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# 16871

# Flood Risk Assessment Compliance

## For
## Camp Road, Upper Heyford
## Parcel B6
## Rev 0

## July 2015

Contents



Appendices

## 1.0 Introduction

1.1 This Flood Risk Assessment Compliance report has been prepared on behalf of Bovis Homes in support of their Reserved Matters application for Parcel B6 of the redevelopment off Camp Road, Upper Heyford. This report also covers the re-plan of a small number of dwellings within Parcel B2b. Refer to **Appendix A** for residential parcel plan.

1.2 The purpose of this report is to demonstrate that the proposed drainage design for these dwellings complies with the approved Flood Risk Assessment (FRA) carried out by Waterman dated October 2010 (Ref C11234 ES 001).

1.3 This reserved matters application includes 27 new dwellings on Parcel B6 located between Camp Road and Gordon Road, and also the re-plan of 14 units previously approved as part of Parcel B2b immediately south of B6. Refer to **Appendix B** for the proposed masterplan and areas covered by this reserved matters application.

1.4 This report is intended to assist in the discharge of Planning Conditions of the Outline Planning Consent that requires the developer to demonstrate compliance with the approved FRA.

## 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 Parcel B2b forms part of the larger Catchment 1 that seeks to utilize a series of strategic attenuation features. This catchment allows for sub-parcels, such as B2b, to discharge unrestricted runoff into these strategic attenuation features, with only strategic flow controls restricting discharge from the strategic features before discharge to the culverted watercourse at the far south of the catchment. No attenuation is required within the individual parcels that make up Catchment 1. Strategic attenuation features need only attenuate to existing 1 in 100 year discharge with a 30% allowance for climate change.

2.8 Parcel B6 forms part of the larger Catchment 2. The FRA is less clear on the attenuation strategy but seeks to attenuate to existing 1 in 100 year discharge with a 30% allowance for climate change. The attenuation strategy includes the use of oversize pipes, permeable paving and attenuation tanks but without the benefit of strategic features requiring on-parcel attenuation and flow restriction.

2.9 The FRA also requires a 10% betterment of existing flows entering the eastern tributary of the Gallos Brook, however, this has no bearing on this report and FRA catchments 1 and 2 located to the west and centre of the development.

## 3.0 Proposed Development

3.1 The proposed areas of development as part of this reserved matters can be seen in **Appendix B**. This should be read in conjunction with **Appendix A** giving parcel reference numbers.

3.2 Parcel B6 comprises of two separate areas. The main parcel comprising of 25 new dwellings is a long thin parcel located between Camp Road and Gordon Road. A small parcel comprising of just two units also makes up Parcel B6 and is located immediately south east of the main parcel, located off Dow Street. Parcel B6 comprises of 0.99 hectares of land in total.

3.3 Parcel B6 currently comprises of a number of existing features including water tanks, pump houses, parking and landscaped areas. These features currently benefit from a number of surface water connections to the existing sewer network with no evidence of attenuation or flow restriction before entering the main drainage infrastructure.

3.4 This report also pertains to the re-plan of 14 units previously approved as part of B2b. These units are located off the existing Gordon Road and Eady Road.

3.5 The B2b parcel relates to just 0.42 hectares (refer to **Appendix B** for proposed layouts).

3.6 A Flood Risk Compliance note was prepared and approved for B2b. This 14 unit re-plan makes no change to the philosophy or calculations contained therein.

### Discharge Strategy

3.7 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 even, while taking climate change into account”.

3.8 Parcel B6 currently discharges to the existing surface water system within the FRA Catchment 2 area. This system has recently been diverted to achieve a number of aims, to clear development parcels of existing infrastructure, provide an outfall and upgrade aging infrastructure.

3.9 It is proposed to maintain the existing drainage regime on Parcel B6 discharging to the existing surface water sewers, albeit, recently diverted to suit the proposed development parcels. Due to the reuse of existing sewers it is necessary to restrict surface water runoff to a rate that will not increase flood risk within the limits of the existing/improved sewers. Refer to **Appendix C** for the proposed drainage strategy plans.

3.10 Due to the topography and geographical location of the various parts to Parcel B6 there will be three points of connection to the diverted sewer.

3.11 The majority of the site will connect into the diversion at the north eastern corner of B6. A flow control chamber containing an orifice plate will be used to restricted discharge to a maximum 5 l/s.

3.12 Due to the topography, those units that front onto Dow Street will drain via separate connection to the diverted sewer. A flow control chamber containing an orifice plate will be used to restrict discharge to 1 l/s.

3.13 The further two units to the south of the main parcel, also fronting Dow Street will have a separate connection to the diverted sewer due to its geographical separation from the other units. A flow control chamber containing an orifice plate will be used to restrict discharge to 1 l/s.

3.14 The final outfall from the existing diverted sewer is at the same point identified within the Approved FRA confirming compliance with the strategy within the FRA.

3.15 **As there is no demonstrable restriction of flows from the existing site the proposals present a large degree of betterment, over and above that prescribed by the FRA.**

3.16 The re-plan of 14 units on Parcel B2b does not seek to alter the drainage principles of the previously approved scheme.

3.17 Parcel B2b forms part of a wider catchment (FRA catchment 1). The entire catchment will be restricted by a strategic flow control to a rate no greater than the existing 1 in 100 year rate prior to discharge to the existing watercourse. Sub parcels, such as parcel B2b, will not be restricted until it reaches the strategic control.

3.18 An assessment has been undertaken comparing the impermeable area of the re-planned 14 units with the approved scheme.

| | |
|---|---|
| Approved scheme impermeable area | 1,532.25 $m^2$ |
| Proposed re-plan impermeable area | 1,322.90 $m^2$ |

3.19 **It can be seen from the above that the proposed re-plan will reduce the impermeable area and therefore represents a betterment in both discharge rate and performance of the system.**

**Attenuation Strategy**

3.20 In accordance with the Approved FRA it is proposed to use a combination of permeable paving and below ground cellular attenuation tanks within Parcel B6. Refer to **Appendix C** for the proposed drainage layout.

3.21 The majority of the attenuation required on the main body of Parcel B6 will be provided within below ground attenuation tanks connected to the main sewers and located under a landscaped area. The tank is likely to be a Polystorm unit which has a proven track record.

3.22 Permeable paving will be used on some of the private drives. These areas will provide both water quality benefits and attenuation at source for rain falling on the drives. Due to the impermeable nature of the site geology, these will be Type C permeable paving with positive connection to the gravity sewers and no infiltration.

3.23 Due to the limited depth of permeable sub-base, calculated to be 450mm deep, house drainage connections will be made to the gravity sewers in this area.

3.24 The two smaller areas that contribute to Parcel B6 will be attenuated within Type C permeable paving within the parking bays. It is proposed to use a greater depth of permeable stone, circa 600mm, to allow connections from rainwater downpipes directly into the sub-base.

3.25 The parking bays are typically divided by footway. In these locations, adjacent areas of permeable paving will be linked by small diameter sewer. Finally, the permeable paving will be connected to the existing diverted sewer via a flow control chamber to restrict the outfall and maximize the attenuation potential of the permeable paving.

3.26 **This solution helps with both water quality and attenuation at source and complies with the strategy included in the FRA or permeable paving, oversize pipes and attenuation tanks.**

3.27 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. Water butts will be provided on social units.

3.28 **Parcel B2b re-plan does not require attenuation as confirmed in the Approved FRA Compliance Note for this parcel. Parcel B2b is therefore deemed compliant with the FRA.**

## 4.0 Hydraulic Performance

4.1 Parcel B6 connects to the existing diverted sewer known as the 'Central Diversion'. A detailed WinDes model provides full assessment of the entire route and catchment of the diversion including Parcel B6.

4.2 The WinDes model and results are contained within **Appendix D** although it should be noted that these calculations cover a far greater network than just Parcel B6.

4.3 The main drainage run through parcel B6 can be identified within the calculations as PN ref 10.000 with the attenuation tank modelled at PN 11.000

4.4 The five units fronting Dow Street are modelled as PN ref 12.000.

4.5 The two units also fronting Dow Street are modelled as PN ref 13.000

4.6 As required by the FRA we have simulated the 1 in 100 year rainfall event including a 30% allowance for climate change. A multitude of storms durations have been run to identify the critical storm.

4.7 The results can be summarized as follows:

| | | |
|---|---|---|
| PN 10.000 | Flood risk but no flood | max discharge 5 l/s |
| PN 11.000 | Flood risk but no flood | |
| PN 12.000 | Surcharged | max discharge 1 l/s |
| PN 13.000 | Surcharged | max discharge 1 l/s |

4.8 **Based on the above results the drainage proposals can accommodate a 1 in 100 year event, including 30% allowance for climate change without flooding. This is in compliance with the requirements of the FRA.**

4.9 It may be noted that there is flooding within the downstream of parcel B6. This flooding has been explained and approved as part of the Condition 30 report. In summary it is an existing network within the base. Calculations have been provided as part of Condition 30 report to demonstrate the proposed works provide a reduction in flooding and therefore betterment. The above results do not impact upon this.

4.10 Parcel B2b re-plan has been demonstrated (see para 3.17) to comprise of less impermeable area than the previously approved Reserved Matters Application and Approved Flood Risk Compliance Note.

4.11 This reduction in impermeable area offers a betterment over and above the previously approved scheme. There is therefore no intention to re-run the calculations.

4.12 **Parcel B2b re-plan is therefore an improvement over the approved FRA Compliance Note and still fully compliant with the FRA.**

**Exceedance**

4.13 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 floor levels and external 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. The natural topography of the parcel falls from North to South.

**Pollution prevention**

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

4.15 It is noted that the outfalls from both Catchment 1 and 2 pass through a petrol interceptor before discharge into the existing watercourse which meets the requirements of PPG3. There is therefore no intention to provide further interceptors within the Parcel demise.

## 5.0 Summary and Conclusions

5.1 This report has been prepared to allow discharge of planning conditions which requires evidence of compliance with the approved Waterman Flood Risk Assessment.

5.2 The drainage proposals for Parcel B6 have been demonstrated to comply with the aspirations of the approved FRA.

5.3 The performance of the drainage scheme for B6 has also been demonstrated to comply with the requirements of the FRA.

5.4 This report also pertains to the replan of 14 units on Parcel B2b.

5.5 This replan provides a greater permeable area and therefore the impermeable areas have reduced from the previously approved scheme.

5.6 With a reduction in impermeable area and no change to the principles in the previously approved FRA Compliance Note, Parcel B2b is also deemed to comply with the approved FRA.

# APPENDIX A

# Residential Parcel Plan

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3. Masterplan reference 14272-01-dw-411-030 illustrative masterplan by Scott Brownrigg

N

PH11
PH2
D5a
Trenchard Circle
B4b
PH10
B3
D2b
PH8
B4d
D3b
PH8
D5b
Free school
B1
PH7
D2d
Village centre
D1c
B2a
B2b
BB
PH5c
D2e
B6
Gym
D1a
D1b
PH1
Cricket pitch & village green
D2a
PH3
D6a
PH5
PH6
D4b
PH5b
D4a
D4a
PH5b
D3a
PH4

0 20 40 60 100 200 300 400

| Revision | Description | Drawn | Checked | Date |
|---|---|---|---|---|
| B | Parcel references updated | AT | JF | 16.06.15 |
| A | Parcel references updated | AT | JF | 27.01.14 |

Preliminary ■ Information □ Tender □ Construction □ As Built □

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Title UPPER HEYFORD

Details RESIDENTIAL PARCEL PLAN

Scale: 1:2000 @ A1 Date: Dec 2012 Drawn: JGF Chk: IDB

HEYF/5/118 B

*Please consider the environment before printing this drawing*

# APPENDIX B

# Proposed Masterplan

## ACCOMMODATION SCHEDULE
### PARCELS B5B

| | House Type | Square footage | No. units | No. Beds | Total sqft. |
|---|---|---|---|---|---|
| **OPEN MARKET** | 302A | 853 | 1 | 4 | 853 |
| | 303A | 959 | 1 | 4 | 959 |
| | P404 | 1343 | 1 | 4 | 1343 |
| | P502 | 1752 | 2 | 5 | 3504 |
| **OM TOTAL** | | | **5** | | **6659** |
| **AFFORDABLE** | Maisonette | 550 | 2 | 1 | 1100 |
| | 241 | 764 | 8 | 2 | 6112 |
| **AFF TOTAL** | | | **10** | | **7212** |
| **TOTAL** | | | **15** | | **13871** |

| | |
|---|---|
| Net Developable Area | 0.320 Ha<br>0.791 Acres |
| Coverage | 17542.2 sqft/acre |
| Density | 46.875 DPH |

## ACCOMMODATION SCHEDULE
### PARCEL B6

| | House Type | Square footage | No. units | No. Beds | Total sqft. |
|---|---|---|---|---|---|
| | P404A | 1343 | 1 | 4 | 1343 |
| | P408 | 1300 | 3 | 4 | 3900 |
| | P409 | 1311 | 8 | 4 | 10488 |
| | C525 | 1530 | 1 | 5 | 1530 |
| | P506 | 1955 | 2 | 5 | 3910 |
| | P505 | 1977 | 1 | 5 | 1977 |
| **OM TOTAL** | | | **16** | | **23148** |
| **AFFORDABLE** | Maisonette | 550 | 4 | 1 | 2200 |
| | 241 | 764 | 4 | 2 | 3056 |
| | 351 | 853 | 1 | 3 | 853 |
| | TYPE A | 1190 | 4 | 3 | 4760 |
| **AFF TOTAL** | | | **13** | | **10869** |
| **TOTAL** | | | **29** | | **34017** |

| | |
|---|---|
| Net Developable Area | 0.73 Ha<br>1.804 Acres |
| Coverage | 18858.2 sqft/acre |
| Density | 39.726 DPH |




N W E S 0 5 10 20m

# HEYFORD PARK - **SITE LAYOUT (DRAFT) PARCEL B6**

Pegasus Urban Design

| T 01285 641717 | F 01285 642348 | www.pegasuspg.co.uk | Team: MCC/CCW | Date: 22nd June 2015 | Scale: 1:500 @ A1 | drwg: **B.0285**_60I | Client: **Bovis Homes** |

# APPENDIX C

## Proposed levels and drainage layouts

## SAFETY HEALTH AND ENVIRONMENTAL

THERE ARE NO EXCEPTIONAL RISKS ASSOCIATED WITH THESE WORKS. REFER TO THE DESIGNERS RISK ASSESSMENT FOR THE FULL ASSESSMENT OF RISKS.

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ALL FLOOR LEVELS +/- 450mm

| REVISION | DESCRIPTION | DRAWN | CHECKED | DATE |
|---|---|---|---|---|
| PRELIMINARY ■ | INFORMATION □ TENDER □ CONSTRUCTION □ AS BUILT □ | | | |

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TITLE UPPER HEYFORD
PARCEL B6

DETAILS FINISHED FLOOR LEVELS & DRAINAGE STRATEGY

SCALE: 1:200 @ A1 DATE: JULY 2015 DRAWN: JGF CHK: JGF

HEYF-5-724

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Filepath: F:\Engineer

## SAFETY HEALTH AND ENVIRONMENTAL

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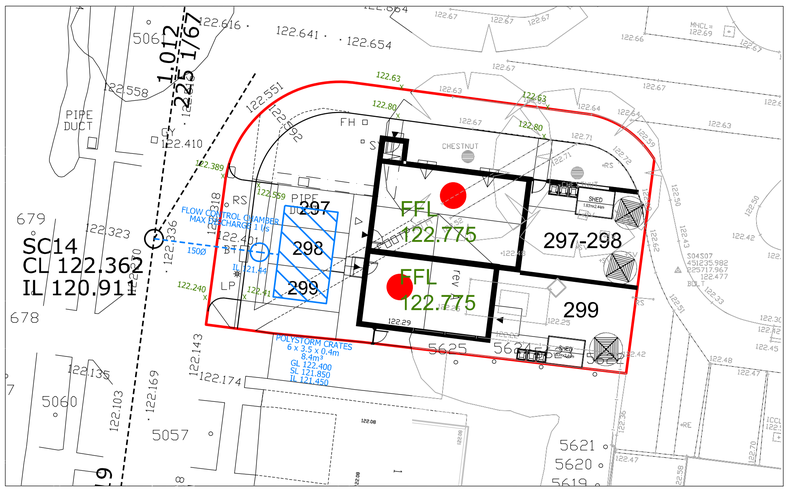
SC12
CL 124.253
IL 122.103

SC13
CL 124.1
IL 122.0

1.011
225 1/178

1.012
225 1/67

SEE INSET




ALL FLOOR LEVELS +/- 450mm

| REVISION | DESCRIPTION | DRAWN | CHECKED | DATE |
|---|---|---|---|---|

PRELIMINARY ■ INFORMATION ☐ TENDER ☐ CONSTRUCTION ☐ AS BUILT ☐

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TITLE UPPER HEYFORD
PARCEL B6

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HEYF-5-725

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# APPENDIX D

# MicroDrainage Calculations

## 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 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 1.023 | 20.664 | 0.861 | 24.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 19.000 | 15.210 | 0.070 | 217.3 | 0.026 | 5.00 | 0.0 | 0.600 | o | 375 | |
| 19.001 | 47.310 | 0.470 | 100.7 | 0.000 | 0.00 | 0.0 | 0.600 | o | 150 | |
| 1.024 | 22.191 | 0.107 | 207.4 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 3.458 | 0.0 | 0.0 | 0.0 | 1.04 | 73.5 | 0.0 |
| 1.023 | 0.00 | 16.46 | 118.191 | 3.458 | 0.0 | 0.0 | 0.0 | 3.22 | 227.8 | 0.0 |
| 19.000 | 0.00 | 5.21 | 118.020 | 0.026 | 0.0 | 0.0 | 0.0 | 1.23 | 135.3 | 0.0 |
| 19.001 | 0.00 | 5.99 | 117.950 | 0.026 | 0.0 | 0.0 | 0.0 | 1.00 | 17.7 | 0.0 |
| 1.024 | 0.00 | 16.80 | 117.330 | 3.484 | 0.0 | 0.0 | 0.0 | 1.09 | 76.9 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.025 | 47.926 | 0.225 | 213.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 20.000 | 45.191 | 0.190 | 237.8 | 0.090 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 21.000 | 8.916 | 0.050 | 178.3 | 0.100 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 21.001 | 14.955 | 0.070 | 213.6 | 0.100 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 21.002 | 31.564 | 0.140 | 225.5 | 0.119 | 0.00 | 0.0 | 0.600 | oo | 43 | |
| 21.003 | 12.952 | 0.050 | 259.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 20.001 | 75.871 | 0.270 | 281.0 | 0.074 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 22.000 | 14.667 | 0.090 | 163.0 | 0.100 | 5.00 | 0.0 | 0.600 | o | 225 | |
| 22.001 | 7.980 | 0.050 | 159.6 | 0.100 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 22.002 | 35.000 | 0.180 | 194.4 | 0.121 | 0.00 | 0.0 | 0.600 | oo | 42 | |
| 22.003 | 14.500 | 0.080 | 181.3 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 20.002 | 25.245 | 0.090 | 280.5 | 0.000 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 20.003 | 16.985 | 0.060 | 283.1 | 0.046 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 20.004 | 30.268 | 0.110 | 275.2 | 0.000 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 23.000 | 29.525 | 0.100 | 295.3 | 0.354 | 5.00 | 0.0 | 0.600 | o | 600 | |
| 23.001 | 16.210 | 0.170 | 95.4 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.025 | 0.00 | 17.54 | 117.223 | 3.484 | 0.0 | 0.0 | 0.0 | 1.07 | 75.9 | 0.0 |
| 20.000 | 0.00 | 5.74 | 119.100 | 0.090 | 0.0 | 0.0 | 0.0 | 1.02 | 71.8 | 0.0 |
| 21.000 | 0.00 | 5.13 | 119.370 | 0.100 | 0.0 | 0.0 | 0.0 | 1.17 | 83.0 | 0.0 |
| 21.001 | 0.00 | 5.36 | 119.320 | 0.200 | 0.0 | 0.0 | 0.0 | 1.07 | 75.8 | 0.0 |
| 21.002 | 0.00 | 5.75 | 119.100 | 0.319 | 0.0 | 0.0 | 0.0 | 1.35 | 429.2 | 0.0 |
| 21.003 | 0.00 | 5.97 | 118.960 | 0.319 | 0.0 | 0.0 | 0.0 | 0.97 | 68.7 | 0.0 |
| 20.001 | 0.00 | 7.02 | 118.760 | 0.483 | 0.0 | 0.0 | 0.0 | 1.21 | 192.1 | 0.0 |
| 22.000 | 0.00 | 5.24 | 119.190 | 0.100 | 0.0 | 0.0 | 0.0 | 1.02 | 40.6 | 0.0 |
| 22.001 | 0.00 | 5.35 | 119.025 | 0.200 | 0.0 | 0.0 | 0.0 | 1.24 | 87.8 | 0.0 |
| 22.002 | 0.00 | 5.80 | 118.900 | 0.321 | 0.0 | 0.0 | 0.0 | 1.30 | 286.5 | 0.0 |
| 22.003 | 0.00 | 6.00 | 118.720 | 0.321 | 0.0 | 0.0 | 0.0 | 1.16 | 82.3 | 0.0 |
| 20.002 | 0.00 | 7.37 | 118.490 | 0.804 | 0.0 | 0.0 | 0.0 | 1.21 | 192.3 | 0.0 |
| 20.003 | 0.00 | 7.60 | 118.400 | 0.850 | 0.0 | 0.0 | 0.0 | 1.20 | 191.4 | 0.0 |
| 20.004 | 0.00 | 8.01 | 118.340 | 0.850 | 0.0 | 0.0 | 0.0 | 1.22 | 194.1 | 0.0 |
| 23.000 | 0.00 | 5.35 | 118.500 | 0.354 | 0.0 | 0.0 | 0.0 | 1.41 | 399.2 | 0.0 |
| 23.001 | 0.00 | 5.48 | 118.400 | 0.354 | 0.0 | 0.0 | 0.0 | 2.08 | 331.2 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 20.005 | 16.985 | 0.075 | 226.5 | 0.000 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 20.006 | 15.017 | 0.035 | 429.1 | 0.052 | 0.00 | 0.0 | 0.600 | o | 600 | |
| 24.000 | 16.432 | 0.100 | 164.3 | 0.082 | 5.00 | 0.0 | 0.600 | o | 225 | |
| 24.001 | 29.945 | 0.060 | 499.1 | 0.100 | 0.00 | 0.0 | 0.600 | o | 600 | |
| 25.000 | 24.172 | 0.060 | 402.9 | 0.066 | 5.00 | 0.0 | 0.600 | o | 600 | |
| 24.002 | 14.980 | 0.030 | 499.3 | 0.000 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 20.007 | 55.756 | 0.087 | 640.9 | 0.049 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 20.008 | 30.423 | 0.048 | 633.8 | 0.050 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 20.009 | 33.817 | 0.050 | 676.3 | 0.025 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 26.000 | 118.673 | 0.490 | 242.2 | 0.133 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 26.001 | 37.524 | 0.160 | 234.5 | 0.062 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 26.002 | 17.274 | 0.070 | 246.8 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 27.000 | 35.127 | 0.080 | 439.1 | 0.100 | 5.00 | 0.0 | 0.600 | o | 750 | |
| 27.001 | 45.634 | 0.080 | 570.4 | 0.162 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 27.002 | 12.910 | 0.710 | 18.2 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 20.005 | 0.00 | 8.22 | 118.230 | 1.204 | 0.0 | 0.0 | 0.0 | 1.35 | 214.2 | 0.0 |
| 20.006 | 0.00 | 8.44 | 118.005 | 1.256 | 0.0 | 0.0 | 0.0 | 1.17 | 330.6 | 0.0 |
| 24.000 | 0.00 | 5.27 | 118.535 | 0.082 | 0.0 | 0.0 | 0.0 | 1.02 | 40.4 | 0.0 |
| 24.001 | 0.00 | 5.73 | 118.060 | 0.182 | 0.0 | 0.0 | 0.0 | 1.08 | 306.3 | 0.0 |
| 25.000 | 0.00 | 5.33 | 118.060 | 0.066 | 0.0 | 0.0 | 0.0 | 1.21 | 341.3 | 0.0 |
| 24.002 | 0.00 | 5.93 | 117.850 | 0.248 | 0.0 | 0.0 | 0.0 | 1.25 | 550.2 | 0.0 |
| 20.007 | 0.00 | 9.29 | 117.820 | 1.553 | 0.0 | 0.0 | 0.0 | 1.10 | 485.1 | 0.0 |
| 20.008 | 0.00 | 9.74 | 117.733 | 1.603 | 0.0 | 0.0 | 0.0 | 1.10 | 487.8 | 0.0 |
| 20.009 | 0.00 | 10.27 | 117.685 | 1.628 | 0.0 | 0.0 | 0.0 | 1.07 | 472.0 | 0.0 |
| 26.000 | 0.00 | 6.97 | 120.650 | 0.133 | 0.0 | 0.0 | 0.0 | 1.01 | 71.1 | 0.0 |
| 26.001 | 0.00 | 7.58 | 120.160 | 0.195 | 0.0 | 0.0 | 0.0 | 1.02 | 72.3 | 0.0 |
| 26.002 | 0.00 | 7.87 | 120.000 | 0.195 | 0.0 | 0.0 | 0.0 | 1.00 | 70.4 | 0.0 |
| 27.000 | 0.00 | 5.44 | 120.800 | 0.100 | 0.0 | 0.0 | 0.0 | 1.33 | 587.1 | 0.0 |
| 27.001 | 0.00 | 6.09 | 120.720 | 0.262 | 0.0 | 0.0 | 0.0 | 1.16 | 514.5 | 0.0 |
| 27.002 | 0.00 | 6.15 | 120.640 | 0.262 | 0.0 | 0.0 | 0.0 | 3.70 | 261.9 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 26.003 | 21.403 | 0.090 | 237.8 | 0.030 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 26.004 | 28.979 | 0.130 | 222.9 | 0.037 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 28.000 | 35.164 | 0.060 | 586.1 | 0.097 | 5.00 | 0.0 | 0.600 | o | 600 | |
| 28.001 | 44.383 | 0.080 | 554.8 | 0.168 | 0.00 | 0.0 | 0.600 | o | 600 | |
| 28.002 | 14.568 | 0.150 | 97.1 | 0.031 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 26.005 | 52.766 | 0.420 | 125.6 | 0.075 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 26.006 | 38.318 | 0.610 | 62.8 | 0.075 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 26.007 | 11.948 | 0.190 | 62.9 | 0.075 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 29.000 | 24.371 | 0.100 | 243.7 | 0.050 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 29.001 | 11.936 | 1.190 | 10.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 150 | |
| 26.008 | 65.185 | 0.340 | 191.7 | 0.075 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 30.000 | 55.878 | 0.360 | 155.2 | 0.203 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 30.001 | 18.884 | 0.100 | 188.8 | 0.087 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 30.002 | 25.497 | 0.140 | 182.1 | 0.108 | 0.00 | 0.0 | 0.600 | o | 600 | |
| 30.003 | 6.480 | 0.150 | 43.2 | 0.066 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 26.003 | 0.00 | 8.22 | 119.930 | 0.487 | 0.0 | 0.0 | 0.0 | 1.02 | 71.8 | 0.0 |
| 26.004 | 0.00 | 8.68 | 119.840 | 0.524 | 0.0 | 0.0 | 0.0 | 1.05 | 74.1 | 0.0 |
| 28.000 | 0.00 | 5.59 | 120.000 | 0.097 | 0.0 | 0.0 | 0.0 | 1.00 | 282.4 | 0.0 |
| 28.001 | 0.00 | 6.31 | 119.940 | 0.265 | 0.0 | 0.0 | 0.0 | 1.03 | 290.3 | 0.0 |
| 28.002 | 0.00 | 6.46 | 119.860 | 0.296 | 0.0 | 0.0 | 0.0 | 1.60 | 112.8 | 0.0 |
| 26.005 | 0.00 | 9.31 | 119.710 | 0.895 | 0.0 | 0.0 | 0.0 | 1.40 | 99.1 | 0.0 |
| 26.006 | 0.00 | 9.63 | 119.290 | 0.970 | 0.0 | 0.0 | 0.0 | 1.99 | 140.5 | 0.0 |
| 26.007 | 0.00 | 9.71 | 118.530 | 1.045 | 0.0 | 0.0 | 0.0 | 2.57 | 408.3 | 0.0 |
| 29.000 | 0.00 | 5.41 | 119.930 | 0.050 | 0.0 | 0.0 | 0.0 | 1.00 | 70.9 | 0.0 |
| 29.001 | 0.00 | 5.47 | 119.830 | 0.050 | 0.0 | 0.0 | 0.0 | 3.20 | 56.6 | 0.0 |
| 26.008 | 0.00 | 10.45 | 118.340 | 1.170 | 0.0 | 0.0 | 0.0 | 1.46 | 233.0 | 0.0 |
| 30.000 | 0.00 | 5.74 | 119.200 | 0.203 | 0.0 | 0.0 | 0.0 | 1.26 | 89.0 | 0.0 |
| 30.001 | 0.00 | 6.02 | 118.840 | 0.290 | 0.0 | 0.0 | 0.0 | 1.14 | 80.6 | 0.0 |
| 30.002 | 0.00 | 6.25 | 118.440 | 0.398 | 0.0 | 0.0 | 0.0 | 1.80 | 509.3 | 0.0 |
| 30.003 | 0.00 | 6.30 | 118.300 | 0.464 | 0.0 | 0.0 | 0.0 | 2.40 | 169.6 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 26.009 | 29.819 | 0.065 | 458.8 | 0.031 | 0.00 | 0.0 | 0.600 | o | 600 | |
| 31.000 | 40.691 | 0.120 | 339.1 | 0.090 | 5.00 | 0.0 | 0.600 | o | 525 | |
| 31.001 | 17.440 | 0.295 | 59.1 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 20.010 | 23.889 | 0.055 | 434.3 | 0.100 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 20.011 | 7.756 | 0.070 | 110.8 | 0.288 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 32.000 | 17.551 | 0.100 | 175.5 | 0.026 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 32.001 | 17.392 | 0.100 | 173.9 | 0.028 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 32.002 | 16.123 | 0.090 | 179.1 | 0.028 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 32.003 | 13.713 | 0.050 | 274.3 | 0.000 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 20.012 | 33.095 | 0.065 | 509.2 | 0.000 | 0.00 | 0.0 | 0.600 | o | 750 | |
| 33.000 | 26.703 | 0.065 | 410.8 | 0.000 | 5.00 | 0.0 | 0.600 | o | 900 | |
| 20.013 | 18.700 | 0.045 | 415.6 | 0.000 | 0.00 | 0.0 | 0.600 | o | 900 | |
| 34.000 | 20.000 | 0.030 | 666.7 | 0.100 | 5.00 | 0.0 | 0.600 | o | 900 | |
| 20.014 | 24.518 | 0.030 | 817.3 | 0.000 | 0.00 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 26.009 | 0.00 | 10.89 | 117.850 | 1.665 | 0.0 | 0.0 | 0.0 | 1.13 | 319.6 | 0.0 |
| 31.000 | 0.00 | 5.56 | 118.500 | 0.090 | 0.0 | 0.0 | 0.0 | 1.21 | 262.1 | 0.0 |
| 31.001 | 0.00 | 5.70 | 118.380 | 0.090 | 0.0 | 0.0 | 0.0 | 2.05 | 144.8 | 0.0 |
| 20.010 | 0.00 | 11.18 | 117.635 | 3.483 | 0.0 | 0.0 | 0.0 | 1.34 | 590.4 | 0.0 |
| 20.011 | 0.00 | 11.23 | 117.580 | 3.771 | 0.0 | 0.0 | 0.0 | 2.66 | 1174.3 | 0.0 |
| 32.000 | 0.00 | 5.25 | 118.300 | 0.026 | 0.0 | 0.0 | 0.0 | 1.18 | 83.7 | 0.0 |
| 32.001 | 0.00 | 5.49 | 118.200 | 0.054 | 0.0 | 0.0 | 0.0 | 1.19 | 84.1 | 0.0 |
| 32.002 | 0.00 | 5.72 | 118.100 | 0.082 | 0.0 | 0.0 | 0.0 | 1.17 | 82.8 | 0.0 |
| 32.003 | 0.00 | 5.93 | 117.935 | 0.082 | 0.0 | 0.0 | 0.0 | 1.09 | 120.3 | 0.0 |
| 20.012 | 0.00 | 11.68 | 117.510 | 3.853 | 0.0 | 0.0 | 0.0 | 1.23 | 544.9 | 0.0 |
| 33.000 | 0.00 | 5.29 | 117.360 | 0.000 | 0.0 | 0.0 | 0.0 | 1.54 | 979.4 | 0.0 |
| 20.013 | 0.00 | 11.88 | 117.295 | 3.853 | 0.0 | 0.0 | 0.0 | 1.53 | 973.8 | 0.0 |
| 34.000 | 0.00 | 5.28 | 117.280 | 0.100 | 0.0 | 0.0 | 0.0 | 1.21 | 767.2 | 0.0 |
| 20.014 | 0.00 | 12.26 | 117.250 | 3.953 | 0.0 | 0.0 | 0.0 | 1.09 | 692.1 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 20.015 | 27.835 | 0.060 | 463.9 | 0.100 | 0.00 | 0.0 | 0.600 | o | 900 | |
| 20.016 | 6.492 | 0.030 | 216.4 | 0.061 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 20.017 | 18.010 | 0.095 | 189.6 | 0.023 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 20.018 | 11.134 | 0.037 | 300.9 | 0.100 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 35.000 | 8.070 | 0.077 | 104.8 | 0.029 | 5.00 | 0.0 | 0.600 | o | 150 | |
| 1.026 | 6.515 | 0.131 | 49.7 | 0.000 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 1.027 | 21.272 | 0.239 | 89.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 1.028 | 9.700# | 0.208 | 46.6 | 0.032 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 1.029 | 12.290 | 0.085 | 144.6 | 0.000 | 0.00 | 0.0 | 0.600 | o | 375 | |
| 36.000 | 33.338 | 0.250 | 133.4 | 0.090 | 5.00 | 0.0 | 0.600 | o | 300 | |
| 36.001 | 37.692 | 0.160 | 235.6 | 0.090 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 36.002 | 21.562 | 0.100 | 215.6 | 0.040 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 36.003 | 13.000 | 0.080 | 162.5 | 0.000 | 0.00 | 0.0 | 0.600 | o | 300 | |
| 37.000 | 65.000# | 0.500 | 130.0 | 0.000 | 5.00 | 0.0 | 0.600 | \/ | -2 | |
| 38.000 | 15.600 | 0.050 | 312.0 | 0.250 | 5.00 | 0.0 | 0.600 | o | 450 | |
| 37.001 | 1.000 | 0.400 | 2.5 | 0.000 | 0.00 | 0.0 | 0.600 | \/ | -2 | |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 20.015 | 0.00 | 12.58 | 117.220 | 4.053 | 0.0 | 0.0 | 0.0 | 1.45 | 921.2 | 0.0 |
| 20.016 | 0.00 | 12.67 | 117.160 | 4.114 | 0.0 | 0.0 | 0.0 | 1.23 | 135.6 | 0.0 |
| 20.017 | 0.00 | 12.90 | 117.130 | 4.137 | 0.0 | 0.0 | 0.0 | 1.31 | 145.0 | 0.0 |
| 20.018 | 0.00 | 13.08 | 117.035 | 4.237 | 0.0 | 0.0 | 0.0 | 1.04 | 114.8 | 0.0 |
| 35.000 | 0.00 | 5.14 | 117.300 | 0.029 | 0.0 | 0.0 | 0.0 | 0.98 | 17.3 | 0.0 |
| 1.026 | 0.00 | 17.58 | 116.998 | 7.750 | 0.0 | 0.0 | 0.0 | 2.57 | 284.4 | 0.0 |
| 1.027 | 0.00 | 17.77 | 116.867 | 7.750 | 0.0 | 0.0 | 0.0 | 1.92 | 212.2 | 0.0 |
| 1.028 | 0.00 | 17.83 | 116.628 | 7.782 | 0.0 | 0.0 | 0.0 | 2.66 | 293.7 | 0.0 |
| 1.029 | 0.00 | 17.97 | 116.420 | 7.782 | 0.0 | 0.0 | 0.0 | 1.50 | 166.2 | 0.0 |
| 36.000 | 0.00 | 5.41 | 117.140 | 0.090 | 0.0 | 0.0 | 0.0 | 1.36 | 96.1 | 0.0 |
| 36.001 | 0.00 | 6.02 | 116.890 | 0.180 | 0.0 | 0.0 | 0.0 | 1.02 | 72.1 | 0.0 |
| 36.002 | 0.00 | 6.36 | 116.730 | 0.220 | 0.0 | 0.0 | 0.0 | 1.07 | 75.4 | 0.0 |
| 36.003 | 0.00 | 6.54 | 116.630 | 0.220 | 0.0 | 0.0 | 0.0 | 1.23 | 87.0 | 0.0 |
| 37.000 | 0.00 | 5.33 | 118.900 | 0.000 | 0.0 | 0.0 | 0.0 | 3.28 | 4159.5 | 0.0 |
| 38.000 | 0.00 | 5.23 | 118.450 | 0.250 | 0.0 | 0.0 | 0.0 | 1.15 | 182.2 | 0.0 |
| 37.001 | 0.00 | 5.33 | 118.400 | 0.250 | 0.0 | 0.0 | 0.0 | 23.72 | 30098.7 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 37.002 | 87.370# | 0.100 | 873.7 | 0.180 | 0.00 | 0.0 | 0.600 | \/ | -2 | |
| 37.003 | 11.503 | 1.050 | 11.0 | 0.000 | 0.00 | 0.0 | 0.600 | o | 150 | |
| 36.004 | 34.248 | 0.220 | 155.7 | 0.082 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 36.005 | 5.260 | 0.070 | 75.1 | 0.000 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 1.030 | 28.710 | 0.160 | 179.4 | 0.000 | 0.00 | 0.0 | 0.600 | o | 450 | |
| 1.031 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| 37.002 | 0.00 | 6.49 | 118.000 | 0.430 | 0.0 | 0.0 | 0.0 | 1.26 | 1594.6 | 0.0 |
| 37.003 | 0.00 | 6.55 | 117.900 | 0.430 | 0.0 | 0.0 | 0.0 | 3.06 | 54.1 | 0.0 |
| 36.004 | 0.00 | 6.90 | 116.550 | 0.732 | 0.0 | 0.0 | 0.0 | 1.63 | 258.8 | 0.0 |
| 36.005 | 0.00 | 6.94 | 116.330 | 0.732 | 0.0 | 0.0 | 0.0 | 2.35 | 373.3 | 0.0 |
| 1.030 | 0.00 | 18.28 | 116.260 | 8.514 | 0.0 | 0.0 | 0.0 | 1.51 | 240.9 | 0.0 |
| 1.031 | 0.00 | 18.30 | 116.010 | 8.514 | 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) |
|---|---|---|---|---|---|---|
| 1.031 | 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) | 240 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 4 |

| | | | |
|---|---|---|---|
| Number of Input Hydrographs | 0 | Number of Storage Structures | 31 |
| Number of Online Controls | 19 | 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

## Synthetic Rainfall Details

| | |
|---|---|
| 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) | 120 |

## 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 Optimum® Manhole: 65 (D4b), DS/PN: 19.001, Volume (m³): 3.2

| | |
|---|---|
| Unit Reference | MD-SHE-0134-8000-0800-8000 |
| Design Head (m) | 0.800 |
| Design Flow (l/s) | 8.0 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Diameter (mm) | 134 |
| Invert Level (m) | 117.950 |
| Minimum Outlet Pipe Diameter (mm) | 150 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 0.800 | 8.0 |
| Flush-Flo™ | 0.251 | 8.0 |
| Kick-Flo® | 0.558 | 6.7 |
| Mean Flow over Head Range | - | 6.8 |

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

## Hydro-Brake Optimum® Manhole: 65 (D4b), DS/PN: 19.001, Volume (m³): 3.2

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 4.8 | 1.200 | 9.6 | 3.000 | 14.9 | 7.000 | 22.3 |
| 0.200 | 7.9 | 1.400 | 10.4 | 3.500 | 16.0 | 7.500 | 23.1 |
| 0.300 | 7.9 | 1.600 | 11.0 | 4.000 | 17.1 | 8.000 | 23.8 |
| 0.400 | 7.7 | 1.800 | 11.7 | 4.500 | 18.1 | 8.500 | 24.4 |
| 0.500 | 7.3 | 2.000 | 12.3 | 5.000 | 19.0 | 9.000 | 25.2 |
| 0.600 | 7.0 | 2.200 | 12.8 | 5.500 | 19.9 | 9.500 | 25.9 |
| 0.800 | 8.0 | 2.400 | 13.4 | 6.000 | 20.7 | | |
| 1.000 | 8.8 | 2.600 | 13.9 | 6.500 | 21.5 | | |

## Hydro-Brake® Manhole: 3 (D2a), DS/PN: 21.003, 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: 22.003, 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: 11 (D4b), DS/PN: 23.001, Volume (m³): 13.4

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 118.400
Design Flow (l/s) 70.0 Diameter (mm) 299

## Hydro-Brake® Manhole: 11 (D4b), DS/PN: 23.001, Volume (m³): 13.4

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 9.7 | 1.200 | 68.0 | 3.000 | 88.5 | 7.000 | 135.0 |
| 0.200 | 27.9 | 1.400 | 67.9 | 3.500 | 95.5 | 7.500 | 139.7 |
| 0.300 | 47.2 | 1.600 | 69.1 | 4.000 | 102.0 | 8.000 | 144.3 |
| 0.400 | 62.7 | 1.800 | 71.2 | 4.500 | 108.2 | 8.500 | 148.7 |
| 0.500 | 71.1 | 2.000 | 73.8 | 5.000 | 114.1 | 9.000 | 153.0 |
| 0.600 | 73.4 | 2.200 | 76.6 | 5.500 | 119.6 | 9.500 | 157.2 |
| 0.800 | 72.8 | 2.400 | 79.6 | 6.000 | 124.9 | | |
| 1.000 | 69.9 | 2.600 | 82.6 | 6.500 | 130.0 | | |

Pre-initialised control selected, excessive flows may result.

## Hydro-Brake® Manhole: 18 (D3a), DS/PN: 20.009, Volume (m³): 21.3

Design Head (m) 2.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.685
Design Flow (l/s) 180.0 Diameter (mm) 442

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 13.6 | 1.200 | 193.1 | 3.000 | 197.1 | 7.000 | 294.9 |
| 0.200 | 41.6 | 1.400 | 187.8 | 3.500 | 210.2 | 7.500 | 305.3 |
| 0.300 | 75.8 | 1.600 | 183.1 | 4.000 | 223.6 | 8.000 | 315.3 |
| 0.400 | 110.9 | 1.800 | 180.4 | 4.500 | 236.7 | 8.500 | 325.0 |
| 0.500 | 143.0 | 2.000 | 180.0 | 5.000 | 249.4 | 9.000 | 334.4 |
| 0.600 | 168.6 | 2.200 | 181.4 | 5.500 | 261.4 | 9.500 | 343.5 |
| 0.800 | 192.4 | 2.400 | 184.1 | 6.000 | 273.0 | | |
| 1.000 | 195.8 | 2.600 | 187.8 | 6.500 | 284.2 | | |

Pre-initialised control selected, excessive flows may result.

## Hydro-Brake Optimum® Manhole: 22 (D6a), DS/PN: 27.002, 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

## Hydro-Brake Optimum® Manhole: 22 (D6a), DS/PN: 27.002, Volume (m³): 24.8

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: 28.002, Volume (m³): 17.0

| | |
|---|---|
| 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 | | |

## Hydro-Brake Optimum® Manhole: 31 (D4b), DS/PN: 29.001, Volume (m³): 5.9

| | |
|---|---|
| Unit Reference | MD-SHE-0138-9000-1000-9000 |
| Design Head (m) | 1.000 |

## Hydro-Brake Optimum® Manhole: 31 (D4b), DS/PN: 29.001, Volume (m³): 5.9

| | |
|---|---|
| Design Flow (l/s) | 9.0 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Diameter (mm) | 138 |
| Invert Level (m) | 119.830 |
| Minimum Outlet Pipe Diameter (mm) | 225 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 1.000 | 8.9 |
| Flush-Flo™ | 0.301 | 8.9 |
| Kick-Flo® | 0.667 | 7.4 |
| Mean Flow over Head Range | - | 7.7 |

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 | 5.0 | 1.200 | 9.7 | 3.000 | 15.0 | 7.000 | 22.6 |
| 0.200 | 8.7 | 1.400 | 10.5 | 3.500 | 16.2 | 7.500 | 23.3 |
| 0.300 | 8.9 | 1.600 | 11.2 | 4.000 | 17.2 | 8.000 | 24.1 |
| 0.400 | 8.8 | 1.800 | 11.8 | 4.500 | 18.2 | 8.500 | 24.8 |
| 0.500 | 8.6 | 2.000 | 12.4 | 5.000 | 19.2 | 9.000 | 25.5 |
| 0.600 | 8.1 | 2.200 | 13.0 | 5.500 | 20.1 | 9.500 | 26.1 |
| 0.800 | 8.1 | 2.400 | 13.5 | 6.000 | 20.9 | | |
| 1.000 | 8.9 | 2.600 | 14.0 | 6.500 | 21.8 | | |

## Hydro-Brake® Manhole: 39 (D6a), DS/PN: 30.003, 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 | | |

Pre-initialised control selected, excessive flows may result.

## Hydro-Brake Optimum® Manhole: 42 (D4b), DS/PN: 31.001, Volume (m³): 12.4

| | |
|---|---|
| Unit Reference | MD-SHE-0149-1080-1000-1080 |
| Design Head (m) | 1.000 |
| Design Flow (l/s) | 10.8 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Diameter (mm) | 149 |
| Invert Level (m) | 118.380 |
| Minimum Outlet Pipe Diameter (mm) | 225 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Design Point (Calculated) | 1.000 | 10.5 |
| Flush-Flo™ | 0.305 | 10.5 |
| Kick-Flo® | 0.677 | 8.8 |
| Mean Flow over Head Range | - | 9.0 |

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 | 5.4 | 1.200 | 11.5 | 3.000 | 17.7 | 7.000 | 26.6 |
| 0.200 | 10.2 | 1.400 | 12.3 | 3.500 | 19.1 | 7.500 | 27.5 |
| 0.300 | 10.5 | 1.600 | 13.1 | 4.000 | 20.3 | 8.000 | 28.4 |
| 0.400 | 10.4 | 1.800 | 13.9 | 4.500 | 21.5 | 8.500 | 29.2 |
| 0.500 | 10.1 | 2.000 | 14.6 | 5.000 | 22.6 | 9.000 | 30.1 |
| 0.600 | 9.6 | 2.200 | 15.3 | 5.500 | 23.7 | 9.500 | 30.9 |
| 0.800 | 9.5 | 2.400 | 15.9 | 6.000 | 24.7 | | |
| 1.000 | 10.5 | 2.600 | 16.6 | 6.500 | 25.7 | | |

## Orifice Manhole: 46 (D4a), DS/PN: 32.003, Volume (m³): 6.3

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 117.935

## Hydro-Brake Optimum® Manhole: 48 (D3a), DS/PN: 20.012, Volume (m³): 10.3

| | |
|---|---|
| Unit Reference | MD-SHE-0398-1100-2000-1100 |
| Design Head (m) | 2.000 |
| Design Flow (l/s) | 110.0 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Diameter (mm) | 398 |
| Invert Level (m) | 117.510 |
| 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 | 109.7 |

## Hydro-Brake Optimum® Manhole: 48 (D3a), DS/PN: 20.012, Volume (m³): 10.3

| Control Points | Head (m) | Flow (l/s) |
|---|---|---|
| Flush-Flo™ | 0.687 | 109.7 |
| Kick-Flo® | 1.431 | 93.3 |
| Mean Flow over Head Range | - | 92.5 |

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 | 11.0 | 1.200 | 103.6 | 3.000 | 133.7 | 7.000 | 202.2 |
| 0.200 | 39.2 | 1.400 | 95.5 | 3.500 | 144.1 | 7.500 | 209.2 |
| 0.300 | 75.7 | 1.600 | 98.5 | 4.000 | 153.8 | 8.000 | 215.9 |
| 0.400 | 104.4 | 1.800 | 104.3 | 4.500 | 162.9 | 8.500 | 222.4 |
| 0.500 | 107.7 | 2.000 | 109.7 | 5.000 | 171.5 | 9.000 | 228.7 |
| 0.600 | 109.3 | 2.200 | 114.9 | 5.500 | 179.7 | 9.500 | 234.9 |
| 0.800 | 109.2 | 2.400 | 119.9 | 6.000 | 187.5 | | |
| 1.000 | 107.2 | 2.600 | 124.7 | 6.500 | 195.0 | | |

## Hydro-Brake® Manhole: 54 (D3a), DS/PN: 20.016, Volume (m³): 21.0

Design Head (m) 1.300 Hydro-Brake® Type Md6 SW Only Invert Level (m) 117.160
Design Flow (l/s) 112.0 Diameter (mm) 362

| 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.

## Orifice Manhole: Swale, DS/PN: 37.001, Volume (m³): 84.9

Diameter (m) 0.300 Discharge Coefficient 0.600 Invert Level (m) 118.400

## Hydro-Brake® Manhole: 62 (D3a), DS/PN: 36.004, Volume (m³): 5.4

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 116.550
Design Flow (l/s) 110.5 Diameter (mm) 354

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.100 | 11.3 | 0.200 | 33.4 | 0.300 | 58.6 | 0.400 | 82.0 |

Hydro-Brake® Manhole: 62 (D3a), DS/PN: 36.004, Volume (m³): 5.4

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|---|---|
| 0.500 | 99.6 | 1.800 | 104.4 | 4.000 | 143.1 | 7.500 | 195.8 |
| 0.600 | 108.8 | 2.000 | 106.7 | 4.500 | 151.7 | 8.000 | 202.2 |
| 0.800 | 112.4 | 2.200 | 109.7 | 5.000 | 159.9 | 8.500 | 208.4 |
| 1.000 | 110.2 | 2.400 | 113.1 | 5.500 | 167.7 | 9.000 | 214.5 |
| 1.200 | 106.4 | 2.600 | 116.8 | 6.000 | 175.1 | 9.500 | 220.4 |
| 1.400 | 103.9 | 3.000 | 124.5 | 6.500 | 182.3 | | |
| 1.600 | 103.3 | 3.500 | 134.0 | 7.000 | 189.2 | | |

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: 2b (D2a), DS/PN: 21.002

Invert Level (m) 119.100

| 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: 22.003

Invert Level (m) 118.720

Tank or Pond Manhole: 6 (D2a), DS/PN: 22.003

| 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: 10 (D4b), DS/PN: 23.000

Invert Level (m) 118.550

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 120.0 | 1.200 | 120.0 | 1.201 | 0.0 |

Tank or Pond Manhole: 14 (D2a), DS/PN: 24.001

Invert Level (m) 118.210

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 192.0 | 0.800 | 192.0 | 0.801 | 0.0 |

Tank or Pond Manhole: 17a (D3a), DS/PN: 20.008

Invert Level (m) 117.733

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 288.5 | 1.200 | 288.5 | 1.201 | 0.0 |

Tank or Pond Manhole: 18 (D3a), DS/PN: 20.009

Invert Level (m) 117.685

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 97.0 | 1.500 | 97.0 | 1.501 | 0.0 |

Tank or Pond Manhole: 21a (D6a), DS/PN: 27.001

Invert Level (m) 120.720

| 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: 26 (D6a), DS/PN: 28.001

Invert Level (m) 119.960

| 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: 29.001

Invert Level (m) 119.950

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 21.0 | 0.500 | 21.0 | 0.501 | 0.0 |

Tank or Pond Manhole: 37 (D6a), DS/PN: 30.001

Invert Level (m) 118.840

| 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: 30.002

Invert Level (m) 118.440

| 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: 31.000

Invert Level (m) 118.500

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 60.0 | 1.000 | 60.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 45 (D4a), DS/PN: 32.000

Invert Level (m) 118.300

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 50.0 | 1.000 | 50.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 45a (D4a), DS/PN: 32.001

Invert Level (m) 118.200

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 50.0 | 1.000 | 50.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 45b (D4a), DS/PN: 32.002

Invert Level (m) 118.100

Tank or Pond Manhole: 45b (D4a), DS/PN: 32.002

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 50.0 | 1.000 | 50.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 49 (D3a), DS/PN: 33.000

Invert Level (m) 117.380

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 85.0 | 1.000 | 85.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 123 (D3a), DS/PN: 20.014

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: 20.015

Invert Level (m) 117.220

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 74.0 | 1.000 | 74.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 54 (D3a), DS/PN: 20.016

Invert Level (m) 117.160

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 313.0 | 1.000 | 313.0 | 1.001 | 0.0 |

Tank or Pond Manhole: 58 (D3a), DS/PN: 1.026

Invert Level (m) 116.998

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 81.0 | 0.500 | 81.0 | 0.501 | 0.0 |

Tank or Pond Manhole: 62 (D3a), DS/PN: 36.004

Invert Level (m) 116.650

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 99.0 | 0.500 | 99.0 | 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 | 31 |
| Number of Online Controls | 19 | 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 | 120 Winter | 100 | +30% | 100/15 Summer | 100/15 Summer | | | 13 |
| 1.019 | 240 Winter | 100 | +30% | 100/15 Summer | 100/15 Summer | | | 14 |
| 1.020 | 240 Winter | 100 | +30% | 100/15 Summer | | | | |
| 1.021 | 240 Winter | 100 | +30% | | | | | |
| 18.000 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Summer | | | 6 |
| 1.022 | 60 Winter | 100 | +30% | | | | | |
| 1.023 | 60 Winter | 100 | +30% | | | | | |
| 19.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 19.001 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Winter | | | 1 |
| 1.024 | 360 Winter | 100 | +30% | 100/15 Summer | | | | |
| 1.025 | 360 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.000 | 120 Winter | 100 | +30% | 100/15 Winter | | | | |
| 21.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 21.001 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 21.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 21.003 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.001 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 22.000 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Winter | | | 1 |
| 22.001 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Winter | | | 1 |
| 22.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 22.003 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.002 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.003 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.004 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 23.000 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 23.001 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.005 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.006 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 24.000 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 24.001 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 25.000 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 24.002 | 120 Winter | 100 | +30% | 100/15 Summer | 100/120 Winter | | | 1 |
| 20.007 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.008 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.009 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.001 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 27.000 | 15 Winter | 100 | +30% | | | | | |
| 27.001 | 15 Winter | 100 | +30% | 100/15 Winter | | | | |
| 27.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.003 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.004 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 28.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 28.001 | 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. |
|---|---|---|---|---|---|---|---|---|
| 28.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.005 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.006 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.007 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 29.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 29.001 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.008 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 30.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 30.001 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 30.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 30.003 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 26.009 | 15 Summer | 100 | +30% | 100/15 Summer | | | | |
| 31.000 | 120 Winter | 100 | +30% | 100/30 Winter | | | | |
| 31.001 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.010 | 15 Summer | 100 | +30% | 100/15 Summer | | | | |
| 20.011 | 15 Summer | 100 | +30% | 100/15 Summer | | | | |
| 32.000 | 120 Winter | 100 | +30% | 100/30 Winter | | | | |
| 32.001 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 32.002 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 32.003 | 120 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.012 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Summer | | | 2 |
| 33.000 | 360 Winter | 100 | +30% | | | | | |
| 20.013 | 360 Winter | 100 | +30% | 100/240 Winter | | | | |
| 34.000 | 360 Winter | 100 | +30% | 100/360 Winter | | | | |
| 20.014 | 360 Winter | 100 | +30% | 100/240 Winter | | | | |
| 20.015 | 360 Winter | 100 | +30% | 100/240 Winter | | | | |
| 20.016 | 360 Winter | 100 | +30% | 100/15 Summer | | | | |
| 20.017 | 360 Winter | 100 | +30% | 100/120 Summer | | | | |
| 20.018 | 360 Winter | 100 | +30% | 100/120 Summer | | | | |
| 35.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 1.026 | 360 Winter | 100 | +30% | 100/120 Winter | | | | |
| 1.027 | 360 Winter | 100 | +30% | 100/240 Winter | | | | |
| 1.028 | 360 Winter | 100 | +30% | 100/30 Winter | | | | |
| 1.029 | 60 Winter | 100 | +30% | 100/15 Summer | | | | |
| 36.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 36.001 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 36.002 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 36.003 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 37.000 | 60 Winter | 100 | +30% | | | | | |
| 38.000 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 37.001 | 15 Winter | 100 | +30% | | | | | |
| 37.002 | 30 Winter | 100 | +30% | 100/15 Winter | 100/15 Winter | | | 2 |
| 37.003 | 30 Winter | 100 | +30% | 100/15 Summer | 100/15 Winter | | | 2 |
| 36.004 | 15 Winter | 100 | +30% | 100/15 Summer | | | | |
| 36.005 | 60 Winter | 100 | +30% | 100/15 Summer | | | | |
| 1.030 | 60 Winter | 100 | +30% | 100/15 Summer | | | | |
| 1.031 | 60 Winter | 100 | +30% | | | | | |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 1.000 | 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 | 35.813 | 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 | 177.764 | 0.79 | 0.0 | 12.0 | FLOOD |
| 2.003 | SC3 | 125.271 | 1.146 | 171.031 | 0.19 | 0.0 | 21.5 | FLOOD |
| 1.006 | SC4 | 125.284 | 1.834 | 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 | 121.349 | 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 |
| 7.002 | EX MH | 125.248 | 0.838 | 47.694 | 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 |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 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 | 19.953 | 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 | 126.013 | 0.83 | 0.0 | 125.5 | FLOOD |
| 1.018 | 0011 | 120.920 | 0.878 | 26.781 | 1.23 | 0.0 | 64.1 | FLOOD |
| 1.019 | 0480 | 119.863 | 0.531 | 35.690 | 1.47 | 0.0 | 60.6 | FLOOD |
| 1.020 | 0526 | 119.151 | 0.149 | 0.000 | 2.89 | 0.0 | 60.6 | FLOOD RISK |
| 1.021 | 0643 | 118.909 | -0.143 | 0.000 | 0.54 | 0.0 | 60.6 | OK |
| 18.000 | 0497 | 119.700 | 0.726 | 5.824 | 2.53 | 0.0 | 10.3 | FLOOD |
| 1.022 | 0029 | 118.777 | -0.062 | 0.000 | 0.99 | 0.0 | 70.0 | OK |
| 1.023 | 0288 | 118.314 | -0.177 | 0.000 | 0.35 | 0.0 | 70.0 | FLOOD RISK |
| 19.000 | 64 (D4b) | 118.605 | 0.210 | 0.000 | 0.16 | 0.0 | 17.0 | SURCHARGED |
| 19.001 | 65 (D4b) | 118.600 | 0.500 | 0.009 | 0.45 | 0.0 | 7.8 | FLOOD |
| 1.024 | SC17 | 117.736 | 0.106 | 0.000 | 0.96 | 0.0 | 65.1 | SURCHARGED |
| 1.025 | SC18 | 117.644 | 0.121 | 0.000 | 0.91 | 0.0 | 65.0 | SURCHARGED |
| 20.000 | 1 (RMA2) | 119.719 | 0.319 | 0.000 | 0.27 | 0.0 | 17.9 | SURCHARGED |
| 21.000 | 2 (D2a) | 120.074 | 0.404 | 0.000 | 1.24 | 0.0 | 76.4 | SURCHARGED |
| 21.001 | 2a (D2a) | 119.978 | 0.358 | 0.000 | 2.45 | 0.0 | 155.7 | SURCHARGED |
| 21.002 | 2b (D2a) | 119.779 | 0.229 | 0.000 | 0.21 | 0.0 | 78.9 | SURCHARGED |
| 21.003 | 3 (D2a) | 119.769 | 0.509 | 0.000 | 0.79 | 0.0 | 44.5 | SURCHARGED |
| 20.001 | 4 (D2a) | 119.715 | 0.505 | 0.000 | 0.42 | 0.0 | 75.6 | SURCHARGED |
| 22.000 | 5 (D2a) | 120.525 | 1.110 | 5.005 | 1.98 | 0.0 | 70.6 | FLOOD |
| 22.001 | 5a (D2a) | 120.585 | 1.260 | 0.290 | 2.36 | 0.0 | 144.9 | FLOOD |
| 22.002 | 5b (D2a) | 120.569 | 1.294 | 0.000 | 0.89 | 0.0 | 230.0 | FLOOD RISK |
| 22.003 | 6 (D2a) | 120.478 | 1.458 | 0.000 | 0.97 | 0.0 | 66.3 | FLOOD RISK |
| 20.002 | 7 (D2a) | 119.711 | 0.771 | 0.000 | 0.69 | 0.0 | 112.0 | SURCHARGED |
| 20.003 | 8 (D2a) | 119.704 | 0.854 | 0.000 | 0.79 | 0.0 | 118.8 | SURCHARGED |
| 20.004 | 9 (D2a) | 119.697 | 0.907 | 0.000 | 0.69 | 0.0 | 115.3 | SURCHARGED |
| 23.000 | 10 (D4b) | 119.671 | 0.571 | 0.000 | 0.12 | 0.0 | 39.2 | SURCHARGED |
| 23.001 | 11 (D4b) | 119.702 | 0.852 | 0.000 | 0.15 | 0.0 | 34.9 | SURCHARGED |
| 20.005 | 12 (D2a) | 119.689 | 1.009 | 0.000 | 0.86 | 0.0 | 144.8 | SURCHARGED |
| 20.006 | 13 (D2a) | 119.683 | 1.078 | 0.000 | 0.76 | 0.0 | 148.7 | FLOOD RISK |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 24.000 | 14a (D2a) | 119.687 | 0.927 | 0.000 | 0.45 | 0.0 | 16.3 | FLOOD RISK |
| 24.001 | 14 (D2a) | 119.682 | 1.022 | 0.000 | 0.09 | 0.0 | 22.5 | FLOOD RISK |
| 25.000 | 15 (D3a) | 119.681 | 1.021 | 0.000 | 0.05 | 0.0 | 13.1 | FLOOD RISK |
| 24.002 | 16 (D2a) | 119.681 | 1.081 | 0.661 | 0.09 | 0.0 | 24.7 | FLOOD |
| 20.007 | 17 (D2a) | 119.680 | 1.110 | 0.000 | 0.31 | 0.0 | 127.8 | FLOOD RISK |
| 20.008 | 17a (D3a) | 119.678 | 1.195 | 0.000 | 0.17 | 0.0 | 63.5 | SURCHARGED |
| 20.009 | 18 (D3a) | 119.675 | 1.240 | 0.000 | 0.18 | 0.0 | 69.1 | SURCHARGED |
| 26.000 | 19 (D6a) | 123.070 | 2.120 | 0.000 | 1.10 | 0.0 | 76.5 | SURCHARGED |
| 26.001 | 20 (D6a) | 122.391 | 1.931 | 0.000 | 1.56 | 0.0 | 104.5 | SURCHARGED |
| 26.002 | 23a (D6a) | 121.982 | 1.682 | 0.000 | 1.76 | 0.0 | 106.2 | SURCHARGED |
| 27.000 | 21 (D6a) | 121.550 | 0.000 | 0.000 | 0.15 | 0.0 | 71.9 | OK |
| 27.001 | 21a (D6a) | 121.534 | 0.064 | 0.000 | 0.22 | 0.0 | 92.4 | SURCHARGED |
| 27.002 | 22 (D6a) | 121.529 | 0.589 | 0.000 | 0.15 | 0.0 | 31.2 | SURCHARGED |
| 26.003 | 23 (D6a) | 121.774 | 1.544 | 0.000 | 1.49 | 0.0 | 94.0 | SURCHARGED |
| 26.004 | 24 (D6a) | 121.653 | 1.513 | 0.000 | 1.52 | 0.0 | 102.1 | SURCHARGED |
| 28.000 | 25 (D6a) | 120.945 | 0.345 | 0.000 | 0.29 | 0.0 | 67.3 | SURCHARGED |
| 28.001 | 26 (D6a) | 120.942 | 0.402 | 0.000 | 0.18 | 0.0 | 46.0 | SURCHARGED |
| 28.002 | 27 (D6a) | 120.964 | 0.804 | 0.000 | 0.51 | 0.0 | 47.9 | SURCHARGED |
| 26.005 | 28 (D6a) | 121.437 | 1.427 | 0.000 | 1.34 | 0.0 | 125.5 | SURCHARGED |
| 26.006 | 29 (D6a) | 121.141 | 1.551 | 0.000 | 1.06 | 0.0 | 137.3 | SURCHARGED |
| 26.007 | 32 (D6a) | 120.562 | 1.582 | 0.000 | 0.71 | 0.0 | 174.0 | SURCHARGED |
| 29.000 | 30 (D4b) | 120.429 | 0.199 | 0.000 | 0.58 | 0.0 | 36.6 | SURCHARGED |
| 29.001 | 31 (D4b) | 120.412 | 0.432 | 0.000 | 0.17 | 0.0 | 8.9 | SURCHARGED |
| 26.008 | 33 (D6a) | 120.414 | 1.624 | 0.000 | 0.96 | 0.0 | 208.5 | SURCHARGED |
| 30.000 | 34 (D6a) | 120.879 | 1.379 | 0.000 | 1.74 | 0.0 | 146.6 | SURCHARGED |
| 30.001 | 37 (D6a) | 120.821 | 1.681 | 0.000 | 1.82 | 0.0 | 127.1 | SURCHARGED |
| 30.002 | 38 (D6a) | 120.730 | 1.690 | 0.000 | 0.14 | 0.0 | 52.4 | SURCHARGED |
| 30.003 | 39 (D6a) | 120.712 | 2.112 | 0.000 | 0.55 | 0.0 | 53.7 | FLOOD RISK |
| 26.009 | 40 (D6a) | 120.055 | 1.605 | 0.000 | 0.95 | 0.0 | 245.9 | SURCHARGED |
| 31.000 | 41 (D4b) | 119.491 | 0.466 | 0.000 | 0.05 | 0.0 | 10.9 | SURCHARGED |
| 31.001 | 42 (D4b) | 119.520 | 0.840 | 0.000 | 0.08 | 0.0 | 10.4 | SURCHARGED |
| 20.010 | 43 (D3a) | 120.020 | 1.635 | 0.000 | 0.32 | 0.0 | 139.3 | SURCHARGED |
| 20.011 | 44 (D3a) | 120.019 | 1.689 | 0.000 | 0.27 | 0.0 | 163.3 | FLOOD RISK |
| 32.000 | 45 (D4a) | 118.972 | 0.372 | 0.000 | 0.05 | 0.0 | 3.9 | SURCHARGED |
| 32.001 | 45a (D4a) | 118.972 | 0.472 | 0.000 | 0.09 | 0.0 | 6.3 | SURCHARGED |
| 32.002 | 45b (D4a) | 118.976 | 0.576 | 0.000 | 0.14 | 0.0 | 9.5 | SURCHARGED |
| 32.003 | 46 (D4a) | 118.984 | 0.674 | 0.000 | 0.10 | 0.0 | 9.6 | SURCHARGED |
| 20.012 | 48 (D3a) | 119.995 | 1.735 | 5.094 | 0.28 | 0.0 | 119.2 | FLOOD |
| 33.000 | 49 (D3a) | 118.243 | -0.017 | 0.000 | 0.03 | 0.0 | 22.8 | OK |
| 20.013 | 51 (D3a) | 118.243 | 0.048 | 0.000 | 0.18 | 0.0 | 109.6 | SURCHARGED |
| 34.000 | 52 (D4a) | 118.235 | 0.055 | 0.000 | 0.02 | 0.0 | 8.2 | SURCHARGED |
| 20.014 | 123 (D3a) | 118.235 | 0.085 | 0.000 | 0.30 | 0.0 | 114.3 | SURCHARGED |
| 20.015 | 53 (D3a) | 118.227 | 0.107 | 0.000 | 0.18 | 0.0 | 118.1 | SURCHARGED |
| 20.016 | 54 (D3a) | 118.218 | 0.683 | 0.000 | 1.21 | 0.0 | 107.7 | SURCHARGED |
| 20.017 | 55 (D3a) | 117.661 | 0.156 | 0.000 | 0.90 | 0.0 | 107.9 | SURCHARGED |
| 20.018 | 57 (D3a) | 117.556 | 0.146 | 0.000 | 1.26 | 0.0 | 109.3 | SURCHARGED |
| 35.000 | 56 (D3a) | 117.539 | 0.089 | 0.000 | 1.46 | 0.0 | 22.0 | SURCHARGED |
| 1.026 | 58 (D3a) | 117.479 | 0.106 | 0.000 | 1.20 | 0.0 | 170.6 | SURCHARGED |
| 1.027 | 0271 | 117.289 | 0.047 | 0.000 | 0.95 | 0.0 | 170.6 | SURCHARGED |
| 1.028 | 0270 | 117.073 | 0.070 | 0.000 | 0.96 | 0.0 | 171.0 | FLOOD RISK |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 1.029 | Ex MH | 116.902 | 0.107 | 0.000 | 1.28 | 0.0 | 146.0 | FLOOD RISK |
| 36.000 | 60 (D3a) | 118.399 | 0.959 | 0.000 | 0.66 | 0.0 | 58.0 | SURCHARGED |
| 36.001 | 61 (D3a) | 118.321 | 1.131 | 0.000 | 1.66 | 0.0 | 110.6 | SURCHARGED |
| 36.002 | 139 | 118.235 | 1.205 | 0.000 | 2.00 | 0.0 | 132.9 | SURCHARGED |
| 36.003 | 61a (D3a) | 118.142 | 1.212 | 0.000 | 1.82 | 0.0 | 129.2 | SURCHARGED |
| 37.000 | Swale | 118.900 | -0.500 | 0.000 | 0.00 | 0.0 | 0.0 | OK |
| 38.000 | 59 (D3a) | 118.973 | 0.073 | 0.000 | 1.35 | 0.0 | 190.4 | SURCHARGED |
| 37.001 | Swale | 118.898 | -0.002 | 0.000 | 0.04 | 0.0 | 110.5 | FLOOD RISK |
| 37.002 | Swale | 118.500 | 0.000 | 0.080 | 0.13 | 0.0 | 175.7 | FLOOD |
| 37.003 | Swale | 118.409 | 0.359 | 8.709 | 1.09 | 0.0 | 53.4 | FLOOD |
| 36.004 | 62 (D3a) | 118.057 | 1.057 | 0.000 | 0.50 | 0.0 | 112.2 | FLOOD RISK |
| 36.005 | 63 (D3a) | 116.870 | 0.090 | 0.000 | 0.65 | 0.0 | 109.1 | SURCHARGED |
| 1.030 | Ex MH | 116.768 | 0.058 | 0.000 | 1.22 | 0.0 | 252.1 | SURCHARGED |
| 1.031 | PI | 116.363 | -0.097 | 0.000 | 0.98 | 0.0 | 252.1 | OK |