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Flood Risk Assessment

For
Camp Road, Upper Heyford
Phase 6

Version 2
March 2016

Contents

Appendices

1.0 Introduction

1.1 Woods Hardwick Infrastructure LLP have been appointed by Dorchester Group to undertake a Flood Risk Assessment in respect of Phase 6 development proposals at the Upper Heyford development site.

1.2 The wider development site comprises of approximately 76 hectares and has outline planning consent for residential and commercial use.

1.3 A Flood Risk Assessment was prepared and approved in support of the outline application. The report was produced by Waterman in October 2010.

1.4 The site is currently live and a number of development parcels have received reserved matters consent. These parcels have been supported by individual Flood Risk Assessment Compliance Notes to demonstrate that the detailed drainage design accords with those principles approved at the outline stage.

1.5 The purpose of this report is to support a new detailed planning application in support of the development at Phase 6.

1.6 This report does not seek to undo the principles of the approved Flood Risk Assessment but to clarify them within a self-contained Flood Risk Assessment.

1.7 A copy of the residential parcel Plan is contained within **Appendix A.**

2.0 Overview of Approved FRA

2.1 The entire site is located within Flood Zone 1.

2.2 The FRA sets out a detailed approach to attenuation across the Upper Heyford site which comprises of areas identified for retention, areas for refurbishment and areas for redevelopment to provide new residential dwellings.

2.3 The Environment Agency (EA) has confirmed that areas identified solely for retention and refurbishment do not require attenuation of existing surface water discharge.

2.4 The fundamental principle of the FRA is that runoff from proposed areas of redevelopment should be attenuated to existing 1 in 100 year flows with a 30% allowance for climate change.

2.5 Attenuation is to be provided through the use of balancing ponds, permeable paving and attenuation tanks where necessary. Swales will be incorporated through the site where appropriate.

2.6 The FRA splits the development into four main catchment areas and provides a series of calculations for each.

2.7 The FRA also requires a 10% betterment of existing flows entering the eastern tributary of the Gallos Brook.

3.0 Existing Site

3.1 Site Description

3.1.1 Phase 6 (parcel D4b) consists of approximately 1.395 hectares of land located to the south of Camp Road.

3.1.2 Phase 6 is located within Catchment Area 2 as identified in the approved FRA figure 5.

3.2 Ground Conditions

3.2.1 Extensive intrusive site investigations have been undertaken which covered the entire site.

3.2.2 The general ground conditions comprise of layers of silt and clay. This is underlain by weathered limestone bedrock at an average depth of 1.5m.

3.3 Hydrology

3.3.1 The wider site includes a number of watercourses and tributaries.

3.3.2 A tributary of the Gallos Brook runs to the east of Phase 6.

3.3.4 There is anecdotal evidence of flooding associated with this tributary at the caravan park to the south of the proposed development parcel

3.3.3 The Gallos Brook joins the River Ray approximately 11km to the south of the site. The River Cherwell is the nearest Main River and is some 1.2km to the west of the site.

4.0 Proposed Development

4.1 Phase 6 (parcel D4b) comprises 43 dwellings within 1.395 hectares of land. Refer to **Appendix B** for the proposed layout.

5.0 Flood Risk Assessment

5.1 Background

5.1.1 The purpose of this section of the report is to identify the risk of flooding to and by the development.

5.1.2 Following the increased frequency of flooding during recent years, much work has been undertaken at a national level to assess the relationship between new development and flood risk. This work resulted in the publication of Planning Policy Statement 25 (PPS25) in early 2007 with an update being released in March 2010.

5.1.3 Alongside the release of the NPPF in March 2012 the TGNPPF was released serving as a flood risk based addendum to the national planning guidance. These documents replace PPS25; however, many of the principles set out in PPS25 remain relevant. The TGNPPF was withdrawn in late 2014 and replaced with the online Planning Practice Guidance (PPG) albeit much of the advice relating to flood risk remains unchanged

5.1.4 Table 1 of PPG: Flood Risk and Coastal Change seeks to define different flood risk Zones where: Zone 1 is considered to be low risk since it is outside of the area which is likely to suffer inundation from a 0.1% probability rainfall event; Zone 2 is considered to be medium risk lying between the 0.1% probability flood contour and the 1% or 100 year flood area; Zone 3 is divided into 2 categories with Zone 3A having a >1% annual probability of river flooding or a >0.5% probability of flooding from the sea and Zone 3B being the functional floodplain. This guidance reaffirms the guidance and categorisation included within PPS25.

5.1.5 The Environment Agency's (EA) flood map demonstrates that this site lies within Flood Zone 1 and is therefore at low risk.

5.1.6 Table 2 of the PPG: Flood Risk and Coastal Change seeks to classify the vulnerability of different land uses. The residential dwellings fall under the More Vulnerable classification.

5.1.7 Finally Table 3 of the PPG: Flood Risk and Coastal Change brings Table 1 and 2 together to provide a matrix defining the level of Flood Risk Assessment required based on the flood zone and vulnerability class of a development.

5.1.8 Table 3 of the PPG: Flood Risk and Coastal Change therefore demonstrates that this land use is appropriate for the site given the flood zone and vulnerability class.

5.2 Risk of Flooding to the Development from Known Sources

5.2.1 Presented below is an analysis and summary of the potential for the site to flood from known sources.

Flooding from Rivers

5.2.2 The Environment Agency's (EA) flood map demonstrates that the site lies within Flood Zone 1.

Flooding from the Sea

5.2.3 Given the site's location some 100km inland there is considered to be no risk of flooding from this source.

Flooding from Land

5.2.4 The EA's surface water flood map demonstrates areas that are at risk of surface water flooding should there be an accumulation at ground level. The map demonstrates that the proposed development is not at risk of surface water flooding.

Flooding from Groundwater

5.2.5 The EA's groundwater flood risk maps demonstrate areas that are at risk of flooding from high groundwater. The site is noted as not at risk.

5.2.6 This is also confirmed on site and via ground water monitoring which noted ground water level some 1.2m below ground level.

Flooding from Sewers

5.2.7 There are no public sewers within the site and all sewers are currently privately owned. There are no reported incidents of flooding from these private sewers.

Flooding from Reservoirs, Canals and Other Artificial Sources

5.2.8 There are no man made features within the vicinity of the development site.

5.3 Risk of Flooding Caused by the Development

5.3.1 Presented below is a summary and analysis of the potential for the site to exacerbate the risk of flooding to third parties both upstream and downstream.

Encroachment onto Floodplain

5.3.2 The entirety of the site lies outside of the floodplain, there is therefore no risk of encroachment.

Impedance of Flood Flows

5.3.3 As the site lies outside of the flood plain there is no risk of the site impeding flood flows.

Contribution to Flood Flows by Development Drainage

5.3.4 The approved FRA produced in support of the outline condition states in Paragraph 3.20: "In accordance with PPS25, local policy and EA guidance the rate of surface water runoff from new development would be controlled so that it does not increase over the existing situation for the 1 in 100 year even, while taking climate change into account".

5.3.7 It is proposed to maintain the existing drainage regime of the site. This will require flows from the proposed development to be restricted to provide the level of improvement required by the EA.

5.3.8 It is proposed to maintain the existing catchments and watershed with the site.

5.3.9 Restriction of proposed surface water runoff and attenuation will ensure the risk to others, and within the development is mitigated.

5.3.10 The detailed drainage strategy is described in more detail in **Section 6** of this report.

5.4 Climate Change

5.4.1 There is an increasing body of scientific evidence that suggests that the global climate is changing as a result of human activity. Past, present and future emissions of greenhouse gases are expected to cause significant climate change during this century.

5.4.2 The nature of climate change will vary: for the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall can be expected. These kinds of changes will have implications on river-flooding and also localised flash flooding.

5.4.3 The PPG requires developments to consider the potential impacts of climate change; as such this assessment makes a 30% allowance for climatic change.

6. SURFACE WATER DISPOSAL

6.1 Principles

6.1.1 In addition to ensuring that the development is not at risk of flooding from external sources, it is also important to ensure that the scheme itself does not exacerbate flood risk for others or within the proposed development. It is therefore essential that the arrangements for storm water disposal are fully assessed to guarantee that the effects are mitigated and that there will be no impact on the existing land drainage regime.

6.1.2 All of the recent guidance on the arrangements for storm water disposal from new developments has encouraged the application of a hierarchy for surface water disposal. This has now been formalised in the Building Regulations Part H.

6.1.3 The first choice for surface water disposal which should be pursued is via infiltration and only where it has been determined that the ground conditions are not suitable should the second choice of disposal to a ditch or watercourse be considered. If there is no alternative the third and last choice of disposal to public sewer can be considered.

6.2 Discharge Strategy

6.2.1 Paragraph 3.20 of the FRA states: "In accordance with PPS25, local policy and EA guidance the rate of surface water runoff from new development would be controlled so that it does not increase over the existing situation for the 1 in 100 year event, while taking climate change into account".

6.2.2 It is proposed to connect the phase 6 network, attenuation and flow controls serving the phase to the surrounding drainage network designed during phases 3, 4 and 5.

6.2.3 Phase 6 had been allowed for in the phase 3-5 network and is therefore not subject to any additional restriction providing it can be demonstrated that once the refined/ expanded phase 6 network is included, there is no additional flooding generated within the phase 3-5 network and that the discharge rate out of the phase 3-5 network is not increased beyond the allowance rate.

6.2.4 The connection points to the phase 3-5 network will be upstream of the pipe runs 21.005, 21.009, 21.011 and 29.008. Slight restrictions on the discharge rates will be required to ensure no flooding to the downstream system.

6.2.5 The phase 3-5 network then connects to the existing "central" network upstream of run 1.028 via an appropriately sized flow control device. The existing system conveys both existing and new development flows to the central outfall. The discharge rate out of this is covered in detail in the phase 3-5 FRA Compliance note. An updated version of the table is shown below:

Total flow from phases 3, 4, 5b, 5 and 6	
	1 in 100yr Discharge (l/s)
Total allowable rate for phases 3-6	585.4 l/s
Actual rate from phases into existing network (runs 21.020, 42.000 and 43.005 in the calculations)	112.2 + 3.3 + 96.6 = 212.1 l/s

6.2.6 The total permissible flow from these phases noted above includes the following information for phase 6 also duplicated from the phase 3-5 Flood Risk Assessment Compliance note:

Phase 6		
	Area (m^2)	**1 in 100yr Discharge (l/s)**
Existing Impermeable surfacing	6168	69.6 l/s

6.2.7 The full simulated network calculations include runs outside of the phase 3-5 and phase 6 networks, however these elements are not included as part of this report.

6.2.8 The purpose of this report is not to revisit the calculation of the allowable rates stated within the FRA or previously approved FRA-Cs.

6.3 Attenuation Strategy

6.3.1 The parcels contain attenuation in the form of underground tanks and oversized pipes both within the application boundary.

6.3.2 The oversized pipes are proposed for adoption by the Water Company.

6.3.3 The underground storage tanks will cater for the majority of the attenuation required and either be maintained by the Water Company or a management company.

6.3.4 The discharge into phase 3-5 network from phase 6 will be controlled using hydro-brake vortex controllers and orifices to maximise the efficiency of the storage network and the ensure there is no increased flood risk in the downstream system.

6.3.5 Living roofs have been discounted as they are not in keeping with the strict urban planning requirements within a conservation area. Rain water harvesting has also been discounted due to ongoing maintenance issues and integration into domestic plumbing.

7.0 Hydraulic Performance

7.1 Modelling

7.1.1 A detailed Microdrainage model has been constructed to simulate the 1 in 100 year (plus climate change) storm for the full network including the phase 6 system.

7.1.2 The Microdrainage model (refer to **Appendix C**) demonstrates that the total proposed 1 in 100 year (plus climate change) discharge rate from the phases 3-5 does not exceed 585.4 l/s at runs 21.020, 42.000 and 43.005 once phase 6 details have been refined from those assumed in the original calculations.

7.1.3 The 212.1 l/s discharge rate achieved is significantly lower than the allowable discharge rate.

7.2 Exceedance

7.2.1 During storms in excess of the designated storm, there is the potential for the storage structures and drainage system to be overwhelmed, leading to flooding. Indicative finished levels have been designed so that during these periods, flood water will be directed away from the proposed building entrances and into the roads and soft landscaping areas.

7.3 Pollution prevention

7.3.1 As the parking areas are smaller than 800m sq, PPG3 states that trapped gullies will provide suitable protection against contamination.

7.3.2 It is noted that the off parcel sewer passes through a petrol interceptor before discharge into the existing watercourse which meets the requirements of PPG3.

8.0 Summary and Conclusions

8.1 This Flood Risk Assessment has been prepared in support of a detailed planning application for Phase 6 at the Upper Heyford Development.

8.2 This FRA has been produced maintaining the same principles as the approved FRA attached to the outline planning consent.

8.3 The scheme has been assessed and is deemed not to be at risk of flooding and is also located within Flood Zone 1.

8.4 The FRA confirms no attenuation is required for areas being refurbished or retained.

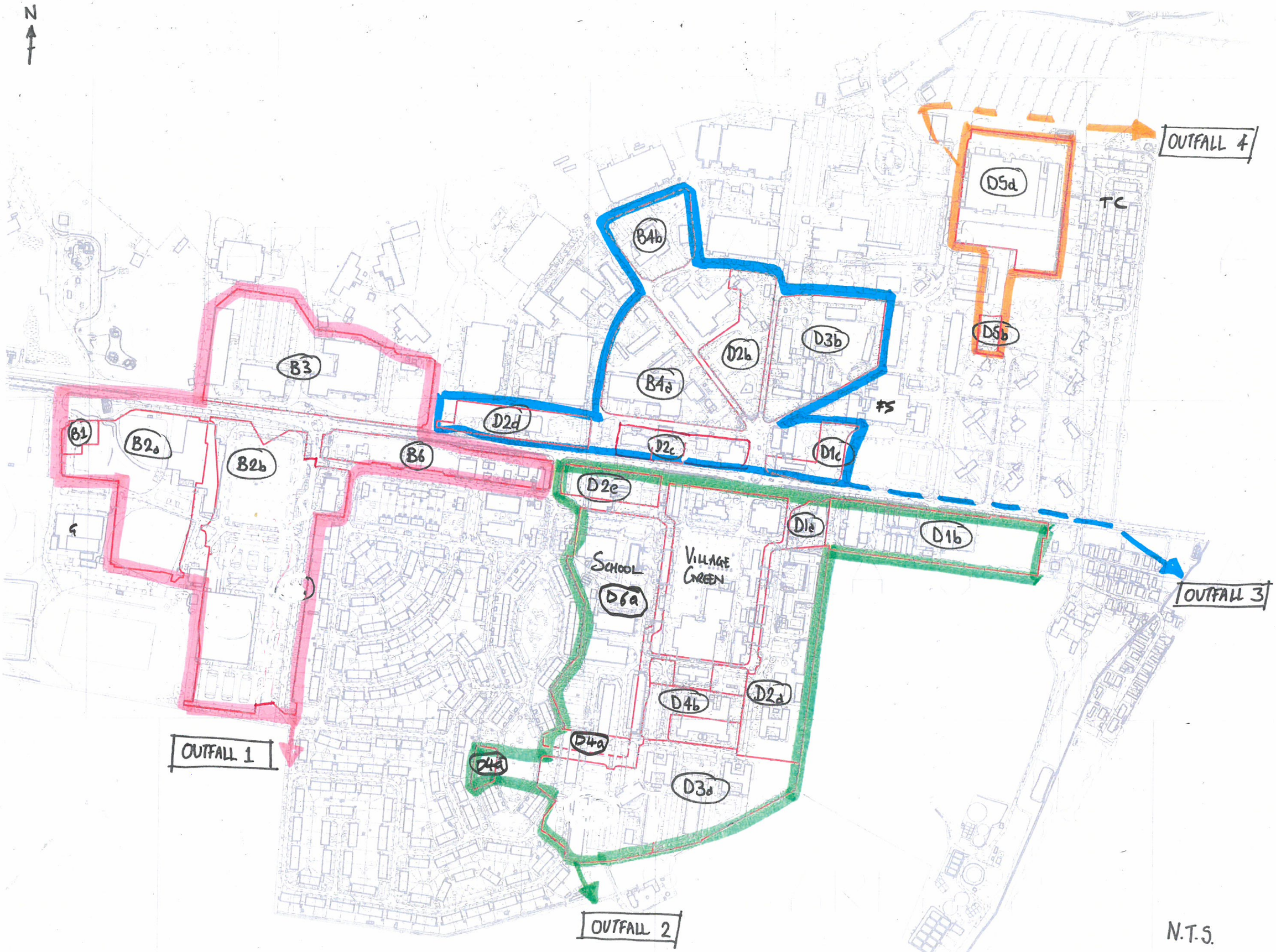
8.5 The FRA requires surface water runoff from new development to be restricted to existing 1 in 100 year runoff rates, and flows attenuated including a 30% allowance for climate change.

8.6 A Microdrainage model has been created and the results demonstrate a significant betterment in discharge rates.

8.7 Based on the detailed assessment of flood risk and betterment in proposed flows we fully support this planning application.

APPENDIX A

Residential Parcel Plan


N
OUTFALL 4
D5a
TC
B4b
D5b
B3
D2b
D3b
B4a
#5
B1
B2a
D2d
D2c
D1c
B2b
B6
D2e
D1a
D1b
SCHOOL
VILLAGE GREEN
OUTFALL 3
D6a
D4b
D2a
D4a
D4c
D3a
OUTFALL 1
OUTFALL 2
N.T.S.

APPENDIX B

Proposed levels and drainage layout

NOTES

1. Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the architect or engineer before proceeding. © This drawing is copyright.

2. Reproduced from OS Sitemap ® by permission of Ordnance Survey® on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright 2008. All rights reserved. Licence number 100007126.

3. Until technical approval has been obtained from the relevant authorities, all drawings are issued as preliminary and not for construction. Should the contractor commence site work prior to approval being given it is entirely at his own risk.

Building Drainage

1. All connections to adoptable manholes from private building drainage to be 150mm diameter pipes unless otherwise specified.

2. All house drainage to be 100mm dia unless otherwise stated, and laid in accordance with current Building Regulations and BS8301 : 1985.

3. All private drainage products are to be Polypipe or similar approved.

4. Pipe bedding material is to be Class S with 150mm minimum thickness surround.

5. Backfill is to be be with selected fill free of stones larger than 40mm, lumps of clay over 100mm, timber, frozen material and vegetable matter.

NOTES

6. Pipe protection of house drainage runs is required in accordance with the Typical House Drainage Details drawing. The contractor shall satisfy themselves and agree with the Site Management the actual extent of pipe protection required.

7. Pipes entering and leaving manholes/inspection chambers shall include a rocker pipe, 600mm in length.

8. Brickwork to chambers shall be Class B Engineering to BS3921.

9. Rainwater pipes are to be sited on side elevations whenever possible.

10. All retaining walls with a height of 600mm or greater are to include 1.2m high post and rail fencing unless located in rear gardens. Similar retaining walls in rear gardens are to include 900mm height picket fence.

11. All flights of steps to primary level access, with more than 2 steps are to be provided with handrailing, except where the steps are 900mm are more appart.

12. Brick retaining walls are to be used in preference to gravel boards for front garden areas.

13. Drainage and road design subject to Water and Highway Authority approval.

14. Edge restraint to private/blockwork - 2 stretcher course (unless noted otherwise).

KEY

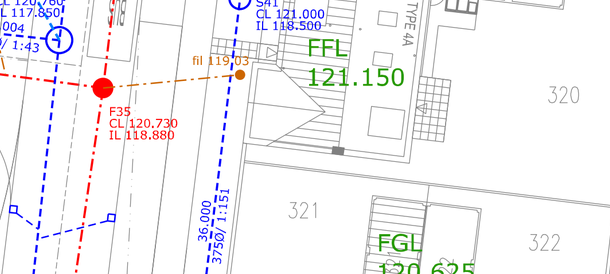
Adoptable Sewers

- F1 — Proposed Adoptable Foul Sewer
- S1 — Proposed Adoptable Surface Water Sewer
- G / ExG — Highway Gully (Existing)

Private Drains

- fil25.30 — Medium Foul I.C. (450mm dia. Depth to invert 600-1000mm) Non Entry I.C. (330mm dia. Depth to invert 1000-3000mm)
- fil 25.30 — Large Foul I.C. (1200x750mm or PC rings. Depth to invert 1000-1800mm)
- sil 25.30 — Medium Surface Water I.C. (450mm dia. Depth to invert 600-1000mm) Non Entry I.C. (330mm dia. Depth to invert 1000-3000mm)
- sil 25.30 — Large Surface Water I.C.(1200x750mm or PC rings. Depth to invert 1000-1800mm)
- YG — Yard gully
- ACO — Drainage Channel to be ACO MultiDrain MD or similar approved
- IL 25.30 — Rodding Eye

Plot No. 6
Tanking (Max. height prefixed by TK)
Pedestrian Door to Garage
Unilog Retaining Wall. Max. retained height
sw - standing waste; aav - air admittance valve
Soil & vent pipe to tile or ridge vent
Exposed Brickwork. Max. height below dpc.
House Type
ss - stub stack; bf - balanced flue
Proposed Ground Level
Retaining Wall. Max retained height & type (refer to SRWT-4-01E for details)
Finished Floor Level
No of Steps. Ref going A-300, B-450, C-600, D-900
Shared drive construction
Gravel Board (RC - Reinforced Concrete Backing)



DRAINAGE WITHIN THE ROADS SURROUNDING PHASE 6 ARE TO BE INSTALLED AS PART OF PHASE 3, 4 AND 5 WORKS.

SUB STATION AND ASSOCIATED DRAINAGE IS TO BE INSTALLED AS PART OF PHASE WORKS.

RWP, SVP AND GULLEY POSITIONS TBC AS PART OF THE DETAILED DESIGN. FFLS ARE +/- 450MM

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT AUTHORITIES, ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR COMMENCE SITE WORK PRIOR TO APPROVAL BEING GIVEN IT IS ENTIRELY AT HIS OWN RISK.

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE
C	Updated to suit latest site layout	AT	JF	22.03.16
B	Latest layout shown	AT	JF	12.01.16
A	Updated to suit latest site layout	AT	JF	23.10.15

PRELIMINARY ■ INFORMATION ☐ TENDER ☐ CONSTRUCTION ☐ AS BUILT ☐

WOODS HARDWICK
ARCHITECTS, ENGINEERS AND DEVELOPMENT CONSULTANTS

TITLE UPPER HEYFORD
PARCEL D4b (PHASE 6)

DETAILS PROPOSED ENGINEERING LAYOUT

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SCALE: A1- 1:250 DATE: SEPTEMBER 2015 DRAWN: AT CHK: JF

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HEYF-5-936 C

APPENDIX C

Proposed Microdrainage Calculations

Note:

The calculations include the entire network including existing areas upstream and areas downstream of this phase. The runs numbers which relate to Phase 6 (in the order shown in the calculations) are:
Pipe ref 24.000 25.000 24.001 24.002 24.003 28.000 33.000 33.001 36.000 36.001

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for SWS

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
Site Location	GB 450500 225250 SP 50500 25250
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Maximum Rainfall (mm/hr)	0
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for SWS

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.000	46.310	0.699	66.3	0.462	5.00	0.0	0.600	o	225	
1.001	27.589	0.287	96.1	0.090	0.00	0.0	0.600	o	225	
1.002	19.709	0.161	122.4	0.084	0.00	0.0	0.600	o	225	
1.003	54.656	0.602	90.8	0.024	0.00	0.0	0.600	o	225	
1.004	48.308	0.537	90.0	0.000	0.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	5.48	125.633	0.462	0.0	0.0	0.0	1.61	64.0	0.0
1.001	0.00	5.82	124.934	0.552	0.0	0.0	0.0	1.33	53.0	0.0
1.002	0.00	6.10	124.647	0.636	0.0	0.0	0.0	1.18	46.9	0.0
1.003	0.00	6.77	124.486	0.660	0.0	0.0	0.0	1.37	54.6	0.0
1.004	0.00	7.25	123.809	0.660	0.0	0.0	0.0	1.66	117.2	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
1.005	11.396	0.122	93.4	0.000	0.00	0.0	0.600	o	300	
2.000	9.477	0.311	30.5	0.100	5.00	0.0	0.600	o	150	
2.001	22.265	0.731	30.5	0.049	0.00	0.0	0.600	o	150	
2.002	38.145#	0.302	126.3	0.109	0.00	0.0	0.600	o	150	
2.003	7.222#	0.675	10.7	0.000	0.00	0.0	0.600	o	225	
1.006	59.849	0.160	374.1	0.145	0.00	0.0	0.600	o	450	
3.000	26.967	0.234	115.2	0.105	5.00	0.0	0.600	o	150	
3.001	46.625	0.520	89.7	0.090	0.00	0.0	0.600	o	150	
3.002	4.363	0.018	242.4	0.130	0.00	0.0	0.600	o	150	
3.003	22.819	0.169	135.0	0.076	0.00	0.0	0.600	o	150	
3.004	21.320#	0.119	179.2	0.060	0.00	0.0	0.600	o	150	
4.000	71.622	0.359	199.5	0.175	5.00	0.0	0.600	o	150	
3.005	27.060#	0.185	146.3	0.000	0.00	0.0	0.600	o	450	
5.000	8.420#	0.093	90.5	0.057	5.00	0.0	0.600	o	150	
3.006	40.137	0.227	176.8	0.057	0.00	0.0	0.600	o	450	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	0.00	7.37	123.272	0.660	0.0	0.0	0.0	1.63	115.0	0.0
2.000	0.00	5.09	125.319	0.100	0.0	0.0	0.0	1.83	32.3	0.0
2.001	0.00	5.29	125.008	0.149	0.0	0.0	0.0	1.83	32.4	0.0
2.002	0.00	6.00	124.277	0.258	0.0	0.0	0.0	0.89	15.8	0.0
2.003	0.00	6.03	123.900	0.258	0.0	0.0	0.0	4.02	160.0	0.0
1.006	0.00	8.32	123.000	1.063	0.0	0.0	0.0	1.05	166.2	0.0
3.000	0.00	5.48	126.002	0.105	0.0	0.0	0.0	0.94	16.5	0.0
3.001	0.00	6.21	125.768	0.195	0.0	0.0	0.0	1.06	18.8	0.0
3.002	0.00	6.33	125.248	0.325	0.0	0.0	0.0	0.64	11.3	0.0
3.003	0.00	6.77	125.230	0.401	0.0	0.0	0.0	0.86	15.3	0.0
3.004	0.00	7.24	125.061	0.461	0.0	0.0	0.0	0.75	13.2	0.0
4.000	0.00	6.69	125.351	0.175	0.0	0.0	0.0	0.71	12.5	0.0
3.005	0.00	7.51	124.892	0.636	0.0	0.0	0.0	1.68	267.0	0.0
5.000	0.00	5.13	125.100	0.057	0.0	0.0	0.0	1.06	18.7	0.0
3.006	0.00	7.95	124.707	0.750	0.0	0.0	0.0	1.53	242.7	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
3.007	20.544	0.085	241.7	0.074	0.00	0.0	0.600	o	450	
3.008	7.935	1.330	6.0	0.000	0.00	0.0	0.600	o	225	
6.000	8.698	0.037	235.1	0.000	5.00	0.0	0.600	o	300	
6.001	24.347	0.063	386.5	0.000	0.00	0.0	0.600	o	450	
1.007	37.392	0.253	147.8	0.069	0.00	0.0	0.600	o	150	
7.000	12.065#	0.453	26.6	0.036	5.00	0.0	0.600	o	100	
7.001	33.946#	0.418	81.2	0.060	0.00	0.0	0.600	o	100	
7.002	24.933	0.375	66.5	0.042	0.00	0.0	0.600	o	150	
7.003	12.230	0.045	271.8	0.045	0.00	0.0	0.600	o	150	
8.000	11.634	0.383	30.4	0.061	5.00	0.0	0.600	o	100	
7.004	48.302	0.600	80.5	0.055	0.00	0.0	0.600	o	150	
7.005	39.390	0.653	60.3	0.000	0.00	0.0	0.600	o	150	
1.008	13.653	0.092	148.4	0.000	0.00	0.0	0.600	o	150	
1.009	29.758	0.157	189.5	0.000	0.00	0.0	0.600	o	225	
9.000	49.037	0.490	100.1	0.102	5.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.007	0.00	8.21	124.480	0.824	0.0	0.0	0.0	1.30	207.3	0.0
3.008	0.00	8.24	124.395	0.824	0.0	0.0	0.0	5.39	214.4	0.0
6.000	0.00	5.14	122.940	0.000	0.0	0.0	0.0	1.02	72.2	0.0
6.001	0.00	5.54	122.903	0.000	0.0	0.0	0.0	1.03	163.5	0.0
1.007	0.00	9.08	122.840	1.956	0.0	0.0	0.0	0.82	14.6	0.0
7.000	0.00	5.13	125.181	0.036	0.0	0.0	0.0	1.50	11.8	0.0
7.001	0.00	5.80	124.728	0.096	0.0	0.0	0.0	0.85	6.7	0.0
7.002	0.00	6.13	124.260	0.138	0.0	0.0	0.0	1.24	21.8	0.0
7.003	0.00	6.47	123.885	0.183	0.0	0.0	0.0	0.60	10.7	0.0
8.000	0.00	5.14	124.273	0.061	0.0	0.0	0.0	1.41	11.0	0.0
7.004	0.00	7.19	123.840	0.299	0.0	0.0	0.0	1.12	19.8	0.0
7.005	0.00	7.69	123.240	0.299	0.0	0.0	0.0	1.30	22.9	0.0
1.008	0.00	9.36	122.587	2.255	0.0	0.0	0.0	0.82	14.5	0.0
1.009	0.00	9.88	122.420	2.255	0.0	0.0	0.0	0.95	37.6	0.0
9.000	0.00	5.52	122.870	0.102	0.0	0.0	0.0	1.57	111.1	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
9.001	3.625	0.042	86.3	0.000	0.00	0.0	0.600	o	150	
1.010	23.462	0.160	146.6	0.030	0.00	0.0	0.600	o	225	
10.000	15.760	0.100	157.6	0.030	5.00	0.0	0.600	o	225	
10.001	13.900	0.090	154.4	0.030	0.00	0.0	0.600	o	225	
10.002	26.250	0.160	164.1	0.030	0.00	0.0	0.600	o	225	
10.003	23.160	0.140	165.4	0.037	0.00	0.0	0.600	o	225	
10.004	21.300	0.130	163.8	0.030	0.00	0.0	0.600	o	225	
10.005	12.120	0.075	161.6	0.000	0.00	0.0	0.600	o	225	
10.006	16.610	0.090	184.6	0.030	0.00	0.0	0.600	o	300	
11.000	9.110	0.050	182.2	0.035	5.00	0.0	0.600	o	300	
10.007	6.510	0.030	217.0	0.000	0.00	0.0	0.600	o	300	
10.008	12.600	0.060	210.0	0.030	0.00	0.0	0.600	o	300	
10.009	28.830	0.130	221.8	0.010	0.00	0.0	0.600	o	300	
10.010	23.380	0.110	212.5	0.038	0.00	0.0	0.600	o	300	
10.011	9.000	0.102	88.2	0.000	0.00	0.0	0.600	o	150	
1.011	14.060	0.079	178.0	0.000	0.00	0.0	0.600	o	225	
1.012	74.443	1.113	66.9	0.046	0.00	0.0	0.600	o	225	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
9.001	0.00	5.58	122.380	0.102	0.0	0.0	0.0	1.08	19.1	0.0
1.010	0.00	10.24	122.263	2.387	0.0	0.0	0.0	1.08	42.8	0.0
10.000	0.00	5.25	123.470	0.030	0.0	0.0	0.0	1.04	41.3	0.0
10.001	0.00	5.47	123.370	0.060	0.0	0.0	0.0	1.05	41.7	0.0
10.002	0.00	5.90	123.280	0.090	0.0	0.0	0.0	1.02	40.5	0.0
10.003	0.00	6.28	123.120	0.127	0.0	0.0	0.0	1.01	40.3	0.0
10.004	0.00	6.63	122.980	0.157	0.0	0.0	0.0	1.02	40.5	0.0
10.005	0.00	6.83	122.850	0.157	0.0	0.0	0.0	1.03	40.8	0.0
10.006	0.00	7.07	122.700	0.187	0.0	0.0	0.0	1.15	81.6	0.0
11.000	0.00	5.13	122.660	0.035	0.0	0.0	0.0	1.16	82.1	0.0
10.007	0.00	7.17	122.610	0.222	0.0	0.0	0.0	1.06	75.2	0.0
10.008	0.00	7.37	122.580	0.252	0.0	0.0	0.0	1.08	76.4	0.0
10.009	0.00	7.82	122.520	0.262	0.0	0.0	0.0	1.05	74.3	0.0
10.010	0.00	8.19	122.390	0.300	0.0	0.0	0.0	1.07	76.0	0.0
10.011	0.00	8.33	122.280	0.300	0.0	0.0	0.0	1.07	18.9	0.0
1.011	0.00	10.48	122.103	2.687	0.0	0.0	0.0	0.98	38.8	0.0
1.012	0.00	11.26	122.024	2.733	0.0	0.0	0.0	1.60	63.7	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
12.000	1.770	0.180	9.8	0.037	5.00	0.0	0.600	o	150	
12.001	8.180	0.760	10.8	0.000	0.00	0.0	0.600	o	150	
13.000	1.000	0.010	100.0	0.016	5.00	0.0	0.600	o	150	
13.001	6.940	0.454	15.3	0.000	0.00	0.0	0.600	o	150	
1.013	38.178	0.321	118.9	0.021	0.00	0.0	0.600	o	225	
1.014	39.956	0.269	148.5	0.012	0.00	0.0	0.600	oo	-1	
1.015	14.126	0.079	178.8	0.015	0.00	0.0	0.600	oo	-1	
14.000	16.816	0.095	177.0	0.000	5.00	0.0	0.600	o	300	
14.001	23.092	0.066	349.9	0.070	0.00	0.0	0.600	o	300	
15.000	7.219	0.024	300.8	0.080	5.00	0.0	0.600	o	300	
14.002	37.034	0.553	67.0	0.020	0.00	0.0	0.600	o	450	
14.003	22.412	0.230	97.4	0.080	0.00	0.0	0.600	o	450	
14.004	12.749	0.110	115.9	0.000	0.00	0.0	0.600	o	300	
14.005	21.721	0.325	66.8	0.027	0.00	0.0	0.600	o	300	
16.000	30.605	0.313	97.8	0.020	5.00	0.0	0.600	o	150	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
12.000	0.00	5.01	122.510	0.037	0.0	0.0	0.0	3.23	57.1	0.0
12.001	0.00	5.05	122.330	0.037	0.0	0.0	0.0	3.09	54.6	0.0
13.000	0.00	5.02	121.450	0.016	0.0	0.0	0.0	1.00	17.8	0.0
13.001	0.00	5.06	121.440	0.016	0.0	0.0	0.0	2.59	45.8	0.0
1.013	0.00	11.79	120.911	2.807	0.0	0.0	0.0	1.20	47.6	0.0
1.014	0.00	12.41	120.590	2.819	0.0	0.0	0.0	1.07	85.6	0.0
1.015	0.00	12.65	120.321	2.834	0.0	0.0	0.0	0.97	78.0	0.0
14.000	0.00	5.24	122.676	0.000	0.0	0.0	0.0	1.18	83.3	0.0
14.001	0.00	5.70	122.581	0.070	0.0	0.0	0.0	0.83	59.0	0.0
15.000	0.00	5.13	122.539	0.080	0.0	0.0	0.0	0.90	63.7	0.0
14.002	0.00	5.95	122.515	0.170	0.0	0.0	0.0	2.49	395.6	0.0
14.003	0.00	6.13	121.962	0.250	0.0	0.0	0.0	2.06	327.6	0.0
14.004	0.00	6.27	121.732	0.250	0.0	0.0	0.0	1.46	103.2	0.0
14.005	0.00	6.46	121.622	0.277	0.0	0.0	0.0	1.93	136.1	0.0
16.000	0.00	5.50	121.610	0.020	0.0	0.0	0.0	1.02	18.0	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
17.000	52.101	0.591	88.2	0.040	5.00	0.0	0.600	o	100	
17.001	27.999	0.358	78.2	0.056	0.00	0.0	0.600	o	150	
14.006	17.974	1.055	17.0	0.010	0.00	0.0	0.600	o	225	
1.016	27.337	0.141	193.9	0.047	0.00	0.0	0.600	oo	-1	
1.017	8.947	0.284	31.5	0.000	0.00	0.0	0.600	oo	-1	
1.018	66.119	0.710	93.1	0.066	0.00	0.0	0.600	o	225	
1.019	47.865	0.330	145.0	0.066	0.00	0.0	0.600	o	225	
1.020	8.672	0.025	346.9	0.000	0.00	0.0	0.600	o	225	
1.021	14.635	0.213	68.7	0.000	0.00	0.0	0.600	o	300	
18.000	27.683	0.135	205.1	0.042	5.00	0.0	0.600	o	100	
1.022	78.854	0.348	226.6	0.084	0.00	0.0	0.600	o	300	
1.023	18.085#	0.861	21.0	0.000	0.00	0.0	0.600	o	300	
19.000	11.820#	0.210	56.3	0.037	5.00	0.0	0.600	o	225	
20.000	88.500#	0.970	91.2	0.114	5.00	0.0	0.600	o	225	
20.001	18.920#	0.200	94.6	0.000	0.00	0.0	0.600	o	225	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
17.000	0.00	6.06	122.246	0.040	0.0	0.0	0.0	0.82	6.4	0.0
17.001	0.00	6.47	121.655	0.096	0.0	0.0	0.0	1.14	20.1	0.0
14.006	0.00	6.56	121.297	0.403	0.0	0.0	0.0	3.19	126.7	0.0
1.016	0.00	13.14	120.242	3.284	0.0	0.0	0.0	0.94	74.8	0.0
1.017	0.00	13.20	120.101	3.284	0.0	0.0	0.0	2.34	187.1	0.0
1.018	0.00	14.02	119.817	3.350	0.0	0.0	0.0	1.36	53.9	0.0
1.019	0.00	14.75	119.107	3.416	0.0	0.0	0.0	1.08	43.1	0.0
1.020	0.00	14.96	118.777	3.416	0.0	0.0	0.0	0.70	27.7	0.0
1.021	0.00	15.09	118.752	3.416	0.0	0.0	0.0	1.90	134.3	0.0
18.000	0.00	5.87	118.874	0.042	0.0	0.0	0.0	0.53	4.2	0.0
1.022	0.00	16.35	118.539	3.542	0.0	0.0	0.0	1.04	73.5	0.0
1.023	0.00	16.44	118.191	3.542	0.0	0.0	0.0	3.45	243.6	0.0
19.000	0.00	5.11	117.975	0.037	0.0	0.0	0.0	1.75	69.5	0.0
20.000	0.00	6.08	120.500	0.114	0.0	0.0	0.0	1.37	54.4	0.0
20.001	0.00	6.31	119.530	0.114	0.0	0.0	0.0	1.34	53.5	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
20.002	36.550#	1.255	29.1	0.020	0.00	0.0	0.600	o	225	
20.003	23.948#	0.310	77.3	0.051	0.00	0.0	0.600	o	225	
19.001	24.910#	0.160	155.7	0.032	0.00	0.0	0.600	o	300	
19.002	46.775#	0.200	233.9	0.039	0.00	0.0	0.600	o	300	
1.024	23.505#	0.107	219.7	0.000	0.00	0.0	0.600	o	300	
1.025	21.756#	0.103	211.2	0.000	0.00	0.0	0.600	o	300	
1.026	10.222#	0.060	170.4	0.000	0.00	0.0	0.600	o	300	
1.027	20.569#	0.102	201.7	0.000	0.00	0.0	0.600	o	300	
21.000	45.191#	0.190	237.8	0.090	5.00	0.0	0.600	o	300	
22.000	8.916#	0.050	178.3	0.100	5.00	0.0	0.600	o	300	
22.001	14.955#	0.070	213.6	0.100	0.00	0.0	0.600	o	300	
22.002	31.564#	0.140	225.5	0.119	0.00	0.0	0.600	oo	43	
22.003	12.952#	0.050	259.0	0.000	0.00	0.0	0.600	o	300	
21.001	75.871#	0.270	281.0	0.074	0.00	0.0	0.600	o	450	
23.000	14.667#	0.090	163.0	0.100	5.00	0.0	0.600	o	225	
23.001	7.980#	0.050	159.6	0.100	0.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
20.002	0.00	6.56	119.330	0.134	0.0	0.0	0.0	2.43	96.8	0.0
20.003	0.00	6.83	118.075	0.185	0.0	0.0	0.0	1.49	59.2	0.0
19.001	0.00	7.16	117.690	0.254	0.0	0.0	0.0	1.26	88.9	0.0
19.002	0.00	7.92	117.530	0.293	0.0	0.0	0.0	1.02	72.4	0.0
1.024	0.00	16.81	117.330	3.835	0.0	0.0	0.0	1.06	74.7	0.0
1.025	0.00	17.15	117.223	3.835	0.0	0.0	0.0	1.08	76.2	0.0
1.026	0.00	17.29	117.120	3.835	0.0	0.0	0.0	1.20	84.9	0.0
1.027	0.00	17.60	117.060	3.835	0.0	0.0	0.0	1.10	78.0	0.0
21.000	0.00	5.74	119.100	0.090	0.0	0.0	0.0	1.02	71.8	0.0
22.000	0.00	5.13	119.370	0.100	0.0	0.0	0.0	1.17	83.0	0.0
22.001	0.00	5.36	119.320	0.200	0.0	0.0	0.0	1.07	75.8	0.0
22.002	0.00	5.75	119.100	0.319	0.0	0.0	0.0	1.35	429.2	0.0
22.003	0.00	5.97	118.960	0.319	0.0	0.0	0.0	0.97	68.7	0.0
21.001	0.00	7.02	118.760	0.483	0.0	0.0	0.0	1.21	192.1	0.0
23.000	0.00	5.24	119.190	0.100	0.0	0.0	0.0	1.02	40.6	0.0
23.001	0.00	5.35	119.025	0.200	0.0	0.0	0.0	1.24	87.8	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
23.002	35.000#	0.180	194.4	0.121	0.00	0.0	0.600	oo	42	
23.003	14.500#	0.080	181.3	0.000	0.00	0.0	0.600	o	300	
21.002	25.245#	0.090	280.5	0.000	0.00	0.0	0.600	o	450	
21.003	16.985#	0.060	283.1	0.046	0.00	0.0	0.600	o	450	
21.004	3.977#	0.015	265.1	0.000	0.00	0.0	0.600	o	450	
24.000	15.528#	0.300	51.8	0.064	5.00	0.0	0.600	o	300	
24.001	37.970#	0.690	55.0	0.057	0.00	0.0	0.600	o	300	
25.000	8.500#	0.050	170.0	0.247	5.00	0.0	0.600	oo	41	
24.002	12.474#	0.050	249.5	0.112	0.00	0.0	0.600	o	600	
24.003	8.990#	0.060	149.8	0.000	0.00	0.0	0.600	o	375	
21.005	26.290#	0.095	276.7	0.000	0.00	0.0	0.600	o	450	
21.006	16.985#	0.075	226.5	0.000	0.00	0.0	0.600	o	450	
21.007	15.017#	0.035	429.1	0.052	0.00	0.0	0.600	o	600	
26.000	16.432#	0.100	164.3	0.082	5.00	0.0	0.600	o	225	
26.001	29.945#	0.060	499.1	0.100	0.00	0.0	0.600	o	600	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
23.002	0.00	5.80	118.900	0.321	0.0	0.0	0.0	1.30	286.5	0.0
23.003	0.00	6.00	118.720	0.321	0.0	0.0	0.0	1.16	82.3	0.0
21.002	0.00	7.37	118.490	0.804	0.0	0.0	0.0	1.21	192.3	0.0
21.003	0.00	7.60	118.400	0.850	0.0	0.0	0.0	1.20	191.4	0.0
21.004	0.00	7.65	118.340	0.850	0.0	0.0	0.0	1.24	197.8	0.0
24.000	0.00	5.12	119.800	0.064	0.0	0.0	0.0	2.19	154.8	0.0
24.001	0.00	5.42	119.500	0.121	0.0	0.0	0.0	2.12	150.1	0.0
25.000	0.00	5.12	118.860	0.247	0.0	0.0	0.0	1.20	169.3	0.0
24.002	0.00	5.55	118.510	0.480	0.0	0.0	0.0	1.54	434.6	0.0
24.003	0.00	5.65	118.460	0.480	0.0	0.0	0.0	1.48	163.2	0.0
21.005	0.00	8.01	118.325	1.330	0.0	0.0	0.0	1.22	193.6	0.0
21.006	0.00	8.22	118.230	1.330	0.0	0.0	0.0	1.35	214.2	0.0
21.007	0.00	8.44	118.005	1.382	0.0	0.0	0.0	1.17	330.6	0.0
26.000	0.00	5.27	118.535	0.082	0.0	0.0	0.0	1.02	40.4	0.0
26.001	0.00	5.73	118.060	0.182	0.0	0.0	0.0	1.08	306.3	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
27.000	24.172#	0.060	402.9	0.056	5.00	0.0	0.600	o	600	
26.002	14.980#	0.030	499.3	0.000	0.00	0.0	0.600	o	750	
21.008	67.596#	0.104	650.0	0.067	0.00	0.0	0.600	o	750	
28.000	4.430#	0.014	316.4	0.111	5.00	0.0	0.600	o	525	
21.009	33.583#	0.051	658.5	0.109	0.00	0.0	0.600	o	750	
21.010	18.617#	0.030	620.6	0.132	0.00	0.0	0.600	o	750	
29.000	105.340#	0.490	215.0	0.133	5.00	0.0	0.600	o	300	
29.001	38.530#	0.160	240.8	0.020	0.00	0.0	0.600	o	300	
29.002	17.110#	0.070	244.4	0.088	0.00	0.0	0.600	o	300	
30.000	27.055#	0.080	338.2	0.130	5.00	0.0	0.600	o	750	
31.000	19.140#	0.040	478.5	0.076	5.00	0.0	0.600	o	750	
30.001	45.605#	0.080	570.1	0.063	0.00	0.0	0.600	o	750	
30.002	7.091#	0.710	10.0	0.000	0.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
27.000	0.00	5.33	118.060	0.056	0.0	0.0	0.0	1.21	341.3	0.0
26.002	0.00	5.93	117.850	0.238	0.0	0.0	0.0	1.25	550.2	0.0
21.008	0.00	9.47	117.820	1.687	0.0	0.0	0.0	1.09	481.6	0.0
28.000	0.00	5.06	117.955	0.111	0.0	0.0	0.0	1.25	271.4	0.0
21.009	0.00	9.99	117.716	1.907	0.0	0.0	0.0	1.08	478.4	0.0
21.010	0.00	10.27	117.665	2.039	0.0	0.0	0.0	1.12	493.0	0.0
29.000	0.00	6.64	120.650	0.133	0.0	0.0	0.0	1.07	75.5	0.0
29.001	0.00	7.28	120.160	0.153	0.0	0.0	0.0	1.01	71.3	0.0
29.002	0.00	7.56	120.000	0.241	0.0	0.0	0.0	1.00	70.8	0.0
30.000	0.00	5.30	120.800	0.130	0.0	0.0	0.0	1.52	669.8	0.0
31.000	0.00	5.25	120.760	0.076	0.0	0.0	0.0	1.27	562.2	0.0
30.001	0.00	5.95	120.720	0.269	0.0	0.0	0.0	1.16	514.6	0.0
30.002	0.00	5.97	120.640	0.269	0.0	0.0	0.0	5.00	353.6	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
29.003	19.900#	0.090	221.1	0.030	0.00	0.0	0.600	o	300	
29.004	29.530#	0.130	227.2	0.030	0.00	0.0	0.600	o	300	
32.000	20.790#	0.060	346.5	0.178	5.00	0.0	0.600	o	600	
32.001	45.220#	0.080	565.3	0.069	0.00	0.0	0.600	o	600	
32.002	7.510#	0.150	50.1	0.000	0.00	0.0	0.600	o	300	
29.005	68.040#	0.470	144.8	0.093	0.00	0.0	0.600	o	375	
29.006	37.480#	0.560	66.9	0.132	0.00	0.0	0.600	o	375	
29.007	11.948#	0.190	62.9	0.128	0.00	0.0	0.600	o	450	
33.000	3.600#	0.030	120.0	0.050	5.00	0.0	0.600	o	300	
33.001	11.654#	1.140	10.2	0.000	0.00	0.0	0.600	o	150	
29.008	65.185#	0.340	191.7	0.050	0.00	0.0	0.600	o	450	
34.000	51.632#	0.360	143.4	0.132	5.00	0.0	0.600	o	300	
34.001	4.880#	0.050	97.6	0.050	0.00	0.0	0.600	o	300	
35.000	16.273#	0.110	147.9	0.030	5.00	0.0	0.600	o	300	
34.002	17.330#	0.100	173.3	0.083	0.00	0.0	0.600	o	600	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
29.003	0.00	7.88	119.930	0.540	0.0	0.0	0.0	1.05	74.5	0.0
29.004	0.00	8.35	119.840	0.570	0.0	0.0	0.0	1.04	73.4	0.0
32.000	0.00	5.27	120.000	0.178	0.0	0.0	0.0	1.30	368.3	0.0
32.001	0.00	6.01	119.940	0.247	0.0	0.0	0.0	1.02	287.6	0.0
32.002	0.00	6.06	119.860	0.247	0.0	0.0	0.0	2.23	157.4	0.0
29.005	0.00	9.11	119.635	0.910	0.0	0.0	0.0	1.50	166.1	0.0
29.006	0.00	9.39	119.165	1.042	0.0	0.0	0.0	2.22	244.9	0.0
29.007	0.00	9.47	118.530	1.170	0.0	0.0	0.0	2.57	408.3	0.0
33.000	0.00	5.04	119.810	0.050	0.0	0.0	0.0	1.43	101.4	0.0
33.001	0.00	5.10	119.780	0.050	0.0	0.0	0.0	3.17	56.0	0.0
29.008	0.00	10.21	118.340	1.270	0.0	0.0	0.0	1.46	233.0	0.0
34.000	0.00	5.66	119.200	0.132	0.0	0.0	0.0	1.31	92.7	0.0
34.001	0.00	5.71	118.840	0.182	0.0	0.0	0.0	1.59	112.5	0.0
35.000	0.00	5.21	118.900	0.030	0.0	0.0	0.0	1.29	91.2	0.0
34.002	0.00	5.86	118.490	0.295	0.0	0.0	0.0	1.85	522.2	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
34.003	25.500#	0.090	283.3	0.056	0.00	0.0	0.600	o	600	
34.004	6.480#	0.150	43.2	0.000	0.00	0.0	0.600	o	300	
29.009	29.819#	0.065	458.8	0.047	0.00	0.0	0.600	o	600	
36.000	18.144#	0.120	151.2	0.034	5.00	0.0	0.600	o	375	
36.001	18.124#	0.295	61.4	0.034	0.00	0.0	0.600	o	300	
21.011	23.889#	0.040	597.2	0.076	0.00	0.0	0.600	o	750	
21.012	7.756#	0.035	221.6	0.000	0.00	0.0	0.600	o	750	
37.000	17.551#	0.090	195.0	0.035	5.00	0.0	0.600	o	300	
37.001	17.392#	0.085	204.6	0.038	0.00	0.0	0.600	o	300	
37.002	16.123#	0.065	248.0	0.038	0.00	0.0	0.600	o	300	
37.003	13.713#	0.050	274.3	0.000	0.00	0.0	0.600	o	300	
38.000	52.116#	0.670	77.8	0.100	5.00	0.0	0.600	o	300	
21.013	33.095#	0.065	509.2	0.000	0.00	0.0	0.600	o	750	
39.000	36.503#	0.085	429.4	0.069	5.00	0.0	0.600	o	900	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
34.003	0.00	6.16	118.390	0.351	0.0	0.0	0.0	1.44	407.6	0.0
34.004	0.00	6.20	118.300	0.351	0.0	0.0	0.0	2.40	169.6	0.0
29.009	0.00	10.65	117.850	1.668	0.0	0.0	0.0	1.13	319.6	0.0
36.000	0.00	5.21	118.500	0.034	0.0	0.0	0.0	1.47	162.5	0.0
36.001	0.00	5.36	118.380	0.068	0.0	0.0	0.0	2.01	142.0	0.0
21.011	0.00	11.00	117.635	3.851	0.0	0.0	0.0	1.14	502.7	0.0
21.012	0.00	11.07	117.595	3.851	0.0	0.0	0.0	1.88	828.7	0.0
37.000	0.00	5.26	118.300	0.035	0.0	0.0	0.0	1.12	79.3	0.0
37.001	0.00	5.53	118.210	0.073	0.0	0.0	0.0	1.10	77.4	0.0
37.002	0.00	5.80	118.125	0.111	0.0	0.0	0.0	0.99	70.2	0.0
37.003	0.00	6.04	118.060	0.111	0.0	0.0	0.0	0.94	66.8	0.0
38.000	0.00	5.49	118.230	0.100	0.0	0.0	0.0	1.78	126.1	0.0
21.013	0.00	11.51	117.560	4.062	0.0	0.0	0.0	1.23	544.9	0.0
39.000	0.00	5.40	117.430	0.069	0.0	0.0	0.0	1.51	957.8	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
21.014	18.722#	0.095	197.1	0.015	0.00	0.0	0.600	o	900	
40.000	15.090#	0.030	503.0	0.090	5.00	0.0	0.600	o	900	
21.015	23.110#	0.030	770.3	0.020	0.00	0.0	0.600	o	900	
21.016	13.416#	0.030	447.2	0.040	0.00	0.0	0.600	o	900	
21.017	14.567#	0.030	485.6	0.040	0.00	0.0	0.600	o	900	
21.018	6.492#	0.030	216.4	0.046	0.00	0.0	0.600	o	900	
41.000	14.400#	0.050	288.0	0.040	5.00	0.0	0.600	o	450	
21.019	18.010#	0.095	189.6	0.000	0.00	0.0	0.600	o	375	
21.020	11.134#	0.137	81.3	0.044	0.00	0.0	0.600	o	375	
42.000	8.070#	0.077	104.8	0.040	5.00	0.0	0.600	o	150	
1.028	6.515#	0.081	80.4	0.030	0.00	0.0	0.600	o	375	
1.029	21.272	0.239	89.0	0.000	0.00	0.0	0.600	o	375	
1.030	9.900#	0.158	62.7	0.032	0.00	0.0	0.600	o	375	
43.000	33.338#	0.200	166.7	0.119	5.00	0.0	0.600	o	300	
43.001	37.692#	0.160	235.6	0.100	0.00	0.0	0.600	o	300	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
21.014	0.00	11.65	117.345	4.146	0.0	0.0	0.0	2.23	1417.7	0.0
40.000	0.00	5.18	117.280	0.090	0.0	0.0	0.0	1.39	884.4	0.0
21.015	0.00	12.00	117.250	4.256	0.0	0.0	0.0	1.12	713.1	0.0
21.016	0.00	12.15	117.220	4.296	0.0	0.0	0.0	1.48	938.4	0.0
21.017	0.00	12.32	117.190	4.336	0.0	0.0	0.0	1.42	900.3	0.0
21.018	0.00	12.37	117.160	4.382	0.0	0.0	0.0	2.13	1352.5	0.0
41.000	0.00	5.20	117.180	0.040	0.0	0.0	0.0	1.19	189.7	0.0
21.019	0.00	12.60	117.130	4.422	0.0	0.0	0.0	1.31	145.0	0.0
21.020	0.00	12.69	117.035	4.466	0.0	0.0	0.0	2.01	222.1	0.0
42.000	0.00	5.14	117.200	0.040	0.0	0.0	0.0	0.98	17.3	0.0
1.028	0.00	17.65	116.898	8.371	0.0	0.0	0.0	2.02	223.3	0.0
1.029	0.00	17.84	116.817	8.371	0.0	0.0	0.0	1.92	212.2	0.0
1.030	0.00	17.91	116.578	8.403	0.0	0.0	0.0	2.29	253.2	0.0
43.000	0.00	5.46	117.140	0.119	0.0	0.0	0.0	1.21	85.9	0.0
43.001	0.00	6.07	116.940	0.219	0.0	0.0	0.0	1.02	72.1	0.0

Network Design Table for SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
43.002	26.668#	0.110	242.4	0.039	0.00	0.0	0.600	o	300	
43.003	13.050#	0.070	186.4	0.071	0.00	0.0	0.600	o	300	
44.000	8.820#	0.100	88.2	0.010	5.00	0.0	0.600	o	225	
44.001	1.000	0.010	100.0	0.000	0.00	0.0	0.600	\/	-3	
45.000	35.000#	0.110	318.2	0.098	5.00	0.0	0.600	o	375	
45.001	8.580#	0.030	286.0	0.051	0.00	0.0	0.600	o	375	
45.002	14.670#	0.040	366.8	0.100	0.00	0.0	0.600	o	375	
44.002	30.540#	0.080	381.8	0.000	0.00	0.0	0.600	\/	-3	
44.003	21.500#	0.180	119.4	0.000	0.00	0.0	0.600	o	150	
44.004	10.000#	0.090	111.1	0.000	0.00	0.0	0.600	o	150	
44.005	91.800#	0.600	153.0	0.000	0.00	0.0	0.600	\/	-3	
44.006	5.700#	1.000	5.7	0.000	0.00	0.0	0.600	o	150	
43.004	34.962#	0.140	249.7	0.000	0.00	0.0	0.600	o	375	
43.005	4.489#	0.040	112.2	0.000	0.00	0.0	0.600	o	375	
1.031	12.290#	0.085	144.6	0.000	0.00	0.0	0.600	o	375	
1.032	28.710#	0.160	179.4	0.000	0.00	0.0	0.600	o	450	
1.033	5.466#	0.210	26.0	0.000	0.00	0.0	0.600	o	450	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
43.002	0.00	6.52	116.780	0.258	0.0	0.0	0.0	1.01	71.1	0.0
43.003	0.00	6.70	116.670	0.329	0.0	0.0	0.0	1.15	81.2	0.0
44.000	0.00	5.11	119.000	0.010	0.0	0.0	0.0	1.39	55.4	0.0
44.001	0.00	5.11	118.900	0.010	0.0	0.0	0.0	3.38	4689.2	0.0
45.000	0.00	5.58	119.030	0.098	0.0	0.0	0.0	1.01	111.6	0.0
45.001	0.00	5.71	118.920	0.149	0.0	0.0	0.0	1.07	117.8	0.0
45.002	0.00	5.97	118.890	0.249	0.0	0.0	0.0	0.94	103.8	0.0
44.002	0.00	6.27	118.850	0.259	0.0	0.0	0.0	1.73	2391.3	0.0
44.003	0.00	6.66	118.770	0.259	0.0	0.0	0.0	0.92	16.2	0.0
44.004	0.00	6.83	118.590	0.259	0.0	0.0	0.0	0.95	16.8	0.0
44.005	0.00	7.39	118.500	0.259	0.0	0.0	0.0	2.73	3787.6	0.0
44.006	0.00	7.41	117.900	0.259	0.0	0.0	0.0	4.25	75.1	0.0
43.004	0.00	7.92	116.600	0.588	0.0	0.0	0.0	1.14	126.1	0.0
43.005	0.00	7.97	116.460	0.588	0.0	0.0	0.0	1.71	188.8	0.0
1.031	0.00	18.04	116.420	8.991	0.0	0.0	0.0	1.50	166.2	0.0
1.032	0.00	18.36	116.260	8.991	0.0	0.0	0.0	1.51	240.9	0.0
1.033	0.00	18.38	116.010	8.991	0.0	0.0	0.0	4.00	635.8	0.0

Free Flowing Outfall Details for SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.033	Outfall	116.600	115.800	121.405	0	0

Simulation Criteria for SWS

Volumetric Runoff Coeff	0.840	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	1.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	120
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	2

Number of Input Hydrographs	0	Number of Storage Structures	37
Number of Online Controls	18	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location GB 450500 225250 SP 50500 25250	
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	60

Online Controls for SWS

Hydro-Brake® Manhole: SC6, DS/PN: 1.007, Volume (m³): 26.3

Design Head (m) 1.200 Hydro-Brake® Type Md6 SW Only Invert Level (m) 122.840
Design Flow (l/s) 10.0 Diameter (mm) 126

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.1	1.200	9.9	3.000	15.7	7.000	24.0
0.200	8.0	1.400	10.7	3.500	16.9	7.500	24.8
0.300	8.5	1.600	11.5	4.000	18.1	8.000	25.6
0.400	8.1	1.800	12.2	4.500	19.2	8.500	26.4
0.500	7.8	2.000	12.8	5.000	20.3	9.000	27.2
0.600	7.8	2.200	13.4	5.500	21.2	9.500	27.9
0.800	8.3	2.400	14.0	6.000	22.2		
1.000	9.1	2.600	14.6	6.500	23.1		

Orifice Manhole: 12 (B6), DS/PN: 10.011, Volume (m³): 5.3

Diameter (m) 0.046 Discharge Coefficient 0.600 Invert Level (m) 122.280

Orifice Manhole: 13 (B6), DS/PN: 12.001, Volume (m³): 2.2

Diameter (m) 0.027 Discharge Coefficient 0.600 Invert Level (m) 122.330

Orifice Manhole: 14 (B6), DS/PN: 13.001, Volume (m³): 3.1

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 121.440

Hydro-Brake® Manhole: 70 (D4b), DS/PN: 19.002, Volume (m³): 4.7

Design Head (m) 0.900 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.530
Design Flow (l/s) 26.0 Diameter (mm) 203

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.8	1.200	26.9	3.000	40.7	7.000	62.2
0.200	17.6	1.400	28.4	3.500	44.0	7.500	64.4
0.300	25.5	1.600	30.0	4.000	47.0	8.000	66.5
0.400	27.8	1.800	31.7	4.500	49.9	8.500	68.5
0.500	27.9	2.000	33.3	5.000	52.6	9.000	70.5
0.600	27.2	2.200	34.9	5.500	55.1	9.500	72.5
0.800	25.9	2.400	36.4	6.000	57.6		
1.000	25.9	2.600	37.9	6.500	59.9		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 3 (D2a), DS/PN: 22.003, Volume (m³): 16.0

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.960
Design Flow (l/s) 63.0 Diameter (mm) 287

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.4	1.200	61.2	3.000	81.5	7.000	124.3
0.200	26.7	1.400	61.5	3.500	87.9	7.500	128.7
0.300	44.6	1.600	62.9	4.000	94.0	8.000	132.9
0.400	58.4	1.800	65.1	4.500	99.7	8.500	137.0
0.500	64.8	2.000	67.7	5.000	105.1	9.000	141.0
0.600	66.4	2.200	70.4	5.500	110.2	9.500	144.8
0.800	65.3	2.400	73.2	6.000	115.1		
1.000	62.6	2.600	76.0	6.500	119.8		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 6 (D2a), DS/PN: 23.003, Volume (m³): 12.2

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.720
Design Flow (l/s) 63.0 Diameter (mm) 287

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.4	1.200	61.2	3.000	81.5	7.000	124.3
0.200	26.7	1.400	61.5	3.500	87.9	7.500	128.7
0.300	44.6	1.600	62.9	4.000	94.0	8.000	132.9
0.400	58.4	1.800	65.1	4.500	99.7	8.500	137.0
0.500	64.8	2.000	67.7	5.000	105.1	9.000	141.0
0.600	66.4	2.200	70.4	5.500	110.2	9.500	144.8
0.800	65.3	2.400	73.2	6.000	115.1		
1.000	62.6	2.600	76.0	6.500	119.8		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 83 (D4b), DS/PN: 24.003, Volume (m³): 10.7

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.460
Design Flow (l/s) 30.0 Diameter (mm) 215

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.2	1.200	30.6	3.000	45.7	7.000	69.8
0.200	18.9	1.400	32.0	3.500	49.3	7.500	72.2
0.300	28.4	1.600	33.8	4.000	52.7	8.000	74.6
0.400	31.9	1.800	35.6	4.500	55.9	8.500	76.9
0.500	32.3	2.000	37.4	5.000	59.0	9.000	79.1
0.600	31.7	2.200	39.2	5.500	61.9	9.500	81.3
0.800	30.1	2.400	40.9	6.000	64.6		
1.000	29.7	2.600	42.5	6.500	67.2		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 18 (D3a), DS/PN: 21.010, Volume (m³): 28.3

Design Head (m) 2.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.665
Design Flow (l/s) 185.0 Diameter (mm) 446

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	13.7	1.200	197.7	3.000	200.9	7.000	300.3
0.200	42.0	1.400	192.4	3.500	214.1	7.500	310.8
0.300	76.5	1.600	187.5	4.000	227.7	8.000	321.0
0.400	112.2	1.800	184.7	4.500	241.1	8.500	330.9
0.500	144.9	2.000	184.0	5.000	253.9	9.000	340.5
0.600	171.3	2.200	185.3	5.500	266.2	9.500	349.8
0.800	196.4	2.400	187.9	6.000	278.0		
1.000	200.3	2.600	191.6	6.500	289.3		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake Optimum® Manhole: 22 (D6a), DS/PN: 30.002, Volume (m³): 24.8

Unit Reference	MD-SHE-0235-3140-1500-3140
Design Head (m)	1.500
Design Flow (l/s)	31.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	235
Invert Level (m)	120.640
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.500	31.3
Flush-Flo™	0.465	31.3
Kick-Flo®	1.020	26.1
Mean Flow over Head Range	-	26.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.8	1.200	28.2	3.000	43.7	7.000	65.9
0.200	23.7	1.400	30.3	3.500	47.1	7.500	68.2
0.300	30.3	1.600	32.3	4.000	50.3	8.000	70.3
0.400	31.2	1.800	34.2	4.500	53.2	8.500	72.5
0.500	31.3	2.000	36.0	5.000	56.0	9.000	74.5
0.600	31.0	2.200	37.7	5.500	58.6	9.500	76.5
0.800	29.9	2.400	39.3	6.000	61.2		
1.000	26.7	2.600	40.8	6.500	63.6		

Hydro-Brake Optimum® Manhole: 27 (D6a), DS/PN: 32.002, Volume (m³): 17.2

Unit Reference	MD-SHE-0294-5000-1000-5000
Design Head (m)	1.000
Design Flow (l/s)	50.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	294
Invert Level (m)	119.860
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	49.9
Flush-Flo™	0.444	49.9
Kick-Flo®	0.783	44.4
Mean Flow over Head Range	-	40.1

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	9.1	1.200	54.5	3.000	85.0	7.000	128.5
0.200	30.3	1.400	58.7	3.500	91.6	7.500	132.9
0.300	48.4	1.600	62.6	4.000	97.7	8.000	137.1
0.400	49.8	1.800	66.3	4.500	103.5	8.500	141.3
0.500	49.8	2.000	69.8	5.000	109.0	9.000	145.3
0.600	48.9	2.200	73.1	5.500	114.2	9.500	149.2
0.800	44.9	2.400	76.2	6.000	119.1		
1.000	49.9	2.600	79.3	6.500	123.9		

Orifice Manhole: 31 (D4b), DS/PN: 33.001, Volume (m³): 4.6

Diameter (m) 0.053 Discharge Coefficient 0.600 Invert Level (m) 119.780

Hydro-Brake® Manhole: 39 (D6a), DS/PN: 34.004, Volume (m³): 13.0

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.300
Design Flow (l/s) 50.0 Diameter (mm) 263

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	8.7	1.200	49.2	3.000	68.4	7.000	104.4
0.200	24.2	1.400	50.1	3.500	73.8	7.500	108.1
0.300	39.4	1.600	51.8	4.000	78.9	8.000	111.6
0.400	49.6	1.800	54.0	4.500	83.7	8.500	115.1
0.500	52.9	2.000	56.4	5.000	88.2	9.000	118.4
0.600	53.5	2.200	58.9	5.500	92.5	9.500	121.6
0.800	51.7	2.400	61.3	6.000	96.7		
1.000	49.6	2.600	63.7	6.500	100.6		

Hydro-Brake® Manhole: 39 (D6a), DS/PN: 34.004, Volume (m³): 13.0

Pre-initialised control selected, excessive flows may result.

Orifice Manhole: 42 (D4b), DS/PN: 36.001, Volume (m³): 5.0

Diameter (m) 0.053 Discharge Coefficient 0.600 Invert Level (m) 118.380

Orifice Manhole: 46 (D4a), DS/PN: 37.003, Volume (m³): 6.0

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 118.060

Hydro-Brake Optimum® Manhole: 47 (D3a), DS/PN: 21.013, Volume (m³): 13.2

Unit Reference	MD-SHE-0410-1180-2000-1180
Design Head (m)	2.000
Design Flow (l/s)	118.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Diameter (mm)	410
Invert Level (m)	117.560
Minimum Outlet Pipe Diameter (mm)	450
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	117.7
Flush-Flo™	0.700	117.4
Kick-Flo®	1.438	100.3
Mean Flow over Head Range	-	98.8

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	11.2	1.200	111.2	3.000	143.4	7.000	217.0
0.200	40.1	1.400	103.0	3.500	154.6	7.500	224.5
0.300	78.0	1.600	105.6	4.000	165.0	8.000	231.7
0.400	111.3	1.800	111.8	4.500	174.8	8.500	238.7
0.500	115.1	2.000	117.7	5.000	184.0	9.000	245.5
0.600	116.9	2.200	123.3	5.500	192.8	9.500	252.1
0.800	117.1	2.400	128.6	6.000	201.2		
1.000	115.0	2.600	133.7	6.500	209.3		

Hydro-Brake® Manhole: 56 (D3a), DS/PN: 21.019, Volume (m³): 10.3

Design Head (m) 1.300 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.130
Design Flow (l/s) 112.0 Diameter (mm) 362

Hydro-Brake® Manhole: 56 (D3a), DS/PN: 21.019, Volume (m³): 10.3

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	11.5	1.200	113.0	3.000	130.3	7.000	197.8
0.200	34.2	1.400	110.1	3.500	140.1	7.500	204.8
0.300	60.2	1.600	109.2	4.000	149.6	8.000	211.5
0.400	84.7	1.800	110.1	4.500	158.6	8.500	218.0
0.500	103.7	2.000	112.2	5.000	167.2	9.000	224.3
0.600	114.3	2.200	115.1	5.500	175.3	9.500	230.4
0.800	118.9	2.400	118.6	6.000	183.1		
1.000	116.9	2.600	122.4	6.500	190.6		

Pre-initialised control selected, excessive flows may result.

Hydro-Brake® Manhole: 67 (D3a), DS/PN: 43.004, Volume (m³): 5.5

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 116.600
Design Flow (l/s) 95.0 Diameter (mm) 334

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	10.7	1.200	91.0	3.000	110.6	7.000	168.4
0.200	31.4	1.400	89.4	3.500	119.2	7.500	174.3
0.300	54.5	1.600	89.6	4.000	127.3	8.000	180.0
0.400	75.1	1.800	91.2	4.500	135.0	8.500	185.6
0.500	89.4	2.000	93.7	5.000	142.3	9.000	190.9
0.600	95.4	2.200	96.8	5.500	149.3	9.500	196.2
0.800	97.0	2.400	100.1	6.000	155.9		
1.000	94.3	2.600	103.6	6.500	162.3		

Pre-initialised control selected, excessive flows may result.

Storage Structures for SWS

Tank or Pond Manhole: TANK, DS/PN: 6.000

Invert Level (m) 122.940

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	470.0	1.200	470.0	1.201	0.0

Porous Car Park Manhole: 1 (B6), DS/PN: 10.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.3
Membrane Percolation (mm/hr)	1000	Length (m)	18.0
Max Percolation (l/s)	26.5	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.600	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: 2 (B6), DS/PN: 10.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	40.0
Max Percolation (l/s)	33.3	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.600	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: 3 (B6), DS/PN: 10.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	39.0
Max Percolation (l/s)	32.5	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.750	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: 4 (B6), DS/PN: 10.003

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	3.0
Membrane Percolation (mm/hr)	1000	Length (m)	60.0
Max Percolation (l/s)	50.0	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	123.750	Cap Volume Depth (m)	0.000

Porous Car Park Manhole: 5 (B6), DS/PN: 10.004

Infiltration Coefficient Base (m/hr)	0.00000	Safety Factor	2.0
Membrane Percolation (mm/hr)	1000	Porosity	0.30
Max Percolation (l/s)	45.0	Invert Level (m)	123.750

Porous Car Park Manhole: 5 (B6), DS/PN: 10.004

Width (m)	3.0	Depression Storage (mm)	5
Length (m)	54.0	Evaporation (mm/day)	3
Slope (1:X)	500.0	Cap Volume Depth (m)	0.000

Tank or Pond Manhole: Tank (B6), DS/PN: 11.000

Invert Level (m) 122.660

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	143.0	0.800	143.0	0.801	0.0

Porous Car Park Manhole: PP (B6), DS/PN: 12.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	162.5	Slope (1:X)	300.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	122.580	Cap Volume Depth (m)	0.000

Tank or Pond Manhole: 14 (B6), DS/PN: 13.001

Invert Level (m) 121.440

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	20.0	0.400	20.0	0.401	0.0

Tank or Pond Manhole: 0011, DS/PN: 1.018

Invert Level (m) 119.830

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	133.0	0.800	133.0	0.801	0.0

Tank or Pond Manhole: 70 (D4b), DS/PN: 19.002

Invert Level (m) 117.600

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	154.0	0.500	154.0	0.501	0.0

Tank or Pond Manhole: 2b (D2a), DS/PN: 22.002

Invert Level (m) 119.100

Tank or Pond Manhole: 2b (D2a), DS/PN: 22.002

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	98.0	0.800	98.0	0.801	0.0

Tank or Pond Manhole: 6 (D2a), DS/PN: 23.003

Invert Level (m) 118.720

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	63.0	0.800	63.0	0.801	0.0

Tank or Pond Manhole: Tank (D4b), DS/PN: 25.000

Invert Level (m) 118.860

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	135.0	1.000	135.0	1.001	0.0

Tank or Pond Manhole: 14 (D2a), DS/PN: 26.001

Invert Level (m) 118.210

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	175.0	0.800	175.0	0.801	0.0

Complex Manhole: 85 (D4b), DS/PN: 28.000

Tank or Pond

Invert Level (m) 118.040

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	165.0	1.200	165.0	1.201	0.0

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation (l/s)	104.2	Slope (1:X)	500.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	119.900	Cap Volume Depth (m)	0.000

Tank or Pond Manhole: 17a (D3a), DS/PN: 21.009

Invert Level (m) 117.733

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	175.0	1.500	175.0	1.501	0.0

Tank or Pond Manhole: 18 (D3a), DS/PN: 21.010

Invert Level (m) 117.685

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	146.5	1.200	146.5	1.201	0.0

Tank or Pond Manhole: 21a (D6a), DS/PN: 31.000

Invert Level (m) 120.760

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	63.0	1.000	63.0	1.001	0.0

Tank or Pond Manhole: 25 (D6a), DS/PN: 32.000

Invert Level (m) 120.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	90.0	1.000	90.0	1.001	0.0

Tank or Pond Manhole: 31 (D4b), DS/PN: 33.001

Invert Level (m) 119.830

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	14.0	0.500	14.0	0.501	0.0

Tank or Pond Manhole: 37 (D6a), DS/PN: 34.002

Invert Level (m) 118.490

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	40.0	1.000	40.0	1.001	0.0

Tank or Pond Manhole: 38 (D6a), DS/PN: 34.003

Invert Level (m) 118.390

Tank or Pond Manhole: 38 (D6a), DS/PN: 34.003

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	83.0	1.000	83.0	1.001	0.0

Tank or Pond Manhole: 41 (D4b), DS/PN: 36.000

Invert Level (m) 118.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	44.0	1.000	44.0	1.001	0.0

Tank or Pond Manhole: 45 (D4a), DS/PN: 37.000

Invert Level (m) 118.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	36.0	1.000	36.0	1.001	0.0

Tank or Pond Manhole: 45a (D4a), DS/PN: 37.001

Invert Level (m) 118.210

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	36.0	1.000	36.0	1.001	0.0

Tank or Pond Manhole: 45b (D4a), DS/PN: 37.002

Invert Level (m) 118.125

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	36.0	1.000	36.0	1.001	0.0

Tank or Pond Manhole: 47a (D3a), DS/PN: 38.000

Invert Level (m) 118.230

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	71.0	0.500	71.0	0.501	0.0

Tank or Pond Manhole: 49 (D3a), DS/PN: 39.000

Invert Level (m) 117.430

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	71.0	1.000	71.0	1.001	0.0

Tank or Pond Manhole: 52 (D3a), DS/PN: 21.015

Invert Level (m) 117.250

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	56.0	1.000	56.0	1.001	0.0

Tank or Pond Manhole: 53 (D3a), DS/PN: 21.016

Invert Level (m) 117.220

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	72.0	1.000	72.0	1.001	0.0

Tank or Pond Manhole: 54 (D3a), DS/PN: 21.018

Invert Level (m) 117.160

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	65.0	1.000	65.0	1.001	0.0

Tank or Pond Manhole: 55 (D3a), DS/PN: 41.000

Invert Level (m) 117.180

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	248.0	1.000	248.0	1.001	0.0

Tank or Pond Manhole: SC18c, DS/PN: 1.028

Invert Level (m) 116.998

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	80.2	0.500	80.2	0.501	0.0

Tank or Pond Manhole: Swale (D3a), DS/PN: 44.001

Invert Level (m) 118.900

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	28.4	0.500	81.7	0.501	0.0

Tank or Pond Manhole: Pipe (D3a), DS/PN: 44.006

Invert Level (m) 117.900

Tank or Pond Manhole: Pipe (D3a), DS/PN: 44.006

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	22.8	0.500	61.8	0.501	0.0

Tank or Pond Manhole: 67 (D3a), DS/PN: 43.004

Invert Level (m) 116.650

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	94.5	0.500	94.5	0.501	0.0

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Storage Structures	37
Number of Online Controls	18	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Site Location GB 450500 225250 SP 50500 25250	
C (1km)	-0.023
D1 (1km)	0.328
D2 (1km)	0.309
D3 (1km)	0.264
E (1km)	0.292
F (1km)	2.461
Cv (Summer)	0.750
Cv (Winter)	0.840

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			9
1.001	120 Winter	100	+30%	100/15 Summer	100/15 Summer			12
1.002	15 Winter	100	+30%	100/15 Summer				
1.003	240 Winter	100	+30%	100/15 Summer	100/15 Summer			14
1.004	240 Winter	100	+30%	100/15 Summer				
1.005	360 Winter	100	+30%	100/15 Summer	100/60 Summer			14
2.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
2.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
2.002	960 Winter	100	+30%	100/15 Summer	100/15 Summer			18
2.003	480 Winter	100	+30%	100/15 Summer	100/60 Summer			14
1.006	360 Winter	100	+30%	100/15 Summer				
3.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
3.001	60 Winter	100	+30%	100/15 Summer	100/15 Summer			14
3.002	30 Winter	100	+30%	100/15 Summer	100/15 Summer			14
3.003	15 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
3.004	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
4.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
3.005	240 Winter	100	+30%	100/15 Summer				
5.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
3.006	360 Winter	100	+30%	100/15 Summer				
3.007	480 Winter	100	+30%	100/15 Summer				
3.008	360 Winter	100	+30%	100/15 Summer	100/15 Summer			15
6.000	360 Winter	100	+30%	100/15 Summer				
6.001	360 Winter	100	+30%	100/15 Summer				
1.007	360 Winter	100	+30%	100/15 Summer	100/60 Summer			14
7.000	60 Winter	100	+30%	100/15 Summer	100/15 Summer			8
7.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
7.002	60 Winter	100	+30%	100/15 Summer	100/15 Summer			11
7.003	15 Summer	100	+30%	100/15 Summer				
8.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			8
7.004	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
7.005	15 Winter	100	+30%	100/15 Summer				
1.008	15 Winter	100	+30%	100/15 Summer				
1.009	15 Winter	100	+30%	100/15 Summer				
9.000	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
9.001	15 Winter	100	+30%	100/15 Summer				
1.010	15 Winter	100	+30%	100/15 Summer				
10.000	15 Winter	100	+30%	100/15 Summer				
10.001	15 Winter	100	+30%	100/15 Summer				
10.002	15 Winter	100	+30%	100/15 Summer				
10.003	15 Summer	100	+30%	100/15 Summer				
10.004	15 Summer	100	+30%	100/15 Summer				
10.005	120 Winter	100	+30%	100/15 Summer				
10.006	120 Winter	100	+30%	100/15 Summer				
11.000	120 Winter	100	+30%	100/15 Summer				
10.007	120 Winter	100	+30%	100/15 Summer				
10.008	120 Winter	100	+30%	100/15 Summer				
10.009	120 Winter	100	+30%	100/15 Summer				
10.010	120 Winter	100	+30%	100/15 Summer				
10.011	120 Winter	100	+30%	100/15 Summer				
1.011	15 Winter	100	+30%	100/15 Summer				
1.012	15 Winter	100	+30%	100/15 Summer				
12.000	120 Winter	100	+30%	100/15 Summer				
12.001	120 Winter	100	+30%	100/15 Summer				
13.000	60 Winter	100	+30%	100/15 Summer				
13.001	60 Winter	100	+30%	100/15 Summer				
1.013	30 Winter	100	+30%	100/15 Summer	100/15 Summer			5
1.014	30 Winter	100	+30%	100/15 Summer	100/15 Summer			8
1.015	15 Winter	100	+30%	100/15 Summer				
14.000	15 Winter	100	+30%					
14.001	15 Winter	100	+30%	100/15 Summer				
15.000	15 Winter	100	+30%	100/15 Summer				
14.002	15 Winter	100	+30%					
14.003	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
14.004	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
14.005	15 Summer	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
16.000	15 Winter	100	+30%	100/15 Summer				
17.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
17.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			7
14.006	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
1.016	15 Winter	100	+30%	100/15 Summer				
1.017	120 Winter	100	+30%	100/15 Summer	100/15 Summer			14
1.018	60 Winter	100	+30%	100/15 Summer	100/15 Summer			13
1.019	120 Winter	100	+30%	100/15 Summer	100/15 Summer			14
1.020	15 Winter	100	+30%	100/15 Summer	100/15 Summer			4
1.021	15 Winter	100	+30%	100/15 Summer				
18.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			6
1.022	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
1.023	60 Winter	100	+30%	100/30 Winter	100/30 Winter			3
19.000	60 Winter	100	+30%	100/15 Summer	100/30 Winter			3
20.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
20.001	15 Winter	100	+30%	100/15 Summer				
20.002	15 Winter	100	+30%	100/15 Summer				
20.003	15 Winter	100	+30%	100/15 Summer				
19.001	30 Winter	100	+30%	100/15 Summer				
19.002	30 Winter	100	+30%	100/15 Summer	100/15 Winter			4
1.024	60 Winter	100	+30%	100/15 Summer	100/60 Winter			1
1.025	120 Winter	100	+30%	100/15 Summer				
1.026	360 Winter	100	+30%	100/15 Summer				
1.027	360 Winter	100	+30%	100/15 Summer				
21.000	120 Winter	100	+30%	100/15 Winter				
22.000	15 Winter	100	+30%	100/15 Summer				
22.001	15 Winter	100	+30%	100/15 Summer				
22.002	15 Winter	100	+30%	100/15 Summer				
22.003	15 Winter	100	+30%	100/15 Summer				
21.001	120 Winter	100	+30%	100/15 Summer				
23.000	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
23.001	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
23.002	15 Winter	100	+30%	100/15 Summer				
23.003	15 Winter	100	+30%	100/15 Summer				
21.002	120 Winter	100	+30%	100/15 Summer				
21.003	120 Winter	100	+30%	100/15 Summer				
21.004	120 Winter	100	+30%	100/15 Summer				
24.000	15 Winter	100	+30%					
24.001	15 Winter	100	+30%	100/15 Winter				
25.000	30 Winter	100	+30%	100/15 Summer				
24.002	30 Winter	100	+30%	100/15 Summer				
24.003	30 Winter	100	+30%	100/15 Summer				
21.005	120 Winter	100	+30%	100/15 Summer				
21.006	120 Winter	100	+30%	100/15 Summer				
21.007	120 Winter	100	+30%	100/15 Summer				
26.000	120 Winter	100	+30%	100/15 Summer				
26.001	120 Winter	100	+30%	100/15 Summer				
27.000	120 Winter	100	+30%	100/15 Summer				
26.002	120 Winter	100	+30%	100/15 Summer				
21.008	120 Winter	100	+30%	100/15 Summer				
28.000	120 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
21.009	120 Winter	100	+30%	100/15 Summer				
21.010	120 Winter	100	+30%	100/15 Summer				
29.000	15 Winter	100	+30%	100/15 Summer				
29.001	15 Winter	100	+30%	100/15 Summer				
29.002	15 Winter	100	+30%	100/15 Summer				
30.000	15 Winter	100	+30%					
31.000	15 Winter	100	+30%					
30.001	15 Winter	100	+30%					
30.002	15 Winter	100	+30%	100/15 Summer				
29.003	15 Winter	100	+30%	100/15 Summer				
29.004	15 Winter	100	+30%	100/15 Summer				
32.000	15 Winter	100	+30%	100/15 Winter				
32.001	15 Winter	100	+30%	100/15 Summer				
32.002	15 Winter	100	+30%	100/15 Summer				
29.005	15 Winter	100	+30%	100/15 Summer				
29.006	15 Winter	100	+30%	100/15 Summer				
29.007	15 Winter	100	+30%	100/15 Summer				
33.000	15 Winter	100	+30%					
33.001	30 Winter	100	+30%	100/15 Summer				
29.008	15 Winter	100	+30%	100/15 Summer				
34.000	15 Winter	100	+30%	100/15 Summer				
34.001	120 Winter	100	+30%	100/15 Summer				
35.000	120 Winter	100	+30%	100/30 Winter				
34.002	120 Winter	100	+30%	100/15 Summer				
34.003	120 Winter	100	+30%	100/15 Summer				
34.004	120 Winter	100	+30%	100/15 Summer				
29.009	120 Winter	100	+30%	100/15 Summer				
36.000	120 Winter	100	+30%	100/15 Summer				
36.001	120 Winter	100	+30%	100/15 Summer				
21.011	120 Winter	100	+30%	100/15 Summer				
21.012	120 Winter	100	+30%	100/15 Summer				
37.000	120 Winter	100	+30%	100/15 Winter				
37.001	120 Winter	100	+30%	100/15 Summer				
37.002	120 Winter	100	+30%	100/15 Summer				
37.003	120 Winter	100	+30%	100/15 Summer				
38.000	120 Winter	100	+30%	100/15 Summer	100/120 Winter			1
21.013	120 Winter	100	+30%	100/15 Summer				
39.000	240 Winter	100	+30%	100/240 Winter				
21.014	240 Winter	100	+30%	100/120 Winter				
40.000	240 Winter	100	+30%	100/120 Winter				
21.015	240 Winter	100	+30%	100/120 Winter				
21.016	240 Winter	100	+30%	100/120 Summer				
21.017	240 Winter	100	+30%	100/120 Summer				
21.018	240 Winter	100	+30%	100/120 Summer				
41.000	240 Winter	100	+30%	100/15 Summer				
21.019	240 Winter	100	+30%	100/15 Summer				
21.020	360 Winter	100	+30%	100/15 Summer				
42.000	360 Winter	100	+30%	100/15 Summer				
1.028	360 Winter	100	+30%	100/15 Summer				
1.029	360 Winter	100	+30%	100/15 Summer				
1.030	360 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
43.000	15 Winter	100	+30%	100/15 Summer				
43.001	15 Winter	100	+30%	100/15 Summer				
43.002	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
43.003	15 Winter	100	+30%	100/15 Summer				
44.000	30 Winter	100	+30%	100/15 Summer				
44.001	30 Winter	100	+30%					
45.000	15 Winter	100	+30%	100/15 Summer				
45.001	15 Winter	100	+30%	100/15 Summer				
45.002	15 Winter	100	+30%	100/15 Summer				
44.002	30 Winter	100	+30%	100/15 Winter				
44.003	30 Winter	100	+30%	100/15 Summer				
44.004	30 Winter	100	+30%	100/15 Summer				
44.005	30 Winter	100	+30%					
44.006	15 Winter	100	+30%	100/15 Winter				
43.004	15 Winter	100	+30%	100/15 Summer				
43.005	60 Winter	100	+30%	100/15 Summer				
1.031	60 Winter	100	+30%	100/15 Summer				
1.032	60 Winter	100	+30%	100/30 Winter				
1.033	60 Winter	100	+30%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	0542	126.686	0.828	107.399	0.95	0.0	58.2	FLOOD
1.001	0648	126.133	0.974	56.912	1.13	0.0	55.6	FLOOD
1.002	Ex MH	126.096	1.224	0.000	1.73	0.0	73.5	FLOOD RISK
1.003	0579	125.676	0.965	35.815	1.13	0.0	59.4	FLOOD
1.004	SC1	125.386	1.277	0.000	0.53	0.0	58.7	FLOOD RISK
1.005	SC2	125.290	1.718	83.615	0.56	0.0	49.0	FLOOD
2.000	0580	125.973	0.504	24.401	0.94	0.0	26.9	FLOOD
2.001	EX MH	125.958	0.800	1.371	1.08	0.0	33.2	FLOOD
2.002	1015	125.259	0.832	177.669	0.79	0.0	12.0	FLOOD
2.003	SC3	125.271	1.146	171.032	0.19	0.0	22.5	FLOOD
1.006	SC4	125.285	1.835	0.000	0.52	0.0	79.2	FLOOD RISK
3.000	0613	126.898	0.746	19.754	1.24	0.0	19.6	FLOOD
3.001	0615	126.569	0.651	59.557	0.90	0.0	16.5	FLOOD
3.002	0610	126.456	1.058	64.742	2.88	0.0	27.3	FLOOD
3.003	0611	126.836	1.456	0.000	1.89	0.0	27.3	FLOOD RISK
3.004	0532	126.435	1.224	7.482	3.35	0.0	41.8	FLOOD
4.000	1032	126.879	1.378	37.165	2.19	0.0	27.0	FLOOD
3.005	0608	125.622	0.280	0.000	0.23	0.0	51.5	SURCHARGED
5.000	GY	125.653	0.403	2.927	2.01	0.0	32.7	FLOOD
3.006	0530	125.508	0.351	0.000	0.25	0.0	54.8	FLOOD RISK
3.007	0544	125.400	0.470	0.000	0.32	0.0	53.1	FLOOD RISK
3.008	0529	125.306	0.686	72.962	0.37	0.0	59.3	FLOOD
6.000	TANK	125.285	2.045	0.000	0.00	0.0	0.0	FLOOD RISK
6.001	SC5	125.285	1.932	0.000	0.00	0.0	0.0	FLOOD RISK
1.007	SC6	125.285	2.295	121.350	0.95	0.0	13.4	FLOOD
7.000	0842	126.179	0.898	12.629	0.75	0.0	8.3	FLOOD
7.001	0772	126.190	1.362	10.220	1.53	0.0	10.0	FLOOD

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

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
7.002	EX MH	125.248	0.838	47.695	1.04	0.0	21.5	FLOOD
7.003	0535	125.732	1.697	0.000	2.26	0.0	22.0	FLOOD RISK
8.000	0533	125.774	1.401	12.477	1.31	0.0	13.6	FLOOD
7.004	0524	125.648	1.658	7.409	1.69	0.0	32.6	FLOOD
7.005	SC19	125.164	1.774	0.000	1.08	0.0	23.9	FLOOD RISK
1.008	SC7	124.734	1.997	0.000	2.50	0.0	33.2	SURCHARGED
1.009	SC8	124.561	1.916	0.000	0.97	0.0	34.2	SURCHARGED
9.000	SC9	125.066	1.896	0.394	0.53	0.0	55.2	FLOOD
9.001	SC10	124.931	2.401	0.000	3.47	0.0	44.6	FLOOD RISK
1.010	SC11	124.515	2.027	0.000	1.66	0.0	65.1	SURCHARGED
10.000	1 (B6)	123.870	0.175	0.000	0.37	0.0	13.4	SURCHARGED
10.001	2 (B6)	123.854	0.259	0.000	0.79	0.0	28.7	SURCHARGED
10.002	3 (B6)	123.835	0.330	0.000	0.81	0.0	30.4	SURCHARGED
10.003	4 (B6)	123.816	0.471	0.000	1.04	0.0	38.3	SURCHARGED
10.004	5 (B6)	123.752	0.547	0.000	1.37	0.0	50.5	SURCHARGED
10.005	6 (B6)	123.738	0.663	0.000	0.75	0.0	26.4	SURCHARGED
10.006	7 (B6)	123.737	0.737	0.000	0.46	0.0	31.8	SURCHARGED
11.000	Tank (B6)	123.736	0.776	0.000	0.27	0.0	16.8	FLOOD RISK
10.007	8 (B6)	123.735	0.825	0.000	0.33	0.0	17.5	FLOOD RISK
10.008	9 (B6)	123.734	0.854	0.000	0.27	0.0	16.6	SURCHARGED
10.009	10 (B6)	123.731	0.911	0.000	0.19	0.0	12.7	SURCHARGED
10.010	11 (B6)	123.727	1.037	0.000	0.14	0.0	9.4	FLOOD RISK
10.011	12 (B6)	123.722	1.292	0.000	0.30	0.0	5.0	FLOOD RISK
1.011	SC12	124.082	1.754	0.000	1.80	0.0	61.1	FLOOD RISK
1.012	SC13	123.833	1.584	0.000	1.14	0.0	70.6	SURCHARGED
12.000	PP (B6)	122.812	0.152	0.000	0.12	0.0	3.1	SURCHARGED
12.001	13 (B6)	122.811	0.331	0.000	0.02	0.0	1.0	SURCHARGED
13.000	PP (B6)	122.016	0.416	0.000	0.49	0.0	5.3	SURCHARGED
13.001	14 (B6)	122.016	0.426	0.000	0.02	0.0	1.0	SURCHARGED
1.013	SC14	122.365	1.229	3.090	1.46	0.0	65.7	FLOOD
1.014	SC15	121.695	0.880	19.959	0.96	0.0	78.4	FLOOD
1.015	SC16	121.639	1.093	0.000	1.14	0.0	77.8	SURCHARGED
14.000	0015	122.918	-0.058	0.000	0.02	0.0	1.3	OK
14.001	0014	122.919	0.038	0.000	0.95	0.0	49.6	SURCHARGED
15.000	0005	122.908	0.069	0.000	1.30	0.0	60.2	SURCHARGED
14.002	0004	122.851	-0.114	0.000	0.35	0.0	121.4	OK
14.003	0454	122.755	0.343	13.125	0.46	0.0	124.6	FLOOD
14.004	0326	122.712	0.680	0.090	1.13	0.0	94.2	FLOOD
14.005	0323	122.599	0.677	0.000	0.93	0.0	111.3	FLOOD RISK
16.000	0455	122.489	0.729	0.000	0.76	0.0	13.1	FLOOD RISK
17.000	0460	122.823	0.477	7.284	1.03	0.0	6.5	FLOOD
17.001	0459	122.214	0.409	19.419	1.46	0.0	28.1	FLOOD
14.006	0373	122.292	0.770	4.754	0.94	0.0	107.0	FLOOD
1.016	0009	121.563	1.096	0.000	2.58	0.0	179.0	SURCHARGED
1.017	0010	121.052	0.726	126.141	0.83	0.0	125.5	FLOOD
1.018	0011	120.920	0.878	26.922	1.22	0.0	63.9	FLOOD
1.019	0480	119.865	0.533	37.565	1.47	0.0	60.6	FLOOD
1.020	0526	119.418	0.416	1.328	2.91	0.0	61.2	FLOOD
1.021	0643	119.361	0.309	0.000	0.57	0.0	63.6	FLOOD RISK
18.000	0497	119.701	0.727	6.556	2.53	0.0	10.3	FLOOD

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

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.022	0029	119.239	0.400	0.117	1.41	0.0	99.6	FLOOD
1.023	0288	118.496	0.005	4.531	0.42	0.0	88.4	FLOOD
19.000	72 (D4b)	118.807	0.607	6.814	0.34	0.0	19.9	FLOOD
20.000	76 (D4b)	121.632	0.907	1.751	1.27	0.0	67.3	FLOOD
20.001	75 (D4b)	120.275	0.520	0.000	1.38	0.0	66.5	SURCHARGED
20.002	74 (D4b)	119.947	0.392	0.000	0.79	0.0	71.8	SURCHARGED
20.003	73 (D4b)	119.283	0.983	0.000	1.71	0.0	93.0	FLOOD RISK
19.001	71 (D4b)	118.854	0.864	0.000	1.43	0.0	113.8	FLOOD RISK
19.002	70 (D4b)	118.753	0.923	2.803	0.41	0.0	27.7	FLOOD
1.024	SC17	118.280	0.650	0.052	1.50	0.0	99.4	FLOOD
1.025	SC18	118.058	0.535	0.000	1.47	0.0	98.4	FLOOD RISK
1.026	SC18a	117.917	0.497	0.000	1.33	0.0	81.5	SURCHARGED
1.027	SC18b	117.832	0.472	0.000	1.19	0.0	81.4	SURCHARGED
21.000	1 (D2a)	119.648	0.248	0.000	0.27	0.0	17.9	SURCHARGED
22.000	2 (D2a)	120.074	0.404	0.000	1.24	0.0	76.3	SURCHARGED
22.001	2a (D2a)	119.978	0.358	0.000	2.45	0.0	155.7	SURCHARGED
22.002	2b (D2a)	119.795	0.245	0.000	0.21	0.0	78.9	SURCHARGED
22.003	3 (D2a)	119.808	0.548	0.000	0.92	0.0	51.6	SURCHARGED
21.001	4 (D2a)	119.644	0.434	0.000	0.41	0.0	74.7	SURCHARGED
23.000	5 (D2a)	120.525	1.110	5.492	1.98	0.0	70.5	FLOOD
23.001	5a (D2a)	120.585	1.260	0.630	2.36	0.0	144.8	FLOOD
23.002	5b (D2a)	120.592	1.317	0.000	0.89	0.0	229.9	FLOOD RISK
23.003	6 (D2a)	120.505	1.485	0.000	0.97	0.0	66.3	FLOOD RISK
21.002	7 (D2a)	119.639	0.699	0.000	0.67	0.0	107.8	SURCHARGED
21.003	8 (D2a)	119.631	0.781	0.000	0.76	0.0	114.4	SURCHARGED
21.004	9 (D2a)	119.624	0.834	0.000	0.95	0.0	113.0	SURCHARGED
24.000	80 (D4b)	119.928	-0.172	0.000	0.38	0.0	49.4	OK
24.001	81 (D4b)	119.867	0.067	0.000	0.66	0.0	92.0	SURCHARGED
25.000	Tank (D4b)	119.842	0.682	0.000	0.24	0.0	29.7	SURCHARGED
24.002	82 (D4b)	119.836	0.726	0.000	0.15	0.0	43.6	SURCHARGED
24.003	83 (D4b)	119.821	0.986	0.000	0.30	0.0	32.3	SURCHARGED
21.005	84 (D4b)	119.621	0.846	0.000	0.87	0.0	142.9	SURCHARGED
21.006	12 (D2a)	119.574	0.894	0.000	0.81	0.0	136.9	SURCHARGED
21.007	13 (D2a)	119.564	0.959	0.000	0.73	0.0	142.3	SURCHARGED
26.000	14a (D2a)	119.566	0.806	0.000	0.45	0.0	16.3	FLOOD RISK
26.001	14 (D2a)	119.561	0.901	0.000	0.08	0.0	19.0	FLOOD RISK
27.000	15 (D3a)	119.560	0.900	0.000	0.04	0.0	11.1	SURCHARGED
26.002	16 (D2a)	119.560	0.960	0.000	0.06	0.0	17.6	FLOOD RISK
21.008	17 (D2a)	119.559	0.989	0.000	0.31	0.0	132.5	SURCHARGED
28.000	85 (D4b)	119.553	1.073	0.000	0.11	0.0	18.5	SURCHARGED
21.009	17a (D3a)	119.553	1.087	0.000	0.20	0.0	76.4	SURCHARGED
21.010	18 (D3a)	119.547	1.132	0.000	0.29	0.0	76.4	SURCHARGED
29.000	19 (D6a)	123.022	2.072	0.000	1.09	0.0	79.7	SURCHARGED
29.001	20 (D6a)	122.357	1.897	0.000	1.38	0.0	91.0	SURCHARGED
29.002	23a (D6a)	122.114	1.814	0.000	2.15	0.0	129.8	SURCHARGED
30.000	21 (D6a)	121.550	0.000	0.000	0.19	0.0	94.3	OK
31.000	21a (D6a)	121.478	-0.032	0.000	0.05	0.0	17.3	OK
30.001	21b (D6a)	121.470	0.000	0.000	0.18	0.0	76.4	OK
30.002	22 (D6a)	121.425	0.485	0.000	0.15	0.0	31.2	SURCHARGED
29.003	23 (D6a)	121.802	1.572	0.000	1.90	0.0	123.4	SURCHARGED

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29.004	24 (D6a)	121.550	1.410	0.000	2.01	0.0	134.2	SURCHARGED
32.000	25 (D6a)	120.718	0.118	0.000	0.17	0.0	47.0	SURCHARGED
32.001	26 (D6a)	120.682	0.142	0.000	0.23	0.0	57.9	SURCHARGED
32.002	27 (D6a)	120.740	0.580	0.000	0.51	0.0	49.6	SURCHARGED
29.005	28 (D6a)	121.114	1.104	0.000	1.04	0.0	162.9	SURCHARGED
29.006	29 (D6a)	120.714	1.174	0.000	1.05	0.0	232.8	SURCHARGED
29.007	32 (D6a)	120.128	1.148	0.000	1.27	0.0	311.9	SURCHARGED
33.000	Tank (D4b)	120.110	0.000	0.000	0.58	0.0	35.9	SURCHARGED*
33.001	31 (D4b)	121.101	1.171	0.000	0.13	0.0	6.7	SURCHARGED
29.008	33 (D6a)	119.824	1.034	0.000	1.55	0.0	334.2	SURCHARGED
34.000	34 (D6a)	119.848	0.348	0.000	1.12	0.0	98.1	SURCHARGED
34.001	35 (D6a)	119.457	0.317	0.000	0.59	0.0	36.2	SURCHARGED
35.000	137	119.456	0.256	0.000	0.08	0.0	6.0	SURCHARGED
34.002	37 (D6a)	119.455	0.365	0.000	0.12	0.0	40.2	SURCHARGED
34.003	38 (D6a)	119.461	0.471	0.000	0.10	0.0	32.7	SURCHARGED
34.004	39 (D6a)	119.463	0.863	0.000	0.33	0.0	32.5	SURCHARGED
29.009	40 (D6a)	119.344	0.894	0.000	0.77	0.0	199.5	SURCHARGED
36.000	41 (D4b)	119.259	0.384	0.000	0.03	0.0	3.4	SURCHARGED
36.001	42 (D4b)	119.259	0.579	0.000	0.03	0.0	3.5	SURCHARGED
21.011	43 (D3a)	119.328	0.943	0.000	0.47	0.0	156.1	SURCHARGED
21.012	44 (D3a)	119.312	0.967	0.000	0.35	0.0	154.5	SURCHARGED
37.000	45 (D4a)	119.082	0.482	0.000	0.06	0.0	4.2	SURCHARGED
37.001	45a (D4a)	119.082	0.572	0.000	0.09	0.0	6.2	SURCHARGED
37.002	45b (D4a)	119.085	0.660	0.000	0.16	0.0	9.3	SURCHARGED
37.003	46 (D4a)	119.094	0.734	0.000	0.17	0.0	9.5	SURCHARGED
38.000	47a (D3a)	119.306	0.776	1.350	0.15	0.0	17.8	FLOOD
21.013	47 (D3a)	119.304	0.994	0.000	0.27	0.0	117.3	SURCHARGED
39.000	49 (D3a)	118.542	0.212	0.000	0.04	0.0	26.3	SURCHARGED
21.014	50 (D3a)	118.542	0.297	0.000	0.14	0.0	129.4	SURCHARGED
40.000	51 (D3a)	118.534	0.354	0.000	0.02	0.0	10.0	SURCHARGED
21.015	52 (D3a)	118.534	0.384	0.000	0.33	0.0	127.6	SURCHARGED
21.016	53 (D3a)	118.525	0.405	0.000	0.29	0.0	129.5	SURCHARGED
21.017	53a (D3a)	118.518	0.428	0.000	0.31	0.0	130.6	SURCHARGED
21.018	54 (D3a)	118.510	0.450	0.000	0.21	0.0	127.5	SURCHARGED
41.000	55 (D3a)	118.505	0.875	0.000	0.17	0.0	24.3	FLOOD RISK
21.019	56 (D3a)	118.505	1.000	0.000	0.96	0.0	114.7	FLOOD RISK
21.020	57 (D3a)	117.842	0.432	0.000	0.77	0.0	112.2	SURCHARGED
42.000	58 (D3a)	117.719	0.369	0.000	0.22	0.0	3.3	SURCHARGED
1.028	SC18c	117.716	0.443	0.000	1.67	0.0	186.2	SURCHARGED
1.029	0271	117.489	0.297	0.000	1.04	0.0	186.3	SURCHARGED
1.030	0270	117.232	0.279	0.000	1.20	0.0	187.2	FLOOD RISK
43.000	59 (D3a)	119.115	1.675	0.000	0.96	0.0	75.7	SURCHARGED
43.001	60 (D3a)	118.976	1.736	0.000	1.95	0.0	130.3	FLOOD RISK
43.002	61 (D3a)	118.710	1.630	0.431	2.34	0.0	149.8	FLOOD
43.003	62 (D3a)	118.457	1.487	0.000	2.82	0.0	187.2	SURCHARGED
44.000	69 (D3a)	119.398	0.173	0.000	0.10	0.0	4.4	SURCHARGED
44.001	Swale (D3a)	119.396	-0.004	0.000	0.01	0.0	17.3	FLOOD RISK
45.000	63 (D3a)	119.622	0.217	0.000	0.73	0.0	73.2	SURCHARGED
45.001	64 (D3a)	119.537	0.242	0.000	1.32	0.0	110.5	SURCHARGED
45.002	65 (D3a)	119.452	0.187	0.000	2.48	0.0	185.5	SURCHARGED

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44.002	Swale (D3a)	119.397	0.047	0.000	0.06	0.0	87.5	FLOOD RISK
44.003	Pipe (D3a)	119.326	0.406	0.000	1.58	0.0	24.2	FLOOD RISK
44.004	66 (D3a)	118.877	0.137	0.000	1.61	0.0	24.2	SURCHARGED
44.005	Swale (D3a)	118.556	-0.444	0.000	0.01	0.0	24.2	OK
44.006	Pipe (D3a)	118.121	0.071	0.000	0.76	0.0	47.1	FLOOD RISK
43.004	67 (D3a)	118.230	1.255	0.000	0.86	0.0	96.9	FLOOD RISK
43.005	68 (D3a)	117.159	0.324	0.000	0.90	0.0	96.6	SURCHARGED
1.031	EX MH A	117.066	0.271	0.000	2.00	0.0	228.6	FLOOD RISK
1.032	EX MH	116.725	0.015	0.000	1.11	0.0	228.6	SURCHARGED
1.033	PI	116.339	-0.121	0.000	0.88	0.0	228.6	OK