92.143	-0.138	0.000	1.00		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
98.000	ATSD8104_1897A	3.3	OK	
99.000	ATSD8105_3814A	6.1	OK	
98.001	ATSD8105_2201D	9.1	OK	
98.002	ATSD8104_1898A	31.8	OK	
100.000	ATSD8104_1192A	0.0	OK	
101.000	ATSD8104_1797A	18.5	SURCHARGED	
98.003	ATSD8104_1493B	61.3	OK	
102.000	ATSD8104_1688A	0.0	OK	
102.001	ATSD8104_1790B	7.8	OK	
64.023	ATSD8104_1591A	722.6	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 0, 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)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)
64.000	ATSD8205_7389B	15 Winter	100	+0%	5/15 Summer	30/15 Summer			107.143	1.245	44.804	1.10	
64.001	ATSD8205_6080A	30 Winter	100	+0%	5/15 Summer	100/15 Summer			105.775	1.803	6.513	1.16	
64.002	ATSD8205_5075C	15 Winter	100	+0%	5/15 Summer				104.059	1.864	0.000	1.39	
64.003	ATSD8205_4976A	15 Winter	100	+0%	5/15 Summer				103.417	1.496	0.000	0.97	
64.004	ATSD8205_4674A	15 Winter	100	+0%	5/15 Summer				103.041	1.508	0.000	1.21	
64.005	ATSD8205_4272A	30 Winter	100	+0%	5/15 Summer				102.486	1.360	0.000	2.91	
65.000	ATSD8205_7487B	15 Summer	100	+0%					105.263	-0.300	0.000	0.00	
66.000	GNATSD8205_7487B	30 Winter	100	+0%	30/15 Summer	100/15 Summer			107.622	0.606	6.125	1.18	
65.001	ATSD8205_6079A	30 Winter	100	+0%					104.107	-0.166	0.000	0.41	
67.000	ATSD8205_5071C	15 Summer	100	+0%					103.893	-0.225	0.000	0.00	
67.001	ATSD8205_5071A	30 Winter	100	+0%	100/15 Summer				103.610	0.671	0.000	0.18	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
64.000	ATSD8205_7389B		133.7	FLOOD	10
64.001	ATSD8205_6080A		156.6	FLOOD	5
64.002	ATSD8205_5075C		197.0	FLOOD RISK	
64.003	ATSD8205_4976A		196.6	SURCHARGED	
64.004	ATSD8205_4674A		230.4	SURCHARGED	
64.005	ATSD8205_4272A		257.9	SURCHARGED	
65.000	ATSD8205_7487B		0.0	OK	
66.000	GNATSD8205_7487B		52.6	FLOOD	4
65.001	ATSD8205_6079A		52.6	OK	
67.000	ATSD8205_5071C		0.0	OK	
67.001	ATSD8205_5071A		11.4	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)
68.000	GNATSD8205_6079A	30 Winter	100	+0%	30/15 Summer	100/15 Winter			106.091	0.605	5.292	1.16	
65.002	ATSD8205_4973A	30 Winter	100	+0%	30/30 Winter				103.607	1.141	0.000	0.85	
69.000	GNATSD8205_4973A	30 Winter	100	+0%	5/15 Winter	30/15 Summer			104.382	0.630	30.430	1.14	
65.003	ATSD8205_3465B	60 Winter	100	+0%	5/15 Summer				101.929	1.777	0.000	2.26	
64.006	ATSD8205_3367B	60 Winter	100	+0%	30/30 Summer				101.327	1.110	0.000	0.36	
64.007	ATSD8205_2664B	60 Winter	100	+0%	30/15 Summer				101.080	1.721	0.000	0.50	
70.000	ATSD8205_3164B	60 Winter	100	+0%	30/30 Summer				101.006	1.066	0.000	0.14	
71.000	ATSD8205_3465A	30 Winter	100	+0%	5/15 Summer	30/15 Summer			102.265	0.638	38.411	1.26	
70.001	ATSD8205_1858B	60 Winter	100	+0%	5/15 Summer				101.006	2.155	0.000	0.56	
64.008	ATSD8205_1860A	60 Winter	100	+0%	5/15 Summer	30/60 Winter			100.887	2.431	181.478	2.32	
64.009	ATSD8205_1057A	60 Winter	100	+0%	30/30 Summer				100.108	1.808	0.000	0.85	
72.000	ATSD8205_2257A	15 Summer	100	+0%					100.371	-0.225	0.000	0.00	
72.001	ATSD8205_2056B	15 Summer	100	+0%					100.284	-0.225	0.000	0.00	
72.002	ATSD8205_1152B	60 Winter	100	+0%	100/15 Summer				100.212	0.895	0.000	0.60	
72.003	ATSD8205_0348A	60 Winter	100	+0%	30/30 Winter				100.116	1.235	0.000	0.35	
73.000	GNATSD8205_1858B	15 Winter	100	+0%					100.405	-0.163	0.000	0.17	
72.004	ATSD8205_0250A	60 Winter	100	+0%	5/30 Winter				99.990	2.389	0.000	1.09	
64.010	ATSD8205_0152B	60 Winter	100	+0%	30/15 Summer	100/60 Winter			99.884	2.203	3.341	1.22	
64.011	ATSD8105_9448A	60 Winter	100	+0%	30/15 Summer	100/60 Winter			99.611	2.200	0.211	0.96	
74.000	ATSD8105_8541A	60 Winter	100	+0%	30/60 Winter				99.204	0.951	0.000	0.03	
75.000	ATSD8205_0250B	60 Winter	100	+0%	100/30 Winter				99.222	0.112	0.000	0.10	
74.001	ATSD8105_8742A	60 Winter	100	+0%	30/30 Summer				99.202	1.667	0.000	0.16	
64.012	ATSD8105_8644A	60 Winter	100	+0%	30/15 Summer	100/60 Winter			99.195	2.260	0.508	1.08	
76.000	ATSD8105_9946B	30 Winter	100	+0%	100/15 Winter				99.287	0.409	0.000	0.64	
76.001	ATSD8105_9544A	30 Winter	100	+0%	100/15 Summer				99.229	0.745	0.000	0.55	
76.002	ATSD8105_9142A	30 Winter	100	+0%	30/30 Winter				99.127	1.171	0.000	0.62	
77.000	ATSD8105_8832A	30 Winter	100	+0%	100/15 Winter				99.189	0.256	0.000	0.83	
77.001	ATSD8105_8538A	30 Winter	100	+0%	100/15 Winter				99.002	0.556	0.000	0.23	
76.003	ATSD8105_8539A	60 Winter	100	+0%	5/15 Summer	100/30 Winter			98.958	2.247	37.521	1.76	
78.000	ATSD8105_8541A	60 Winter	100	+0%	100/15 Winter				98.934	0.687	0.000	0.03	
64.013	ATSD8105_8340A	60 Winter	100	+0%	30/15 Summer				98.933	2.221	0.000	1.14	
79.000	ATSD8105_8544A	60 Winter	100	+0%	100/30 Winter				98.515	0.586	0.000	0.02	
79.001	ATSD8105_7840A	60 Winter	100	+0%	30/60 Winter				98.515	1.204	0.000	0.53	
79.002	ATSD8105_7337A	60 Winter	100	+0%	30/30 Winter				98.423	1.458	0.000	0.59	
79.003	ATSD8105_6934B	60 Winter	100	+0%	30/15 Summer	100/60 Winter			98.257	1.955	4.976	0.67	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
68.000	GNATSD8205_6079A		60.9	FLOOD	3
65.002	ATSD8205_4973A		108.0	SURCHARGED	
69.000	GNATSD8205_4973A		57.2	FLOOD	12
65.003	ATSD8205_3465B		157.9	FLOOD RISK	
64.006	ATSD8205_3367B		420.3	SURCHARGED	
64.007	ATSD8205_2664B		450.0	FLOOD RISK	
70.000	ATSD8205_3164B		6.4	SURCHARGED	
71.000	ATSD8205_3465A		45.3	FLOOD	14
70.001	ATSD8205_1858B		71.0	FLOOD RISK	
64.008	ATSD8205_1860A		406.0	FLOOD	8
64.009	ATSD8205_1057A		408.4	SURCHARGED	
72.000	ATSD8205_2257A		0.0	OK	
72.001	ATSD8205_2056B		0.0	OK	
72.002	ATSD8205_1152B		45.3	SURCHARGED	
72.003	ATSD8205_0348A		79.8	SURCHARGED	
73.000	GNATSD8205_1858B		5.3	OK	
72.004	ATSD8205_0250A		77.3	SURCHARGED	
64.010	ATSD8205_0152B		430.6	FLOOD	1
64.011	ATSD8105_9448A		434.6	FLOOD	1
74.000	ATSD8105_8541A		0.4	FLOOD RISK	
75.000	ATSD8205_0250B		3.0	SURCHARGED	
74.001	ATSD8105_8742A		13.2	SURCHARGED	
64.012	ATSD8105_8644A		455.2	FLOOD	1
76.000	ATSD8105_9946B		31.7	SURCHARGED	
76.001	ATSD8105_9544A		59.6	SURCHARGED	
76.002	ATSD8105_9142A		85.2	SURCHARGED	
77.000	ATSD8105_8832A		77.1	SURCHARGED	
77.001	ATSD8105_8538A		76.1	SURCHARGED	
76.003	ATSD8105_8539A		119.7	FLOOD	3
78.000	ATSD8105_8541A		0.4	SURCHARGED	
64.013	ATSD8105_8340A		502.5	SURCHARGED	
79.000	ATSD8105_8544A		2.2	SURCHARGED	
79.001	ATSD8105_7840A		43.1	SURCHARGED	
79.002	ATSD8105_7337A		70.8	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
79.003	ATSD8105_6934B		77.9	FLOOD	1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)
80.000	ATSD8105_8036B	60 Winter	100	+0%	100/60 Winter				98.388	0.204	0.000	0.01	
80.001	ATSD8105_7734A	60 Winter	100	+0%	100/30 Summer				98.388	0.713	0.000	0.42	
80.002	ATSD8105_7131B	60 Winter	100	+0%	30/15 Winter				98.311	1.591	0.000	0.37	
81.000	GNATSD8105_8340A	15 Winter	100	+0%					98.692	-0.082	0.000	0.42	
64.014	ATSD8105_7033A	60 Winter	100	+0%	5/15 Winter				98.176	2.174	0.000	1.79	
64.015	UNCHMH2	60 Winter	100	+0%	5/15 Winter				97.837	1.950	0.000	1.72	
82.000	ATSD8105_6427B	60 Winter	100	+0%	30/15 Summer				97.517	1.595	0.000	0.63	
83.000	GNATSD8105_7033A	15 Winter	100	+0%					98.015	-0.104	0.000	0.20	
64.016	ATSD8105_6328B	60 Winter	100	+0%	5/30 Summer				97.449	1.700	0.000	1.67	
64.017	EXUNCH1	60 Winter	100	+0%	5/30 Winter				96.800	1.290	0.000	1.62	
84.000	ATSD8105_6834C	15 Winter	100	+0%	30/15 Summer				97.633	1.408	0.000	0.18	
84.001	ATSD8105_5727A	15 Winter	100	+0%	5/15 Summer	100/15 Summer			97.633	2.087	9.215	1.67	
84.002	ATSD8105_4821C	15 Winter	100	+0%	5/15 Summer				96.769	1.772	0.000	2.97	
85.000	GNATSD8105_7131B	15 Summer	100	+0%					97.266	-0.150	0.000	0.00	
85.001	ATSD8105_6427C	15 Winter	100	+0%					96.891	-0.030	0.000	0.70	
85.002	ATSD8105_5018A	60 Winter	100	+0%	100/60 Winter				96.056	0.015	0.000	0.46	
86.000	GNATSD8105_6328B	15 Winter	100	+0%					97.697	-0.081	0.000	0.43	
64.018	ATSD8105_4919A	60 Winter	100	+0%	30/15 Summer				95.950	0.764	0.000	1.61	
87.000	GNATSD8105_4919A	15 Winter	100	+0%	5/15 Summer	100/15 Summer			97.535	0.602	1.536	2.02	
64.019	ATSD8105_4517B	60 Winter	100	+0%	100/30 Winter				95.328	0.363	0.000	0.89	
88.000	GNATSD8105_4517B	60 Winter	100	+0%	5/15 Summer	5/15 Summer			97.393	0.657	57.091	1.40	
89.000	ATSD8105_4917D	15 Summer	100	+0%					95.903	-0.300	0.000	0.00	
89.001	ATSD8105_4111A	15 Winter	100	+0%					95.211	-0.042	0.000	0.97	
89.002	ATSD8105_3506B	15 Winter	100	+0%					94.396	-0.065	0.000	0.95	
64.020	ATSD8105_3308B	60 Winter	100	+0%	30/30 Winter				94.314	0.675	0.000	1.26	
90.000	ATSD8104_2096C	15 Summer	100	+0%					94.465	-0.150	0.000	0.00	
91.000	GNATSD8105_3308B	60 Winter	100	+0%	5/15 Summer	5/15 Summer			96.706	0.654	53.584	1.40	
92.000	GNATSD8104_2096C	15 Summer	100	+0%					94.930	-0.150	0.000	0.00	
64.021	ATSD8104_2298C	60 Winter	100	+0%	30/30 Summer				93.125	0.239	0.000	1.41	
93.000	ATSD8105_3305C	15 Summer	100	+0%					94.612	-0.225	0.000	0.00	
94.000	ATSD8104_1890A	15 Summer	100	+0%					94.311	-0.150	0.000	0.00	
95.000	GNATSD8105_3305C	60 Winter	100	+0%	5/15 Summer	5/15 Summer			96.137	0.700	100.463	1.48	
96.000	GNATSD8104_1890A	15 Summer	100	+0%					94.911	-0.150	0.000	0.00	
64.022	ATSD8104_2194A	60 Winter	100	+0%	100/60 Winter				92.713	0.035	0.000	1.05	
97.000	ATSD8104_1894D	15 Summer	100	+0%					94.330	-0.150	0.000	0.00	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
80.000	ATSD8105_8036B		0.6	SURCHARGED	
80.001	ATSD8105_7734A		53.0	SURCHARGED	
80.002	ATSD8105_7131B		76.0	FLOOD RISK	
81.000	GNATSD8105_8340A		4.2	OK	
64.014	ATSD8105_7033A		583.7	SURCHARGED	
64.015	UNCHMH2		577.2	SURCHARGED	
82.000	ATSD8105_6427B		28.8	SURCHARGED	
83.000	GNATSD8105_7033A		2.1	OK	
64.016	ATSD8105_6328B		597.4	SURCHARGED	
64.017	EXUNCH1		592.8	SURCHARGED	
84.000	ATSD8105_6834C		6.4	SURCHARGED	
84.001	ATSD8105_5727A		59.9	FLOOD	6
84.002	ATSD8105_4821C		127.9	SURCHARGED	
85.000	GNATSD8105_7131B		0.0	OK	
85.001	ATSD8105_6427C		9.1	OK	
85.002	ATSD8105_5018A		89.9	SURCHARGED	
86.000	GNATSD8105_6328B		4.7	OK	
64.018	ATSD8105_4919A		727.5	SURCHARGED	
87.000	GNATSD8105_4919A		20.7	FLOOD	5
64.019	ATSD8105_4517B		740.0	SURCHARGED	
88.000	GNATSD8105_4517B		14.6	FLOOD	38
89.000	ATSD8105_4917D		0.0	OK	
89.001	ATSD8105_4111A		101.6	OK	
89.002	ATSD8105_3506B		182.4	OK	
64.020	ATSD8105_3308B		786.9	SURCHARGED	
90.000	ATSD8104_2096C		0.0	OK	
91.000	GNATSD8105_3308B		14.5	FLOOD	38
92.000	GNATSD8104_2096C		0.0	OK	
64.021	ATSD8104_2298C		803.8	SURCHARGED	
93.000	ATSD8105_3305C		0.0	OK	
94.000	ATSD8104_1890A		0.0	OK	
95.000	GNATSD8105_3305C		13.8	FLOOD	53
96.000	GNATSD8104_1890A		0.0	OK	
64.022	ATSD8104_2194A		832.1	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
97.000	ATSD8104_1894D		0.0	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Existing Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
98.000	ATSD8104_1897A	15 Winter	100	+0%					96.819	-0.193	0.000	0.05		
99.000	ATSD8105_3814A	15 Winter	100	+0%					96.174	-0.148	0.000	0.22		
98.001	ATSD8105_2201D	30 Winter	100	+0%					94.791	-0.147	0.000	0.26		
98.002	ATSD8104_1898A	15 Winter	100	+0%	100/15 Summer				94.461	0.053	0.000	1.12		
100.000	ATSD8104_1192A	15 Summer	100	+0%					95.437	-0.150	0.000	0.00		
101.000	ATSD8104_1797A	15 Winter	100	+0%	30/15 Summer				95.279	0.871	0.000	1.84		
98.003	ATSD8104_1493B	15 Winter	100	+0%					93.945	-0.104	0.000	0.54		
102.000	ATSD8104_1688A	15 Summer	100	+0%					94.134	-0.150	0.000	0.00		
102.001	ATSD8104_1790B	15 Winter	100	+0%					93.010	-0.184	0.000	0.08		
64.023	ATSD8104_1591A	60 Winter	100	+0%	100/30 Winter				92.336	0.055	0.000	1.20		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
98.000	ATSD8104_1897A	4.4	OK	
99.000	ATSD8105_3814A	8.1	OK	
98.001	ATSD8105_2201D	12.2	OK	
98.002	ATSD8104_1898A	39.2	SURCHARGED	
100.000	ATSD8104_1192A	0.0	OK	
101.000	ATSD8104_1797A	23.9	SURCHARGED	
98.003	ATSD8104_1493B	75.5	OK	
102.000	ATSD8104_1688A	0.0	OK	
102.001	ATSD8104_1790B	10.4	OK	
64.023	ATSD8104_1591A	864.9	SURCHARGED	

Annex C New Catchment MicroDrainage Reports

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Catchment - 01

Pipe Sizes STANDARD Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	0
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	0.900
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Catchment - 01

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.359 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1
Climate Change (%)	30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH01-01	15 Winter	1	+30%					92.193	-0.175	0.000	0.11			4.3	OK
2.000	DN01-01	15 Winter	1	+30%					92.115	-0.213	0.000	0.02			1.9	OK
1.001	MH01-02	15 Winter	1	+30%					92.114	-0.107	0.000	0.54			10.2	OK
3.000	MH01-03_1	15 Winter	1	+30%					93.030	-0.096	0.000	0.54			24.3	OK*
1.002	MH01-04	15 Winter	1	+30%					92.061	-0.133	0.000	0.35			34.4	OK
4.000	ASTD8206_6809A	15 Winter	1	+30%					95.616	-0.162	0.000	0.01			0.2	OK
4.001	ASTD8206_6910A	15 Winter	1	+30%					95.617	-0.113	0.000	0.49			32.5	OK
5.000	ASTD8206_6809A_1	15 Winter	1	+30%					95.645	-0.208	0.000	0.02			1.0	OK*
5.001	ASTD8206_6220A	15 Winter	1	+30%					93.548	-0.287	0.000	0.01			1.0	OK
4.002	ASTD8206_6321A	15 Winter	1	+30%					93.405	-0.204	0.000	0.22			33.7	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
1.000	MH01-01	
2.000	DN01-01	
1.001	MH01-02	
3.000	MH01-03_1	
1.002	MH01-04	
4.000	ASTD8206_6809A	
4.001	ASTD8206_6910A	
5.000	ASTD8206_6809A_1	
5.001	ASTD8206_6220A	
4.002	ASTD8206_6321A	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
6.000	MH01-05	15 Winter	1	+30%					93.209	-0.131	0.000	0.38			17.5
4.003	MH01-06	15 Winter	1	+30%					93.187	-0.063	0.000	0.97			49.3
4.004	ASTD8206_6422A	15 Winter	1	+30%					93.053	-0.191	0.000	0.28			49.5
7.000	MH01-07	15 Winter	1	+30%					92.880	-0.206	0.000	0.20			16.4
8.000	MH01-08	15 Winter	1	+30%					93.211	-0.157	0.000	0.04			1.0
8.001	DN01-02	15 Winter	1	+30%					93.210	-0.141	0.000	0.30			11.8
8.002	DN01-03	15 Winter	1	+30%					93.028	-0.118	0.000	0.46			13.7
8.003	ASTD8206_6226A	15 Winter	1	+30%					92.980	-0.129	0.000	0.38			13.7
7.001	MH01-09	15 Winter	1	+30%					92.338	-0.148	0.000	0.50			36.6
4.005	MH01-10	15 Winter	1	+30%					91.997	-0.238	0.000	0.45			91.5
4.006	MH01-11	15 Winter	1	+30%					91.755	-0.258	0.000	0.38			96.5
9.000	MH01-06_1	15 Winter	1	+30%					93.158	-0.131	0.000	0.35			20.7
10.000	MH01-12	15 Summer	1	+30%					93.082	-0.225	0.000	0.00			0.0
9.001	MH01-03	15 Winter	1	+30%					91.832	-0.143	0.000	0.28			20.6
4.007	MH01-13	15 Winter	1	+30%					91.648	0.000	0.000	1.56			112.0
11.000	MH01-14	15 Winter	1	+30%					92.116	-0.177	0.000	0.34			30.3
4.008	MH01-15	15 Winter	1	+30%					91.259	-0.365	0.000	0.38			147.9
4.009	MH01-16	15 Winter	1	+30%					91.143	-0.355	0.000	0.44			154.7
12.000	ASTD8205_8386A_1	15 Summer	1	+30%					100.145	-0.150	0.000	0.00			0.0
12.001	ATSD8205_7697A	15 Summer	1	+30%					97.000	-0.150	0.000	0.00			0.0
13.000	ASTD8205_9190B_1	15 Winter	1	+30%					99.564	-0.225	0.000	0.14			16.1
13.001	DN01-04	15 Winter	1	+30%					98.413	-0.195	0.000	0.26			28.8
14.000	EXDN01-01	15 Winter	1	+30%					103.187	-0.108	0.000	0.17			3.1
14.001	EXDN01-02	15 Winter	1	+30%					101.927	-0.098	0.000	0.26			5.3
14.002	EXDN01-03	15 Winter	1	+30%					100.983	-0.080	0.000	0.44			7.7
14.003	EXDN01-04	15 Winter	1	+30%					100.347	-0.065	0.000	0.61			8.1
15.000	ATSD8205_5675A	15 Winter	1	+30%					105.099	-0.109	0.000	0.16			2.4
15.001	DN01-05	15 Winter	1	+30%					103.975	-0.095	0.000	0.28			6.9
15.002	DN01-06	15 Winter	1	+30%					101.622	-0.096	0.000	0.28			8.3
15.003	DN01-07	15 Winter	1	+30%					100.811	-0.064	0.000	0.61			8.1
15.004	DN01-08	15 Winter	1	+30%					100.477	-0.058	0.000	0.69			8.1
14.004	ATSD8205_7390A	15 Winter	1	+30%					98.558	-0.136	0.000	0.33			16.1
16.000	ATSD8205_7799A	15 Summer	1	+30%					98.800	0.000	0.000	1.65			18.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
6.000	MH01-05	OK	
4.003	MH01-06	OK	
4.004	ASTD8206_6422A	OK	
7.000	MH01-07	OK	
8.000	MH01-08	OK	
8.001	DN01-02	OK*	
8.002	DN01-03	OK*	
8.003	ASTD8206_6226A	OK	
7.001	MH01-09	OK	
4.005	MH01-10	OK	
4.006	MH01-11	OK	
9.000	MH01-06_1	OK*	
10.000	MH01-12	OK	
9.001	MH01-03	OK	
4.007	MH01-13	OK	
11.000	MH01-14	OK	
4.008	MH01-15	OK	
4.009	MH01-16	OK	
12.000	ASTD8205_8386A_1	OK*	
12.001	ATSD8205_7697A	OK	
13.000	ASTD8205_9190B_1	OK	
13.001	DN01-04	OK*	
14.000	EXDN01-01	OK*	
14.001	EXDN01-02	OK*	
14.002	EXDN01-03	OK*	
14.003	EXDN01-04	OK*	
15.000	ATSD8205_5675A	OK	
15.001	DN01-05	OK	
15.002	DN01-06	OK*	
15.003	DN01-07	OK*	
15.004	DN01-08	OK	
14.004	ATSD8205_7390A	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
16.000	ATSD8205_7799A	SURCHARGED*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
17.000	RE01-01	15 Winter	1	+30%					100.408	-0.092	0.000	0.32			6.9
17.001	DN01-09	15 Winter	1	+30%					99.554	-0.074	0.000	0.49			9.6
17.002	DN01-10	15 Winter	1	+30%					98.600	-0.082	0.000	0.43			9.6
14.005	ATSD8205_7591C	15 Winter	1	+30%					98.396	-0.069	0.000	0.92			59.5
13.002	MH01-17	15 Winter	1	+30%					98.140	-0.070	0.000	0.99			80.3
13.003	ASTD8205_8386A	15 Winter	1	+30%					97.831	-0.297	0.000	0.10			81.7
18.000	DN01-11	15 Winter	1	+30%					96.692	-0.200	0.000	0.23			36.0
18.001	MH01-18	15 Winter	1	+30%					93.655	-0.164	0.000	0.42			35.8
19.000	DN01-12	15 Winter	1	+30%					96.210	-0.188	0.000	0.29			44.6
19.001	DN01-13	15 Winter	1	+30%					93.685	-0.073	0.000	0.82			43.6
19.002	ASTD8205_9085A	15 Winter	1	+30%					93.672	-0.081	0.000	0.85			44.6
19.003	DN01-14	15 Winter	1	+30%					93.638	-0.088	0.000	0.93			43.9
18.002	MH01-19	15 Winter	1	+30%					93.497	-0.208	0.000	0.41			86.7
18.003	DN01-15	15 Winter	1	+30%					93.172	-0.254	0.000	0.23			86.5
18.004	DN01-16	15 Winter	1	+30%					92.265	-0.232	0.000	0.31			86.0
20.000	ASTD8206_7900A	30 Winter	1	+30%	1/15 Summer				98.660	0.710	0.000	0.53			9.5
21.000	DN01-17	15 Winter	1	+30%					104.561	-0.182	0.000	0.08			6.9
21.001	MH01-20	15 Winter	1	+30%					98.975	-0.176	0.000	0.11			6.9
20.001	ASTD8206_8501A	30 Winter	1	+30%	1/15 Summer				98.583	1.275	0.000	1.44			32.3
22.000	ASTD8206_1314A	15 Winter	1	+30%					105.223	0.000	0.000	1.01			26.3
22.001	ASTD8206_0809C	15 Winter	1	+30%					103.303	-0.117	0.000	0.47			26.1
22.002	ASTD8206_9901C	30 Winter	1	+30%	1/15 Summer				101.599	0.018	0.000	1.83			28.8
22.003	ASTD8306_0000B	30 Winter	1	+30%					101.401	-0.151	0.000	0.23			29.1
22.004	ASTD8205_9899A	30 Winter	1	+30%					100.227	-0.130	0.000	0.37			34.5
22.005	ASTD8205_9596A	15 Winter	1	+30%	1/15 Summer				98.944	0.190	0.000	0.63			40.3
23.000	ASTD8205_9486C	15 Winter	1	+30%	1/15 Winter				99.241	0.011	0.000	0.10			1.2
23.001	DN01-18	15 Summer	1	+30%					99.149	0.000	0.000	0.15			2.6
23.002	ASTD8205_9489A	15 Winter	1	+30%	1/15 Summer				99.237	0.169	0.000	2.15			16.5
23.003	ASTD8205_9491A	15 Winter	1	+30%					98.869	-0.151	0.000	0.24			16.5
22.006	ASTD8205_9494A	15 Winter	1	+30%	1/15 Summer				98.793	0.382	0.000	2.66			57.6
20.002	ASTD8205_9193A	15 Winter	1	+30%	1/15 Summer				98.191	1.088	0.000	4.04			87.6
20.003	ASTD8205_9190B	15 Winter	1	+30%					96.945	-0.087	0.000	0.95			87.4
20.004	ASTD8205_9091A	15 Winter	1	+30%					96.685	-0.287	0.000	0.13			87.4

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
17.000	RE01-01	OK	
17.001	DN01-09	OK*	
17.002	DN01-10	OK*	
14.005	ATSD8205_7591C	OK	
13.002	MH01-17	OK	
13.003	ASTD8205_8386A	OK	
18.000	DN01-11	OK	
18.001	MH01-18	OK	
19.000	DN01-12	OK	
19.001	DN01-13	OK	
19.002	ASTD8205_9085A	OK	
19.003	DN01-14	OK*	
18.002	MH01-19	OK	
18.003	DN01-15	OK*	
18.004	DN01-16	OK*	
20.000	ASTD8206_7900A	SURCHARGED	
21.000	DN01-17	OK*	
21.001	MH01-20	OK	
20.001	ASTD8206_8501A	SURCHARGED	
22.000	ASTD8206_1314A	SURCHARGED*	
22.001	ASTD8206_0809C	OK*	
22.002	ASTD8206_9901C	SURCHARGED	
22.003	ASTD8306_0000B	OK	
22.004	ASTD8205_9899A	OK	
22.005	ASTD8205_9596A	SURCHARGED	
23.000	ASTD8205_9486C	SURCHARGED	
23.001	DN01-18	SURCHARGED*	
23.002	ASTD8205_9489A	SURCHARGED	
23.003	ASTD8205_9491A	OK	
22.006	ASTD8205_9494A	SURCHARGED	
20.002	ASTD8205_9193A	SURCHARGED	
20.003	ASTD8205_9190B	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.004	ASTD8205_9091A	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
20.005	MH01-21	30 Winter	1	+30%	1/15 Summer				93.081	0.005	0.000	1.85			92.1
20.006	DN01-19	30 Winter	1	+30%					92.824	-0.226	0.000	0.33			92.0
13.004	MH01-22	15 Winter	1	+30%					91.822	-0.168	0.000	0.95			264.7
13.005	DN01-20	30 Winter	1	+30%					91.668	-0.292	0.000	0.45			245.6
13.006	DN01-21	30 Winter	1	+30%					91.602	-0.189	0.000	0.42			231.3
12.002	MH01-23	30 Winter	1	+30%					91.580	-0.154	0.000	1.15			231.9
12.003	DN01-22	30 Winter	1	+30%					91.429	-0.283	0.000	0.74			231.4
24.000	MH01-24	15 Winter	1	+30%					92.387	-0.145	0.000	0.27			10.5
24.001	DN01-23	15 Winter	1	+30%					92.329	-0.127	0.000	0.38			18.4
24.002	DN01-24	15 Winter	1	+30%					91.843	-0.130	0.000	0.37			18.2
25.000	ASTD8205_9091A_1	15 Winter	1	+30%					100.295	-0.068	0.000	0.57			16.6
25.001	ASTD8206_8201B	15 Winter	1	+30%					95.761	-0.102	0.000	0.23			16.6
12.004	MH01-25	30 Winter	1	+30%					91.386	-0.308	0.000	0.65			258.4
12.005	DN01-25	30 Winter	1	+30%					91.260	-0.409	0.000	0.43			258.3
12.006	DN01-26	30 Winter	1	+30%					91.144	-0.414	0.000	0.41			259.7
1.003	MH01-26	30 Winter	1	+30%					90.867	-0.531	0.000	0.37			401.6
26.000	ATSD8306_0413A	15 Winter	1	+30%					104.211	-0.151	0.000	0.23			16.6
26.001	ATSD8206_9810A	15 Winter	1	+30%					102.814	-0.140	0.000	0.30			29.8
26.002	ATSD8206_9206A	15 Winter	1	+30%					100.140	-0.131	0.000	0.37			47.0
26.003	ATSD8206_8705A	15 Winter	1	+30%					95.190	-0.190	0.000	0.29			52.1
26.004	ATSD8206_8505A	15 Winter	1	+30%					94.713	-0.093	0.000	0.82			56.4
26.005	ATSD8206_8405A	15 Winter	1	+30%					94.560	-0.095	0.000	0.80			60.9
1.004	ATSD8206_8206A	30 Winter	1	+30%					90.774	-0.516	0.000	0.51			430.5
27.000	DN01-27	30 Winter	1	+30%					100.972	-0.218	0.000	0.01			0.9
27.001	CP01-01	15 Winter	1	+30%					99.611	-0.199	0.000	0.03			4.4
27.002	CP01-02	15 Winter	1	+30%					95.068	-0.182	0.000	0.08			7.6
27.003	CP01-03	15 Winter	1	+30%					94.022	-0.078	0.000	0.66			9.1
27.004	CP01-04	15 Winter	1	+30%					93.995	-0.082	0.000	0.66			12.6
27.005	CP01-05	15 Winter	1	+30%					93.958	-0.060	0.000	0.89			12.3
1.005	ATSD8206_8408A	30 Winter	1	+30%					90.630	-0.612	0.000	0.36			426.0
1.006	ATSD8206_8408E	30 Winter	1	+30%					90.309	-0.631	0.000	0.33			409.0
1.007	ATSD8206_8408F	30 Winter	1	+30%					89.991	-0.573	0.000	0.33			390.1
1.008	MH01-27	30 Winter	1	+30%					89.874	-0.520	0.000	0.51			387.2

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.005	MH01-21	SURCHARGED	
20.006	DN01-19	OK*	
13.004	MH01-22	OK	
13.005	DN01-20	OK*	
13.006	DN01-21	OK*	
12.002	MH01-23	OK	
12.003	DN01-22	OK*	
24.000	MH01-24	OK	
24.001	DN01-23	OK*	
24.002	DN01-24	OK*	
25.000	ASTD8205_9091A_1	OK*	
25.001	ASTD8206_8201B	OK	
12.004	MH01-25	OK	
12.005	DN01-25	OK*	
12.006	DN01-26	OK*	
1.003	MH01-26	OK	
26.000	ATSD8306_0413A	OK	
26.001	ATSD8206_9810A	OK	
26.002	ATSD8206_9206A	OK	
26.003	ATSD8206_8705A	OK	
26.004	ATSD8206_8505A	OK	
26.005	ATSD8206_8405A	OK	
1.004	ATSD8206_8206A	OK	
27.000	DN01-27	OK*	
27.001	CP01-01	OK	
27.002	CP01-02	OK	
27.003	CP01-03	OK	
27.004	CP01-04	OK	
27.005	CP01-05	OK	
1.005	ATSD8206_8408A	OK	
1.006	ATSD8206_8408E	OK	
1.007	ATSD8206_8408F	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.008	MH01-27	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.009	PI01-01	30 Winter	1	+30%					89.725	-0.625	0.000	0.35			387.1	OK	
28.000	MH01-28	15 Winter	1	+30%					104.674	-0.122	0.000	0.41			35.8	OK	
28.001	MH01-29	15 Winter	1	+30%					101.958	-0.128	0.000	0.38			42.0	OK	
28.002	MH01-30	15 Winter	1	+30%					100.335	-0.123	0.000	0.42			46.8	OK	
28.003	MH01-31	15 Winter	1	+30%					99.061	-0.112	0.000	0.50			51.5	OK	
28.004	MH01-32	15 Winter	1	+30%					97.832	-0.195	0.000	0.27			55.6	OK	
28.005	MH01-33	15 Winter	1	+30%					96.765	-0.190	0.000	0.28			58.9	OK	
28.006	MH01-34	15 Winter	1	+30%					95.824	-0.186	0.000	0.30			63.1	OK	
28.007	MH01-35	15 Winter	1	+30%					94.797	-0.182	0.000	0.32			67.6	OK	
28.008	MH01-36	15 Winter	1	+30%					93.718	-0.178	0.000	0.34			71.7	OK	
28.009	MH01-37	15 Winter	1	+30%					92.678	-0.173	0.000	0.37			76.1	OK	
28.010	MH01-38	15 Winter	1	+30%					91.687	-0.162	0.000	0.43			80.2	OK	
28.011	MH01-39	15 Winter	1	+30%					90.787	-0.234	0.000	0.30			84.2	OK	
29.000	MH01-40	15 Winter	1	+30%					97.883	-0.156	0.000	0.20			15.2	OK	
29.001	MH01-41	15 Winter	1	+30%					97.022	-0.162	0.000	0.17			16.8	OK	
29.002	MH01-42	15 Winter	1	+30%					95.775	-0.134	0.000	0.34			28.0	OK	
30.000	DN01-28	30 Winter	1	+30%					101.898	-0.127	0.000	0.06			1.9	OK*	
30.001	CP01-06	15 Winter	1	+30%					100.168	-0.199	0.000	0.03			4.3	OK	
31.000	CP01-07	30 Winter	1	+30%					101.629	-0.137	0.000	0.02			0.8	OK	
30.002	MH01-43	15 Winter	1	+30%					95.835	-0.196	0.000	0.04			4.9	OK	
29.003	MH01-44	15 Winter	1	+30%					95.090	-0.186	0.000	0.47			49.3	OK	
32.000	MH01-45	15 Winter	1	+30%					97.787	-0.167	0.000	0.15			6.6	OK	
32.001	MH01-46	15 Winter	1	+30%					97.462	-0.163	0.000	0.17			12.3	OK	
32.002	MH01-47	15 Winter	1	+30%					96.543	-0.059	0.000	0.88			14.8	OK	
33.000	DN01-29	15 Winter	1	+30%					95.896	-0.077	0.000	0.48			3.4	OK*	
29.004	MH01-48	15 Winter	1	+30%					95.001	-0.030	0.000	1.00			56.1	OK	
34.000	DN01-30	30 Winter	1	+30%					101.684	-0.118	0.000	0.10			2.4	OK*	
34.001	CP01-08	30 Winter	1	+30%					99.832	-0.207	0.000	0.02			2.4	OK	
29.005	MH01-49	15 Winter	1	+30%					94.733	-0.284	0.000	0.13			61.1	OK	
35.000	DN01-31	15 Winter	1	+30%					96.878	-0.139	0.000	0.02			0.8	OK*	
29.006	MH01-50	15 Winter	1	+30%					92.584	-0.263	0.000	0.20			61.9	OK	
29.007	DN01-32	15 Winter	1	+30%					91.262	-0.267	0.000	0.18			62.0	OK*	
36.000	DN01-33	15 Winter	1	+30%					93.229	-0.193	0.000	0.05			4.3	OK*	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
29.008	MH01-51	15 Winter	1	+30%					90.460	-0.333	0.000	0.15			66.1	OK	
37.000	CP01-09	15 Winter	1	+30%					90.648	-0.268	0.000	0.03			0.9	OK	
38.000	DN01-34	30 Winter	1	+30%					92.956	-0.100	0.000	0.24			5.0	OK*	
38.001	CP01-10	30 Winter	1	+30%					91.837	-0.195	0.000	0.04			5.0	OK	
39.000	CP01-11	15 Winter	1	+30%					92.488	-0.204	0.000	0.02			0.9	OK	
39.001	CP01-12	15 Winter	1	+30%					92.205	-0.200	0.000	0.03			1.5	OK	
39.002	CP01-13	15 Winter	1	+30%					91.768	-0.196	0.000	0.04			2.7	OK	
39.003	CP01-14	15 Winter	1	+30%					91.255	-0.188	0.000	0.06			5.0	OK	
37.001	MH01-52	15 Winter	1	+30%					90.552	-0.332	0.000	0.03			9.7	OK	
40.000	CP01-15	15 Winter	1	+30%					91.760	-0.152	0.000	0.22			15.9	OK	
40.001	CP01-16	15 Winter	1	+30%					90.833	-0.140	0.000	0.30			23.2	OK	
37.002	MH01-53	15 Winter	1	+30%					89.833	-0.435	0.000	0.07			35.6	OK	
37.003	MH01-54	15 Winter	1	+30%					89.272	-0.461	0.000	0.09			35.2	OK	
37.004	MH01-55	15 Winter	1	+30%					89.223	-0.360	0.000	0.21			44.7	OK	
37.005	MH01-56	15 Winter	1	+30%					89.201	-0.340	0.000	0.20			42.5	OK	
29.009	MH01-57	15 Winter	1	+30%					89.186	-0.312	0.000	0.45			109.8	OK	
28.012	MH01-58	15 Winter	1	+30%					89.105	-0.337	0.000	0.41			180.2	OK	
41.000	CP01-17	30 Winter	1	+30%					93.004	-0.169	0.000	0.14			3.8	OK	
41.001	CP01-18	30 Winter	1	+30%					92.758	-0.155	0.000	0.21			5.8	OK	
41.002	MH01-59	30 Winter	1	+30%					92.490	-0.167	0.000	0.15			5.8	OK	
42.000	MH01-60	15 Winter	1	+30%					97.554	-0.130	0.000	0.37			27.8	OK	
42.001	MH01-61	15 Winter	1	+30%					97.213	-0.134	0.000	0.33			27.4	OK	
42.002	MH01-62	15 Winter	1	+30%					95.084	-0.112	0.000	0.48			42.4	OK	
41.003	MH01-63	15 Winter	1	+30%					92.424	-0.118	0.000	0.46			47.4	OK	
41.004	CP01-19	15 Winter	1	+30%					91.772	-0.148	0.000	0.49			51.1	OK	
41.005	MH01-64	15 Winter	1	+30%					90.657	-0.235	0.000	0.29			49.9	OK	
43.000	DN01-35	15 Winter	1	+30%					91.408	-0.084	0.000	0.40			5.6	OK*	
41.006	MH01-65	15 Winter	1	+30%					90.152	-0.148	0.000	0.66			54.3	OK	
44.000	DN01-36	15 Winter	1	+30%					90.783	-0.117	0.000	0.11			0.8	OK*	
41.007	MH01-66	15 Winter	1	+30%					90.036	-0.152	0.000	0.66			53.9	OK	
28.013	MH01-67	15 Winter	1	+30%					89.060	-0.385	0.000	0.48			208.9	OK	
28.014	PI01-02	480 Winter	1	+30%					89.042	-0.413	0.000	0.08			42.9	OK	
1.010	PO01-01	480 Winter	1	+30%					89.041	-0.257	0.000	0.23			68.2	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.011	DN01-37	480 Winter	1	+30%					88.798	-1.702	0.000	0.01			68.2	OK	
1.012	DN01-38	480 Winter	1	+30%					88.766	-1.734	0.000	0.01			68.2	OK	
1.013	MH01-68	480 Winter	1	+30%					88.721	-1.779	0.000	0.01			68.2	OK	
45.000	CP01-20	30 Winter	1	+30%					90.012	-0.136	0.000	0.02			0.1	OK	
46.000	CP01-21	15 Winter	1	+30%					90.877	-0.208	0.000	0.02			0.9	OK	
46.001	CP01-22	15 Winter	1	+30%					90.407	-0.193	0.000	0.05			0.9	OK	
46.002	CP01-23	15 Winter	1	+30%					90.356	-0.193	0.000	0.05			0.9	OK	
46.003	CP01-24	30 Winter	1	+30%					90.305	-0.185	0.000	0.07			1.4	OK	
46.004	CP01-25	30 Winter	1	+30%					90.254	-0.180	0.000	0.09			1.4	OK	
47.000	CP01-26	30 Winter	1	+30%					101.898	-0.127	0.000	0.06			1.1	OK	
47.001	CP01-27	30 Winter	1	+30%					101.151	-0.213	0.000	0.01			1.5	OK	
47.002	CP01-28	15 Winter	1	+30%					98.649	-0.203	0.000	0.02			2.8	OK	
47.003	CP01-29	15 Winter	1	+30%					94.107	-0.197	0.000	0.04			5.1	OK	
47.004	CP01-30	15 Winter	1	+30%					91.686	-0.164	0.000	0.16			12.1	OK	
47.005	CP01-31	15 Winter	1	+30%					90.455	-0.123	0.000	0.42			16.4	OK	
47.006	CP01-32	15 Winter	1	+30%					90.208	-0.150	0.000	0.42			22.4	OK	
47.007	CP01-33	15 Winter	1	+30%					90.166	-0.097	0.000	0.68			22.0	OK	
47.008	CP01-34	15 Winter	1	+30%					90.121	-0.106	0.000	0.74			27.4	OK	
46.005	CP01-35	15 Winter	1	+30%					89.970	-0.189	0.000	0.29			30.7	OK	
48.000	CP01-36	30 Winter	1	+30%					101.105	-0.110	0.000	0.16			1.1	OK	
48.001	CP01-37	30 Winter	1	+30%					100.931	-0.208	0.000	0.02			1.6	OK	
48.002	CP01-38	15 Winter	1	+30%					98.619	-0.206	0.000	0.02			2.4	OK	
48.003	CP01-39	15 Winter	1	+30%					96.061	-0.199	0.000	0.03			4.2	OK	
48.004	CP01-40	15 Winter	1	+30%					92.152	-0.182	0.000	0.08			7.7	OK	
48.005	CP01-41	15 Winter	1	+30%					90.812	-0.158	0.000	0.19			10.1	OK	
48.006	CP01-42	15 Winter	1	+30%					90.475	-0.135	0.000	0.33			12.4	OK	
48.007	CP01-43	15 Winter	1	+30%					90.258	-0.118	0.000	0.46			14.6	OK	
48.008	CP01-44	15 Winter	1	+30%					90.167	-0.070	0.000	0.80			15.3	OK	
48.009	CP01-45	15 Winter	1	+30%					90.109	-0.066	0.000	0.81			15.6	OK	
48.010	CP01-46	15 Winter	1	+30%					90.065	-0.047	0.000	0.96			15.5	OK	
48.011	CP01-47	15 Winter	1	+30%					90.019	-0.058	0.000	0.91			15.7	OK	
45.001	CP01-48	15 Winter	1	+30%					89.349	-0.213	0.000	0.54			44.8	OK	
45.002	MH01-69	15 Winter	1	+30%					89.275	-0.261	0.000	0.37			44.4	OK	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Catchment - 01

Pipe Sizes STANDARD Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	0
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	0.900
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Catchment - 01

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH01-01	15 Winter	5	+30%					92.208	-0.160	0.000	0.18			7.0
2.000	DN01-01	15 Winter	5	+30%					92.162	-0.166	0.000	0.04			3.1
1.001	MH01-02	15 Winter	5	+30%	30/15 Summer				92.160	-0.061	0.000	0.87			16.4
3.000	MH01-03_1	15 Winter	5	+30%					93.096	-0.030	0.000	0.89			40.0
1.002	MH01-04	15 Winter	5	+30%	100/15 Winter				92.091	-0.103	0.000	0.57			56.5
4.000	ASTD8206_6809A	15 Winter	5	+30%	30/15 Summer				95.660	-0.118	0.000	0.01			0.3
4.001	ASTD8206_6910A	15 Winter	5	+30%	30/15 Summer	100/15 Summer			95.660	-0.070	0.000	0.77			51.3
5.000	ASTD8206_6809A_1	15 Winter	5	+30%					95.652	-0.201	0.000	0.03			1.7
5.001	ASTD8206_6220A	15 Winter	5	+30%					93.556	-0.279	0.000	0.01			1.7

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded	
1.000	MH01-01	OK		
2.000	DN01-01	OK		
1.001	MH01-02	OK		
3.000	MH01-03_1	OK*		
1.002	MH01-04	OK		
4.000	ASTD8206_6809A	OK		
4.001	ASTD8206_6910A	OK		4
5.000	ASTD8206_6809A_1	OK*		
5.001	ASTD8206_6220A	OK		

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
4.002	ASTD8206_6321A	15 Winter	5	+30%	100/15 Summer				93.433	-0.176	0.000	0.36			53.4
6.000	MH01-05	15 Winter	5	+30%	5/15 Summer				93.376	0.036	0.000	0.59			27.0
4.003	MH01-06	15 Winter	5	+30%	5/15 Summer				93.333	0.083	0.000	1.59			80.8
4.004	ASTD8206_6422A	15 Winter	5	+30%	100/15 Winter				93.086	-0.158	0.000	0.46			80.6
7.000	MH01-07	15 Winter	5	+30%	100/15 Summer				92.909	-0.177	0.000	0.32			27.0
8.000	MH01-08	15 Winter	5	+30%	30/15 Summer				93.239	-0.129	0.000	0.06			1.7
8.001	DN01-02	15 Winter	5	+30%					93.238	-0.113	0.000	0.49			19.4
8.002	DN01-03	15 Winter	5	+30%					93.068	-0.078	0.000	0.75			22.5
8.003	ASTD8206_6226A	15 Winter	5	+30%	30/15 Summer				93.013	-0.096	0.000	0.62			22.6
7.001	MH01-09	15 Winter	5	+30%	30/15 Summer				92.396	-0.090	0.000	0.81			59.5
4.005	MH01-10	15 Winter	5	+30%	30/15 Summer				92.074	-0.161	0.000	0.73			149.3
4.006	MH01-11	15 Winter	5	+30%	30/15 Summer				91.838	-0.175	0.000	0.60			154.3
9.000	MH01-06_1	15 Winter	5	+30%					93.190	-0.099	0.000	0.57			33.9
10.000	MH01-12	15 Summer	5	+30%					93.082	-0.225	0.000	0.00			0.0
9.001	MH01-03	15 Winter	5	+30%	30/15 Winter				91.858	-0.117	0.000	0.46			33.7
4.007	MH01-13	15 Winter	5	+30%	5/15 Summer				91.703	0.055	0.000	2.49			178.4
11.000	MH01-14	15 Winter	5	+30%	100/15 Summer				92.157	-0.136	0.000	0.56			49.7
4.008	MH01-15	15 Winter	5	+30%	30/15 Winter				91.367	-0.257	0.000	0.60			234.5
4.009	MH01-16	15 Winter	5	+30%	30/15 Summer				91.255	-0.243	0.000	0.71			251.7
12.000	ASTD8205_8386A_1	15 Summer	5	+30%					100.145	-0.150	0.000	0.00			0.0
12.001	ATSD8205_7697A	15 Summer	5	+30%					97.000	-0.150	0.000	0.00			0.0
13.000	ASTD8205_9190B_1	15 Winter	5	+30%					99.587	-0.202	0.000	0.22			26.5
13.001	DN01-04	15 Winter	5	+30%					98.446	-0.162	0.000	0.43			47.3
14.000	EXDN01-01	15 Winter	5	+30%					103.200	-0.095	0.000	0.28			5.0
14.001	EXDN01-02	15 Winter	5	+30%					101.944	-0.081	0.000	0.42			8.7
14.002	EXDN01-03	15 Winter	5	+30%					101.010	-0.053	0.000	0.72			12.7
14.003	EXDN01-04	15 Winter	5	+30%					100.382	-0.030	0.000	1.00			13.3
15.000	ATSD8205_5675A	15 Winter	5	+30%					105.111	-0.097	0.000	0.26			3.9
15.001	DN01-05	15 Winter	5	+30%	100/15 Summer				103.993	-0.077	0.000	0.46			11.3
15.002	DN01-06	15 Winter	5	+30%					101.639	-0.079	0.000	0.45			13.6
15.003	DN01-07	15 Winter	5	+30%					100.872	-0.003	0.000	0.98			13.1
15.004	DN01-08	15 Winter	5	+30%	5/15 Winter				100.540	0.005	0.000	1.12			13.1
14.004	ATSD8205_7390A	15 Winter	5	+30%	5/15 Summer				98.812	0.118	0.000	0.53			25.8

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
4.002	ASTD8206_6321A	OK	
6.000	MH01-05	SURCHARGED	
4.003	MH01-06	SURCHARGED	
4.004	ASTD8206_6422A	OK	
7.000	MH01-07	OK	
8.000	MH01-08	OK	
8.001	DN01-02	OK*	
8.002	DN01-03	OK*	
8.003	ASTD8206_6226A	OK	
7.001	MH01-09	OK	
4.005	MH01-10	OK	
4.006	MH01-11	OK	
9.000	MH01-06_1	OK*	
10.000	MH01-12	OK	
9.001	MH01-03	OK	
4.007	MH01-13	SURCHARGED	
11.000	MH01-14	OK	
4.008	MH01-15	OK	
4.009	MH01-16	OK	
12.000	ASTD8205_8386A_1	OK*	
12.001	ATSD8205_7697A	OK	
13.000	ASTD8205_9190B_1	OK	
13.001	DN01-04	OK*	
14.000	EXDN01-01	OK*	
14.001	EXDN01-02	OK*	
14.002	EXDN01-03	OK*	
14.003	EXDN01-04	OK*	
15.000	ATSD8205_5675A	OK	
15.001	DN01-05	OK	
15.002	DN01-06	OK*	
15.003	DN01-07	OK*	
15.004	DN01-08	SURCHARGED	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
14.004	ATSD8205_7390A	SURCHARGED	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
16.000	ATSD8205_7799A	15 Summer	5	+30%					98.800	0.000	0.000	2.20			24.2
17.000	RE01-01	15 Winter	5	+30%	30/15 Summer	100/15 Winter			100.428	-0.072	0.000	0.53			11.3
17.001	DN01-09	15 Winter	5	+30%					99.583	-0.045	0.000	0.81			15.8
17.002	DN01-10	15 Summer	5	+30%					98.682	0.000	0.000	0.61			13.9
14.005	ATSD8205_7591C	15 Winter	5	+30%	5/15 Summer	100/15 Summer			98.749	0.284	0.000	1.33			85.5
13.002	MH01-17	15 Winter	5	+30%	5/15 Summer				98.278	0.068	0.000	1.42			114.8
13.003	ASTD8205_8386A	15 Winter	5	+30%					97.846	-0.282	0.000	0.14			117.1
18.000	DN01-11	15 Winter	5	+30%					96.723	-0.169	0.000	0.37			59.1
18.001	MH01-18	15 Winter	5	+30%	30/15 Summer				93.704	-0.115	0.000	0.70			58.8
19.000	DN01-12	15 Winter	5	+30%	100/15 Summer				96.247	-0.151	0.000	0.47			73.1
19.001	DN01-13	15 Winter	5	+30%	5/15 Summer				93.850	0.092	0.000	1.37			72.8
19.002	ASTD8205_9085A	15 Winter	5	+30%	5/15 Summer				93.765	0.012	0.000	1.42			74.5
19.003	DN01-14	15 Winter	5	+30%					93.726	0.000	0.000	1.59			74.8
18.002	MH01-19	15 Winter	5	+30%	30/15 Summer				93.562	-0.143	0.000	0.69			146.0
18.003	DN01-15	15 Winter	5	+30%					93.213	-0.213	0.000	0.39			146.0
18.004	DN01-16	15 Winter	5	+30%					92.315	-0.182	0.000	0.52			145.3
20.000	ASTD8206_7900A	30 Winter	5	+30%	5/15 Summer	5/30 Winter			100.100	2.150	0.074	0.73			13.0
21.000	DN01-17	15 Winter	5	+30%					104.573	-0.170	0.000	0.13			11.4
21.001	MH01-20	30 Winter	5	+30%	5/15 Summer				99.982	0.831	0.000	0.19			12.4
20.001	ASTD8206_8501A	30 Winter	5	+30%	5/15 Summer	5/30 Winter			99.953	2.645	0.055	2.15			48.0
22.000	ASTD8206_1314A	15 Summer	5	+30%					105.223	0.000	0.000	1.17			30.4
22.001	ASTD8206_0809C	15 Winter	5	+30%					103.316	-0.104	0.000	0.56			31.4
22.002	ASTD8206_9901C	30 Winter	5	+30%	5/15 Summer				101.625	0.044	0.000	2.20			34.6
22.003	ASTD8306_0000B	30 Winter	5	+30%					101.408	-0.144	0.000	0.28			35.0
22.004	ASTD8205_9899A	15 Winter	5	+30%	30/15 Summer				100.244	-0.113	0.000	0.49			45.5
22.005	ASTD8205_9596A	30 Winter	5	+30%	5/15 Summer	30/15 Summer			99.784	1.030	0.000	0.82			52.0
23.000	ASTD8205_9486C	30 Winter	5	+30%	5/15 Summer				99.751	0.521	0.000	0.23			2.8
23.001	DN01-18	15 Summer	5	+30%					99.149	0.000	0.000	0.34			5.7
23.002	ASTD8205_9489A	30 Winter	5	+30%	5/15 Summer	30/15 Summer			99.749	0.681	0.000	2.82			21.7
23.003	ASTD8205_9491A	30 Winter	5	+30%	5/15 Summer				99.595	0.575	0.000	0.25			17.7
22.006	ASTD8205_9494A	30 Winter	5	+30%	5/15 Summer	30/15 Summer			99.561	1.150	0.000	3.14			68.0
20.002	ASTD8205_9193A	30 Winter	5	+30%	5/15 Summer				98.983	1.880	0.000	5.21			113.0
20.003	ASTD8205_9190B	30 Winter	5	+30%	5/15 Summer				97.043	0.011	0.000	1.22			113.0

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
16.000	ATSD8205_7799A	SURCHARGED*	
17.000	RE01-01	OK	3
17.001	DN01-09	OK*	
17.002	DN01-10	SURCHARGED*	
14.005	ATSD8205_7591C	SURCHARGED	6
13.002	MH01-17	SURCHARGED	
13.003	ASTD8205_8386A	OK	
18.000	DN01-11	OK	
18.001	MH01-18	OK	
19.000	DN01-12	OK	
19.001	DN01-13	SURCHARGED	
19.002	ASTD8205_9085A	SURCHARGED	
19.003	DN01-14	OK*	
18.002	MH01-19	OK	
18.003	DN01-15	OK*	
18.004	DN01-16	OK*	
20.000	ASTD8206_7900A	FLOOD	21
21.000	DN01-17	OK*	
21.001	MH01-20	FLOOD RISK	
20.001	ASTD8206_8501A	FLOOD	20
22.000	ASTD8206_1314A	SURCHARGED*	
22.001	ASTD8206_0809C	OK*	
22.002	ASTD8206_9901C	SURCHARGED	
22.003	ASTD8306_0000B	OK	
22.004	ASTD8205_9899A	OK	
22.005	ASTD8205_9596A	FLOOD RISK	18
23.000	ASTD8205_9486C	SURCHARGED	
23.001	DN01-18	SURCHARGED*	
23.002	ASTD8205_9489A	SURCHARGED	13
23.003	ASTD8205_9491A	SURCHARGED	
22.006	ASTD8205_9494A	FLOOD RISK	15
20.002	ASTD8205_9193A	SURCHARGED	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.003	ASTD8205_9190B	SURCHARGED	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
20.004	ASTD8205_9091A	30 Winter	5	+30%					96.698	-0.274	0.000	0.16			113.0
20.005	MH01-21	30 Winter	5	+30%	5/15 Summer				93.130	0.054	0.000	2.45			122.0
20.006	DN01-19	30 Winter	5	+30%					92.849	-0.201	0.000	0.44			122.0
13.004	MH01-22	60 Summer	5	+30%	30/15 Summer				91.990	0.000	0.000	1.17			324.3
13.005	DN01-20	30 Winter	5	+30%					91.858	-0.102	0.000	0.66			362.3
13.006	DN01-21	30 Winter	5	+30%					91.778	-0.013	0.000	0.65			360.6
12.002	MH01-23	30 Winter	5	+30%	5/30 Winter				91.742	0.008	0.000	1.81			363.7
12.003	DN01-22	30 Winter	5	+30%					91.697	-0.015	0.000	1.13			353.1
24.000	MH01-24	15 Winter	5	+30%	30/15 Summer				92.413	-0.119	0.000	0.45			17.3
24.001	DN01-23	15 Winter	5	+30%					92.363	-0.093	0.000	0.63			30.2
24.002	DN01-24	15 Winter	5	+30%					91.876	-0.097	0.000	0.61			29.9
25.000	ASTD8205_9091A_1	15 Winter	5	+30%					100.329	-0.034	0.000	0.94			27.2
25.001	ASTD8206_8201B	15 Winter	5	+30%					95.777	-0.086	0.000	0.38			27.2
12.004	MH01-25	30 Winter	5	+30%	30/15 Summer				91.666	-0.028	0.000	1.00			397.4
12.005	DN01-25	30 Winter	5	+30%					91.363	-0.306	0.000	0.66			397.4
12.006	DN01-26	30 Winter	5	+30%					91.246	-0.312	0.000	0.64			401.5
1.003	MH01-26	30 Winter	5	+30%	30/30 Winter				91.059	-0.339	0.000	0.59			643.2
26.000	ATSD8306_0413A	15 Winter	5	+30%	100/15 Summer				104.235	-0.127	0.000	0.38			27.2
26.001	ATSD8206_9810A	15 Winter	5	+30%	100/15 Summer				102.841	-0.113	0.000	0.49			48.9
26.002	ATSD8206_9206A	15 Winter	5	+30%	30/15 Summer				100.173	-0.098	0.000	0.60			77.1
26.003	ATSD8206_8705A	15 Winter	5	+30%	30/15 Summer				95.226	-0.154	0.000	0.48			85.5
26.004	ATSD8206_8505A	15 Winter	5	+30%	5/15 Summer				94.874	0.068	0.000	1.32			91.3
26.005	ATSD8206_8405A	15 Winter	5	+30%	5/15 Summer				94.739	0.084	0.000	1.31			99.2
1.004	ATSD8206_8206A	30 Winter	5	+30%	30/30 Winter				90.970	-0.320	0.000	0.82			691.5
27.000	DN01-27	30 Winter	5	+30%					100.977	-0.213	0.000	0.01			1.5
27.001	CP01-01	15 Winter	5	+30%					99.618	-0.192	0.000	0.05			7.3
27.002	CP01-02	15 Winter	5	+30%					95.080	-0.170	0.000	0.13			12.4
27.003	CP01-03	15 Winter	5	+30%	5/15 Summer				94.115	0.015	0.000	1.05			14.5
27.004	CP01-04	15 Winter	5	+30%	5/15 Summer				94.091	0.014	0.000	1.08			20.7
27.005	CP01-05	15 Summer	5	+30%	30/15 Summer				94.018	0.000	0.000	1.35			18.7
1.005	ATSD8206_8408A	30 Winter	5	+30%	100/15 Summer				90.772	-0.470	0.000	0.57			683.5
1.006	ATSD8206_8408E	30 Winter	5	+30%	100/30 Winter				90.439	-0.501	0.000	0.52			655.1
1.007	ATSD8206_8408F	30 Winter	5	+30%	100/30 Summer				90.162	-0.402	0.000	0.51			612.4

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.004	ASTD8205_9091A	OK	
20.005	MH01-21	SURCHARGED	
20.006	DN01-19	OK*	
13.004	MH01-22	OK	
13.005	DN01-20	OK*	
13.006	DN01-21	OK*	
12.002	MH01-23	SURCHARGED	
12.003	DN01-22	OK*	
24.000	MH01-24	OK	
24.001	DN01-23	OK*	
24.002	DN01-24	OK*	
25.000	ASTD8205_9091A_1	OK*	
25.001	ASTD8206_8201B	OK	
12.004	MH01-25	OK	
12.005	DN01-25	OK*	
12.006	DN01-26	OK*	
1.003	MH01-26	OK	
26.000	ATSD8306_0413A	OK	
26.001	ATSD8206_9810A	OK	
26.002	ATSD8206_9206A	OK	
26.003	ATSD8206_8705A	OK	
26.004	ATSD8206_8505A	SURCHARGED	
26.005	ATSD8206_8405A	SURCHARGED	
1.004	ATSD8206_8206A	OK	
27.000	DN01-27	OK*	
27.001	CP01-01	OK	
27.002	CP01-02	OK	
27.003	CP01-03	SURCHARGED	
27.004	CP01-04	SURCHARGED	
27.005	CP01-05	OK	
1.005	ATSD8206_8408A	OK	
1.006	ATSD8206_8408E	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.007	ATSD8206_8408F	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.008	MH01-27	30 Winter	5	+30%	100/30 Summer				90.056	-0.338	0.000	0.80			606.9
1.009	PI01-01	30 Winter	5	+30%					89.851	-0.499	0.000	0.54			607.4
28.000	MH01-28	15 Winter	5	+30%	30/15 Summer	100/15 Summer			104.710	-0.086	0.000	0.68			58.7
28.001	MH01-29	15 Winter	5	+30%	30/15 Summer				101.991	-0.095	0.000	0.63			68.9
28.002	MH01-30	15 Winter	5	+30%	30/15 Summer				100.372	-0.086	0.000	0.70			76.8
28.003	MH01-31	15 Winter	5	+30%	30/15 Summer				99.104	-0.069	0.000	0.83			84.4
28.004	MH01-32	15 Winter	5	+30%					97.866	-0.161	0.000	0.43			91.2
28.005	MH01-33	15 Winter	5	+30%					96.800	-0.155	0.000	0.47			96.7
28.006	MH01-34	15 Winter	5	+30%	100/15 Winter				95.861	-0.149	0.000	0.50			103.5
28.007	MH01-35	15 Winter	5	+30%	100/15 Summer				94.835	-0.144	0.000	0.53			110.8
28.008	MH01-36	15 Winter	5	+30%	100/15 Summer				93.758	-0.138	0.000	0.56			117.6
28.009	MH01-37	15 Winter	5	+30%	30/15 Summer				92.721	-0.130	0.000	0.61			124.8
28.010	MH01-38	15 Winter	5	+30%	30/15 Summer				91.737	-0.112	0.000	0.71			131.6
28.011	MH01-39	15 Winter	5	+30%					90.833	-0.188	0.000	0.50			138.1
29.000	MH01-40	15 Winter	5	+30%					97.903	-0.136	0.000	0.33			24.9
29.001	MH01-41	15 Winter	5	+30%	100/15 Summer				97.041	-0.143	0.000	0.28			27.6
29.002	MH01-42	15 Winter	5	+30%	30/15 Summer				95.805	-0.104	0.000	0.55			46.0
30.000	DN01-28	30 Winter	5	+30%					101.905	-0.120	0.000	0.09			3.0
30.001	CP01-06	15 Winter	5	+30%					100.175	-0.192	0.000	0.05			7.0
31.000	CP01-07	30 Winter	5	+30%					101.633	-0.133	0.000	0.03			1.4
30.002	MH01-43	15 Winter	5	+30%	100/15 Summer				95.844	-0.187	0.000	0.07			8.1
29.003	MH01-44	15 Winter	5	+30%	30/15 Summer				95.209	-0.067	0.000	0.76			80.0
32.000	MH01-45	15 Winter	5	+30%					97.804	-0.150	0.000	0.24			10.8
32.001	MH01-46	15 Winter	5	+30%					97.480	-0.145	0.000	0.27			20.2
32.002	MH01-47	15 Winter	5	+30%	5/15 Summer				96.606	0.004	0.000	1.46			24.5
33.000	DN01-29	15 Winter	5	+30%					95.923	-0.050	0.000	0.78			5.6
29.004	MH01-48	15 Winter	5	+30%	5/15 Summer				95.053	0.022	0.000	1.91			107.2
34.000	DN01-30	30 Winter	5	+30%					101.693	-0.109	0.000	0.17			3.9
34.001	CP01-08	30 Winter	5	+30%					99.839	-0.200	0.000	0.03			3.9
29.005	MH01-49	15 Winter	5	+30%					94.770	-0.247	0.000	0.25			115.5
35.000	DN01-31	15 Winter	5	+30%					96.883	-0.134	0.000	0.03			1.3
29.006	MH01-50	15 Winter	5	+30%					92.629	-0.218	0.000	0.37			116.9
29.007	DN01-32	15 Winter	5	+30%					91.307	-0.222	0.000	0.35			116.9

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.008	MH01-27	OK	
1.009	PI01-01	OK	
28.000	MH01-28	OK	2
28.001	MH01-29	OK	
28.002	MH01-30	OK	
28.003	MH01-31	OK	
28.004	MH01-32	OK	
28.005	MH01-33	OK	
28.006	MH01-34	OK	
28.007	MH01-35	OK	
28.008	MH01-36	OK	
28.009	MH01-37	OK	
28.010	MH01-38	OK	
28.011	MH01-39	OK	
29.000	MH01-40	OK	
29.001	MH01-41	OK	
29.002	MH01-42	OK	
30.000	DN01-28	OK*	
30.001	CP01-06	OK	
31.000	CP01-07	OK	
30.002	MH01-43	OK	
29.003	MH01-44	OK	
32.000	MH01-45	OK	
32.001	MH01-46	OK	
32.002	MH01-47	SURCHARGED	
33.000	DN01-29	OK*	
29.004	MH01-48	SURCHARGED	
34.000	DN01-30	OK*	
34.001	CP01-08	OK	
29.005	MH01-49	OK	
35.000	DN01-31	OK*	
29.006	MH01-50	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
29.007	DN01-32	OK*	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
36.000	DN01-33	15 Winter	5	+30%					93.240	-0.182	0.000	0.08			7.0	OK*
29.008	MH01-51	15 Winter	5	+30%					90.507	-0.286	0.000	0.29			123.4	OK
37.000	CP01-09	15 Winter	5	+30%					90.656	-0.260	0.000	0.04			1.4	OK
38.000	DN01-34	30 Winter	5	+30%					92.971	-0.085	0.000	0.40			8.1	OK*
38.001	CP01-10	30 Winter	5	+30%					91.847	-0.185	0.000	0.07			8.2	OK
39.000	CP01-11	15 Winter	5	+30%					92.494	-0.198	0.000	0.03			1.5	OK
39.001	CP01-12	15 Winter	5	+30%					92.211	-0.194	0.000	0.05			2.5	OK
39.002	CP01-13	15 Winter	5	+30%					91.778	-0.186	0.000	0.07			4.5	OK
39.003	CP01-14	15 Winter	5	+30%					91.267	-0.176	0.000	0.11			8.3	OK
37.001	MH01-52	15 Winter	5	+30%					90.564	-0.320	0.000	0.05			16.0	OK
40.000	CP01-15	15 Winter	5	+30%					91.783	-0.129	0.000	0.37			26.1	OK
40.001	CP01-16	15 Winter	5	+30%	100/15 Summer				90.861	-0.112	0.000	0.49			37.9	OK
37.002	MH01-53	15 Winter	5	+30%					89.860	-0.408	0.000	0.11			58.3	OK
37.003	MH01-54	15 Winter	5	+30%	100/15 Summer				89.362	-0.371	0.000	0.15			57.6	OK
37.004	MH01-55	15 Winter	5	+30%	30/15 Summer				89.351	-0.232	0.000	0.33			70.1	OK
37.005	MH01-56	15 Winter	5	+30%	30/15 Summer				89.340	-0.201	0.000	0.29			62.1	OK
29.009	MH01-57	15 Winter	5	+30%	30/15 Summer				89.329	-0.169	0.000	0.74			181.8	OK
28.012	MH01-58	15 Winter	5	+30%	30/15 Summer				89.259	-0.183	0.000	0.67			296.3	OK
41.000	CP01-17	30 Winter	5	+30%	100/15 Winter				93.020	-0.153	0.000	0.23			6.3	OK
41.001	CP01-18	30 Winter	5	+30%	100/15 Summer				92.780	-0.133	0.000	0.34			9.5	OK
41.002	MH01-59	30 Winter	5	+30%	30/15 Summer				92.508	-0.149	0.000	0.25			9.5	OK
42.000	MH01-60	15 Winter	5	+30%	30/15 Summer				97.586	-0.098	0.000	0.60			45.6	OK
42.001	MH01-61	15 Winter	5	+30%	30/15 Summer				97.243	-0.104	0.000	0.55			44.9	OK
42.002	MH01-62	15 Winter	5	+30%	30/15 Summer				95.127	-0.069	0.000	0.79			69.6	OK
41.003	MH01-63	15 Winter	5	+30%	30/15 Summer				92.464	-0.078	0.000	0.75			77.9	OK
41.004	CP01-19	15 Winter	5	+30%	30/15 Summer				91.831	-0.089	0.000	0.81			83.9	OK
41.005	MH01-64	15 Winter	5	+30%	100/15 Winter				90.703	-0.189	0.000	0.48			81.8	OK
43.000	DN01-35	15 Winter	5	+30%					91.431	-0.061	0.000	0.66			9.2	OK*
41.006	MH01-65	15 Winter	5	+30%	5/15 Winter				90.303	0.003	0.000	1.03			84.8	SURCHARGED
44.000	DN01-36	15 Winter	5	+30%					90.793	-0.107	0.000	0.18			1.3	OK*
41.007	MH01-66	15 Winter	5	+30%	30/15 Summer				90.142	-0.046	0.000	1.00			81.5	OK
28.013	MH01-67	360 Winter	5	+30%	30/15 Summer				89.228	-0.217	0.000	0.20			86.9	OK
28.014	PI01-02	360 Winter	5	+30%	30/120 Winter				89.224	-0.231	0.000	0.15			82.2	OK

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
36.000	DN01-33	
29.008	MH01-51	
37.000	CP01-09	
38.000	DN01-34	
38.001	CP01-10	
39.000	CP01-11	
39.001	CP01-12	
39.002	CP01-13	
39.003	CP01-14	
37.001	MH01-52	
40.000	CP01-15	
40.001	CP01-16	
37.002	MH01-53	
37.003	MH01-54	
37.004	MH01-55	
37.005	MH01-56	
29.009	MH01-57	
28.012	MH01-58	
41.000	CP01-17	
41.001	CP01-18	
41.002	MH01-59	
42.000	MH01-60	
42.001	MH01-61	
42.002	MH01-62	
41.003	MH01-63	
41.004	CP01-19	
41.005	MH01-64	
43.000	DN01-35	
41.006	MH01-65	
44.000	DN01-36	
41.007	MH01-66	
28.013	MH01-67	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
28.014	PI01-02	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.010	PO01-01	360 Winter	5	+30%	30/60 Summer				89.220	-0.078	0.000	0.46			140.1
1.011	DN01-37	360 Winter	5	+30%					88.888	-1.612	0.000	0.01			140.0
1.012	DN01-38	360 Winter	5	+30%					88.840	-1.660	0.000	0.01			140.0
1.013	MH01-68	360 Winter	5	+30%					88.767	-1.733	0.000	0.01			140.0
45.000	CP01-20	30 Winter	5	+30%					90.015	-0.133	0.000	0.03			0.2
46.000	CP01-21	15 Winter	5	+30%					90.884	-0.201	0.000	0.03			1.5
46.001	CP01-22	15 Winter	5	+30%					90.417	-0.183	0.000	0.08			1.5
46.002	CP01-23	15 Winter	5	+30%					90.366	-0.183	0.000	0.08			1.5
46.003	CP01-24	15 Winter	5	+30%					90.318	-0.172	0.000	0.13			2.4
46.004	CP01-25	15 Winter	5	+30%					90.267	-0.167	0.000	0.15			2.4
47.000	CP01-26	30 Winter	5	+30%					101.905	-0.120	0.000	0.09			1.8
47.001	CP01-27	30 Winter	5	+30%					101.159	-0.205	0.000	0.02			2.5
47.002	CP01-28	15 Winter	5	+30%					98.654	-0.198	0.000	0.03			4.5
47.003	CP01-29	15 Winter	5	+30%					94.115	-0.189	0.000	0.06			8.4
47.004	CP01-30	15 Winter	5	+30%	100/15 Summer				91.704	-0.146	0.000	0.27			19.9
47.005	CP01-31	15 Winter	5	+30%	30/15 Summer				90.492	-0.086	0.000	0.69			27.0
47.006	CP01-32	15 Winter	5	+30%	30/15 Summer				90.313	-0.045	0.000	0.66			34.9
47.007	CP01-33	15 Winter	5	+30%	5/15 Winter				90.267	0.004	0.000	1.09			35.3
47.008	CP01-34	15 Winter	5	+30%	30/15 Summer				90.227	0.000	0.000	1.17			43.7
46.005	CP01-35	15 Winter	5	+30%	100/15 Summer				90.005	-0.154	0.000	0.47			49.6
48.000	CP01-36	30 Winter	5	+30%					101.117	-0.098	0.000	0.26			1.7
48.001	CP01-37	30 Winter	5	+30%					100.938	-0.201	0.000	0.03			2.6
48.002	CP01-38	15 Winter	5	+30%					98.625	-0.200	0.000	0.03			4.0
48.003	CP01-39	15 Winter	5	+30%					96.067	-0.193	0.000	0.05			7.0
48.004	CP01-40	15 Winter	5	+30%					92.164	-0.170	0.000	0.13			12.7
48.005	CP01-41	15 Winter	5	+30%	30/15 Summer				90.832	-0.138	0.000	0.32			16.7
48.006	CP01-42	15 Winter	5	+30%	30/15 Summer	100/15 Summer			90.504	-0.106	0.000	0.54			20.3
48.007	CP01-43	15 Winter	5	+30%	30/15 Summer	100/15 Winter			90.349	-0.027	0.000	0.70			22.2
48.008	CP01-44	15 Winter	5	+30%	5/15 Summer				90.300	0.063	0.000	1.15			22.0
48.009	CP01-45	15 Winter	5	+30%	5/15 Summer				90.226	0.051	0.000	1.16			22.4
48.010	CP01-46	15 Winter	5	+30%	5/15 Summer				90.143	0.031	0.000	1.43			23.0
48.011	CP01-47	15 Winter	5	+30%	5/15 Summer				90.089	0.012	0.000	1.36			23.5
45.001	CP01-48	15 Winter	5	+30%	30/15 Winter				89.438	-0.124	0.000	0.86			71.0

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded	
1.010	PO01-01	OK		
1.011	DN01-37	OK		
1.012	DN01-38	OK		
1.013	MH01-68	OK		
45.000	CP01-20	OK		
46.000	CP01-21	OK		
46.001	CP01-22	OK		
46.002	CP01-23	OK		
46.003	CP01-24	OK		
46.004	CP01-25	OK		
47.000	CP01-26	OK		
47.001	CP01-27	OK		
47.002	CP01-28	OK		
47.003	CP01-29	OK		
47.004	CP01-30	OK		
47.005	CP01-31	OK		
47.006	CP01-32	OK		
47.007	CP01-33	SURCHARGED		
47.008	CP01-34	OK		
46.005	CP01-35	OK		
48.000	CP01-36	OK		
48.001	CP01-37	OK		
48.002	CP01-38	OK		
48.003	CP01-39	OK		
48.004	CP01-40	OK		
48.005	CP01-41	OK		
48.006	CP01-42	OK		4
48.007	CP01-43	OK		1
48.008	CP01-44	SURCHARGED		
48.009	CP01-45	SURCHARGED		
48.010	CP01-46	SURCHARGED		
48.011	CP01-47	SURCHARGED		

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
45.001	CP01-48	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
45.002	MH01-69	15 Winter	5	+30%	100/15 Summer				89.333	-0.203	0.000	0.58			69.6	OK

PN	US/MH Name	Level Exceeded
45.002	MH01-69	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH01-01	15 Winter	30	+30%					92.267	-0.101	0.000	0.30			11.9
2.000	DN01-01	15 Winter	30	+30%					92.245	-0.083	0.000	0.06			5.3
1.001	MH01-02	15 Winter	30	+30%	30/15 Summer				92.241	0.020	0.000	1.64			30.8
3.000	MH01-03_1	15 Summer	30	+30%					93.126	0.000	0.000	1.27			56.6
1.002	MH01-04	15 Winter	30	+30%	100/15 Winter				92.128	-0.066	0.000	0.84			83.3
4.000	ASTD8206_6809A	15 Winter	30	+30%	30/15 Summer				96.819	1.041	0.000	0.27			7.5
4.001	ASTD8206_6910A	15 Winter	30	+30%	30/15 Summer	100/15 Summer			96.827	1.097	0.000	1.20			80.3
5.000	ASTD8206_6809A_1	15 Winter	30	+30%					95.658	-0.195	0.000	0.04			2.9
5.001	ASTD8206_6220A	15 Winter	30	+30%					93.599	-0.236	0.000	0.02			2.7

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.000	MH01-01	OK	
2.000	DN01-01	OK	
1.001	MH01-02	SURCHARGED	
3.000	MH01-03_1	SURCHARGED*	
1.002	MH01-04	OK	
4.000	ASTD8206_6809A	SURCHARGED	
4.001	ASTD8206_6910A	FLOOD RISK	4
5.000	ASTD8206_6809A_1	OK*	
5.001	ASTD8206_6220A	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
4.002	ASTD8206_6321A	15 Winter	30	+30%	100/15 Summer				93.597	-0.012	0.000	0.57			84.8
6.000	MH01-05	15 Winter	30	+30%	5/15 Summer				93.583	0.243	0.000	1.04			48.2
4.003	MH01-06	15 Winter	30	+30%	5/15 Summer				93.487	0.237	0.000	2.49			126.5
4.004	ASTD8206_6422A	15 Winter	30	+30%	100/15 Winter				93.134	-0.110	0.000	0.72			126.6
7.000	MH01-07	15 Winter	30	+30%	100/15 Summer				92.953	-0.133	0.000	0.54			45.6
8.000	MH01-08	15 Winter	30	+30%	30/15 Summer				93.409	0.041	0.000	0.14			3.8
8.001	DN01-02	15 Summer	30	+30%					93.351	0.000	0.000	0.93			36.9
8.002	DN01-03	15 Summer	30	+30%					93.146	0.000	0.000	1.41			42.1
8.003	ASTD8206_6226A	15 Winter	30	+30%	30/15 Summer				93.128	0.019	0.000	1.16			42.5
7.001	MH01-09	15 Winter	30	+30%	30/15 Summer				92.756	0.270	0.000	1.24			91.3
4.005	MH01-10	15 Winter	30	+30%	30/15 Summer				92.421	0.186	0.000	1.08			220.9
4.006	MH01-11	15 Winter	30	+30%	30/15 Summer				92.159	0.146	0.000	0.90			229.5
9.000	MH01-06_1	15 Winter	30	+30%					93.260	-0.029	0.000	0.95			57.1
10.000	MH01-12	15 Summer	30	+30%					93.082	-0.225	0.000	0.00			0.0
9.001	MH01-03	15 Winter	30	+30%	30/15 Winter				92.002	0.027	0.000	0.74			53.8
4.007	MH01-13	15 Winter	30	+30%	5/15 Summer				91.859	0.211	0.000	3.80			272.2
11.000	MH01-14	15 Winter	30	+30%	100/15 Summer				92.229	-0.064	0.000	0.91			80.4
4.008	MH01-15	30 Winter	30	+30%	30/15 Winter				91.641	0.017	0.000	0.87			338.5
4.009	MH01-16	30 Winter	30	+30%	30/15 Summer				91.543	0.045	0.000	1.04			367.0
12.000	ASTD8205_8386A_1	15 Summer	30	+30%					100.145	-0.150	0.000	0.00			0.0
12.001	ATSD8205_7697A	15 Summer	30	+30%					97.000	-0.150	0.000	0.00			0.0
13.000	ASTD8205_9190B_1	15 Winter	30	+30%					99.620	-0.169	0.000	0.38			44.6
13.001	DN01-04	15 Summer	30	+30%					98.608	0.000	0.000	0.71			78.4
14.000	EXDN01-01	15 Winter	30	+30%					103.219	-0.076	0.000	0.48			8.5
14.001	EXDN01-02	15 Winter	30	+30%					101.977	-0.048	0.000	0.75			15.4
14.002	EXDN01-03	15 Summer	30	+30%					101.063	0.000	0.000	1.09			19.2
14.003	EXDN01-04	15 Summer	30	+30%					100.412	0.000	0.000	1.49			19.8
15.000	ATSD8205_5675A	15 Winter	30	+30%					105.130	-0.078	0.000	0.44			6.6
15.001	DN01-05	15 Winter	30	+30%	100/15 Summer				104.035	-0.035	0.000	0.88			21.8
15.002	DN01-06	15 Summer	30	+30%					101.718	0.000	0.000	0.77			23.1
15.003	DN01-07	15 Summer	30	+30%					100.875	0.000	0.000	1.53			20.3
15.004	DN01-08	15 Winter	30	+30%	5/15 Winter				100.641	0.106	0.000	1.79			21.0
14.004	ATSD8205_7390A	15 Winter	30	+30%	5/15 Summer				99.633	0.939	0.000	0.88			42.8

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
4.002	ASTD8206_6321A	OK	
6.000	MH01-05	SURCHARGED	
4.003	MH01-06	SURCHARGED	
4.004	ASTD8206_6422A	OK	
7.000	MH01-07	OK	
8.000	MH01-08	SURCHARGED	
8.001	DN01-02	SURCHARGED*	
8.002	DN01-03	SURCHARGED*	
8.003	ASTD8206_6226A	SURCHARGED	
7.001	MH01-09	SURCHARGED	
4.005	MH01-10	SURCHARGED	
4.006	MH01-11	SURCHARGED	
9.000	MH01-06_1	OK*	
10.000	MH01-12	OK	
9.001	MH01-03	SURCHARGED	
4.007	MH01-13	SURCHARGED	
11.000	MH01-14	OK	
4.008	MH01-15	SURCHARGED	
4.009	MH01-16	SURCHARGED	
12.000	ASTD8205_8386A_1	OK*	
12.001	ATSD8205_7697A	OK	
13.000	ASTD8205_9190B_1	OK	
13.001	DN01-04	SURCHARGED*	
14.000	EXDN01-01	OK*	
14.001	EXDN01-02	OK*	
14.002	EXDN01-03	SURCHARGED*	
14.003	EXDN01-04	SURCHARGED*	
15.000	ATSD8205_5675A	OK	
15.001	DN01-05	OK	
15.002	DN01-06	SURCHARGED*	
15.003	DN01-07	SURCHARGED*	
15.004	DN01-08	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
14.004	ATSD8205_7390A	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
16.000	ATSD8205_7799A	15 Summer	30	+30%					98.800	0.000	0.000	2.98			32.7
17.000	RE01-01	15 Winter	30	+30%	30/15 Summer	100/15 Winter			100.947	0.447	0.000	0.79			16.8
17.001	DN01-09	15 Summer	30	+30%					99.628	0.000	0.000	0.99			19.3
17.002	DN01-10	15 Summer	30	+30%					98.682	0.000	0.000	1.04			23.4
14.005	ATSD8205_7591C	15 Winter	30	+30%	5/15 Summer	100/15 Summer			99.495	1.030	0.000	1.87			120.4
13.002	MH01-17	15 Winter	30	+30%	5/15 Summer				98.547	0.337	0.000	2.25			182.3
13.003	ASTD8205_8386A	15 Winter	30	+30%					97.872	-0.256	0.000	0.22			185.6
18.000	DN01-11	15 Winter	30	+30%					96.772	-0.120	0.000	0.63			99.6
18.001	MH01-18	15 Winter	30	+30%	30/15 Summer				93.914	0.095	0.000	1.14			96.6
19.000	DN01-12	15 Winter	30	+30%	100/15 Summer				96.307	-0.091	0.000	0.79			123.3
19.001	DN01-13	15 Winter	30	+30%	5/15 Summer				94.184	0.426	0.000	2.23			118.8
19.002	ASTD8205_9085A	15 Winter	30	+30%	5/15 Summer				93.955	0.202	0.000	2.33			122.2
19.003	DN01-14	15 Summer	30	+30%					93.726	0.000	0.000	2.46			115.8
18.002	MH01-19	15 Winter	30	+30%	30/15 Summer				93.764	0.059	0.000	1.12			235.8
18.003	DN01-15	15 Winter	30	+30%					93.267	-0.159	0.000	0.62			235.0
18.004	DN01-16	30 Winter	30	+30%					92.497	0.000	0.000	0.73			201.9
20.000	ASTD8206_7900A	30 Winter	30	+30%	5/15 Summer	5/30 Winter			100.109	2.159	9.176	1.07			19.2
21.000	DN01-17	15 Winter	30	+30%					104.590	-0.153	0.000	0.22			19.2
21.001	MH01-20	15 Winter	30	+30%	5/15 Summer				100.029	0.878	0.000	0.30			19.1
20.001	ASTD8206_8501A	30 Winter	30	+30%	5/15 Summer	5/30 Winter			99.978	2.670	25.288	2.11			47.2
22.000	ASTD8206_1314A	15 Summer	30	+30%					105.223	0.000	0.000	1.50			39.0
22.001	ASTD8206_0809C	30 Winter	30	+30%					103.341	-0.079	0.000	0.75			41.7
22.002	ASTD8206_9901C	30 Winter	30	+30%	5/15 Summer				101.677	0.096	0.000	2.81			44.3
22.003	ASTD8306_0000B	15 Winter	30	+30%					101.420	-0.132	0.000	0.36			44.7
22.004	ASTD8205_9899A	15 Winter	30	+30%	30/15 Summer				100.869	0.512	0.000	0.71			66.0
22.005	ASTD8205_9596A	30 Winter	30	+30%	5/15 Summer	30/15 Summer			100.036	1.282	17.069	1.07			68.2
23.000	ASTD8205_9486C	15 Winter	30	+30%	5/15 Summer				100.532	1.302	0.000	0.43			5.2
23.001	DN01-18	15 Summer	30	+30%					99.149	0.000	0.000	0.38			6.4
23.002	ASTD8205_9489A	15 Winter	30	+30%	5/15 Summer	30/15 Summer			100.517	1.449	3.029	3.78			29.0
23.003	ASTD8205_9491A	30 Winter	30	+30%	5/15 Summer				99.913	0.893	0.000	0.39			27.3
22.006	ASTD8205_9494A	30 Winter	30	+30%	5/15 Summer	30/15 Summer			99.821	1.410	5.078	3.39			73.4
20.002	ASTD8205_9193A	15 Winter	30	+30%	5/15 Summer				99.220	2.117	0.000	5.40			117.1
20.003	ASTD8205_9190B	30 Winter	30	+30%	5/15 Summer				97.050	0.018	0.000	1.27			117.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
16.000	ATSD8205_7799A	SURCHARGED*	
17.000	RE01-01	SURCHARGED	3
17.001	DN01-09	SURCHARGED*	
17.002	DN01-10	SURCHARGED*	
14.005	ATSD8205_7591C	FLOOD RISK	6
13.002	MH01-17	SURCHARGED	
13.003	ASTD8205_8386A	OK	
18.000	DN01-11	OK	
18.001	MH01-18	SURCHARGED	
19.000	DN01-12	OK	
19.001	DN01-13	SURCHARGED	
19.002	ASTD8205_9085A	SURCHARGED	
19.003	DN01-14	SURCHARGED*	
18.002	MH01-19	SURCHARGED	
18.003	DN01-15	OK*	
18.004	DN01-16	SURCHARGED*	
20.000	ASTD8206_7900A	FLOOD	21
21.000	DN01-17	OK*	
21.001	MH01-20	FLOOD RISK	
20.001	ASTD8206_8501A	FLOOD	20
22.000	ASTD8206_1314A	SURCHARGED*	
22.001	ASTD8206_0809C	OK*	
22.002	ASTD8206_9901C	SURCHARGED	
22.003	ASTD8306_0000B	OK	
22.004	ASTD8205_9899A	SURCHARGED	
22.005	ASTD8205_9596A	FLOOD	18
23.000	ASTD8205_9486C	FLOOD RISK	
23.001	DN01-18	SURCHARGED*	
23.002	ASTD8205_9489A	FLOOD	13
23.003	ASTD8205_9491A	FLOOD RISK	
22.006	ASTD8205_9494A	FLOOD	15
20.002	ASTD8205_9193A	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.003	ASTD8205_9190B	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
20.004	ASTD8205_9091A	30 Winter	30	+30%					96.700	-0.272	0.000	0.17			117.1
20.005	MH01-21	30 Winter	30	+30%	5/15 Summer				93.183	0.107	0.000	3.04			151.0
20.006	DN01-19	30 Winter	30	+30%					92.873	-0.177	0.000	0.55			150.8
13.004	MH01-22	30 Winter	30	+30%	30/15 Summer				92.351	0.361	0.000	2.10			583.1
13.005	DN01-20	15 Summer	30	+30%					91.960	0.000	0.000	1.00			546.3
13.006	DN01-21	15 Summer	30	+30%					91.791	0.000	0.000	0.98			538.6
12.002	MH01-23	30 Winter	30	+30%	5/30 Winter				92.057	0.323	0.000	2.81			566.6
12.003	DN01-22	15 Summer	30	+30%					91.712	0.000	0.000	1.73			538.7
24.000	MH01-24	15 Winter	30	+30%	30/15 Summer				92.598	0.066	0.000	0.72			28.1
24.001	DN01-23	15 Summer	30	+30%					92.456	0.000	0.000	1.06			51.0
24.002	DN01-24	30 Winter	30	+30%					91.973	0.000	0.000	0.91			44.6
25.000	ASTD8205_9091A_1	15 Summer	30	+30%					100.363	0.000	0.000	1.11			32.0
25.001	ASTD8206_8201B	15 Winter	30	+30%					95.784	-0.079	0.000	0.46			33.2
12.004	MH01-25	30 Winter	30	+30%	30/15 Summer				91.945	0.251	0.000	1.66			659.3
12.005	DN01-25	30 Winter	30	+30%					91.669	0.000	0.000	1.09			659.6
12.006	DN01-26	30 Winter	30	+30%					91.558	0.000	0.000	1.07			668.2
1.003	MH01-26	30 Winter	30	+30%	30/30 Winter				91.406	0.008	0.000	1.00			1098.4
26.000	ATSD8306_0413A	15 Winter	30	+30%	100/15 Summer				104.271	-0.091	0.000	0.64			45.8
26.001	ATSD8206_9810A	15 Winter	30	+30%	100/15 Summer				102.903	-0.051	0.000	0.89			89.0
26.002	ATSD8206_9206A	15 Winter	30	+30%	30/15 Summer				100.752	0.481	0.000	1.06			135.8
26.003	ATSD8206_8705A	15 Winter	30	+30%	30/15 Summer				96.078	0.698	0.000	0.83			149.5
26.004	ATSD8206_8505A	15 Winter	30	+30%	5/15 Summer				95.669	0.863	0.000	2.34			161.8
26.005	ATSD8206_8405A	15 Winter	30	+30%	5/15 Summer				95.245	0.590	0.000	2.30			174.8
1.004	ATSD8206_8206A	30 Winter	30	+30%	30/30 Winter				91.306	0.016	0.000	1.44			1212.2
27.000	DN01-27	30 Winter	30	+30%					100.985	-0.205	0.000	0.02			2.6
27.001	CP01-01	15 Winter	30	+30%					99.634	-0.176	0.000	0.11			14.9
27.002	CP01-02	15 Winter	30	+30%					95.106	-0.144	0.000	0.28			25.9
27.003	CP01-03	15 Winter	30	+30%	5/15 Summer				94.459	0.359	0.000	2.13			29.4
27.004	CP01-04	15 Winter	30	+30%	5/15 Summer				94.393	0.316	0.000	2.19			42.0
27.005	CP01-05	15 Winter	30	+30%	30/15 Summer				94.102	0.084	0.000	3.00			41.7
1.005	ATSD8206_8408A	30 Winter	30	+30%	100/15 Summer				91.193	-0.049	0.000	0.97			1163.6
1.006	ATSD8206_8408E	30 Winter	30	+30%	100/30 Winter				90.709	-0.231	0.000	0.86			1077.9
1.007	ATSD8206_8408F	30 Winter	30	+30%	100/30 Summer				90.521	-0.043	0.000	0.78			933.7

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.004	ASTD8205_9091A	OK	
20.005	MH01-21	SURCHARGED	
20.006	DN01-19	OK*	
13.004	MH01-22	SURCHARGED	
13.005	DN01-20	SURCHARGED*	
13.006	DN01-21	SURCHARGED*	
12.002	MH01-23	SURCHARGED	
12.003	DN01-22	SURCHARGED*	
24.000	MH01-24	SURCHARGED	
24.001	DN01-23	SURCHARGED*	
24.002	DN01-24	SURCHARGED*	
25.000	ASTD8205_9091A_1	SURCHARGED*	
25.001	ASTD8206_8201B	OK	
12.004	MH01-25	SURCHARGED	
12.005	DN01-25	SURCHARGED*	
12.006	DN01-26	SURCHARGED*	
1.003	MH01-26	SURCHARGED	
26.000	ATSD8306_0413A	OK	
26.001	ATSD8206_9810A	OK	
26.002	ATSD8206_9206A	SURCHARGED	
26.003	ATSD8206_8705A	SURCHARGED	
26.004	ATSD8206_8505A	SURCHARGED	
26.005	ATSD8206_8405A	SURCHARGED	
1.004	ATSD8206_8206A	SURCHARGED	
27.000	DN01-27	OK*	
27.001	CP01-01	OK	
27.002	CP01-02	OK	
27.003	CP01-03	SURCHARGED	
27.004	CP01-04	SURCHARGED	
27.005	CP01-05	SURCHARGED	
1.005	ATSD8206_8408A	OK	
1.006	ATSD8206_8408E	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.007	ATSD8206_8408F	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.008	MH01-27	60 Winter	30	+30%	100/30 Summer				90.394	0.000	0.000	1.13			859.8
1.009	PI01-01	30 Winter	30	+30%					90.034	-0.316	0.000	0.83			931.0
28.000	MH01-28	15 Winter	30	+30%	30/15 Summer	100/15 Summer			105.114	0.318	0.000	1.01			87.8
28.001	MH01-29	15 Winter	30	+30%	30/15 Summer				102.342	0.256	0.000	0.92			100.7
28.002	MH01-30	15 Winter	30	+30%	30/15 Summer				100.972	0.514	0.000	1.01			111.3
28.003	MH01-31	15 Winter	30	+30%	30/15 Summer				99.678	0.505	0.000	1.20			122.6
28.004	MH01-32	15 Winter	30	+30%					97.903	-0.124	0.000	0.64			134.6
28.005	MH01-33	15 Winter	30	+30%					96.843	-0.112	0.000	0.71			146.1
28.006	MH01-34	15 Winter	30	+30%	100/15 Winter				95.910	-0.100	0.000	0.77			160.0
28.007	MH01-35	15 Winter	30	+30%	100/15 Summer				94.891	-0.088	0.000	0.83			174.0
28.008	MH01-36	15 Winter	30	+30%	100/15 Summer				93.832	-0.064	0.000	0.89			186.9
28.009	MH01-37	15 Winter	30	+30%	30/15 Summer				93.019	0.168	0.000	0.96			197.4
28.010	MH01-38	15 Winter	30	+30%	30/15 Summer				92.081	0.232	0.000	1.13			209.6
28.011	MH01-39	15 Winter	30	+30%					90.902	-0.119	0.000	0.79			220.5
29.000	MH01-40	15 Winter	30	+30%					97.935	-0.104	0.000	0.55			42.0
29.001	MH01-41	15 Winter	30	+30%	100/15 Summer				97.071	-0.113	0.000	0.48			47.5
29.002	MH01-42	15 Winter	30	+30%	30/15 Summer				96.307	0.398	0.000	0.94			78.0
30.000	DN01-28	30 Winter	30	+30%					101.914	-0.111	0.000	0.16			5.2
30.001	CP01-06	15 Winter	30	+30%					100.190	-0.177	0.000	0.10			13.6
31.000	CP01-07	30 Winter	30	+30%					101.637	-0.129	0.000	0.05			2.3
30.002	MH01-43	15 Winter	30	+30%	100/15 Summer				95.859	-0.172	0.000	0.12			15.2
29.003	MH01-44	15 Winter	30	+30%	30/15 Summer				95.743	0.467	0.000	1.36			142.2
32.000	MH01-45	15 Winter	30	+30%					97.830	-0.124	0.000	0.40			18.2
32.001	MH01-46	15 Winter	30	+30%					97.515	-0.110	0.000	0.50			36.9
32.002	MH01-47	15 Winter	30	+30%	5/15 Summer				96.730	0.128	0.000	2.76			46.3
33.000	DN01-29	15 Summer	30	+30%					95.973	0.000	0.000	1.15			8.1
29.004	MH01-48	15 Winter	30	+30%	5/15 Summer				95.243	0.212	0.000	3.45			193.5
34.000	DN01-30	30 Winter	30	+30%					101.707	-0.095	0.000	0.29			6.6
34.001	CP01-08	30 Winter	30	+30%					99.845	-0.194	0.000	0.05			6.6
29.005	MH01-49	15 Winter	30	+30%					94.820	-0.197	0.000	0.45			207.3
35.000	DN01-31	15 Winter	30	+30%					96.887	-0.130	0.000	0.04			2.1
29.006	MH01-50	15 Winter	30	+30%					92.695	-0.152	0.000	0.66			209.1
29.007	DN01-32	15 Winter	30	+30%					91.369	-0.160	0.000	0.62			208.2

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.008	MH01-27	OK	
1.009	PI01-01	OK	
28.000	MH01-28	SURCHARGED	2
28.001	MH01-29	SURCHARGED	
28.002	MH01-30	SURCHARGED	
28.003	MH01-31	SURCHARGED	
28.004	MH01-32	OK	
28.005	MH01-33	OK	
28.006	MH01-34	OK	
28.007	MH01-35	OK	
28.008	MH01-36	OK	
28.009	MH01-37	SURCHARGED	
28.010	MH01-38	SURCHARGED	
28.011	MH01-39	OK	
29.000	MH01-40	OK	
29.001	MH01-41	OK	
29.002	MH01-42	SURCHARGED	
30.000	DN01-28	OK*	
30.001	CP01-06	OK	
31.000	CP01-07	OK	
30.002	MH01-43	OK	
29.003	MH01-44	SURCHARGED	
32.000	MH01-45	OK	
32.001	MH01-46	OK	
32.002	MH01-47	SURCHARGED	
33.000	DN01-29	SURCHARGED*	
29.004	MH01-48	SURCHARGED	
34.000	DN01-30	OK*	
34.001	CP01-08	OK	
29.005	MH01-49	OK	
35.000	DN01-31	OK*	
29.006	MH01-50	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
29.007	DN01-32	OK*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
36.000	DN01-33	15 Winter	30	+30%					93.253	-0.169	0.000	0.14			11.8	OK*
29.008	MH01-51	15 Winter	30	+30%					90.571	-0.222	0.000	0.51			220.2	OK
37.000	CP01-09	15 Winter	30	+30%					90.669	-0.247	0.000	0.07			2.4	OK
38.000	DN01-34	30 Winter	30	+30%					92.997	-0.059	0.000	0.68			13.9	OK*
38.001	CP01-10	30 Winter	30	+30%					91.860	-0.172	0.000	0.13			14.0	OK
39.000	CP01-11	15 Winter	30	+30%					92.501	-0.191	0.000	0.06			2.5	OK
39.001	CP01-12	15 Winter	30	+30%					92.225	-0.180	0.000	0.08			4.5	OK
39.002	CP01-13	15 Winter	30	+30%					91.794	-0.170	0.000	0.13			8.7	OK
39.003	CP01-14	15 Winter	30	+30%					91.289	-0.154	0.000	0.22			16.8	OK
37.001	MH01-52	15 Winter	30	+30%					90.586	-0.298	0.000	0.09			28.8	OK
40.000	CP01-15	15 Winter	30	+30%					91.818	-0.094	0.000	0.62			43.9	OK
40.001	CP01-16	15 Winter	30	+30%	100/15 Summer				90.916	-0.057	0.000	0.88			67.8	OK
37.002	MH01-53	15 Winter	30	+30%					89.905	-0.363	0.000	0.20			105.2	OK
37.003	MH01-54	15 Winter	30	+30%	100/15 Summer				89.712	-0.021	0.000	0.25			96.1	OK
37.004	MH01-55	15 Winter	30	+30%	30/15 Summer				89.692	0.109	0.000	0.54			115.4	SURCHARGED
37.005	MH01-56	15 Winter	30	+30%	30/15 Summer				89.674	0.133	0.000	0.42			91.4	SURCHARGED
29.009	MH01-57	15 Winter	30	+30%	30/15 Summer				89.656	0.158	0.000	1.26			310.1	SURCHARGED
28.012	MH01-58	15 Winter	30	+30%	30/15 Summer				89.564	0.122	0.000	1.14			503.0	SURCHARGED
41.000	CP01-17	30 Winter	30	+30%	100/15 Winter				93.045	-0.128	0.000	0.39			10.7	OK
41.001	CP01-18	15 Winter	30	+30%	100/15 Summer				92.863	-0.050	0.000	0.57			15.8	OK
41.002	MH01-59	15 Winter	30	+30%	30/15 Summer				92.815	0.158	0.000	0.91			34.8	SURCHARGED
42.000	MH01-60	15 Winter	30	+30%	30/15 Summer				97.847	0.163	0.000	0.96			72.8	SURCHARGED
42.001	MH01-61	15 Winter	30	+30%	30/15 Summer				97.573	0.226	0.000	0.83			68.3	SURCHARGED
42.002	MH01-62	15 Winter	30	+30%	30/15 Summer				96.319	1.123	0.000	1.16			101.5	SURCHARGED
41.003	MH01-63	15 Winter	30	+30%	30/15 Summer				92.791	0.249	0.000	1.04			108.1	SURCHARGED
41.004	CP01-19	15 Winter	30	+30%	30/15 Summer				92.122	0.202	0.000	1.09			113.9	SURCHARGED
41.005	MH01-64	15 Winter	30	+30%	100/15 Winter				90.791	-0.101	0.000	0.66			112.8	OK
43.000	DN01-35	30 Winter	30	+30%					91.492	0.000	0.000	1.04			14.6	SURCHARGED*
41.006	MH01-65	15 Winter	30	+30%	5/15 Winter				90.549	0.249	0.000	1.49			123.6	SURCHARGED
44.000	DN01-36	15 Winter	30	+30%					90.807	-0.093	0.000	0.31			2.1	OK*
41.007	MH01-66	30 Winter	30	+30%	30/15 Summer				90.294	0.106	0.000	1.53			124.8	SURCHARGED
28.013	MH01-67	240 Winter	30	+30%	30/15 Summer				89.496	0.051	0.000	0.42			180.0	SURCHARGED
28.014	PI01-02	240 Winter	30	+30%	30/120 Winter				89.489	0.034	0.000	0.31			170.2	SURCHARGED

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
36.000	DN01-33	
29.008	MH01-51	
37.000	CP01-09	
38.000	DN01-34	
38.001	CP01-10	
39.000	CP01-11	
39.001	CP01-12	
39.002	CP01-13	
39.003	CP01-14	
37.001	MH01-52	
40.000	CP01-15	
40.001	CP01-16	
37.002	MH01-53	
37.003	MH01-54	
37.004	MH01-55	
37.005	MH01-56	
29.009	MH01-57	
28.012	MH01-58	
41.000	CP01-17	
41.001	CP01-18	
41.002	MH01-59	
42.000	MH01-60	
42.001	MH01-61	
42.002	MH01-62	
41.003	MH01-63	
41.004	CP01-19	
41.005	MH01-64	
43.000	DN01-35	
41.006	MH01-65	
44.000	DN01-36	
41.007	MH01-66	
28.013	MH01-67	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
28.014	PI01-02	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.010	PO01-01	240 Winter	30	+30%	30/60 Summer				89.483	0.185	0.000	0.89			268.3
1.011	DN01-37	240 Winter	30	+30%					89.008	-1.492	0.000	0.02			268.2
1.012	DN01-38	240 Winter	30	+30%					88.958	-1.542	0.000	0.02			268.0
1.013	MH01-68	240 Winter	30	+30%					88.881	-1.619	0.000	0.03			267.9
45.000	CP01-20	30 Winter	30	+30%					90.021	-0.127	0.000	0.05			0.4
46.000	CP01-21	15 Winter	30	+30%					90.890	-0.195	0.000	0.04			2.6
46.001	CP01-22	15 Winter	30	+30%					90.430	-0.170	0.000	0.14			2.6
46.002	CP01-23	15 Winter	30	+30%					90.380	-0.169	0.000	0.14			2.6
46.003	CP01-24	15 Winter	30	+30%					90.337	-0.153	0.000	0.22			4.2
46.004	CP01-25	15 Winter	30	+30%					90.287	-0.147	0.000	0.26			4.1
47.000	CP01-26	30 Winter	30	+30%					101.915	-0.110	0.000	0.16			3.0
47.001	CP01-27	15 Winter	30	+30%					101.166	-0.198	0.000	0.03			4.5
47.002	CP01-28	15 Winter	30	+30%					98.665	-0.187	0.000	0.06			8.8
47.003	CP01-29	15 Winter	30	+30%					94.132	-0.172	0.000	0.13			17.2
47.004	CP01-30	15 Winter	30	+30%	100/15 Summer				91.746	-0.104	0.000	0.56			41.5
47.005	CP01-31	15 Winter	30	+30%	30/15 Summer				91.044	0.466	0.000	1.29			50.3
47.006	CP01-32	15 Winter	30	+30%	30/15 Summer				90.682	0.324	0.000	1.28			68.1
47.007	CP01-33	15 Winter	30	+30%	5/15 Winter				90.518	0.255	0.000	2.13			69.2
47.008	CP01-34	15 Winter	30	+30%	30/15 Summer				90.398	0.171	0.000	2.31			86.1
46.005	CP01-35	15 Winter	30	+30%	100/15 Summer				90.085	-0.074	0.000	0.92			96.5
48.000	CP01-36	30 Winter	30	+30%					101.135	-0.080	0.000	0.44			3.0
48.001	CP01-37	15 Winter	30	+30%					100.945	-0.194	0.000	0.05			4.7
48.002	CP01-38	15 Winter	30	+30%					98.635	-0.190	0.000	0.06			7.7
48.003	CP01-39	15 Winter	30	+30%					96.083	-0.177	0.000	0.10			14.1
48.004	CP01-40	15 Winter	30	+30%					92.190	-0.144	0.000	0.28			26.4
48.005	CP01-41	15 Winter	30	+30%	30/15 Summer				91.144	0.174	0.000	0.63			33.0
48.006	CP01-42	15 Winter	30	+30%	30/15 Summer	100/15 Summer			91.077	0.467	0.000	0.85			31.8
48.007	CP01-43	15 Winter	30	+30%	30/15 Summer	100/15 Winter			90.944	0.568	0.000	1.07			34.2
48.008	CP01-44	15 Winter	30	+30%	5/15 Summer				90.790	0.553	0.000	1.85			35.5
48.009	CP01-45	15 Winter	30	+30%	5/15 Summer				90.584	0.409	0.000	1.92			37.0
48.010	CP01-46	15 Winter	30	+30%	5/15 Summer				90.348	0.236	0.000	2.38			38.2
48.011	CP01-47	15 Winter	30	+30%	5/15 Summer				90.197	0.120	0.000	2.24			38.7
45.001	CP01-48	15 Winter	30	+30%	30/15 Winter				89.577	0.015	0.000	1.62			132.8

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.010	PO01-01	SURCHARGED	
1.011	DN01-37	OK	
1.012	DN01-38	OK	
1.013	MH01-68	OK	
45.000	CP01-20	OK	
46.000	CP01-21	OK	
46.001	CP01-22	OK	
46.002	CP01-23	OK	
46.003	CP01-24	OK	
46.004	CP01-25	OK	
47.000	CP01-26	OK	
47.001	CP01-27	OK	
47.002	CP01-28	OK	
47.003	CP01-29	OK	
47.004	CP01-30	OK	
47.005	CP01-31	SURCHARGED	
47.006	CP01-32	SURCHARGED	
47.007	CP01-33	SURCHARGED	
47.008	CP01-34	SURCHARGED	
46.005	CP01-35	OK	
48.000	CP01-36	OK	
48.001	CP01-37	OK	
48.002	CP01-38	OK	
48.003	CP01-39	OK	
48.004	CP01-40	OK	
48.005	CP01-41	SURCHARGED	
48.006	CP01-42	SURCHARGED	4
48.007	CP01-43	SURCHARGED	1
48.008	CP01-44	SURCHARGED	
48.009	CP01-45	SURCHARGED	
48.010	CP01-46	SURCHARGED	
48.011	CP01-47	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
45.001	CP01-48	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
45.002	MH01-69	15 Winter	30	+30%	100/15 Summer				89.536	0.000	0.000	1.08			129.6	OK

PN	US/MH Name	Level Exceeded
45.002	MH01-69	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	MH01-01	30 Winter	100	+30%					92.324	-0.044	0.000	0.33			12.9
2.000	DN01-01	30 Winter	100	+30%					92.312	-0.016	0.000	0.07			5.7
1.001	MH01-02	30 Winter	100	+30%	30/15 Summer				92.309	0.088	0.000	1.77			33.3
3.000	MH01-03_1	15 Summer	100	+30%					93.126	0.000	0.000	1.55			69.2
1.002	MH01-04	30 Winter	100	+30%	100/15 Winter				92.286	0.092	0.000	0.94			93.7
4.000	ASTD8206_6809A	15 Winter	100	+30%	30/15 Summer				96.982	1.204	0.000	0.39			10.9
4.001	ASTD8206_6910A	15 Winter	100	+30%	30/15 Summer	100/15 Summer			96.982	1.252	8.276	1.25			83.9
5.000	ASTD8206_6809A_1	15 Winter	100	+30%					95.663	-0.190	0.000	0.06			3.8
5.001	ASTD8206_6220A	15 Winter	100	+30%					93.696	-0.139	0.000	0.03			3.7

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.000	MH01-01	OK	
2.000	DN01-01	OK	
1.001	MH01-02	SURCHARGED	
3.000	MH01-03_1	SURCHARGED*	
1.002	MH01-04	SURCHARGED	
4.000	ASTD8206_6809A	FLOOD RISK	
4.001	ASTD8206_6910A	FLOOD	4
5.000	ASTD8206_6809A_1	OK*	
5.001	ASTD8206_6220A	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
4.002	ASTD8206_6321A	15 Winter	100	+30%	100/15 Summer				93.693	0.084	0.000	0.61			92.3
6.000	MH01-05	15 Winter	100	+30%	5/15 Summer				93.753	0.413	0.000	1.39			64.0
4.003	MH01-06	15 Winter	100	+30%	5/15 Summer				93.577	0.327	0.000	2.89			146.7
4.004	ASTD8206_6422A	30 Winter	100	+30%	100/15 Winter				93.277	0.033	0.000	0.78			137.0
7.000	MH01-07	15 Winter	100	+30%	100/15 Summer				93.610	0.524	0.000	0.65			54.7
8.000	MH01-08	15 Winter	100	+30%	30/15 Summer				93.720	0.352	0.000	0.17			4.6
8.001	DN01-02	15 Summer	100	+30%					93.351	0.000	0.000	1.18			46.9
8.002	DN01-03	15 Summer	100	+30%					93.146	0.000	0.000	1.83			54.6
8.003	ASTD8206_6226A	15 Winter	100	+30%	30/15 Summer				93.513	0.404	0.000	1.43			52.2
7.001	MH01-09	15 Winter	100	+30%	30/15 Summer				93.430	0.944	0.000	1.40			103.4
4.005	MH01-10	30 Winter	100	+30%	30/15 Summer				93.010	0.775	0.000	1.16			237.4
4.006	MH01-11	30 Winter	100	+30%	30/15 Summer				92.719	0.706	0.000	0.99			253.3
9.000	MH01-06_1	15 Summer	100	+30%					93.289	0.000	0.000	1.10			65.6
10.000	MH01-12	15 Summer	100	+30%					93.082	-0.225	0.000	0.00			0.0
9.001	MH01-03	30 Winter	100	+30%	30/15 Winter				92.530	0.555	0.000	0.72			52.3
4.007	MH01-13	30 Winter	100	+30%	5/15 Summer				92.378	0.730	0.000	4.17			298.5
11.000	MH01-14	15 Winter	100	+30%	100/15 Summer				92.664	0.371	0.000	1.13			99.9
4.008	MH01-15	30 Winter	100	+30%	30/15 Winter				92.098	0.474	0.000	1.04			404.7
4.009	MH01-16	30 Winter	100	+30%	30/15 Summer				91.964	0.466	0.000	1.28			453.5
12.000	ASTD8205_8386A_1	15 Summer	100	+30%					100.145	-0.150	0.000	0.00			0.0
12.001	ATSD8205_7697A	15 Summer	100	+30%					97.000	-0.150	0.000	0.00			0.0
13.000	ASTD8205_9190B_1	15 Winter	100	+30%					99.644	-0.145	0.000	0.50			59.4
13.001	DN01-04	15 Summer	100	+30%					98.608	0.000	0.000	0.83			91.8
14.000	EXDN01-01	15 Winter	100	+30%					103.234	-0.061	0.000	0.64			11.3
14.001	EXDN01-02	15 Summer	100	+30%					102.025	0.000	0.000	0.81			16.5
14.002	EXDN01-03	15 Summer	100	+30%					101.063	0.000	0.000	1.25			22.1
14.003	EXDN01-04	15 Summer	100	+30%					100.412	0.000	0.000	1.70			22.6
15.000	ATSD8205_5675A	15 Winter	100	+30%					105.143	-0.065	0.000	0.58			8.7
15.001	DN01-05	15 Winter	100	+30%	100/15 Summer				104.338	0.268	0.000	0.96			23.9
15.002	DN01-06	15 Summer	100	+30%					101.718	0.000	0.000	0.82			24.8
15.003	DN01-07	15 Summer	100	+30%					100.875	0.000	0.000	1.75			23.2
15.004	DN01-08	30 Winter	100	+30%	5/15 Winter				100.692	0.157	0.000	2.05			24.0
14.004	ATSD8205_7390A	30 Winter	100	+30%	5/15 Summer				99.856	1.162	0.000	0.96			46.8

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
4.002	ASTD8206_6321A	SURCHARGED	
6.000	MH01-05	SURCHARGED	
4.003	MH01-06	SURCHARGED	
4.004	ASTD8206_6422A	SURCHARGED	
7.000	MH01-07	SURCHARGED	
8.000	MH01-08	SURCHARGED	
8.001	DN01-02	SURCHARGED*	
8.002	DN01-03	SURCHARGED*	
8.003	ASTD8206_6226A	SURCHARGED	
7.001	MH01-09	SURCHARGED	
4.005	MH01-10	SURCHARGED	
4.006	MH01-11	SURCHARGED	
9.000	MH01-06_1	SURCHARGED*	
10.000	MH01-12	OK	
9.001	MH01-03	SURCHARGED	
4.007	MH01-13	SURCHARGED	
11.000	MH01-14	SURCHARGED	
4.008	MH01-15	SURCHARGED	
4.009	MH01-16	SURCHARGED	
12.000	ASTD8205_8386A_1	OK*	
12.001	ATSD8205_7697A	OK	
13.000	ASTD8205_9190B_1	OK	
13.001	DN01-04	SURCHARGED*	
14.000	EXDN01-01	OK*	
14.001	EXDN01-02	SURCHARGED*	
14.002	EXDN01-03	SURCHARGED*	
14.003	EXDN01-04	SURCHARGED*	
15.000	ATSD8205_5675A	OK	
15.001	DN01-05	SURCHARGED	
15.002	DN01-06	SURCHARGED*	
15.003	DN01-07	SURCHARGED*	
15.004	DN01-08	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
14.004	ATSD8205_7390A	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
16.000	ATSD8205_7799A	15 Summer	100	+30%					98.800	0.000	0.000	3.53			38.8
17.000	RE01-01	30 Winter	100	+30%	30/15 Summer	100/15 Winter			101.701	1.201	0.954	0.89			18.9
17.001	DN01-09	15 Summer	100	+30%					99.628	0.000	0.000	1.10			21.5
17.002	DN01-10	15 Summer	100	+30%					98.682	0.000	0.000	1.16			26.2
14.005	ATSD8205_7591C	30 Winter	100	+30%	5/15 Summer	100/15 Summer			99.643	1.178	10.475	2.19			140.7
13.002	MH01-17	15 Winter	100	+30%	5/15 Summer				98.712	0.502	0.000	2.66			215.5
13.003	ASTD8205_8386A	15 Winter	100	+30%					97.883	-0.245	0.000	0.26			220.3
18.000	DN01-11	15 Winter	100	+30%					96.812	-0.080	0.000	0.84			132.5
18.001	MH01-18	30 Winter	100	+30%	30/15 Summer				94.405	0.586	0.000	1.21			102.5
19.000	DN01-12	15 Winter	100	+30%	100/15 Summer				96.952	0.554	0.000	0.94			146.8
19.001	DN01-13	15 Winter	100	+30%	5/15 Summer				94.775	1.017	0.000	2.65			141.2
19.002	ASTD8205_9085A	15 Winter	100	+30%	5/15 Summer				94.488	0.735	0.000	2.72			142.6
19.003	DN01-14	15 Summer	100	+30%					93.726	0.000	0.000	3.06			144.0
18.002	MH01-19	30 Winter	100	+30%	30/15 Summer				94.289	0.584	0.000	1.21			254.3
18.003	DN01-15	15 Summer	100	+30%					93.426	0.000	0.000	0.74			278.7
18.004	DN01-16	15 Summer	100	+30%					92.497	0.000	0.000	0.97			269.0
20.000	ASTD8206_7900A	60 Winter	100	+30%	5/15 Summer	5/30 Winter			100.117	2.167	17.046	1.24			22.2
21.000	DN01-17	15 Winter	100	+30%					104.602	-0.141	0.000	0.30			25.5
21.001	MH01-20	30 Winter	100	+30%	5/15 Summer				100.093	0.942	0.000	0.39			25.0
20.001	ASTD8206_8501A	30 Winter	100	+30%	5/15 Summer	5/30 Winter			100.003	2.695	50.131	2.11			47.2
22.000	ASTD8206_1314A	15 Summer	100	+30%					105.223	0.000	0.000	1.74			45.1
22.001	ASTD8206_0809C	30 Winter	100	+30%					103.360	-0.060	0.000	0.88			49.5
22.002	ASTD8206_9901C	30 Winter	100	+30%	5/15 Summer				101.733	0.152	0.000	3.35			52.8
22.003	ASTD8306_0000B	15 Winter	100	+30%					101.483	-0.069	0.000	0.43			53.8
22.004	ASTD8205_9899A	15 Winter	100	+30%	30/15 Summer				101.288	0.931	0.000	0.87			81.0
22.005	ASTD8205_9596A	60 Winter	100	+30%	5/15 Summer	30/15 Summer			100.061	1.307	41.741	1.04			66.6
23.000	ASTD8205_9486C	15 Winter	100	+30%	5/15 Summer				100.546	1.316	0.000	0.44			5.2
23.001	DN01-18	15 Summer	100	+30%					99.149	0.000	0.000	0.48			8.1
23.002	ASTD8205_9489A	30 Winter	100	+30%	5/15 Summer	30/15 Summer			100.526	1.458	12.209	3.57			27.4
23.003	ASTD8205_9491A	15 Winter	100	+30%	5/15 Summer				99.920	0.900	0.000	0.39			27.5
22.006	ASTD8205_9494A	60 Winter	100	+30%	5/15 Summer	30/15 Summer			99.829	1.418	13.229	3.31			71.5
20.002	ASTD8205_9193A	15 Summer	100	+30%	5/15 Summer				99.250	2.147	0.000	5.40			117.2
20.003	ASTD8205_9190B	60 Winter	100	+30%	5/15 Summer				97.050	0.018	0.000	1.27			117.4

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
16.000	ATSD8205_7799A	SURCHARGED*	
17.000	RE01-01	FLOOD	3
17.001	DN01-09	SURCHARGED*	
17.002	DN01-10	SURCHARGED*	
14.005	ATSD8205_7591C	FLOOD	6
13.002	MH01-17	SURCHARGED	
13.003	ASTD8205_8386A	OK	
18.000	DN01-11	OK	
18.001	MH01-18	SURCHARGED	
19.000	DN01-12	SURCHARGED	
19.001	DN01-13	FLOOD RISK	
19.002	ASTD8205_9085A	SURCHARGED	
19.003	DN01-14	SURCHARGED*	
18.002	MH01-19	SURCHARGED	
18.003	DN01-15	SURCHARGED*	
18.004	DN01-16	SURCHARGED*	
20.000	ASTD8206_7900A	FLOOD	21
21.000	DN01-17	OK*	
21.001	MH01-20	FLOOD RISK	
20.001	ASTD8206_8501A	FLOOD	20
22.000	ASTD8206_1314A	SURCHARGED*	
22.001	ASTD8206_0809C	OK*	
22.002	ASTD8206_9901C	SURCHARGED	
22.003	ASTD8306_0000B	OK	
22.004	ASTD8205_9899A	FLOOD RISK	
22.005	ASTD8205_9596A	FLOOD	18
23.000	ASTD8205_9486C	FLOOD RISK	
23.001	DN01-18	SURCHARGED*	
23.002	ASTD8205_9489A	FLOOD	13
23.003	ASTD8205_9491A	FLOOD RISK	
22.006	ASTD8205_9494A	FLOOD	15
20.002	ASTD8205_9193A	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.003	ASTD8205_9190B	SURCHARGED	

. | M60 Simister Island
. | PFC Stage 3
. | Proposed Catchment 01

Date 11-May-23 | Designed by AP
File HE548642-JAC-HDG-SII_N01-CA-D-0106.MDX | Checked by PT

Innovyze | Network 2020.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
20.004	ASTD8205_9091A	60 Winter	100	+30%					96.700	-0.272	0.000	0.17			117.4
20.005	MH01-21	30 Winter	100	+30%	5/15 Summer				93.643	0.567	0.000	3.38			168.2
20.006	DN01-19	30 Winter	100	+30%					93.050	0.000	0.000	0.61			168.1
13.004	MH01-22	30 Winter	100	+30%	30/15 Summer				93.375	1.385	0.000	2.35			652.0
13.005	DN01-20	15 Summer	100	+30%					91.960	0.000	0.000	1.18			645.7
13.006	DN01-21	15 Summer	100	+30%					91.791	0.000	0.000	1.15			632.6
12.002	MH01-23	30 Winter	100	+30%	5/30 Winter				92.824	1.090	0.000	3.20			643.5
12.003	DN01-22	15 Summer	100	+30%					91.712	0.000	0.000	1.99			620.4
24.000	MH01-24	15 Winter	100	+30%	30/15 Summer				93.052	0.520	0.000	0.91			35.2
24.001	DN01-23	15 Summer	100	+30%					92.456	0.000	0.000	1.30			62.5
24.002	DN01-24	15 Summer	100	+30%					91.973	0.000	0.000	1.24			60.4
25.000	ASTD8205_9091A_1	15 Summer	100	+30%					100.363	0.000	0.000	1.24			36.0
25.001	ASTD8206_8201B	30 Winter	100	+30%					95.790	-0.073	0.000	0.53			38.0
12.004	MH01-25	30 Winter	100	+30%	30/15 Summer				92.485	0.791	0.000	1.92			762.0
12.005	DN01-25	15 Summer	100	+30%					91.669	0.000	0.000	1.18			712.8
12.006	DN01-26	15 Summer	100	+30%					91.558	0.000	0.000	1.14			716.7
1.003	MH01-26	30 Winter	100	+30%	30/30 Winter				91.764	0.366	0.000	1.19			1297.3
26.000	ATSD8306_0413A	15 Winter	100	+30%	100/15 Summer				104.667	0.305	0.000	0.80			57.2
26.001	ATSD8206_9810A	15 Winter	100	+30%	100/15 Summer				103.933	0.979	0.000	0.95			94.6
26.002	ATSD8206_9206A	15 Winter	100	+30%	30/15 Summer				101.682	1.411	0.000	1.18			150.9
26.003	ATSD8206_8705A	15 Winter	100	+30%	30/15 Summer				96.554	1.174	0.000	0.94			168.8
26.004	ATSD8206_8505A	15 Winter	100	+30%	5/15 Summer				96.038	1.232	0.000	2.67			184.5
26.005	ATSD8206_8405A	15 Winter	100	+30%	5/15 Summer				95.489	0.834	0.000	2.65			201.4
1.004	ATSD8206_8206A	30 Winter	100	+30%	30/30 Winter				91.611	0.321	0.000	1.77			1484.7
27.000	DN01-27	30 Winter	100	+30%					100.989	-0.201	0.000	0.02			3.4
27.001	CP01-01	15 Winter	100	+30%					99.641	-0.169	0.000	0.14			19.8
27.002	CP01-02	15 Winter	100	+30%					95.120	-0.130	0.000	0.37			34.5
27.003	CP01-03	15 Winter	100	+30%	5/15 Summer				94.778	0.678	0.000	2.79			38.5
27.004	CP01-04	15 Winter	100	+30%	5/15 Summer				94.668	0.591	0.000	2.83			54.3
27.005	CP01-05	15 Winter	100	+30%	30/15 Summer				94.182	0.164	0.000	3.93			54.6
1.005	ATSD8206_8408A	30 Winter	100	+30%	100/15 Summer				91.375	0.133	0.000	1.22			1452.7
1.006	ATSD8206_8408E	30 Winter	100	+30%	100/30 Winter				91.012	0.072	0.000	1.05			1308.7
1.007	ATSD8206_8408F	30 Winter	100	+30%	100/30 Summer				90.643	0.079	0.000	1.05			1251.6

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
20.004	ASTD8205_9091A	OK	
20.005	MH01-21	SURCHARGED	
20.006	DN01-19	SURCHARGED*	
13.004	MH01-22	SURCHARGED	
13.005	DN01-20	SURCHARGED*	
13.006	DN01-21	SURCHARGED*	
12.002	MH01-23	SURCHARGED	
12.003	DN01-22	SURCHARGED*	
24.000	MH01-24	SURCHARGED	
24.001	DN01-23	SURCHARGED*	
24.002	DN01-24	SURCHARGED*	
25.000	ASTD8205_9091A_1	SURCHARGED*	
25.001	ASTD8206_8201B	OK	
12.004	MH01-25	SURCHARGED	
12.005	DN01-25	SURCHARGED*	
12.006	DN01-26	SURCHARGED*	
1.003	MH01-26	SURCHARGED	
26.000	ATSD8306_0413A	SURCHARGED	
26.001	ATSD8206_9810A	SURCHARGED	
26.002	ATSD8206_9206A	FLOOD RISK	
26.003	ATSD8206_8705A	SURCHARGED	
26.004	ATSD8206_8505A	SURCHARGED	
26.005	ATSD8206_8405A	SURCHARGED	
1.004	ATSD8206_8206A	SURCHARGED	
27.000	DN01-27	OK*	
27.001	CP01-01	OK	
27.002	CP01-02	OK	
27.003	CP01-03	FLOOD RISK	
27.004	CP01-04	SURCHARGED	
27.005	CP01-05	SURCHARGED	
1.005	ATSD8206_8408A	SURCHARGED	
1.006	ATSD8206_8408E	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.007	ATSD8206_8408F	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.008	MH01-27	30 Winter	100	+30%	100/30 Summer				90.454	0.060	0.000	1.64			1246.6
1.009	PI01-01	60 Winter	100	+30%					90.350	0.000	0.000	1.07			1202.7
28.000	MH01-28	15 Winter	100	+30%	30/15 Summer	100/15 Summer			105.998	1.202	2.493	1.07			92.9
28.001	MH01-29	15 Winter	100	+30%	30/15 Summer				103.026	0.940	0.000	0.98			107.2
28.002	MH01-30	15 Winter	100	+30%	30/15 Summer				101.476	1.018	0.000	1.09			119.7
28.003	MH01-31	15 Winter	100	+30%	30/15 Summer				99.971	0.798	0.000	1.30			133.1
28.004	MH01-32	15 Winter	100	+30%					97.916	-0.111	0.000	0.71			149.1
28.005	MH01-33	15 Winter	100	+30%					96.861	-0.094	0.000	0.80			164.5
28.006	MH01-34	15 Winter	100	+30%	100/15 Winter				96.038	0.028	0.000	0.87			182.1
28.007	MH01-35	15 Winter	100	+30%	100/15 Summer				95.296	0.317	0.000	0.91			190.9
28.008	MH01-36	15 Winter	100	+30%	100/15 Summer				94.408	0.512	0.000	0.97			202.8
28.009	MH01-37	15 Winter	100	+30%	30/15 Summer				93.427	0.576	0.000	1.06			217.0
28.010	MH01-38	15 Winter	100	+30%	30/15 Summer				92.302	0.453	0.000	1.25			231.0
28.011	MH01-39	15 Winter	100	+30%					90.922	-0.099	0.000	0.88			245.7
29.000	MH01-40	15 Winter	100	+30%					97.960	-0.079	0.000	0.73			55.9
29.001	MH01-41	15 Winter	100	+30%	100/15 Summer				97.432	0.248	0.000	0.58			57.5
29.002	MH01-42	15 Winter	100	+30%	30/15 Summer				97.021	1.112	0.000	1.16			96.0
30.000	DN01-28	30 Winter	100	+30%					101.921	-0.104	0.000	0.21			7.0
30.001	CP01-06	15 Winter	100	+30%					100.197	-0.170	0.000	0.13			18.1
31.000	CP01-07	30 Winter	100	+30%					101.641	-0.125	0.000	0.07			3.1
30.002	MH01-43	15 Winter	100	+30%	100/15 Summer				96.206	0.175	0.000	0.16			19.5
29.003	MH01-44	15 Winter	100	+30%	30/15 Summer				96.184	0.908	0.000	1.70			178.2
32.000	MH01-45	15 Winter	100	+30%					97.849	-0.105	0.000	0.53			24.2
32.001	MH01-46	15 Winter	100	+30%					97.538	-0.087	0.000	0.66			49.1
32.002	MH01-47	15 Winter	100	+30%	5/15 Summer				96.857	0.255	0.000	3.65			61.2
33.000	DN01-29	15 Summer	100	+30%					95.973	0.000	0.000	1.50			10.7
29.004	MH01-48	15 Winter	100	+30%	5/15 Summer				95.394	0.363	0.000	4.38			245.9
34.000	DN01-30	30 Winter	100	+30%					101.717	-0.085	0.000	0.39			8.9
34.001	CP01-08	30 Winter	100	+30%					99.851	-0.188	0.000	0.06			8.9
29.005	MH01-49	15 Winter	100	+30%					94.848	-0.169	0.000	0.58			264.5
35.000	DN01-31	15 Winter	100	+30%					96.890	-0.127	0.000	0.06			2.8
29.006	MH01-50	15 Winter	100	+30%					92.737	-0.110	0.000	0.84			267.0
29.007	DN01-32	15 Winter	100	+30%					91.408	-0.121	0.000	0.79			265.9

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.008	MH01-27	SURCHARGED	
1.009	PI01-01	OK	
28.000	MH01-28	FLOOD	2
28.001	MH01-29	FLOOD RISK	
28.002	MH01-30	FLOOD RISK	
28.003	MH01-31	SURCHARGED	
28.004	MH01-32	OK	
28.005	MH01-33	OK	
28.006	MH01-34	SURCHARGED	
28.007	MH01-35	SURCHARGED	
28.008	MH01-36	SURCHARGED	
28.009	MH01-37	SURCHARGED	
28.010	MH01-38	SURCHARGED	
28.011	MH01-39	OK	
29.000	MH01-40	OK	
29.001	MH01-41	SURCHARGED	
29.002	MH01-42	FLOOD RISK	
30.000	DN01-28	OK*	
30.001	CP01-06	OK	
31.000	CP01-07	OK	
30.002	MH01-43	SURCHARGED	
29.003	MH01-44	FLOOD RISK	
32.000	MH01-45	OK	
32.001	MH01-46	OK	
32.002	MH01-47	SURCHARGED	
33.000	DN01-29	SURCHARGED*	
29.004	MH01-48	SURCHARGED	
34.000	DN01-30	OK*	
34.001	CP01-08	OK	
29.005	MH01-49	OK	
35.000	DN01-31	OK*	
29.006	MH01-50	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
29.007	DN01-32	OK*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
36.000	DN01-33	15 Winter	100	+30%					93.262	-0.160	0.000	0.19			15.7	OK*
29.008	MH01-51	15 Winter	100	+30%					90.609	-0.184	0.000	0.65			281.4	OK
37.000	CP01-09	15 Winter	100	+30%					90.679	-0.237	0.000	0.10			3.2	OK
38.000	DN01-34	30 Winter	100	+30%					93.018	-0.038	0.000	0.91			18.7	OK*
38.001	CP01-10	30 Winter	100	+30%					91.869	-0.163	0.000	0.17			18.8	OK
39.000	CP01-11	15 Winter	100	+30%					92.507	-0.185	0.000	0.07			3.4	OK
39.001	CP01-12	15 Winter	100	+30%					92.231	-0.174	0.000	0.11			6.0	OK
39.002	CP01-13	15 Winter	100	+30%					91.803	-0.161	0.000	0.18			11.6	OK
39.003	CP01-14	15 Winter	100	+30%					91.301	-0.142	0.000	0.29			22.4	OK
37.001	MH01-52	15 Winter	100	+30%					90.597	-0.287	0.000	0.12			38.4	OK
40.000	CP01-15	15 Winter	100	+30%					91.846	-0.066	0.000	0.82			58.4	OK
40.001	CP01-16	15 Winter	100	+30%	100/15 Summer				91.182	0.209	0.000	1.13			86.8	SURCHARGED
37.002	MH01-53	30 Winter	100	+30%					90.094	-0.174	0.000	0.23			118.3	OK
37.003	MH01-54	30 Winter	100	+30%	100/15 Summer				90.069	0.336	0.000	0.25			98.8	SURCHARGED
37.004	MH01-55	30 Winter	100	+30%	30/15 Summer				90.052	0.469	0.000	0.65			137.8	SURCHARGED
37.005	MH01-56	30 Winter	100	+30%	30/15 Summer				90.033	0.492	0.000	0.63			137.3	SURCHARGED
29.009	MH01-57	30 Winter	100	+30%	30/15 Summer				90.011	0.513	0.000	1.57			386.4	SURCHARGED
28.012	MH01-58	15 Winter	100	+30%	30/15 Summer				89.887	0.445	0.000	1.47			646.2	SURCHARGED
41.000	CP01-17	30 Winter	100	+30%	100/15 Winter				93.346	0.173	0.000	0.56			15.6	SURCHARGED
41.001	CP01-18	30 Winter	100	+30%	100/15 Summer				93.280	0.367	0.000	0.99			27.5	SURCHARGED
41.002	MH01-59	30 Winter	100	+30%	30/15 Summer				93.185	0.528	0.000	1.10			41.8	SURCHARGED
42.000	MH01-60	15 Winter	100	+30%	30/15 Summer				99.249	1.565	0.000	1.05			79.4	SURCHARGED
42.001	MH01-61	15 Winter	100	+30%	30/15 Summer				98.919	1.572	0.000	0.86			70.7	SURCHARGED
42.002	MH01-62	15 Winter	100	+30%	30/15 Summer				97.381	2.185	0.000	1.27			111.0	FLOOD RISK
41.003	MH01-63	30 Winter	100	+30%	30/15 Summer				93.155	0.613	0.000	1.12			115.7	SURCHARGED
41.004	CP01-19	30 Winter	100	+30%	30/15 Summer				92.380	0.460	0.000	1.19			124.0	SURCHARGED
41.005	MH01-64	30 Winter	100	+30%	100/15 Winter				90.962	0.070	0.000	0.71			121.2	SURCHARGED
43.000	DN01-35	15 Summer	100	+30%					91.492	0.000	0.000	1.22			17.1	SURCHARGED*
41.006	MH01-65	30 Winter	100	+30%	5/15 Winter				90.669	0.369	0.000	1.68			138.8	SURCHARGED
44.000	DN01-36	15 Winter	100	+30%					90.817	-0.083	0.000	0.41			2.8	OK*
41.007	MH01-66	30 Winter	100	+30%	30/15 Summer				90.351	0.163	0.000	1.73			140.6	SURCHARGED
28.013	MH01-67	15 Winter	100	+30%	30/15 Summer				89.752	0.307	0.000	1.65			714.1	SURCHARGED
28.014	PI01-02	180 Winter	100	+30%	30/120 Winter				89.708	0.253	0.000	0.51			281.6	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
36.000	DN01-33	
29.008	MH01-51	
37.000	CP01-09	
38.000	DN01-34	
38.001	CP01-10	
39.000	CP01-11	
39.001	CP01-12	
39.002	CP01-13	
39.003	CP01-14	
37.001	MH01-52	
40.000	CP01-15	
40.001	CP01-16	
37.002	MH01-53	
37.003	MH01-54	
37.004	MH01-55	
37.005	MH01-56	
29.009	MH01-57	
28.012	MH01-58	
41.000	CP01-17	
41.001	CP01-18	
41.002	MH01-59	
42.000	MH01-60	
42.001	MH01-61	
42.002	MH01-62	
41.003	MH01-63	
41.004	CP01-19	
41.005	MH01-64	
43.000	DN01-35	
41.006	MH01-65	
44.000	DN01-36	
41.007	MH01-66	
28.013	MH01-67	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Level Exceeded
28.014	PI01-02	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.010	PO01-01	180 Winter	100	+30%	30/60 Summer				89.700	0.402	0.000	1.40			422.6
1.011	DN01-37	180 Winter	100	+30%					89.109	-1.391	0.000	0.04			422.7
1.012	DN01-38	180 Winter	100	+30%					89.050	-1.450	0.000	0.03			421.9
1.013	MH01-68	180 Winter	100	+30%					88.963	-1.537	0.000	0.04			421.8
45.000	CP01-20	30 Winter	100	+30%					90.025	-0.123	0.000	0.07			0.5
46.000	CP01-21	15 Winter	100	+30%					90.895	-0.190	0.000	0.06			3.5
46.001	CP01-22	15 Winter	100	+30%					90.439	-0.161	0.000	0.18			3.4
46.002	CP01-23	15 Winter	100	+30%					90.390	-0.159	0.000	0.18			3.5
46.003	CP01-24	15 Winter	100	+30%					90.350	-0.140	0.000	0.29			5.7
46.004	CP01-25	15 Winter	100	+30%					90.302	-0.132	0.000	0.36			5.5
47.000	CP01-26	30 Winter	100	+30%					101.922	-0.103	0.000	0.21			4.0
47.001	CP01-27	15 Winter	100	+30%					101.170	-0.194	0.000	0.04			5.9
47.002	CP01-28	15 Winter	100	+30%					98.672	-0.180	0.000	0.09			11.8
47.003	CP01-29	15 Winter	100	+30%					94.141	-0.163	0.000	0.17			22.9
47.004	CP01-30	15 Winter	100	+30%	100/15 Summer				92.067	0.217	0.000	0.67			50.1
47.005	CP01-31	15 Winter	100	+30%	30/15 Summer				91.570	0.992	0.000	1.58			61.7
47.006	CP01-32	15 Winter	100	+30%	30/15 Summer				91.028	0.670	0.000	1.59			84.6
47.007	CP01-33	15 Winter	100	+30%	5/15 Winter				90.781	0.518	0.000	2.64			85.5
47.008	CP01-34	15 Winter	100	+30%	30/15 Summer				90.603	0.376	0.000	2.90			108.1
46.005	CP01-35	15 Winter	100	+30%	100/15 Summer				90.245	0.086	0.000	1.15			121.4
48.000	CP01-36	30 Winter	100	+30%					101.149	-0.066	0.000	0.60			4.0
48.001	CP01-37	15 Winter	100	+30%					100.951	-0.188	0.000	0.06			6.3
48.002	CP01-38	15 Winter	100	+30%					98.641	-0.184	0.000	0.08			10.3
48.003	CP01-39	15 Winter	100	+30%					96.090	-0.170	0.000	0.13			18.7
48.004	CP01-40	15 Winter	100	+30%					92.204	-0.130	0.000	0.37			35.1
48.005	CP01-41	15 Winter	100	+30%	30/15 Summer				91.641	0.671	0.000	0.72			37.9
48.006	CP01-42	15 Winter	100	+30%	30/15 Summer	100/15 Summer			91.427	0.817	1.990	0.96			36.0
48.007	CP01-43	15 Winter	100	+30%	30/15 Summer	100/15 Winter			91.289	0.913	0.093	1.28			40.9
48.008	CP01-44	15 Winter	100	+30%	5/15 Summer				91.117	0.880	0.000	2.19			42.1
48.009	CP01-45	15 Winter	100	+30%	5/15 Summer				90.840	0.665	0.000	2.31			44.4
48.010	CP01-46	30 Winter	100	+30%	5/15 Summer				90.500	0.388	0.000	2.86			46.0
48.011	CP01-47	30 Winter	100	+30%	5/15 Summer				90.282	0.205	0.000	2.74			47.3
45.001	CP01-48	15 Winter	100	+30%	30/15 Winter				89.625	0.063	0.000	2.05			168.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
1.010	PO01-01	SURCHARGED	
1.011	DN01-37	OK	
1.012	DN01-38	OK	
1.013	MH01-68	OK	
45.000	CP01-20	OK	
46.000	CP01-21	OK	
46.001	CP01-22	OK	
46.002	CP01-23	OK	
46.003	CP01-24	OK	
46.004	CP01-25	OK	
47.000	CP01-26	OK	
47.001	CP01-27	OK	
47.002	CP01-28	OK	
47.003	CP01-29	OK	
47.004	CP01-30	SURCHARGED	
47.005	CP01-31	FLOOD RISK	
47.006	CP01-32	SURCHARGED	
47.007	CP01-33	SURCHARGED	
47.008	CP01-34	SURCHARGED	
46.005	CP01-35	SURCHARGED	
48.000	CP01-36	OK	
48.001	CP01-37	OK	
48.002	CP01-38	OK	
48.003	CP01-39	OK	
48.004	CP01-40	OK	
48.005	CP01-41	FLOOD RISK	
48.006	CP01-42	FLOOD	4
48.007	CP01-43	FLOOD	1
48.008	CP01-44	FLOOD RISK	
48.009	CP01-45	FLOOD RISK	
48.010	CP01-46	SURCHARGED	
48.011	CP01-47	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Status	Level Exceeded
45.001	CP01-48	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment - 01

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
45.002	MH01-69	15 Winter	100	+30%	100/15 Summer				89.560	0.024	0.000	1.38			166.2	SURCHARGED

PN	US/MH Name	Level Exceeded
45.002	MH01-69	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	30
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm)	18.800	Cv (Summer)	0.750
Return Period (years)	1	Ratio R	0.314	Cv (Winter)	0.840
Region England and Wales	Profile Type	Summer	Storm Duration (mins)		30

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.314 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1
Climate Change (%)	30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	SMH1.0	15 Summer	1	+30%					93.119	-0.225	0.000	0.00			0.0	OK
S1.001	SMH1.1	15 Winter	1	+30%					92.711	-0.101	0.000	0.54			21.2	OK
S1.002	SMH1.2	15 Winter	1	+30%					92.151	-0.129	0.000	0.59			40.0	OK
S2.000	SATSD8206_4845A	15 Winter	1	+30%					98.769	-0.131	0.000	0.04			1.1	OK*
S3.000	SATSD8206_4455B	15 Winter	1	+30%					99.123	-0.125	0.000	0.07			1.7	OK*
S2.001	SATSD8206_4749A	15 Winter	1	+30%					97.284	-0.132	0.000	0.03			2.9	OK
S4.000	SATSD8206_5437B	15 Winter	1	+30%					93.869	-0.090	0.000	0.34			5.4	OK*
S2.002	SMH2.2	15 Winter	1	+30%					92.294	-0.257	0.000	0.05			8.3	OK
S1.003	SMH1.3	15 Winter	1	+30%					91.902	-0.162	0.000	0.61			57.1	OK
S5.000	SMH5.0	15 Summer	1	+30%					92.861	-0.225	0.000	0.00			0.0	OK

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

PN	US/MH Name	Level Exceeded
S1.000	SMH1.0	
S1.001	SMH1.1	
S1.002	SMH1.2	
S2.000	SATSD8206_4845A	
S3.000	SATSD8206_4455B	
S2.001	SATSD8206_4749A	
S4.000	SATSD8206_5437B	
S2.002	SMH2.2	
S1.003	SMH1.3	
S5.000	SMH5.0	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S5.001	SMH5.1	15 Winter	1	+30%					92.423	-0.126	0.000	0.40			15.6
S1.004	SMH1.4	15 Winter	1	+30%					91.371	-0.642	0.000	0.18			85.4
S6.000	SMH6.0	15 Winter	1	+30%					93.306	-0.211	0.000	0.01			1.0
S1.005	SMH1.5	15 Winter	1	+30%					91.314	-0.665	0.000	0.11			87.0
S7.000	SATSD8206_4455A	15 Winter	1	+30%					99.098	-0.145	0.000	0.01			0.4
S8.000	SATSD8206_4262A	15 Winter	1	+30%					97.472	-0.127	0.000	0.06			1.1
S7.001	SATSD8206_4457A	15 Winter	1	+30%					96.577	-0.138	0.000	0.02			1.5
S9.000	SATSD8206_4850A	15 Winter	1	+30%					93.259	-0.095	0.000	0.29			4.9
S7.002	SMH7.2	15 Winter	1	+30%					92.110	-0.251	0.000	0.06			6.5
S10.000	SMH10.0	15 Summer	1	+30%					92.713	-0.225	0.000	0.00			0.0
S7.003	SMH7.3	15 Winter	1	+30%					92.017	-0.173	0.000	0.37			22.9
S11.000	SMH11.0	15 Summer	1	+30%					92.383	-0.225	0.000	0.00			0.0
S7.004	SMH7.4	15 Winter	1	+30%					91.930	-0.194	0.000	0.27			38.0
S1.006	SMH1.6	15 Winter	1	+30%					91.222	-0.590	0.000	0.16			115.3
S12.000	SMH12.0	15 Summer	1	+30%					92.117	-0.225	0.000	0.00			0.0
S12.001	SMH12.1	15 Winter	1	+30%					91.857	-0.174	0.000	0.11			8.7
S1.007	SMH1.7	15 Winter	1	+30%					91.171	-0.531	0.000	0.16			110.4
S13.000	SMH13.0	15 Winter	1	+30%					92.938	-0.196	0.000	0.04			1.9
S13.001	SMH13.1	15 Winter	1	+30%					92.016	-0.141	0.000	0.30			9.5
S13.002	SMH13.2	15 Winter	1	+30%					91.461	-0.207	0.000	0.21			9.5
S14.000	SATSD8206_4558B	15 Winter	1	+30%					93.058	-0.086	0.000	0.38			5.8
S14.001	SMH14.1	15 Winter	1	+30%					91.902	-0.252	0.000	0.06			7.9
S15.000	SMH15.0	15 Summer	1	+30%					92.310	-0.225	0.000	0.00			0.0
S14.002	SMH14.2	15 Winter	1	+30%					91.648	-0.202	0.000	0.23			29.5
S16.000	SMH16.0	15 Summer	1	+30%					91.848	-0.225	0.000	0.00			0.0
S14.003	SMH14.3	15 Winter	1	+30%					91.483	-0.111	0.000	0.71			41.4
S1.008	SMH1.8	30 Winter	1	+30%	1/15 Winter				91.166	0.053	0.000	0.73			133.5

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

PN	US/MH Name	Status	Level Exceeded
S5.001	SMH5.1	OK	
S1.004	SMH1.4	OK	
S6.000	SMH6.0	OK	
S1.005	SMH1.5	OK	
S7.000	SATSD8206_4455A	OK*	
S8.000	SATSD8206_4262A	OK*	
S7.001	SATSD8206_4457A	OK	
S9.000	SATSD8206_4850A	OK*	
S7.002	SMH7.2	OK	
S10.000	SMH10.0	OK	
S7.003	SMH7.3	OK	
S11.000	SMH11.0	OK	
S7.004	SMH7.4	OK	
S1.006	SMH1.6	OK	
S12.000	SMH12.0	OK	
S12.001	SMH12.1	OK	
S1.007	SMH1.7	OK	
S13.000	SMH13.0	OK	
S13.001	SMH13.1	OK	
S13.002	SMH13.2	OK	
S14.000	SATSD8206_4558B	OK*	
S14.001	SMH14.1	OK	
S15.000	SMH15.0	OK	
S14.002	SMH14.2	OK	
S16.000	SMH16.0	OK	
S14.003	SMH14.3	OK	
S1.008	SMH1.8	SURCHARGED	

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	SMH1.0	15 Summer	5	+30%	30/15 Summer				93.119	-0.225	0.000	0.00			0.0
S1.001	SMH1.1	15 Winter	5	+30%	30/15 Summer	100/15 Summer			92.762	-0.050	0.000	0.88			34.6
S1.002	SMH1.2	15 Winter	5	+30%	30/15 Summer				92.221	-0.059	0.000	0.96			65.0
S2.000	SATSD8206_4845A	15 Winter	5	+30%					98.774	-0.126	0.000	0.06			1.8
S3.000	SATSD8206_4455B	15 Winter	5	+30%					99.131	-0.117	0.000	0.11			2.9
S2.001	SATSD8206_4749A	15 Winter	5	+30%					97.288	-0.128	0.000	0.05			4.7
S4.000	SATSD8206_5437B	15 Winter	5	+30%					93.889	-0.070	0.000	0.56			8.9
S2.002	SMH2.2	15 Winter	5	+30%	30/30 Winter				92.308	-0.243	0.000	0.08			13.6
S1.003	SMH1.3	15 Winter	5	+30%	30/15 Summer				91.989	-0.076	0.000	0.99			93.0

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

PN	US/MH Name	Status	Level Exceeded
S1.000	SMH1.0	OK	
S1.001	SMH1.1	OK	4
S1.002	SMH1.2	OK	
S2.000	SATSD8206_4845A	OK*	
S3.000	SATSD8206_4455B	OK*	
S2.001	SATSD8206_4749A	OK	
S4.000	SATSD8206_5437B	OK*	
S2.002	SMH2.2	OK	
S1.003	SMH1.3	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S5.000	SMH5.0	15 Summer	5	+30%	100/15 Winter				92.861	-0.225	0.000	0.00			0.0
S5.001	SMH5.1	15 Winter	5	+30%	30/15 Summer				92.457	-0.092	0.000	0.65			25.4
S1.004	SMH1.4	30 Winter	5	+30%	30/15 Summer				91.590	-0.424	0.000	0.26			125.5
S6.000	SMH6.0	15 Winter	5	+30%					93.315	-0.202	0.000	0.02			1.6
S1.005	SMH1.5	30 Winter	5	+30%	30/15 Summer				91.586	-0.393	0.000	0.16			124.2
S7.000	SATSD8206_4455A	15 Winter	5	+30%					99.102	-0.141	0.000	0.01			0.7
S8.000	SATSD8206_4262A	15 Winter	5	+30%					97.480	-0.119	0.000	0.09			1.8
S7.001	SATSD8206_4457A	15 Winter	5	+30%					96.582	-0.133	0.000	0.03			2.5
S9.000	SATSD8206_4850A	15 Winter	5	+30%					93.277	-0.077	0.000	0.48			8.1
S7.002	SMH7.2	15 Winter	5	+30%	30/15 Winter				92.126	-0.235	0.000	0.11			10.6
S10.000	SMH10.0	15 Summer	5	+30%	100/15 Winter				92.713	-0.225	0.000	0.00			0.0
S7.003	SMH7.3	15 Winter	5	+30%	30/15 Summer				92.060	-0.130	0.000	0.61			37.7
S11.000	SMH11.0	15 Summer	5	+30%	30/30 Winter				92.383	-0.225	0.000	0.00			0.0
S7.004	SMH7.4	15 Winter	5	+30%	30/15 Summer				91.965	-0.159	0.000	0.45			62.5
S1.006	SMH1.6	30 Winter	5	+30%	30/15 Summer				91.578	-0.234	0.000	0.19			137.6
S12.000	SMH12.0	15 Summer	5	+30%	30/15 Winter				92.117	-0.225	0.000	0.00			0.0
S12.001	SMH12.1	15 Winter	5	+30%	30/15 Summer				91.872	-0.159	0.000	0.19			14.2
S1.007	SMH1.7	30 Winter	5	+30%	30/15 Summer	100/15 Winter			91.568	-0.133	0.000	0.15			109.8
S13.000	SMH13.0	15 Winter	5	+30%					92.947	-0.187	0.000	0.07			3.1
S13.001	SMH13.1	15 Winter	5	+30%	30/15 Winter				92.044	-0.113	0.000	0.46			14.6
S13.002	SMH13.2	30 Winter	5	+30%	30/15 Summer	100/15 Winter			91.561	-0.107	0.000	0.29			13.3
S14.000	SATSD8206_4558B	15 Winter	5	+30%					93.079	-0.065	0.000	0.62			9.5
S14.001	SMH14.1	15 Winter	5	+30%	30/15 Winter				91.917	-0.236	0.000	0.10			13.0
S15.000	SMH15.0	15 Summer	5	+30%	30/30 Winter				92.310	-0.225	0.000	0.00			0.0
S14.002	SMH14.2	15 Winter	5	+30%	30/15 Summer				91.679	-0.171	0.000	0.38			48.5
S16.000	SMH16.0	15 Summer	5	+30%	30/15 Summer				91.848	-0.225	0.000	0.00			0.0
S14.003	SMH14.3	15 Winter	5	+30%	5/15 Winter	100/15 Summer			91.602	0.008	0.000	1.17			68.2
S1.008	SMH1.8	30 Winter	5	+30%	5/15 Summer	100/15 Winter			91.558	0.445	0.000	0.73			134.5

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

PN	US/MH Name	Status	Level Exceeded	
S5.000	SMH5.0	OK		
S5.001	SMH5.1	OK		
S1.004	SMH1.4	OK		
S6.000	SMH6.0	OK		
S1.005	SMH1.5	OK		
S7.000	SATSD8206_4455A	OK*		
S8.000	SATSD8206_4262A	OK*		
S7.001	SATSD8206_4457A	OK		
S9.000	SATSD8206_4850A	OK*		
S7.002	SMH7.2	OK		
S10.000	SMH10.0	OK		
S7.003	SMH7.3	OK		
S11.000	SMH11.0	OK		
S7.004	SMH7.4	OK		
S1.006	SMH1.6	OK		
S12.000	SMH12.0	OK		
S12.001	SMH12.1	OK		
S1.007	SMH1.7	OK		5
S13.000	SMH13.0	OK		
S13.001	SMH13.1	OK		
S13.002	SMH13.2	OK		5
S14.000	SATSD8206_4558B	OK*		
S14.001	SMH14.1	OK		
S15.000	SMH15.0	OK		
S14.002	SMH14.2	OK		
S16.000	SMH16.0	OK		
S14.003	SMH14.3	SURCHARGED		8
S1.008	SMH1.8	SURCHARGED		4

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	SMH1.0	15 Winter	30	+30%	30/15 Summer				93.761	0.417	0.000	0.07			2.8
S1.001	SMH1.1	15 Winter	30	+30%	30/15 Summer	100/15 Summer			93.783	0.971	0.000	1.34			52.4
S1.002	SMH1.2	30 Winter	30	+30%	30/15 Summer				92.933	0.653	0.000	1.35			90.6
S2.000	SATSD8206_4845A	15 Winter	30	+30%					98.782	-0.118	0.000	0.11			3.1
S3.000	SATSD8206_4455B	15 Winter	30	+30%					99.141	-0.107	0.000	0.19			4.8
S2.001	SATSD8206_4749A	15 Winter	30	+30%					97.296	-0.120	0.000	0.09			7.9
S4.000	SATSD8206_5437B	15 Winter	30	+30%					93.924	-0.035	0.000	0.93			14.9
S2.002	SMH2.2	30 Winter	30	+30%	30/30 Winter				92.856	0.305	0.000	0.13			20.8
S1.003	SMH1.3	30 Winter	30	+30%	30/15 Summer				92.839	0.774	0.000	1.45			135.3

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

PN	US/MH Name	Status	Level Exceeded
S1.000	SMH1.0	SURCHARGED	
S1.001	SMH1.1	SURCHARGED	4
S1.002	SMH1.2	SURCHARGED	
S2.000	SATSD8206_4845A	OK*	
S3.000	SATSD8206_4455B	OK*	
S2.001	SATSD8206_4749A	OK	
S4.000	SATSD8206_5437B	OK*	
S2.002	SMH2.2	SURCHARGED	
S1.003	SMH1.3	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S5.000	SMH5.0	15 Summer	30	+30%	100/15 Winter				92.861	-0.225	0.000	0.00			0.0
S5.001	SMH5.1	30 Winter	30	+30%	30/15 Summer				92.834	0.285	0.000	1.00			39.1
S1.004	SMH1.4	30 Winter	30	+30%	30/15 Summer				92.801	0.787	0.000	0.42			199.4
S6.000	SMH6.0	15 Winter	30	+30%					93.319	-0.198	0.000	0.04			2.6
S1.005	SMH1.5	30 Winter	30	+30%	30/15 Summer				92.794	0.815	0.000	0.22			169.8
S7.000	SATSD8206_4455A	15 Winter	30	+30%					99.108	-0.135	0.000	0.02			1.1
S8.000	SATSD8206_4262A	15 Winter	30	+30%					97.488	-0.111	0.000	0.16			3.1
S7.001	SATSD8206_4457A	15 Winter	30	+30%					96.586	-0.129	0.000	0.05			4.2
S9.000	SATSD8206_4850A	15 Winter	30	+30%					93.307	-0.047	0.000	0.81			13.6
S7.002	SMH7.2	30 Winter	30	+30%	30/15 Winter				92.842	0.481	0.000	0.16			15.9
S10.000	SMH10.0	30 Winter	30	+30%	100/15 Winter				92.828	-0.110	0.000	0.01			0.5
S7.003	SMH7.3	30 Winter	30	+30%	30/15 Summer				92.830	0.640	0.000	0.99			61.1
S11.000	SMH11.0	30 Winter	30	+30%	30/30 Winter				92.806	0.198	0.000	0.04			1.5
S7.004	SMH7.4	30 Winter	30	+30%	30/15 Summer				92.809	0.685	0.000	0.73			101.7
S1.006	SMH1.6	30 Winter	30	+30%	30/15 Summer				92.783	0.971	0.000	0.25			180.0
S12.000	SMH12.0	30 Winter	30	+30%	30/15 Winter				92.773	0.431	0.000	0.04			1.6
S12.001	SMH12.1	30 Winter	30	+30%	30/15 Summer				92.775	0.744	0.000	0.31			23.3
S1.007	SMH1.7	30 Winter	30	+30%	30/15 Summer	100/15 Winter			92.768	1.066	0.000	0.24			167.3
S13.000	SMH13.0	15 Winter	30	+30%					92.959	-0.175	0.000	0.11			5.1
S13.001	SMH13.1	30 Winter	30	+30%	30/15 Winter				92.794	0.637	0.000	0.74			23.5
S13.002	SMH13.2	30 Winter	30	+30%	30/15 Summer	100/15 Winter			92.755	1.087	0.000	0.40			18.2
S14.000	SATSD8206_4558B	30 Winter	30	+30%					93.144	0.000	0.000	0.98			15.2
S14.001	SMH14.1	30 Winter	30	+30%	30/15 Winter				92.800	0.647	0.000	0.15			19.8
S15.000	SMH15.0	30 Winter	30	+30%	30/30 Winter				92.785	0.250	0.000	0.04			1.5
S14.002	SMH14.2	30 Winter	30	+30%	30/15 Summer				92.788	0.938	0.000	0.58			73.3
S16.000	SMH16.0	30 Winter	30	+30%	30/15 Summer				92.780	0.707	0.000	0.03			1.6
S14.003	SMH14.3	30 Winter	30	+30%	5/15 Winter	100/15 Summer			92.781	1.188	0.000	1.76			102.7
S1.008	SMH1.8	30 Winter	30	+30%	5/15 Summer	100/15 Winter			92.753	1.640	0.000	1.10			201.4

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

PN	US/MH Name	Status	Level Exceeded
S5.000	SMH5.0	OK	
S5.001	SMH5.1	SURCHARGED	
S1.004	SMH1.4	SURCHARGED	
S6.000	SMH6.0	OK	
S1.005	SMH1.5	SURCHARGED	
S7.000	SATSD8206_4455A	OK*	
S8.000	SATSD8206_4262A	OK*	
S7.001	SATSD8206_4457A	OK	
S9.000	SATSD8206_4850A	OK*	
S7.002	SMH7.2	SURCHARGED	
S10.000	SMH10.0	OK	
S7.003	SMH7.3	SURCHARGED	
S11.000	SMH11.0	SURCHARGED	
S7.004	SMH7.4	SURCHARGED	
S1.006	SMH1.6	SURCHARGED	
S12.000	SMH12.0	SURCHARGED	
S12.001	SMH12.1	SURCHARGED	
S1.007	SMH1.7	FLOOD RISK	5
S13.000	SMH13.0	OK	
S13.001	SMH13.1	SURCHARGED	
S13.002	SMH13.2	FLOOD RISK	5
S14.000	SATSD8206_4558B	SURCHARGED*	
S14.001	SMH14.1	SURCHARGED	
S15.000	SMH15.0	SURCHARGED	
S14.002	SMH14.2	FLOOD RISK	
S16.000	SMH16.0	SURCHARGED	
S14.003	SMH14.3	FLOOD RISK	8
S1.008	SMH1.8	FLOOD RISK	4

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	SMH1.0	15 Winter	100	+30%	30/15 Summer				94.471	1.127	0.000	0.14			5.7
S1.001	SMH1.1	15 Winter	100	+30%	30/15 Summer	100/15 Summer			94.471	1.659	2.474	1.48			57.8
S1.002	SMH1.2	30 Winter	100	+30%	30/15 Summer				93.699	1.419	0.000	1.58			106.2
S2.000	SATSD8206_4845A	15 Winter	100	+30%					98.787	-0.113	0.000	0.14			4.1
S3.000	SATSD8206_4455B	15 Winter	100	+30%					99.148	-0.100	0.000	0.25			6.4
S2.001	SATSD8206_4749A	15 Winter	100	+30%					97.301	-0.115	0.000	0.12			10.5
S4.000	SATSD8206_5437B	15 Summer	100	+30%					93.959	0.000	0.000	1.01			16.1
S2.002	SMH2.2	30 Winter	100	+30%	30/30 Winter				93.180	0.630	0.000	0.16			26.5
S1.003	SMH1.3	30 Winter	100	+30%	30/15 Summer				93.158	1.093	0.000	1.68			157.1

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

PN	US/MH Name	Status	Level Exceeded
S1.000	SMH1.0	FLOOD RISK	
S1.001	SMH1.1	FLOOD	4
S1.002	SMH1.2	SURCHARGED	
S2.000	SATSD8206_4845A	OK*	
S3.000	SATSD8206_4455B	OK*	
S2.001	SATSD8206_4749A	OK	
S4.000	SATSD8206_5437B	SURCHARGED*	
S2.002	SMH2.2	SURCHARGED	
S1.003	SMH1.3	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S5.000	SMH5.0	30 Winter	100	+30%	100/15 Winter				93.380	0.294	0.000	0.03			1.0
S5.001	SMH5.1	30 Winter	100	+30%	30/15 Summer				93.383	0.834	0.000	1.08			42.2
S1.004	SMH1.4	30 Winter	100	+30%	30/15 Summer				93.002	0.989	0.000	0.47			225.3
S6.000	SMH6.0	15 Winter	100	+30%					93.323	-0.194	0.000	0.05			3.5
S1.005	SMH1.5	30 Winter	100	+30%	30/15 Summer				92.989	1.010	0.000	0.29			228.9
S7.000	SATSD8206_4455A	15 Winter	100	+30%					99.110	-0.133	0.000	0.03			1.5
S8.000	SATSD8206_4262A	15 Winter	100	+30%					97.495	-0.104	0.000	0.21			4.1
S7.001	SATSD8206_4457A	15 Winter	100	+30%					96.590	-0.125	0.000	0.06			5.6
S9.000	SATSD8206_4850A	15 Summer	100	+30%					93.354	0.000	0.000	0.91			15.4
S7.002	SMH7.2	30 Winter	100	+30%	30/15 Winter				93.161	0.800	0.000	0.21			20.9
S10.000	SMH10.0	30 Winter	100	+30%	100/15 Winter				93.141	0.203	0.000	0.02			1.0
S7.003	SMH7.3	30 Winter	100	+30%	30/15 Summer				93.148	0.958	0.000	1.30			80.5
S11.000	SMH11.0	30 Winter	100	+30%	30/30 Winter				93.083	0.475	0.000	0.04			1.6
S7.004	SMH7.4	30 Winter	100	+30%	30/15 Summer				93.090	0.966	0.000	0.88			123.0
S1.006	SMH1.6	30 Winter	100	+30%	30/15 Summer				92.967	1.156	0.000	0.45			333.6
S12.000	SMH12.0	60 Winter	100	+30%	30/15 Winter				92.953	0.611	0.000	0.06			2.5
S12.001	SMH12.1	30 Winter	100	+30%	30/15 Summer				92.953	0.922	0.000	0.39			29.9
S1.007	SMH1.7	30 Winter	100	+30%	30/15 Summer	100/15 Winter			92.942	1.240	28.898	0.39			277.0
S13.000	SMH13.0	30 Winter	100	+30%					93.116	-0.018	0.000	0.14			6.6
S13.001	SMH13.1	30 Winter	100	+30%	30/15 Winter				93.086	0.929	0.000	0.84			26.5
S13.002	SMH13.2	30 Winter	100	+30%	30/15 Summer	100/15 Winter			92.873	1.205	25.000	1.78			81.3
S14.000	SATSD8206_4558B	15 Summer	100	+30%					93.144	0.000	0.000	1.00			15.4
S14.001	SMH14.1	30 Winter	100	+30%	30/15 Winter				92.931	0.777	0.000	0.17			21.9
S15.000	SMH15.0	30 Winter	100	+30%	30/30 Winter				92.911	0.376	0.000	0.08			3.5
S14.002	SMH14.2	30 Winter	100	+30%	30/15 Summer				92.911	1.061	0.000	0.65			82.1
S16.000	SMH16.0	60 Winter	100	+30%	30/15 Summer				92.863	0.790	0.000	0.11			5.4
S14.003	SMH14.3	60 Winter	100	+30%	5/15 Winter	100/15 Summer			92.863	1.269	69.744	2.36			137.6
S1.008	SMH1.8	60 Winter	100	+30%	5/15 Summer	100/15 Winter			92.945	1.832	6.281	1.13			206.8

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

PN	US/MH Name	Status	Level Exceeded
S5.000	SMH5.0	SURCHARGED	
S5.001	SMH5.1	SURCHARGED	
S1.004	SMH1.4	SURCHARGED	
S6.000	SMH6.0	OK	
S1.005	SMH1.5	SURCHARGED	
S7.000	SATSD8206_4455A	OK*	
S8.000	SATSD8206_4262A	OK*	
S7.001	SATSD8206_4457A	OK	
S9.000	SATSD8206_4850A	SURCHARGED*	
S7.002	SMH7.2	SURCHARGED	
S10.000	SMH10.0	SURCHARGED	
S7.003	SMH7.3	SURCHARGED	
S11.000	SMH11.0	SURCHARGED	
S7.004	SMH7.4	SURCHARGED	
S1.006	SMH1.6	FLOOD RISK	
S12.000	SMH12.0	SURCHARGED	
S12.001	SMH12.1	SURCHARGED	
S1.007	SMH1.7	FLOOD	5
S13.000	SMH13.0	OK	
S13.001	SMH13.1	FLOOD RISK	
S13.002	SMH13.2	FLOOD	5
S14.000	SATSD8206_4558B	SURCHARGED*	
S14.001	SMH14.1	SURCHARGED	
S15.000	SMH15.0	SURCHARGED	
S14.002	SMH14.2	FLOOD RISK	
S16.000	SMH16.0	SURCHARGED	
S14.003	SMH14.3	FLOOD	8
S1.008	SMH1.8	FLOOD	4

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Catchment - 04

Pipe Sizes M60 Pipe Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	0
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Proposed Catchment - 04

Volumetric Runoff Coeff	0.840	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	15

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.358 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1
Climate Change (%)	30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	EXMH04-01	15 Winter	1	+30%					105.819	-0.079	0.000	0.80			96.9	OK	
1.001	EXMH04-02	15 Winter	1	+30%					103.906	-0.066	0.000	0.92			124.1	OK	
1.002	MH04-01	15 Winter	1	+30%					102.040	-0.145	0.000	0.78			144.3	OK	
1.003	MH04-02	15 Winter	1	+30%					101.897	-0.178	0.000	0.67			146.9	OK	
1.004	MH04-03	15 Winter	1	+30%					101.674	-0.216	0.000	0.53			161.3	OK	
1.005	MH04-04	15 Winter	1	+30%					101.165	-0.198	0.000	0.59			181.6	OK	
1.006	MH04-05	15 Winter	1	+30%					100.628	-0.183	0.000	0.65			198.4	OK	
1.007	MH04-06	15 Winter	1	+30%					99.908	-0.359	0.000	0.34			211.2	OK	
1.008	MH04-07	15 Winter	1	+30%					99.186	-0.405	0.000	0.33			229.2	OK	
2.000	MH04-08	15 Summer	1	+30%					100.437	-0.225	0.000	0.00			0.0	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	CP04-01	15 Winter	1	+30%					101.130	-0.132	0.000	0.36			19.3	OK
1.009	MH04-09	15 Winter	1	+30%					98.840	-0.384	0.000	0.39			248.7	OK
1.010	MH04-10	15 Winter	1	+30%					98.454	-0.511	0.000	0.13			258.6	OK
1.011	MH04-11	15 Winter	1	+30%					96.371	-0.302	0.000	0.25			249.9	OK
4.000	EXMH04-03	15 Summer	1	+30%					105.263	-0.300	0.000	0.00			0.0	OK
5.000	EXCP04-01	15 Winter	1	+30%					106.932	-0.084	0.000	0.71			31.5	OK
4.001	EXMH04-04	15 Winter	1	+30%					104.072	-0.201	0.000	0.24			31.2	OK
4.002	DN04-01	15 Winter	1	+30%					102.524	-0.104	0.000	0.38			31.7	OK*
6.000	MH04-12	15 Winter	1	+30%					103.445	-0.096	0.000	0.61			32.0	OK
7.000	EXCP04-02	15 Winter	1	+30%					105.400	-0.086	0.000	0.63			35.1	OK
7.001	DN01-02	15 Winter	1	+30%					103.729	-0.062	0.000	0.87			35.4	OK*
4.003	MH04-13	15 Winter	1	+30%					102.485	-0.033	0.000	1.00			81.0	OK
4.004	DN04-03	15 Winter	1	+30%					102.296	-0.100	0.000	0.75			77.4	OK*
4.005	DN04-04	15 Winter	1	+30%					101.010	-0.187	0.000	0.30			77.9	OK*
8.000	EXCP04-03	15 Winter	1	+30%					103.536	-0.115	0.000	0.70			51.2	OK
8.001	DN04-05	15 Winter	1	+30%					103.374	-0.156	0.000	0.46			50.1	OK*
8.002	DN04-06	15 Winter	1	+30%					101.634	-0.163	0.000	0.43			50.0	OK*
4.006	MH04-14	15 Winter	1	+30%					99.855	-0.297	0.000	0.25			128.0	OK
4.007	MH04-15	15 Winter	1	+30%					98.880	-0.331	0.000	0.16			127.8	OK
1.012	MH04-16	15 Winter	1	+30%					96.202	-0.798	0.000	0.09			332.0	OK
1.013	MH04-17	30 Winter	1	+30%					95.796	-0.439	0.000	0.27			331.2	OK
1.014	MH04-18	30 Winter	1	+30%					94.662	-0.460	0.000	0.22			332.2	OK
1.015	MH04-19	30 Winter	1	+30%					93.538	-0.132	0.000	0.99			333.5	OK
9.000	MH04-20	15 Winter	1	+30%					103.541	-0.167	0.000	0.15			15.5	OK
9.001	DN04-07	15 Winter	1	+30%					101.421	-0.169	0.000	0.14			15.5	OK*
9.002	MH04-21	15 Winter	1	+30%					99.332	-0.140	0.000	0.30			43.7	OK
10.000	MH04-22	15 Winter	1	+30%					98.710	-0.119	0.000	0.44			29.2	OK
11.000	MH04-23	15 Winter	1	+30%					98.878	-0.053	0.000	0.93			40.3	OK
11.001	MH04-24	15 Winter	1	+30%					98.295	-0.348	0.000	0.12			42.6	OK
10.001	MH04-25	15 Winter	1	+30%					98.082	-0.139	0.000	0.59			75.5	OK
12.000	CP04-02	15 Winter	1	+30%					100.302	-0.160	0.000	0.19			15.7	OK
12.001	CP04-03	15 Winter	1	+30%					99.019	-0.132	0.000	0.35			23.6	OK
12.002	CP04-04	15 Winter	1	+30%					98.094	-0.130	0.000	0.25			29.6	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Level Exceeded
3.000	CP04-01	
1.009	MH04-09	
1.010	MH04-10	
1.011	MH04-11	
4.000	EXMH04-03	
5.000	EXCP04-01	
4.001	EXMH04-04	
4.002	DN04-01	
6.000	MH04-12	
7.000	EXCP04-02	
7.001	DN01-02	
4.003	MH04-13	
4.004	DN04-03	
4.005	DN04-04	
8.000	EXCP04-03	
8.001	DN04-05	
8.002	DN04-06	
4.006	MH04-14	
4.007	MH04-15	
1.012	MH04-16	
1.013	MH04-17	
1.014	MH04-18	
1.015	MH04-19	
9.000	MH04-20	
9.001	DN04-07	
9.002	MH04-21	
10.000	MH04-22	
11.000	MH04-23	
11.001	MH04-24	
10.001	MH04-25	
12.000	CP04-02	
12.001	CP04-03	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Level Exceeded
12.002	CP04-04	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
12.003	MH04-26	15 Winter	1	+30%					98.054	-0.103	0.000	0.36			34.1	OK	
10.002	MH04-27	15 Winter	1	+30%					98.042	-0.100	0.000	0.75			99.1	OK	
9.003	MH04-28	15 Winter	1	+30%					97.981	-0.073	0.000	0.98			130.4	OK	
9.004	DN04-08	15 Winter	1	+30%					97.634	-1.200	0.000	0.01			130.1	OK	
9.005	DN04-09	15 Winter	1	+30%					96.874	-0.424	0.000	0.07			133.3	OK	
9.006	DN04-10	15 Winter	1	+30%					96.157	-0.410	0.000	0.08			134.4	OK	
9.007	DN04-11	15 Winter	1	+30%					95.932	-0.463	0.000	0.12			134.2	OK*	
9.008	MH04-29	15 Winter	1	+30%					94.050	-0.444	0.000	0.15			135.1	OK	
1.016	PI04-01	360 Winter	1	+30%					93.214	-0.369	0.000	0.15			45.5	OK	
1.017	PO04-01	480 Winter	1	+30%					93.331	-0.027	0.000	0.23			43.7	OK	
1.018	MH04-30	720 Winter	1	+30%					92.984	-0.241	0.000	0.38			44.4	OK	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Catchment - 04

Pipe Sizes M60 Pipe Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	0
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Proposed Catchment - 04

Volumetric Runoff Coeff	0.840	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	15

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	EXMH04-01	15 Winter	5	+30%	5/15 Summer	30/15 Summer			106.623	0.725	0.000	1.03			125.6
1.001	EXMH04-02	15 Winter	5	+30%	5/15 Summer	100/15 Summer			104.617	0.645	0.000	1.16			156.7
1.002	MH04-01	15 Winter	5	+30%	30/15 Summer				102.095	-0.090	0.000	0.99			182.3
1.003	MH04-02	15 Winter	5	+30%	30/15 Summer				101.946	-0.129	0.000	0.86			186.2
1.004	MH04-03	15 Winter	5	+30%	30/15 Summer				101.718	-0.172	0.000	0.69			212.4
1.005	MH04-04	15 Winter	5	+30%	30/15 Summer				101.225	-0.138	0.000	0.81			248.8
1.006	MH04-05	15 Winter	5	+30%	30/15 Summer				100.703	-0.108	0.000	0.93			281.0
1.007	MH04-06	15 Winter	5	+30%					99.966	-0.301	0.000	0.49			306.8
1.008	MH04-07	15 Winter	5	+30%					99.255	-0.336	0.000	0.50			341.1

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	EXMH04-01	SURCHARGED	13
1.001	EXMH04-02	SURCHARGED	5
1.002	MH04-01	OK	
1.003	MH04-02	OK	
1.004	MH04-03	OK	
1.005	MH04-04	OK	
1.006	MH04-05	OK	
1.007	MH04-06	OK	
1.008	MH04-07	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
2.000	MH04-08	15 Summer	5	+30%					100.437	-0.225	0.000	0.00			0.0
3.000	CP04-01	15 Winter	5	+30%	100/15 Summer				101.162	-0.100	0.000	0.60			31.7
1.009	MH04-09	15 Winter	5	+30%					98.919	-0.305	0.000	0.58			374.1
1.010	MH04-10	15 Winter	5	+30%					98.497	-0.468	0.000	0.20			393.4
1.011	MH04-11	15 Winter	5	+30%					96.448	-0.225	0.000	0.37			377.0
4.000	EXMH04-03	15 Summer	5	+30%					105.263	-0.300	0.000	0.00			0.0
5.000	EXCP04-01	15 Winter	5	+30%	5/15 Winter	30/15 Summer			107.170	0.154	0.000	1.05			46.7
4.001	EXMH04-04	15 Winter	5	+30%	100/15 Summer				104.096	-0.177	0.000	0.35			46.5
4.002	DN04-01	15 Summer	5	+30%					102.628	0.000	0.000	0.70			57.8
6.000	MH04-12	15 Winter	5	+30%	30/15 Summer	100/15 Summer			103.512	-0.029	0.000	1.00			52.2
7.000	EXCP04-02	15 Winter	5	+30%	5/15 Summer	30/15 Summer			105.570	0.084	0.000	0.98			54.1
7.001	DN01-02	15 Summer	5	+30%					103.791	0.000	0.000	1.30			53.0
4.003	MH04-13	15 Winter	5	+30%	5/15 Summer				102.979	0.461	0.000	1.46			117.9
4.004	DN04-03	15 Summer	5	+30%					102.396	0.000	0.000	1.05			108.6
4.005	DN04-04	15 Winter	5	+30%					101.037	-0.160	0.000	0.45			114.2
8.000	EXCP04-03	15 Winter	5	+30%	5/15 Winter	30/15 Winter			103.675	0.024	0.000	1.15			84.2
8.001	DN04-05	15 Winter	5	+30%					103.427	-0.103	0.000	0.74			81.6
8.002	DN04-06	15 Winter	5	+30%					101.683	-0.114	0.000	0.70			81.5
4.006	MH04-14	15 Winter	5	+30%					99.896	-0.256	0.000	0.39			196.0
4.007	MH04-15	15 Winter	5	+30%					98.911	-0.300	0.000	0.24			196.0
1.012	MH04-16	15 Winter	5	+30%					96.303	-0.697	0.000	0.14			517.9
1.013	MH04-17	30 Winter	5	+30%					95.866	-0.369	0.000	0.42			527.0
1.014	MH04-18	30 Winter	5	+30%					94.724	-0.398	0.000	0.35			528.5
1.015	MH04-19	30 Winter	5	+30%	5/15 Summer				93.770	0.100	0.000	1.58			531.1
9.000	MH04-20	15 Winter	5	+30%					103.559	-0.149	0.000	0.24			25.5
9.001	DN04-07	15 Winter	5	+30%					101.438	-0.152	0.000	0.23			25.3
9.002	MH04-21	15 Winter	5	+30%	30/15 Summer				99.360	-0.112	0.000	0.49			71.7
10.000	MH04-22	15 Winter	5	+30%	30/15 Summer	100/15 Summer			98.749	-0.080	0.000	0.72			48.0
11.000	MH04-23	15 Winter	5	+30%	5/15 Summer	30/15 Summer			99.202	0.271	0.000	1.39			60.2
11.001	MH04-24	15 Winter	5	+30%	30/15 Summer				98.522	-0.121	0.000	0.16			60.3
10.001	MH04-25	15 Winter	5	+30%	5/15 Summer				98.448	0.227	0.000	0.83			105.4
12.000	CP04-02	15 Winter	5	+30%					100.322	-0.140	0.000	0.30			25.8
12.001	CP04-03	15 Winter	5	+30%	30/15 Summer	100/15 Summer			99.051	-0.100	0.000	0.58			38.8

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
2.000	MH04-08	OK	
3.000	CP04-01	OK	
1.009	MH04-09	OK	
1.010	MH04-10	OK	
1.011	MH04-11	FLOOD RISK	
4.000	EXMH04-03	OK	
5.000	EXCP04-01	SURCHARGED	12
4.001	EXMH04-04	OK	
4.002	DN04-01	SURCHARGED*	
6.000	MH04-12	OK	4
7.000	EXCP04-02	SURCHARGED	9
7.001	DN01-02	SURCHARGED*	
4.003	MH04-13	SURCHARGED	
4.004	DN04-03	SURCHARGED*	
4.005	DN04-04	OK*	
8.000	EXCP04-03	SURCHARGED	7
8.001	DN04-05	OK*	
8.002	DN04-06	OK*	
4.006	MH04-14	OK	
4.007	MH04-15	OK	
1.012	MH04-16	OK	
1.013	MH04-17	OK	
1.014	MH04-18	OK	
1.015	MH04-19	SURCHARGED	
9.000	MH04-20	OK	
9.001	DN04-07	OK*	
9.002	MH04-21	OK	
10.000	MH04-22	OK	3
11.000	MH04-23	SURCHARGED	10
11.001	MH04-24	OK	
10.001	MH04-25	SURCHARGED	
12.000	CP04-02	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
12.001	CP04-03	OK	4

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
12.002	CP04-04	15 Winter	5	+30%	5/15 Summer	30/15 Summer			98.434	0.210	0.000	0.41			48.7
12.003	MH04-26	15 Winter	5	+30%	5/15 Summer				98.410	0.253	0.000	0.54			50.5
10.002	MH04-27	15 Winter	5	+30%	5/15 Summer				98.399	0.257	0.000	1.22			160.5
9.003	MH04-28	15 Winter	5	+30%	5/15 Summer				98.265	0.211	0.000	1.56			207.8
9.004	DN04-08	15 Winter	5	+30%					97.677	-1.157	0.000	0.01			209.3
9.005	DN04-09	15 Winter	5	+30%					96.919	-0.379	0.000	0.11			213.1
9.006	DN04-10	15 Winter	5	+30%					96.207	-0.360	0.000	0.13			215.8
9.007	DN04-11	15 Winter	5	+30%					95.972	-0.423	0.000	0.19			215.8
9.008	MH04-29	15 Winter	5	+30%					94.094	-0.400	0.000	0.24			217.4
1.016	PI04-01	600 Winter	5	+30%	30/180 Winter				93.376	-0.207	0.000	0.25			76.6
1.017	PO04-01	960 Summer	5	+30%	5/120 Summer				93.527	0.169	0.000	0.35			65.5
1.018	MH04-30	1440 Summer	5	+30%	100/120 Winter				93.048	-0.177	0.000	0.52			60.3

PN	US/MH Name	Status	Level Exceeded
12.002	CP04-04	SURCHARGED	11
12.003	MH04-26	SURCHARGED	
10.002	MH04-27	SURCHARGED	
9.003	MH04-28	SURCHARGED	
9.004	DN04-08	OK	
9.005	DN04-09	OK	
9.006	DN04-10	OK	
9.007	DN04-11	OK*	
9.008	MH04-29	OK	
1.016	PI04-01	OK	
1.017	PO04-01	SURCHARGED	
1.018	MH04-30	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	EXMH04-01	15 Winter	30	+30%	5/15 Summer	30/15 Summer			107.134	1.236	36.275	1.15			139.9
1.001	EXMH04-02	15 Winter	30	+30%	5/15 Summer	100/15 Summer			105.678	1.706	0.000	1.32			178.0
1.002	MH04-01	15 Winter	30	+30%	30/15 Summer				102.543	0.358	0.000	1.25			230.1
1.003	MH04-02	15 Winter	30	+30%	30/15 Summer				102.377	0.302	0.000	1.07			232.8
1.004	MH04-03	15 Winter	30	+30%	30/15 Summer				102.170	0.280	0.000	0.89			271.5
1.005	MH04-04	15 Winter	30	+30%	30/15 Summer				101.749	0.386	0.000	1.07			327.9
1.006	MH04-05	15 Winter	30	+30%	30/15 Summer				101.105	0.294	0.000	1.25			378.2
1.007	MH04-06	15 Winter	30	+30%					100.036	-0.231	0.000	0.68			427.2
1.008	MH04-07	15 Winter	30	+30%					99.350	-0.241	0.000	0.73			499.0

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	EXMH04-01	FLOOD	13
1.001	EXMH04-02	FLOOD RISK	5
1.002	MH04-01	SURCHARGED	
1.003	MH04-02	SURCHARGED	
1.004	MH04-03	SURCHARGED	
1.005	MH04-04	SURCHARGED	
1.006	MH04-05	SURCHARGED	
1.007	MH04-06	OK	
1.008	MH04-07	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
2.000	MH04-08	15 Summer	30	+30%					100.437	-0.225	0.000	0.00			0.0
3.000	CP04-01	15 Winter	30	+30%	100/15 Summer				101.221	-0.041	0.000	1.00			53.2
1.009	MH04-09	15 Winter	30	+30%					99.032	-0.192	0.000	0.86			553.2
1.010	MH04-10	15 Winter	30	+30%					98.548	-0.417	0.000	0.31			592.8
1.011	MH04-11	15 Winter	30	+30%					96.542	-0.131	0.000	0.55			560.4
4.000	EXMH04-03	15 Summer	30	+30%					105.263	-0.300	0.000	0.00			0.0
5.000	EXCP04-01	30 Winter	30	+30%	5/15 Winter	30/15 Summer			107.626	0.610	10.277	1.19			52.6
4.001	EXMH04-04	30 Winter	30	+30%	100/15 Summer				104.232	-0.041	0.000	0.44			57.2
4.002	DN04-01	15 Summer	30	+30%					102.628	0.000	0.000	1.04			86.5
6.000	MH04-12	15 Winter	30	+30%	30/15 Summer	100/15 Summer			104.175	0.634	0.000	1.50			78.4
7.000	EXCP04-02	15 Winter	30	+30%	5/15 Summer	30/15 Summer			106.092	0.606	5.742	1.12			61.9
7.001	DN01-02	15 Summer	30	+30%					103.791	0.000	0.000	1.52			62.0
4.003	MH04-13	30 Winter	30	+30%	5/15 Summer				103.871	1.353	0.000	1.77			143.8
4.004	DN04-03	15 Summer	30	+30%					102.396	0.000	0.000	1.32			136.4
4.005	DN04-04	30 Winter	30	+30%					101.057	-0.140	0.000	0.56			142.6
8.000	EXCP04-03	15 Winter	30	+30%	5/15 Winter	30/15 Winter			104.252	0.601	0.616	1.66			122.3
8.001	DN04-05	15 Summer	30	+30%					103.530	0.000	0.000	1.05			115.1
8.002	DN04-06	30 Winter	30	+30%					101.797	0.000	0.000	1.03			120.0
4.006	MH04-14	30 Winter	30	+30%					99.933	-0.219	0.000	0.52			262.2
4.007	MH04-15	30 Winter	30	+30%					98.938	-0.273	0.000	0.33			262.5
1.012	MH04-16	30 Winter	30	+30%					96.401	-0.599	0.000	0.21			766.8
1.013	MH04-17	30 Winter	30	+30%					95.943	-0.292	0.000	0.62			764.9
1.014	MH04-18	30 Winter	30	+30%					94.789	-0.333	0.000	0.51			766.4
1.015	MH04-19	30 Winter	30	+30%	5/15 Summer				94.014	0.344	0.000	2.30			771.2
9.000	MH04-20	15 Winter	30	+30%					103.584	-0.124	0.000	0.41			42.9
9.001	DN04-07	15 Winter	30	+30%					101.462	-0.128	0.000	0.38			42.7
9.002	MH04-21	15 Winter	30	+30%	30/15 Summer				99.782	0.310	0.000	0.88			128.4
10.000	MH04-22	15 Winter	30	+30%	30/15 Summer	100/15 Summer			99.671	0.842	0.000	1.05			70.1
11.000	MH04-23	15 Winter	30	+30%	5/15 Summer	30/15 Summer			99.914	0.983	4.068	1.76			76.5
11.001	MH04-24	15 Winter	30	+30%	30/15 Summer				99.190	0.547	0.000	0.22			79.5
10.001	MH04-25	15 Winter	30	+30%	5/15 Summer				98.959	0.738	0.000	1.28			162.9
12.000	CP04-02	15 Winter	30	+30%					100.351	-0.111	0.000	0.51			43.4
12.001	CP04-03	15 Winter	30	+30%	30/15 Summer	100/15 Summer			99.587	0.436	0.000	0.92			61.4

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
2.000	MH04-08	OK	
3.000	CP04-01	OK	
1.009	MH04-09	OK	
1.010	MH04-10	OK	
1.011	MH04-11	FLOOD RISK	
4.000	EXMH04-03	OK	
5.000	EXCP04-01	FLOOD	12
4.001	EXMH04-04	OK	
4.002	DN04-01	SURCHARGED*	
6.000	MH04-12	SURCHARGED	4
7.000	EXCP04-02	FLOOD	9
7.001	DN01-02	SURCHARGED*	
4.003	MH04-13	SURCHARGED	
4.004	DN04-03	SURCHARGED*	
4.005	DN04-04	OK*	
8.000	EXCP04-03	FLOOD	7
8.001	DN04-05	SURCHARGED*	
8.002	DN04-06	SURCHARGED*	
4.006	MH04-14	OK	
4.007	MH04-15	OK	
1.012	MH04-16	OK	
1.013	MH04-17	OK	
1.014	MH04-18	OK	
1.015	MH04-19	FLOOD RISK	
9.000	MH04-20	OK	
9.001	DN04-07	OK*	
9.002	MH04-21	SURCHARGED	
10.000	MH04-22	SURCHARGED	3
11.000	MH04-23	FLOOD	10
11.001	MH04-24	FLOOD RISK	
10.001	MH04-25	SURCHARGED	
12.000	CP04-02	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
12.001	CP04-03	FLOOD RISK	4

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
12.002	CP04-04	15 Winter	30	+30%	5/15 Summer	30/15 Summer			98.790	0.566	16.406	0.74			88.1
12.003	MH04-26	15 Winter	30	+30%	5/15 Summer				98.830	0.673	0.000	0.98			91.7
10.002	MH04-27	15 Winter	30	+30%	5/15 Summer				98.830	0.688	0.000	1.66			218.5
9.003	MH04-28	15 Winter	30	+30%	5/15 Summer				98.668	0.614	0.000	2.22			296.7
9.004	DN04-08	15 Winter	30	+30%					97.724	-1.110	0.000	0.02			299.8
9.005	DN04-09	15 Winter	30	+30%					96.962	-0.336	0.000	0.16			305.1
9.006	DN04-10	15 Winter	30	+30%					96.252	-0.315	0.000	0.19			310.3
9.007	DN04-11	30 Winter	30	+30%					96.010	-0.385	0.000	0.28			311.2
9.008	MH04-29	30 Winter	30	+30%					94.141	-0.353	0.000	0.36			316.0
1.016	PI04-01	480 Winter	30	+30%	30/180 Winter				93.618	0.035	0.000	0.32			97.8
1.017	PO04-01	180 Winter	30	+30%	5/120 Summer				93.683	0.325	0.000	0.52			96.7
1.018	MH04-30	480 Winter	30	+30%	100/120 Winter				93.124	-0.101	0.000	0.83			96.6

PN	US/MH Name	Status	Level Exceeded
12.002	CP04-04	FLOOD	11
12.003	MH04-26	SURCHARGED	
10.002	MH04-27	SURCHARGED	
9.003	MH04-28	SURCHARGED	
9.004	DN04-08	OK	
9.005	DN04-09	OK	
9.006	DN04-10	OK	
9.007	DN04-11	OK*	
9.008	MH04-29	OK	
1.016	PI04-01	SURCHARGED	
1.017	PO04-01	SURCHARGED	
1.018	MH04-30	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.000	EXMH04-01	30 Winter	100	+30%	5/15 Summer	30/15 Summer			107.180	1.282	81.579	1.20			145.8
1.001	EXMH04-02	15 Winter	100	+30%	5/15 Summer	100/15 Summer			105.780	1.808	12.431	1.39			187.4
1.002	MH04-01	15 Winter	100	+30%	30/15 Summer				103.347	1.162	0.000	1.29			238.1
1.003	MH04-02	15 Winter	100	+30%	30/15 Summer				103.174	1.099	0.000	1.16			251.7
1.004	MH04-03	15 Winter	100	+30%	30/15 Summer				102.961	1.071	0.000	1.00			306.4
1.005	MH04-04	15 Winter	100	+30%	30/15 Summer				102.461	1.098	0.000	1.26			384.5
1.006	MH04-05	15 Winter	100	+30%	30/15 Summer				101.572	0.761	0.000	1.53			465.2
1.007	MH04-06	15 Winter	100	+30%					100.103	-0.164	0.000	0.85			534.2
1.008	MH04-07	15 Winter	100	+30%					99.443	-0.148	0.000	0.89			611.5

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
1.000	EXMH04-01	FLOOD	13
1.001	EXMH04-02	FLOOD	5
1.002	MH04-01	SURCHARGED	
1.003	MH04-02	FLOOD RISK	
1.004	MH04-03	FLOOD RISK	
1.005	MH04-04	FLOOD RISK	
1.006	MH04-05	SURCHARGED	
1.007	MH04-06	OK	
1.008	MH04-07	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
2.000	MH04-08	15 Summer	100	+30%					100.437	-0.225	0.000	0.00			0.0
3.000	CP04-01	15 Winter	100	+30%	100/15 Summer				101.669	0.407	0.000	1.27			67.5
1.009	MH04-09	15 Winter	100	+30%					99.224	0.000	0.000	1.01			655.1
1.010	MH04-10	15 Winter	100	+30%					98.574	-0.391	0.000	0.37			706.7
1.011	MH04-11	30 Winter	100	+30%					96.588	-0.085	0.000	0.67			686.3
4.000	EXMH04-03	15 Summer	100	+30%					105.263	-0.300	0.000	0.00			0.0
5.000	EXCP04-01	30 Winter	100	+30%	5/15 Winter	30/15 Summer			107.645	0.629	29.085	1.19			52.9
4.001	EXMH04-04	30 Winter	100	+30%	100/15 Summer				104.594	0.321	0.000	0.47			62.0
4.002	DN04-01	15 Summer	100	+30%					102.628	0.000	0.000	1.07			88.8
6.000	MH04-12	30 Winter	100	+30%	30/15 Summer	100/15 Summer			104.650	1.109	2.993	1.40			73.1
7.000	EXCP04-02	15 Winter	100	+30%	5/15 Summer	30/15 Summer			106.104	0.618	17.596	1.11			61.8
7.001	DN01-02	15 Summer	100	+30%					103.791	0.000	0.000	1.53			62.5
4.003	MH04-13	30 Winter	100	+30%	5/15 Summer				104.238	1.720	0.000	1.89			153.2
4.004	DN04-03	15 Summer	100	+30%					102.396	0.000	0.000	1.40			145.5
4.005	DN04-04	30 Winter	100	+30%					101.064	-0.133	0.000	0.59			152.3
8.000	EXCP04-03	30 Winter	100	+30%	5/15 Winter	30/15 Winter			104.272	0.621	21.434	1.68			123.2
8.001	DN04-05	15 Summer	100	+30%					103.530	0.000	0.000	1.11			121.7
8.002	DN04-06	15 Summer	100	+30%					101.797	0.000	0.000	1.05			121.6
4.006	MH04-14	30 Winter	100	+30%					99.939	-0.213	0.000	0.54			274.3
4.007	MH04-15	30 Winter	100	+30%					98.942	-0.269	0.000	0.34			274.4
1.012	MH04-16	30 Winter	100	+30%					96.456	-0.544	0.000	0.25			915.4
1.013	MH04-17	30 Winter	100	+30%					95.991	-0.244	0.000	0.73			909.5
1.014	MH04-18	30 Winter	100	+30%					94.828	-0.294	0.000	0.61			912.3
1.015	MH04-19	30 Winter	100	+30%	5/15 Summer				94.209	0.539	0.000	2.74			919.9
9.000	MH04-20	15 Winter	100	+30%					103.603	-0.105	0.000	0.55			57.1
9.001	DN04-07	15 Winter	100	+30%					101.480	-0.110	0.000	0.51			56.8
9.002	MH04-21	15 Winter	100	+30%	30/15 Summer				100.764	1.292	0.000	1.17			169.4
10.000	MH04-22	15 Winter	100	+30%	30/15 Summer	100/15 Summer			100.064	1.235	2.173	1.29			85.9
11.000	MH04-23	15 Winter	100	+30%	5/15 Summer	30/15 Summer			99.927	0.996	16.966	1.91			83.1
11.001	MH04-24	15 Winter	100	+30%	30/15 Summer				99.321	0.678	0.000	0.24			86.2
10.001	MH04-25	15 Winter	100	+30%	5/15 Summer				99.106	0.885	0.000	1.44			183.2
12.000	CP04-02	15 Winter	100	+30%					100.374	-0.088	0.000	0.68			57.8
12.001	CP04-03	30 Winter	100	+30%	30/15 Summer	100/15 Summer			99.656	0.505	5.496	0.96			64.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
2.000	MH04-08	OK	
3.000	CP04-01	FLOOD RISK	
1.009	MH04-09	OK	
1.010	MH04-10	OK	
1.011	MH04-11	FLOOD RISK	
4.000	EXMH04-03	OK	
5.000	EXCP04-01	FLOOD	12
4.001	EXMH04-04	SURCHARGED	
4.002	DN04-01	SURCHARGED*	
6.000	MH04-12	FLOOD	4
7.000	EXCP04-02	FLOOD	9
7.001	DN01-02	SURCHARGED*	
4.003	MH04-13	FLOOD RISK	
4.004	DN04-03	SURCHARGED*	
4.005	DN04-04	OK*	
8.000	EXCP04-03	FLOOD	7
8.001	DN04-05	SURCHARGED*	
8.002	DN04-06	SURCHARGED*	
4.006	MH04-14	OK	
4.007	MH04-15	OK	
1.012	MH04-16	OK	
1.013	MH04-17	OK	
1.014	MH04-18	OK	
1.015	MH04-19	FLOOD RISK	
9.000	MH04-20	OK	
9.001	DN04-07	OK*	
9.002	MH04-21	SURCHARGED	
10.000	MH04-22	FLOOD	3
11.000	MH04-23	FLOOD	10
11.001	MH04-24	FLOOD RISK	
10.001	MH04-25	FLOOD RISK	
12.000	CP04-02	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Status	Level Exceeded
12.001	CP04-03	FLOOD	4

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 04

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
12.002	CP04-04	30 Winter	100	+30%	5/15 Summer	30/15 Summer			98.821	0.597	47.603	0.84			100.5
12.003	MH04-26	15 Summer	100	+30%	5/15 Summer				98.884	0.727	0.000	1.13			106.0
10.002	MH04-27	15 Summer	100	+30%	5/15 Summer				98.928	0.786	0.000	1.72			225.9
9.003	MH04-28	15 Summer	100	+30%	5/15 Summer				98.822	0.768	0.000	2.39			319.4
9.004	DN04-08	15 Winter	100	+30%					97.741	-1.093	0.000	0.02			332.1
9.005	DN04-09	15 Winter	100	+30%					96.978	-0.320	0.000	0.18			345.5
9.006	DN04-10	30 Winter	100	+30%					96.269	-0.298	0.000	0.21			351.2
9.007	DN04-11	30 Winter	100	+30%					96.025	-0.370	0.000	0.31			351.6
9.008	MH04-29	30 Winter	100	+30%					94.159	-0.335	0.000	0.40			358.8
1.016	PI04-01	360 Winter	100	+30%	30/180 Winter				93.820	0.237	0.000	0.47			144.8
1.017	PO04-01	180 Winter	100	+30%	5/120 Summer				93.878	0.520	0.000	0.77			143.7
1.018	MH04-30	480 Winter	100	+30%	100/120 Winter				93.287	0.062	0.000	1.19			137.8

PN	US/MH Name	Status	Level Exceeded
12.002	CP04-04	FLOOD	11
12.003	MH04-26	SURCHARGED	
10.002	MH04-27	SURCHARGED	
9.003	MH04-28	SURCHARGED	
9.004	DN04-08	OK	
9.005	DN04-09	OK	
9.006	DN04-10	FLOOD RISK*	
9.007	DN04-11	OK*	
9.008	MH04-29	OK	
1.016	PI04-01	SURCHARGED	
1.017	PO04-01	FLOOD RISK	
1.018	MH04-30	FLOOD RISK	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Catchment - 05

Pipe Sizes M60 Pipe Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	20
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Proposed Catchment - 05

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.358 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 1
Climate Change (%) 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	MH05-01	15 Winter	1	+30%					99.593	-0.107	0.000	0.18			6.0	OK	
S1.001	MH05-02	15 Winter	1	+30%					98.517	-0.093	0.000	0.30			8.7	OK	
S2.000	MH05-03	15 Winter	1	+30%					98.862	-0.108	0.000	0.17			6.1	OK	
S1.002	MH05-04	15 Winter	1	+30%					97.789	-0.108	0.000	0.53			38.6	OK	
S1.003	MH05-05	15 Winter	1	+30%					96.388	-0.262	0.000	0.20			38.7	OK	
S1.004	MH05-06	15 Winter	1	+30%					96.155	-0.245	0.000	0.26			59.5	OK	
S3.000	CP05-01	15 Winter	1	+30%					99.410	-0.206	0.000	0.21			25.9	OK	
S3.001	CP05-02	15 Winter	1	+30%					98.715	-0.219	0.000	0.16			25.9	OK	
S3.002	MH05-07	15 Winter	1	+30%					95.561	-0.239	0.000	0.28			33.4	OK	
S4.000	MH05-08	15 Winter	1	+30%					100.826	-0.221	0.000	0.34			57.2	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S4.001	MH05-09	15 Winter	1	+30%					100.243	-0.220	0.000	0.35			57.0	OK	
S5.000	CP05-03	15 Winter	1	+30%					105.222	-0.128	0.000	0.05			1.8	OK	
S4.002	MH05-10	15 Winter	1	+30%					99.616	-0.262	0.000	0.19			57.2	OK	
S6.000	DN05-01	15 Winter	1	+30%					99.810	-0.186	0.000	0.31			42.9	OK	
S4.003	MH05-11	15 Winter	1	+30%					96.644	-0.247	0.000	0.26			100.0	OK	
S1.005	MH05-12	15 Winter	1	+30%					95.157	-0.433	0.000	0.28			191.5	OK	
S1.006	MH05-13	15 Winter	1	+30%					94.918	-0.374	0.000	0.41			192.5	OK	
S1.007	MH05-14	15 Winter	1	+30%					94.784	-0.396	0.000	0.35			205.8	OK	
S1.008	MH05-15	15 Winter	1	+30%					94.531	-0.348	0.000	0.46			226.1	OK	
S1.009	MH05-16	15 Winter	1	+30%					94.248	-0.324	0.000	0.52			236.7	OK	
S1.010	MH05-17	15 Winter	1	+30%					94.029	-0.304	0.000	0.57			239.5	OK	
S1.011	MH05-18	30 Winter	1	+30%					93.858	-0.277	0.000	0.61			226.5	OK	
S1.012	MH05-19	30 Winter	1	+30%					93.721	-0.287	0.000	0.61			228.1	OK	
S1.013	MH05-20	30 Winter	1	+30%					93.571	-0.301	0.000	0.58			228.8	OK	
S7.000	CP05-04	15 Winter	1	+30%					100.102	-0.181	0.000	0.09			3.5	OK	
S7.001	MH05-21	15 Winter	1	+30%					99.431	-0.180	0.000	0.09			3.4	OK	
S7.002	CP05-05	15 Winter	1	+30%					98.813	-0.165	0.000	0.15			5.2	OK	
S7.003	CP05-06	15 Winter	1	+30%					98.393	-0.139	0.000	0.29			14.2	OK	
S7.004	CP05-07	15 Winter	1	+30%					97.475	-0.162	0.000	0.17			17.2	OK	
S8.000	CP05-08	15 Winter	1	+30%					97.566	-0.085	0.000	0.38			5.1	OK	
S8.001	CP05-09	15 Winter	1	+30%					96.803	-0.094	0.000	0.30			8.2	OK	
S7.005	MH05-22	30 Winter	1	+30%					93.311	-0.521	0.000	0.03			23.3	OK	
S9.000	MH05-23	15 Winter	1	+30%					98.540	-0.185	0.000	0.29			41.3	OK	
S9.001	MH05-24	15 Winter	1	+30%					96.415	-0.143	0.000	0.54			69.8	OK	
S7.006	MH05-25	30 Winter	1	+30%					93.310	-0.450	0.000	0.11			75.2	OK	
S1.014	MH05-26	30 Winter	1	+30%					93.291	-0.404	0.000	0.38			257.2	OK	
S10.000	MH05-27	15 Summer	1	+30%					100.331	-0.150	0.000	0.00			0.0	OK	
S10.001	MH05-28	15 Winter	1	+30%					98.003	-0.080	0.000	0.40			8.4	OK	
S10.002	MH05-29	15 Winter	1	+30%					96.138	-0.056	0.000	0.71			16.1	OK	
S1.015	MH05-30	30 Winter	1	+30%					93.241	-0.381	0.000	0.70			261.3	OK	
S11.000	CP05-10	15 Winter	1	+30%					95.643	-0.115	0.000	0.12			1.9	OK	
S11.001	MH05-31	15 Winter	1	+30%					93.467	-0.190	0.000	0.06			1.9	OK	
S12.000	MH05-32	60 Winter	1	+30%					93.004	-0.756	0.000	0.03			18.5	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S13.000	CP05-11	15 Winter	1	+30%					104.461	-0.089	0.000	0.35			8.3	OK	
S14.000	MH05-33	15 Winter	1	+30%					97.053	-0.102	0.000	0.55			11.9	OK	
S14.001	MH05-34	15 Winter	1	+30%					96.996	-0.080	0.000	0.66			15.0	OK	
S14.002	MH05-35	15 Winter	1	+30%					96.632	-0.092	0.000	0.57			12.9	OK	
S13.001	MH05-36	15 Winter	1	+30%					96.412	-0.097	0.000	0.56			23.2	OK	
S13.002	MH05-37	30 Winter	1	+30%					95.533	-0.092	0.000	0.63			27.4	OK	
S13.003	MH05-38	30 Winter	1	+30%					94.515	-0.098	0.000	0.61			27.7	OK	
S12.001	MH05-39	30 Winter	1	+30%					93.162	-0.519	0.000	0.03			18.9	OK	
S1.016	MH05-40	30 Winter	1	+30%					93.206	-0.020	0.000	0.78			181.0	OK	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Catchment - 05

Pipe Sizes M60 Pipe Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	20
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Proposed Catchment - 05

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	MH05-01	15 Winter	5	+30%	100/15 Summer				99.606	-0.094	0.000	0.30			9.9	OK
S1.001	MH05-02	15 Winter	5	+30%	30/15 Summer				98.536	-0.074	0.000	0.50			14.4	OK
S2.000	MH05-03	15 Winter	5	+30%	30/15 Summer				98.874	-0.096	0.000	0.28			10.1	OK
S1.002	MH05-04	15 Winter	5	+30%	30/15 Summer	100/15 Winter			97.835	-0.062	0.000	0.86			63.3	OK
S1.003	MH05-05	15 Winter	5	+30%	100/15 Summer				96.422	-0.228	0.000	0.32			63.5	OK
S1.004	MH05-06	15 Winter	5	+30%	100/15 Summer				96.197	-0.203	0.000	0.43			97.9	OK
S3.000	CP05-01	15 Winter	5	+30%					99.439	-0.177	0.000	0.35			42.6	OK
S3.001	CP05-02	15 Winter	5	+30%					98.740	-0.194	0.000	0.27			42.5	OK
S3.002	MH05-07	15 Winter	5	+30%	30/30 Winter				95.606	-0.194	0.000	0.47			54.9	OK

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Level Exceeded
S1.000	MH05-01	
S1.001	MH05-02	
S2.000	MH05-03	
S1.002	MH05-04	1
S1.003	MH05-05	
S1.004	MH05-06	
S3.000	CP05-01	
S3.001	CP05-02	
S3.002	MH05-07	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S4.000	MH05-08	15 Winter	5	+30%	100/15 Summer				100.877	-0.170	0.000	0.56			94.0
S4.001	MH05-09	15 Winter	5	+30%	100/15 Summer				100.296	-0.167	0.000	0.57			93.7
S5.000	CP05-03	15 Winter	5	+30%					105.229	-0.121	0.000	0.08			3.0
S4.002	MH05-10	15 Winter	5	+30%					99.650	-0.228	0.000	0.32			94.0
S6.000	DN05-01	15 Winter	5	+30%	100/15 Winter				99.847	-0.149	0.000	0.51			70.5
S4.003	MH05-11	15 Winter	5	+30%	100/15 Summer	100/30 Winter			96.686	-0.205	0.000	0.42			164.3
S1.005	MH05-12	15 Winter	5	+30%	30/15 Winter				95.236	-0.354	0.000	0.45			314.5
S1.006	MH05-13	15 Winter	5	+30%	30/15 Winter				95.026	-0.266	0.000	0.68			316.3
S1.007	MH05-14	15 Winter	5	+30%	30/15 Winter				94.878	-0.302	0.000	0.58			337.7
S1.008	MH05-15	15 Winter	5	+30%	30/15 Summer				94.653	-0.226	0.000	0.75			371.2
S1.009	MH05-16	15 Winter	5	+30%	30/15 Summer				94.385	-0.187	0.000	0.85			385.1
S1.010	MH05-17	15 Winter	5	+30%	30/15 Summer				94.176	-0.157	0.000	0.91			386.0
S1.011	MH05-18	15 Winter	5	+30%	30/15 Summer				94.029	-0.106	0.000	0.99			365.5
S1.012	MH05-19	30 Winter	5	+30%	30/15 Summer				93.879	-0.129	0.000	0.98			365.3
S1.013	MH05-20	30 Winter	5	+30%	30/15 Summer				93.746	-0.126	0.000	0.92			358.4
S7.000	CP05-04	15 Winter	5	+30%					100.114	-0.169	0.000	0.14			5.7
S7.001	MH05-21	15 Winter	5	+30%					99.443	-0.168	0.000	0.14			5.6
S7.002	CP05-05	15 Winter	5	+30%					98.832	-0.146	0.000	0.25			8.6
S7.003	CP05-06	15 Winter	5	+30%	100/15 Summer				98.421	-0.111	0.000	0.49			23.4
S7.004	CP05-07	15 Winter	5	+30%					97.494	-0.143	0.000	0.29			28.4
S8.000	CP05-08	15 Winter	5	+30%	30/15 Winter				97.589	-0.062	0.000	0.62			8.4
S8.001	CP05-09	15 Winter	5	+30%	100/15 Summer				96.822	-0.075	0.000	0.49			13.5
S7.005	MH05-22	30 Winter	5	+30%	30/15 Winter				93.682	-0.150	0.000	0.05			38.0
S9.000	MH05-23	15 Winter	5	+30%	30/15 Summer				98.578	-0.147	0.000	0.48			67.9
S9.001	MH05-24	15 Winter	5	+30%	30/15 Summer				96.477	-0.081	0.000	0.88			114.7
S7.006	MH05-25	30 Winter	5	+30%	30/15 Winter				93.677	-0.083	0.000	0.18			122.8
S1.014	MH05-26	30 Winter	5	+30%	30/15 Summer				93.609	-0.086	0.000	0.57			387.4
S10.000	MH05-27	15 Summer	5	+30%					100.331	-0.150	0.000	0.00			0.0
S10.001	MH05-28	15 Winter	5	+30%	30/15 Summer				98.029	-0.054	0.000	0.65			13.7
S10.002	MH05-29	15 Winter	5	+30%	5/15 Summer				96.336	0.142	0.000	1.03			23.5
S1.015	MH05-30	30 Winter	5	+30%	30/15 Summer				93.532	-0.090	0.000	1.05			393.2
S11.000	CP05-10	15 Winter	5	+30%					95.653	-0.105	0.000	0.20			3.1
S11.001	MH05-31	30 Winter	5	+30%	30/15 Summer				93.510	-0.147	0.000	0.09			3.0

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S4.000	MH05-08	OK	
S4.001	MH05-09	OK	
S5.000	CP05-03	OK	
S4.002	MH05-10	OK	
S6.000	DN05-01	OK	
S4.003	MH05-11	OK	1
S1.005	MH05-12	OK	
S1.006	MH05-13	OK	
S1.007	MH05-14	OK	
S1.008	MH05-15	OK	
S1.009	MH05-16	OK	
S1.010	MH05-17	OK	
S1.011	MH05-18	OK	
S1.012	MH05-19	OK	
S1.013	MH05-20	OK	
S7.000	CP05-04	OK	
S7.001	MH05-21	OK	
S7.002	CP05-05	OK	
S7.003	CP05-06	OK	
S7.004	CP05-07	OK	
S8.000	CP05-08	OK	
S8.001	CP05-09	OK	
S7.005	MH05-22	OK	
S9.000	MH05-23	OK	
S9.001	MH05-24	OK	
S7.006	MH05-25	OK	
S1.014	MH05-26	OK	
S10.000	MH05-27	OK	
S10.001	MH05-28	OK	
S10.002	MH05-29	SURCHARGED	
S1.015	MH05-30	OK	
S11.000	CP05-10	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S11.001	MH05-31	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S12.000	MH05-32	60 Winter	5	+30%					93.210	-0.550	0.000	0.13			78.8
S13.000	CP05-11	15 Winter	5	+30%	100/15 Summer				104.482	-0.068	0.000	0.58			13.6
S14.000	MH05-33	15 Winter	5	+30%	5/15 Winter	100/15 Summer			97.159	0.004	0.000	0.85			18.4
S14.001	MH05-34	15 Winter	5	+30%	5/15 Summer				97.113	0.037	0.000	0.98			22.1
S14.002	MH05-35	15 Winter	5	+30%	30/15 Summer				96.676	-0.048	0.000	0.89			20.1
S13.001	MH05-36	30 Winter	5	+30%	30/15 Summer				96.459	-0.050	0.000	0.92			37.9
S13.002	MH05-37	30 Winter	5	+30%	5/30 Winter				95.626	0.001	0.000	1.00			43.6
S13.003	MH05-38	30 Winter	5	+30%	30/15 Summer				94.563	-0.050	0.000	0.97			43.8
S12.001	MH05-39	30 Winter	5	+30%	30/15 Winter				93.319	-0.362	0.000	0.12			78.2
S1.016	MH05-40	30 Winter	5	+30%	5/15 Summer				93.509	0.283	0.000	0.84			195.2

PN	US/MH Name	Status	Level Exceeded
S12.000	MH05-32	OK	
S13.000	CP05-11	OK	
S14.000	MH05-33	SURCHARGED	6
S14.001	MH05-34	SURCHARGED	
S14.002	MH05-35	OK	
S13.001	MH05-36	OK	
S13.002	MH05-37	SURCHARGED	
S13.003	MH05-38	OK	
S12.001	MH05-39	OK	
S1.016	MH05-40	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	MH05-01	15 Winter	30	+30%	100/15 Summer				99.626	-0.074	0.000	0.50			16.7	OK
S1.001	MH05-02	15 Winter	30	+30%	30/15 Summer				99.341	0.731	0.000	0.83			23.8	SURCHARGED
S2.000	MH05-03	15 Winter	30	+30%	30/15 Summer				99.118	0.148	0.000	0.44			15.8	SURCHARGED
S1.002	MH05-04	15 Winter	30	+30%	30/15 Summer	100/15 Winter			98.943	1.046	0.000	1.34			98.6	SURCHARGED
S1.003	MH05-05	15 Winter	30	+30%	100/15 Summer				96.464	-0.186	0.000	0.50			98.8	OK
S1.004	MH05-06	15 Winter	30	+30%	100/15 Summer				96.267	-0.133	0.000	0.72			164.3	OK
S3.000	CP05-01	15 Winter	30	+30%					99.483	-0.133	0.000	0.59			71.7	OK
S3.001	CP05-02	15 Winter	30	+30%					98.776	-0.158	0.000	0.45			71.7	OK
S3.002	MH05-07	30 Winter	30	+30%	30/30 Winter				96.155	0.355	0.000	0.74			87.5	SURCHARGED

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Level Exceeded
S1.000	MH05-01	
S1.001	MH05-02	
S2.000	MH05-03	
S1.002	MH05-04	1
S1.003	MH05-05	
S1.004	MH05-06	
S3.000	CP05-01	
S3.001	CP05-02	
S3.002	MH05-07	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S4.000	MH05-08	15 Winter	30	+30%	100/15 Summer				100.967	-0.080	0.000	0.94			158.5
S4.001	MH05-09	15 Winter	30	+30%	100/15 Summer				100.393	-0.070	0.000	0.97			158.2
S5.000	CP05-03	15 Winter	30	+30%					105.237	-0.113	0.000	0.14			5.0
S4.002	MH05-10	15 Winter	30	+30%					99.702	-0.176	0.000	0.54			158.9
S6.000	DN05-01	15 Winter	30	+30%	100/15 Winter				99.910	-0.086	0.000	0.86			118.7
S4.003	MH05-11	15 Winter	30	+30%	100/15 Summer	100/30 Winter			96.751	-0.140	0.000	0.71			277.3
S1.005	MH05-12	30 Winter	30	+30%	30/15 Winter				96.058	0.468	0.000	0.67			466.5
S1.006	MH05-13	30 Winter	30	+30%	30/15 Winter				95.893	0.601	0.000	0.95			443.3
S1.007	MH05-14	30 Winter	30	+30%	30/15 Winter				95.854	0.674	0.000	0.82			475.1
S1.008	MH05-15	30 Winter	30	+30%	30/15 Summer				95.695	0.816	0.000	1.00			495.3
S1.009	MH05-16	30 Winter	30	+30%	30/15 Summer				95.419	0.847	0.000	1.12			510.0
S1.010	MH05-17	30 Winter	30	+30%	30/15 Summer				95.152	0.819	0.000	1.25			528.0
S1.011	MH05-18	30 Winter	30	+30%	30/15 Summer				94.857	0.722	0.000	1.40			515.4
S1.012	MH05-19	30 Winter	30	+30%	30/15 Summer				94.605	0.597	0.000	1.42			527.3
S1.013	MH05-20	30 Winter	30	+30%	30/15 Summer				94.323	0.451	0.000	1.36			534.4
S7.000	CP05-04	15 Winter	30	+30%					100.132	-0.151	0.000	0.24			9.6
S7.001	MH05-21	15 Winter	30	+30%					99.461	-0.150	0.000	0.24			9.4
S7.002	CP05-05	15 Winter	30	+30%					98.861	-0.117	0.000	0.43			14.4
S7.003	CP05-06	15 Winter	30	+30%	100/15 Summer				98.503	-0.029	0.000	0.96			46.1
S7.004	CP05-07	15 Winter	30	+30%					97.534	-0.103	0.000	0.56			56.0
S8.000	CP05-08	15 Winter	30	+30%	30/15 Winter				97.723	0.072	0.000	1.02			13.9
S8.001	CP05-09	15 Winter	30	+30%	100/15 Summer				96.857	-0.040	0.000	0.85			23.6
S7.005	MH05-22	30 Winter	30	+30%	30/15 Winter				94.031	0.199	0.000	0.08			69.2
S9.000	MH05-23	15 Winter	30	+30%	30/15 Summer				98.923	0.198	0.000	0.77			107.4
S9.001	MH05-24	15 Winter	30	+30%	30/15 Summer				97.698	1.140	0.000	1.34			174.3
S7.006	MH05-25	30 Winter	30	+30%	30/15 Winter				94.027	0.267	0.000	0.33			219.2
S1.014	MH05-26	30 Winter	30	+30%	30/15 Summer				94.011	0.316	0.000	0.99			677.7
S10.000	MH05-27	15 Summer	30	+30%					100.331	-0.150	0.000	0.00			0.0
S10.001	MH05-28	15 Winter	30	+30%	30/15 Summer				98.912	0.829	0.000	0.85			17.9
S10.002	MH05-29	15 Winter	30	+30%	5/15 Summer				97.658	1.464	0.000	1.30			29.6
S1.015	MH05-30	30 Winter	30	+30%	30/15 Summer				93.947	0.325	0.000	1.89			708.9
S11.000	CP05-10	15 Winter	30	+30%					95.668	-0.090	0.000	0.34			5.3
S11.001	MH05-31	30 Winter	30	+30%	30/15 Summer				93.912	0.255	0.000	0.16			5.3

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S4.000	MH05-08	OK	
S4.001	MH05-09	OK	
S5.000	CP05-03	OK	
S4.002	MH05-10	OK	
S6.000	DN05-01	OK	
S4.003	MH05-11	OK	1
S1.005	MH05-12	SURCHARGED	
S1.006	MH05-13	SURCHARGED	
S1.007	MH05-14	SURCHARGED	
S1.008	MH05-15	SURCHARGED	
S1.009	MH05-16	SURCHARGED	
S1.010	MH05-17	SURCHARGED	
S1.011	MH05-18	SURCHARGED	
S1.012	MH05-19	SURCHARGED	
S1.013	MH05-20	SURCHARGED	
S7.000	CP05-04	OK	
S7.001	MH05-21	OK	
S7.002	CP05-05	OK	
S7.003	CP05-06	OK	
S7.004	CP05-07	OK	
S8.000	CP05-08	SURCHARGED	
S8.001	CP05-09	OK	
S7.005	MH05-22	SURCHARGED	
S9.000	MH05-23	SURCHARGED	
S9.001	MH05-24	SURCHARGED	
S7.006	MH05-25	SURCHARGED	
S1.014	MH05-26	SURCHARGED	
S10.000	MH05-27	OK	
S10.001	MH05-28	SURCHARGED	
S10.002	MH05-29	SURCHARGED	
S1.015	MH05-30	SURCHARGED	
S11.000	CP05-10	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S11.001	MH05-31	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S12.000	MH05-32	60 Winter	30	+30%					93.485	-0.275	0.000	0.16			94.5
S13.000	CP05-11	15 Winter	30	+30%	100/15 Summer				104.518	-0.032	0.000	0.98			22.9
S14.000	MH05-33	15 Winter	30	+30%	5/15 Winter	100/15 Summer			97.834	0.679	0.000	1.28			27.7
S14.001	MH05-34	15 Winter	30	+30%	5/15 Summer				97.699	0.623	0.000	1.53			34.7
S14.002	MH05-35	30 Winter	30	+30%	30/15 Summer				97.436	0.712	0.000	1.10			24.8
S13.001	MH05-36	30 Winter	30	+30%	30/15 Summer				97.228	0.719	0.000	1.11			45.8
S13.002	MH05-37	30 Winter	30	+30%	5/30 Winter				96.099	0.474	0.000	1.19			51.9
S13.003	MH05-38	30 Winter	30	+30%	30/15 Summer				94.642	0.029	0.000	1.16			52.4
S12.001	MH05-39	30 Winter	30	+30%	30/15 Winter				93.824	0.143	0.000	0.11			71.4
S1.016	MH05-40	30 Winter	30	+30%	5/15 Summer				93.908	0.682	0.000	1.40			324.0

PN	US/MH Name	Status	Level Exceeded
S12.000	MH05-32	OK	
S13.000	CP05-11	OK	
S14.000	MH05-33	SURCHARGED	6
S14.001	MH05-34	SURCHARGED	
S14.002	MH05-35	SURCHARGED	
S13.001	MH05-36	SURCHARGED	
S13.002	MH05-37	SURCHARGED	
S13.003	MH05-38	SURCHARGED	
S12.001	MH05-39	SURCHARGED	
S1.016	MH05-40	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S1.000	MH05-01	15 Winter	100	+30%	100/15 Summer				100.396	0.696	0.000	0.59			19.5
S1.001	MH05-02	15 Winter	100	+30%	30/15 Summer				100.155	1.545	0.000	0.95			27.2
S2.000	MH05-03	15 Winter	100	+30%	30/15 Summer				100.082	1.112	0.000	0.58			20.5
S1.002	MH05-04	15 Winter	100	+30%	30/15 Summer	100/15 Winter			99.776	1.879	0.216	1.57			115.4
S1.003	MH05-05	30 Winter	100	+30%	100/15 Summer				97.880	1.230	0.000	0.52			101.8
S1.004	MH05-06	30 Winter	100	+30%	100/15 Summer				97.730	1.330	0.000	0.76			173.9
S3.000	CP05-01	15 Winter	100	+30%					99.518	-0.098	0.000	0.79			95.4
S3.001	CP05-02	15 Winter	100	+30%					98.803	-0.131	0.000	0.60			95.3
S3.002	MH05-07	30 Winter	100	+30%	30/30 Winter				97.684	1.884	0.000	0.86			101.4

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S1.000	MH05-01	FLOOD RISK	
S1.001	MH05-02	FLOOD RISK	
S2.000	MH05-03	SURCHARGED	
S1.002	MH05-04	FLOOD	1
S1.003	MH05-05	FLOOD RISK	
S1.004	MH05-06	FLOOD RISK	
S3.000	CP05-01	OK	
S3.001	CP05-02	OK	
S3.002	MH05-07	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S4.000	MH05-08	15 Winter	100	+30%	100/15 Summer				101.423	0.376	0.000	1.16			196.5
S4.001	MH05-09	15 Winter	100	+30%	100/15 Summer				100.662	0.199	0.000	1.15			187.1
S5.000	CP05-03	15 Winter	100	+30%					105.244	-0.106	0.000	0.19			6.7
S4.002	MH05-10	15 Winter	100	+30%					99.726	-0.152	0.000	0.65			192.1
S6.000	DN05-01	30 Winter	100	+30%	100/15 Winter				100.482	0.486	0.000	1.01			139.9
S4.003	MH05-11	30 Winter	100	+30%	100/15 Summer	100/30 Winter			98.051	1.160	6.656	0.76			294.0
S1.005	MH05-12	30 Winter	100	+30%	30/15 Winter				97.547	1.957	0.000	0.70			483.2
S1.006	MH05-13	30 Winter	100	+30%	30/15 Winter				97.374	2.082	0.000	1.03			481.4
S1.007	MH05-14	30 Winter	100	+30%	30/15 Winter				97.239	2.059	0.000	0.86			503.6
S1.008	MH05-15	30 Winter	100	+30%	30/15 Summer				97.015	2.136	0.000	1.14			561.7
S1.009	MH05-16	30 Winter	100	+30%	30/15 Summer				96.633	2.061	0.000	1.35			614.1
S1.010	MH05-17	30 Winter	100	+30%	30/15 Summer				96.211	1.878	0.000	1.58			665.9
S1.011	MH05-18	30 Winter	100	+30%	30/15 Summer				95.761	1.626	0.000	1.78			655.3
S1.012	MH05-19	30 Winter	100	+30%	30/15 Summer				95.373	1.365	0.000	1.82			677.7
S1.013	MH05-20	30 Winter	100	+30%	30/15 Summer				94.919	1.047	0.000	1.77			693.8
S7.000	CP05-04	15 Winter	100	+30%					100.145	-0.138	0.000	0.31			12.8
S7.001	MH05-21	15 Winter	100	+30%					99.474	-0.137	0.000	0.32			12.5
S7.002	CP05-05	15 Winter	100	+30%					98.896	-0.082	0.000	0.56			19.1
S7.003	CP05-06	15 Winter	100	+30%	100/15 Summer				98.764	0.232	0.000	1.10			53.1
S7.004	CP05-07	15 Winter	100	+30%					97.546	-0.091	0.000	0.65			64.4
S8.000	CP05-08	15 Winter	100	+30%	30/15 Winter				98.201	0.550	0.000	1.27			17.3
S8.001	CP05-09	15 Winter	100	+30%	100/15 Summer				96.955	0.058	0.000	1.01			27.8
S7.005	MH05-22	30 Winter	100	+30%	30/15 Winter				94.374	0.542	0.000	0.10			86.4
S9.000	MH05-23	15 Winter	100	+30%	30/15 Summer				100.499	1.774	0.000	0.88			124.1
S9.001	MH05-24	15 Winter	100	+30%	30/15 Summer				98.759	2.201	0.000	1.60			207.9
S7.006	MH05-25	30 Winter	100	+30%	30/15 Winter				94.369	0.609	0.000	0.42			280.3
S1.014	MH05-26	30 Winter	100	+30%	30/15 Summer				94.350	0.655	0.000	1.40			954.3
S10.000	MH05-27	15 Summer	100	+30%					100.331	-0.150	0.000	0.00			0.0
S10.001	MH05-28	15 Winter	100	+30%	30/15 Summer				99.916	1.833	0.000	0.86			18.1
S10.002	MH05-29	15 Winter	100	+30%	5/15 Summer				98.711	2.517	0.000	1.47			33.5
S1.015	MH05-30	30 Winter	100	+30%	30/15 Summer				94.206	0.584	0.000	2.64			988.8
S11.000	CP05-10	15 Winter	100	+30%					95.678	-0.080	0.000	0.45			7.0
S11.001	MH05-31	30 Winter	100	+30%	30/15 Summer				94.055	0.398	0.000	0.25			8.2

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S4.000	MH05-08	SURCHARGED	
S4.001	MH05-09	SURCHARGED	
S5.000	CP05-03	OK	
S4.002	MH05-10	OK	
S6.000	DN05-01	FLOOD RISK	
S4.003	MH05-11	FLOOD	1
S1.005	MH05-12	SURCHARGED	
S1.006	MH05-13	SURCHARGED	
S1.007	MH05-14	SURCHARGED	
S1.008	MH05-15	SURCHARGED	
S1.009	MH05-16	SURCHARGED	
S1.010	MH05-17	SURCHARGED	
S1.011	MH05-18	SURCHARGED	
S1.012	MH05-19	SURCHARGED	
S1.013	MH05-20	SURCHARGED	
S7.000	CP05-04	OK	
S7.001	MH05-21	OK	
S7.002	CP05-05	OK	
S7.003	CP05-06	SURCHARGED	
S7.004	CP05-07	OK	
S8.000	CP05-08	SURCHARGED	
S8.001	CP05-09	SURCHARGED	
S7.005	MH05-22	FLOOD RISK	
S9.000	MH05-23	SURCHARGED	
S9.001	MH05-24	SURCHARGED	
S7.006	MH05-25	SURCHARGED	
S1.014	MH05-26	SURCHARGED	
S10.000	MH05-27	OK	
S10.001	MH05-28	SURCHARGED	
S10.002	MH05-29	SURCHARGED	
S1.015	MH05-30	SURCHARGED	
S11.000	CP05-10	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Status	Level Exceeded
S11.001	MH05-31	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 05

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S12.000	MH05-32	60 Winter	100	+30%					93.758	-0.002	0.000	0.16			94.4
S13.000	CP05-11	15 Winter	100	+30%	100/15 Summer				105.386	0.836	0.000	1.06			24.9
S14.000	MH05-33	30 Winter	100	+30%	5/15 Winter	100/15 Summer			98.280	1.125	10.598	1.51			32.7
S14.001	MH05-34	30 Winter	100	+30%	5/15 Summer				98.378	1.302	0.000	1.52			34.4
S14.002	MH05-35	30 Winter	100	+30%	30/15 Summer				98.402	1.678	0.000	1.34			30.2
S13.001	MH05-36	30 Winter	100	+30%	30/15 Summer				98.312	1.803	0.000	1.24			51.1
S13.002	MH05-37	30 Winter	100	+30%	5/30 Winter				96.899	1.274	0.000	1.43			62.7
S13.003	MH05-38	60 Winter	100	+30%	30/15 Summer				94.718	0.105	0.000	1.41			63.8
S12.001	MH05-39	30 Winter	100	+30%	30/15 Winter				93.935	0.254	0.000	0.06			40.1
S1.016	MH05-40	30 Winter	100	+30%	5/15 Summer				94.050	0.824	0.000	1.68			389.9

PN	US/MH Name	Status	Level Exceeded
S12.000	MH05-32	OK	
S13.000	CP05-11	FLOOD RISK	
S14.000	MH05-33	FLOOD	6
S14.001	MH05-34	SURCHARGED	
S14.002	MH05-35	SURCHARGED	
S13.001	MH05-36	SURCHARGED	
S13.002	MH05-37	SURCHARGED	
S13.003	MH05-38	SURCHARGED	
S12.001	MH05-39	SURCHARGED	
S1.016	MH05-40	SURCHARGED	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Catchment - 06

Pipe Sizes STANDARD Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	10	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	30
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Proposed Catchment - 06

Volumetric Runoff Coeff	0.840	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	120
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	2

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 3	Number of Storage Structures 0	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	60

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.314 Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1
Climate Change (%)	30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	MH06-01	15 Winter	1	+30%					99.495	-0.216	0.000	0.17			13.0	OK	
1.001	MH06-02	15 Winter	1	+30%					99.286	-0.258	0.000	0.21			23.8	OK	
2.000	MH06-03	15 Winter	1	+30%					100.555	-0.215	0.000	0.01			0.4	OK	
2.001	MH06-04	15 Winter	1	+30%					100.077	-0.295	0.000	0.00			0.4	OK	
1.002	MH06-05	15 Winter	1	+30%					99.200	-0.227	0.000	0.32			32.6	OK	
1.003	MH06-06	15 Winter	1	+30%					99.065	-0.200	0.000	0.44			42.4	OK	
3.000	MH06-07	15 Winter	1	+30%					99.720	-0.173	0.000	0.12			5.9	OK	
1.004	MH06-08	15 Winter	1	+30%					98.888	-0.297	0.000	0.24			45.4	OK	
1.005	MH06-09	15 Winter	1	+30%					98.655	-0.259	0.000	0.37			64.3	OK	
1.006	MH06-10	15 Winter	1	+30%					98.541	-0.260	0.000	0.36			69.1	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.007	MH06-11	15 Winter	1	+30%					98.220	-0.239	0.000	0.44			85.8	OK
1.008	MH06-12	30 Winter	1	+30%					97.875	-0.212	0.000	0.54			103.0	OK
1.009	MH06-13	30 Winter	1	+30%					97.729	-0.202	0.000	0.58			112.6	OK
1.010	MH06-14	30 Winter	1	+30%					97.561	-0.196	0.000	0.61			112.3	OK
4.000	MH06-15	15 Winter	1	+30%					99.177	-0.386	0.000	0.05			11.0	OK
4.001	MH06-16	15 Winter	1	+30%					98.775	-0.274	0.000	0.29			39.8	OK
4.002	MH06-17	15 Winter	1	+30%					98.602	-0.269	0.000	0.34			68.5	OK
4.003	MH06-18	15 Winter	1	+30%					98.401	-0.274	0.000	0.32			79.5	OK
4.004	MH06-19	15 Winter	1	+30%					97.936	-0.220	0.000	0.50			98.9	OK
4.005	MH06-20	15 Winter	1	+30%					97.648	-0.190	0.000	0.63			115.4	OK
4.006	MH06-21	15 Winter	1	+30%					97.471	-0.212	0.000	0.66			122.0	OK
5.000	ATSD8105_8832A	15 Winter	1	+30%					98.759	-0.174	0.000	0.35			32.7	OK
5.001	ATSD8105_8538A	15 Winter	1	+30%					98.227	-0.219	0.000	0.16			32.8	OK
5.002	MH06-22	15 Winter	1	+30%					97.621	-0.173	0.000	0.38			32.6	OK
1.011	MH06-23	30 Winter	1	+30%					97.066	-0.549	0.000	0.31			245.6	OK
1.012	MH06-24	30 Winter	1	+30%					96.879	-0.558	0.000	0.31			239.8	OK
1.013	MH06-25	30 Winter	1	+30%					96.656	-0.603	0.000	0.24			236.5	OK
1.014	MH06-26	30 Winter	1	+30%					96.429	-0.543	0.000	0.33			234.7	OK
1.015	DN06-01	30 Winter	1	+30%					96.279	-0.653	0.000	0.17			233.6	OK*
1.016	DN06-02	30 Winter	1	+30%					95.956	-0.599	0.000	0.24			234.0	OK*
1.017	MH06-27	30 Winter	1	+30%					95.887	-0.637	0.000	0.19			232.7	OK
1.018	MH06-28	30 Winter	1	+30%					95.542	-0.537	0.000	0.34			231.7	OK
1.019	DN06-03	30 Winter	1	+30%					95.414	-0.629	0.000	0.20			231.8	OK*
1.020	DN06-04	30 Winter	1	+30%					95.181	-0.592	0.000	0.24			232.7	OK*
6.000	MH06-29	15 Winter	1	+30%					96.897	-0.712	0.000	0.01			6.5	OK
6.001	MH06-30	15 Winter	1	+30%					96.738	-0.653	0.000	0.04			24.6	OK
6.002	MH06-31	15 Winter	1	+30%					96.552	-0.617	0.000	0.07			44.1	OK
6.003	MH06-32	15 Winter	1	+30%					96.383	-0.585	0.000	0.11			61.0	OK
7.000	MH06-33	15 Winter	1	+30%					99.788	-0.195	0.000	0.04			1.6	OK
7.001	MH06-34	15 Winter	1	+30%					99.644	-0.195	0.000	0.04			1.6	OK
7.002	MH06-35	15 Winter	1	+30%					99.511	-0.169	0.000	0.13			5.1	OK
7.003	MH06-36	15 Winter	1	+30%					98.833	-0.181	0.000	0.08			6.6	OK
7.004	MH06-37	15 Winter	1	+30%					96.757	-0.242	0.000	0.09			6.6	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Level Exceeded
1.007	MH06-11	
1.008	MH06-12	
1.009	MH06-13	
1.010	MH06-14	
4.000	MH06-15	
4.001	MH06-16	
4.002	MH06-17	
4.003	MH06-18	
4.004	MH06-19	
4.005	MH06-20	
4.006	MH06-21	
5.000	ATSD8105_8832A	
5.001	ATSD8105_8538A	
5.002	MH06-22	
1.011	MH06-23	
1.012	MH06-24	
1.013	MH06-25	
1.014	MH06-26	
1.015	DN06-01	
1.016	DN06-02	
1.017	MH06-27	
1.018	MH06-28	
1.019	DN06-03	
1.020	DN06-04	
6.000	MH06-29	
6.001	MH06-30	
6.002	MH06-31	
6.003	MH06-32	
7.000	MH06-33	
7.001	MH06-34	
7.002	MH06-35	
7.003	MH06-36	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Level Exceeded
7.004	MH06-37	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
7.005	MH06-38	15 Winter	1	+30%					96.595	-0.232	0.000	0.12			6.6
6.004	MH06-39	15 Winter	1	+30%					96.246	-0.534	0.000	0.15			74.0
6.005	MH06-40	15 Winter	1	+30%					96.123	-0.526	0.000	0.19			87.0
6.006	MH06-41	15 Winter	1	+30%					95.966	-0.601	0.000	0.09			94.5
6.007	MH06-42	30 Winter	1	+30%					95.384	-0.667	0.000	0.13			100.3
6.008	MH06-43	30 Winter	1	+30%					95.247	-0.623	0.000	0.16			110.2
6.009	MH06-44	30 Winter	1	+30%					95.183	-0.600	0.000	0.19			112.2
1.021	MH06-45	30 Winter	1	+30%					95.163	-0.575	0.000	0.28			301.3
8.000	MH06-46	15 Winter	1	+30%					97.110	-0.671	0.000	0.02			15.8
8.001	MH06-47	15 Winter	1	+30%					96.956	-0.650	0.000	0.04			36.1
8.002	MH06-48	15 Winter	1	+30%					96.474	-0.602	0.000	0.08			66.2
8.003	MH06-49	15 Winter	1	+30%					96.152	-0.548	0.000	0.15			87.3
8.004	MH06-50	15 Winter	1	+30%					96.030	-0.540	0.000	0.17			100.7
8.005	MH06-51	15 Winter	1	+30%					95.656	-0.691	0.000	0.12			118.8
8.006	MH06-52	15 Winter	1	+30%					95.451	-0.707	0.000	0.10			127.2
8.007	MH06-53	15 Winter	1	+30%					95.007	-0.702	0.000	0.11			148.1
8.008	MH06-54	60 Winter	1	+30%					94.340	-0.840	0.000	0.07			130.0
8.009	MH06-55	60 Winter	1	+30%					94.316	-0.636	0.000	0.09			134.2
1.022	MH06-56	60 Winter	1	+30%					94.300	-0.573	0.000	0.25			356.2
1.023	MH06-57	60 Winter	1	+30%					94.260	-0.032	0.000	0.22			309.2
1.024	ATSD8104_2298C	60 Winter	1	+30%	1/15 Summer				93.852	0.966	0.000	0.53			297.7
1.025	DN06-05	60 Winter	1	+30%					92.687	0.000	0.000	0.64			297.8
9.000	MH06-58	15 Winter	1	+30%					94.170	-0.691	0.000	0.02			13.7
9.001	MH06-59	15 Winter	1	+30%					93.704	-0.625	0.000	0.07			46.3
10.000	MH06-60	15 Winter	1	+30%					94.190	-0.165	0.000	0.16			6.8
1.026	MH06-61	60 Winter	1	+30%	1/30 Summer				92.848	0.207	0.000	0.67			306.9
1.027	DN06-06	60 Winter	1	+30%					92.604	0.000	0.000	0.35			306.7
11.000	ATSD8104_1797A	15 Winter	1	+30%					94.300	-0.108	0.000	0.18			2.3
12.000	MH06-62	15 Winter	1	+30%					94.650	-0.714	0.000	0.01			10.5
12.001	MH06-63	15 Winter	1	+30%					93.886	-0.671	0.000	0.02			20.4
13.000	ATSD8104_1192A	15 Winter	1	+30%					95.459	-0.128	0.000	0.05			1.8
11.001	MH06-64	15 Winter	1	+30%					93.536	-0.628	0.000	0.06			37.9
14.000	ATSD8104_1688A	15 Winter	1	+30%					94.820	-0.184	0.000	0.08			5.5

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.005	MH06-38	OK	
6.004	MH06-39	OK	
6.005	MH06-40	OK	
6.006	MH06-41	OK	
6.007	MH06-42	OK	
6.008	MH06-43	OK	
6.009	MH06-44	OK	
1.021	MH06-45	OK	
8.000	MH06-46	OK	
8.001	MH06-47	OK	
8.002	MH06-48	OK	
8.003	MH06-49	OK	
8.004	MH06-50	OK	
8.005	MH06-51	OK	
8.006	MH06-52	OK	
8.007	MH06-53	OK	
8.008	MH06-54	OK	
8.009	MH06-55	OK	
1.022	MH06-56	OK	
1.023	MH06-57	OK	
1.024	ATSD8104_2298C	SURCHARGED	
1.025	DN06-05	SURCHARGED*	
9.000	MH06-58	OK	
9.001	MH06-59	OK	
10.000	MH06-60	OK	
1.026	MH06-61	SURCHARGED	
1.027	DN06-06	SURCHARGED*	
11.000	ATSD8104_1797A	OK*	
12.000	MH06-62	OK	
12.001	MH06-63	OK	
13.000	ATSD8104_1192A	OK*	
11.001	MH06-64	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
14.000	ATSD8104_1688A	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
14.001	ATSD8104_1790B	15 Winter	1	+30%					94.304	-0.190	0.000	0.06			5.4
1.028	ATSD8104_1591A	60 Winter	1	+30%	1/15 Summer				92.635	0.336	0.000	0.43			314.2

PN	US/MH Name	Status	Level Exceeded
14.001	ATSD8104_1790B	OK	
1.028	ATSD8104_1591A	SURCHARGED	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH06-01	15 Winter	5	+30%	100/15 Summer				99.520	-0.191	0.000	0.28			21.3	OK
1.001	MH06-02	15 Winter	5	+30%	100/15 Summer				99.323	-0.221	0.000	0.35			38.9	OK
2.000	MH06-03	15 Winter	5	+30%					100.562	-0.208	0.000	0.02			0.7	OK
2.001	MH06-04	15 Winter	5	+30%					100.080	-0.292	0.000	0.01			0.7	OK
1.002	MH06-05	15 Winter	5	+30%	30/15 Winter				99.248	-0.179	0.000	0.52			53.5	OK
1.003	MH06-06	15 Winter	5	+30%	30/15 Summer				99.128	-0.137	0.000	0.72			69.1	OK
3.000	MH06-07	15 Winter	5	+30%	100/15 Winter				99.736	-0.157	0.000	0.19			9.6	OK
1.004	MH06-08	15 Winter	5	+30%	100/15 Summer				98.935	-0.250	0.000	0.40			74.1	OK
1.005	MH06-09	15 Winter	5	+30%	30/15 Winter				98.719	-0.195	0.000	0.61			104.7	OK

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Level Exceeded
1.000	MH06-01	
1.001	MH06-02	
2.000	MH06-03	
2.001	MH06-04	
1.002	MH06-05	
1.003	MH06-06	
3.000	MH06-07	
1.004	MH06-08	
1.005	MH06-09	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.006	MH06-10	15 Winter	5	+30%	30/15 Summer				98.604	-0.197	0.000	0.59			112.3
1.007	MH06-11	15 Winter	5	+30%	30/15 Summer				98.294	-0.165	0.000	0.70			138.6
1.008	MH06-12	15 Winter	5	+30%	30/15 Summer	100/60 Summer			97.963	-0.124	0.000	0.87			164.4
1.009	MH06-13	30 Winter	5	+30%	30/15 Summer	100/60 Winter			97.820	-0.111	0.000	0.92			177.8
1.010	MH06-14	30 Winter	5	+30%	30/15 Summer	100/60 Winter			97.658	-0.099	0.000	0.97			177.5
4.000	MH06-15	15 Winter	5	+30%	100/15 Summer				99.199	-0.364	0.000	0.08			18.1
4.001	MH06-16	15 Winter	5	+30%	30/15 Winter				98.832	-0.217	0.000	0.48			65.4
4.002	MH06-17	15 Winter	5	+30%	30/15 Summer				98.660	-0.211	0.000	0.55			111.7
4.003	MH06-18	15 Winter	5	+30%	30/15 Summer	100/15 Winter			98.457	-0.218	0.000	0.52			129.6
4.004	MH06-19	15 Winter	5	+30%	30/15 Summer	100/60 Winter			98.023	-0.133	0.000	0.82			160.9
4.005	MH06-20	15 Winter	5	+30%	30/15 Summer	100/60 Summer			97.781	-0.057	0.000	0.99			181.3
4.006	MH06-21	15 Winter	5	+30%	30/15 Summer	100/60 Winter			97.639	-0.044	0.000	1.00			184.4
5.000	ATSD8105_8832A	15 Winter	5	+30%	100/15 Summer				98.801	-0.132	0.000	0.58			53.7
5.001	ATSD8105_8538A	15 Winter	5	+30%	100/120 Summer				98.251	-0.195	0.000	0.27			53.8
5.002	MH06-22	15 Winter	5	+30%	30/15 Winter				97.665	-0.129	0.000	0.62			53.3
1.011	MH06-23	30 Winter	5	+30%	30/60 Winter				97.167	-0.448	0.000	0.49			383.8
1.012	MH06-24	30 Winter	5	+30%	100/30 Winter				96.980	-0.457	0.000	0.48			377.3
1.013	MH06-25	30 Winter	5	+30%	30/60 Winter	100/240 Winter			96.741	-0.518	0.000	0.38			374.0
1.014	MH06-26	30 Winter	5	+30%	30/30 Winter	100/120 Winter			96.537	-0.435	0.000	0.53			371.6
1.015	DN06-01	30 Winter	5	+30%					96.348	-0.584	0.000	0.27			370.5
1.016	DN06-02	30 Winter	5	+30%					96.042	-0.513	0.000	0.39			369.8
1.017	MH06-27	30 Winter	5	+30%	30/30 Winter				95.959	-0.565	0.000	0.30			368.5
1.018	MH06-28	30 Winter	5	+30%	30/30 Summer	100/180 Summer			95.651	-0.428	0.000	0.54			366.6
1.019	DN06-03	30 Winter	5	+30%					95.487	-0.556	0.000	0.31			365.5
1.020	DN06-04	30 Winter	5	+30%					95.273	-0.500	0.000	0.39			369.1
6.000	MH06-29	15 Winter	5	+30%					96.922	-0.687	0.000	0.02			10.6
6.001	MH06-30	15 Winter	5	+30%					96.766	-0.625	0.000	0.06			40.2
6.002	MH06-31	15 Winter	5	+30%					96.592	-0.577	0.000	0.12			71.9
6.003	MH06-32	15 Winter	5	+30%					96.430	-0.538	0.000	0.18			99.6
7.000	MH06-33	15 Winter	5	+30%					99.797	-0.186	0.000	0.07			2.5
7.001	MH06-34	15 Winter	5	+30%					99.652	-0.187	0.000	0.07			2.5
7.002	MH06-35	15 Winter	5	+30%					99.528	-0.152	0.000	0.22			8.5
7.003	MH06-36	15 Winter	5	+30%					98.845	-0.169	0.000	0.14			10.8

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded	
1.006	MH06-10	OK		
1.007	MH06-11	OK		
1.008	MH06-12	OK		
1.009	MH06-13	OK		
1.010	MH06-14	OK		
4.000	MH06-15	OK		
4.001	MH06-16	OK		
4.002	MH06-17	OK		
4.003	MH06-18	OK		1
4.004	MH06-19	OK		
4.005	MH06-20	OK		
4.006	MH06-21	OK		
5.000	ATSD8105_8832A	OK		
5.001	ATSD8105_8538A	OK		
5.002	MH06-22	OK		
1.011	MH06-23	OK		
1.012	MH06-24	OK		
1.013	MH06-25	OK		
1.014	MH06-26	OK		1
1.015	DN06-01	OK*		
1.016	DN06-02	OK*		
1.017	MH06-27	OK		
1.018	MH06-28	OK		
1.019	DN06-03	OK*		
1.020	DN06-04	OK*		
6.000	MH06-29	OK		
6.001	MH06-30	OK		
6.002	MH06-31	OK		
6.003	MH06-32	OK		
7.000	MH06-33	OK		
7.001	MH06-34	OK		
7.002	MH06-35	OK		

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.003	MH06-36	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
7.004	MH06-37	15 Winter	5	+30%					96.773	-0.226	0.000	0.14			10.9
7.005	MH06-38	15 Winter	5	+30%					96.615	-0.212	0.000	0.19			10.9
6.004	MH06-39	15 Winter	5	+30%	100/60 Winter				96.311	-0.469	0.000	0.25			121.0
6.005	MH06-40	15 Winter	5	+30%	100/60 Winter				96.190	-0.459	0.000	0.32			142.9
6.006	MH06-41	15 Winter	5	+30%	100/30 Winter				96.006	-0.561	0.000	0.14			155.6
6.007	MH06-42	15 Winter	5	+30%	30/30 Summer				95.459	-0.592	0.000	0.21			166.4
6.008	MH06-43	30 Winter	5	+30%	30/30 Summer				95.327	-0.543	0.000	0.25			176.9
6.009	MH06-44	30 Winter	5	+30%	30/30 Summer				95.272	-0.511	0.000	0.31			180.6
1.021	MH06-45	60 Winter	5	+30%	30/15 Winter				95.258	-0.480	0.000	0.40			422.4
8.000	MH06-46	15 Winter	5	+30%					97.128	-0.653	0.000	0.04			26.0
8.001	MH06-47	15 Winter	5	+30%					96.986	-0.620	0.000	0.07			59.0
8.002	MH06-48	15 Winter	5	+30%					96.513	-0.563	0.000	0.14			108.5
8.003	MH06-49	15 Winter	5	+30%	100/30 Winter				96.213	-0.487	0.000	0.25			143.2
8.004	MH06-50	15 Winter	5	+30%	100/30 Winter				96.093	-0.477	0.000	0.28			160.8
8.005	MH06-51	15 Winter	5	+30%	100/30 Summer				95.717	-0.630	0.000	0.19			190.9
8.006	MH06-52	15 Winter	5	+30%	30/30 Winter				95.503	-0.655	0.000	0.16			204.3
8.007	MH06-53	60 Winter	5	+30%	30/30 Summer				95.237	-0.472	0.000	0.13			171.1
8.008	MH06-54	60 Winter	5	+30%	5/60 Winter	100/30 Winter			95.211	0.031	0.000	0.10			196.2
8.009	MH06-55	60 Winter	5	+30%	5/30 Winter	30/30 Winter			95.204	0.252	0.000	0.13			203.5
1.022	MH06-56	60 Winter	5	+30%	5/30 Winter				95.183	0.310	0.000	0.29			425.5
1.023	MH06-57	60 Winter	5	+30%	5/15 Summer	30/30 Winter			95.139	0.847	0.000	0.26			369.0
1.024	ATSD8104_2298C	60 Winter	5	+30%	5/15 Summer	100/240 Summer			94.663	1.777	0.000	0.66			375.8
1.025	DN06-05	15 Summer	5	+30%					92.687	0.000	0.000	0.68			317.8
9.000	MH06-58	15 Winter	5	+30%					94.193	-0.668	0.000	0.03			22.5
9.001	MH06-59	15 Winter	5	+30%	100/30 Winter				93.744	-0.585	0.000	0.11			76.4
10.000	MH06-60	15 Winter	5	+30%	100/30 Winter				94.208	-0.147	0.000	0.26			11.2
1.026	MH06-61	60 Winter	5	+30%	5/15 Summer				93.579	0.938	0.000	0.91			413.9
1.027	DN06-06	15 Summer	5	+30%					92.604	0.000	0.000	0.37			316.6
11.000	ATSD8104_1797A	15 Winter	5	+30%					94.313	-0.095	0.000	0.29			3.8
12.000	MH06-62	15 Winter	5	+30%					94.673	-0.691	0.000	0.02			17.2
12.001	MH06-63	15 Winter	5	+30%					93.904	-0.653	0.000	0.04			33.4
13.000	ATSD8104_1192A	15 Winter	5	+30%					95.466	-0.121	0.000	0.09			2.9
11.001	MH06-64	15 Winter	5	+30%	100/30 Winter				93.575	-0.589	0.000	0.10			62.1

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.004	MH06-37	OK	
7.005	MH06-38	OK	
6.004	MH06-39	OK	
6.005	MH06-40	OK	
6.006	MH06-41	OK	
6.007	MH06-42	OK	
6.008	MH06-43	OK	
6.009	MH06-44	OK	
1.021	MH06-45	OK	
8.000	MH06-46	OK	
8.001	MH06-47	OK	
8.002	MH06-48	OK	
8.003	MH06-49	OK	
8.004	MH06-50	OK	
8.005	MH06-51	OK	
8.006	MH06-52	OK	
8.007	MH06-53	OK	
8.008	MH06-54	SURCHARGED	4
8.009	MH06-55	SURCHARGED	15
1.022	MH06-56	SURCHARGED	
1.023	MH06-57	SURCHARGED	12
1.024	ATSD8104_2298C	SURCHARGED	
1.025	DN06-05	SURCHARGED*	
9.000	MH06-58	OK	
9.001	MH06-59	OK	
10.000	MH06-60	OK	
1.026	MH06-61	SURCHARGED	
1.027	DN06-06	SURCHARGED*	
11.000	ATSD8104_1797A	OK*	
12.000	MH06-62	OK	
12.001	MH06-63	OK	
13.000	ATSD8104_1192A	OK*	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
11.001	MH06-64	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
14.000	ATSD8104_1688A	15 Winter	5	+30%					94.832	-0.172	0.000	0.12			9.0
14.001	ATSD8104_1790B	15 Winter	5	+30%					94.315	-0.179	0.000	0.09			8.9
1.028	ATSD8104_1591A	60 Winter	5	+30%	5/15 Summer				93.401	1.102	0.000	0.56			404.5

PN	US/MH Name	Status	Level Exceeded
14.000	ATSD8104_1688A	OK	
14.001	ATSD8104_1790B	OK	
1.028	ATSD8104_1591A	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 0.750
Site Location	GB 382877 406385 SD 82877 06385		Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	5, 30, 100
Climate Change (%)	30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH06-01	15 Winter	30	+30%	100/15 Summer				99.557	-0.154	0.000	0.46			35.9	OK
1.001	MH06-02	15 Winter	30	+30%	100/15 Summer				99.493	-0.051	0.000	0.59			65.9	OK
2.000	MH06-03	15 Winter	30	+30%					100.569	-0.201	0.000	0.03			1.2	OK
2.001	MH06-04	15 Winter	30	+30%					100.086	-0.286	0.000	0.01			1.2	OK
1.002	MH06-05	15 Winter	30	+30%	30/15 Winter				99.430	0.003	0.000	0.88			90.3	SURCHARGED
1.003	MH06-06	15 Winter	30	+30%	30/15 Summer				99.298	0.033	0.000	1.25			120.4	SURCHARGED
3.000	MH06-07	15 Winter	30	+30%	100/15 Winter				99.757	-0.136	0.000	0.32			16.2	OK
1.004	MH06-08	15 Winter	30	+30%	100/15 Summer				99.154	-0.031	0.000	0.65			119.8	OK
1.005	MH06-09	15 Winter	30	+30%	30/15 Winter				99.044	0.130	0.000	0.89			152.7	SURCHARGED

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Level Exceeded
1.000	MH06-01	
1.001	MH06-02	
2.000	MH06-03	
2.001	MH06-04	
1.002	MH06-05	
1.003	MH06-06	
3.000	MH06-07	
1.004	MH06-08	
1.005	MH06-09	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.006	MH06-10	15 Winter	30	+30%	30/15 Summer				98.947	0.146	0.000	0.82			155.3
1.007	MH06-11	30 Winter	30	+30%	30/15 Summer				98.750	0.291	0.000	0.95			186.8
1.008	MH06-12	30 Winter	30	+30%	30/15 Summer	100/60 Summer			98.410	0.323	0.000	1.22			231.3
1.009	MH06-13	30 Winter	30	+30%	30/15 Summer	100/60 Winter			98.173	0.242	0.000	1.32			254.7
1.010	MH06-14	30 Winter	30	+30%	30/15 Summer	100/60 Winter			97.866	0.109	0.000	1.38			254.1
4.000	MH06-15	15 Winter	30	+30%	100/15 Summer				99.224	-0.339	0.000	0.13			30.5
4.001	MH06-16	15 Winter	30	+30%	30/15 Winter				99.061	0.012	0.000	0.85			115.9
4.002	MH06-17	15 Winter	30	+30%	30/15 Summer				98.995	0.124	0.000	0.88			180.2
4.003	MH06-18	15 Winter	30	+30%	30/15 Summer	100/15 Winter			98.881	0.206	0.000	0.74			186.0
4.004	MH06-19	15 Winter	30	+30%	30/15 Summer	100/60 Winter			98.593	0.437	0.000	1.18			231.3
4.005	MH06-20	15 Winter	30	+30%	30/15 Summer	100/60 Summer			98.136	0.298	0.000	1.50			275.4
4.006	MH06-21	60 Winter	30	+30%	30/15 Summer	100/60 Winter			97.838	0.155	0.000	1.34			246.9
5.000	ATSD8105_8832A	15 Winter	30	+30%	100/15 Summer				98.898	-0.035	0.000	0.98			90.6
5.001	ATSD8105_8538A	15 Winter	30	+30%	100/120 Summer				98.286	-0.160	0.000	0.45			90.4
5.002	MH06-22	15 Winter	30	+30%	30/15 Winter				97.799	0.005	0.000	1.03			89.6
1.011	MH06-23	60 Winter	30	+30%	30/60 Winter				97.623	0.008	0.000	0.65			509.8
1.012	MH06-24	120 Winter	30	+30%	100/30 Winter				97.435	-0.002	0.000	0.46			362.7
1.013	MH06-25	60 Winter	30	+30%	30/60 Winter	100/240 Winter			97.269	0.010	0.000	0.49			484.8
1.014	MH06-26	60 Winter	30	+30%	30/30 Winter	100/120 Winter			97.142	0.170	0.000	0.68			476.4
1.015	DN06-01	120 Summer	30	+30%					96.932	0.000	0.000	0.30			409.4
1.016	DN06-02	30 Winter	30	+30%					96.555	0.000	0.000	0.71			675.9
1.017	MH06-27	60 Winter	30	+30%	30/30 Winter				96.682	0.158	0.000	0.34			427.9
1.018	MH06-28	120 Winter	30	+30%	30/30 Summer	100/180 Summer			96.631	0.552	0.000	0.57			388.3
1.019	DN06-03	30 Winter	30	+30%					96.043	0.000	0.000	0.49			579.7
1.020	DN06-04	30 Winter	30	+30%					95.773	0.000	0.000	0.61			585.6
6.000	MH06-29	15 Winter	30	+30%					96.948	-0.661	0.000	0.03			17.9
6.001	MH06-30	15 Winter	30	+30%					96.827	-0.564	0.000	0.13			78.7
6.002	MH06-31	15 Winter	30	+30%					96.672	-0.497	0.000	0.23			139.4
6.003	MH06-32	15 Winter	30	+30%					96.532	-0.436	0.000	0.34			188.7
7.000	MH06-33	15 Winter	30	+30%					99.809	-0.174	0.000	0.12			4.3
7.001	MH06-34	15 Winter	30	+30%					99.665	-0.174	0.000	0.12			4.3
7.002	MH06-35	15 Winter	30	+30%					99.563	-0.117	0.000	0.42			16.2
7.003	MH06-36	15 Winter	30	+30%					98.869	-0.145	0.000	0.27			21.0

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
1.006	MH06-10	SURCHARGED	
1.007	MH06-11	SURCHARGED	
1.008	MH06-12	SURCHARGED	
1.009	MH06-13	SURCHARGED	
1.010	MH06-14	SURCHARGED	
4.000	MH06-15	OK	
4.001	MH06-16	SURCHARGED	
4.002	MH06-17	SURCHARGED	
4.003	MH06-18	SURCHARGED	1
4.004	MH06-19	SURCHARGED	
4.005	MH06-20	SURCHARGED	
4.006	MH06-21	SURCHARGED	
5.000	ATSD8105_8832A	OK	
5.001	ATSD8105_8538A	OK	
5.002	MH06-22	SURCHARGED	
1.011	MH06-23	SURCHARGED	
1.012	MH06-24	OK	
1.013	MH06-25	SURCHARGED	
1.014	MH06-26	SURCHARGED	1
1.015	DN06-01	SURCHARGED*	
1.016	DN06-02	SURCHARGED*	
1.017	MH06-27	SURCHARGED	
1.018	MH06-28	SURCHARGED	
1.019	DN06-03	SURCHARGED*	
1.020	DN06-04	SURCHARGED*	
6.000	MH06-29	OK	
6.001	MH06-30	OK	
6.002	MH06-31	OK	
6.003	MH06-32	OK	
7.000	MH06-33	OK	
7.001	MH06-34	OK	
7.002	MH06-35	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.003	MH06-36	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
7.004	MH06-37	15 Winter	30	+30%					96.805	-0.194	0.000	0.27			20.9
7.005	MH06-38	15 Winter	30	+30%					96.653	-0.174	0.000	0.37			21.0
6.004	MH06-39	60 Winter	30	+30%	100/60 Winter				96.447	-0.333	0.000	0.30			145.0
6.005	MH06-40	60 Winter	30	+30%	100/60 Winter				96.415	-0.234	0.000	0.40			179.5
6.006	MH06-41	60 Winter	30	+30%	100/30 Winter				96.369	-0.198	0.000	0.18			199.7
6.007	MH06-42	60 Winter	30	+30%	30/30 Summer				96.336	0.285	0.000	0.27			212.7
6.008	MH06-43	60 Winter	30	+30%	30/30 Summer				96.357	0.487	0.000	0.32			229.1
6.009	MH06-44	60 Winter	30	+30%	30/30 Summer				96.351	0.568	0.000	0.40			232.2
1.021	MH06-45	60 Winter	30	+30%	30/15 Winter				96.345	0.607	0.000	0.47			497.0
8.000	MH06-46	15 Winter	30	+30%					97.159	-0.622	0.000	0.07			43.8
8.001	MH06-47	15 Winter	30	+30%					97.039	-0.567	0.000	0.13			112.0
8.002	MH06-48	15 Winter	30	+30%					96.599	-0.477	0.000	0.27			214.2
8.003	MH06-49	60 Winter	30	+30%	100/30 Winter				96.465	-0.235	0.000	0.28			161.9
8.004	MH06-50	60 Winter	30	+30%	100/30 Winter				96.428	-0.142	0.000	0.32			187.6
8.005	MH06-51	60 Winter	30	+30%	100/30 Summer				96.347	0.000	0.000	0.23			227.3
8.006	MH06-52	120 Winter	30	+30%	30/30 Winter				96.284	0.126	0.000	0.12			155.1
8.007	MH06-53	60 Winter	30	+30%	30/30 Summer				96.273	0.564	0.000	0.20			267.1
8.008	MH06-54	60 Winter	30	+30%	5/60 Winter	100/30 Winter			96.267	1.087	0.000	0.13			257.2
8.009	MH06-55	60 Winter	30	+30%	5/30 Winter	30/30 Winter			96.264	1.312	61.898	0.15			237.2
1.022	MH06-56	60 Winter	30	+30%	5/30 Winter				96.263	1.390	0.000	0.32			465.0
1.023	MH06-57	60 Winter	30	+30%	5/15 Summer	30/30 Winter			96.238	1.946	1.661	0.32			453.6
1.024	ATSD8104_2298C	60 Winter	30	+30%	5/15 Summer	100/240 Summer			95.502	2.616	0.000	0.82			463.9
1.025	DN06-05	15 Summer	30	+30%					92.687	0.000	0.000	0.92			428.9
9.000	MH06-58	60 Winter	30	+30%					94.243	-0.618	0.000	0.02			21.0
9.001	MH06-59	60 Winter	30	+30%	100/30 Winter				94.243	-0.086	0.000	0.11			78.8
10.000	MH06-60	60 Winter	30	+30%	100/30 Winter				94.263	-0.092	0.000	0.24			10.2
1.026	MH06-61	60 Winter	30	+30%	5/15 Summer				94.237	1.596	0.000	1.10			500.6
1.027	DN06-06	15 Summer	30	+30%					92.604	0.000	0.000	0.55			475.0
11.000	ATSD8104_1797A	15 Winter	30	+30%					94.332	-0.076	0.000	0.48			6.4
12.000	MH06-62	15 Winter	30	+30%					94.697	-0.667	0.000	0.03			28.9
12.001	MH06-63	15 Winter	30	+30%					93.945	-0.612	0.000	0.07			62.1
13.000	ATSD8104_1192A	15 Winter	30	+30%					95.475	-0.112	0.000	0.14			4.8
11.001	MH06-64	60 Winter	30	+30%	100/30 Winter				93.940	-0.224	0.000	0.11			67.6

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.004	MH06-37	OK	
7.005	MH06-38	OK	
6.004	MH06-39	OK	
6.005	MH06-40	OK	
6.006	MH06-41	OK	
6.007	MH06-42	SURCHARGED	
6.008	MH06-43	SURCHARGED	
6.009	MH06-44	SURCHARGED	
1.021	MH06-45	SURCHARGED	
8.000	MH06-46	OK	
8.001	MH06-47	OK	
8.002	MH06-48	OK	
8.003	MH06-49	OK	
8.004	MH06-50	OK	
8.005	MH06-51	OK	
8.006	MH06-52	SURCHARGED	
8.007	MH06-53	SURCHARGED	
8.008	MH06-54	FLOOD RISK	4
8.009	MH06-55	FLOOD	15
1.022	MH06-56	SURCHARGED	
1.023	MH06-57	FLOOD	12
1.024	ATSD8104_2298C	SURCHARGED	
1.025	DN06-05	SURCHARGED*	
9.000	MH06-58	OK	
9.001	MH06-59	OK	
10.000	MH06-60	OK	
1.026	MH06-61	SURCHARGED	
1.027	DN06-06	SURCHARGED*	
11.000	ATSD8104_1797A	OK*	
12.000	MH06-62	OK	
12.001	MH06-63	OK	
13.000	ATSD8104_1192A	OK*	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
11.001	MH06-64	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
14.000	ATSD8104_1688A	15 Winter	30	+30%					94.849	-0.155	0.000	0.21			15.1
14.001	ATSD8104_1790B	15 Winter	30	+30%					94.329	-0.165	0.000	0.16			14.9
1.028	ATSD8104_1591A	60 Winter	30	+30%	5/15 Summer				93.940	1.641	0.000	0.68			493.7

PN	US/MH Name	Status	Level Exceeded
14.000	ATSD8104_1688A	OK	
14.001	ATSD8104_1790B	OK	
1.028	ATSD8104_1591A	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH06-01	15 Winter	100	+30%	100/15 Summer				100.540	0.829	0.000	0.55			42.4	SURCHARGED
1.001	MH06-02	15 Winter	100	+30%	100/15 Summer				100.443	0.899	0.000	0.65			72.8	SURCHARGED
2.000	MH06-03	15 Winter	100	+30%					100.572	-0.198	0.000	0.04			1.6	OK
2.001	MH06-04	15 Winter	100	+30%					100.330	-0.042	0.000	0.08			9.3	OK
1.002	MH06-05	15 Winter	100	+30%	30/15 Winter				100.351	0.924	0.000	0.97			99.6	SURCHARGED
1.003	MH06-06	15 Winter	100	+30%	30/15 Summer				100.270	1.005	0.000	1.38			132.7	SURCHARGED
3.000	MH06-07	15 Winter	100	+30%	100/15 Winter				100.220	0.327	0.000	0.43			21.6	SURCHARGED
1.004	MH06-08	15 Winter	100	+30%	100/15 Summer				100.191	1.006	0.000	0.65			120.6	SURCHARGED
1.005	MH06-09	15 Winter	100	+30%	30/15 Winter				100.087	1.173	0.000	1.00			172.8	FLOOD RISK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Level Exceeded
1.000	MH06-01	
1.001	MH06-02	
2.000	MH06-03	
2.001	MH06-04	
1.002	MH06-05	
1.003	MH06-06	
3.000	MH06-07	
1.004	MH06-08	
1.005	MH06-09	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.006	MH06-10	15 Winter	100	+30%	30/15 Summer				99.973	1.172	0.000	0.99			187.8
1.007	MH06-11	30 Winter	100	+30%	30/15 Summer				99.617	1.158	0.000	1.22			240.9
1.008	MH06-12	120 Summer	100	+30%	30/15 Summer	100/60 Summer			99.119	1.032	0.000	1.05			198.0
1.009	MH06-13	180 Summer	100	+30%	30/15 Summer	100/60 Winter			98.930	0.999	0.000	1.05			203.4
1.010	MH06-14	30 Winter	100	+30%	30/15 Summer	100/60 Winter			98.555	0.798	0.000	1.85			339.5
4.000	MH06-15	15 Winter	100	+30%	100/15 Summer				100.113	0.550	0.000	0.16			36.9
4.001	MH06-16	15 Winter	100	+30%	30/15 Winter				100.016	0.967	0.000	0.79			107.8
4.002	MH06-17	15 Winter	100	+30%	30/15 Summer				99.868	0.997	0.000	0.94			192.1
4.003	MH06-18	15 Winter	100	+30%	30/15 Summer	100/15 Winter			99.675	1.000	0.375	0.92			230.9
4.004	MH06-19	15 Winter	100	+30%	30/15 Summer	100/60 Winter			99.266	1.110	0.000	1.50			293.4
4.005	MH06-20	120 Summer	100	+30%	30/15 Summer	100/60 Summer			98.852	1.014	0.033	1.23			225.6
4.006	MH06-21	180 Summer	100	+30%	30/15 Summer	100/60 Winter			98.748	1.065	0.000	1.15			211.2
5.000	ATSD8105_8832A	15 Winter	100	+30%	100/15 Summer				99.284	0.351	0.000	1.27			118.1
5.001	ATSD8105_8538A	180 Summer	100	+30%	100/120 Summer				98.568	0.122	0.000	0.20			41.1
5.002	MH06-22	180 Summer	100	+30%	30/15 Winter				98.472	0.678	0.000	0.48			41.5
1.011	MH06-23	180 Summer	100	+30%	30/60 Winter				98.459	0.844	0.000	0.57			447.5
1.012	MH06-24	180 Summer	100	+30%	100/30 Winter				98.451	1.014	0.000	0.58			452.9
1.013	MH06-25	180 Summer	100	+30%	30/60 Winter	100/240 Winter			98.438	1.179	0.000	0.44			439.3
1.014	MH06-26	180 Summer	100	+30%	30/30 Winter	100/120 Winter			98.261	1.289	138.345	0.80			565.1
1.015	DN06-01	30 Winter	100	+30%					96.932	0.000	0.000	0.49			671.6
1.016	DN06-02	15 Summer	100	+30%					96.555	0.000	0.000	0.72			688.5
1.017	MH06-27	120 Winter	100	+30%	30/30 Winter				97.151	0.627	0.000	0.35			436.2
1.018	MH06-28	360 Winter	100	+30%	30/30 Summer	100/180 Summer			97.027	0.948	0.000	0.39			266.8
1.019	DN06-03	15 Summer	100	+30%					96.043	0.000	0.000	0.50			581.6
1.020	DN06-04	15 Summer	100	+30%					95.773	0.000	0.000	0.61			580.7
6.000	MH06-29	15 Winter	100	+30%					96.965	-0.644	0.000	0.04			23.8
6.001	MH06-30	60 Winter	100	+30%					96.919	-0.472	0.000	0.09			58.7
6.002	MH06-31	60 Winter	100	+30%					96.914	-0.255	0.000	0.18			109.3
6.003	MH06-32	60 Winter	100	+30%					96.884	-0.084	0.000	0.27			154.2
7.000	MH06-33	15 Winter	100	+30%					99.817	-0.166	0.000	0.16			5.7
7.001	MH06-34	15 Winter	100	+30%					99.673	-0.166	0.000	0.15			5.7
7.002	MH06-35	15 Winter	100	+30%					99.584	-0.096	0.000	0.55			21.6
7.003	MH06-36	15 Winter	100	+30%					98.883	-0.131	0.000	0.35			27.8

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
1.006	MH06-10	FLOOD RISK	
1.007	MH06-11	FLOOD RISK	
1.008	MH06-12	FLOOD RISK	
1.009	MH06-13	FLOOD RISK	
1.010	MH06-14	SURCHARGED	
4.000	MH06-15	SURCHARGED	
4.001	MH06-16	FLOOD RISK	
4.002	MH06-17	FLOOD RISK	
4.003	MH06-18	FLOOD	1
4.004	MH06-19	FLOOD RISK	
4.005	MH06-20	FLOOD	
4.006	MH06-21	FLOOD RISK	
5.000	ATSD8105_8832A	SURCHARGED	
5.001	ATSD8105_8538A	SURCHARGED	
5.002	MH06-22	SURCHARGED	
1.011	MH06-23	SURCHARGED	
1.012	MH06-24	SURCHARGED	
1.013	MH06-25	FLOOD RISK	
1.014	MH06-26	FLOOD	1
1.015	DN06-01	SURCHARGED*	
1.016	DN06-02	SURCHARGED*	
1.017	MH06-27	SURCHARGED	
1.018	MH06-28	FLOOD RISK	
1.019	DN06-03	SURCHARGED*	
1.020	DN06-04	SURCHARGED*	
6.000	MH06-29	OK	
6.001	MH06-30	OK	
6.002	MH06-31	OK	
6.003	MH06-32	OK	
7.000	MH06-33	OK	
7.001	MH06-34	OK	
7.002	MH06-35	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.003	MH06-36	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
7.004	MH06-37	60 Winter	100	+30%					96.834	-0.165	0.000	0.23			17.9
7.005	MH06-38	60 Winter	100	+30%					96.827	0.000	0.000	0.31			17.9
6.004	MH06-39	60 Winter	100	+30%	100/60 Winter				96.816	0.036	0.000	0.40			191.8
6.005	MH06-40	60 Winter	100	+30%	100/60 Winter				96.809	0.160	0.000	0.52			232.5
6.006	MH06-41	60 Winter	100	+30%	100/30 Winter				96.801	0.234	0.000	0.23			246.4
6.007	MH06-42	60 Winter	100	+30%	30/30 Summer				96.572	0.521	0.000	0.31			247.0
6.008	MH06-43	60 Winter	100	+30%	30/30 Summer				96.563	0.693	0.000	0.34			239.4
6.009	MH06-44	60 Winter	100	+30%	30/30 Summer				96.554	0.771	0.000	0.41			242.1
1.021	MH06-45	60 Winter	100	+30%	30/15 Winter				96.547	0.809	0.000	0.70			740.6
8.000	MH06-46	15 Winter	100	+30%					97.183	-0.598	0.000	0.09			58.3
8.001	MH06-47	15 Winter	100	+30%					97.070	-0.536	0.000	0.17			149.3
8.002	MH06-48	60 Winter	100	+30%					96.889	-0.187	0.000	0.21			160.1
8.003	MH06-49	60 Winter	100	+30%	100/30 Winter				96.857	0.157	0.000	0.38			215.9
8.004	MH06-50	60 Winter	100	+30%	100/30 Winter				96.852	0.282	0.000	0.42			245.3
8.005	MH06-51	60 Winter	100	+30%	100/30 Summer				96.846	0.499	0.000	0.29			281.3
8.006	MH06-52	60 Winter	100	+30%	30/30 Winter				96.842	0.684	0.000	0.22			280.4
8.007	MH06-53	60 Winter	100	+30%	30/30 Summer				96.665	0.956	0.000	0.21			285.3
8.008	MH06-54	60 Winter	100	+30%	5/60 Winter	100/30 Winter			96.465	1.285	84.749	0.13			256.0
8.009	MH06-55	60 Winter	100	+30%	5/30 Winter	30/30 Winter			96.462	1.510	259.947	0.12			185.4
1.022	MH06-56	60 Winter	100	+30%	5/30 Winter				96.461	1.588	0.000	0.48			690.5
1.023	MH06-57	60 Winter	100	+30%	5/15 Summer	30/30 Winter			96.434	2.142	198.498	0.33			469.7
1.024	ATSD8104_2298C	60 Winter	100	+30%	5/15 Summer	100/240 Summer			95.763	2.877	0.000	0.83			469.5
1.025	DN06-05	15 Summer	100	+30%					92.687	0.000	0.000	1.06			493.5
9.000	MH06-58	60 Winter	100	+30%					94.629	-0.232	0.000	0.03			28.1
9.001	MH06-59	60 Winter	100	+30%	100/30 Winter				94.616	0.287	0.000	0.13			92.9
10.000	MH06-60	60 Winter	100	+30%	100/30 Winter				94.603	0.248	0.000	0.32			13.6
1.026	MH06-61	60 Winter	100	+30%	5/15 Summer				94.582	1.941	0.000	1.15			525.7
1.027	DN06-06	15 Summer	100	+30%					92.604	0.000	0.000	0.55			472.2
11.000	ATSD8104_1797A	60 Winter	100	+30%					94.408	0.000	0.000	0.49			6.5
12.000	MH06-62	15 Winter	100	+30%					94.707	-0.657	0.000	0.04			38.5
12.001	MH06-63	60 Winter	100	+30%					94.397	-0.160	0.000	0.05			45.6
13.000	ATSD8104_1192A	15 Winter	100	+30%					95.481	-0.106	0.000	0.19			6.4
11.001	MH06-64	60 Winter	100	+30%	100/30 Winter				94.371	0.207	0.000	0.14			82.3

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
7.004	MH06-37	OK	
7.005	MH06-38	OK	
6.004	MH06-39	SURCHARGED	
6.005	MH06-40	SURCHARGED	
6.006	MH06-41	SURCHARGED	
6.007	MH06-42	SURCHARGED	
6.008	MH06-43	SURCHARGED	
6.009	MH06-44	SURCHARGED	
1.021	MH06-45	SURCHARGED	
8.000	MH06-46	OK	
8.001	MH06-47	OK	
8.002	MH06-48	OK	
8.003	MH06-49	SURCHARGED	
8.004	MH06-50	SURCHARGED	
8.005	MH06-51	SURCHARGED	
8.006	MH06-52	SURCHARGED	
8.007	MH06-53	FLOOD RISK	
8.008	MH06-54	FLOOD	4
8.009	MH06-55	FLOOD	15
1.022	MH06-56	FLOOD RISK	
1.023	MH06-57	FLOOD	12
1.024	ATSD8104_2298C	FLOOD RISK	
1.025	DN06-05	SURCHARGED*	
9.000	MH06-58	OK	
9.001	MH06-59	SURCHARGED	
10.000	MH06-60	SURCHARGED	
1.026	MH06-61	SURCHARGED	
1.027	DN06-06	SURCHARGED*	
11.000	ATSD8104_1797A	SURCHARGED*	
12.000	MH06-62	OK	
12.001	MH06-63	OK	
13.000	ATSD8104_1192A	OK*	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Status	Level Exceeded
11.001	MH06-64	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 06

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
14.000	ATSD8104_1688A	15 Winter	100	+30%					94.860	-0.144	0.000	0.28			20.1
14.001	ATSD8104_1790B	60 Winter	100	+30%					94.356	-0.138	0.000	0.12			11.0
1.028	ATSD8104_1591A	60 Winter	100	+30%	5/15 Summer				94.352	2.053	0.000	0.75			538.5

PN	US/MH Name	Status	Level Exceeded
14.000	ATSD8104_1688A	OK	
14.001	ATSD8104_1790B	OK	
1.028	ATSD8104_1591A	SURCHARGED	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Proposed Catchment - 07

Pipe Sizes STANDARD Manhole Sizes M60 MH

FEH Rainfall Model

Return Period (years)	2	Volumetric Runoff Coeff.	0.750
		PIMP (%)	100
FEH Rainfall Version	2013	Add Flow / Climate Change (%)	20
Site Location	GB 382877 406385 SD 82877 06385	Minimum Backdrop Height (m)	0.200
Data Type	Point	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	100	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Simulation Criteria for Proposed Catchment - 07

Volumetric Runoff Coeff	0.750	Manhole Headloss Coeff (Global)	0.500	Inlet Coeffiecient	0.800
Areal Reduction Factor	1.000	Foul Sewage per hectare (l/s)	0.000	Flow per Person per Day (l/per/day)	0.000
Hot Start (mins)	0	Additional Flow - % of Total Flow	0.000	Run Time (mins)	60
Hot Start Level (mm)	0	MADD Factor * 10m³/ha Storage	2.000	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840
Data Type	Point	Storm Duration (mins)	30

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.800 Cv (Summer) 0.750
Region England and Wales Ratio R 0.314 Cv (Winter) 0.840

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	MH07-01	15 Winter	1	+30%					105.344	-0.191	0.000	0.27			31.6	OK	
1.001	MH07-02	15 Winter	1	+30%					104.422	-0.170	0.000	0.38			46.6	OK	
1.002	MH07-03	15 Winter	1	+30%					103.120	-0.175	0.000	0.36			62.6	OK	
1.003	MH07-04	15 Winter	1	+30%					99.022	-0.207	0.000	0.21			62.4	OK	
2.000	CP07-01	15 Winter	1	+30%					97.067	-0.157	0.000	0.20			4.3	OK	
1.004	MH07-05	15 Winter	1	+30%					96.815	-0.228	0.000	0.32			65.8	OK	
3.000	DN0-01	15 Winter	1	+30%					97.131	-0.082	0.000	0.42			5.2	OK*	
1.005	MH07-06	15 Winter	1	+30%					95.896	-0.232	0.000	0.31			70.4	OK	
4.000	DN07-02	15 Winter	1	+30%					96.533	-0.103	0.000	0.21			3.7	OK*	
1.006	MH07-07	15 Winter	1	+30%					95.082	-0.347	0.000	0.12			74.5	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
5.000	CP07-02	15 Winter	1	+30%					99.118	-0.199	0.000	0.03			1.7	OK
6.000	CP07-03	15 Winter	1	+30%					100.504	-0.212	0.000	0.01			1.5	OK
5.001	MH07-08	15 Winter	1	+30%					98.817	-0.195	0.000	0.04			3.1	OK
5.002	CP07-04	15 Winter	1	+30%					97.678	-0.195	0.000	0.04			6.2	OK
7.000	CP07-05	15 Winter	1	+30%					97.982	-0.218	0.000	0.01			0.7	OK
8.000	MH07-09	15 Winter	1	+30%					101.147	-0.153	0.000	0.21			15.3	OK
8.001	MH07-10	15 Winter	1	+30%					99.210	-0.142	0.000	0.29			21.5	OK
9.000	EXRE07-01	15 Winter	1	+30%					98.899	-0.129	0.000	0.37			11.7	OK
9.001	EXRE07-02	15 Winter	1	+30%					98.549	-0.128	0.000	0.39			11.7	OK
9.002	EX ATSD8205_7191A	15 Winter	1	+30%					98.434	-0.127	0.000	0.39			20.4	OK
8.002	MH07-11	15 Winter	1	+30%					98.094	-0.153	0.000	0.48			44.4	OK
10.000	CP07-06	15 Winter	1	+30%					101.379	-0.216	0.000	0.01			0.6	OK
10.001	CP07-07	15 Winter	1	+30%					99.368	-0.199	0.000	0.03			1.7	OK
10.002	MH07-12	15 Winter	1	+30%					98.278	-0.206	0.000	0.02			1.6	OK
8.003	MH07-13	15 Winter	1	+30%					97.906	-0.163	0.000	0.60			50.5	OK
8.004	MH07-14	15 Winter	1	+30%					97.756	-0.243	0.000	0.26			61.8	OK
8.005	MH07-15	15 Winter	1	+30%					96.377	-0.142	0.000	0.70			61.3	OK
7.001	MH07-16	15 Winter	1	+30%					94.807	-0.193	0.000	0.47			62.2	OK
7.002	MH07-17	15 Winter	1	+30%					94.646	-0.241	0.000	0.28			63.3	OK
7.003	MH07-18	30 Winter	1	+30%					94.286	-0.070	0.000	0.70			56.7	OK
11.000	CP07-08	15 Winter	1	+30%					94.904	-0.052	0.000	0.76			5.1	OK
5.003	MH07-19	30 Winter	1	+30%					94.236	-0.031	0.000	0.73			59.8	OK
12.000	CP07-09	30 Winter	1	+30%					98.424	-0.217	0.000	0.01			1.0	OK
5.004	CP07-10	30 Winter	1	+30%					94.172	0.000	0.000	1.19			60.8	OK
5.005	DN07-03	15 Winter	1	+30%					93.896	-0.255	0.000	0.22			61.0	OK*
13.000	DN07-04	15 Winter	1	+30%					95.812	-0.114	0.000	0.13			4.2	OK*
14.000	CP07-11	15 Winter	1	+30%					102.603	-0.198	0.000	0.03			1.8	OK
14.001	CP07-12	15 Winter	1	+30%					101.139	-0.181	0.000	0.08			7.7	OK
15.000	CP07-13	15 Winter	1	+30%					99.102	-0.190	0.000	0.06			4.1	OK
14.002	MH07-20	15 Winter	1	+30%					97.802	-0.179	0.000	0.09			11.7	OK
16.000	CP07-14	30 Winter	1	+30%					94.984	-0.192	0.000	0.05			3.7	OK
1.007	MH07-21	15 Winter	1	+30%					93.232	-0.253	0.000	0.40			139.9	OK
1.008	MH07-22	15 Winter	1	+30%					92.412	-0.424	0.000	0.30			139.9	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Level Exceeded
5.000	CP07-02	
6.000	CP07-03	
5.001	MH07-08	
5.002	CP07-04	
7.000	CP07-05	
8.000	MH07-09	
8.001	MH07-10	
9.000	EXRE07-01	
9.001	EXRE07-02	
9.002	EX ATSD8205_7191A	
8.002	MH07-11	
10.000	CP07-06	
10.001	CP07-07	
10.002	MH07-12	
8.003	MH07-13	
8.004	MH07-14	
8.005	MH07-15	
7.001	MH07-16	
7.002	MH07-17	
7.003	MH07-18	
11.000	CP07-08	
5.003	MH07-19	
12.000	CP07-09	
5.004	CP07-10	
5.005	DN07-03	
13.000	DN07-04	
14.000	CP07-11	
14.001	CP07-12	
15.000	CP07-13	
14.002	MH07-20	
16.000	CP07-14	
1.007	MH07-21	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Level Exceeded
1.008	MH07-22	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.009	PI07-01	1440 Winter	1	+30%					92.194	-0.030	0.000	0.09			5.2	OK	
1.010	PO07-01	1440 Winter	1	+30%					92.197	-0.027	0.000	0.10			4.7	OK	
1.011	MH07-23	1440 Winter	1	+30%					91.928	-0.236	0.000	0.10			4.6	OK	
1.012	MH07-24	1440 Winter	1	+30%					91.862	-0.236	0.000	0.10			4.6	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 382877 406385 SD 82877 06385	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	5, 30, 100
Climate Change (%)	30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH07-01	15 Winter	5	+30%	100/15 Summer				105.379	-0.156	0.000	0.45			51.8	OK
1.001	MH07-02	15 Winter	5	+30%	30/15 Summer				104.468	-0.124	0.000	0.62			76.5	OK
1.002	MH07-03	15 Winter	5	+30%	100/15 Summer				103.163	-0.132	0.000	0.59			102.8	OK
1.003	MH07-04	15 Winter	5	+30%					99.050	-0.179	0.000	0.35			102.5	OK
2.000	CP07-01	15 Winter	5	+30%					97.087	-0.137	0.000	0.32			7.0	OK
1.004	MH07-05	15 Winter	5	+30%					96.863	-0.180	0.000	0.53			108.0	OK
3.000	DN0-01	15 Winter	5	+30%					97.155	-0.058	0.000	0.70			8.5	OK*
1.005	MH07-06	15 Winter	5	+30%					95.943	-0.185	0.000	0.51			114.9	OK
4.000	DN07-02	15 Winter	5	+30%					96.547	-0.089	0.000	0.35			6.1	OK*

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Level Exceeded
1.000	MH07-01	
1.001	MH07-02	
1.002	MH07-03	
1.003	MH07-04	
2.000	CP07-01	
1.004	MH07-05	
3.000	DN0-01	
1.005	MH07-06	
4.000	DN07-02	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.006	MH07-07	15 Winter	5	+30%					95.114	-0.315	0.000	0.20			121.6
5.000	CP07-02	15 Winter	5	+30%					99.124	-0.193	0.000	0.05			2.7
6.000	CP07-03	15 Winter	5	+30%					100.513	-0.203	0.000	0.02			2.4
5.001	MH07-08	15 Winter	5	+30%					98.827	-0.185	0.000	0.07			5.1
5.002	CP07-04	15 Winter	5	+30%					97.688	-0.185	0.000	0.07			10.1
7.000	CP07-05	15 Winter	5	+30%					97.987	-0.213	0.000	0.01			1.1
8.000	MH07-09	15 Winter	5	+30%					101.169	-0.131	0.000	0.35			25.1
8.001	MH07-10	15 Winter	5	+30%	100/15 Summer				99.237	-0.115	0.000	0.47			35.3
9.000	EXRE07-01	15 Winter	5	+30%	30/15 Summer				98.932	-0.096	0.000	0.61			19.3
9.001	EXRE07-02	15 Winter	5	+30%	30/15 Summer				98.583	-0.094	0.000	0.64			19.2
9.002	EX ATSD8205_7191A	15 Winter	5	+30%	30/15 Summer				98.467	-0.094	0.000	0.63			33.2
8.002	MH07-11	15 Winter	5	+30%	30/15 Summer				98.150	-0.097	0.000	0.78			72.5
10.000	CP07-06	15 Winter	5	+30%					101.385	-0.210	0.000	0.01			0.9
10.001	CP07-07	15 Winter	5	+30%					99.374	-0.193	0.000	0.05			2.6
10.002	MH07-12	15 Winter	5	+30%					98.284	-0.200	0.000	0.03			2.7
8.003	MH07-13	15 Winter	5	+30%	30/15 Summer				97.994	-0.075	0.000	0.98			82.5
8.004	MH07-14	15 Winter	5	+30%					97.797	-0.202	0.000	0.43			100.8
8.005	MH07-15	15 Winter	5	+30%	5/15 Winter				96.523	0.004	0.000	1.14			99.5
7.001	MH07-16	15 Winter	5	+30%	30/15 Summer				94.879	-0.121	0.000	0.77			101.8
7.002	MH07-17	15 Winter	5	+30%	30/15 Summer				94.692	-0.195	0.000	0.45			104.2
7.003	MH07-18	15 Winter	5	+30%	5/15 Summer	100/15 Winter			94.485	0.129	0.000	1.16			94.6
11.000	CP07-08	15 Winter	5	+30%	5/15 Summer	100/15 Winter			94.993	0.037	0.000	1.22			8.2
5.003	MH07-19	15 Winter	5	+30%	5/15 Summer				94.364	0.097	0.000	1.31			107.0
12.000	CP07-09	30 Winter	5	+30%					98.429	-0.212	0.000	0.01			1.6
5.004	CP07-10	15 Winter	5	+30%	5/15 Summer				94.208	0.036	0.000	2.10			107.6
5.005	DN07-03	15 Winter	5	+30%					93.938	-0.213	0.000	0.39			107.8
13.000	DN07-04	15 Winter	5	+30%					95.823	-0.103	0.000	0.22			7.0
14.000	CP07-11	15 Winter	5	+30%					102.610	-0.191	0.000	0.05			3.0
14.001	CP07-12	15 Winter	5	+30%					101.151	-0.169	0.000	0.14			12.6
15.000	CP07-13	15 Winter	5	+30%					99.113	-0.179	0.000	0.09			6.8
14.002	MH07-20	15 Winter	5	+30%					97.814	-0.167	0.000	0.15			19.3
16.000	CP07-14	30 Winter	5	+30%					94.995	-0.181	0.000	0.08			5.9
1.007	MH07-21	15 Winter	5	+30%	30/15 Summer				93.307	-0.178	0.000	0.67			237.2

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Status	Level Exceeded
1.006	MH07-07	OK	
5.000	CP07-02	OK	
6.000	CP07-03	OK	
5.001	MH07-08	OK	
5.002	CP07-04	OK	
7.000	CP07-05	OK	
8.000	MH07-09	OK	
8.001	MH07-10	OK	
9.000	EXRE07-01	OK	
9.001	EXRE07-02	OK	
9.002	EX ATSD8205_7191A	OK	
8.002	MH07-11	OK	
10.000	CP07-06	OK	
10.001	CP07-07	OK	
10.002	MH07-12	OK	
8.003	MH07-13	OK	
8.004	MH07-14	OK	
8.005	MH07-15	SURCHARGED	
7.001	MH07-16	OK	
7.002	MH07-17	OK	
7.003	MH07-18	SURCHARGED	3
11.000	CP07-08	SURCHARGED	3
5.003	MH07-19	SURCHARGED	
12.000	CP07-09	OK	
5.004	CP07-10	SURCHARGED	
5.005	DN07-03	OK*	
13.000	DN07-04	OK*	
14.000	CP07-11	OK	
14.001	CP07-12	OK	
15.000	CP07-13	OK	
14.002	MH07-20	OK	
16.000	CP07-14	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Status	Level Exceeded
1.007	MH07-21	OK	

5 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.008	MH07-22	15 Winter	5	+30%	100/30 Winter				92.503	-0.333	0.000	0.51			236.9	OK
1.009	PI07-01	1440 Winter	5	+30%	5/240 Winter				92.306	0.082	0.000	0.10			5.6	SURCHARGED
1.010	PO07-01	1440 Winter	5	+30%	5/240 Winter				92.310	0.086	0.000	0.11			4.7	SURCHARGED
1.011	MH07-23	480 Winter	5	+30%					91.928	-0.236	0.000	0.10			4.7	OK
1.012	MH07-24	360 Winter	5	+30%					91.862	-0.236	0.000	0.10			4.7	OK

PN	US/MH Name	Level Exceeded
1.008	MH07-22	
1.009	PI07-01	
1.010	PO07-01	
1.011	MH07-23	
1.012	MH07-24	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 382877 406385 SD 82877 06385 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 5, 30, 100
Climate Change (%) 30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH07-01	15 Winter	30	+30%	100/15 Summer				105.436	-0.099	0.000	0.75			87.3	OK
1.001	MH07-02	15 Winter	30	+30%	30/15 Summer				104.751	0.159	0.000	1.04			128.4	SURCHARGED
1.002	MH07-03	15 Winter	30	+30%	100/15 Summer				103.273	-0.022	0.000	1.00			173.4	OK
1.003	MH07-04	15 Winter	30	+30%					99.095	-0.134	0.000	0.59			173.4	OK
2.000	CP07-01	15 Winter	30	+30%					97.118	-0.106	0.000	0.54			11.6	OK
1.004	MH07-05	15 Winter	30	+30%					96.945	-0.098	0.000	0.89			183.4	OK
3.000	DN0-01	15 Summer	30	+30%					97.213	0.000	0.000	1.02			12.4	SURCHARGED*
1.005	MH07-06	15 Winter	30	+30%					96.022	-0.106	0.000	0.86			194.9	OK
4.000	DN07-02	15 Winter	30	+30%					96.568	-0.068	0.000	0.58			10.4	OK*

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Level Exceeded
1.000	MH07-01	
1.001	MH07-02	
1.002	MH07-03	
1.003	MH07-04	
2.000	CP07-01	
1.004	MH07-05	
3.000	DN0-01	
1.005	MH07-06	
4.000	DN07-02	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.006	MH07-07	15 Winter	30	+30%					95.157	-0.272	0.000	0.33			204.7
5.000	CP07-02	15 Winter	30	+30%					99.136	-0.181	0.000	0.08			4.6
6.000	CP07-03	15 Winter	30	+30%					100.518	-0.198	0.000	0.03			4.1
5.001	MH07-08	15 Winter	30	+30%					98.839	-0.173	0.000	0.12			8.6
5.002	CP07-04	15 Winter	30	+30%					97.704	-0.169	0.000	0.13			18.8
7.000	CP07-05	15 Winter	30	+30%					97.996	-0.204	0.000	0.02			1.9
8.000	MH07-09	15 Winter	30	+30%					101.204	-0.096	0.000	0.59			42.3
8.001	MH07-10	15 Winter	30	+30%	100/15 Summer				99.289	-0.063	0.000	0.84			62.6
9.000	EXRE07-01	15 Winter	30	+30%	30/15 Summer				99.162	0.134	0.000	1.04			32.7
9.001	EXRE07-02	15 Winter	30	+30%	30/15 Summer				98.798	0.121	0.000	1.21			36.4
9.002	EX ATSD8205_7191A	15 Winter	30	+30%	30/15 Summer				98.741	0.180	0.000	0.98			52.0
8.002	MH07-11	15 Winter	30	+30%	30/15 Summer				98.462	0.215	0.000	1.27			117.1
10.000	CP07-06	15 Winter	30	+30%					101.394	-0.201	0.000	0.02			1.5
10.001	CP07-07	15 Winter	30	+30%					99.389	-0.178	0.000	0.09			5.0
10.002	MH07-12	15 Winter	30	+30%					98.293	-0.191	0.000	0.06			5.1
8.003	MH07-13	15 Winter	30	+30%	30/15 Summer				98.172	0.103	0.000	1.62			136.5
8.004	MH07-14	15 Winter	30	+30%					97.867	-0.132	0.000	0.72			169.0
8.005	MH07-15	15 Winter	30	+30%	5/15 Winter				96.682	0.163	0.000	1.92			167.7
7.001	MH07-16	15 Winter	30	+30%	30/15 Summer				95.513	0.513	0.000	1.24			163.8
7.002	MH07-17	15 Winter	30	+30%	30/15 Summer				95.364	0.477	0.000	0.70			161.5
7.003	MH07-18	15 Winter	30	+30%	5/15 Summer	100/15 Winter			95.125	0.769	0.000	1.92			156.3
11.000	CP07-08	15 Winter	30	+30%	5/15 Summer	100/15 Winter			95.223	0.267	0.000	2.00			13.5
5.003	MH07-19	15 Winter	30	+30%	5/15 Summer				94.801	0.534	0.000	2.16			176.6
12.000	CP07-09	30 Winter	30	+30%					98.439	-0.202	0.000	0.02			2.8
5.004	CP07-10	15 Winter	30	+30%	5/15 Summer				94.342	0.170	0.000	3.49			179.0
5.005	DN07-03	15 Winter	30	+30%					93.995	-0.156	0.000	0.64			178.5
13.000	DN07-04	15 Winter	30	+30%					95.838	-0.088	0.000	0.36			11.7
14.000	CP07-11	15 Winter	30	+30%					102.622	-0.179	0.000	0.09			5.0
14.001	CP07-12	15 Winter	30	+30%					101.177	-0.143	0.000	0.27			25.0
15.000	CP07-13	15 Winter	30	+30%					99.126	-0.166	0.000	0.16			11.4
14.002	MH07-20	15 Winter	30	+30%					97.837	-0.144	0.000	0.28			35.6
16.000	CP07-14	30 Winter	30	+30%					95.008	-0.168	0.000	0.15			10.1
1.007	MH07-21	15 Winter	30	+30%	30/15 Summer				93.679	0.194	0.000	1.15			403.7

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Status	Level Exceeded
1.006	MH07-07	OK	
5.000	CP07-02	OK	
6.000	CP07-03	OK	
5.001	MH07-08	OK	
5.002	CP07-04	OK	
7.000	CP07-05	OK	
8.000	MH07-09	OK	
8.001	MH07-10	OK	
9.000	EXRE07-01	SURCHARGED	
9.001	EXRE07-02	SURCHARGED	
9.002	EX ATSD8205_7191A	SURCHARGED	
8.002	MH07-11	SURCHARGED	
10.000	CP07-06	OK	
10.001	CP07-07	OK	
10.002	MH07-12	OK	
8.003	MH07-13	SURCHARGED	
8.004	MH07-14	OK	
8.005	MH07-15	SURCHARGED	
7.001	MH07-16	SURCHARGED	
7.002	MH07-17	SURCHARGED	
7.003	MH07-18	SURCHARGED	3
11.000	CP07-08	SURCHARGED	3
5.003	MH07-19	SURCHARGED	
12.000	CP07-09	OK	
5.004	CP07-10	SURCHARGED	
5.005	DN07-03	OK*	
13.000	DN07-04	OK*	
14.000	CP07-11	OK	
14.001	CP07-12	OK	
15.000	CP07-13	OK	
14.002	MH07-20	OK	
16.000	CP07-14	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Status	Level Exceeded
1.007	MH07-21	SURCHARGED	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.008	MH07-22	15 Winter	30	+30%	100/30 Winter				92.649	-0.187	0.000	0.86			399.9	OK
1.009	PI07-01	1440 Winter	30	+30%	5/240 Winter				92.529	0.305	0.000	0.10			5.9	SURCHARGED
1.010	PO07-01	1440 Winter	30	+30%	5/240 Winter				92.533	0.309	0.000	0.11			4.7	SURCHARGED
1.011	MH07-23	60 Summer	30	+30%					91.928	-0.236	0.000	0.10			4.7	OK
1.012	MH07-24	1440 Summer	30	+30%					91.862	-0.236	0.000	0.10			4.7	OK

PN	US/MH Name	Level Exceeded
1.008	MH07-22	
1.009	PI07-01	
1.010	PO07-01	
1.011	MH07-23	
1.012	MH07-24	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model		FEH	Data Type Point
FEH Rainfall Version		2013	Cv (Summer) 0.750
Site Location	GB 382877 406385 SD 82877 06385		Cv (Winter) 0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	5, 30, 100
Climate Change (%)	30, 30, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	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	MH07-01	15 Winter	100	+30%	100/15 Summer				106.073	0.538	0.000	0.86			99.1	SURCHARGED
1.001	MH07-02	15 Winter	100	+30%	30/15 Summer				105.454	0.862	0.000	1.15			141.2	SURCHARGED
1.002	MH07-03	15 Winter	100	+30%	100/15 Summer				103.707	0.412	0.000	1.08			187.1	SURCHARGED
1.003	MH07-04	15 Winter	100	+30%					99.102	-0.127	0.000	0.63			187.1	OK
2.000	CP07-01	15 Winter	100	+30%					97.143	-0.081	0.000	0.71			15.4	OK
1.004	MH07-05	15 Winter	100	+30%					96.964	-0.079	0.000	0.98			201.5	OK
3.000	DN0-01	15 Summer	100	+30%					97.213	0.000	0.000	1.29			15.7	SURCHARGED*
1.005	MH07-06	15 Winter	100	+30%					96.044	-0.084	0.000	0.96			216.9	OK
4.000	DN07-02	15 Winter	100	+30%					96.586	-0.050	0.000	0.78			13.8	OK*

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Level Exceeded
1.000	MH07-01	
1.001	MH07-02	
1.002	MH07-03	
1.003	MH07-04	
2.000	CP07-01	
1.004	MH07-05	
3.000	DN0-01	
1.005	MH07-06	
4.000	DN07-02	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
1.006	MH07-07	15 Winter	100	+30%					95.169	-0.260	0.000	0.37			230.6
5.000	CP07-02	15 Winter	100	+30%					99.142	-0.175	0.000	0.11			6.1
6.000	CP07-03	15 Winter	100	+30%					100.522	-0.194	0.000	0.05			5.4
5.001	MH07-08	15 Winter	100	+30%					98.848	-0.164	0.000	0.16			11.5
5.002	CP07-04	15 Winter	100	+30%					97.713	-0.160	0.000	0.18			25.0
7.000	CP07-05	15 Winter	100	+30%					97.999	-0.201	0.000	0.03			2.5
8.000	MH07-09	15 Winter	100	+30%					101.232	-0.068	0.000	0.79			56.3
8.001	MH07-10	15 Winter	100	+30%	100/15 Summer				99.789	0.437	0.000	0.99			73.6
9.000	EXRE07-01	15 Winter	100	+30%	30/15 Summer				99.626	0.598	0.000	1.38			43.5
9.001	EXRE07-02	15 Winter	100	+30%	30/15 Summer				99.272	0.595	0.000	1.56			46.9
9.002	EX ATSD8205_7191A	15 Winter	100	+30%	30/15 Summer				99.175	0.614	0.000	1.19			62.9
8.002	MH07-11	15 Winter	100	+30%	30/15 Summer				98.699	0.452	0.000	1.56			144.5
10.000	CP07-06	15 Winter	100	+30%					101.396	-0.199	0.000	0.03			2.0
10.001	CP07-07	15 Winter	100	+30%					99.396	-0.171	0.000	0.12			6.7
10.002	MH07-12	15 Winter	100	+30%					98.299	-0.185	0.000	0.07			6.8
8.003	MH07-13	15 Winter	100	+30%	30/15 Summer				98.264	0.195	0.000	1.97			165.9
8.004	MH07-14	15 Winter	100	+30%					97.934	-0.065	0.000	0.88			206.3
8.005	MH07-15	15 Winter	100	+30%	5/15 Winter				96.775	0.256	0.000	2.36			206.7
7.001	MH07-16	15 Winter	100	+30%	30/15 Summer				96.243	1.243	0.000	1.54			202.8
7.002	MH07-17	15 Winter	100	+30%	30/15 Summer				95.983	1.096	0.000	0.88			202.6
7.003	MH07-18	30 Winter	100	+30%	5/15 Summer	100/15 Winter			95.561	1.205	5.344	2.24			182.1
11.000	CP07-08	30 Winter	100	+30%	5/15 Summer	100/15 Winter			95.556	0.600	0.494	2.32			15.6
5.003	MH07-19	15 Winter	100	+30%	5/15 Summer				95.221	0.954	0.000	2.46			201.3
12.000	CP07-09	30 Winter	100	+30%					98.441	-0.200	0.000	0.03			3.7
5.004	CP07-10	15 Winter	100	+30%	5/15 Summer				94.678	0.506	0.000	3.98			204.0
5.005	DN07-03	15 Summer	100	+30%					94.151	0.000	0.000	0.74			205.3
13.000	DN07-04	15 Winter	100	+30%					95.849	-0.077	0.000	0.48			15.6
14.000	CP07-11	15 Winter	100	+30%					102.628	-0.173	0.000	0.12			6.7
14.001	CP07-12	15 Winter	100	+30%					101.191	-0.129	0.000	0.36			33.3
15.000	CP07-13	15 Winter	100	+30%					99.137	-0.155	0.000	0.21			15.2
14.002	MH07-20	15 Winter	100	+30%					97.851	-0.130	0.000	0.37			47.4
16.000	CP07-14	30 Winter	100	+30%					95.018	-0.158	0.000	0.20			13.6
1.007	MH07-21	15 Winter	100	+30%	30/15 Summer				94.059	0.574	0.000	1.38			485.6

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Status	Level Exceeded	
1.006	MH07-07	OK		
5.000	CP07-02	OK		
6.000	CP07-03	OK		
5.001	MH07-08	OK		
5.002	CP07-04	OK		
7.000	CP07-05	OK		
8.000	MH07-09	OK		
8.001	MH07-10	SURCHARGED		
9.000	EXRE07-01	FLOOD RISK		
9.001	EXRE07-02	SURCHARGED		
9.002	EX ATSD8205_7191A	SURCHARGED		
8.002	MH07-11	SURCHARGED		
10.000	CP07-06	OK		
10.001	CP07-07	OK		
10.002	MH07-12	OK		
8.003	MH07-13	SURCHARGED		
8.004	MH07-14	OK		
8.005	MH07-15	SURCHARGED		
7.001	MH07-16	SURCHARGED		
7.002	MH07-17	FLOOD RISK		
7.003	MH07-18	FLOOD		3
11.000	CP07-08	FLOOD		3
5.003	MH07-19	SURCHARGED		
12.000	CP07-09	OK		
5.004	CP07-10	SURCHARGED		
5.005	DN07-03	SURCHARGED*		
13.000	DN07-04	OK*		
14.000	CP07-11	OK		
14.001	CP07-12	OK		
15.000	CP07-13	OK		
14.002	MH07-20	OK		
16.000	CP07-14	OK		

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Status	Level Exceeded
1.007	MH07-21	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Proposed Catchment - 07

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.008	MH07-22	30 Winter	100	+30%	100/30 Winter				92.838	0.002	0.000	1.02			476.6	SURCHARGED
1.009	PI07-01	1440 Winter	100	+30%	5/240 Winter				92.720	0.496	0.000	0.09			5.4	SURCHARGED
1.010	PO07-01	1440 Winter	100	+30%	5/240 Winter				92.720	0.496	0.000	0.11			4.7	SURCHARGED
1.011	MH07-23	1440 Winter	100	+30%					91.928	-0.236	0.000	0.10			4.7	OK
1.012	MH07-24	1440 Winter	100	+30%					91.862	-0.236	0.000	0.10			4.7	OK

PN	US/MH Name	Level Exceeded
1.008	MH07-22	
1.009	PI07-01	
1.010	PO07-01	
1.011	MH07-23	
1.012	MH07-24	

Annex D Historical flood records

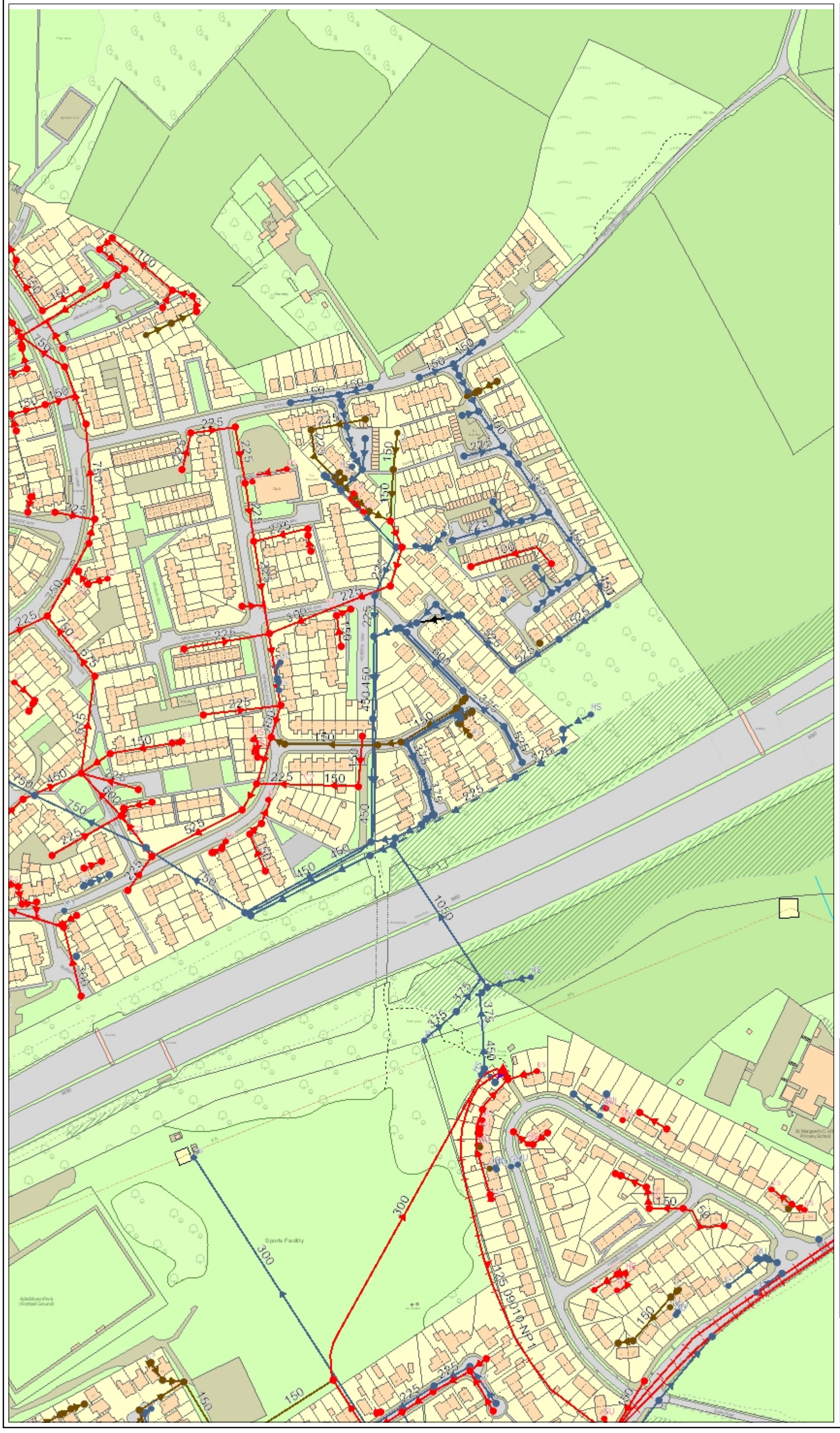
D.1 Flooding hotspots


M62 J19/A6046
Birch
Simister
M60 J18/M62 J18/M66
M60 J17/A56
M60 J19/A57B
M60 J20/A664/A
Key
A1 (Highest)
A (Very High)
B (High)
C (Moderate)
D (Low)
X (Risk Addressed)
Not determined

D.2 Flooding hotspots coordinates

Unique DDMS Asset Reference	Asset Type	Asset Owner	OS Easting Co-ordinate	OS Northing Co-ordinate	Drainage Asset Baseline Category
1588	Hotspot	National Highways	381178	404914	A1
1469	Hotspot	National Highways	383003	405871	A1
1552	Hotspot	National Highways	382986	405715	A
2303	Hotspot	National Highways	382315	407189	A
1589	Hotspot	National Highways	380645	404599	B
1815	Hotspot	National Highways	381187	404985	B
2427	Hotspot	National Highways	381729	405358	B
2405	Hotspot	National Highways	382277	405641	B
2417	Hotspot	National Highways	382591	405804	B
1468	Hotspot	National Highways	380593	404610	C
2406	Hotspot	National Highways	382612	405796	C
2548	Hotspot	National Highways	382856	406061	C
1481	Hotspot	National Highways	382395	406821	X - Risk Addressed

Annex E United Utilities Information



United Utilities Maps for Safe Dig

Date :	20/09/2022 11:39:33
Centre X :	382250
Centre Y :	405750
Scale :	2500
UserName:	H1GHW4YS

Extract from maps of United Utilities' Underground Assets

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

United Utilities
Water for the North West