Addendum to Flood Risk Assessment
Land at North-West Haverhill

September 2010

BIDWELLS

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North West Haverhill Urban Extension

Addendum No.1

to

Flood Risk Assessment & Drainage Strategy dated 13 February 2009

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Approved: ..... John Hawkins
Director

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- Letter MLM to AW 15 September 2010

1 Introduction

1.1 This Addendum to the Flood Risk Assessment has been prepared on behalf of The North West Haverhill Consortium of Landowners and relates to a planning application submitted to St Edmundsbury Borough Council (SEBC) on 30 April 2009. The application seeks planning permission for the development of approximately 48 hectares (ha) of land to the north west of Haverhill for a new urban extension to the town and associated relief road comprising "mixed use development including construction of relief road and associated works and landscaping buffer; residential development, a primary school, local centre including retail and community uses, public open space, landscaping, infrastructure, servicing and other associated works" (Application Ref: SE/09/1283).

1.2 The FRA Addendum has been prepared following various amendments to the surface water drainage strategy in response to discussions and negotiations which have taken place in relation to the application since its registration on 30 October 2010. It specifically responds to various concerns expressed by the Environment Agency (EA), Anglian Water (AW) and the Local Planning Authority, St Edmundsbury Borough Council (SEBC) in relation to the surface water drainage strategy. The FRA Addendum updates and should be read in conjunction with the April 2009 Flood Risk Assessment submitted with the planning application.

2 Environment Agency Requirements

2.1 As part of the consultation in relation to the planning application, the proposals for the surface water drainage were the subject of an objection by the Environment Agency (EA) (ref: AC/2009/110413/02-L01 shown in Appendix C) as they considered that the surface water proposals were not sufficiently developed to demonstrate how run-off from the proposed development would be attenuated on site and discharged at rates not exceeding existing greenfield run-off rates.

2.2 In response to the EA's concerns, surface water modelling was undertaken using Microdrainage Software to demonstrate how the surface water run-off from the site would be collected, routed, attenuated and discharged from the site. These calculations demonstrated that discharge rates from the site could be restricted to the equivalent existing greenfield run-off rates of:

Return Period (years)	Greenfield Run-off Rate (l/s/ha)
1	1.99
30	5.41
100	7.43

2.3 Surface water drainage calculations (Microdrainage) and drawings were issued to the Environment Agency (EA) on 12 March 2010. Further clarification was sought by the EA on 19 March 2010 and this additional information was issued to the EA on 29 March 2010.

2.4 Following the submission of the surface water drainage information to the EA a response was received on 14 April 2010. In its response, although the EA maintained its objection to the development due to Anglian Water (AW) not having accepted the discharges into its sewers, it did state that the information submitted in respect of the surface water drainage strategy “is sufficient for an outline planning application for a major development”.

2.5 Although the EA were satisfied that the surface water run-off from the site could be managed and discharged at equivalent existing greenfield run-off rates, the layout did not meet the requirements of the Local Planning Authority (LPA). A meeting was held on 06 August 2010 with LPA representatives to discuss its requirements.

2.6 Discussions were also held with AW regarding the connection of two ditches to AW sewers in Gurlings Close and Forest Glade. AW required proof that the watercourses connected into its sewers and that a CCTV survey should be undertaken to demonstrate the connections.

3 Local Planning Authority (LPA) Requirements

3.1 During the consultation on the planning application the LPA expressed concerns that the proposed surface water drainage layout would place a significant maintenance burden on them due to a reliance on below ground attenuation crates. The Council did not want to adopt below ground storage due to the potential difficulties and cost of maintenance associated with them. A meeting was held on 06 August 2010 with LPA representatives to discuss its requirements in detail.

3.2 One of the main areas of concern was the 850m^2 attenuation tank within the area adjacent to Chapel Farm Park which is allocated for allotments. Discussions around this area in particular have led to the proposal to build in a rainwater harvesting capability into the design.

3.3 The LPA also wished to see more open features such as ponds, swales and rills within the design to provide a more sustainable approach and create a more pleasant feel to the residential areas within the development.

3.4 It was agreed that the surface water drainage system would be remodelled to achieve:

- Removal of below ground attenuation from areas of public open space generally, except beneath the allotments and at the east end of the site where additional storage should be provided to provide water for irrigation. It was agreed that in these particular locations the LPA would be potentially willing to adopt the below ground attenuation systems.

- Below ground attenuation elsewhere to be provided in car parking areas within the residential areas, which would not require LPA adoption. Instead their maintenance would be by a management company set up to maintain shared private areas.

- Increase in the use of swales/rills across the site. It was discussed that these features are only practicable for storage purposes where the roads run parallel with the contours, but could be used for conveyance on steeper slopes.

4 Drainage Design

4.1 The drainage design was previously split into eight networks all with separate outfalls to one of the three watercourses that cross the site. The areas that were required to be amended were residential areas 1 to 5 inclusive. Residential areas 6 to 8 inclusive were not required to be amended as they contained no below ground attenuation in locations where they would be adopted by the LPA, except at the eastern extent as noted in Section 3.4.

4.2 To eliminate the need for below ground attenuation in some areas, the flow rate into the sewers within the highway network needs to be minimised. These sewers discharge to attenuation ponds adjacent to the watercourses. The public open space suitable for attenuation and adjacent to the watercourses is limited, therefore the space available for attenuation ponds is small. This problem is accentuated by the land available being typically sloping as per the majority of the site.

4.3 To limit the flow to the sewers, each of the residential areas 1 to 5 was remodelled to provide below ground attenuation in areas which will form parking courts within each block of housing. The discharge from each of these was limited to a maximum of 5l/s to minimise the attenuation requirement in the ponds at the bottom of the drainage networks.

4.4 The results of the remodelling of these drainage networks are contained within **Appendix B** with drawings showing the revised layout contained in **Appendix A.** Areas 2, 4 and 5 were remodelled with the outfall locations and the allowable discharge rates remaining the same as the original drainage model.

4.5 Areas 1 and 3 were treated differently from the other remodelled areas. This was due to the available space for a pond at the outfall for network 3 being extremely limited and therefore there not being sufficient open storage at this location. To resolve this issue, areas 1 and 3 were combined in one model. This allowed the drainage from this new combined catchment area to have two outfalls into watercourse A. To model this, a hydrobrake was used to control the discharge from the first pond (previously the crate storage and discharge from Area 3) with an offline weir also modelled at the same node. The discharge from the weir overflow was routed to a swale which was the head of a run in the original Area 1 model. This arrangement allows the maximum discharge from the former Area 3 to be discharged into the watercourse at this location whilst not causing flooding or uncontrolled discharge to the watercourse at this location. The effect of overflowing some of the water from the original Area 3 into Area 1 was to require an increase in the size of the pond at the second outfall (originally the outfall for Area 1).

4.6 The new combined network (labelled residential area 1) includes below ground attenuation within each of the car parking areas serving residential blocks.

4.7 The total discharge from the two discharge locations (ponds) for the combined network is the same as the combined discharge from the previous networks 1 and 3. To demonstrate this, the two outfalls are linked in the model by including the existing watercourse and taking the final outfall from the system to be a length of the watercourse downstream of the second outfall.

4.8 The remodelled drainage meets the requirement of not exceeding the existing greenfield discharge rates that had been accepted by the EA in the previous drainage design. This is in accordance with both Planning Policy Statement 25 (PPS25) Development and Flood Risk and CIRIA document C697 The SUDS Manual. Through the use of rainwater harvesting within storage tanks, not least for use within the allotments but also as a source of water for the maintenance of open spaces, the volume of run-off from the site will also be reduced, this is also in accordance with CIRIA C697.

4.9 The models show a small volume of flooding in the 100 year climate change events. This minor flooding will be contained within the road ways and routed to the ponds for attenuation. There will be no uncontrolled discharge off site.

4.10 Please note that the numbering system for the residential areas has been amended due to the increase in the number of pipe runs needed in the new models. The table below summarises the changes:

Residential Area	Previous Pipe Numbers	New Pipe Numbers
1	1.000 to 15.000	100.000 series
2	20.000 to 37.000	200.000 series
3	40.000 to 46.000	Included in 100.000 series
4	50.000 to 60.000	400.000 series
5	70.000 to 78.000	500.000 series
6#	80.000 to 83.000	600.000 series
7#	90.000 to 100.000	700.000 series
8#	110.000 to 115.000	800.000 series
9*	N/A	900.000 series
10*	N/A	950.000 series

* = These new networks were previously in residential area 3 but now have separate outfalls.

= These networks have not been amended except for renumbering.

5 Anglian Water Approval

5.1 Two of the three receiving watercourses discharge to AW sewers to the south of the proposed development, one in a public space at the bottom of Gurlings Close and one in Forest Glade. The discharge locations can be seen on drawing 612263/550 in **Appendix A**.

5.2 CCTV investigation was undertaken to confirm the connection of the two watercourses to the AW sewers. The results of this were issued to AW on 15 September 2010, see letter in **Appendix C**. This letter sets out the findings of the CCTV survey and the proposed discharge rates to the two watercourses that connect to the AW sewers. The proposed maximum discharge rates are equivalent to the existing greenfield run-off rates for the 100 year return period and in fact provide betterment in that it is proposed to restrict run-off from the 100 year rainfall event including allowance for climate change, to the existing 100 year greenfield run-off rate.

6 Conclusions

6.1 The FRA Addendum has been prepared following various amendments to the surface water drainage strategy in response to discussions and negotiations which have taken place in relation to the application since its registration. It specifically responds to various concerns expressed by the Environment Agency, Anglian Water and St Edmundsbury Borough Council in relation to the surface water drainage strategy.

6.2 The surface water drainage networks have been remodelled following comments received from the Local Planning Authority.

6.3 The drainage designs for residential areas 1 to 5 inclusive have been remodelled to remove below ground attenuation from areas adoptable by the local authority, except in two areas, namely the allotments and the east of the site. The attenuation in these areas will be designed to provide a water resource to the allotment users and the Local Authority.

6.4 The discharge rates from the site are designed to be no greater than existing equivalent greenfield run-off rates. This includes for the 100 year rainfall event including allowance for climate change to discharge to the receiving watercourses at a rate not exceeding the existing 100 year greenfield run-off rate.

6.5 The revised drainage design decreases flood risk downstream of the site as the total volume discharged will be reduced by the rainwater harvesting features incorporated in the design.

6.6 Consequently, as a result of the proposed amendments to the surface water drainage design it is considered that the revised proposals effectively respond to the various consultation issues in relation to the surface water drainage strategy. The proposed development will not have any significant detrimental effects in terms of surface water drainage and flood risk and are fully compliant with PPS25 and relevant Development Plan policies. We therefore consider that there are no substantive drainage reasons why the proposals should not be granted planning permission by SEBC.

Appendix A - MLM Drawings

612263/541 – Section Through Storage Crates and Chapel Farm Park Allotments
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NOTES

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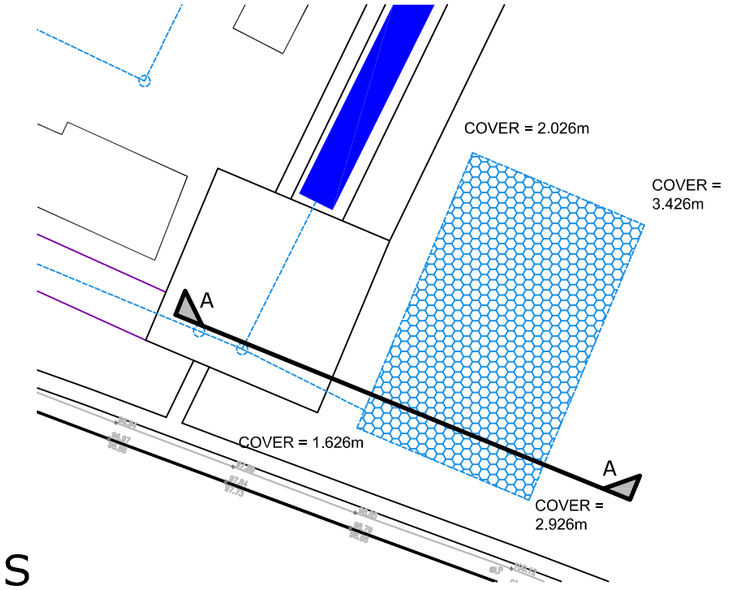

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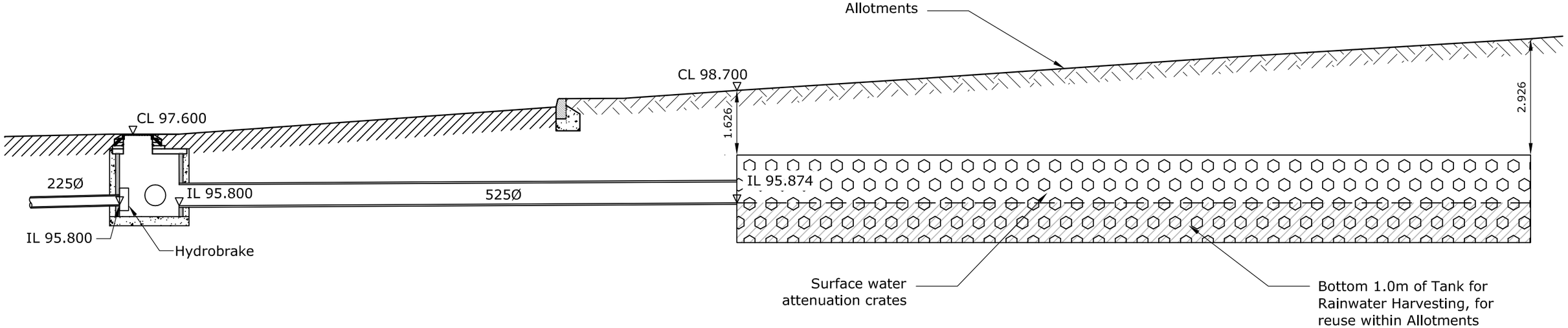

SECTION A-A

Rev	Date	Description	Made	Ckd
B	14/09/10	Updated to suit revised layout	AS	
A	05/08/10	FIRST ISSUE	AP	JRC

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Drawing Status: **INFORMATION**

Client: NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drg Title: SECTION THROUGH STORAGE CRATES AT CHAPEL FARM PARK ALLOTMENTS

Drawn	Checked	Approved	Date
AP	JRC	JJH	30/07/2010

Scales: 1:100 @ A3

Drg No.: 612263/541

Rev: B

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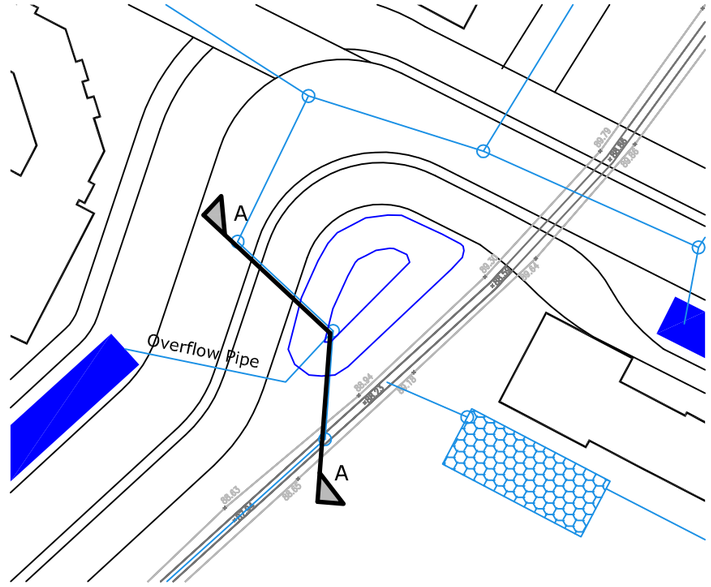

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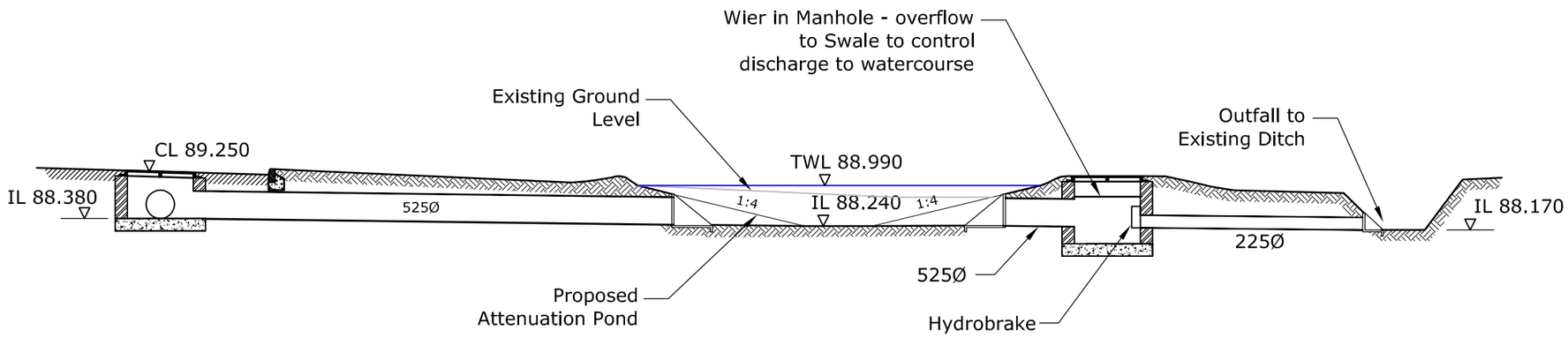

SECTION A-A

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A	14/09/10	FIRST ISSUE	AS	

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Drawing Status: INFORMATION

Client: NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drg Title: SECTION THROUGH STORAGE POND TO EXISTING DITCH

Drawn	Checked	Approved	Date
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Scales: 1:100 @ A3

Drg No.: 612263/542

Rev: A

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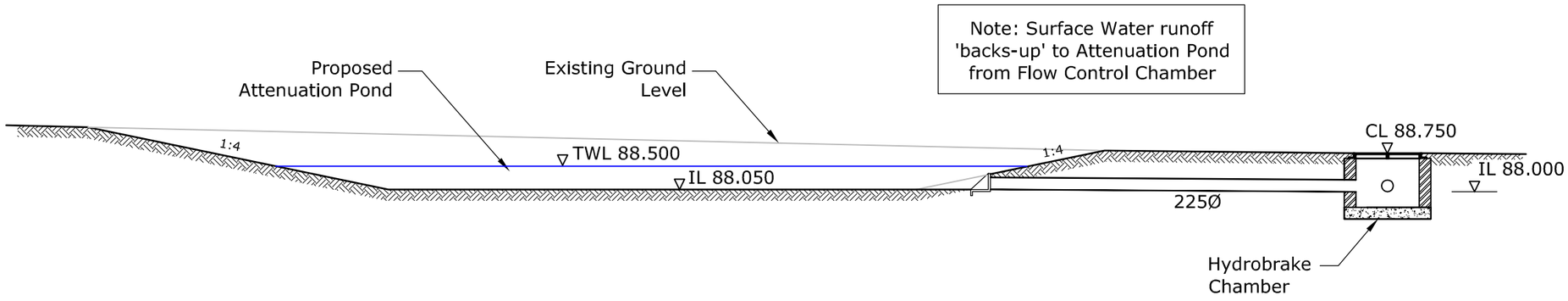

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Client: NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drg Title: SECTION THROUGH STORAGE POND TO FLOW CONTROL MANHOLE

Drawn	Checked	Approved	Date
AS	JRC	JJH	14/09/2010

Scales: 1:100 @ A3

Drg No.: 612263/543

Rev: A

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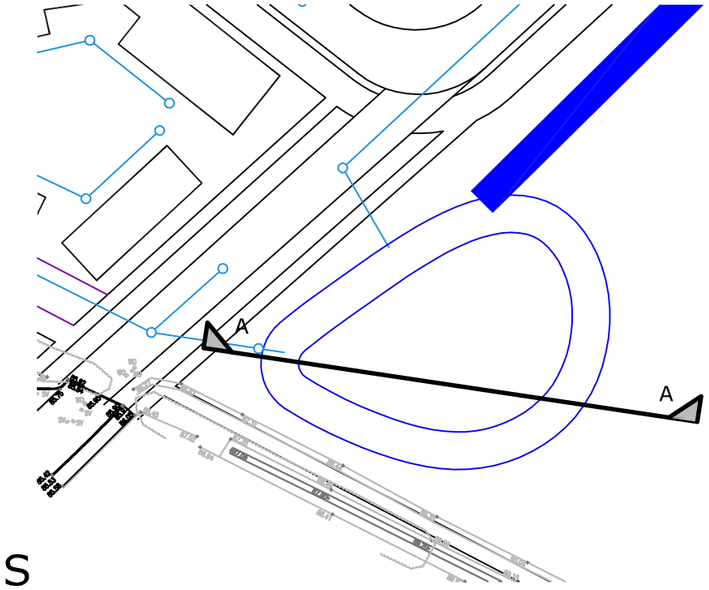

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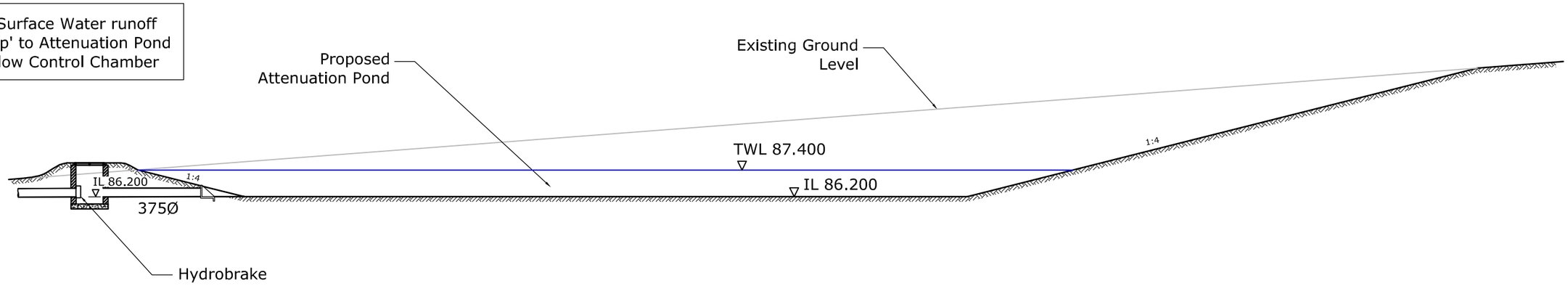

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Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drg Title: SECTION THROUGH STORAGE POND TO FLOW CONTROL MANHOLE

Drawn	Checked	Approved	Date
AS	JRC	JJH	14/09/2010

Scales: 1:50 @ A3

Drg No.: 612263/544

Rev: A

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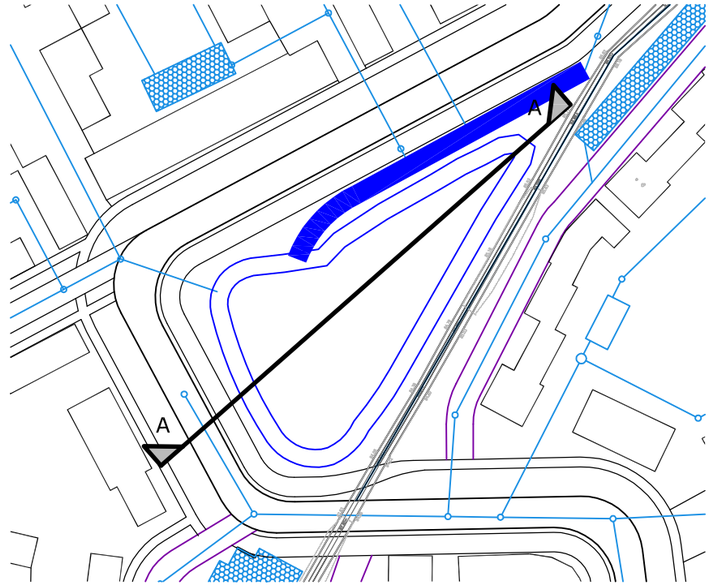

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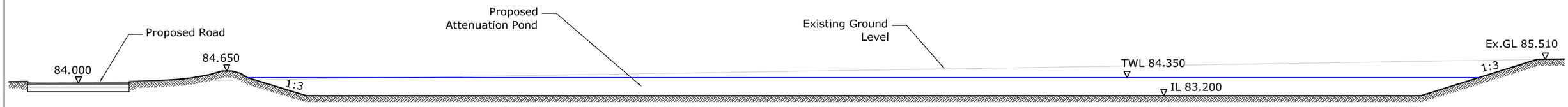

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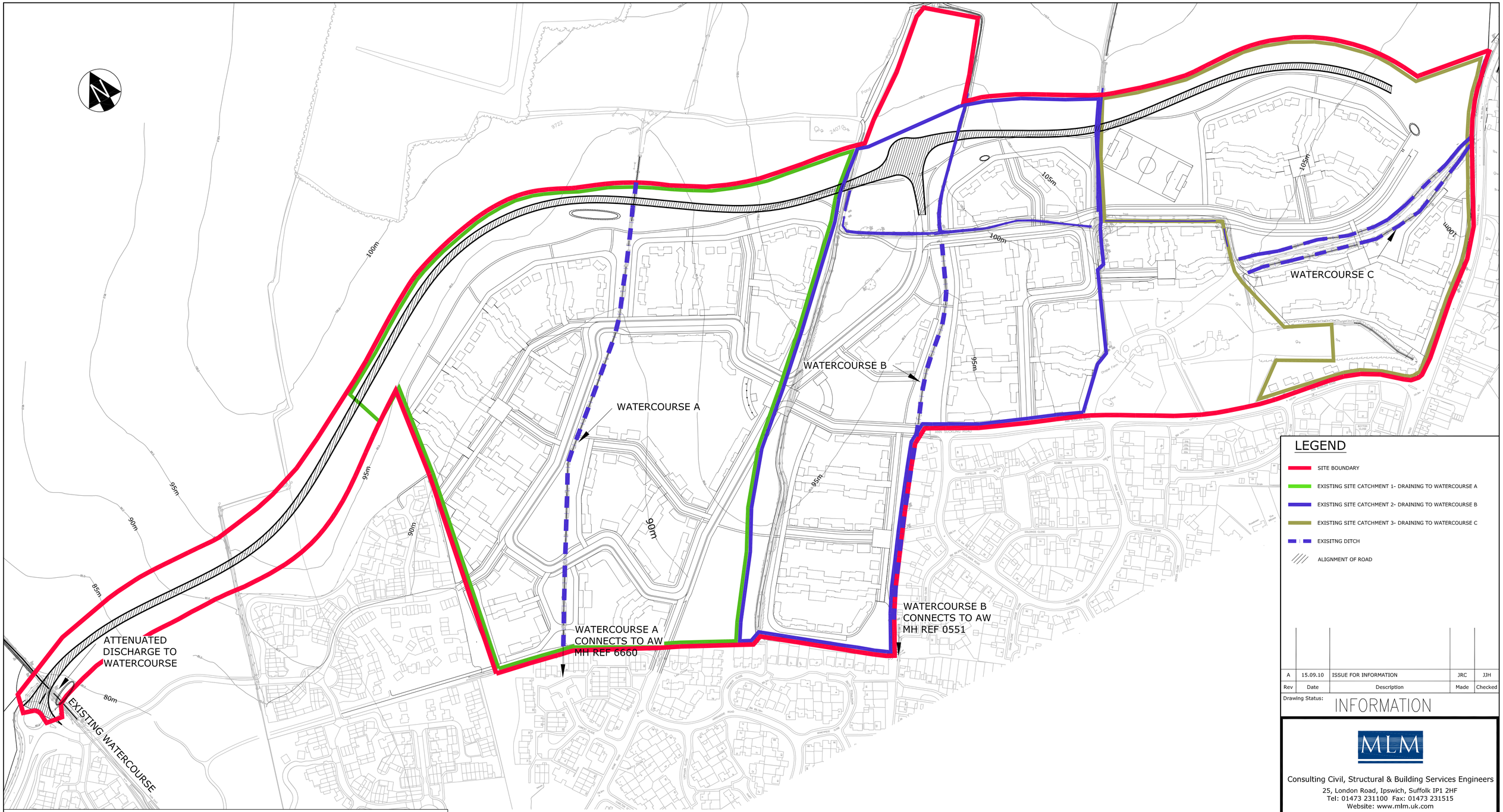
Drg Title: SECTION THROUGH STORAGE POND

Drawn	Checked	Approved	Date
AS	JRC	JJH	20/09/2010

Scales: 1:50 @ A3

Drg No.: 612263/545

Rev: A



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LEGEND

- SITE BOUNDARY
- EXISTING SITE CATCHMENT 1- DRAINING TO WATERCOURSE A
- EXISTING SITE CATCHMENT 2- DRAINING TO WATERCOURSE B
- EXISTING SITE CATCHMENT 3- DRAINING TO WATERCOURSE C
- EXISITNG DITCH
- ALIGNMENT OF ROAD

Rev	Date	Description	Made	Checked
A	15.09.10	ISSUE FOR INFORMATION	JRC	JJH

Drawing Status: INFORMATION

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Client: NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title: WATERCOURSE CATCHMENT PLAN

Drawn	Checked	Approved	Date
JRC	JJH	JJH	15 SEPT 10

Scales: 1:1,000 @ A1; 1:2,000 @ A3

Drawing No.: 612263/550

Rev: A

PROPOSED BRIDGE REQUIRED OVER EXISTING STREAM FULL EXTENT OF BRIDGE DETAILS T.B.C

MH 12
C.L. 80.800
I.L. 78.006

MH 13
C.L. 80.600
I.L. 77.970
I.L. 79.480 (OVERFLOW)

MH 11
C.L. 81.200
I.L. 78.348

MH 10
C.L. 81.600
I.L. 78.388

PN 1.011/ 15000/495

PN 1.010/ 12000/495

PN 1.009/ 12000/510

FLOW CONTROL LIMITING DISCHARGE FROM MANHOLE 14 TO EXISTING DITCH. OVERFLOW PIPE TO LEAVE MANHOLE 14 AT THE 1 IN 30 YEAR WATER LEVEL

MH 15
C.L. 80.160
I.L. 77.765

FLOW CONTROL LIMITING DISCHARGE FROM MANHOLE 12 TO EXISTING DITCH. OVERFLOW TO BE USED WITH OUTGOING IL SET AT 1 IN 30 YEAR WATER LEVEL

OVERFLOW

I.L. 79.48

9000/500

3000/525

PN 1.012/1500/150

MH 14
C.L. 79.900
I.L. 77.800

MH 16
C.L. 79.340
I.L. 77.725

POND IL 79.48
TOP W.L. IN 100 YR + CC STORM = 80.02

HEADWALL
PIPE I.L. 77.500
DITCH I.L. 77.350

CONDER BYPASS PETROL INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

HEADWALL
PIPE I.L. 77.800
DITCH I.L. 77.250

Bush
Sp:4.50
Ht:3.00

HAWTHORN
Sp:7.00
Di:0.40
Ht:5.00

HAWTHORN
Sp:4.50
Di:0.25
Ht:4.00

H.CHESTNUT
Sp:12.00
Di:1.00
Ht:8.00

Swale(x2)

NOTES

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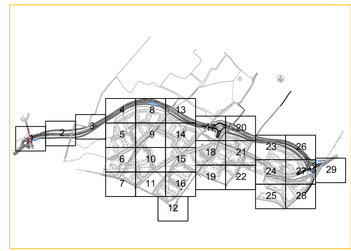
8. ROAD LAYOUT TAKEN FROM MLM DRAWINGS 612263/97_P1, 98_P1, 99_P1 & 100_P1.

9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

MLM

Consulting Civil, Structural & Building Services Engineers
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Tel: 01473 231100 Fax: 01473 231515
Website: www.mlm.uk.com
Ashford * Cambridge * Chelmsford * London * Norwich.

Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 1 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/600

Rev P1

MH 8
C.L. 83.000
I.L. 78.789

PN 1.006/900Ø/500

PN 1.007/900Ø/504

MH 7
C.L. 84.600
~~D.D. 83.100 (300Ø INLET)~~
I.L. 78.881 (900Ø OUTLET)

PN 1.005/300Ø/17

MH 6
C.L. 89.200
I.L. 87.890

PN 1.004/ 300Ø/18

PN 1.008/ 10500/500

MH 9
C.L. 82.700
I.L. 78.613

ADDITIONAL DISCHARGE FROM FUTURE EXPANSION AREA TO DITCH.

NOTES

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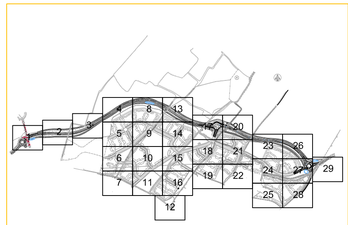

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 2 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/601

Rev P1

MH 2
C.L. 96.600
I.L. 95.005

PN 1.000/2250/89

PN 1.001/2250/34

MH 3
C.L. 94.700
I.L. 92.925

PN 1.002/2250/29

MH 4
C.L. 92.800
I.L. 91.530

PN 1.003/3000/20

MH 5
C.L. 91.400
I.L. 89.870

NOTES

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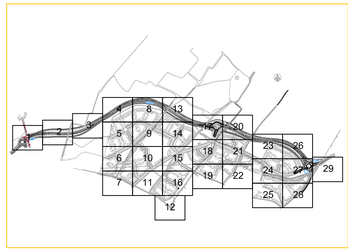

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 3 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/602

Rev P1

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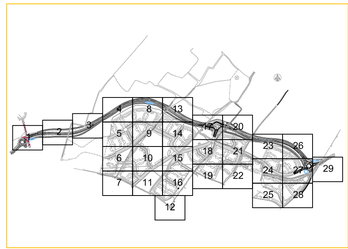

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Client
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 4 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/603

Rev P1

MH 1
C.L. 97.100
I.L. 95.535

MH 13
C.L. 96.720
I.L. 93.088

MH 14
C.L. 96.560
I.L. 93.033 (7800)
I.L. 92.883 (9000)

MH 15
C.L. 96.220
I.L. 92.808

MH 16
C.L. 95.830
I.L. 92.726 (900Ø)
I.L. 92.576 (1050Ø)

PN 3.003/

PN 3.002/9000/599

PN 3.001/9000/600

PN 3.000/7500/600

132.002 / SWALE

132.003 / 150

132.004 / SWALE

132.005 / 150

127.000 / 225

127.001 / 225

126.000 / 225

129.000 / 225

105m³ @ 1.0m Deep
5l/s Discharge

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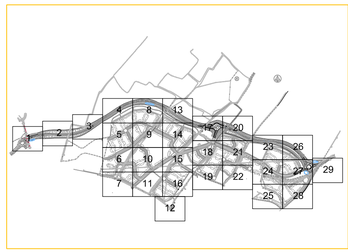

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Client
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 5 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/604

Rev P1

102m³ @ 1.0m Deep
5l/s Discharge

96m³ @ 1.0m Deep
5l/s Discharge

5 l/s DISCHARGE ALLOWANCE INTO PIPE 133.000 FOR FUTURE EXPANSION. ADDITIONAL DISCHARGE FROM FUTURE EXPANSION AREA TO DITCH AT WEST BOUNDARY OF SITE.

Hydrobrake
30l/s @ 1.05m Head

126.003 / RILL

126.004 / 300

134.001 / 225

134.002 / 150

134.003 / 1050

132.008 / 1050

133.000 / 1050

136.000 / 1050

132.006 / 300

132.007 / 300

134.002 / 150

135.000 / 225

134.000 / 225

129.000 / 225

126.000 / 225

126.001 / 225

126.002 / 150

129.001 / 225

126.005 / 300

131.000 / 225

132.009 / 375

131.001 / 225

130.000 / 225

130.001 / 225

130.002 / 150

130.003 / 150

138.000 / 300

137.000 / 300

139.000 / 300

137.001 / 300

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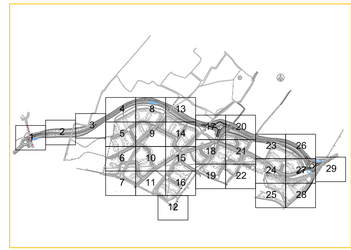

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 6 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales		Drawing No.	Rev
1:250	@ A1	612263/605	P1
1:500	@ A3		

60m³ @ 1.0m Deep 5l/s Discharge

126m³ @ 1.0m Deep 5l/s Discharge

141.001 / 150

141.000 / 225

139.000 / 300

130.003 / 150

132.010 / 375

117.006 / SWALE

117.007 / SWALE

117.008 / SWALE

142.000 / 225

141.002 / 150

140.002 / 1050

141.001 / 375

140.001 / 1050

140.000 / 1050

AREA @ 84.350 mAOD = 2128m²

AREA @ 83.200 mAOD = 1437m²

100.014 / EXISTING DITCH

220.005 / 1050

5 l/s

AREA 1 DISCHARGE TO DITCH MAX ALLOWED DISCHARGE RATES
5.6 ha
1yr - 11.1 l/s
30yr - 30.3 l/s
100yr - 41.6 l/s

117.009 / 375

222.000 / 225

100.015 / EXISTING DITCH

220.006 / 1050

218.005 / 225

213.004 / 300

213.003 / 300

213.002 / 225

HYDROBRAKE 120 l/s @ 2.0m HEAD

213.005 / 300

223.000 / 300

213.006 / 300

213.007 / 300

224.000 / 150

224.001 / 150

AREAS
- to 0.2m deep = 220m²
- to 0.4m deep = 240m²
- to 0.6m deep = 260m²
- to 0.8m deep = 280m²
- to 1.0m deep = 300m²
- to 1.2m deep = 320m²

212.000 / 225

210.000 / 225

209.000 / 225

200.013 / 300

AREA 2 DISCHARGE TO DITCH MAX
ALLOWED DISCHARGE RATES
7.5 ha
1yr - 14.9 l/s
30yr - 40.6 l/s
100yr - 55.7 l/s

50m² @ 1.0m Deep
5l/s Discharge

130m² @ 1.2m Deep
6l/s Discharge

70m² @ 1.0m Deep
5l/s Discharge

HYDROBRAKE 22 l/s @ 1.5m HEAD

POND FEATURE ON LINE OF DITCH. NOT ATTENUATION FACILITY

Pipe:450ø
IL:80.755

NOTES

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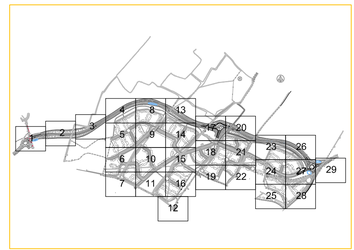

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 7 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/606

Rev P1

10500/595

MH 17
C.L. 95.500
I.L. 92.521

PN 3.004/ 10500/600

MH 18
C.L. 95.240
I.L. 92.326

PN 3.005/ 12000/598

MH 19
C.L. 95.040
I.L. 92.284

PN 3.006/ 12000/606

MH 20
C.L. 94.740
I.L. 92.233

PN 3.007/ 12000/736

FLOW CONTROL LIMITING DISCHARGE
FROM MANHOLE 20 TO EXISTING DITCH.
OVERFLOW TO BE USED WITH OUTGOING
IL SET AT 1 IN 30 YEAR WATER LEVEL

MH 21
C.L. 95.200
I.L. 92.177
I.L. 93.500
(OVERFLOW)

PN 2.011/ 1500Ø/150

PN 2.011/12000/832

IL 93.500

POND IL 93.50
TOP W.L. IN 100 YR +
CC STORM = 94.15

CONDER BYPASS PETROL
INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

132.000 / SWALE

132.001 / 150

950.000 / SWALE

150/220

136m³ @ 1.0m Deep
5l/s Discharge

120.000/300

121.000 / 225

119.000 / 300

119.001 / 300

119.002 / 150

118.000 / 225

119.003 / 150

121.001 / 225

119.003 / 300

100m³ @ 1.0m Deep
5l/s Discharge

114.000 / 225

113.000 / 225

113.001 / 225

115.000 / 225

112.006 / 225

950.001 / 150

NOTES

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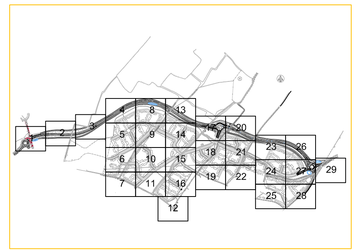
8. ROAD LAYOUT TAKEN FROM MLM DRAWINGS 612263/97_P1, 98_P1, 99_P1 & 100_P1.

9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

MLM

Consulting Civil, Structural & Building Services Engineers
25, London Road, Ipswich, Suffolk IP1 2HF
Tel: 01473 231100 Fax: 01473 231515
Website: www.mlm.uk.com
Ashford * Cambridge * Chelmsford * London * Norwich.

Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 8 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/607 Rev P1

NOTES

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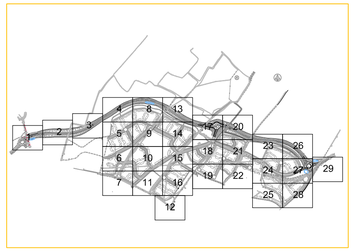

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 9 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales: 1:250 @ A1, 1:500 @ A3

Drawing No. 612263/608 Rev P1

NOTES

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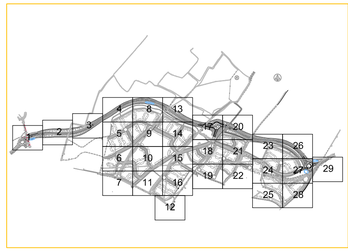

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 10 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/609

Rev P1

213.001 / 1500
215.003 /225
215.002 /225
215.001 / 225
203.001 / 300
213.000 / 225
204.000 / 300
200.005 / SWALE
206.000 /225
207.000 /225
204.001 / 300
205.000 / 225
200.006 / 225
804.001 / RILL
803.000 / 300
804.002 / 300
HYDROBRAKE 5 l/s @ 1.2m HEAD
1.8H CB

AREAS

- to 0.2m deep = 200m²
- to 0.6m deep = 250m²
- to 1.2m deep = 300m²

NOTES

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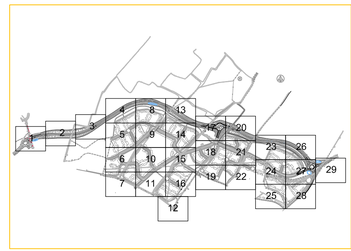

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 11 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/610

Rev P1

804.002 / 300
805.001 / 150
805.002 / 150
804.003 / 300
805.000 / 150
800.005 / SWALE
900.006 / 225
Pipe:450ø
IL:82.576
AREA @ 84.200 mAOD = 897m²
AREA @ 83.000 mAOD = 367m²

AREA 8 DISCHARGE TO DITCH MAX
ALLOWED DISCHARGE RATES
4.0 ha
1yr - 8.0 l/s
30yr - 21.6 l/s
100yr - 29.7 l/s

83.53
83.52
83.20
83.23
82.68
82.91
82.86
82.19
82.23

NOTES

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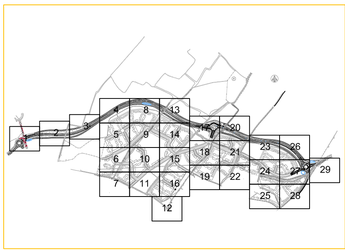

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

MLM

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Ashford * Cambridge * Chelmsford * London * Norwich.

Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 12 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/611

Rev P1

PN 2.011/1200Ø/832

MH 12
C.L. 95.200
I.L. 92.927 525Ø
I.L. 92.252 1200Ø

600Ø PIPE TO BE USED TO DIVERT EXISTING DITCH UNDER PROPOSED HIGHWAY

I.L. 91.690

DITCH I.L. 91.620
FLOW CONTROL LIMITING DISCHARGE FROM MANHOLE 21 TO EXISTING DITCH.

PN 2.010/ 525Ø/141

MH 11
C.L. 96.540
I.L. 93.200

PN 2.009/ 300Ø/15

MH 10
C.L. 98.500
I.L. 96.946

PN 2.008/ 300Ø/28

MH 9
C.L. 99.600
I.L. 98.100

PN 2.007/ 300Ø/27

MH 8
C.L. 100.880
I.L. 99.339

PN 2.006/ 300Ø/28

112.005 / 150

112.004 / SWALE

112.003 / 150

112.002 / SWALE

111.000 / 225

NOTES

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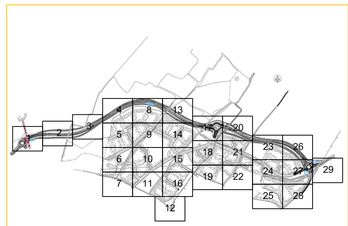

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

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Ashford * Cambridge * Chelmsford * London * Norwich.

Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 13 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/612

Rev P1

NOTES

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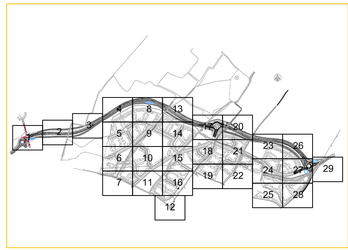

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Client: NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title: SURFACE WATER DRAINAGE STRATEGY SHEET 14 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales: 1:250 @ A1, 1:500 @ A3

Drawing No.: 612263/613

Rev: P1

NOTES

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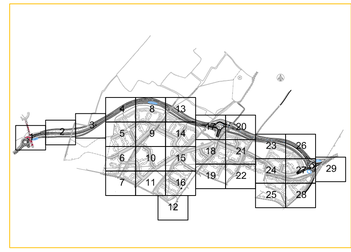

LEGEND

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- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 15 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/614 Rev P1

800.000 / 300

800.002 / SWALE

802.000 / 300

800.003 / SWALE

803.000 / 300

800.004 / SWALE

AREA @ 87.050 mAOD = 109m²

AREA @ 88.250 mAOD = 424m²

AREA @ 85.100 mAOD = 72m²

AREA @ 86.300 mAOD = 331m²

HYDROBRAKE 10 l/s
@ 1.0m HEAD

HYDROBRAKE 10 l/s
@ 1.0m HEAD

CYPRESS
Sp:5.50
D:0.45
Ht:9.00

CYPRESS
Sp:5.50
D:0.45
Ht:9.00

NOTES

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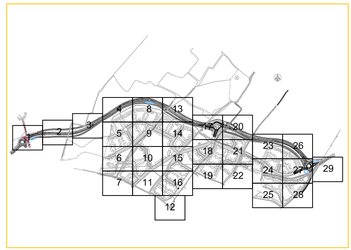
8. ROAD LAYOUT TAKEN FROM MLM DRAWINGS 612263/97_P1, 98_P1, 99_P1 & 100_P1.

9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

MLM

Consulting Civil, Structural & Building Services Engineers
25, London Road, Ipswich, Suffolk IP1 2HF
Tel: 01473 231100 Fax: 01473 231515
Website: www.mlm.uk.com
Ashford * Cambridge * Chelmsford * London * Norwich.

Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 16 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/615

Rev P1

MH 7
C.L. 102.289
I.L. 100.789

PN 2.005/ 3000/27

MH 6
C.L. 103.250
I.L. 101.629

PN 2.004 / 3000/28

MH 4
C.L. 105.740
I.L. 104.240

PN 2.003/ 3000/34

MH 5
C.L. 104.650
I.L. 102.950

PN 2.002/ 3000/232

MH 3
C.L. 105.600
I.L. 104.290

PN 2.001/ 3000/105

MH 2
C.L. 106.050
I.L. 104.550

PN 2.000/ 2250/42

MH 1
C.L. 106.834
I.L. 105.409

6000 PIPE TO BE USED TO DIVERT EXISTING DITCH UNDER PROPOSED HIGHWAY

112.000 / SWALE

Pipe:225ø
IL:102.150

Pipe:225ø
IL:102.041

OAK
Sp:10.50
Di:0.45
Ht:9.00

OAK
Sp:12.50
Di:0.40
Ht:8.00

ASH
Sp:8.50
Di:0.45
Ht:7.00

@ 1.0m Deep Discharge

402.000 / 150

401.000 / 225

500.006 / 225

500.007 / 300

506.000 / 1...

12574.97

NOTES

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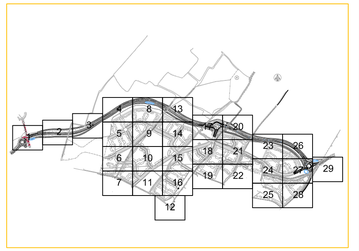
9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 17 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/616

Rev P1

NOTES

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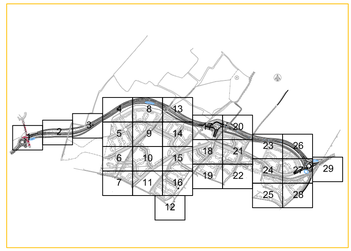
9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 18 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/617 Rev P1

401.001 / SWALE
98.61
98.33
98.11
401.000 / 225
500.008 / 300
505.002 /150
5 l/s
505.003 / 150
508.000 / 1200
500.009 / 225
504.001 / 1200
504.000 / 1200
Pipe:300ø
IL:96.242
HYDROBRAKE 5 l/s
@ 1.0m HEAD
500.010 / 225
520.000 / 225
521.000 / 150
521.001 / 150
522.000 / 150
523.000 / 150
524.000 / 150
521.002 / 150
5 l/s
521.003 / 150
520.001 / 225
520.002 / 225
525.000 / 225
405.000 / 225
526.000 / 150
525.001 / 1050
520.003 / 225
405.001 / 225
405.002 / 225
406.000 / 225
105m³ @ 1.0m Deep
5l/s Discharge
520.004 / 225
404.000 / 750
AREA 5 DISCHARGE TO DITCH MAX
ALLOWED DISCHARGE RATES
2.7 ha
1yr - 5.4 l/s
30yr - 14.6 l/s
100yr - 20.1 l/s
400.007 / 750
405.003 / 150
500.012 / 300
600.013 / 5 l/s
300
404.001 / 750
HYDROBRAKE 5 l/s @ 0.75m HEAD
513.001 / 225
513.000 / 225
514.004 / 150
519.000 / 225
5 l/s
514.003 / 150
518.000 / 225
500.011 / 300
516.000 / 225
517.000 / 225
514.002 / 225
514.001 / 225
515.001 / 150
514.000 / 150
510.000 / 150
511.000 / 150
5 l/s
510.001 / 150
512.000 / 225
510.002 / 150
509.001 / 225
509.000 / 225
HAZEL
Sp:4.50
Di:0.50
Ht:3.50
OAK
Sp:12.00
Di:0.85
Ht:11.00
100.0
950

AREA @ 91.050 mAOD = 337m²
AREA @ 89.850 mAOD = 125m²

Catchpit Manhole

400.008 / 225

414.000 / 150

513.000 / 225

416.000 / 225

415.002 / 150

98m³ @ 1.0m Deep
5l/s Discharge

414.001 / 225

407.010 / 225

400.009 / 225

415.001 / 300

415.000 / 225

407.004 / SWALE

412.003 / 225

407.005 / SWALE

400.009 / 225

AREA 4 DISCHARGE TO DITCH MAX
ALLOWED DISCHARGE RATES
6.0 ha
1yr - 11.5 l/s
30yr - 31.4 l/s
100yr - 43.1 l/s

407.009 / 750

407.008 / 225

407.006 / 525

640m² x 1.2m DEEP

407.007 / 225

HYDROBRAKE 5 l/s @ 1m HEAD

413.000 / 525

NOTES

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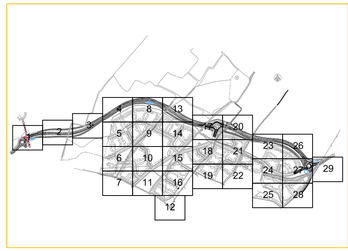
9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 19 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/618

Rev P1

FLOW CONTROL LIMITING DISCHARGE
FROM MANHOLE 6 TO EXISTING DITCH.
OVERFLOW TO BE USED WITH OUTGOING
IL SET AT 1:1N 30 YEAR WATER LEVEL

MH 8
C.L. 108.400
I.L. 106.160

PN 4.005/ 1250/282

PN 5.001/13500/761

PN 4.004/7500/753

6000Ø PIPE TO BE USED TO
DIVERT EXISTING DITCH
UNDER PROPOSED HIGHWAY

MH 9
C.L. 107.700
I.L. 106.110

MH 7
C.L. 108.400
I.L. 106.178

PN 4.006/2250/4

I.L. 99.810

CONDER BYPASS
PETROL INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

MH 5
C.L. 108.400
I.L. 106.216

PN 5.000/13500/755

DITCH I.L.
99.660

MH 10
C.L. 101.000
I.L. 99.920

FLOW CONTROL LIMITING DISCHARGE
FROM MANHOLE 8 TO EXISTING DITCH

MH 6
C.L. 108.400
I.L. 106.231

OFFLINE STORAGE
IN 13500 PIPES

PN 4.003/7500/755

MH 4
C.L. 108.940
I.L. 106.295

PN 4.002/ 6000/600

MH 3
C.L. 109.080
I.L. 106.491

6000Ø PIPE TO BE USED TO
DIVERT EXISTING DITCH
UNDER PROPOSED HIGHWAY

500.005 / 225

500.004 / 225

500.003 / 150

500.002 / 150

500.001 / 150

505.000 / 225

505.001 / 225

503.000

502.000

128,382

135,251

137,042

143,511

NOTES

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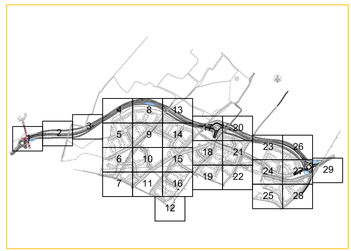

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 20 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/619

Rev P1

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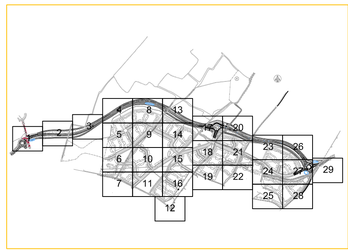

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Client
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

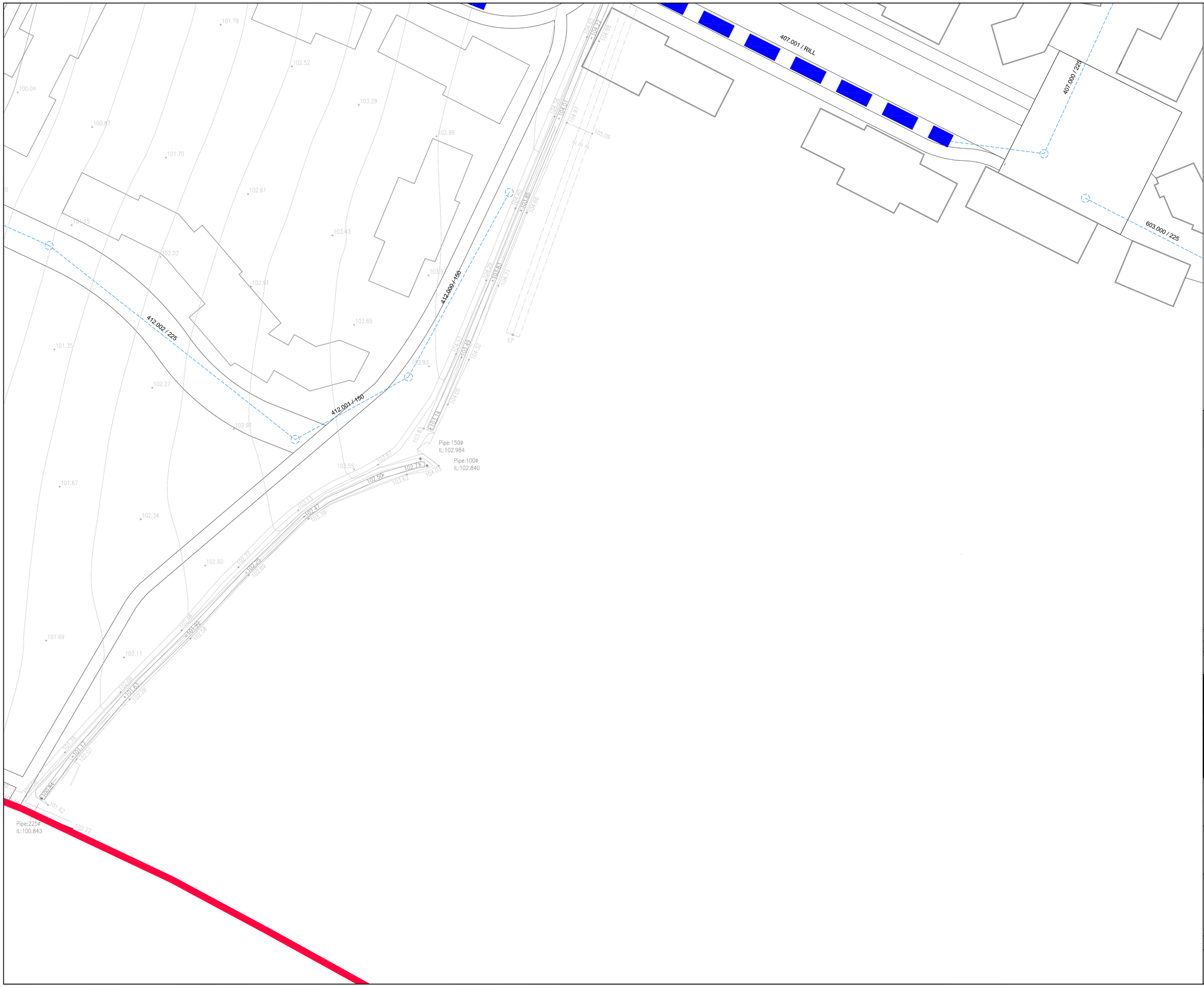
Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 21 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/620

Rev P1



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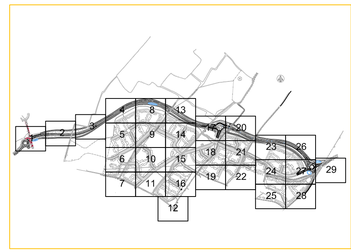

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 22 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/621

Rev P1

PN 4.001/450Ø/398

PN 4.000/300Ø/250

MH 2
C.L. 109.080
I.L. 106.755

MH 1
C.L. 108.640
I.L. 107.140

MH 1
C.L. 107.700
I.L. 106.275

PN 8.000/225Ø/46

522.820

1550.436

700.000 / 900

601.000 / 225

701.000 / 225

701.001 / 225

600.001 / SWALE

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.

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3. RAINWATER HARVESTING WILL BE ENCOURAGED THROUGHOUT THE DEVELOPMENT.

4. WHEREVER POSSIBLE, POSITIVELY DRAINED IMPERMEABLE SURFACING WILL BE KEPT TO A MINIMUM.

5. WHERE OTHER METHODS OF STORAGE ARE IMPRACTICAL, BELOW GROUND STORAGE CAN BE PROVIDED WITHIN THE SUB-BASE OF PERMEABLE PAVING, FRENCH DRAINS, OR IN CRATES/TANKS

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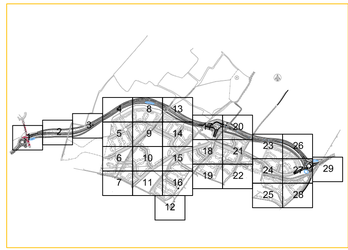
8. ROAD LAYOUT TAKEN FROM MLM DRAWINGS 612263/97_P1, 98_P1, 99_P1 & 100_P1.

9. INDICATIVE PROPOSED DEVELOPMENT LAYOUT TAKEN FROM BIDWELLS DRAWING SW51000002-22 REVISION N.



LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

MLM

Consulting Civil, Structural & Building Services Engineers
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Website: www.mlm.uk.com
Ashford * Cambridge * Chelmsford * London * Norwich.

Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 23 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/622

Rev P1

NOTES

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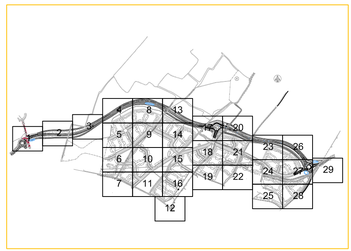

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

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Client: NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project: NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title: SURFACE WATER DRAINAGE STRATEGY SHEET 24 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales: 1:250 @ A1, 1:500 @ A3

Drawing No. 612263/623 Rev P1

601.000 / 225
602.000 / 150
600.001 / SWALE
600.002 / 300
600.003 / 300
603.001 / 300
603.002 / 300
603.003 / 300
701.001 / 225
701.002 / 300
700.004 / 900
700.005 / 375
700.006 / 375
700.007 / 375
700.008 / 450
HYDROBRAKE 100 l/s @ 1.5m HEAD
702.000 / 300
702.001 / 300
600.004 / 225
705.000 / 150
705.001 / 225
705.002 / 225
705.003 / 225
706.004 / 1200
AREA @ 104.55 mAOD = 654m²
AREA @ 103.350 mAOD = 167m²
AREA 6 DISCHARGE TO DITCH MAX ALLOWED DISCHARGE RATES
1.9 ha
1yr - 3.8 l/s
30yr - 10.3 l/s
100yr - 14.1 l/s

NOTES

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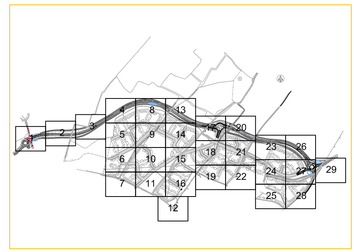

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

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Client
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 25 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/624

Rev P1

MH 2
C.L. 106.760
I.L. 105.260

PN 8.001/300Ø/40

MH 3
C.L. 105.760
I.L. 104.260

PN 8.002/300Ø/38

PN 8.003/300Ø/45

MH 4
C.L. 105.130
I.L. 103.630

PN 8.004/300Ø/133

MH 6
C.L. 105.750
I.L. 103.155

MH 5
C.L. 104.730
I.L. 103.230

PN 8.005/300Ø/132

MH 7
C.L. 104.550
I.L. 102.815

PN 8.006/300Ø/48

MH 1
C.L. 103.800
I.L. 102.300

PN 6.000/ 300Ø/33

700.001 / 900

700.002 / 900

704.000 / 150

700.003 / 900

NOTES

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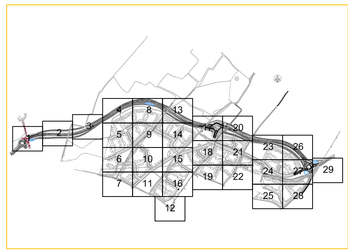

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 26 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/625

Rev P1

MH 2
C.L. 102.720
I.L. 101.220

PN 6.001/ 3000/51

MH 3
C.L. 102.400
I.L. 100.900

PN 6.002
3000/22

MH 4
C.L. 101.878
I.L. 100.303

PN 8.007/3000/48

MH 8
C.L. 103.300
I.L. 101.800

PN 8.007/3000/107

CONDER BYPASS PETROL
INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

PN 6.003/ 3750/241

MH 5
C.L. 101.878
I.L. 100.155

PN 6.004/ 3750/75

MH 6
C.L. 101.378
I.L 99.953

PN 7.000/ 1250/123

POND IL 98.67
TOP W.L. IN 100 YR
+ CC STORM = 99.48

MH 7 (FLOW CONTROL)
C.L. 101.500
I.L. 98.670

I.L. 100.490
DITCH I.L.
100.265

Pipe: 300ø
IL99.867

AREA @ 101.100 mAOD = 1014m²
AREA @ 99.900 mAOD = 379m²

STORAGE POND TO
DISCHARGE INTO EXISTING
DITCH AS SHOWN.

HYDROBRAKE 5 l/s @ 1.0m HEAD

200m² x 1.0m DEEP

PN 6.005/ 1500/150

CONDER BYPASS PETROL
INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

EXISTING DITCH TO BE
RE-ROUTED AS SHOWN TO
AVOID PROPOSED ROAD AND
FOOTWAY AS NECESSARY

I.L. 98.785

DITCH I.L. 98.350

AREA @ 99.250 mAOD = 323m²

AREA @ 98.050 mAOD = 86m²

AREA 7 DISCHARGE TO DITCH MAX
ALLOWED DISCHARGE RATES
4.6 ha
1yr - 9.1 l/s
30yr - 24.9 l/s
100yr - 34.2 l/s

703.000 / 225
703.001/ 225
704.001 / 225
704.002 / 225
703.001 / 300
700.010 / 450
700.011 / 450
700.008 / 450
700.009 / 450
707.000 / 150
705.009 / 375
705.008 / 375
705.004 / 375
700.012 / 225
700.013 / 225
708.008 / 1200

ELM
Sp:6.50
Di:0.35
Ht:3.50

ELM
Sp:8.00
Di:0.50
Ht:5.50

NOTES

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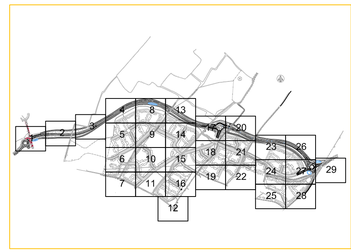

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
P1	14.09.10	ISSUE FOR APPROVAL	AS	JRC

Drawing Status: PRELIMINARY

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Client
NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY SHEET 27 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/626

Rev P1

NOTES

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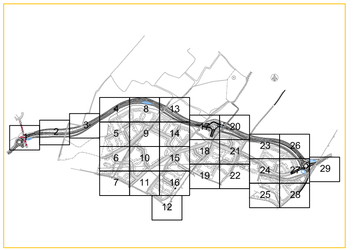

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 28 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No. 612263/627

Rev P1

PN 8.006/3000Ø/148

MH 8
C.L. 103.300
I.L. 101.800

PN 8.007/300Ø/107

CONDER BYPASS PETROL
INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

MH 4
C.L. 101.878
I.L. 100.303

POND IL 98.67
TOP W.L. IN 100 YR + CC STORM = 100.95

MH 9 (FLOW CONTROL)
C.L. 102.800
I.L. 100.385

PN 8.008/ 150Ø/147

DITCH
I.L. 102.275
I.L. 100.200

PN 6.003/ 375Ø/241

MH 5
C.L. 101.878
I.L. 100.155

PN 6.004/ 375Ø/76

MH 6
C.L. 101.378
I.L. 99.953

PN 7.000/ 1250/123

POND IL 98.67
TOP W.L. IN 100 YR
+ CC STORM = 99.48

MH 7 (FLOW CONTROL)
C.L. 101.500
I.L. 98.670

I.L. 100.490
DITCH I.L.
100.265

600Ø PIPE TO BE USED TO DIVERT EXISTING DITCH UNDER EXISTING TRACK AS NECESSARY

600Ø PIPE TO BE USED TO DIVERT EXISTING DITCH UNDER PROPOSED HIGHWAY

ND TO
STING
HOWN.

PN 6.005/ 1500/150

CONDER BYPASS PETROL
INTERCEPTOR
CNSB1.5/2
1.0m DIAMETER
1.4m LENGTH

EXISTING DITCH TO BE RE-ROUTED AS SHOWN TO AVOID PROPOSED ROAD AND FOOTWAY AS NECESSARY

I.L. 98.785

DITCH I.L. 98.350

700.013/225

3/1200

H.CHESTNUT
Sp:6.00
Di:0.30
Ht:8.00

HAWTHORN
Sp:5.50
Di:0.35
Ht:4.50

Stoys(x2)

TP

NOTES

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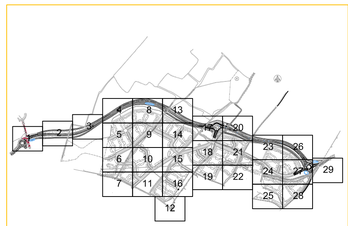

LEGEND

- SITE BOUNDARY
- SWALE
- RILL
- OVERFLOW
- 5.000/450 PIPE NO./DIAMETER
- POND
- ATTENUATION CRATES

Rev	Date	Description	Made	Checked
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NORTH WEST HAVERHILL LANDOWNERS CONSORTIUM

Project
NORTH WEST HAVERHILL URBAN EXTENSION

Drawing Title
SURFACE WATER DRAINAGE STRATEGY
SHEET 29 OF 29

Drawn	Checked	Approved	Date
AS	JRC	JJH	14.09.2010

Scales
1:250 @ A1
1:500 @ A3

Drawing No.
612263/628

Rev
P1

Appendix B - Microdrainage Calculations

Microdrainage Printouts for Networks 1 to 10 (excluding Network 3)

Microdrainage Calculations for Residential Area 1

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
100.000	37.800	0.821	46.0	0.048	3.00	0.600	o	225
101.000	17.160	0.293	58.6	0.018	3.00	0.600	o	225
101.001	6.375	0.507	12.6	0.037	0.00	0.600	o	225
102.000	19.121	0.375	51.0	0.075	3.00	0.600	o	225
101.002	5.800	0.149	38.9	0.000	0.00	0.600	o	150
101.003	19.950	0.997	20.0	0.000	0.00	0.600	o	150
100.001	12.620	0.166	76.0	0.013	0.00	0.600	o	300
103.000	33.400	0.576	58.0	0.040	3.00	0.600	o	225
103.001	30.000	0.511	58.7	0.240	0.00	0.600	o	300
100.002	18.030	0.309	58.3	0.019	0.00	0.600	o	375
104.000	10.400	0.130	80.0	0.041	3.00	0.600	o	225
104.001	9.971	0.325	30.7	0.076	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
100.000	23	99.200	97.900	1.075	98.600	97.079	1.296		1050
101.000	23	100.400	99.100	1.075	100.200	98.807	1.168		1050
101.001	23	100.200	98.807	1.168	99.600	98.300	1.075		1050
102.000	23	100.250	98.675	1.350	99.600	98.300	1.075		1050
101.002	23	99.600	98.300	1.150	99.600	98.151	1.299	Hydro-Brake®	1050
101.003	23	99.600	98.151	1.299	98.600	97.154	1.296		1050
100.001	23	98.600	97.004	1.296	98.500	96.838	1.362		1050
103.000	23	100.300	98.000	2.075	99.800	97.424	2.151		1200
103.001	23	99.800	97.349	2.151	98.500	96.838	1.362		1200
100.002	23	98.500	96.763	1.362	98.200	96.454	1.371		1350
104.000	12	99.400	97.760	1.415	99.200	97.630	1.345		1050
104.001	13	99.200	97.630	1.345	99.400	97.305	1.870		1050

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
105.000	13.541	0.395	34.3	0.081	3.00	0.600	o	225
104.002	6.740	0.067	100.6	0.000	0.00	0.600	o	150
104.003	21.950	0.559	39.3	0.000	0.00	0.600	o	150
100.003	8.080	0.081	99.8	0.018	0.00	0.600	o	375
100.004	13.270	0.133	99.8	0.000	0.00	0.600	o	375
106.000	86.600	1.750	49.5	0.076	3.00	0.600	\/	-2
106.001	3.225	0.022	150.0	0.000	0.00	0.600	o	225
100.005	44.230	3.350	13.2	0.000	0.00	0.600	\/	-3
107.000	43.470	0.396	109.8	0.137	3.00	0.600	o	225
107.001	13.185	0.682	19.3	0.045	0.00	0.600	o	225
108.000	36.270	1.278	28.4	0.098	3.00	0.600	o	225
107.002	5.960	0.432	13.8	0.000	0.00	0.600	o	150
107.003	15.870	0.415	38.2	0.000	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
105.000	14	99.750	97.700	1.825	99.400	97.305	1.870		1200
104.002	15	99.400	97.305	1.945	99.300	97.238	1.912	Hydro-Brake®	1200
104.003	19	99.300	97.238	1.912	98.200	96.679	1.371		1200
100.003	20	98.200	96.454	1.371	98.150	96.373	1.402		1350
100.004	21	98.150	96.373	1.402	96.750	96.240	0.135		1350
106.000	22	98.521	97.771	0.000	96.600	96.021	-0.171		0
106.001	21	96.600	96.021	0.354	96.750	96.000	0.526		10000
100.005	25	96.750	96.000	0.601	93.400	92.650	0.601		10000
107.000	25	97.600	94.800	2.575	96.800	94.404	2.171		1200
107.001	26	96.800	94.404	2.171	95.300	93.722	1.353		1200
108.000	27	96.000	95.000	0.775	95.300	93.722	1.353		1050
107.002	28	95.300	93.722	1.428	94.800	93.290	1.360	Hydro-Brake®	1050
107.003	31	94.800	93.290	1.360	94.000	92.875	0.975		1050

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
109.000	38.250	0.320	119.5	0.051	3.00	0.600	o	225
109.001	21.460	0.180	119.5	0.023	0.00	0.600	o	225
107.004	22.580	0.130	173.7	0.000	0.00	0.600	o	225
100.006	59.950	3.200	18.7	0.048	0.00	0.600	\/	-3
100.007	8.000	0.255	31.4	0.000	0.00	0.600	o	500
110.000	41.490	0.830	50.0	0.113	3.00	0.600	o	225
110.001	9.775	0.370	26.4	0.048	0.00	0.600	o	225
111.000	26.770	1.190	22.5	0.093	3.00	0.600	o	225
110.002	17.180	0.805	21.3	0.000	0.00	0.600	o	150
112.000	77.094	2.000	38.5	0.043	3.00	0.600	\/	-10
112.001	5.635	0.020	281.8	0.000	0.00	0.600	o	150
112.002	61.915	1.830	33.8	0.036	0.00	0.600	\/	-10
112.003	5.823	0.030	194.1	0.000	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
109.000	32	94.500	93.300	0.975	94.200	92.980	0.995		1050
109.001	33	94.200	92.980	0.995	94.000	92.800	0.975		1050
107.004	34	94.000	92.800	0.975	93.400	92.670	0.505		1050
100.006	35	93.400	92.650	0.601	90.200	89.450	0.601		10000
100.007	36	90.200	89.300	0.400	90.200	89.045	0.655		10000
110.000	37	93.700	91.700	1.775	92.900	90.870	1.805		1200
110.001	38	92.900	90.870	1.805	92.000	90.500	1.275		1200
111.000	39	93.000	91.690	1.085	92.000	90.500	1.275		1050
110.002	43	92.000	90.500	1.350	90.700	89.695	0.855	Hydro-Brake®	1050
112.000	44	99.350	98.650	0.325	97.350	96.650	0.325		0
112.001	41	97.350	96.650	0.550	97.330	96.630	0.550		10000
112.002	42	97.330	96.630	0.325	95.550	94.800	0.375		10000
112.003	43	95.550	94.800	0.600	95.520	94.770	0.600		10000

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
112.004	47.800	3.120	15.3	0.027	0.00	0.600	\/	-10
112.005	17.778	0.422	42.1	0.000	0.00	0.600	o	150
112.006	48.058	1.333	36.1	0.039	0.00	0.600	o	225
110.003	31.340	0.500	62.7	0.013	0.00	0.600	o	300
100.008	22.620	0.470	48.1	0.010	0.00	0.600	o	500
113.000	32.390	0.648	50.0	0.107	3.00	0.600	o	225
113.001	32.274	0.963	33.5	0.052	0.00	0.600	o	225
114.000	16.685	0.088	189.6	0.071	3.00	0.600	o	225
113.002	3.450	0.058	59.5	0.000	0.00	0.600	o	150
113.003	16.600	0.166	100.0	0.000	0.00	0.600	o	150
115.000	55.880	1.074	52.0	0.046	3.00	0.600	o	225
113.004	20.820	0.276	75.4	0.011	0.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
112.004	44	95.520	94.770	0.375	92.400	91.650	0.375		10000
112.005	45	92.400	91.450	0.800	92.150	91.028	0.972	Hydro-Brake®	10000
112.006	46	92.150	90.953	0.972	90.700	89.620	0.855		1050
110.003	45	90.700	89.545	0.855	90.200	89.045	0.855		1050
100.008	46	90.200	89.045	0.655	89.700	88.575	0.625		1500
113.000	47	92.900	90.836	1.839	91.550	90.188	1.137		1200
113.001	48	91.550	90.188	1.137	90.600	89.225	1.150		1050
114.000	49	91.300	89.313	1.762	90.600	89.225	1.150		1200
113.002	50	90.600	89.225	1.225	90.450	89.167	1.133	Hydro-Brake®	1050
113.003	52	90.450	89.167	1.133	90.200	89.001	1.049		1050
115.000	53	91.800	90.000	1.575	90.200	88.926	1.049		1200
113.004	54	90.200	88.851	1.049	89.700	88.575	0.825		1050

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
100.009	17.587	0.117	150.3	0.033	0.00	0.600	o	500
116.000	26.553	0.267	99.4	0.045	3.00	0.600	o	225
100.010	15.541	0.078	199.2	0.020	0.00	0.600	o	500
100.011	12.531	0.138	90.8	0.000	0.00	0.600	o	500
100.012	10.400	0.072	144.4	0.000	0.00	0.600	o	225
100.013	128.115	3.136	40.9	0.000	0.00	0.600	\/	-5
100.014	95.257	1.759	54.2	0.000	0.00	0.600	\/	-5
117.000	33.950	0.750	45.3	0.070	3.00	0.600	\/	-2
118.000	71.050	3.553	20.0	0.066	3.00	0.600	o	300
118.001	35.035	0.350	100.0	0.036	0.00	0.600	o	300
119.000	30.951	0.656	47.2	0.102	3.00	0.600	o	300
119.001	14.833	0.386	38.4	0.050	0.00	0.600	o	300
120.000	12.183	0.973	12.5	0.130	3.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
100.009	55	89.700	88.575	0.625	89.750	88.458	0.792		1500
116.000	56	90.250	89.000	1.025	89.750	88.733	0.792		1050
100.010	57	89.750	88.458	0.792	89.250	88.380	0.370		1500
100.011	54	89.250	88.380	0.370	89.000	88.242	0.258		1500
100.012	55	89.000	88.242	0.533	88.916	88.170	0.521	Complex	1500
100.013	56	88.916	88.170	0.521	85.780	85.034	0.521		10000
100.014	57	85.780	85.034	0.521	83.920	83.275	0.420		0
117.000	59	89.000	88.250	0.000	88.250	87.500	0.000		0
118.000	60	93.750	92.550	0.900	90.400	88.997	1.103		1050
118.001	61	90.400	88.997	1.103	90.700	88.647	1.753		1050
119.000	62	93.150	91.069	1.781	91.500	90.413	0.787		1200
119.001	63	91.500	90.413	0.787	91.600	90.027	1.273		1050
120.000	64	93.000	91.000	1.700	91.600	90.027	1.273		1200

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
119.002	5.367	0.059	91.0	0.000	0.00	0.600	o	150
119.003	19.735	1.321	14.9	0.000	0.00	0.600	o	150
118.002	8.597	0.086	100.0	0.000	0.00	0.600	o	300
121.000	31.341	1.254	25.0	0.044	3.00	0.600	o	225
121.001	24.728	2.260	10.9	0.015	0.00	0.600	o	225
118.003	63.431	0.646	98.2	0.061	0.00	0.600	o	300
122.000	21.656	0.217	99.8	0.061	3.00	0.600	o	225
122.001	27.570	0.408	67.6	0.043	0.00	0.600	o	225
123.000	5.000	0.050	100.0	0.000	3.00	0.600	o	225
122.002	7.300	0.085	85.9	0.000	0.00	0.600	o	150
118.004	18.350	0.090	203.9	0.000	0.00	0.600	o	375
117.001	47.000	1.250	37.6	0.081	0.00	0.600	\/	-6

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
119.002	65	91.600	90.027	1.423	91.650	89.968	1.532	Hydro-Brake®	1050
119.003	67	91.650	89.968	1.532	90.700	88.647	1.903		1200
118.002	68	90.700	88.497	1.903	90.600	88.411	1.889		1200
121.000	69	93.200	92.000	0.975	92.000	90.746	1.029		1050
121.001	70	92.000	90.746	1.029	90.600	88.486	1.889		1050
118.003	71	90.600	88.411	1.889	88.700	87.765	0.635		1200
122.000	72	89.700	88.700	0.775	89.500	88.483	0.792		1050
122.001	73	89.500	88.483	0.792	88.750	88.075	0.450		1050
123.000	74	88.800	88.050	0.525	88.750	88.000	0.525		1050
122.002	75	88.750	88.000	0.600	88.700	87.915	0.635	Hydro-Brake®	1050
118.004	76	88.700	87.690	0.635	88.250	87.600	0.275		1350
117.001	77	88.250	87.500	0.275	87.000	86.250	0.275		10000

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
124.000	42.529	0.450	94.5	0.117	3.00	0.600	o	225
124.001	11.674	0.333	35.1	0.034	0.00	0.600	o	225
125.000	28.568	0.733	39.0	0.118	3.00	0.600	o	225
124.002	4.935	0.142	34.8	0.000	0.00	0.600	o	150
124.003	17.663	0.075	235.5	0.000	0.00	0.600	o	150
117.002	17.464	0.500	34.9	0.037	0.00	0.600	\/	-7
117.003	9.140	0.725	12.6	0.000	0.00	0.600	o	500
126.000	29.017	1.451	20.0	0.101	3.00	0.600	o	225
126.001	15.436	0.383	40.3	0.031	0.00	0.600	o	225
127.000	31.189	1.559	20.0	0.091	3.00	0.600	o	225
127.001	9.700	0.375	25.9	0.030	0.00	0.600	o	225
126.002	22.754	0.666	34.2	0.000	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
124.000	78	88.950	87.350	1.375	88.250	86.900	1.125		1050
124.001	79	88.250	86.900	1.125	87.900	86.567	1.108		1050
125.000	80	88.800	87.300	1.275	87.900	86.567	1.108		1050
124.002	81	87.900	86.567	1.183	87.750	86.425	1.175	Hydro-Brake®	1050
124.003	83	87.750	86.425	1.175	87.000	86.350	0.500		1050
117.002	84	87.000	86.250	0.500	86.500	85.750	0.500		10000
117.003	85	86.500	85.750	0.250	86.300	85.025	0.775		10000
126.000	86	92.800	91.800	0.775	91.300	90.349	0.726		1050
126.001	87	91.300	90.349	0.726	91.200	89.966	1.009		1050
127.000	88	92.900	91.900	0.775	91.500	90.341	0.934		1050
127.001	89	91.500	90.341	0.934	91.200	89.966	1.009		1050
126.002	91	91.200	89.966	1.084	89.800	89.300	0.350	Hydro-Brake®	1050

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
128.000	20.776	0.400	51.9	0.016	3.00	0.600	|_|	-8
126.003	34.949	0.175	200.0	0.020	0.00	0.600	|_|	-8
126.004	8.592	0.325	26.4	0.000	0.00	0.600	o	300
129.000	37.020	1.851	20.0	0.045	3.00	0.600	o	225
129.001	28.726	1.774	16.2	0.028	0.00	0.600	o	225
126.005	96.133	3.425	28.1	0.055	0.00	0.600	o	300
117.004	16.550	0.100	165.5	0.045	0.00	0.600	o	500
117.005	7.450	0.050	149.0	0.000	0.00	0.600	o	500
117.006	26.860	0.400	67.2	0.048	0.00	0.600	\/	-6
130.000	45.607	1.824	25.0	0.083	3.00	0.600	o	225
130.001	6.096	0.404	15.1	0.039	0.00	0.600	o	225
131.000	17.791	0.712	25.0	0.053	3.00	0.600	o	225
131.001	15.977	1.016	15.7	0.018	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
128.000	92	90.250	89.500	0.450	89.800	89.100	0.400		0
126.003	93	89.800	89.100	0.400	89.800	88.925	0.575		10000
126.004	94	89.800	88.925	0.575	89.800	88.600	0.900		10000
129.000	95	93.300	92.300	0.775	91.200	90.449	0.526		1050
129.001	96	91.200	90.449	0.526	89.800	88.675	0.900		1050
126.005	97	89.800	88.600	0.900	86.300	85.175	0.825		1050
117.004	98	86.300	84.975	0.825	85.800	84.875	0.425		1500
117.005	99	85.800	84.875	0.425	85.700	84.825	0.375		1500
117.006	100	85.700	84.825	0.400	85.150	84.425	0.250		10000
130.000	101	88.500	87.500	0.775	86.700	85.676	0.799		1050
130.001	102	86.700	85.676	0.799	86.600	85.272	1.103		1050
131.000	103	88.450	87.000	1.225	87.700	86.288	1.187		1050
131.001	104	87.700	86.288	1.187	86.600	85.272	1.103		1050

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
130.002	32.107	0.296	108.5	0.000	0.00	0.600	o	150
130.003	10.448	0.426	24.5	0.000	0.00	0.600	o	150
117.007	14.028	0.100	140.3	0.027	0.00	0.600	|_|	-8
132.000	93.000	0.186	500.0	0.049	3.00	0.600	\/	-9
132.001	6.989	0.023	303.9	0.000	0.00	0.600	o	225
132.002	76.911	0.154	499.4	0.045	0.00	0.600	\/	-9
132.003	5.569	0.019	293.1	0.000	0.00	0.600	o	225
132.004	52.438	0.105	499.4	0.034	0.00	0.600	\/	-9
132.005	9.450	0.047	201.1	0.000	0.00	0.600	o	150
132.006	50.477	2.969	17.0	0.057	0.00	0.600	o	300
132.007	34.788	2.747	12.7	0.032	0.00	0.600	o	300
133.000	50.129	1.171	42.8	0.027	3.00	0.600	o	1050
132.008	5.104	0.255	20.0	0.000	0.00	0.600	o	1050
134.000	38.970	0.650	60.0	0.088	3.00	0.600	o	225
134.001	8.136	0.262	31.1	0.027	0.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
130.002	106	86.600	85.272	1.178	86.550	84.976	1.424	Hydro-Brake®	1050
130.003	108	86.550	84.976	1.424	85.150	84.550	0.450		1050
117.007	110	85.150	84.400	0.450	85.150	84.300	0.550		10000
132.000	111	94.300	93.550	0.425	94.114	93.364	0.425		0
132.001	112	94.114	93.364	0.525	94.091	93.341	0.525		10000
132.002	113	94.091	93.341	0.425	93.937	93.187	0.425		10000
132.003	114	93.937	93.187	0.525	93.918	93.168	0.525		10000
132.004	115	93.918	93.168	0.425	93.871	93.063	0.483		10000
132.005	116	93.871	93.063	0.658	94.400	93.016	1.234		10000
132.006	117	94.400	93.016	1.084	91.350	90.047	1.003		1050
132.007	118	91.350	90.047	1.003	89.400	87.300	1.800		1050
133.000	119	90.000	87.800	1.150	89.400	86.629	1.721		1800
132.008	120	89.400	86.629	1.721	89.400	86.374	1.976		1800
134.000	121	92.800	89.244	3.331	90.600	88.594	1.781		1200
134.001	122	90.600	88.519	1.781	90.600	88.257	2.043		1200

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
135.000	23.118	1.043	22.2	0.100	3.00	0.600	o	300
134.002	12.464	0.125	99.7	0.000	0.00	0.600	o	150
134.003	24.265	0.682	35.6	0.000	0.00	0.600	o	150
136.000	30.750	0.308	99.8	0.000	3.00	0.600	o	1050
134.004	10.113	0.176	57.5	0.000	0.00	0.600	o	1050
132.009	70.517	1.934	36.5	0.078	0.00	0.600	o	375
137.000	48.203	1.812	26.6	0.124	3.00	0.600	o	300
138.000	47.762	1.912	25.0	0.099	3.00	0.600	o	300
137.001	22.522	0.273	82.5	0.000	0.00	0.600	o	300
132.010	35.413	0.140	253.0	0.000	0.00	0.600	o	375

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
135.000	123	92.800	89.300	3.200	90.600	88.257	2.043		1200
134.002	124	90.600	88.257	2.193	90.600	88.132	2.318	Hydro-Brake®	1200
134.003	126	90.600	88.132	2.318	89.250	87.450	1.650		1200
136.000	128	89.400	86.858	1.492	89.250	86.550	1.650		1800
134.004	129	89.250	86.550	1.650	89.400	86.374	1.976		1800
132.009	130	89.400	86.374	2.651	86.100	84.440	1.285	Hydro-Brake®	1800
137.000	131	88.700	86.600	1.800	86.500	84.788	1.412		1200
138.000	133	88.700	86.700	1.700	86.500	84.788	1.412		1200
137.001	134	86.500	84.788	1.412	86.100	84.515	1.285	Hydro-Brake®	1050
132.010	137	86.100	84.440	1.285	85.150	84.300	0.475		1350

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
117.008	30.855	0.700	44.1	0.048	0.00	0.600	|_|	-8
139.000	84.325	3.900	21.6	0.067	3.00	0.600	o	300
140.000	33.229	1.225	27.1	0.060	3.00	0.600	o	225
140.001	26.102	0.232	112.5	0.044	0.00	0.600	o	300
141.000	34.283	1.300	26.4	0.096	3.00	0.600	o	225
142.000	20.152	1.100	18.3	0.052	3.00	0.600	o	225
141.001	2.987	0.030	99.6	0.000	0.00	0.600	o	150
141.002	20.818	0.252	82.6	0.000	0.00	0.600	o	150
140.002	13.229	0.118	112.1	0.010	0.00	0.600	o	300
139.001	20.900	0.550	38.0	0.000	0.00	0.600	o	300
117.009	6.527	0.030	217.6	0.000	0.00	0.600	o	375

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
117.008	138	85.150	84.300	0.550	84.500	83.600	0.600		10000
139.000	139	89.250	88.050	0.900	85.350	84.150	0.900		1050
140.000	140	87.000	85.800	0.975	85.700	84.575	0.900		1050
140.001	141	85.700	84.500	0.900	85.450	84.268	0.882		1050
141.000	130	88.000	86.000	1.775	86.200	84.700	1.275		1200
142.000	131	86.800	85.800	0.775	86.200	84.700	1.275		1050
141.001	132	86.200	84.700	1.350	86.100	84.670	1.280	Hydro-Brake®	1050
141.002	133	86.100	84.670	1.280	85.450	84.418	0.882		1050
140.002	130	85.450	84.268	0.882	85.350	84.150	0.900		1050
139.001	142	85.350	84.150	0.900	84.500	83.600	0.600		1050
117.009	143	84.500	83.200	0.925	83.920	83.170	0.375	Complex	10000

Existing Network Details for Area3_AS.sws

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
100.015	5.000	0.270	18.5	0.000	0.00	0.600	\/	-5

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
100.015	143	83.920	83.170	0.525	83.650	82.900	0.525		10000

Free Flowing Outfall Details for Area3_AS.sws

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
100.015	Ditch	83.650	82.900	82.900	0	0

Simulation Criteria for Area3_AS.sws

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	240
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	4

Number of Input Hydrographs	0	Number of Storage Structures	15
Number of Online Controls	17	Number of Time/Area Diagrams	0
Number of Offline Controls	1		

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	120

Online Controls for Area3_AS.sws

Hydro-Brake® Manhole: 23, DS/PN: 101.002, Volume (m³): 2.1

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 98.300
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 15, DS/PN: 104.002, Volume (m³): 3.2

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 97.305
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 28, DS/PN: 107.002, Volume (m³): 3.2

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 93.722
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.000	5.0	2.400	7.8	5.500	11.8
0.200	4.1	1.200	5.5	2.600	8.1	6.000	12.3
0.300	3.9	1.400	6.0	3.000	8.7	6.500	12.9
0.400	3.8	1.600	6.4	3.500	9.4	7.000	13.3
0.500	3.8	1.800	6.8	4.000	10.1	7.500	13.8
0.600	4.0	2.000	7.1	4.500	10.7	8.000	14.3
0.800	4.5	2.200	7.5	5.000	11.3	8.500	14.7

Hydro-Brake® Manhole: 28, DS/PN: 107.002, Volume (m³): 3.2

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
9.000	15.1	9.500	15.5

Hydro-Brake® Manhole: 43, DS/PN: 110.002, Volume (m³): 2.7

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 90.500
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 45, DS/PN: 112.005, Volume (m³): 88.8

Design Head (m) 0.750 Diameter (mm) 100
Design Flow (l/s) 5.0 Invert Level (m) 91.450
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	1.200	6.3	3.000	9.9	7.000	15.1
0.200	4.7	1.400	6.8	3.500	10.7	7.500	15.6
0.300	4.6	1.600	7.2	4.000	11.4	8.000	16.1
0.400	4.4	1.800	7.7	4.500	12.1	8.500	16.6
0.500	4.4	2.000	8.1	5.000	12.8	9.000	17.1
0.600	4.6	2.200	8.5	5.500	13.4	9.500	17.6
0.800	5.1	2.400	8.8	6.000	14.0		
1.000	5.7	2.600	9.2	6.500	14.5		

Hydro-Brake® Manhole: 50, DS/PN: 113.002, Volume (m³): 3.1

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 89.225
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.500	3.8	1.200	5.5	2.000	7.1
0.200	4.1	0.600	4.0	1.400	6.0	2.200	7.5
0.300	3.9	0.800	4.5	1.600	6.4	2.400	7.8
0.400	3.8	1.000	5.0	1.800	6.8	2.600	8.1

Hydro-Brake® Manhole: 50, DS/PN: 113.002, Volume (m³): 3.1

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
3.000	8.7	5.000	11.3	7.000	13.3	9.000	15.1
3.500	9.4	5.500	11.8	7.500	13.8	9.500	15.5
4.000	10.1	6.000	12.3	8.000	14.3		
4.500	10.7	6.500	12.9	8.500	14.7		

Complex Manhole: 55, DS/PN: 100.012, Volume (m³): 3.5

Hydro-Brake®

Design Head (m) 0.550 Hydro-Brake® Type Md3 Invert Level (m) 88.242
Design Flow (l/s) 8.0 Diameter (mm) 106

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.8	1.200	12.0	3.000	19.0	7.000	29.0
0.200	6.5	1.400	13.0	3.500	20.5	7.500	30.0
0.300	6.2	1.600	13.8	4.000	21.9	8.000	31.0
0.400	6.9	1.800	14.7	4.500	23.2	8.500	31.9
0.500	7.7	2.000	15.5	5.000	24.5	9.000	32.8
0.600	8.5	2.200	16.2	5.500	25.7	9.500	33.7
0.800	9.8	2.400	17.0	6.000	26.8		
1.000	10.9	2.600	17.6	6.500	27.9		

Hydro-Brake®

Design Head (m) 0.350 Hydro-Brake® Type Md7 Invert Level (m) 90.242
Design Flow (l/s) 10.0 Diameter (mm) 159

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.0	1.200	18.7	3.000	29.6	7.000	45.1
0.200	9.1	1.400	20.2	3.500	31.9	7.500	46.7
0.300	9.4	1.600	21.6	4.000	34.1	8.000	48.3
0.400	10.8	1.800	22.9	4.500	36.2	8.500	49.7
0.500	12.1	2.000	24.1	5.000	38.2	9.000	51.2
0.600	13.2	2.200	25.3	5.500	40.0	9.500	52.6
0.800	15.3	2.400	26.4	6.000	41.8		
1.000	17.1	2.600	27.5	6.500	43.5		

Hydro-Brake® Manhole: 65, DS/PN: 119.002, Volume (m³): 3.1

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 90.027
Hydro-Brake® Type Md6 SW Only

Hydro-Brake® Manhole: 65, DS/PN: 119.002, Volume (m³): 3.1

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.200	4.1	0.300	3.9	0.400	3.8

Hydro-Brake® Manhole: 65, DS/PN: 119.002, Volume (m³): 3.1

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.500	3.8	1.800	6.8	4.000	10.1	7.500	13.8
0.600	4.0	2.000	7.1	4.500	10.7	8.000	14.3
0.800	4.5	2.200	7.5	5.000	11.3	8.500	14.7
1.000	5.0	2.400	7.8	5.500	11.8	9.000	15.1
1.200	5.5	2.600	8.1	6.000	12.3	9.500	15.5
1.400	6.0	3.000	8.7	6.500	12.9		
1.600	6.4	3.500	9.4	7.000	13.3		

Hydro-Brake® Manhole: 75, DS/PN: 122.002, Volume (m³): 1.9

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 88.000
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 81, DS/PN: 124.002, Volume (m³): 2.7

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 86.567
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 91, DS/PN: 126.002, Volume (m³): 2.0

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 89.966
Hydro-Brake® Type Md6 SW Only

Hydro-Brake® Manhole: 91, DS/PN: 126.002, Volume (m³): 2.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.200	4.1	0.300	3.9	0.400	3.8

Hydro-Brake® Manhole: 91, DS/PN: 126.002, Volume (m³): 2.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.500	3.8	1.800	6.8	4.000	10.1	7.500	13.8
0.600	4.0	2.000	7.1	4.500	10.7	8.000	14.3
0.800	4.5	2.200	7.5	5.000	11.3	8.500	14.7
1.000	5.0	2.400	7.8	5.500	11.8	9.000	15.1
1.200	5.5	2.600	8.1	6.000	12.3	9.500	15.5
1.400	6.0	3.000	8.7	6.500	12.9		
1.600	6.4	3.500	9.4	7.000	13.3		

Hydro-Brake® Manhole: 106, DS/PN: 130.002, Volume (m³): 1.9

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 85.272
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 124, DS/PN: 134.002, Volume (m³): 4.7

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 88.257
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 130, DS/PN: 132.009, Volume (m³): 17.8

Design Head (m) 1.050 Diameter (mm) 218
Design Flow (l/s) 30.0 Invert Level (m) 86.374
Hydro-Brake® Type Md5 SW Only

Hydro-Brake® Manhole: 130, DS/PN: 132.009, Volume (m³): 17.8

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.8	0.200	18.6	0.300	25.2	0.400	27.6

Hydro-Brake® Manhole: 130, DS/PN: 132.009, Volume (m³): 17.8

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.500	27.8	1.800	38.4	4.000	57.2	7.500	78.3
0.600	27.5	2.000	40.5	4.500	60.7	8.000	80.9
0.800	27.9	2.200	42.4	5.000	64.0	8.500	83.4
1.000	29.5	2.400	44.3	5.500	67.1	9.000	85.8
1.200	31.7	2.600	46.1	6.000	70.1	9.500	88.2
1.400	34.0	3.000	49.5	6.500	72.9		
1.600	36.2	3.500	53.5	7.000	75.7		

Hydro-Brake® Manhole: 134, DS/PN: 137.001, Volume (m³): 8.1

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 84.788
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 132, DS/PN: 141.001, Volume (m³): 3.4

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 84.700
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Complex Manhole: 143, DS/PN: 117.009, Volume (m³): 111.0

Hydro-Brake®

Design Head (m) 0.500 Hydro-Brake® Type Md3 Invert Level (m) 83.200
Design Flow (l/s) 8.0 Diameter (mm) 108

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.9	1.200	12.4	3.000	19.7	7.000	30.1
0.200	6.8	1.400	13.4	3.500	21.3	7.500	31.1
0.300	6.4	1.600	14.4	4.000	22.7	8.000	32.1
0.400	7.2	1.800	15.2	4.500	24.1	8.500	33.1
0.500	8.0	2.000	16.1	5.000	25.4	9.000	34.1
0.600	8.8	2.200	16.9	5.500	26.6	9.500	35.0
0.800	10.2	2.400	17.6	6.000	27.8		
1.000	11.4	2.600	18.3	6.500	29.0		

Hydro-Brake®

Design Head (m) 0.500 Hydro-Brake® Type Md7 Invert Level (m) 83.800
Design Flow (l/s) 30.0 Diameter (mm) 251

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	1.200	46.6	3.000	73.6	7.000	112.5
0.200	17.8	1.400	50.3	3.500	79.5	7.500	116.4
0.300	27.6	1.600	53.8	4.000	85.0	8.000	120.3
0.400	28.7	1.800	57.0	4.500	90.2	8.500	124.0
0.500	30.1	2.000	60.1	5.000	95.1	9.000	127.6
0.600	32.9	2.200	63.1	5.500	99.7	9.500	131.1
0.800	38.0	2.400	65.9	6.000	104.2		
1.000	42.5	2.600	68.6	6.500	108.4		

Offline Controls for Area3_AS.sws

Weir Manhole: 55, DS/PN: 100.012, Loop to PN: 117.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 88.700

Storage Structures for Area3_AS.sws

Tank or Pond Manhole: 23, DS/PN: 101.002

Invert Level (m) 98.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	50.0	1.000	50.0

Tank or Pond Manhole: 15, DS/PN: 104.002

Invert Level (m) 97.305

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	50.0	1.000	50.0

Tank or Pond Manhole: 28, DS/PN: 107.002

Invert Level (m) 93.722

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.000	100.0

Tank or Pond Manhole: 43, DS/PN: 110.002

Invert Level (m) 91.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	115.0	1.000	115.0

Tank or Pond Manhole: 50, DS/PN: 113.002

Invert Level (m) 89.225

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.000	100.0

Tank or Pond Manhole: 55, DS/PN: 100.012

Invert Level (m) 88.242

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	28.0	0.750	149.0

Tank or Pond Manhole: 65, DS/PN: 119.002

Invert Level (m) 90.027

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	136.0	1.000	136.0

Tank or Pond Manhole: 74, DS/PN: 123.000

Invert Level (m) 88.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	50.0	0.450	164.0

Tank or Pond Manhole: 81, DS/PN: 124.002

Invert Level (m) 86.567

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	126.0	1.000	126.0

Tank or Pond Manhole: 91, DS/PN: 126.002

Invert Level (m) 89.966

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	105.0	1.000	105.0

Tank or Pond Manhole: 106, DS/PN: 130.002

Invert Level (m) 85.272

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	96.0	1.000	96.0

Tank or Pond Manhole: 124, DS/PN: 134.002

Invert Level (m) 88.257

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	102.0	1.000	102.0

Tank or Pond Manhole: 134, DS/PN: 137.001

Invert Level (m) 84.788

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	126.0	1.000	126.0

Tank or Pond Manhole: 132, DS/PN: 141.001

Invert Level (m) 84.700

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	60.0	1.000	60.0

Tank or Pond Manhole: 143, DS/PN: 117.009

Invert Level (m) 83.200

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1437.0	1.150	2128.0

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
100.000	15 Summer	1	0%					
101.000	15 Summer	1	0%					
101.001	15 Summer	1	0%	100/30 Winter				
102.000	15 Summer	1	0%	100/15 Summer				
101.002	30 Winter	1	0%	30/15 Summer				
101.003	30 Winter	1	0%					
100.001	15 Summer	1	0%	100/15 Summer				
103.000	15 Summer	1	0%	100/15 Summer				
103.001	15 Winter	1	0%	30/15 Summer				
100.002	15 Winter	1	0%	30/15 Summer				
104.000	15 Summer	1	0%	30/15 Winter				
104.001	15 Summer	1	0%	30/15 Summer				
105.000	15 Summer	1	0%	30/15 Summer				
104.002	60 Winter	1	0%	1/15 Summer				
104.003	120 Summer	1	0%	100/15 Winter				
100.003	15 Winter	1	0%	30/15 Summer				
100.004	15 Winter	1	0%	30/15 Summer				
106.000	15 Summer	1	0%					
106.001	30 Winter	1	0%					
100.005	15 Winter	1	0%					
107.000	15 Summer	1	0%	30/15 Summer				
107.001	15 Summer	1	0%	100/15 Summer				
108.000	15 Summer	1	0%					
107.002	120 Winter	1	0%	1/15 Winter				
107.003	120 Winter	1	0%					
109.000	15 Summer	1	0%	100/15 Summer				
109.001	15 Summer	1	0%	100/15 Summer				
107.004	15 Winter	1	0%	30/15 Summer				
100.006	15 Winter	1	0%					
100.007	15 Winter	1	0%	100/15 Summer				
110.000	15 Summer	1	0%	30/15 Summer				
110.001	30 Winter	1	0%	1/15 Winter				
111.000	15 Summer	1	0%	100/15 Summer				
110.002	30 Winter	1	0%	1/15 Summer				
112.000	15 Summer	1	0%					
112.001	60 Winter	1	0%					
112.002	15 Winter	1	0%					

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
112.003	60 Winter	1	0%					
112.004	15 Winter	1	0%					
112.005	120 Winter	1	0%	30/30 Winter				
112.006	15 Winter	1	0%					
110.003	15 Winter	1	0%					
100.008	15 Winter	1	0%	30/15 Winter				
113.000	15 Summer	1	0%	100/15 Summer				
113.001	15 Summer	1	0%	100/15 Summer				
114.000	15 Summer	1	0%	30/15 Summer				
113.002	120 Winter	1	0%	1/30 Winter				
113.003	120 Winter	1	0%	30/15 Winter				
115.000	15 Summer	1	0%					
113.004	120 Winter	1	0%	30/15 Summer				
100.009	120 Winter	1	0%	1/30 Winter				
116.000	15 Summer	1	0%	100/15 Summer				
100.010	60 Winter	1	0%	1/30 Winter				
100.011	60 Winter	1	0%	1/30 Winter				
100.012	120 Winter	1	0%	1/15 Summer		1/15 Summer	54	
100.013	60 Winter	1	0%					
100.014	120 Winter	1	0%					
117.000	120 Winter	1	0%					
118.000	15 Summer	1	0%					
118.001	15 Summer	1	0%	100/15 Summer				
119.000	15 Summer	1	0%					
119.001	15 Summer	1	0%	100/30 Winter				
120.000	15 Summer	1	0%					
119.002	120 Winter	1	0%	1/60 Winter				
119.003	120 Winter	1	0%					
118.002	15 Summer	1	0%	30/15 Summer				
121.000	15 Summer	1	0%					
121.001	15 Summer	1	0%					
118.003	15 Winter	1	0%	30/15 Summer				
122.000	15 Summer	1	0%	100/15 Summer				
122.001	15 Summer	1	0%	100/15 Summer				
123.000	15 Winter	1	0%	30/15 Winter				
122.002	15 Winter	1	0%	1/15 Summer				
118.004	15 Winter	1	0%	100/15 Summer				
117.001	15 Winter	1	0%					
124.000	15 Summer	1	0%	30/15 Summer				
124.001	15 Summer	1	0%	30/15 Summer				
125.000	15 Summer	1	0%	100/15 Summer				
124.002	120 Winter	1	0%	1/60 Winter				
124.003	120 Winter	1	0%					
117.002	120 Winter	1	0%					
117.003	120 Winter	1	0%					
126.000	15 Summer	1	0%					
126.001	15 Summer	1	0%	100/15 Summer				
127.000	15 Summer	1	0%					

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
127.001	15 Summer	1	0%	100/15 Summer				
126.002	120 Winter	1	0%	1/30 Winter				
128.000	15 Summer	1	0%					
126.003	15 Winter	1	0%					
126.004	60 Winter	1	0%					
129.000	15 Summer	1	0%					
129.001	15 Summer	1	0%					
126.005	15 Summer	1	0%					
117.004	15 Winter	1	0%	30/15 Summer				
117.005	15 Winter	1	0%	30/15 Summer				
117.006	15 Winter	1	0%					
130.000	15 Summer	1	0%					
130.001	15 Summer	1	0%	100/15 Summer				
131.000	15 Summer	1	0%					
131.001	15 Summer	1	0%					
130.002	60 Winter	1	0%	30/15 Summer				
130.003	60 Winter	1	0%					
117.007	120 Winter	1	0%					
132.000	15 Summer	1	0%					
132.001	60 Winter	1	0%					
132.002	15 Winter	1	0%					
132.003	120 Winter	1	0%					
132.004	15 Winter	1	0%					
132.005	120 Winter	1	0%					
132.006	15 Winter	1	0%					
132.007	15 Winter	1	0%					
133.000	15 Summer	1	0%					
132.008	15 Winter	1	0%					
134.000	15 Summer	1	0%	100/15 Summer				
134.001	15 Summer	1	0%	100/15 Summer				
135.000	15 Summer	1	0%					
134.002	60 Winter	1	0%	30/15 Summer				
134.003	60 Winter	1	0%					
136.000	60 Winter	1	0%					
134.004	15 Winter	1	0%					
132.009	15 Winter	1	0%	30/15 Summer				
137.000	15 Summer	1	0%					
138.000	15 Summer	1	0%					
137.001	120 Winter	1	0%	30/15 Summer				
132.010	15 Winter	1	0%					
117.008	15 Winter	1	0%					
139.000	15 Summer	1	0%					
140.000	15 Summer	1	0%					
140.001	15 Summer	1	0%					
141.000	15 Summer	1	0%					
142.000	15 Summer	1	0%					
141.001	60 Winter	1	0%	1/30 Winter				
141.002	60 Winter	1	0%					

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
140.002	15 Summer	1	0%					
139.001	15 Summer	1	0%					
117.009	1440 Winter	1	0%	1/360 Winter				
100.015	1440 Winter	1	0%					

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
100.000	23	97.951	-0.174	0.000	0.11	0.0	8.2	OK
101.000	23	99.133	-0.192	0.000	0.05	0.0	3.2	OK
101.001	23	98.847	-0.185	0.000	0.07	0.0	7.4	OK
102.000	23	98.744	-0.156	0.000	0.20	0.0	13.2	OK
101.002	23	98.445	-0.005	0.000	0.16	0.0	3.8	OK
101.003	23	98.183	-0.118	0.000	0.10	0.0	3.8	OK
100.001	23	97.071	-0.233	0.000	0.11	0.0	11.4	OK
103.000	23	98.050	-0.175	0.000	0.11	0.0	6.9	OK
103.001	23	97.455	-0.194	0.000	0.27	0.0	35.9	OK
100.002	23	96.884	-0.254	0.000	0.23	0.0	49.2	OK
104.000	12	97.818	-0.167	0.000	0.15	0.0	7.2	OK
104.001	13	97.699	-0.156	0.000	0.20	0.0	15.9	OK
105.000	14	97.766	-0.159	0.000	0.18	0.0	14.2	OK
104.002	15	97.541	0.086	0.000	0.27	0.0	4.1	SURCHARGED
104.003	19	97.277	-0.111	0.000	0.15	0.0	4.1	OK
100.003	20	96.642	-0.187	0.000	0.50	0.0	55.3	OK
100.004	21	96.535	-0.213	0.000	0.39	0.0	55.3	OK
106.000	22	97.782	-0.739	0.000	0.00	0.0	13.2	OK
106.001	21	96.075	-0.171	0.000	0.13	0.0	3.6	OK
100.005	25	96.024	-0.726	0.000	0.01	0.0	57.3	OK
107.000	25	94.916	-0.109	0.000	0.48	0.0	22.9	OK
107.001	26	94.485	-0.144	0.000	0.28	0.0	28.5	OK
108.000	27	95.067	-0.158	0.000	0.19	0.0	17.1	OK
107.002	28	93.926	0.054	0.000	0.10	0.0	4.1	SURCHARGED
107.003	31	93.329	-0.111	0.000	0.15	0.0	4.1	OK
109.000	32	93.369	-0.156	0.000	0.19	0.0	8.6	OK
109.001	33	93.058	-0.147	0.000	0.26	0.0	11.3	OK
107.004	34	92.895	-0.130	0.000	0.38	0.0	13.6	OK
100.006	35	92.687	-0.713	0.000	0.01	0.0	73.9	OK
100.007	36	89.447	-0.353	0.000	0.19	0.0	66.1	OK
110.000	37	91.783	-0.142	0.000	0.27	0.0	19.1	OK
110.001	38	91.112	0.017	0.000	0.20	0.0	16.5	SURCHARGED
111.000	39	91.751	-0.164	0.000	0.16	0.0	16.3	OK
110.002	43	91.109	0.459	0.000	0.11	0.0	4.1	SURCHARGED
112.000	44	98.657	-0.743	0.000	0.00	0.0	7.5	OK
112.001	41	96.688	-0.112	0.000	0.15	0.0	1.3	OK
112.002	42	96.635	-0.745	0.000	0.00	0.0	5.0	OK
112.003	43	94.843	-0.107	0.000	0.18	0.0	1.9	OK
112.004	44	94.772	-0.748	0.000	0.00	0.0	3.6	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
112.005	45	91.513	-0.087	0.000	0.06	0.0	1.6	OK
112.006	46	90.989	-0.189	0.000	0.06	0.0	4.9	OK
110.003	45	89.602	-0.243	0.000	0.08	0.0	10.5	OK
100.008	46	89.178	-0.367	0.000	0.16	0.0	75.6	OK
113.000	47	90.917	-0.144	0.000	0.27	0.0	18.4	OK
113.001	48	90.272	-0.141	0.000	0.29	0.0	24.4	OK
114.000	49	89.410	-0.128	0.000	0.36	0.0	12.0	OK
113.002	50	89.387	0.012	0.000	0.25	0.0	3.7	SURCHARGED
113.003	52	89.215	-0.102	0.000	0.22	0.0	3.7	OK
115.000	53	90.052	-0.173	0.000	0.11	0.0	7.9	OK
113.004	54	89.149	-0.002	0.000	0.05	0.0	5.6	OK
100.009	55	89.137	0.062	0.000	0.19	0.0	45.0	SURCHARGED
116.000	56	89.062	-0.163	0.000	0.16	0.0	7.6	OK
100.010	57	89.021	0.063	0.000	0.26	0.0	57.2	SURCHARGED
100.011	54	88.914	0.034	0.000	0.21	0.0	53.0	SURCHARGED
100.012	55	88.787	0.320	0.000	0.22	37.8	8.1	FLOOD RISK
100.013	56	88.174	-0.746	0.000	0.00	0.0	8.1	OK
100.014	57	85.039	-0.745	0.000	0.00	0.0	8.1	OK
117.000	59	88.279	-0.721	0.000	0.01	0.0	39.5	OK
118.000	60	92.593	-0.257	0.000	0.05	0.0	11.3	OK
118.001	61	89.076	-0.221	0.000	0.15	0.0	15.7	OK
119.000	62	91.139	-0.230	0.000	0.12	0.0	17.9	OK
119.001	63	90.493	-0.220	0.000	0.15	0.0	23.0	OK
120.000	64	91.062	-0.238	0.000	0.09	0.0	22.9	OK
119.002	65	90.190	0.013	0.000	0.26	0.0	4.0	SURCHARGED
119.003	67	89.998	-0.120	0.000	0.09	0.0	4.0	OK
118.002	68	88.594	-0.203	0.000	0.23	0.0	17.1	OK
121.000	69	92.043	-0.182	0.000	0.08	0.0	7.7	OK
121.001	70	90.784	-0.187	0.000	0.06	0.0	9.2	OK
118.003	71	88.525	-0.186	0.000	0.30	0.0	32.5	OK
122.000	72	88.773	-0.152	0.000	0.22	0.0	10.4	OK
122.001	73	88.562	-0.146	0.000	0.26	0.0	15.5	OK
123.000	74	88.112	-0.163	0.000	0.08	0.0	2.5	OK
122.002	75	88.288	0.138	0.000	0.25	0.0	4.1	SURCHARGED
118.004	76	87.833	-0.232	0.000	0.31	0.0	36.4	OK
117.001	77	87.538	-0.712	0.000	0.01	0.0	53.0	OK
124.000	78	87.451	-0.124	0.000	0.39	0.0	19.6	OK
124.001	79	86.988	-0.137	0.000	0.32	0.0	24.0	OK
125.000	80	87.380	-0.145	0.000	0.27	0.0	20.7	OK
124.002	81	86.730	0.013	0.000	0.17	0.0	4.0	SURCHARGED
124.003	83	86.488	-0.087	0.000	0.37	0.0	4.0	OK
117.002	84	86.293	-0.707	0.000	0.01	0.0	57.6	OK
117.003	85	85.855	-0.395	0.000	0.10	0.0	57.8	OK
126.000	86	91.862	-0.163	0.000	0.16	0.0	17.7	OK
126.001	87	90.434	-0.140	0.000	0.29	0.0	20.7	OK
127.000	88	91.958	-0.167	0.000	0.15	0.0	16.0	OK
127.001	89	90.414	-0.151	0.000	0.22	0.0	18.8	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
126.002	91	90.140	0.024	0.000	0.14	0.0	4.0	SURCHARGED
128.000	92	89.503	-0.747	0.000	0.00	0.0	2.8	OK
126.003	93	89.114	-0.736	0.000	0.01	0.0	6.1	OK
126.004	94	88.962	-0.263	0.000	0.04	0.0	5.1	OK
129.000	95	92.340	-0.185	0.000	0.07	0.0	7.9	OK
129.001	96	90.495	-0.179	0.000	0.09	0.0	10.9	OK
126.005	97	88.661	-0.239	0.000	0.09	0.0	18.5	OK
117.004	98	85.167	-0.308	0.000	0.31	0.0	68.9	OK
117.005	99	85.069	-0.306	0.000	0.32	0.0	68.7	OK
117.006	100	84.894	-0.681	0.000	0.02	0.0	70.0	OK
130.000	101	87.558	-0.167	0.000	0.14	0.0	14.3	OK
130.001	102	85.747	-0.154	0.000	0.21	0.0	18.7	OK
131.000	103	87.048	-0.177	0.000	0.10	0.0	9.3	OK
131.001	104	86.335	-0.178	0.000	0.09	0.0	11.1	OK
130.002	106	85.411	-0.010	0.000	0.23	0.0	3.7	OK
130.003	108	85.010	-0.116	0.000	0.12	0.0	3.7	OK
117.007	110	84.523	-0.627	0.000	0.14	0.0	70.8	OK
132.000	111	93.572	-0.728	0.000	0.00	0.0	8.8	OK
132.001	112	93.400	-0.189	0.000	0.06	0.0	1.4	OK
132.002	113	93.355	-0.736	0.000	0.00	0.0	5.1	OK
132.003	114	93.232	-0.180	0.000	0.09	0.0	2.1	OK
132.004	115	93.180	-0.738	0.000	0.00	0.0	3.6	OK
132.005	116	93.110	-0.103	0.000	0.21	0.0	2.3	OK
132.006	117	93.049	-0.267	0.000	0.03	0.0	7.1	OK
132.007	118	90.085	-0.262	0.000	0.04	0.0	11.0	OK
133.000	119	87.815	-1.035	0.000	0.00	0.0	9.8	OK
132.008	120	86.694	-0.985	0.000	0.01	0.0	20.2	OK
134.000	121	89.320	-0.149	0.000	0.23	0.0	14.9	OK
134.001	122	88.596	-0.223	0.000	0.14	0.0	18.4	OK
135.000	123	89.359	-0.241	0.000	0.08	0.0	17.6	OK
134.002	124	88.405	-0.002	0.000	0.24	0.0	3.9	OK
134.003	126	88.169	-0.113	0.000	0.14	0.0	3.9	OK
136.000	128	86.858	-1.050	0.000	0.00	0.0	0.0	OK
134.004	129	86.680	-0.920	0.000	0.00	0.0	5.5	OK
132.009	130	86.680	-0.069	0.000	0.08	0.0	25.4	OK
137.000	131	86.666	-0.234	0.000	0.11	0.0	21.5	OK
138.000	133	86.759	-0.241	0.000	0.08	0.0	17.4	OK
137.001	134	84.922	-0.166	0.000	0.03	0.0	3.6	OK
132.010	137	84.567	-0.248	0.000	0.25	0.0	28.2	OK
117.008	138	84.393	-0.657	0.000	0.09	0.0	96.8	OK
139.000	139	88.094	-0.256	0.000	0.05	0.0	11.3	OK
140.000	140	85.851	-0.174	0.000	0.11	0.0	10.6	OK
140.001	141	84.582	-0.218	0.000	0.16	0.0	15.4	OK
141.000	130	86.064	-0.161	0.000	0.18	0.0	16.9	OK
142.000	131	85.844	-0.181	0.000	0.08	0.0	9.1	OK
141.001	132	84.855	0.005	0.000	0.31	0.0	3.3	SURCHARGED
141.002	133	84.713	-0.107	0.000	0.18	0.0	3.3	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
140.002	130	84.362	-0.206	0.000	0.21	0.0	18.4	OK
139.001	142	84.238	-0.212	0.000	0.19	0.0	29.7	OK
117.009	143	83.684	0.109	0.000	0.09	0.0	7.9	SURCHARGED
100.015	143	83.177	-0.743	0.000	0.01	0.0	15.1	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
100.000	15 Summer	30	0%					
101.000	15 Summer	30	0%					
101.001	15 Summer	30	0%	100/30 Winter				
102.000	60 Winter	30	0%	100/15 Summer				
101.002	60 Winter	30	0%	30/15 Summer				
101.003	480 Winter	30	0%					
100.001	15 Summer	30	0%	100/15 Summer				
103.000	15 Summer	30	0%	100/15 Summer				
103.001	15 Summer	30	0%	30/15 Summer				
100.002	15 Summer	30	0%	30/15 Summer				
104.000	60 Winter	30	0%	30/15 Winter				
104.001	60 Winter	30	0%	30/15 Summer				
105.000	60 Winter	30	0%	30/15 Summer				
104.002	60 Winter	30	0%	1/15 Summer				
104.003	60 Winter	30	0%	100/15 Winter				
100.003	15 Summer	30	0%	30/15 Summer				
100.004	15 Winter	30	0%	30/15 Summer				
106.000	15 Summer	30	0%					
106.001	15 Winter	30	0%					
100.005	15 Winter	30	0%					
107.000	15 Summer	30	0%	30/15 Summer				
107.001	15 Summer	30	0%	100/15 Summer				
108.000	15 Summer	30	0%					
107.002	120 Winter	30	0%	1/15 Winter				
107.003	120 Winter	30	0%					
109.000	15 Summer	30	0%	100/15 Summer				
109.001	15 Summer	30	0%	100/15 Summer				
107.004	15 Summer	30	0%	30/15 Summer				
100.006	15 Winter	30	0%					
100.007	15 Winter	30	0%	100/15 Summer				
110.000	15 Summer	30	0%	30/15 Summer				
110.001	15 Winter	30	0%	1/15 Winter				
111.000	15 Summer	30	0%	100/15 Summer				
110.002	60 Winter	30	0%	1/15 Summer				
112.000	15 Summer	30	0%					
112.001	15 Winter	30	0%					
112.002	15 Winter	30	0%					

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
112.003	30 Winter	30	0%					
112.004	15 Winter	30	0%					
112.005	60 Winter	30	0%	30/30 Winter				
112.006	15 Winter	30	0%					
110.003	15 Winter	30	0%					
100.008	15 Winter	30	0%	30/15 Winter				
113.000	15 Summer	30	0%	100/15 Summer				
113.001	15 Summer	30	0%	100/15 Summer				
114.000	120 Winter	30	0%	30/15 Summer				
113.002	120 Winter	30	0%	1/30 Winter				
113.003	15 Winter	30	0%	30/15 Winter				
115.000	15 Summer	30	0%					
113.004	15 Winter	30	0%	30/15 Summer				
100.009	15 Winter	30	0%	1/30 Winter				
116.000	15 Winter	30	0%	100/15 Summer				
100.010	15 Winter	30	0%	1/30 Winter				
100.011	15 Winter	30	0%	1/30 Winter				
100.012	15 Winter	30	0%	1/15 Summer		1/15 Summer	54	
100.013	15 Winter	30	0%					
100.014	15 Winter	30	0%					
117.000	15 Winter	30	0%					
118.000	15 Summer	30	0%					
118.001	15 Summer	30	0%	100/15 Summer				
119.000	15 Summer	30	0%					
119.001	15 Summer	30	0%	100/30 Winter				
120.000	15 Summer	30	0%					
119.002	120 Winter	30	0%	1/60 Winter				
119.003	15 Winter	30	0%					
118.002	15 Summer	30	0%	30/15 Summer				
121.000	15 Summer	30	0%					
121.001	15 Summer	30	0%					
118.003	15 Summer	30	0%	30/15 Summer				
122.000	15 Summer	30	0%	100/15 Summer				
122.001	15 Summer	30	0%	100/15 Summer				
123.000	30 Winter	30	0%	30/15 Winter				
122.002	15 Summer	30	0%	1/15 Summer				
118.004	15 Summer	30	0%	100/15 Summer				
117.001	30 Winter	30	0%					
124.000	15 Summer	30	0%	30/15 Summer				
124.001	15 Winter	30	0%	30/15 Summer				
125.000	15 Summer	30	0%	100/15 Summer				
124.002	120 Winter	30	0%	1/60 Winter				
124.003	960 Summer	30	0%					
117.002	30 Winter	30	0%					
117.003	30 Winter	30	0%					
126.000	15 Summer	30	0%					
126.001	120 Winter	30	0%	100/15 Summer				
127.000	15 Summer	30	0%					

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
127.001	120 Winter	30	0%	100/15 Summer				
126.002	120 Winter	30	0%	1/30 Winter				
128.000	15 Summer	30	0%					
126.003	15 Winter	30	0%					
126.004	15 Winter	30	0%					
129.000	15 Summer	30	0%					
129.001	15 Summer	30	0%					
126.005	15 Summer	30	0%					
117.004	30 Winter	30	0%	30/15 Summer				
117.005	30 Winter	30	0%	30/15 Summer				
117.006	30 Winter	30	0%					
130.000	15 Summer	30	0%					
130.001	15 Summer	30	0%	100/15 Summer				
131.000	15 Summer	30	0%					
131.001	15 Summer	30	0%					
130.002	60 Winter	30	0%	30/15 Summer				
130.003	360 Summer	30	0%					
117.007	30 Winter	30	0%					
132.000	15 Summer	30	0%					
132.001	15 Winter	30	0%					
132.002	15 Winter	30	0%					
132.003	30 Winter	30	0%					
132.004	60 Winter	30	0%					
132.005	60 Winter	30	0%					
132.006	15 Winter	30	0%					
132.007	15 Winter	30	0%					
133.000	15 Summer	30	0%					
132.008	15 Winter	30	0%					
134.000	15 Summer	30	0%	100/15 Summer				
134.001	120 Winter	30	0%	100/15 Summer				
135.000	15 Summer	30	0%					
134.002	120 Winter	30	0%	30/15 Summer				
134.003	360 Summer	30	0%					
136.000	15 Winter	30	0%					
134.004	15 Winter	30	0%					
132.009	15 Winter	30	0%	30/15 Summer				
137.000	15 Summer	30	0%					
138.000	15 Summer	30	0%					
137.001	120 Winter	30	0%	30/15 Summer				
132.010	30 Winter	30	0%					
117.008	30 Winter	30	0%					
139.000	15 Summer	30	0%					
140.000	15 Summer	30	0%					
140.001	15 Summer	30	0%					
141.000	15 Summer	30	0%					
142.000	15 Summer	30	0%					
141.001	60 Winter	30	0%	1/30 Winter				
141.002	60 Summer	30	0%					

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
140.002	15 Summer	30	0%					
139.001	15 Summer	30	0%					
117.009	960 Winter	30	0%	1/360 Winter				
100.015	960 Winter	30	0%					

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
100.000	23	97.996	-0.129	0.000	0.36	0.0	26.1	OK
101.000	23	99.162	-0.163	0.000	0.16	0.0	10.0	OK
101.001	23	98.888	-0.144	0.000	0.28	0.0	27.6	OK
102.000	23	98.823	-0.077	0.000	0.23	0.0	14.9	OK
101.002	23	98.818	0.368	0.000	0.17	0.0	4.0	SURCHARGED
101.003	23	98.184	-0.117	0.000	0.11	0.0	4.1	OK
100.001	23	97.241	-0.063	0.000	0.34	0.0	34.8	OK
103.000	23	98.092	-0.133	0.000	0.34	0.0	21.6	OK
103.001	23	97.718	0.069	0.000	1.01	0.0	132.7	SURCHARGED
100.002	23	97.202	0.064	0.000	0.77	0.0	166.3	SURCHARGED
104.000	12	98.126	0.141	0.000	0.16	0.0	8.0	SURCHARGED
104.001	13	98.125	0.270	0.000	0.27	0.0	21.4	SURCHARGED
105.000	14	98.124	0.199	0.000	0.20	0.0	15.5	SURCHARGED
104.002	15	98.120	0.665	0.000	0.30	0.0	4.6	SURCHARGED
104.003	19	97.279	-0.109	0.000	0.17	0.0	4.6	OK
100.003	20	97.013	0.184	0.000	1.60	0.0	178.8	SURCHARGED
100.004	21	96.803	0.055	0.000	1.25	0.0	178.4	SURCHARGED
106.000	22	97.805	-0.716	0.000	0.01	0.0	41.5	OK
106.001	21	96.151	-0.095	0.000	0.63	0.0	17.3	OK
100.005	25	96.077	-0.672	0.000	0.02	0.0	194.0	OK
107.000	25	95.549	0.524	0.000	1.46	0.0	68.9	SURCHARGED
107.001	26	94.570	-0.059	0.000	0.87	0.0	89.8	OK
108.000	27	95.126	-0.099	0.000	0.59	0.0	54.3	OK
107.002	28	94.422	0.550	0.000	0.11	0.0	4.3	SURCHARGED
107.003	31	93.330	-0.110	0.000	0.16	0.0	4.3	OK
109.000	32	93.432	-0.093	0.000	0.60	0.0	26.9	OK
109.001	33	93.165	-0.040	0.000	0.85	0.0	36.9	OK
107.004	34	93.040	0.015	0.000	1.09	0.0	39.2	SURCHARGED
100.006	35	92.743	-0.657	0.000	0.02	0.0	249.5	OK
100.007	36	89.602	-0.198	0.000	0.68	0.0	237.4	OK
110.000	37	92.040	0.115	0.000	0.81	0.0	56.8	SURCHARGED
110.001	38	91.536	0.441	0.000	0.88	0.0	74.1	SURCHARGED
111.000	39	91.805	-0.110	0.000	0.51	0.0	51.7	OK
110.002	43	91.469	0.819	0.000	0.14	0.0	5.0	SURCHARGED
112.000	44	98.672	-0.728	0.000	0.01	0.0	23.5	OK
112.001	41	96.741	-0.059	0.000	0.68	0.0	5.9	OK
112.002	42	96.648	-0.732	0.000	0.01	0.0	19.7	OK
112.003	43	94.899	-0.051	0.000	0.77	0.0	8.1	OK
112.004	44	94.779	-0.741	0.000	0.01	0.0	15.0	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
112.005	45	91.626	0.026	0.000	0.18	0.0	4.7	SURCHARGED
112.006	46	91.028	-0.150	0.000	0.24	0.0	19.8	OK
110.003	45	89.644	-0.201	0.000	0.24	0.0	30.4	OK
100.008	46	89.549	0.004	0.000	0.52	0.0	247.6	SURCHARGED
113.000	47	91.000	-0.061	0.000	0.84	0.0	58.1	OK
113.001	48	90.381	-0.032	0.000	0.99	0.0	83.4	OK
114.000	49	89.770	0.232	0.000	0.23	0.0	7.8	SURCHARGED
113.002	50	89.767	0.392	0.000	0.27	0.0	4.1	SURCHARGED
113.003	52	89.359	0.042	0.000	0.28	0.0	4.6	SURCHARGED
115.000	53	90.096	-0.129	0.000	0.35	0.0	24.4	OK
113.004	54	89.345	0.194	0.000	0.29	0.0	32.4	SURCHARGED
100.009	55	89.335	0.260	0.000	1.06	0.0	253.2	SURCHARGED
116.000	56	89.218	-0.007	0.000	0.48	0.0	23.1	OK
100.010	57	89.205	0.247	0.000	1.19	0.0	261.3	SURCHARGED
100.011	54	89.077	0.197	0.000	1.01	0.0	261.3	FLOOD RISK
100.012	55	88.953	0.486	0.000	0.26	216.6	9.2	FLOOD RISK
100.013	56	88.175	-0.745	0.000	0.00	0.0	9.2	OK
100.014	57	85.039	-0.745	0.000	0.00	0.0	9.2	OK
117.000	59	88.355	-0.645	0.000	0.04	0.0	219.5	OK
118.000	60	92.629	-0.221	0.000	0.15	0.0	35.8	OK
118.001	61	89.154	-0.143	0.000	0.52	0.0	53.2	OK
119.000	62	91.200	-0.169	0.000	0.38	0.0	56.8	OK
119.001	63	90.572	-0.141	0.000	0.52	0.0	78.7	OK
120.000	64	91.112	-0.188	0.000	0.29	0.0	72.5	OK
119.002	65	90.559	0.382	0.000	0.27	0.0	4.1	SURCHARGED
119.003	67	89.999	-0.119	0.000	0.09	0.0	4.1	OK
118.002	68	88.831	0.034	0.000	0.73	0.0	53.4	SURCHARGED
121.000	69	92.077	-0.148	0.000	0.25	0.0	24.5	OK
121.001	70	90.818	-0.153	0.000	0.21	0.0	31.0	OK
118.003	71	88.737	0.026	0.000	1.01	0.0	108.0	SURCHARGED
122.000	72	88.844	-0.081	0.000	0.70	0.0	33.0	OK
122.001	73	88.696	-0.012	0.000	0.88	0.0	51.8	OK
123.000	74	88.280	0.005	0.000	0.13	0.0	4.0	SURCHARGED
122.002	75	88.378	0.228	0.000	0.25	0.0	4.1	SURCHARGED
118.004	76	87.982	-0.083	0.000	0.96	0.0	111.0	OK
117.001	77	87.616	-0.634	0.000	0.04	0.0	269.2	OK
124.000	78	87.798	0.223	0.000	1.19	0.0	60.4	SURCHARGED
124.001	79	87.136	0.011	0.000	0.95	0.0	71.3	SURCHARGED
125.000	80	87.462	-0.063	0.000	0.84	0.0	65.4	OK
124.002	81	87.105	0.388	0.000	0.17	0.0	4.1	SURCHARGED
124.003	83	86.489	-0.086	0.000	0.38	0.0	4.1	OK
117.002	84	86.373	-0.627	0.000	0.07	0.0	278.0	OK
117.003	85	85.989	-0.261	0.000	0.47	0.0	275.7	OK
126.000	86	91.916	-0.109	0.000	0.51	0.0	56.0	OK
126.001	87	90.558	-0.016	0.000	0.21	0.0	15.2	OK
127.000	88	92.009	-0.116	0.000	0.46	0.0	50.5	OK
127.001	89	90.557	-0.009	0.000	0.16	0.0	14.0	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
126.002	91	90.554	0.438	0.000	0.14	0.0	4.1	SURCHARGED
128.000	92	89.510	-0.740	0.000	0.01	0.0	9.0	OK
126.003	93	89.138	-0.712	0.000	0.03	0.0	16.9	OK
126.004	94	88.982	-0.243	0.000	0.08	0.0	11.7	OK
129.000	95	92.373	-0.152	0.000	0.23	0.0	25.1	OK
129.001	96	90.537	-0.137	0.000	0.31	0.0	37.7	OK
126.005	97	88.720	-0.180	0.000	0.33	0.0	66.7	OK
117.004	98	85.690	0.215	0.000	1.40	0.0	307.3	SURCHARGED
117.005	99	85.494	0.119	0.000	1.43	0.0	307.0	SURCHARGED
117.006	100	84.980	-0.595	0.000	0.08	0.0	311.1	OK
130.000	101	87.609	-0.116	0.000	0.45	0.0	45.2	OK
130.001	102	85.821	-0.080	0.000	0.71	0.0	63.5	OK
131.000	103	87.088	-0.137	0.000	0.32	0.0	29.5	OK
131.001	104	86.378	-0.135	0.000	0.32	0.0	37.3	OK
130.002	106	85.740	0.318	0.000	0.24	0.0	4.0	SURCHARGED
130.003	108	85.011	-0.115	0.000	0.12	0.0	4.0	OK
117.007	110	84.817	-0.332	0.000	0.59	0.0	301.7	OK
132.000	111	93.620	-0.680	0.000	0.01	0.0	27.7	OK
132.001	112	93.449	-0.140	0.000	0.31	0.0	7.1	OK
132.002	113	93.391	-0.700	0.000	0.01	0.0	17.9	OK
132.003	114	93.284	-0.128	0.000	0.39	0.0	9.0	OK
132.004	115	93.212	-0.706	0.000	0.00	0.0	9.7	OK
132.005	116	93.163	-0.050	0.000	0.78	0.0	8.6	OK
132.006	117	93.082	-0.234	0.000	0.11	0.0	28.1	OK
132.007	118	90.125	-0.222	0.000	0.15	0.0	43.7	OK
133.000	119	87.831	-1.019	0.000	0.01	0.0	20.0	OK
132.008	120	87.156	-0.523	0.000	0.03	0.0	46.5	OK
134.000	121	89.395	-0.074	0.000	0.73	0.0	46.8	OK
134.001	122	88.751	-0.068	0.000	0.10	0.0	13.2	OK
135.000	123	89.406	-0.194	0.000	0.27	0.0	55.8	OK
134.002	124	88.750	0.343	0.000	0.25	0.0	4.1	SURCHARGED
134.003	126	88.170	-0.112	0.000	0.14	0.0	4.1	OK
136.000	128	87.155	-0.753	0.000	0.00	0.0	0.6	OK
134.004	129	87.156	-0.444	0.000	0.01	0.0	11.0	OK
132.009	130	87.156	0.407	0.000	0.09	0.0	27.9	SURCHARGED
137.000	131	86.722	-0.178	0.000	0.33	0.0	67.7	OK
138.000	133	86.806	-0.194	0.000	0.26	0.0	55.2	OK
137.001	134	85.218	0.130	0.000	0.04	0.0	4.0	SURCHARGED
132.010	137	84.593	-0.222	0.000	0.28	0.0	31.7	OK
117.008	138	84.541	-0.509	0.000	0.30	0.0	333.8	OK
139.000	139	88.131	-0.219	0.000	0.15	0.0	35.7	OK
140.000	140	85.894	-0.131	0.000	0.35	0.0	33.4	OK
140.001	141	84.667	-0.133	0.000	0.57	0.0	53.6	OK
141.000	130	86.122	-0.103	0.000	0.56	0.0	53.4	OK
142.000	131	85.879	-0.146	0.000	0.26	0.0	28.9	OK
141.001	132	85.223	0.373	0.000	0.38	0.0	4.1	SURCHARGED
141.002	133	84.718	-0.102	0.000	0.22	0.0	4.1	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
140.002	130	84.462	-0.106	0.000	0.74	0.0	63.5	OK
139.001	142	84.324	-0.126	0.000	0.63	0.0	99.3	OK
117.009	143	84.086	0.511	0.000	0.42	0.0	37.3	SURCHARGED
100.015	143	83.192	-0.728	0.000	0.02	0.0	45.0	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
100.000	15 Summer	100	0%					
101.000	15 Summer	100	0%					
101.001	60 Winter	100	0%	100/30 Winter				
102.000	60 Winter	100	0%	100/15 Summer				
101.002	60 Winter	100	0%	30/15 Summer				
101.003	60 Winter	100	0%					
100.001	15 Winter	100	0%	100/15 Summer				
103.000	15 Winter	100	0%	100/15 Summer				
103.001	15 Winter	100	0%	30/15 Summer				
100.002	15 Winter	100	0%	30/15 Summer				
104.000	60 Winter	100	0%	30/15 Winter				
104.001	60 Winter	100	0%	30/15 Summer				
105.000	60 Winter	100	0%	30/15 Summer				
104.002	60 Winter	100	0%	1/15 Summer				
104.003	15 Winter	100	0%	100/15 Winter				
100.003	15 Winter	100	0%	30/15 Summer				
100.004	15 Winter	100	0%	30/15 Summer				
106.000	15 Summer	100	0%					
106.001	15 Winter	100	0%					
100.005	15 Winter	100	0%					
107.000	15 Summer	100	0%	30/15 Summer				
107.001	15 Winter	100	0%	100/15 Summer				
108.000	15 Summer	100	0%					
107.002	120 Winter	100	0%	1/15 Winter				
107.003	120 Winter	100	0%					
109.000	15 Summer	100	0%	100/15 Summer				
109.001	15 Summer	100	0%	100/15 Summer				
107.004	15 Winter	100	0%	30/15 Summer				
100.006	15 Winter	100	0%					
100.007	15 Winter	100	0%	100/15 Summer				
110.000	15 Summer	100	0%	30/15 Summer				
110.001	15 Winter	100	0%	1/15 Winter				
111.000	15 Summer	100	0%	100/15 Summer				
110.002	60 Winter	100	0%	1/15 Summer				
112.000	15 Summer	100	0%					
112.001	15 Winter	100	0%					
112.002	15 Winter	100	0%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
112.003	30 Winter	100	0%					
112.004	15 Winter	100	0%					
112.005	120 Winter	100	0%	30/30 Winter				
112.006	15 Winter	100	0%					
110.003	15 Winter	100	0%					
100.008	15 Winter	100	0%	30/15 Winter				
113.000	15 Summer	100	0%	100/15 Summer				
113.001	15 Summer	100	0%	100/15 Summer				
114.000	120 Winter	100	0%	30/15 Summer				
113.002	120 Winter	100	0%	1/30 Winter				
113.003	15 Winter	100	0%	30/15 Winter				
115.000	15 Summer	100	0%					
113.004	15 Winter	100	0%	30/15 Summer				
100.009	15 Winter	100	0%	1/30 Winter				
116.000	15 Winter	100	0%	100/15 Summer				
100.010	15 Winter	100	0%	1/30 Winter				
100.011	15 Winter	100	0%	1/30 Winter				
100.012	15 Winter	100	0%	1/15 Summer		1/15 Summer	54	
100.013	15 Winter	100	0%					
100.014	15 Winter	100	0%					
117.000	15 Winter	100	0%					
118.000	15 Summer	100	0%					
118.001	15 Winter	100	0%	100/15 Summer				
119.000	15 Summer	100	0%					
119.001	120 Winter	100	0%	100/30 Winter				
120.000	15 Summer	100	0%					
119.002	120 Winter	100	0%	1/60 Winter				
119.003	120 Winter	100	0%					
118.002	15 Summer	100	0%	30/15 Summer				
121.000	15 Summer	100	0%					
121.001	15 Summer	100	0%					
118.003	15 Summer	100	0%	30/15 Summer				
122.000	15 Summer	100	0%	100/15 Summer				
122.001	15 Summer	100	0%	100/15 Summer				
123.000	30 Winter	100	0%	30/15 Winter				
122.002	15 Summer	100	0%	1/15 Summer				
118.004	15 Winter	100	0%	100/15 Summer				
117.001	15 Winter	100	0%					
124.000	15 Summer	100	0%	30/15 Summer				
124.001	15 Winter	100	0%	30/15 Summer				
125.000	15 Summer	100	0%	100/15 Summer				
124.002	120 Winter	100	0%	1/60 Winter				
124.003	120 Winter	100	0%					
117.002	15 Winter	100	0%					
117.003	30 Winter	100	0%					
126.000	15 Summer	100	0%					
126.001	15 Winter	100	0%	100/15 Summer				
127.000	15 Summer	100	0%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
127.001	120 Winter	100	0%	100/15 Summer				
126.002	120 Winter	100	0%	1/30 Winter				
128.000	15 Summer	100	0%					
126.003	15 Winter	100	0%					
126.004	15 Winter	100	0%					
129.000	15 Summer	100	0%					
129.001	15 Summer	100	0%					
126.005	15 Summer	100	0%					
117.004	30 Winter	100	0%	30/15 Summer				
117.005	30 Winter	100	0%	30/15 Summer				
117.006	30 Winter	100	0%					
130.000	15 Summer	100	0%					
130.001	15 Winter	100	0%	100/15 Summer				
131.000	15 Summer	100	0%					
131.001	15 Summer	100	0%					
130.002	120 Winter	100	0%	30/15 Summer				
130.003	120 Winter	100	0%					
117.007	30 Winter	100	0%					
132.000	15 Summer	100	0%					
132.001	15 Winter	100	0%					
132.002	15 Winter	100	0%					
132.003	30 Winter	100	0%					
132.004	60 Winter	100	0%					
132.005	60 Winter	100	0%					
132.006	15 Winter	100	0%					
132.007	15 Winter	100	0%					
133.000	15 Summer	100	0%					
132.008	15 Winter	100	0%					
134.000	15 Summer	100	0%	100/15 Summer				
134.001	120 Winter	100	0%	100/15 Summer				
135.000	15 Summer	100	0%					
134.002	120 Winter	100	0%	30/15 Summer				
134.003	120 Winter	100	0%					
136.000	15 Winter	100	0%					
134.004	15 Winter	100	0%					
132.009	15 Winter	100	0%	30/15 Summer				
137.000	15 Summer	100	0%					
138.000	15 Summer	100	0%					
137.001	120 Winter	100	0%	30/15 Summer				
132.010	30 Winter	100	0%					
117.008	30 Winter	100	0%					
139.000	15 Summer	100	0%					
140.000	15 Summer	100	0%					
140.001	15 Summer	100	0%					
141.000	15 Summer	100	0%					
142.000	15 Summer	100	0%					
141.001	60 Winter	100	0%	1/30 Winter				
141.002	60 Winter	100	0%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
140.002	15 Summer	100	0%					
139.001	15 Summer	100	0%					
117.009	960 Winter	100	0%	1/360 Winter				
100.015	960 Winter	100	0%					

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
100.000	23	98.022	-0.103	0.000	0.54	0.0	39.3	OK
101.000	23	99.177	-0.148	0.000	0.25	0.0	15.1	OK
101.001	23	99.092	0.060	0.000	0.16	0.0	15.8	SURCHARGED
102.000	23	99.097	0.197	0.000	0.32	0.0	20.8	SURCHARGED
101.002	23	99.090	0.640	0.000	0.19	0.0	4.5	SURCHARGED
101.003	23	98.185	-0.116	0.000	0.12	0.0	4.5	OK
100.001	23	97.859	0.555	0.000	0.38	0.0	38.9	SURCHARGED
103.000	23	98.770	0.545	0.000	0.41	0.0	26.5	SURCHARGED
103.001	23	98.699	1.050	0.000	1.37	0.0	180.6	SURCHARGED
100.002	23	97.720	0.582	0.000	1.06	0.0	230.6	SURCHARGED
104.000	12	98.540	0.555	0.000	0.21	0.0	10.4	SURCHARGED
104.001	13	98.538	0.683	0.000	0.38	0.0	30.1	SURCHARGED
105.000	14	98.537	0.612	0.000	0.28	0.0	21.3	SURCHARGED
104.002	15	98.531	1.076	0.000	0.37	0.0	5.6	SURCHARGED
104.003	19	97.402	0.014	0.000	0.25	0.0	6.7	SURCHARGED
100.003	20	97.378	0.549	0.000	2.17	0.0	241.8	SURCHARGED
100.004	21	96.988	0.240	0.000	1.70	0.0	242.2	SURCHARGED
106.000	22	97.822	-0.699	0.000	0.01	0.0	62.8	OK
106.001	21	96.203	-0.043	0.000	1.00	0.0	27.5	OK
100.005	25	96.089	-0.661	0.000	0.02	0.0	270.3	OK
107.000	25	96.632	1.607	0.000	2.01	0.0	95.1	SURCHARGED
107.001	26	95.149	0.520	0.000	1.14	0.0	117.4	SURCHARGED
108.000	27	95.168	-0.057	0.000	0.89	0.0	82.0	OK
107.002	28	94.755	0.883	0.000	0.13	0.0	5.1	SURCHARGED
107.003	31	93.334	-0.106	0.000	0.19	0.0	5.1	OK
109.000	32	93.580	0.055	0.000	0.86	0.0	38.7	SURCHARGED
109.001	33	93.376	0.171	0.000	1.12	0.0	48.5	SURCHARGED
107.004	34	93.156	0.131	0.000	1.43	0.0	51.6	SURCHARGED
100.006	35	92.759	-0.641	0.000	0.03	0.0	345.1	OK
100.007	36	89.924	0.124	0.000	0.70	0.0	246.5	FLOOD RISK
110.000	37	93.001	1.076	0.000	1.11	0.0	77.9	SURCHARGED
110.001	38	91.989	0.894	0.000	1.25	0.0	105.7	SURCHARGED
111.000	39	91.925	0.010	0.000	0.73	0.0	74.8	SURCHARGED
110.002	43	91.732	1.082	0.000	0.16	0.0	5.6	FLOOD RISK
112.000	44	98.684	-0.716	0.000	0.02	0.0	35.5	OK
112.001	41	96.782	-0.018	0.000	1.00	0.0	8.7	OK
112.002	42	96.657	-0.723	0.000	0.02	0.0	30.6	OK
112.003	43	94.949	-0.001	0.000	1.00	0.0	10.5	OK
112.004	44	94.784	-0.736	0.000	0.01	0.0	23.2	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
112.005	45	91.760	0.160	0.000	0.19	0.0	4.8	SURCHARGED
112.006	46	91.047	-0.131	0.000	0.36	0.0	30.0	OK
110.003	45	89.800	-0.045	0.000	0.34	0.0	44.0	OK
100.008	46	89.774	0.229	0.000	0.56	0.0	267.3	SURCHARGED
113.000	47	91.761	0.700	0.000	1.09	0.0	75.6	SURCHARGED
113.001	48	91.059	0.646	0.000	1.22	0.0	102.9	SURCHARGED
114.000	49	90.051	0.513	0.000	0.33	0.0	11.0	SURCHARGED
113.002	50	90.048	0.673	0.000	0.30	0.0	4.6	SURCHARGED
113.003	52	89.573	0.256	0.000	0.32	0.0	5.3	SURCHARGED
115.000	53	90.122	-0.103	0.000	0.53	0.0	36.6	OK
113.004	54	89.556	0.405	0.000	0.37	0.0	41.4	SURCHARGED
100.009	55	89.542	0.467	0.000	1.21	0.0	288.4	FLOOD RISK
116.000	56	89.384	0.159	0.000	0.72	0.0	34.8	SURCHARGED
100.010	57	89.367	0.409	0.000	1.39	0.0	306.6	SURCHARGED
100.011	54	89.179	0.299	0.000	1.18	0.0	303.8	FLOOD RISK
100.012	55	88.999	0.532	0.000	0.26	278.0	9.5	FLOOD RISK
100.013	56	88.175	-0.745	0.000	0.00	0.0	9.5	OK
100.014	57	85.040	-0.744	0.000	0.00	0.0	9.5	OK
117.000	59	88.370	-0.630	0.000	0.05	0.0	282.9	OK
118.000	60	92.649	-0.201	0.000	0.23	0.0	54.1	OK
118.001	61	89.534	0.237	0.000	0.70	0.0	71.5	SURCHARGED
119.000	62	91.236	-0.133	0.000	0.58	0.0	85.8	OK
119.001	63	90.819	0.106	0.000	0.16	0.0	24.8	SURCHARGED
120.000	64	91.142	-0.158	0.000	0.44	0.0	109.5	OK
119.002	65	90.816	0.639	0.000	0.30	0.0	4.5	SURCHARGED
119.003	67	90.000	-0.118	0.000	0.10	0.0	4.5	OK
118.002	68	89.392	0.595	0.000	0.98	0.0	71.9	SURCHARGED
121.000	69	92.097	-0.128	0.000	0.38	0.0	37.0	OK
121.001	70	90.836	-0.135	0.000	0.32	0.0	46.9	OK
118.003	71	89.301	0.590	0.000	1.33	0.0	141.8	SURCHARGED
122.000	72	89.268	0.343	0.000	0.89	0.0	42.1	SURCHARGED
122.001	73	89.094	0.386	0.000	1.18	0.0	69.5	SURCHARGED
123.000	74	88.378	0.103	0.000	0.12	0.0	3.7	SURCHARGED
122.002	75	88.486	0.336	0.000	0.25	0.0	4.0	FLOOD RISK
118.004	76	88.102	0.037	0.000	1.27	0.0	146.8	SURCHARGED
117.001	77	87.645	-0.605	0.000	0.06	0.0	397.9	OK
124.000	78	88.627	1.052	0.000	1.60	0.0	81.3	SURCHARGED
124.001	79	87.550	0.425	0.000	1.29	0.0	97.0	SURCHARGED
125.000	80	87.907	0.382	0.000	1.18	0.0	91.7	SURCHARGED
124.002	81	87.365	0.648	0.000	0.19	0.0	4.5	SURCHARGED
124.003	83	86.493	-0.082	0.000	0.42	0.0	4.5	OK
117.002	84	86.406	-0.594	0.000	0.10	0.0	409.0	OK
117.003	85	86.231	-0.019	0.000	0.60	0.0	355.1	FLOOD RISK
126.000	86	91.955	-0.070	0.000	0.78	0.0	84.6	OK
126.001	87	91.068	0.494	0.000	1.34	0.0	97.4	FLOOD RISK
127.000	88	92.042	-0.083	0.000	0.70	0.0	76.3	OK
127.001	89	90.849	0.283	0.000	0.23	0.0	19.4	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
126.002	91	90.845	0.729	0.000	0.16	0.0	4.7	SURCHARGED
128.000	92	89.515	-0.735	0.000	0.02	0.0	13.5	OK
126.003	93	89.154	-0.696	0.000	0.04	0.0	23.9	OK
126.004	94	88.996	-0.229	0.000	0.13	0.0	18.3	OK
129.000	95	92.392	-0.133	0.000	0.34	0.0	37.9	OK
129.001	96	90.560	-0.114	0.000	0.47	0.0	56.9	OK
126.005	97	88.751	-0.149	0.000	0.49	0.0	100.7	OK
117.004	98	85.966	0.491	0.000	1.82	0.0	401.3	SURCHARGED
117.005	99	85.633	0.258	0.000	1.87	0.0	401.2	FLOOD RISK
117.006	100	85.018	-0.557	0.000	0.11	0.0	404.5	OK
130.000	101	87.642	-0.083	0.000	0.68	0.0	68.2	OK
130.001	102	86.036	0.136	0.000	1.00	0.0	89.8	SURCHARGED
131.000	103	87.111	-0.114	0.000	0.48	0.0	44.6	OK
131.001	104	86.401	-0.112	0.000	0.48	0.0	56.4	OK
130.002	106	85.979	0.557	0.000	0.26	0.0	4.3	SURCHARGED
130.003	108	85.012	-0.114	0.000	0.13	0.0	4.3	OK
117.007	110	84.942	-0.207	0.000	0.78	0.0	402.5	FLOOD RISK
132.000	111	93.636	-0.664	0.000	0.02	0.0	40.8	OK
132.001	112	93.479	-0.110	0.000	0.52	0.0	12.0	OK
132.002	113	93.417	-0.674	0.000	0.01	0.0	28.1	OK
132.003	114	93.313	-0.099	0.000	0.60	0.0	13.9	OK
132.004	115	93.238	-0.680	0.000	0.01	0.0	14.8	OK
132.005	116	93.203	-0.010	0.000	1.00	0.0	11.0	OK
132.006	117	93.097	-0.219	0.000	0.17	0.0	42.2	OK
132.007	118	90.144	-0.203	0.000	0.23	0.0	65.8	OK
133.000	119	87.842	-1.008	0.000	0.01	0.0	27.6	OK
132.008	120	87.429	-0.250	0.000	0.04	0.0	60.2	OK
134.000	121	89.674	0.205	0.000	1.11	0.0	70.8	SURCHARGED
134.001	122	89.005	0.186	0.000	0.14	0.0	18.2	SURCHARGED
135.000	123	89.434	-0.166	0.000	0.40	0.0	84.4	OK
134.002	124	89.003	0.596	0.000	0.27	0.0	4.4	SURCHARGED
134.003	126	88.171	-0.111	0.000	0.15	0.0	4.4	OK
136.000	128	87.427	-0.481	0.000	0.00	0.0	0.4	OK
134.004	129	87.427	-0.173	0.000	0.01	0.0	9.8	OK
132.009	130	87.427	0.678	0.000	0.10	0.0	30.0	SURCHARGED
137.000	131	86.755	-0.145	0.000	0.50	0.0	102.4	OK
138.000	133	86.833	-0.167	0.000	0.40	0.0	83.4	OK
137.001	134	85.442	0.354	0.000	0.04	0.0	4.1	SURCHARGED
132.010	137	84.640	-0.175	0.000	0.30	0.0	34.3	OK
117.008	138	84.602	-0.447	0.000	0.40	0.0	439.8	OK
139.000	139	88.151	-0.199	0.000	0.23	0.0	54.0	OK
140.000	140	85.919	-0.106	0.000	0.54	0.0	50.4	OK
140.001	141	84.725	-0.075	0.000	0.86	0.0	80.3	OK
141.000	130	86.162	-0.063	0.000	0.84	0.0	80.6	OK
142.000	131	85.899	-0.126	0.000	0.40	0.0	43.7	OK
141.001	132	85.507	0.657	0.000	0.41	0.0	4.5	SURCHARGED
141.002	133	84.720	-0.100	0.000	0.24	0.0	4.5	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
140.002	130	84.568	0.000	0.000	1.02	0.0	87.5	OK
139.001	142	84.374	-0.076	0.000	0.89	0.0	141.0	OK
117.009	143	84.272	0.697	0.000	0.46	0.0	41.0	FLOOD RISK
100.015	143	83.194	-0.726	0.000	0.02	0.0	48.8	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
100.000	15 Winter	100	+30%	100/15 Summer				
101.000	60 Winter	100	+30%	100/60 Winter				
101.001	60 Winter	100	+30%	100/15 Summer				
102.000	60 Winter	100	+30%	100/15 Summer				
101.002	60 Winter	100	+30%	100/15 Summer				
101.003	15 Winter	100	+30%	100/15 Summer				
100.001	15 Winter	100	+30%	100/15 Summer				
103.000	15 Winter	100	+30%	100/15 Summer				
103.001	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
100.002	15 Winter	100	+30%	100/15 Summer				
104.000	60 Winter	100	+30%	100/15 Summer				
104.001	60 Winter	100	+30%	100/15 Summer				
105.000	60 Winter	100	+30%	100/15 Summer				
104.002	60 Winter	100	+30%	100/15 Summer				
104.003	15 Winter	100	+30%	100/15 Summer				
100.003	15 Winter	100	+30%	100/15 Summer				
100.004	15 Winter	100	+30%	100/15 Summer				
106.000	15 Summer	100	+30%					
106.001	15 Winter	100	+30%	100/15 Winter				
100.005	15 Winter	100	+30%					
107.000	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
107.001	15 Winter	100	+30%	100/15 Summer				
108.000	15 Summer	100	+30%	100/15 Summer				
107.002	120 Winter	100	+30%	100/15 Summer				
107.003	15 Winter	100	+30%					
109.000	15 Summer	100	+30%	100/15 Summer				
109.001	15 Summer	100	+30%	100/15 Summer				
107.004	15 Winter	100	+30%	100/15 Summer				
100.006	15 Winter	100	+30%					
100.007	15 Winter	100	+30%	100/15 Summer				
110.000	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
110.001	15 Winter	100	+30%	100/15 Summer				
111.000	15 Summer	100	+30%	100/15 Summer				
110.002	120 Winter	100	+30%	100/15 Summer				
112.000	15 Summer	100	+30%					
112.001	15 Winter	100	+30%	100/15 Summer				
112.002	15 Winter	100	+30%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
112.003	15 Winter	100	+30%	100/15 Summer				
112.004	15 Winter	100	+30%					
112.005	120 Winter	100	+30%	100/15 Summer				
112.006	15 Winter	100	+30%					
110.003	15 Winter	100	+30%	100/15 Summer				
100.008	15 Winter	100	+30%	100/15 Summer				
113.000	15 Summer	100	+30%	100/15 Summer				
113.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
114.000	120 Winter	100	+30%	100/15 Summer				
113.002	120 Winter	100	+30%	100/15 Summer				
113.003	15 Winter	100	+30%	100/15 Summer				
115.000	15 Summer	100	+30%					
113.004	15 Winter	100	+30%	100/15 Summer				
100.009	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
116.000	15 Winter	100	+30%	100/15 Summer				
100.010	15 Winter	100	+30%	100/15 Summer				
100.011	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
100.012	15 Winter	100	+30%	100/15 Summer	100/15 Summer	100/15 Summer	18	4
100.013	15 Winter	100	+30%					
100.014	15 Winter	100	+30%					
117.000	15 Winter	100	+30%					
118.000	15 Summer	100	+30%					
118.001	15 Winter	100	+30%	100/15 Summer				
119.000	15 Summer	100	+30%					
119.001	120 Winter	100	+30%	100/15 Summer				
120.000	15 Summer	100	+30%					
119.002	120 Winter	100	+30%	100/15 Summer				
119.003	15 Winter	100	+30%	100/15 Winter				
118.002	15 Winter	100	+30%	100/15 Summer				
121.000	15 Summer	100	+30%					
121.001	15 Summer	100	+30%					
118.003	15 Winter	100	+30%	100/15 Summer				
122.000	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
122.001	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
123.000	60 Winter	100	+30%	100/15 Summer				
122.002	15 Winter	100	+30%	100/15 Summer				
118.004	15 Winter	100	+30%	100/15 Summer				
117.001	15 Winter	100	+30%					
124.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
124.001	15 Winter	100	+30%	100/15 Summer				
125.000	15 Summer	100	+30%	100/15 Summer				
124.002	120 Winter	100	+30%	100/15 Summer				
124.003	30 Winter	100	+30%					
117.002	30 Winter	100	+30%					
117.003	30 Winter	100	+30%	100/15 Summer				
126.000	15 Summer	100	+30%	100/15 Summer				
126.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
127.000	15 Summer	100	+30%	100/15 Summer				

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
127.001	15 Winter	100	+30%	100/15 Summer				
126.002	120 Winter	100	+30%	100/15 Summer				
128.000	15 Summer	100	+30%					
126.003	15 Winter	100	+30%					
126.004	15 Winter	100	+30%					
129.000	15 Summer	100	+30%					
129.001	15 Summer	100	+30%					
126.005	15 Summer	100	+30%					
117.004	30 Winter	100	+30%	100/15 Summer				
117.005	30 Winter	100	+30%	100/15 Summer				
117.006	30 Winter	100	+30%					
130.000	15 Summer	100	+30%	100/15 Summer				
130.001	15 Summer	100	+30%	100/15 Summer				
131.000	15 Summer	100	+30%					
131.001	15 Summer	100	+30%					
130.002	120 Winter	100	+30%	100/15 Summer				
130.003	30 Winter	100	+30%					
117.007	30 Winter	100	+30%					
132.000	15 Summer	100	+30%					
132.001	15 Winter	100	+30%					
132.002	15 Winter	100	+30%					
132.003	30 Winter	100	+30%					
132.004	60 Winter	100	+30%					
132.005	60 Winter	100	+30%	100/15 Winter				
132.006	15 Winter	100	+30%					
132.007	15 Winter	100	+30%					
133.000	15 Summer	100	+30%					
132.008	30 Winter	100	+30%	100/15 Winter				
134.000	15 Summer	100	+30%	100/15 Summer				
134.001	120 Winter	100	+30%	100/15 Summer				
135.000	15 Summer	100	+30%					
134.002	120 Winter	100	+30%	100/15 Summer				
134.003	120 Winter	100	+30%					
136.000	30 Winter	100	+30%					
134.004	30 Winter	100	+30%	100/15 Winter				
132.009	60 Winter	100	+30%	100/15 Summer				
137.000	15 Summer	100	+30%					
138.000	15 Summer	100	+30%					
137.001	120 Winter	100	+30%	100/15 Summer				
132.010	30 Winter	100	+30%					
117.008	30 Winter	100	+30%					
139.000	15 Summer	100	+30%					
140.000	15 Summer	100	+30%					
140.001	15 Summer	100	+30%	100/15 Summer				
141.000	15 Summer	100	+30%	100/15 Summer				
142.000	15 Summer	100	+30%					
141.001	60 Winter	100	+30%	100/15 Summer				
141.002	15 Summer	100	+30%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.sws

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
140.002	15 Summer	100	+30%	100/15 Summer				
139.001	15 Summer	100	+30%	100/15 Summer				
117.009	960 Winter	100	+30%	100/15 Summer				
100.015	960 Winter	100	+30%					

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
100.000	23	98.625	0.500	0.000	0.62	0.0	45.1	SURCHARGED
101.000	23	99.356	0.031	0.000	0.11	0.0	6.7	SURCHARGED
101.001	23	99.354	0.322	0.000	0.19	0.0	19.6	SURCHARGED
102.000	23	99.359	0.459	0.000	0.40	0.0	26.3	SURCHARGED
101.002	23	99.351	0.901	0.000	0.22	0.0	5.2	FLOOD RISK
101.003	23	98.480	0.179	0.000	0.23	0.0	8.5	SURCHARGED
100.001	23	98.463	1.159	0.000	0.46	0.0	47.1	FLOOD RISK
103.000	23	99.915	1.690	0.000	0.50	0.0	32.2	SURCHARGED
103.001	23	99.800	2.151	0.097	1.72	0.0	227.5	FLOOD
100.002	23	98.323	1.185	0.000	1.31	0.0	283.6	FLOOD RISK
104.000	12	98.945	0.960	0.000	0.28	0.0	13.4	SURCHARGED
104.001	13	98.942	1.087	0.000	0.50	0.0	39.1	FLOOD RISK
105.000	14	98.941	1.016	0.000	0.36	0.0	27.7	SURCHARGED
104.002	15	98.935	1.480	0.000	0.43	0.0	6.4	SURCHARGED
104.003	19	97.804	0.416	0.000	0.37	0.0	10.0	SURCHARGED
100.003	20	97.787	0.958	0.000	2.68	0.0	298.3	SURCHARGED
100.004	21	97.190	0.442	0.000	2.10	0.0	299.8	SURCHARGED
106.000	22	97.837	-0.684	0.000	0.01	0.0	81.5	OK
106.001	21	96.259	0.013	0.000	1.06	0.0	29.3	SURCHARGED
100.005	25	96.097	-0.652	0.000	0.03	0.0	328.8	OK
107.000	25	97.602	2.577	1.507	2.31	0.0	109.3	FLOOD
107.001	26	95.701	1.072	0.000	1.39	0.0	143.0	SURCHARGED
108.000	27	95.550	0.325	0.000	1.03	0.0	95.7	SURCHARGED
107.002	28	95.093	1.221	0.000	0.15	0.0	5.9	FLOOD RISK
107.003	31	93.341	-0.099	0.000	0.20	0.0	5.3	OK
109.000	32	94.014	0.489	0.000	1.03	0.0	46.3	SURCHARGED
109.001	33	93.707	0.502	0.000	1.44	0.0	62.1	SURCHARGED
107.004	34	93.322	0.297	0.000	1.81	0.0	65.1	SURCHARGED
100.006	35	92.771	-0.628	0.000	0.04	0.0	423.8	OK
100.007	36	90.162	0.362	0.000	0.91	0.0	320.5	FLOOD RISK
110.000	37	93.701	1.776	1.205	1.31	0.0	91.5	FLOOD
110.001	38	92.394	1.299	0.000	1.56	0.0	131.3	SURCHARGED
111.000	39	92.358	0.443	0.000	0.91	0.0	92.6	SURCHARGED
110.002	43	91.996	1.346	0.000	0.17	0.0	6.2	FLOOD RISK
112.000	44	98.694	-0.706	0.000	0.03	0.0	46.2	OK
112.001	41	96.817	0.017	0.000	1.49	0.0	12.9	SURCHARGED
112.002	42	96.666	-0.714	0.000	0.03	0.0	39.7	OK
112.003	43	94.982	0.032	0.000	1.52	0.0	16.0	SURCHARGED
112.004	44	94.789	-0.731	0.000	0.01	0.0	30.8	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
112.005	45	91.921	0.321	0.000	0.19	0.0	4.8	SURCHARGED
112.006	46	91.063	-0.115	0.000	0.47	0.0	39.1	OK
110.003	45	90.029	0.184	0.000	0.42	0.0	53.3	SURCHARGED
100.008	46	89.951	0.406	0.000	0.72	0.0	345.2	FLOOD RISK
113.000	47	92.793	1.732	0.000	1.29	0.0	89.1	FLOOD RISK
113.001	48	91.552	1.139	2.179	1.39	0.0	117.8	FLOOD
114.000	49	90.336	0.798	0.000	0.43	0.0	14.3	SURCHARGED
113.002	50	90.332	0.957	0.000	0.35	0.0	5.3	FLOOD RISK
113.003	52	89.773	0.456	0.000	0.47	0.0	7.8	SURCHARGED
115.000	53	90.145	-0.080	0.000	0.68	0.0	47.5	OK
113.004	54	89.762	0.611	0.000	0.42	0.0	47.0	SURCHARGED
100.009	55	89.707	0.632	6.890	1.38	0.0	329.5	FLOOD
116.000	56	89.525	0.300	0.000	0.87	0.0	42.2	SURCHARGED
100.010	57	89.490	0.532	0.000	1.55	0.0	341.6	FLOOD RISK
100.011	54	89.251	0.371	1.355	1.32	0.0	341.1	FLOOD
100.012	55	89.027	0.560	4.095	0.27	319.0	9.7	FLOOD
100.013	56	88.175	-0.745	0.000	0.00	0.0	9.7	OK
100.014	57	85.040	-0.744	0.000	0.00	0.0	9.7	OK
117.000	59	88.379	-0.621	0.000	0.06	0.0	324.0	OK
118.000	60	92.664	-0.186	0.000	0.29	0.0	70.4	OK
118.001	61	90.353	1.056	0.000	0.81	0.0	83.2	FLOOD RISK
119.000	62	91.268	-0.101	0.000	0.75	0.0	111.5	OK
119.001	63	91.080	0.367	0.000	0.21	0.0	30.9	SURCHARGED
120.000	64	91.166	-0.134	0.000	0.58	0.0	142.4	OK
119.002	65	91.076	0.899	0.000	0.34	0.0	5.2	SURCHARGED
119.003	67	90.152	0.034	0.000	0.18	0.0	7.8	SURCHARGED
118.002	68	90.130	1.333	0.000	1.24	0.0	90.8	SURCHARGED
121.000	69	92.113	-0.112	0.000	0.49	0.0	48.1	OK
121.001	70	90.850	-0.121	0.000	0.42	0.0	61.0	OK
118.003	71	90.023	1.312	0.000	1.66	0.0	177.1	SURCHARGED
122.000	72	89.700	0.775	0.456	1.06	0.0	50.2	FLOOD
122.001	73	89.500	0.792	0.033	1.45	0.0	85.5	FLOOD
123.000	74	88.459	0.184	0.000	0.12	0.0	3.7	SURCHARGED
122.002	75	88.635	0.485	0.000	0.24	0.0	4.0	FLOOD RISK
118.004	76	88.178	0.113	0.000	1.57	0.0	181.5	SURCHARGED
117.001	77	87.666	-0.584	0.000	0.07	0.0	494.1	OK
124.000	78	88.953	1.378	3.089	1.70	0.0	86.4	FLOOD
124.001	79	87.812	0.687	0.000	1.53	0.0	115.2	SURCHARGED
125.000	80	88.528	1.003	0.000	1.47	0.0	114.7	FLOOD RISK
124.002	81	87.626	0.909	0.000	0.22	0.0	5.2	FLOOD RISK
124.003	83	86.546	-0.029	0.000	0.47	0.0	5.1	OK
117.002	84	86.525	-0.475	0.000	0.11	0.0	480.4	OK
117.003	85	86.498	0.248	0.000	0.69	0.0	410.0	FLOOD RISK
126.000	86	92.453	0.428	0.000	0.88	0.0	95.9	SURCHARGED
126.001	87	91.301	0.727	1.508	1.50	0.0	108.6	FLOOD
127.000	88	92.213	0.088	0.000	0.85	0.0	92.8	SURCHARGED
127.001	89	91.178	0.612	0.000	1.34	0.0	113.9	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
126.002	91	91.142	1.026	0.000	0.19	0.0	5.5	FLOOD RISK
128.000	92	89.519	-0.731	0.000	0.02	0.0	17.5	OK
126.003	93	89.168	-0.682	0.000	0.05	0.0	30.1	OK
126.004	94	89.007	-0.218	0.000	0.17	0.0	23.9	OK
129.000	95	92.407	-0.118	0.000	0.45	0.0	49.2	OK
129.001	96	90.580	-0.094	0.000	0.61	0.0	74.0	OK
126.005	97	88.779	-0.121	0.000	0.65	0.0	131.6	OK
117.004	98	86.159	0.684	0.000	2.07	0.0	455.4	FLOOD RISK
117.005	99	85.730	0.355	0.000	2.12	0.0	455.6	FLOOD RISK
117.006	100	85.065	-0.510	0.000	0.12	0.0	459.1	OK
130.000	101	87.733	0.008	0.000	0.87	0.0	86.8	SURCHARGED
130.001	102	86.423	0.522	0.000	1.33	0.0	118.8	FLOOD RISK
131.000	103	87.131	-0.094	0.000	0.62	0.0	58.0	OK
131.001	104	86.421	-0.092	0.000	0.63	0.0	73.3	OK
130.002	106	86.225	0.803	0.000	0.30	0.0	4.9	SURCHARGED
130.003	108	85.033	-0.093	0.000	0.15	0.0	4.9	OK
117.007	110	85.017	-0.133	0.000	0.90	0.0	462.6	FLOOD RISK
132.000	111	93.647	-0.653	0.000	0.02	0.0	52.2	OK
132.001	112	93.500	-0.089	0.000	0.68	0.0	15.6	OK
132.002	113	93.431	-0.660	0.000	0.02	0.0	42.7	OK
132.003	114	93.337	-0.075	0.000	0.78	0.0	18.0	OK
132.004	115	93.261	-0.657	0.000	0.01	0.0	20.5	OK
132.005	116	93.243	0.030	0.000	1.34	0.0	14.8	SURCHARGED
132.006	117	93.110	-0.206	0.000	0.21	0.0	54.7	OK
132.007	118	90.158	-0.189	0.000	0.30	0.0	85.5	OK
133.000	119	87.853	-0.997	0.000	0.01	0.0	34.4	OK
132.008	120	87.716	0.037	0.000	0.03	0.0	48.2	SURCHARGED
134.000	121	90.199	0.730	0.000	1.40	0.0	89.4	SURCHARGED
134.001	122	89.261	0.442	0.000	0.18	0.0	23.3	SURCHARGED
135.000	123	89.456	-0.144	0.000	0.52	0.0	109.7	OK
134.002	124	89.259	0.852	0.000	0.31	0.0	5.0	SURCHARGED
134.003	126	88.174	-0.108	0.000	0.18	0.0	5.0	OK
136.000	128	87.714	-0.194	0.000	0.00	0.0	1.1	OK
134.004	129	87.714	0.114	0.000	0.01	0.0	13.4	SURCHARGED
132.009	130	87.703	0.954	0.000	0.10	0.0	32.1	SURCHARGED
137.000	131	86.783	-0.117	0.000	0.65	0.0	133.1	OK
138.000	133	86.855	-0.145	0.000	0.52	0.0	108.5	OK
137.001	134	85.666	0.578	0.000	0.04	0.0	4.7	SURCHARGED
132.010	137	84.685	-0.130	0.000	0.34	0.0	38.4	OK
117.008	138	84.640	-0.410	0.000	0.45	0.0	504.8	OK
139.000	139	88.167	-0.183	0.000	0.30	0.0	70.3	OK
140.000	140	85.941	-0.084	0.000	0.70	0.0	65.6	OK
140.001	141	85.001	0.201	0.000	1.07	0.0	100.6	SURCHARGED
141.000	130	86.543	0.318	0.000	1.00	0.0	95.9	SURCHARGED
142.000	131	85.916	-0.109	0.000	0.51	0.0	56.9	OK
141.001	132	85.779	0.929	0.000	0.48	0.0	5.2	SURCHARGED
141.002	133	84.761	-0.059	0.000	0.25	0.0	4.6	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area3_AS.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
140.002	130	84.744	0.176	0.000	1.30	0.0	111.6	SURCHARGED
139.001	142	84.553	0.103	0.000	1.08	0.0	170.3	SURCHARGED
117.009	143	84.487	0.912	0.000	0.54	0.0	48.1	FLOOD RISK
100.015	143	83.197	-0.723	0.000	0.03	0.0	56.0	OK

Microdrainage Calculations for Residential Area 2

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
200.000	41.594	0.600	69.3	0.035	2.00	0.600		o	225
200.001	27.314	0.325	84.0	0.028	0.00	0.600		o	300
201.000	58.108	0.425	136.7	0.058	2.00	0.600		o	225
200.002	28.037	0.300	93.5	0.090	0.00	0.600		o	300
200.003	65.000	1.321	49.2	0.000	0.00		0.045	3 \=/	600
202.000	45.232	0.780	58.0	0.081	2.00	0.600		o	300
202.001	12.187	0.041	297.2	0.000	0.00	0.600		o	300
200.004	75.000	4.024	18.6	0.000	0.00		0.045	3 \=/	600
203.000	66.135	2.100	31.5	0.100	2.00	0.600		o	300
203.001	13.654	0.045	303.4	0.000	0.00	0.600		o	300
200.005	70.000	5.080	13.8	0.000	0.00		0.045	3 \=/	600
204.000	61.696	3.380	18.3	0.098	2.00	0.600		o	300
204.001	11.178	0.045	248.4	0.000	0.00	0.600		o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
200.000	1	99.900	98.700	0.975	99.300	98.100	0.975		1050
200.001	2	99.300	98.025	0.975	98.900	97.700	0.900		1050
201.000	3	99.400	98.200	0.975	98.900	97.775	0.900		1050
200.002	4	98.900	97.700	0.900	98.100	97.400	0.400		1050
200.003	5	98.100	97.400	0.550	96.800	96.079	0.571		10000
202.000	6	98.100	96.900	0.900	96.800	96.120	0.380		1050
202.001	7	96.800	96.120	0.380	96.800	96.079	0.421		1050
200.004	8	96.800	96.079	0.571	93.300	92.055	1.095		10000
203.000	9	96.200	94.200	1.700	93.100	92.100	0.700		1200
203.001	10	93.100	92.100	0.700	93.300	92.055	0.945		1050
200.005	11	93.300	92.055	1.095	87.800	86.975	0.675		10000
204.000	12	91.600	90.400	0.900	87.800	87.020	0.480		1050
204.001	13	87.800	87.020	0.480	87.800	86.975	0.525		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
200.006	12.688	1.025	12.4	0.000	0.00	0.600		o	225
205.000	11.076	0.100	110.8	0.039	2.00	0.600		o	225
200.007	35.545	3.200	11.1	0.027	0.00	0.600		o	300
206.000	11.774	0.100	117.7	0.017	2.00	0.600		o	225
206.001	14.736	0.250	58.9	0.017	0.00	0.600		o	225
206.002	12.389	0.100	123.9	0.017	0.00	0.600		o	225
207.000	11.667	0.050	233.3	0.060	2.00	0.600		o	225
207.001	17.267	0.100	172.7	0.060	0.00	0.600		o	225
206.003	4.080	0.050	81.6	0.000	0.00	0.600		o	150
200.008	12.213	0.700	17.4	0.000	0.00	0.600		o	300
208.000	13.578	0.017	798.7	0.022	2.00	0.600		o	1050
208.001	29.449	0.036	818.0	0.026	0.00	0.600		o	1050

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
200.006	14	87.800	86.900	0.675	86.200	85.875	0.100	Hydro-Brake®	10000
205.000	15	87.000	86.000	0.775	86.200	85.900	0.075		1050
200.007	16	86.200	85.800	0.100	84.000	82.600	1.100		1050
206.000	17	86.000	83.200	2.575	85.300	83.100	1.975		1200
206.001	18	85.300	83.100	1.975	84.500	82.850	1.425		1200
206.002	19	84.500	82.850	1.425	84.100	82.750	1.125		1050
207.000	20	85.900	82.900	2.775	85.300	82.850	2.225		1200
207.001	21	85.300	82.850	2.225	84.100	82.750	1.125		1200
206.003	22	84.100	82.750	1.200	84.000	82.700	1.150	Hydro-Brake®	1050
200.008	23	84.000	82.550	1.150	83.400	81.850	1.250		1050
208.000	24	85.100	81.903	2.147	84.400	81.886	1.464		1800
208.001	25	84.400	81.886	1.464	83.400	81.850	0.500		1800

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
200.009	34.448	0.115	299.5	0.045	0.00	0.600		o	300
200.010	11.213	0.037	303.1	0.011	0.00	0.600		o	300
209.000	32.710	0.145	225.0	0.057	2.00	0.600		o	225
209.001	22.179	1.000	22.2	0.024	0.00	0.600		o	225
209.002	14.873	0.500	29.7	0.000	0.00	0.600		o	225
210.000	35.219	0.645	54.6	0.052	2.00	0.600		o	225
209.003	7.128	0.050	142.6	0.000	0.00	0.600		o	225
211.000	14.436	0.064	225.6	0.012	2.00	0.600		o	225
209.004	11.353	0.607	18.7	0.000	0.00	0.600		o	225
200.011	11.213	0.037	300.0	0.000	0.00	0.600		o	300
200.012	17.112	0.057	300.0	0.015	0.00	0.600		o	300
212.000	33.409	0.148	225.0	0.026	2.00	0.600		o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
200.009	26	83.400	81.850	1.250	82.600	81.735	0.565	Hydro-Brake®	1800
200.010	27	82.600	81.735	0.565	82.700	81.698	0.702		1050
209.000	28	85.250	84.000	1.025	85.100	83.855	1.020		1050
209.001	29	85.100	83.855	1.020	83.900	82.855	0.820		1050
209.002	30	83.900	82.855	0.820	83.500	82.355	0.920		1050
210.000	31	84.500	83.000	1.275	83.500	82.355	0.920		1050
209.003	32	83.500	82.355	0.920	82.800	82.305	0.270		1050
211.000	33	83.200	82.369	0.606	82.800	82.305	0.270		1050
209.004	34	82.800	82.305	0.270	82.700	81.698	0.777	Hydro-Brake®	1050
200.011	35	82.700	81.623	0.777	82.700	81.585	0.815		1050
200.012	36	82.700	81.585	0.815	83.100	81.528	1.272		1050
212.000	37	83.700	81.676	1.799	83.100	81.528	1.347		1200

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
200.013	8.559	0.601	14.2	0.000	0.00	0.600		o	300
213.000	17.175	0.300	57.3	0.024	2.00	0.600		o	225
213.001	70.775	1.800	39.3	0.039	0.00	0.600		o	225
214.000	39.836	3.000	13.3	0.082	2.00	0.600		o	225
215.000	7.007	0.900	7.8	0.009	2.00	0.600		o	225
216.000	9.443	0.100	94.4	0.013	2.00	0.600		o	225
215.001	44.065	1.650	26.7	0.045	0.00	0.600		o	225
215.002	6.481	0.750	8.6	0.000	0.00	0.600		o	225
215.003	27.843	0.186	150.0	0.044	0.00	0.600		o	225
215.004	5.000	0.250	20.0	0.000	0.00	0.600		o	225
217.000	34.417	0.153	224.9	0.038	2.00	0.600		o	225
215.005	20.932	1.200	17.4	0.000	0.00	0.600		o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
200.013	38	83.100	81.453	1.347	82.200	80.852	1.048		1050
213.000	39	87.500	85.500	1.775	86.500	85.200	1.075		1200
213.001	40	86.500	85.200	1.075	86.250	83.400	2.625		1050
214.000	41	90.400	89.000	1.175	87.750	86.000	1.525		1050
215.000	42	92.600	91.000	1.375	92.200	90.100	1.875		1050
216.000	43	92.000	90.200	1.575	92.200	90.100	1.875		1200
215.001	44	92.200	90.100	1.875	89.250	88.450	0.575		1200
215.002	45	89.250	88.450	0.575	88.600	87.700	0.675		1050
215.003	46	88.600	87.700	0.675	88.750	87.514	1.011		1050
215.004	47	88.750	87.514	1.011	89.000	87.264	1.511		1050
217.000	48	91.250	87.417	3.608	89.000	87.264	1.511		1200
215.005	49	89.000	87.264	1.511	87.750	86.064	1.461	Hydro-Brake®	1200

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
214.001	20.643	2.600	7.9	0.000	0.00	0.600		o	225
213.002	21.882	0.600	36.5	0.030	0.00	0.600		o	225
218.000	10.689	0.100	106.9	0.015	2.00	0.600		o	150
218.001	24.238	0.500	48.5	0.018	0.00	0.600		o	150
218.002	28.254	0.750	37.7	0.026	0.00	0.600		o	150
218.003	35.733	0.750	47.6	0.027	0.00	0.600		o	225
218.004	16.600	0.325	51.1	0.035	0.00	0.600		o	225
219.000	11.992	0.200	60.0	0.015	2.00	0.600		o	150
219.001	25.248	0.451	56.0	0.018	0.00	0.600		o	150
218.005	34.857	1.500	23.2	0.000	0.00	0.600		o	225
213.003	9.573	0.032	300.0	0.000	0.00	0.600		o	300
220.000	25.568	0.700	36.5	0.023	2.00	0.600		o	225
220.001	80.734	4.000	20.2	0.041	0.00	0.600		o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
214.001	50	87.750	86.000	1.525	86.250	83.400	2.625		1200
213.002	51	86.250	83.400	2.625	85.250	82.800	2.225		1200
218.000	52	88.800	86.800	1.850	89.500	86.700	2.650		1200
218.001	53	89.500	86.700	2.650	88.300	86.200	1.950		1200
218.002	54	88.300	86.200	1.950	87.100	85.450	1.500		1200
218.003	55	87.100	85.375	1.500	86.250	84.625	1.400		1050
218.004	56	86.250	84.625	1.400	85.700	84.300	1.175		1050
219.000	57	87.600	84.951	2.499	87.100	84.751	2.199		1200
219.001	58	87.100	84.751	2.199	85.700	84.300	1.250		1200
218.005	59	85.700	84.225	1.250	85.250	82.725	2.300	Hydro-Brake®	1050
213.003	60	85.250	82.650	2.300	84.600	82.618	1.682		1200
220.000	61	94.000	92.500	1.275	92.900	91.800	0.875		1050
220.001	62	92.900	91.800	0.875	89.000	87.800	0.975		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
220.002	46.192	1.800	25.7	0.027	0.00	0.600		o	225
221.000	23.088	1.500	15.4	0.017	2.00	0.600		o	150
221.001	45.345	2.500	18.1	0.039	0.00	0.600		o	225
221.002	55.026	2.600	21.2	0.037	0.00	0.600		o	225
221.003	5.931	0.200	29.7	0.000	0.00	0.600		o	225
221.004	16.961	0.200	84.8	0.000	0.00	0.600		o	225
220.003	7.485	0.033	225.0	0.000	0.00	0.600		o	225
220.004	61.156	3.110	19.7	0.035	0.00	0.600		o	300
220.005	39.370	0.038	1036.1	0.022	0.00	0.600		o	1050
220.006	19.665	0.019	1035.0	0.008	0.00	0.600		o	1050
213.004	38.552	0.129	300.0	0.024	0.00	0.600		o	300
222.000	27.227	0.121	225.0	0.025	2.00	0.600		o	225
213.005	22.781	0.076	300.0	0.024	0.00	0.600		o	300
213.006	7.509	0.025	300.0	0.000	0.00	0.600		o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
220.002	63	89.000	87.800	0.975	87.200	86.000	0.975		1050
221.000	64	94.000	93.000	0.850	92.600	91.500	0.950		1050
221.001	65	92.600	91.425	0.950	90.000	88.925	0.850		1050
221.002	66	90.000	88.925	0.850	87.400	86.325	0.850		1050
221.003	67	87.400	86.325	0.850	87.250	86.125	0.900		1050
221.004	68	87.250	86.125	0.900	87.200	85.925	1.050	Hydro-Brake®	1050
220.003	69	87.200	85.925	1.050	86.750	85.892	0.633		1050
220.004	70	86.750	85.817	0.633	85.600	82.707	2.593		1050
220.005	71	85.600	82.707	1.843	84.500	82.669	0.781		1800
220.006	72	84.500	82.669	0.781	84.600	82.650	0.900		1800
213.004	73	84.600	82.618	1.682	83.700	82.490	0.910		1800
222.000	74	84.300	83.300	0.775	83.700	83.179	0.296		1050
213.005	75	83.700	82.490	0.910	83.600	82.414	0.886		1050
213.006	76	83.600	82.414	0.886	83.400	82.389	0.711		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	n	HYD SECT	DIA (mm)
223.000	47.874	0.160	299.2	0.074	2.00	0.600		o	300
213.007	5.000	1.537	3.3	0.000	0.00	0.600		o	300
224.000	35.825	0.800	44.8	0.039	2.00	0.600		o	150
224.001	10.511	0.400	26.3	0.000	0.00	0.600		o	150
224.002	7.711	0.400	19.3	0.018	0.00	0.600		o	150
225.000	31.691	0.800	39.6	0.027	2.00	0.600		o	150
224.003	5.000	0.050	100.0	0.000	0.00	0.600		o	150
224.004	10.365	0.069	150.0	0.000	0.00	0.600		o	150
226.000	32.737	0.600	54.6	0.025	2.00	0.600		o	225
226.001	22.983	0.102	225.0	0.014	0.00	0.600		o	225
224.005	16.964	0.154	110.2	0.000	0.00	0.600		o	225
200.014	21.500	0.096	224.0	0.000	0.00	0.600		o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
223.000	77	84.400	82.549	1.551	83.400	82.389	0.711		1200
213.007	78	83.400	82.389	0.711	82.200	80.852	1.048		1050
224.000	79	84.200	83.000	1.050	83.200	82.200	0.850		1050
224.001	80	83.200	82.200	0.850	82.750	81.800	0.800		1050
224.002	81	82.750	81.800	0.800	82.400	81.400	0.850		1050
225.000	82	83.200	82.000	1.050	82.400	81.200	1.050		1050
224.003	83	82.400	81.200	1.050	82.200	81.150	0.900		1050
224.004	84	82.200	81.150	0.900	82.200	81.081	0.969	Hydro-Brake®	1050
226.000	85	82.800	81.800	0.775	82.200	81.200	0.775		1050
226.001	86	82.200	81.200	0.775	82.200	81.098	0.877		1050
224.005	87	82.200	81.006	0.969	82.200	80.852	1.123		1050
200.014	88	82.200	80.777	1.123	82.000	80.681	1.019	Complex	1050

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
200.014	Area 2 Outfall	82.000	80.681	0.000	300	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	8
Number of Online Controls	9	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: 14, DS/PN: 200.006, Volume (m³): 394.9

Design Head (m) 1.200 Diameter (mm) 90
Design Flow (l/s) 5.0 Invert Level (m) 86.900
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	5.1	3.000	8.0	7.000	12.2
0.200	3.7	1.400	5.5	3.500	8.6	7.500	12.7
0.300	3.5	1.600	5.8	4.000	9.2	8.000	13.1
0.400	3.4	1.800	6.2	4.500	9.8	8.500	13.5
0.500	3.5	2.000	6.5	5.000	10.3	9.000	13.9
0.600	3.7	2.200	6.9	5.500	10.8	9.500	14.2
0.800	4.1	2.400	7.2	6.000	11.3		
1.000	4.6	2.600	7.5	6.500	11.8		

Hydro-Brake® Manhole: 22, DS/PN: 206.003, Volume (m³): 2.3

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 82.750
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 26, DS/PN: 200.009, Volume (m³): 28.6

Design Head (m) 1.500 Diameter (mm) 177
Design Flow (l/s) 22.0 Invert Level (m) 81.850
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	1.000	18.9	2.400	27.7	5.500	41.9
0.200	14.5	1.200	20.0	2.600	28.8	6.000	43.8
0.300	19.2	1.400	21.3	3.000	31.0	6.500	45.6
0.400	19.9	1.600	22.7	3.500	33.4	7.000	47.3
0.500	19.5	1.800	24.0	4.000	35.7	7.500	49.0
0.600	18.8	2.000	25.3	4.500	37.9	8.000	50.6
0.800	18.3	2.200	26.5	5.000	40.0	8.500	52.1

Hydro-Brake® Manhole: 26, DS/PN: 200.009, Volume (m³): 28.6

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
9.000	53.6	9.500	55.1

Hydro-Brake® Manhole: 34, DS/PN: 209.004, Volume (m³): 1.2

Design Head (m) 1.000 Diameter (mm) 103
Design Flow (l/s) 6.0 Invert Level (m) 82.305
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	6.6	3.000	10.5	7.000	16.0
0.200	5.1	1.400	7.2	3.500	11.3	7.500	16.6
0.300	5.0	1.600	7.7	4.000	12.1	8.000	17.1
0.400	4.8	1.800	8.1	4.500	12.8	8.500	17.6
0.500	4.7	2.000	8.6	5.000	13.5	9.000	18.2
0.600	4.9	2.200	9.0	5.500	14.2	9.500	18.7
0.800	5.5	2.400	9.4	6.000	14.8		
1.000	6.1	2.600	9.8	6.500	15.4		

Hydro-Brake® Manhole: 49, DS/PN: 215.005, Volume (m³): 3.4

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 87.264
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 59, DS/PN: 218.005, Volume (m³): 2.3

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 84.225
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.500	3.8	1.200	5.5	2.000	7.1
0.200	4.1	0.600	4.0	1.400	6.0	2.200	7.5
0.300	3.9	0.800	4.5	1.600	6.4	2.400	7.8
0.400	3.8	1.000	5.0	1.800	6.8	2.600	8.1

Hydro-Brake® Manhole: 59, DS/PN: 218.005, Volume (m³): 2.3

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
3.000	8.7	5.000	11.3	7.000	13.3	9.000	15.1
3.500	9.4	5.500	11.8	7.500	13.8	9.500	15.5
4.000	10.1	6.000	12.3	8.000	14.3		
4.500	10.7	6.500	12.9	8.500	14.7		

Hydro-Brake® Manhole: 68, DS/PN: 221.004, Volume (m³): 1.2

Design Head (m)	1.000	Diameter (mm)	94
Design Flow (l/s)	5.0	Invert Level (m)	86.125
Hydro-Brake® Type	Md6 SW Only		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 84, DS/PN: 224.004, Volume (m³): 1.0

Design Head (m)	1.000	Diameter (mm)	94
Design Flow (l/s)	5.0	Invert Level (m)	81.150
Hydro-Brake® Type	Md6 SW Only		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Complex Manhole: 88, DS/PN: 200.014, Volume (m³): 2.7

Hydro-Brake®

Design Head (m)	0.700	Diameter (mm)	168
Design Flow (l/s)	14.9	Invert Level (m)	80.777
Hydro-Brake® Type	Md5 SW Only		

Hydro-Brake®

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.8	0.200	12.2	0.300	14.3	0.400	14.5

Hydro-Brake®

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.500	14.3	1.800	22.8	4.000	34.0	7.500	46.5
0.600	14.5	2.000	24.0	4.500	36.0	8.000	48.0
0.800	15.6	2.200	25.2	5.000	38.0	8.500	49.5
1.000	17.1	2.400	26.3	5.500	39.8	9.000	51.0
1.200	18.6	2.600	27.4	6.000	41.6	9.500	52.4
1.400	20.1	3.000	29.4	6.500	43.3		
1.600	21.5	3.500	31.8	7.000	44.9		

Hydro-Brake®

Design Head (m) 0.183 Diameter (mm) 194
Design Flow (l/s) 15.0 Invert Level (m) 81.477
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.5	1.200	24.3	3.000	37.2	7.000	56.8
0.200	16.5	1.400	25.8	3.500	40.2	7.500	58.8
0.300	23.4	1.600	27.3	4.000	42.9	8.000	60.7
0.400	24.9	1.800	28.9	4.500	45.6	8.500	62.6
0.500	24.8	2.000	30.4	5.000	48.0	9.000	64.4
0.600	24.1	2.200	31.9	5.500	50.4	9.500	66.2
0.800	23.0	2.400	33.3	6.000	52.6		
1.000	23.3	2.600	34.6	6.500	54.7		

Hydro-Brake®

Design Head (m) 0.320 Diameter (mm) 135
Design Flow (l/s) 10.0 Invert Level (m) 81.660
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.4	1.200	11.4	3.000	18.0	7.000	27.5
0.200	9.2	1.400	12.3	3.500	19.5	7.500	28.5
0.300	10.1	1.600	13.2	4.000	20.8	8.000	29.4
0.400	9.8	1.800	14.0	4.500	22.1	8.500	30.3
0.500	9.4	2.000	14.7	5.000	23.3	9.000	31.2
0.600	9.3	2.200	15.4	5.500	24.4	9.500	32.0
0.800	9.7	2.400	16.1	6.000	25.5		
1.000	10.5	2.600	16.8	6.500	26.5		

Storage Structures for Storm

Tank or Pond Manhole: 14, DS/PN: 200.006

Invert Level (m) 86.900

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	200.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	250.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	250.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	300.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	300.0	2.400	0.0	3.800	0.0		
1.200	300.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 22, DS/PN: 206.003

Invert Level (m) 82.750

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	70.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	70.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	70.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	70.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	70.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	70.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 34, DS/PN: 209.004

Invert Level (m) 82.305

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	130.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	130.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	130.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	130.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	130.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	130.0	2.400	0.0	3.800	0.0		
1.200	130.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 49, DS/PN: 215.005

Invert Level (m) 87.264

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	60.0	0.100	60.0	0.200	60.0	0.300	60.0

Tank or Pond Manhole: 49, DS/PN: 215.005

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.400	60.0	1.000	60.0	1.600	0.0	2.200	0.0
0.500	60.0	1.100	0.0	1.700	0.0	2.300	0.0
0.600	60.0	1.200	0.0	1.800	0.0	2.400	0.0
0.700	60.0	1.300	0.0	1.900	0.0	2.500	0.0
0.800	60.0	1.400	0.0	2.000	0.0		
0.900	60.0	1.500	0.0	2.100	0.0		

Tank or Pond Manhole: 59, DS/PN: 218.005

Invert Level (m) 84.225

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	60.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	60.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	60.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	60.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	60.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	60.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 68, DS/PN: 221.004

Invert Level (m) 86.125

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	50.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	50.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	50.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	50.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	50.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	50.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 84, DS/PN: 224.004

Invert Level (m) 81.150

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	50.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	50.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	50.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	50.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	50.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	50.0	2.400	0.0	3.800	0.0		
1.200	0.0	2.600	0.0	4.000	0.0		

Tank or Pond Manhole: 88, DS/PN: 200.014

Invert Level (m) 80.851

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	200.0	1.400	0.0	2.800	0.0	4.200	0.0
0.200	220.0	1.600	0.0	3.000	0.0	4.400	0.0
0.400	240.0	1.800	0.0	3.200	0.0	4.600	0.0
0.600	260.0	2.000	0.0	3.400	0.0	4.800	0.0
0.800	280.0	2.200	0.0	3.600	0.0	5.000	0.0
1.000	300.0	2.400	0.0	3.800	0.0		
1.200	320.0	2.600	0.0	4.000	0.0		

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.000	15 Summer	1	0%					
200.001	15 Summer	1	0%	100/15 Summer				
201.000	15 Summer	1	0%	100/15 Summer				
200.002	15 Summer	1	0%	100/15 Summer				
200.003	15 Winter	1	0%					
202.000	15 Summer	1	0%					
202.001	15 Summer	1	0%	100/15 Summer				
200.004	15 Winter	1	0%					
203.000	15 Summer	1	0%					
203.001	15 Summer	1	0%	30/15 Summer				
200.005	15 Winter	1	0%					
204.000	15 Summer	1	0%					
204.001	15 Summer	1	0%	30/15 Summer				
200.006	240 Winter	1	0%	30/15 Summer				
205.000	15 Summer	1	0%					
200.007	15 Summer	1	0%					
206.000	15 Summer	1	0%	100/30 Winter				
206.001	15 Summer	1	0%	100/15 Summer				
206.002	15 Summer	1	0%	30/15 Summer				
207.000	15 Summer	1	0%	30/15 Summer				
207.001	15 Summer	1	0%	30/15 Summer				
206.003	60 Winter	1	0%	30/15 Summer				
200.008	15 Summer	1	0%	100/15 Winter				
208.000	15 Winter	1	0%					
208.001	15 Winter	1	0%					
200.009	15 Winter	1	0%	30/15 Summer				
200.010	15 Winter	1	0%					
209.000	15 Summer	1	0%	30/15 Summer				
209.001	15 Summer	1	0%					
209.002	15 Summer	1	0%	100/15 Summer				
210.000	15 Summer	1	0%	100/15 Summer				
209.003	15 Summer	1	0%	30/15 Summer				
211.000	15 Summer	1	0%	100/15 Winter				
209.004	120 Winter	1	0%	30/60 Winter				
200.011	15 Winter	1	0%	100/60 Winter				
200.012	15 Winter	1	0%	100/60 Winter				
212.000	15 Summer	1	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.013	15 Winter	1	0%	100/30 Winter				
213.000	15 Summer	1	0%					
213.001	15 Summer	1	0%	100/15 Summer				
214.000	15 Summer	1	0%					
215.000	15 Summer	1	0%					
216.000	15 Summer	1	0%					
215.001	15 Summer	1	0%					
215.002	15 Summer	1	0%					
215.003	15 Winter	1	0%	30/15 Summer				
215.004	15 Winter	1	0%	30/30 Winter				
217.000	15 Summer	1	0%	30/15 Summer				
215.005	60 Winter	1	0%	30/15 Summer				
214.001	15 Summer	1	0%					
213.002	15 Summer	1	0%	30/15 Summer				
218.000	15 Summer	1	0%	100/15 Summer				
218.001	15 Summer	1	0%	100/15 Summer				
218.002	15 Summer	1	0%	30/15 Summer				
218.003	15 Winter	1	0%					
218.004	15 Winter	1	0%	100/15 Summer				
219.000	15 Summer	1	0%					
219.001	15 Summer	1	0%	100/15 Summer				
218.005	60 Winter	1	0%	30/15 Summer				
213.003	15 Winter	1	0%	30/15 Summer				
220.000	15 Summer	1	0%					
220.001	15 Summer	1	0%					
220.002	15 Summer	1	0%					
221.000	15 Summer	1	0%					
221.001	15 Summer	1	0%					
221.002	15 Summer	1	0%					
221.003	15 Summer	1	0%	100/15 Summer				
221.004	60 Winter	1	0%	30/15 Summer				
220.003	15 Winter	1	0%	30/15 Summer				
220.004	15 Winter	1	0%					
220.005	15 Winter	1	0%					
220.006	15 Winter	1	0%					
213.004	15 Winter	1	0%	30/15 Summer				
222.000	15 Summer	1	0%					
213.005	15 Winter	1	0%	30/15 Summer				
213.006	15 Winter	1	0%	30/15 Summer				
223.000	15 Summer	1	0%	100/15 Summer				
213.007	15 Winter	1	0%					
224.000	15 Summer	1	0%	100/15 Summer				
224.001	15 Summer	1	0%	100/15 Summer				
224.002	15 Summer	1	0%	30/15 Summer				
225.000	15 Summer	1	0%	100/15 Summer				
224.003	15 Summer	1	0%	30/15 Summer				
224.004	240 Winter	1	0%	30/15 Summer				
226.000	15 Summer	1	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
226.001	240 Winter	1	0%	30/15 Summer				
224.005	240 Winter	1	0%	1/120 Winter				
200.014	240 Winter	1	0%	1/15 Winter				

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
200.000	1	98.751	-0.174	0.000	0.12	0.0	6.8	OK
200.001	2	98.086	-0.239	0.000	0.09	0.0	9.7	OK
201.000	3	98.278	-0.147	0.000	0.26	0.0	11.1	OK
200.002	4	97.812	-0.188	0.000	0.30	0.0	31.1	OK
200.003	5	97.466	-0.634	0.000	0.01	0.0	23.1	OK
202.000	6	96.968	-0.232	0.000	0.11	0.0	15.7	OK
202.001	7	96.233	-0.187	0.000	0.29	0.0	15.3	OK
200.004	8	96.133	-0.667	0.000	0.00	0.0	26.5	OK
203.000	9	94.264	-0.236	0.000	0.10	0.0	19.3	OK
203.001	10	92.227	-0.173	0.000	0.36	0.0	18.8	OK
200.005	11	92.108	-1.192	0.000	0.00	0.0	30.2	OK
204.000	12	90.455	-0.245	0.000	0.08	0.0	19.1	OK
204.001	13	87.141	-0.179	0.000	0.34	0.0	19.1	OK
200.006	14	87.076	-0.049	0.000	0.03	0.0	3.6	OK
205.000	15	86.065	-0.160	0.000	0.18	0.0	7.7	OK
200.007	16	85.836	-0.264	0.000	0.03	0.0	10.8	OK
206.000	17	83.243	-0.182	0.000	0.08	0.0	3.3	OK
206.001	18	83.145	-0.180	0.000	0.09	0.0	5.2	OK
206.002	19	82.914	-0.161	0.000	0.18	0.0	7.1	OK
207.000	20	83.002	-0.123	0.000	0.41	0.0	11.7	OK
207.001	21	82.966	-0.109	0.000	0.50	0.0	17.5	OK
206.003	22	82.899	-0.001	0.000	0.28	0.0	3.9	OK
200.008	23	82.596	-0.254	0.000	0.05	0.0	11.3	OK
208.000	24	82.073	-0.880	0.000	0.01	0.0	2.7	OK
208.001	25	82.073	-0.863	0.000	0.01	0.0	3.2	OK
200.009	26	82.072	-0.078	0.000	0.26	0.0	15.3	OK
200.010	27	81.851	-0.184	0.000	0.32	0.0	16.2	OK
209.000	28	84.091	-0.134	0.000	0.32	0.0	10.4	OK
209.001	29	83.909	-0.170	0.000	0.13	0.0	12.9	OK
209.002	30	82.915	-0.165	0.000	0.16	0.0	13.2	OK
210.000	31	83.058	-0.167	0.000	0.15	0.0	10.1	OK
209.003	32	82.500	-0.080	0.000	0.71	0.0	22.3	OK
211.000	33	82.410	-0.184	0.000	0.08	0.0	2.3	OK
209.004	34	82.389	-0.141	0.000	0.02	0.0	2.5	OK
200.011	35	81.745	-0.178	0.000	0.35	0.0	17.9	OK
200.012	36	81.707	-0.178	0.000	0.35	0.0	19.0	OK
212.000	37	81.735	-0.166	0.000	0.16	0.0	5.1	OK
200.013	38	81.516	-0.236	0.000	0.10	0.0	19.9	OK
213.000	39	85.541	-0.184	0.000	0.08	0.0	4.7	OK
213.001	40	85.250	-0.175	0.000	0.11	0.0	8.6	OK

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

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
214.000	41	89.051	-0.174	0.000	0.12	0.0	16.0	OK
215.000	42	91.014	-0.211	0.000	0.01	0.0	1.8	OK
216.000	43	90.235	-0.190	0.000	0.06	0.0	2.6	OK
215.001	44	90.147	-0.178	0.000	0.09	0.0	9.1	OK
215.002	45	88.491	-0.184	0.000	0.07	0.0	9.1	OK
215.003	46	87.794	-0.131	0.000	0.36	0.0	14.2	OK
215.004	47	87.583	-0.156	0.000	0.20	0.0	14.3	OK
217.000	48	87.490	-0.152	0.000	0.22	0.0	7.2	OK
215.005	49	87.407	-0.082	0.000	0.03	0.0	3.8	OK
214.001	50	86.047	-0.178	0.000	0.10	0.0	16.5	OK
213.002	51	83.494	-0.131	0.000	0.35	0.0	27.8	OK
218.000	52	86.845	-0.105	0.000	0.19	0.0	2.9	OK
218.001	53	86.746	-0.104	0.000	0.20	0.0	4.8	OK
218.002	54	86.254	-0.096	0.000	0.29	0.0	8.0	OK
218.003	55	85.435	-0.165	0.000	0.15	0.0	11.0	OK
218.004	56	84.700	-0.150	0.000	0.24	0.0	15.4	OK
219.000	57	84.988	-0.113	0.000	0.14	0.0	2.9	OK
219.001	58	84.798	-0.103	0.000	0.21	0.0	4.9	OK
218.005	59	84.379	-0.071	0.000	0.04	0.0	3.9	OK
213.003	60	82.822	-0.128	0.000	0.56	0.0	27.9	OK
220.000	61	92.534	-0.191	0.000	0.06	0.0	4.5	OK
220.001	62	91.842	-0.183	0.000	0.08	0.0	8.6	OK
220.002	63	87.852	-0.173	0.000	0.12	0.0	12.0	OK
221.000	64	93.027	-0.123	0.000	0.08	0.0	3.3	OK
221.001	65	91.463	-0.187	0.000	0.06	0.0	7.6	OK
221.002	66	88.974	-0.176	0.000	0.11	0.0	11.9	OK
221.003	67	86.391	-0.159	0.000	0.19	0.0	11.9	OK
221.004	68	86.230	-0.120	0.000	0.06	0.0	2.9	OK
220.003	69	86.034	-0.116	0.000	0.47	0.0	12.9	OK
220.004	70	85.869	-0.247	0.000	0.07	0.0	17.2	OK
220.005	71	82.875	-0.882	0.000	0.03	0.0	18.8	OK
220.006	72	82.844	-0.875	0.000	0.05	0.0	19.4	OK
213.004	73	82.805	-0.113	0.000	0.70	0.0	41.4	OK
222.000	74	83.358	-0.167	0.000	0.15	0.0	4.9	OK
213.005	75	82.700	-0.090	0.000	0.79	0.0	44.3	OK
213.006	76	82.644	-0.070	0.000	0.95	0.0	44.4	OK
223.000	77	82.648	-0.201	0.000	0.21	0.0	12.6	OK
213.007	78	82.467	-0.221	0.000	0.16	0.0	48.6	OK
224.000	79	83.056	-0.094	0.000	0.29	0.0	7.5	OK
224.001	80	82.250	-0.100	0.000	0.24	0.0	7.4	OK
224.002	81	81.853	-0.097	0.000	0.26	0.0	9.2	OK
225.000	82	82.045	-0.105	0.000	0.19	0.0	5.3	OK
224.003	83	81.346	-0.004	0.000	1.01	0.0	14.2	OK
224.004	84	81.285	-0.015	0.000	0.14	0.0	1.8	OK
226.000	85	81.840	-0.185	0.000	0.07	0.0	4.9	OK
226.001	86	81.281	-0.144	0.000	0.03	0.0	1.1	OK
224.005	87	81.281	0.051	0.000	0.06	0.0	2.7	SURCHARGED

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

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
200.014	88	81.282	0.205	0.000	0.22	0.0	14.5	SURCHARGED

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.000	15 Summer	30	0%					
200.001	15 Summer	30	0%	100/15 Summer				
201.000	15 Summer	30	0%	100/15 Summer				
200.002	15 Summer	30	0%	100/15 Summer				
200.003	15 Winter	30	0%					
202.000	15 Summer	30	0%					
202.001	15 Summer	30	0%	100/15 Summer				
200.004	15 Winter	30	0%					
203.000	15 Summer	30	0%					
203.001	15 Summer	30	0%	30/15 Summer				
200.005	15 Winter	30	0%					
204.000	15 Summer	30	0%					
204.001	240 Winter	30	0%	30/15 Summer				
200.006	240 Winter	30	0%	30/15 Summer				
205.000	15 Summer	30	0%					
200.007	15 Summer	30	0%					
206.000	15 Summer	30	0%	100/30 Winter				
206.001	60 Winter	30	0%	100/15 Summer				
206.002	60 Winter	30	0%	30/15 Summer				
207.000	15 Summer	30	0%	30/15 Summer				
207.001	15 Summer	30	0%	30/15 Summer				
206.003	60 Winter	30	0%	30/15 Summer				
200.008	15 Summer	30	0%	100/15 Winter				
208.000	15 Winter	30	0%					
208.001	15 Winter	30	0%					
200.009	15 Winter	30	0%	30/15 Summer				
200.010	15 Winter	30	0%					
209.000	15 Summer	30	0%	30/15 Summer				
209.001	15 Summer	30	0%					
209.002	15 Summer	30	0%	100/15 Summer				
210.000	15 Summer	30	0%	100/15 Summer				
209.003	15 Summer	30	0%	30/15 Summer				
211.000	60 Winter	30	0%	100/15 Winter				
209.004	60 Winter	30	0%	30/60 Winter				
200.011	15 Winter	30	0%	100/60 Winter				
200.012	240 Winter	30	0%	100/60 Winter				
212.000	15 Summer	30	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.013	240 Winter	30	0%	100/30 Winter				
213.000	15 Summer	30	0%					
213.001	15 Summer	30	0%	100/15 Summer				
214.000	15 Summer	30	0%					
215.000	15 Summer	30	0%					
216.000	15 Summer	30	0%					
215.001	15 Summer	30	0%					
215.002	15 Summer	30	0%					
215.003	15 Summer	30	0%	30/15 Summer				
215.004	60 Winter	30	0%	30/30 Winter				
217.000	60 Winter	30	0%	30/15 Summer				
215.005	60 Winter	30	0%	30/15 Summer				
214.001	15 Summer	30	0%					
213.002	15 Winter	30	0%	30/15 Summer				
218.000	15 Summer	30	0%	100/15 Summer				
218.001	15 Summer	30	0%	100/15 Summer				
218.002	15 Summer	30	0%	30/15 Summer				
218.003	15 Summer	30	0%					
218.004	15 Summer	30	0%	100/15 Summer				
219.000	15 Summer	30	0%					
219.001	15 Summer	30	0%	100/15 Summer				
218.005	60 Winter	30	0%	30/15 Summer				
213.003	15 Winter	30	0%	30/15 Summer				
220.000	15 Summer	30	0%					
220.001	15 Summer	30	0%					
220.002	15 Summer	30	0%					
221.000	15 Summer	30	0%					
221.001	15 Summer	30	0%					
221.002	15 Summer	30	0%					
221.003	30 Winter	30	0%	100/15 Summer				
221.004	30 Winter	30	0%	30/15 Summer				
220.003	15 Winter	30	0%	30/15 Summer				
220.004	15 Summer	30	0%					
220.005	15 Winter	30	0%					
220.006	15 Winter	30	0%					
213.004	15 Winter	30	0%	30/15 Summer				
222.000	15 Summer	30	0%					
213.005	15 Winter	30	0%	30/15 Summer				
213.006	15 Winter	30	0%	30/15 Summer				
223.000	15 Summer	30	0%	100/15 Summer				
213.007	15 Winter	30	0%					
224.000	15 Summer	30	0%	100/15 Summer				
224.001	15 Summer	30	0%	100/15 Summer				
224.002	15 Summer	30	0%	30/15 Summer				
225.000	15 Summer	30	0%	100/15 Summer				
224.003	15 Summer	30	0%	30/15 Summer				
224.004	360 Winter	30	0%	30/15 Summer				
226.000	15 Summer	30	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
226.001	240 Winter	30	0%	30/15 Summer				
224.005	240 Winter	30	0%	1/120 Winter				
200.014	240 Winter	30	0%	1/15 Winter				

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
200.000	1	98.793	-0.132	0.000	0.36	0.0	21.6	OK
200.001	2	98.142	-0.183	0.000	0.31	0.0	34.1	OK
201.000	3	98.358	-0.067	0.000	0.74	0.0	31.8	OK
200.002	4	97.978	-0.022	0.000	1.00	0.0	103.5	OK
200.003	5	97.541	-0.559	0.000	0.03	0.0	93.5	OK
202.000	6	97.025	-0.175	0.000	0.36	0.0	49.6	OK
202.001	7	96.352	-0.068	0.000	0.91	0.0	47.2	OK
200.004	8	96.197	-0.603	0.000	0.02	0.0	115.8	OK
203.000	9	94.317	-0.183	0.000	0.32	0.0	61.0	OK
203.001	10	92.402	0.002	0.000	1.10	0.0	57.6	SURCHARGED
200.005	11	92.180	-1.120	0.000	0.01	0.0	144.0	OK
204.000	12	90.500	-0.200	0.000	0.24	0.0	60.3	OK
204.001	13	87.406	0.086	0.000	0.12	0.0	6.5	SURCHARGED
200.006	14	87.405	0.280	0.000	0.03	0.0	3.7	SURCHARGED
205.000	15	86.123	-0.102	0.000	0.58	0.0	24.1	OK
200.007	16	85.870	-0.230	0.000	0.12	0.0	37.7	OK
206.000	17	83.277	-0.148	0.000	0.26	0.0	10.5	OK
206.001	18	83.251	-0.074	0.000	0.11	0.0	6.7	OK
206.002	19	83.250	0.175	0.000	0.23	0.0	9.1	SURCHARGED
207.000	20	83.375	0.250	0.000	1.19	0.0	34.3	SURCHARGED
207.001	21	83.296	0.221	0.000	1.72	0.0	60.6	SURCHARGED
206.003	22	83.248	0.348	0.000	0.29	0.0	4.1	SURCHARGED
200.008	23	82.641	-0.209	0.000	0.19	0.0	40.9	OK
208.000	24	82.508	-0.445	0.000	0.02	0.0	8.1	OK
208.001	25	82.508	-0.428	0.000	0.01	0.0	4.5	OK
200.009	26	82.507	0.357	0.000	0.34	0.0	19.9	SURCHARGED
200.010	27	81.884	-0.151	0.000	0.49	0.0	24.7	OK
209.000	28	84.239	0.014	0.000	1.00	0.0	32.3	SURCHARGED
209.001	29	83.960	-0.119	0.000	0.43	0.0	44.0	OK
209.002	30	82.972	-0.107	0.000	0.53	0.0	44.8	OK
210.000	31	83.110	-0.115	0.000	0.48	0.0	31.9	OK
209.003	32	82.793	0.213	0.000	2.30	0.0	72.6	SURCHARGED
211.000	33	82.534	-0.060	0.000	0.07	0.0	2.2	OK
209.004	34	82.534	0.004	0.000	0.05	0.0	5.1	FLOOD RISK
200.011	35	81.794	-0.129	0.000	0.57	0.0	29.2	OK
200.012	36	81.765	-0.120	0.000	0.44	0.0	23.9	OK
212.000	37	81.788	-0.113	0.000	0.49	0.0	16.0	OK
200.013	38	81.748	-0.005	0.000	0.13	0.0	25.3	OK
213.000	39	85.575	-0.150	0.000	0.24	0.0	14.8	OK
213.001	40	85.301	-0.124	0.000	0.39	0.0	31.6	OK

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

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
214.000	41	89.095	-0.130	0.000	0.37	0.0	50.6	OK
215.000	42	91.029	-0.196	0.000	0.04	0.0	5.5	OK
216.000	43	90.264	-0.161	0.000	0.18	0.0	8.0	OK
215.001	44	90.194	-0.131	0.000	0.36	0.0	34.3	OK
215.002	45	88.533	-0.142	0.000	0.28	0.0	33.9	OK
215.003	46	88.086	0.161	0.000	1.36	0.0	53.6	SURCHARGED
215.004	47	87.759	0.020	0.000	0.31	0.0	21.7	SURCHARGED
217.000	48	87.759	0.117	0.000	0.22	0.0	7.1	SURCHARGED
215.005	49	87.756	0.267	0.000	0.04	0.0	4.1	SURCHARGED
214.001	50	86.088	-0.137	0.000	0.32	0.0	53.7	OK
213.002	51	83.935	0.310	0.000	1.09	0.0	85.8	SURCHARGED
218.000	52	86.884	-0.066	0.000	0.60	0.0	9.3	OK
218.001	53	86.797	-0.053	0.000	0.72	0.0	17.4	OK
218.002	54	86.397	0.047	0.000	1.03	0.0	28.6	SURCHARGED
218.003	55	85.499	-0.101	0.000	0.58	0.0	41.3	OK
218.004	56	84.793	-0.057	0.000	0.90	0.0	58.1	OK
219.000	57	85.021	-0.080	0.000	0.44	0.0	9.3	OK
219.001	58	84.853	-0.048	0.000	0.77	0.0	17.4	OK
218.005	59	84.767	0.317	0.000	0.04	0.0	4.1	SURCHARGED
213.003	60	83.333	0.383	0.000	1.70	0.0	84.0	SURCHARGED
220.000	61	92.564	-0.161	0.000	0.18	0.0	14.2	OK
220.001	62	91.884	-0.141	0.000	0.28	0.0	32.1	OK
220.002	63	87.909	-0.116	0.000	0.47	0.0	46.0	OK
221.000	64	93.050	-0.100	0.000	0.24	0.0	10.5	OK
221.001	65	91.501	-0.149	0.000	0.25	0.0	29.0	OK
221.002	66	89.029	-0.121	0.000	0.42	0.0	46.4	OK
221.003	67	86.484	-0.066	0.000	0.48	0.0	30.2	OK
221.004	68	86.480	0.130	0.000	0.08	0.0	4.1	SURCHARGED
220.003	69	86.218	0.068	0.000	1.69	0.0	46.4	SURCHARGED
220.004	70	85.922	-0.194	0.000	0.26	0.0	62.4	OK
220.005	71	83.318	-0.439	0.000	0.10	0.0	64.7	OK
220.006	72	83.298	-0.421	0.000	0.13	0.0	48.3	OK
213.004	73	83.294	0.376	0.000	1.46	0.0	86.1	SURCHARGED
222.000	74	83.410	-0.115	0.000	0.48	0.0	15.4	OK
213.005	75	83.018	0.228	0.000	1.64	0.0	92.6	SURCHARGED
213.006	76	82.811	0.097	0.000	1.97	0.0	92.6	SURCHARGED
223.000	77	82.745	-0.104	0.000	0.67	0.0	40.1	OK
213.007	78	82.516	-0.173	0.000	0.37	0.0	116.1	OK
224.000	79	83.114	-0.036	0.000	0.92	0.0	23.7	OK
224.001	80	82.299	-0.051	0.000	0.75	0.0	23.5	OK
224.002	81	82.061	0.111	0.000	0.86	0.0	30.1	SURCHARGED
225.000	82	82.085	-0.065	0.000	0.61	0.0	16.6	OK
224.003	83	81.779	0.429	0.000	3.09	0.0	43.3	SURCHARGED
224.004	84	81.751	0.451	0.000	0.15	0.0	2.0	SURCHARGED
226.000	85	81.873	-0.152	0.000	0.23	0.0	15.4	OK
226.001	86	81.732	0.307	0.000	0.07	0.0	2.2	SURCHARGED
224.005	87	81.730	0.499	0.000	0.09	0.0	3.8	SURCHARGED

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

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
200.014	88	81.729	0.652	0.000	0.62	0.0	40.1	SURCHARGED

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.000	15 Summer	100	0%					
200.001	15 Summer	100	0%	100/15 Summer				
201.000	15 Summer	100	0%	100/15 Summer				
200.002	15 Summer	100	0%	100/15 Summer				
200.003	15 Winter	100	0%					
202.000	15 Summer	100	0%					
202.001	15 Summer	100	0%	100/15 Summer				
200.004	15 Winter	100	0%					
203.000	15 Summer	100	0%					
203.001	15 Summer	100	0%	30/15 Summer				
200.005	15 Winter	100	0%					
204.000	15 Summer	100	0%					
204.001	360 Winter	100	0%	30/15 Summer				
200.006	360 Winter	100	0%	30/15 Summer				
205.000	15 Summer	100	0%					
200.007	15 Summer	100	0%					
206.000	60 Winter	100	0%	100/30 Winter				
206.001	60 Winter	100	0%	100/15 Summer				
206.002	60 Winter	100	0%	30/15 Summer				
207.000	15 Summer	100	0%	30/15 Summer				
207.001	15 Summer	100	0%	30/15 Summer				
206.003	60 Winter	100	0%	30/15 Summer				
200.008	15 Winter	100	0%	100/15 Winter				
208.000	15 Winter	100	0%					
208.001	15 Winter	100	0%					
200.009	15 Winter	100	0%	30/15 Summer				
200.010	120 Winter	100	0%					
209.000	15 Summer	100	0%	30/15 Summer				
209.001	15 Summer	100	0%					
209.002	15 Summer	100	0%	100/15 Summer				
210.000	15 Summer	100	0%	100/15 Summer				
209.003	15 Summer	100	0%	30/15 Summer				
211.000	60 Winter	100	0%	100/15 Winter				
209.004	60 Winter	100	0%	30/60 Winter				
200.011	120 Winter	100	0%	100/60 Winter				
200.012	120 Winter	100	0%	100/60 Winter				
212.000	240 Winter	100	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.013	240 Winter	100	0%	100/30 Winter				
213.000	15 Summer	100	0%					
213.001	15 Summer	100	0%	100/15 Summer				
214.000	15 Summer	100	0%					
215.000	15 Summer	100	0%					
216.000	15 Summer	100	0%					
215.001	15 Summer	100	0%					
215.002	15 Winter	100	0%					
215.003	15 Winter	100	0%	30/15 Summer				
215.004	60 Winter	100	0%	30/30 Winter				
217.000	60 Winter	100	0%	30/15 Summer				
215.005	60 Winter	100	0%	30/15 Summer				
214.001	15 Summer	100	0%					
213.002	15 Winter	100	0%	30/15 Summer				
218.000	15 Winter	100	0%	100/15 Summer				
218.001	15 Winter	100	0%	100/15 Summer				
218.002	15 Summer	100	0%	30/15 Summer				
218.003	15 Summer	100	0%					
218.004	15 Winter	100	0%	100/15 Summer				
219.000	15 Summer	100	0%					
219.001	60 Winter	100	0%	100/15 Summer				
218.005	60 Winter	100	0%	30/15 Summer				
213.003	15 Winter	100	0%	30/15 Summer				
220.000	15 Summer	100	0%					
220.001	15 Summer	100	0%					
220.002	15 Summer	100	0%					
221.000	15 Summer	100	0%					
221.001	15 Summer	100	0%					
221.002	15 Summer	100	0%					
221.003	15 Winter	100	0%	100/15 Summer				
221.004	30 Winter	100	0%	30/15 Summer				
220.003	15 Winter	100	0%	30/15 Summer				
220.004	15 Summer	100	0%					
220.005	15 Winter	100	0%					
220.006	15 Winter	100	0%					
213.004	15 Winter	100	0%	30/15 Summer				
222.000	15 Summer	100	0%					
213.005	15 Winter	100	0%	30/15 Summer				
213.006	15 Winter	100	0%	30/15 Summer				
223.000	15 Summer	100	0%	100/15 Summer				
213.007	15 Winter	100	0%					
224.000	15 Summer	100	0%	100/15 Summer				
224.001	15 Summer	100	0%	100/15 Summer				
224.002	15 Winter	100	0%	30/15 Summer				
225.000	15 Summer	100	0%	100/15 Summer				
224.003	15 Winter	100	0%	30/15 Summer				
224.004	240 Winter	100	0%	30/15 Summer				
226.000	15 Summer	100	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
226.001	240 Winter	100	0%	30/15 Summer				
224.005	240 Winter	100	0%	1/120 Winter				
200.014	240 Winter	100	0%	1/15 Winter				

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
200.000	1	98.819	-0.106	0.000	0.54	0.0	32.1	OK
200.001	2	98.392	0.067	0.000	0.45	0.0	48.9	SURCHARGED
201.000	3	98.738	0.313	0.000	1.03	0.0	44.2	SURCHARGED
200.002	4	98.259	0.259	0.000	1.36	0.0	140.9	SURCHARGED
200.003	5	97.566	-0.534	0.000	0.04	0.0	133.7	OK
202.000	6	97.059	-0.141	0.000	0.55	0.0	74.9	OK
202.001	7	96.454	0.034	0.000	1.36	0.0	70.9	SURCHARGED
200.004	8	96.225	-0.575	0.000	0.03	0.0	165.4	OK
203.000	9	94.348	-0.152	0.000	0.49	0.0	92.1	OK
203.001	10	92.481	0.081	0.000	1.70	0.0	88.8	SURCHARGED
200.005	11	92.202	-1.098	0.000	0.01	0.0	210.5	OK
204.000	12	90.525	-0.175	0.000	0.37	0.0	91.1	OK
204.001	13	87.607	0.287	0.000	0.12	0.0	6.5	FLOOD RISK
200.006	14	87.607	0.482	0.000	0.03	0.0	3.9	FLOOD RISK
205.000	15	86.162	-0.063	0.000	0.87	0.0	36.3	OK
200.007	16	85.888	-0.212	0.000	0.19	0.0	57.3	OK
206.000	17	83.515	0.090	0.000	0.12	0.0	4.9	SURCHARGED
206.001	18	83.515	0.190	0.000	0.16	0.0	9.4	SURCHARGED
206.002	19	83.512	0.437	0.000	0.31	0.0	12.3	SURCHARGED
207.000	20	83.862	0.737	0.000	1.72	0.0	49.8	SURCHARGED
207.001	21	83.701	0.626	0.000	2.51	0.0	88.3	SURCHARGED
206.003	22	83.509	0.609	0.000	0.32	0.0	4.4	SURCHARGED
200.008	23	82.866	0.016	0.000	0.27	0.0	57.3	SURCHARGED
208.000	24	82.858	-0.095	0.000	0.03	0.0	12.4	OK
208.001	25	82.858	-0.078	0.000	0.01	0.0	4.4	OK
200.009	26	82.857	0.707	0.000	0.34	0.0	19.9	SURCHARGED
200.010	27	82.022	-0.013	0.000	0.43	0.0	21.6	OK
209.000	28	84.456	0.231	0.000	1.46	0.0	47.4	SURCHARGED
209.001	29	83.990	-0.089	0.000	0.66	0.0	66.7	OK
209.002	30	83.338	0.258	0.000	0.76	0.0	64.2	SURCHARGED
210.000	31	83.294	0.069	0.000	0.68	0.0	45.2	SURCHARGED
209.003	32	83.025	0.445	0.000	3.16	0.0	99.7	SURCHARGED
211.000	33	82.664	0.070	0.000	0.10	0.0	3.1	SURCHARGED
209.004	34	82.663	0.134	0.000	0.05	0.0	5.1	FLOOD RISK
200.011	35	81.987	0.064	0.000	0.52	0.0	26.7	SURCHARGED
200.012	36	81.950	0.065	0.000	0.54	0.0	29.2	SURCHARGED
212.000	37	81.894	-0.007	0.000	0.08	0.0	2.5	OK
200.013	38	81.892	0.140	0.000	0.15	0.0	28.2	SURCHARGED
213.000	39	85.594	-0.131	0.000	0.36	0.0	22.4	OK
213.001	40	85.426	0.001	0.000	0.58	0.0	46.4	SURCHARGED

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

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
214.000	41	89.121	-0.104	0.000	0.56	0.0	76.4	OK
215.000	42	91.036	-0.189	0.000	0.06	0.0	8.4	OK
216.000	43	90.280	-0.145	0.000	0.27	0.0	12.1	OK
215.001	44	90.220	-0.105	0.000	0.54	0.0	51.7	OK
215.002	45	88.660	-0.015	0.000	0.40	0.0	48.6	OK
215.003	46	88.557	0.632	0.000	1.93	0.0	75.9	FLOOD RISK
215.004	47	88.025	0.285	0.000	0.41	0.0	28.6	SURCHARGED
217.000	48	88.025	0.383	0.000	0.31	0.0	10.2	SURCHARGED
215.005	49	88.022	0.533	0.000	0.04	0.0	4.4	SURCHARGED
214.001	50	86.109	-0.116	0.000	0.48	0.0	80.3	OK
213.002	51	84.956	1.331	0.000	1.53	0.0	120.7	SURCHARGED
218.000	52	87.132	0.182	0.000	0.76	0.0	11.7	SURCHARGED
218.001	53	87.104	0.254	0.000	0.82	0.0	20.0	SURCHARGED
218.002	54	86.807	0.457	0.000	1.27	0.0	35.2	SURCHARGED
218.003	55	85.524	-0.076	0.000	0.74	0.0	53.0	OK
218.004	56	85.091	0.241	0.000	1.13	0.0	73.5	SURCHARGED
219.000	57	85.067	-0.034	0.000	0.65	0.0	13.6	OK
219.001	58	85.047	0.146	0.000	0.42	0.0	9.5	SURCHARGED
218.005	59	85.042	0.592	0.000	0.04	0.0	4.6	SURCHARGED
213.003	60	83.737	0.787	0.000	2.38	0.0	117.6	SURCHARGED
220.000	61	92.579	-0.146	0.000	0.27	0.0	21.4	OK
220.001	62	91.907	-0.118	0.000	0.43	0.0	48.5	OK
220.002	63	87.942	-0.083	0.000	0.71	0.0	69.5	OK
221.000	64	93.063	-0.087	0.000	0.37	0.0	15.8	OK
221.001	65	91.521	-0.129	0.000	0.37	0.0	43.8	OK
221.002	66	89.059	-0.091	0.000	0.64	0.0	70.0	OK
221.003	67	86.693	0.143	0.000	1.07	0.0	67.6	SURCHARGED
221.004	68	86.682	0.332	0.000	0.08	0.0	4.1	SURCHARGED
220.003	69	86.347	0.197	0.000	2.50	0.0	68.4	SURCHARGED
220.004	70	85.948	-0.168	0.000	0.39	0.0	92.8	OK
220.005	71	83.757	0.000	0.000	0.15	0.0	95.1	OK
220.006	72	83.708	-0.011	0.000	0.16	0.0	61.2	OK
213.004	73	83.680	0.761	0.000	1.86	0.0	109.9	SURCHARGED
222.000	74	83.443	-0.082	0.000	0.73	0.0	23.3	OK
213.005	75	83.232	0.442	0.000	2.09	0.0	118.1	SURCHARGED
213.006	76	82.896	0.182	0.000	2.51	0.0	118.1	SURCHARGED
223.000	77	82.885	0.036	0.000	0.99	0.0	59.7	SURCHARGED
213.007	78	82.538	-0.151	0.000	0.49	0.0	152.1	OK
224.000	79	83.636	0.486	0.000	1.14	0.0	29.3	SURCHARGED
224.001	80	82.703	0.353	0.000	0.78	0.0	24.4	SURCHARGED
224.002	81	82.470	0.520	0.000	0.99	0.0	34.7	FLOOD RISK
225.000	82	82.447	0.297	0.000	0.76	0.0	20.8	SURCHARGED
224.003	83	82.068	0.718	0.000	3.59	0.0	50.2	SURCHARGED
224.004	84	81.922	0.622	0.000	0.19	0.0	2.5	FLOOD RISK
226.000	85	81.892	-0.133	0.000	0.35	0.0	23.2	OK
226.001	86	81.885	0.460	0.000	0.10	0.0	3.0	SURCHARGED
224.005	87	81.882	0.651	0.000	0.09	0.0	3.8	SURCHARGED

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

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
200.014	88	81.879	0.802	0.000	0.81	0.0	52.5	SURCHARGED

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

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.000	15 Winter	100	+30%					
200.001	15 Summer	100	+30%	100/15 Summer				
201.000	15 Summer	100	+30%	100/15 Summer				
200.002	15 Summer	100	+30%	100/15 Summer				
200.003	15 Winter	100	+30%					
202.000	15 Summer	100	+30%					
202.001	15 Summer	100	+30%	100/15 Summer				
200.004	15 Winter	100	+30%					
203.000	15 Summer	100	+30%					
203.001	15 Summer	100	+30%	100/15 Summer				
200.005	15 Winter	100	+30%					
204.000	15 Summer	100	+30%					
204.001	360 Winter	100	+30%	100/15 Summer	100/360 Winter			1
200.006	360 Winter	100	+30%	100/15 Summer	100/360 Winter			1
205.000	15 Summer	100	+30%	100/15 Summer				
200.007	15 Summer	100	+30%					
206.000	60 Winter	100	+30%	100/15 Summer				
206.001	60 Winter	100	+30%	100/15 Summer				
206.002	60 Winter	100	+30%	100/15 Summer				
207.000	15 Summer	100	+30%	100/15 Summer				
207.001	15 Winter	100	+30%	100/15 Summer				
206.003	60 Winter	100	+30%	100/15 Summer				
200.008	15 Winter	100	+30%	100/15 Summer				
208.000	30 Winter	100	+30%	100/15 Summer				
208.001	15 Winter	100	+30%	100/15 Summer				
200.009	15 Winter	100	+30%	100/15 Summer	100/15 Winter			3
200.010	120 Winter	100	+30%	100/60 Winter				
209.000	15 Summer	100	+30%	100/15 Summer				
209.001	15 Summer	100	+30%	100/15 Summer				
209.002	15 Summer	100	+30%	100/15 Summer				
210.000	15 Summer	100	+30%	100/15 Summer				
209.003	15 Summer	100	+30%	100/15 Summer				
211.000	60 Winter	100	+30%	100/15 Summer				
209.004	60 Winter	100	+30%	100/15 Summer				
200.011	120 Winter	100	+30%	100/30 Summer				
200.012	120 Winter	100	+30%	100/15 Winter				
212.000	240 Winter	100	+30%	100/30 Winter				
200.013	240 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
213.000	15 Winter	100	+30%	100/15 Summer				
213.001	15 Winter	100	+30%	100/15 Summer				
214.000	15 Summer	100	+30%					
215.000	15 Summer	100	+30%					
216.000	15 Summer	100	+30%					
215.001	15 Summer	100	+30%					
215.002	15 Summer	100	+30%	100/15 Summer				
215.003	15 Winter	100	+30%	100/15 Summer	100/15 Summer			3
215.004	60 Winter	100	+30%	100/15 Summer				
217.000	60 Winter	100	+30%	100/15 Summer				
215.005	60 Winter	100	+30%	100/15 Summer				
214.001	15 Summer	100	+30%	100/15 Summer				
213.002	15 Winter	100	+30%	100/15 Summer				
218.000	15 Winter	100	+30%	100/15 Summer				
218.001	15 Winter	100	+30%	100/15 Summer				
218.002	15 Winter	100	+30%	100/15 Summer				
218.003	15 Winter	100	+30%	100/15 Summer				
218.004	15 Winter	100	+30%	100/15 Summer				
219.000	15 Winter	100	+30%	100/15 Summer				
219.001	60 Winter	100	+30%	100/15 Summer				
218.005	60 Winter	100	+30%	100/15 Summer				
213.003	15 Winter	100	+30%	100/15 Summer				
220.000	15 Summer	100	+30%					
220.001	15 Summer	100	+30%					
220.002	15 Summer	100	+30%					
221.000	15 Summer	100	+30%					
221.001	15 Summer	100	+30%					
221.002	15 Summer	100	+30%					
221.003	15 Winter	100	+30%	100/15 Summer				
221.004	60 Winter	100	+30%	100/15 Summer				
220.003	15 Summer	100	+30%	100/15 Summer				
220.004	15 Summer	100	+30%					
220.005	15 Winter	100	+30%	100/15 Summer				
220.006	15 Winter	100	+30%	100/15 Summer	100/15 Winter			1
213.004	15 Winter	100	+30%	100/15 Summer				
222.000	15 Winter	100	+30%	100/15 Winter				
213.005	15 Winter	100	+30%	100/15 Summer				
213.006	15 Winter	100	+30%	100/15 Summer				
223.000	15 Summer	100	+30%	100/15 Summer				
213.007	15 Winter	100	+30%					
224.000	15 Summer	100	+30%	100/15 Summer	100/15 Summer			1
224.001	15 Winter	100	+30%	100/15 Summer				
224.002	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
225.000	15 Summer	100	+30%	100/15 Summer				
224.003	15 Winter	100	+30%	100/15 Summer				
224.004	240 Winter	100	+30%	100/15 Summer				
226.000	240 Winter	100	+30%	100/120 Winter				
226.001	240 Winter	100	+30%	100/15 Summer				
224.005	240 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
200.014	240 Winter	100	+30%	100/15 Summer				

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
200.000	1	98.886	-0.039	0.000	0.63	0.0	37.4	OK
200.001	2	98.767	0.442	0.000	0.45	0.0	49.1	SURCHARGED
201.000	3	99.270	0.845	0.000	1.24	0.0	52.9	FLOOD RISK
200.002	4	98.628	0.628	0.000	1.71	0.0	177.9	FLOOD RISK
200.003	5	97.589	-0.511	0.000	0.06	0.0	170.7	OK
202.000	6	97.088	-0.112	0.000	0.71	0.0	97.4	OK
202.001	7	96.516	0.096	0.000	1.78	0.0	92.7	FLOOD RISK
200.004	8	96.244	-0.556	0.000	0.04	0.0	216.2	OK
203.000	9	94.374	-0.126	0.000	0.63	0.0	119.8	OK
203.001	10	92.578	0.178	0.000	2.20	0.0	114.8	SURCHARGED
200.005	11	92.224	-1.076	0.000	0.01	0.0	279.2	OK
204.000	12	90.546	-0.154	0.000	0.48	0.0	118.5	OK
204.001	13	87.801	0.481	1.166	0.15	0.0	8.4	FLOOD
200.006	14	87.801	0.676	0.443	0.03	0.0	4.4	FLOOD
205.000	15	86.245	0.020	0.000	1.14	0.0	47.4	SURCHARGED
200.007	16	85.901	-0.199	0.000	0.24	0.0	75.0	FLOOD RISK
206.000	17	83.789	0.364	0.000	0.15	0.0	6.1	SURCHARGED
206.001	18	83.789	0.464	0.000	0.18	0.0	10.8	SURCHARGED
206.002	19	83.787	0.712	0.000	0.37	0.0	14.9	SURCHARGED
207.000	20	84.412	1.287	0.000	2.14	0.0	61.7	SURCHARGED
207.001	21	84.178	1.103	0.000	3.07	0.0	108.2	SURCHARGED
206.003	22	83.785	0.885	0.000	0.35	0.0	4.9	SURCHARGED
200.008	23	83.429	0.579	0.000	0.35	0.0	72.7	SURCHARGED
208.000	24	83.405	0.452	0.000	0.02	0.0	9.7	SURCHARGED
208.001	25	83.405	0.469	0.000	0.02	0.0	10.5	SURCHARGED
200.009	26	83.405	1.255	4.634	0.38	0.0	22.1	FLOOD
200.010	27	82.249	0.214	0.000	0.44	0.0	22.1	SURCHARGED
209.000	28	84.714	0.489	0.000	1.86	0.0	60.4	SURCHARGED
209.001	29	84.193	0.113	0.000	0.73	0.0	74.4	SURCHARGED
209.002	30	83.622	0.543	0.000	0.91	0.0	76.7	FLOOD RISK
210.000	31	83.708	0.483	0.000	0.83	0.0	54.9	SURCHARGED
209.003	32	83.265	0.685	0.000	3.81	0.0	120.0	FLOOD RISK
211.000	33	82.794	0.200	0.000	0.13	0.0	4.1	SURCHARGED
209.004	34	82.793	0.264	0.000	0.05	0.0	5.1	FLOOD RISK
200.011	35	82.234	0.311	0.000	0.53	0.0	27.2	SURCHARGED
200.012	36	82.172	0.287	0.000	0.56	0.0	30.4	SURCHARGED
212.000	37	82.121	0.220	0.000	0.09	0.0	3.1	SURCHARGED
200.013	38	82.119	0.366	0.000	0.15	0.0	28.8	SURCHARGED
213.000	39	86.330	0.605	0.000	0.40	0.0	24.8	SURCHARGED
213.001	40	86.302	0.877	0.000	0.60	0.0	48.8	FLOOD RISK
214.000	41	89.143	-0.082	0.000	0.73	0.0	99.3	OK
215.000	42	91.043	-0.182	0.000	0.08	0.0	10.9	OK
216.000	43	90.293	-0.132	0.000	0.36	0.0	15.7	OK

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

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
215.001	44	90.243	-0.082	0.000	0.70	0.0	67.1	OK
215.002	45	88.853	0.178	0.000	0.56	0.0	68.1	SURCHARGED
215.003	46	88.605	0.680	4.747	2.02	0.0	79.4	FLOOD
215.004	47	88.288	0.549	0.000	0.54	0.0	38.2	SURCHARGED
217.000	48	88.288	0.646	0.000	0.41	0.0	13.2	SURCHARGED
215.005	49	88.285	0.796	0.000	0.04	0.0	5.1	SURCHARGED
214.001	50	86.314	0.089	0.000	0.59	0.0	99.0	SURCHARGED
213.002	51	85.747	2.122	0.000	1.80	0.0	141.7	SURCHARGED
218.000	52	87.744	0.794	0.000	0.76	0.0	11.7	SURCHARGED
218.001	53	87.720	0.870	0.000	0.87	0.0	21.2	SURCHARGED
218.002	54	87.382	1.032	0.000	1.42	0.0	39.4	SURCHARGED
218.003	55	85.864	0.264	0.000	0.84	0.0	59.8	SURCHARGED
218.004	56	85.343	0.493	0.000	1.31	0.0	85.2	SURCHARGED
219.000	57	85.365	0.264	0.000	0.69	0.0	14.3	SURCHARGED
219.001	58	85.339	0.438	0.000	0.52	0.0	11.8	SURCHARGED
218.005	59	85.334	0.884	0.000	0.05	0.0	5.3	SURCHARGED
213.003	60	84.596	1.646	0.000	2.79	0.0	138.2	SURCHARGED
220.000	61	92.592	-0.133	0.000	0.35	0.0	27.9	OK
220.001	62	91.925	-0.100	0.000	0.56	0.0	63.0	OK
220.002	63	87.986	-0.039	0.000	0.91	0.0	89.9	OK
221.000	64	93.073	-0.077	0.000	0.48	0.0	20.6	OK
221.001	65	91.537	-0.113	0.000	0.49	0.0	57.0	OK
221.002	66	89.086	-0.064	0.000	0.83	0.0	91.0	OK
221.003	67	86.911	0.361	0.000	1.39	0.0	87.6	SURCHARGED
221.004	68	86.873	0.523	0.000	0.09	0.0	4.4	SURCHARGED
220.003	69	86.503	0.353	0.000	3.18	0.0	87.1	SURCHARGED
220.004	70	85.969	-0.148	0.000	0.49	0.0	118.3	OK
220.005	71	84.506	0.749	0.000	0.19	0.0	120.1	SURCHARGED
220.006	72	84.503	0.784	3.947	0.21	0.0	78.8	FLOOD
213.004	73	84.509	1.591	0.000	2.55	0.0	150.7	FLOOD RISK
222.000	74	83.696	0.171	0.000	0.84	0.0	26.9	SURCHARGED
213.005	75	83.682	0.893	0.000	2.80	0.0	158.1	FLOOD RISK
213.006	76	83.076	0.362	0.000	3.37	0.0	158.3	SURCHARGED
223.000	77	83.030	0.181	0.000	1.28	0.0	77.0	SURCHARGED
213.007	78	82.555	-0.134	0.000	0.59	0.0	181.7	OK
224.000	79	84.200	1.050	0.090	1.28	0.0	32.9	FLOOD
224.001	80	83.095	0.745	0.000	0.93	0.0	28.9	FLOOD RISK
224.002	81	82.751	0.801	0.629	1.11	0.0	39.1	FLOOD
225.000	82	82.862	0.712	0.000	0.89	0.0	24.4	SURCHARGED
224.003	83	82.316	0.966	0.000	4.11	0.0	57.6	FLOOD RISK
224.004	84	82.156	0.856	0.000	0.24	0.0	3.1	FLOOD RISK
226.000	85	82.113	0.088	0.000	0.05	0.0	3.1	SURCHARGED
226.001	86	82.111	0.686	0.000	0.13	0.0	4.1	FLOOD RISK
224.005	87	82.109	0.878	0.000	0.08	0.0	3.5	FLOOD RISK
200.014	88	82.105	1.028	0.000	0.82	0.0	53.5	FLOOD RISK

Microdrainage Calculations for Residential Area 4

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
400.000	33.934	0.339	100.1	0.055	3.00	0.600	o	225
401.000	6.771	0.839	8.1	0.031	3.00	0.600	o	150
400.001	16.852	0.169	99.7	0.000	0.00	0.600	o	150
402.000	12.985	0.808	16.1	0.016	3.00	0.600	o	150
400.002	63.220	0.632	100.0	0.037	0.00	0.600	o	225
400.003	17.341	0.235	73.8	0.000	0.00	0.600	o	225
400.004	20.099	0.100	201.0	0.000	0.00	0.600	o	225
403.000	48.417	0.650	74.5	0.065	3.00	0.600	o	225
403.001	143.429	0.100	1434.3	0.170	0.00	0.600	\/	-11
400.005	21.007	1.250	16.8	0.007	0.00	0.600	o	225
400.006	41.402	4.244	9.8	0.023	0.00	0.600	o	225
400.007	43.759	1.030	42.5	0.025	0.00	0.600	o	750
404.000	37.953	0.400	94.9	0.027	3.00	0.600	o	750

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
400.000	1	100.600	99.700	0.675	101.320	99.361	1.734		1050
401.000	2	101.100	100.200	0.750	101.320	99.361	1.809		1050
400.001	3	101.320	99.361	1.809	101.400	99.192	2.058	Hydro-Brake®	1200
402.000	4	101.700	100.000	1.550	101.400	99.192	2.058		1200
400.002	5	101.400	99.117	2.058	100.320	98.485	1.610		1200
400.003	6	100.320	98.485	1.610	99.450	98.250	0.975		1200
400.004	7	99.450	98.250	0.975	98.900	98.150	0.525		1050
403.000	8	100.200	99.000	0.975	99.000	98.350	0.425		1050
403.001	9	99.000	98.250	0.425	98.900	98.150	0.425		10000
400.005	10	98.900	98.150	0.525	98.100	96.900	0.975	Hydro-Brake®	10000
400.006	11	98.100	96.900	0.975	95.300	92.656	2.419		1050
400.007	12	95.300	92.100	2.450	92.200	91.070	0.380		1800
404.000	13	93.400	91.600	1.050	92.400	91.200	0.450		1800

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
405.000	20.706	0.138	150.0	0.077	3.00	0.600	o	225
405.001	26.685	1.779	15.0	0.052	0.00	0.600	o	225
405.002	16.401	0.867	18.9	0.052	0.00	0.600	o	225
406.000	9.212	0.184	50.0	0.048	3.00	0.600	o	225
405.003	17.207	0.916	18.8	0.000	0.00	0.600	o	150
404.001	5.466	0.130	42.0	0.000	0.00	0.600	o	750
400.008	30.382	0.920	33.0	0.000	0.00	0.600	o	225
407.000	45.800	0.500	91.6	0.127	3.00	0.600	o	225
407.001	76.500	1.000	76.5	0.136	0.00	0.600	|_|	-8
408.000	67.100	1.000	67.1	0.097	3.00	0.600	o	225
408.001	55.100	0.800	68.9	0.071	0.00	0.600	o	300
407.002	14.000	0.140	100.0	0.000	0.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
405.000	14	97.400	95.500	1.675	97.500	95.362	1.913		1200
405.001	15	97.500	95.362	1.913	95.700	93.583	1.892		1200
405.002	16	95.700	93.583	1.892	94.000	92.716	1.059		1200
406.000	17	93.800	92.900	0.675	94.000	92.716	1.059		1050
405.003	18	94.000	92.716	1.134	92.400	91.800	0.450	Hydro-Brake®	1050
404.001	19	92.400	91.200	0.450	92.200	91.070	0.380		1800
400.008	20	92.200	91.070	0.905	91.050	90.150	0.675	Hydro-Brake®	1800
407.000	21	106.500	105.075	1.200	105.500	104.575	0.700		1050
407.001	22	105.500	104.500	0.700	104.500	103.500	0.700		10000
408.000	23	106.800	105.375	1.200	105.300	104.375	0.700		1050
408.001	24	105.300	104.300	0.700	104.500	103.500	0.700		1050
407.002	25	104.500	103.500	0.700	104.100	103.360	0.440		10000

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
407.003	73.800	4.800	15.4	0.160	0.00	0.600	|_|	-8
409.000	13.300	0.060	221.7	0.010	3.00	0.600	o	225
410.000	27.900	0.125	223.2	0.094	3.00	0.600	o	225
410.001	22.100	1.235	17.9	0.060	0.00	0.600	o	225
409.001	13.500	0.240	56.3	0.000	0.00	0.600	o	300
411.000	35.900	1.475	24.3	0.063	3.00	0.600	o	225
409.002	22.200	1.000	22.2	0.019	0.00	0.600	o	300
409.003	75.500	0.975	77.4	0.158	0.00	0.600	o	375
407.004	55.400	0.275	201.5	0.110	0.00	0.600	\/	-11
412.000	30.700	0.500	61.4	0.018	3.00	0.600	o	150
412.001	18.900	0.700	27.0	0.000	0.00	0.600	o	150
412.002	45.800	2.200	20.8	0.062	0.00	0.600	o	225
412.003	32.100	1.325	24.2	0.015	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
407.003	26	104.100	103.350	0.450	99.300	98.550	0.450		10000
409.000	27	102.400	100.975	1.200	102.900	100.915	1.760		1050
410.000	28	103.700	102.275	1.200	103.600	102.150	1.225		1050
410.001	29	103.600	102.150	1.225	102.900	100.915	1.760		1050
409.001	30	102.900	100.840	1.760	102.100	100.600	1.200		1200
411.000	31	103.500	102.150	1.125	102.100	100.675	1.200		1050
409.002	32	102.100	100.600	1.200	101.100	99.600	1.200		1050
409.003	33	101.100	99.525	1.200	99.300	98.550	0.375		1350
407.004	34	99.300	98.550	0.425	99.000	98.275	0.400		10000
412.000	35	104.400	103.050	1.200	103.900	102.550	1.200		1050
412.001	36	103.900	102.550	1.200	103.200	101.850	1.200		1050
412.002	37	103.200	101.775	1.200	101.000	99.575	1.200		1050
412.003	38	101.000	99.575	1.200	99.000	98.250	0.525		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
407.005	48.500	1.100	44.1	0.076	0.00	0.600	\/	-11
407.006	17.700	1.350	13.1	0.040	0.00	0.600	o	525
413.000	14.700	0.074	198.6	0.000	3.00	0.600	o	525
407.007	5.000	0.100	50.0	0.000	0.00	0.600	o	225
407.008	39.600	0.079	501.3	0.036	0.00	0.600	o	750
407.009	62.222	0.124	501.8	0.044	0.00	0.600	o	750
414.000	28.115	1.175	23.9	0.010	3.00	0.600	o	150
415.000	21.504	1.230	17.5	0.039	3.00	0.600	o	225
415.001	40.858	4.095	10.0	0.139	0.00	0.600	o	300
416.000	15.275	1.500	10.2	0.041	3.00	0.600	o	225
415.002	24.222	1.175	20.6	0.000	0.00	0.600	o	150
414.001	21.435	0.750	28.6	0.021	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
407.005	39	99.000	98.250	0.425	97.900	97.150	0.425		10000
407.006	40	97.900	97.150	0.225	97.600	95.800	1.275		10000
413.000	41	98.700	95.874	2.301	97.600	95.800	1.275		1500
407.007	42	97.600	95.800	1.575	97.600	95.700	1.675	Hydro-Brake®	1500
407.008	42	97.600	89.213	7.637	94.700	89.134	4.816		1800
407.009	43	94.700	89.134	4.816	90.900	89.010	1.140		1800
414.000	44	92.200	91.000	1.050	90.900	89.825	0.925		1050
415.000	45	97.300	96.400	0.675	96.550	95.170	1.155		1050
415.001	46	96.550	95.095	1.155	92.500	91.000	1.200		1050
416.000	47	93.400	92.500	0.675	92.500	91.000	1.275		1050
415.002	48	92.500	91.000	1.350	90.900	89.825	0.925	Hydro-Brake®	1050
414.001	49	90.900	89.750	0.925	90.900	89.000	1.675		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
407.010	21.721	0.115	188.9	0.000	0.00	0.600	o	225
400.009	24.792	0.234	106.0	0.000	0.00	0.600	o	225
400.010	5.463	0.051	107.1	0.000	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
407.010	50	90.900	89.000	1.675	91.050	88.885	1.940		1800
400.009	51	91.050	88.885	1.940	90.100	88.651	1.224	Hydro-Brake®	1200
400.010	52	90.100	88.651	1.224	89.800	88.600	0.975		1050

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
400.010	DITCH	89.800	88.600	88.600	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	6
Number of Online Controls	7	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306

Synthetic Rainfall Details

F (1km)	2.501
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: 3, DS/PN: 400.001, Volume (m³): 3.6

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 99.361
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 10, DS/PN: 400.005, Volume (m³): 290.6

Design Head (m) 1.200 Diameter (mm) 90
Design Flow (l/s) 5.0 Invert Level (m) 98.150
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	5.1	3.000	8.0	7.000	12.2
0.200	3.7	1.400	5.5	3.500	8.6	7.500	12.7
0.300	3.5	1.600	5.8	4.000	9.2	8.000	13.1
0.400	3.4	1.800	6.2	4.500	9.8	8.500	13.5
0.500	3.5	2.000	6.5	5.000	10.3	9.000	13.9
0.600	3.7	2.200	6.9	5.500	10.8	9.500	14.2
0.800	4.1	2.400	7.2	6.000	11.3		
1.000	4.6	2.600	7.5	6.500	11.8		

Hydro-Brake® Manhole: 18, DS/PN: 405.003, Volume (m³): 2.0

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 92.716
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.000	5.0	2.400	7.8	5.500	11.8
0.200	4.1	1.200	5.5	2.600	8.1	6.000	12.3
0.300	3.9	1.400	6.0	3.000	8.7	6.500	12.9
0.400	3.8	1.600	6.4	3.500	9.4	7.000	13.3
0.500	3.8	1.800	6.8	4.000	10.1	7.500	13.8
0.600	4.0	2.000	7.1	4.500	10.7	8.000	14.3
0.800	4.5	2.200	7.5	5.000	11.3	8.500	14.7

Hydro-Brake® Manhole: 18, DS/PN: 405.003, Volume (m³): 2.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
9.000	15.1	9.500	15.5

Hydro-Brake® Manhole: 20, DS/PN: 400.008, Volume (m³): 23.0

Design Head (m) 0.750 Hydro-Brake® Type Md4 Invert Level (m) 91.070
Design Flow (l/s) 8.0 Diameter (mm) 109

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	10.1	3.000	16.0	7.000	24.5
0.200	7.6	1.400	11.0	3.500	17.3	7.500	25.4
0.300	7.1	1.600	11.7	4.000	18.5	8.000	26.2
0.400	6.5	1.800	12.4	4.500	19.6	8.500	27.0
0.500	6.7	2.000	13.1	5.000	20.7	9.000	27.8
0.600	7.2	2.200	13.7	5.500	21.7	9.500	28.5
0.800	8.3	2.400	14.3	6.000	22.7		
1.000	9.3	2.600	14.9	6.500	23.6		

Hydro-Brake® Manhole: 42, DS/PN: 407.007, Volume (m³): 8.6

Design Head (m) 1.200 Diameter (mm) 90
Design Flow (l/s) 5.0 Invert Level (m) 95.800
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6	1.200	5.1	3.000	8.0	7.000	12.2
0.200	3.7	1.400	5.5	3.500	8.6	7.500	12.7
0.300	3.5	1.600	5.8	4.000	9.2	8.000	13.1
0.400	3.4	1.800	6.2	4.500	9.8	8.500	13.5
0.500	3.5	2.000	6.5	5.000	10.3	9.000	13.9
0.600	3.7	2.200	6.9	5.500	10.8	9.500	14.2
0.800	4.1	2.400	7.2	6.000	11.3		
1.000	4.6	2.600	7.5	6.500	11.8		

Hydro-Brake® Manhole: 48, DS/PN: 415.002, Volume (m³): 4.7

Design Head (m) 1.000 Diameter (mm) 94
Design Flow (l/s) 5.0 Invert Level (m) 91.000
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	0.600	4.0	1.600	6.4	2.600	8.1
0.200	4.1	0.800	4.5	1.800	6.8	3.000	8.7
0.300	3.9	1.000	5.0	2.000	7.1	3.500	9.4
0.400	3.8	1.200	5.5	2.200	7.5	4.000	10.1
0.500	3.8	1.400	6.0	2.400	7.8	4.500	10.7

Hydro-Brake® Manhole: 48, DS/PN: 415.002, Volume (m³): 4.7

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
5.000	11.3	6.500	12.9	8.000	14.3	9.500	15.5
5.500	11.8	7.000	13.3	8.500	14.7		
6.000	12.3	7.500	13.8	9.000	15.1		

Hydro-Brake® Manhole: 51, DS/PN: 400.009, Volume (m³): 4.4

Design Head (m) 2.100 Diameter (mm) 139
Design Flow (l/s) 16.0 Invert Level (m) 88.885
Hydro-Brake® Type Md6 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.6	1.200	12.1	3.000	19.1	7.000	29.2
0.200	9.7	1.400	13.1	3.500	20.6	7.500	30.2
0.300	10.9	1.600	13.9	4.000	22.0	8.000	31.2
0.400	10.6	1.800	14.8	4.500	23.4	8.500	32.1
0.500	10.2	2.000	15.6	5.000	24.6	9.000	33.1
0.600	10.0	2.200	16.4	5.500	25.9	9.500	34.0
0.800	10.4	2.400	17.1	6.000	27.0		
1.000	11.2	2.600	17.8	6.500	28.1		

Storage Structures for Storm

Tank or Pond Manhole: 3, DS/PN: 400.001

Invert Level (m) 99.361

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	30.0	1.000	30.0

Tank or Pond Manhole: 7, DS/PN: 400.004

Invert Level (m) 98.250

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	283.0	1.200	590.0

Tank or Pond Manhole: 18, DS/PN: 405.003

Invert Level (m) 92.716

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	105.0	1.000	105.0

Tank or Pond Manhole: 41, DS/PN: 413.000

Invert Level (m) 95.974

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	640.0	1.200	640.0

Tank or Pond Manhole: 48, DS/PN: 415.002

Invert Level (m) 91.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	98.0	1.000	98.0

Tank or Pond Manhole: 51, DS/PN: 400.009

Invert Level (m) 89.850

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	125.0	1.200	337.0

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

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
400.000	15 Summer	1	0%	100/15 Summer				
401.000	15 Summer	1	0%					
400.001	30 Winter	1	0%	30/15 Summer				
402.000	15 Summer	1	0%					
400.002	15 Winter	1	0%					
400.003	15 Winter	1	0%					
400.004	240 Winter	1	0%	100/120 Winter				
403.000	15 Summer	1	0%					
403.001	15 Winter	1	0%					
400.005	240 Winter	1	0%	30/15 Summer				
400.006	120 Winter	1	0%					
400.007	15 Winter	1	0%					
404.000	15 Summer	1	0%					
405.000	15 Summer	1	0%	30/15 Summer				
405.001	15 Summer	1	0%					
405.002	15 Summer	1	0%	100/15 Summer				
406.000	15 Summer	1	0%	30/15 Winter				
405.003	120 Winter	1	0%	1/60 Winter				
404.001	120 Winter	1	0%	100/120 Winter				
400.008	120 Winter	1	0%	1/15 Winter				
407.000	15 Summer	1	0%	30/15 Summer				
407.001	15 Winter	1	0%					
408.000	15 Summer	1	0%	100/15 Summer				
408.001	15 Summer	1	0%	100/15 Winter				
407.002	15 Winter	1	0%	30/15 Summer				
407.003	15 Winter	1	0%					
409.000	15 Summer	1	0%	100/15 Summer				
410.000	15 Summer	1	0%	30/15 Summer				
410.001	15 Summer	1	0%	100/15 Summer				
409.001	15 Summer	1	0%	100/15 Summer				
411.000	15 Summer	1	0%					
409.002	15 Summer	1	0%	100/15 Summer				
409.003	15 Winter	1	0%	100/15 Summer				
407.004	15 Winter	1	0%					
412.000	15 Summer	1	0%					
412.001	15 Summer	1	0%					
412.002	15 Winter	1	0%					
412.003	15 Winter	1	0%					
407.005	15 Winter	1	0%					
407.006	15 Winter	1	0%					
413.000	480 Winter	1	0%	30/30 Winter				
407.007	15 Winter	1	0%	1/15 Summer	100/120 Summer			
407.008	360 Winter	1	0%	30/120 Summer				
407.009	360 Winter	1	0%	30/60 Winter				
414.000	15 Summer	1	0%					
415.000	15 Summer	1	0%					
415.001	15 Winter	1	0%					
416.000	15 Summer	1	0%					
415.002	60 Winter	1	0%	1/60 Winter				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
414.001	15 Winter	1	0%	30/120 Summer				
407.010	240 Winter	1	0%	1/15 Summer				
400.009	1440 Winter	1	0%	1/15 Summer				
400.010	960 Summer	1	0%					

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
400.000	1	99.769	-0.156	0.000	0.19	0.0	9.3	OK
401.000	2	100.232	-0.118	0.000	0.10	0.0	5.5	OK
400.001	3	99.495	-0.016	0.000	0.22	0.0	3.6	OK
402.000	4	100.026	-0.124	0.000	0.07	0.0	2.8	OK
400.002	5	99.184	-0.158	0.000	0.18	0.0	9.3	OK
400.003	6	98.547	-0.162	0.000	0.17	0.0	9.3	OK
400.004	7	98.298	-0.177	0.000	0.04	0.0	1.3	OK
403.000	8	99.069	-0.156	0.000	0.19	0.0	11.2	OK
403.001	9	98.356	-0.644	0.000	0.01	0.0	19.5	OK
400.005	10	98.293	-0.082	0.000	0.03	0.0	3.5	OK
400.006	11	96.923	-0.201	0.000	0.02	0.0	3.8	OK
400.007	12	92.114	-0.736	0.000	0.00	0.0	6.0	OK
404.000	13	91.618	-0.732	0.000	0.00	0.0	4.6	OK
405.000	14	95.594	-0.131	0.000	0.34	0.0	12.9	OK
405.001	15	95.421	-0.165	0.000	0.15	0.0	19.3	OK
405.002	16	93.657	-0.151	0.000	0.24	0.0	25.6	OK
406.000	17	92.957	-0.168	0.000	0.14	0.0	8.4	OK
405.003	18	92.871	0.005	0.000	0.10	0.0	3.9	SURCHARGED
404.001	19	91.473	-0.477	0.000	0.01	0.0	4.2	OK
400.008	20	91.473	0.178	0.000	0.09	0.0	7.8	SURCHARGED
407.000	21	105.180	-0.120	0.000	0.43	0.0	22.1	OK
407.001	22	104.544	-0.706	0.000	0.03	0.0	32.5	OK
408.000	23	105.457	-0.143	0.000	0.28	0.0	17.1	OK
408.001	24	104.390	-0.210	0.000	0.19	0.0	24.4	OK
407.002	25	103.642	-0.158	0.000	0.45	0.0	41.8	OK
407.003	26	103.383	-0.717	0.000	0.02	0.0	55.0	OK
409.000	27	101.011	-0.189	0.000	0.06	0.0	1.7	OK
410.000	28	102.391	-0.109	0.000	0.49	0.0	15.8	OK
410.001	29	102.219	-0.156	0.000	0.20	0.0	23.0	OK
409.001	30	100.931	-0.209	0.000	0.20	0.0	24.7	OK
411.000	31	102.200	-0.175	0.000	0.11	0.0	11.1	OK
409.002	32	100.686	-0.214	0.000	0.18	0.0	37.2	OK
409.003	33	99.654	-0.246	0.000	0.25	0.0	54.8	OK
407.004	34	98.704	-0.596	0.000	0.03	0.0	104.0	OK
412.000	35	103.088	-0.112	0.000	0.14	0.0	3.0	OK
412.001	36	102.582	-0.118	0.000	0.10	0.0	3.1	OK
412.002	37	101.822	-0.178	0.000	0.10	0.0	10.6	OK
412.003	38	99.628	-0.172	0.000	0.12	0.0	12.4	OK
407.005	39	98.365	-0.635	0.000	0.02	0.0	119.5	OK
407.006	40	97.278	-0.397	0.000	0.14	0.0	121.1	OK

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

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
413.000	41	96.213	-0.186	0.000	0.01	0.0	2.3	OK
407.007	42	96.433	0.408	0.000	0.08	0.0	3.7	SURCHARGED
407.008	42	89.623	-0.340	0.000	0.01	0.0	4.1	OK
407.009	43	89.622	-0.262	0.000	0.01	0.0	5.6	OK
414.000	44	91.022	-0.128	0.000	0.05	0.0	1.8	OK
415.000	45	96.436	-0.189	0.000	0.06	0.0	6.8	OK
415.001	46	95.147	-0.248	0.000	0.07	0.0	23.4	OK
416.000	47	92.533	-0.192	0.000	0.05	0.0	7.2	OK
415.002	48	91.157	0.007	0.000	0.11	0.0	3.9	SURCHARGED
414.001	49	89.788	-0.187	0.000	0.07	0.0	5.9	OK
407.010	50	89.635	0.410	0.000	0.33	0.0	11.4	SURCHARGED
400.009	51	89.852	0.742	0.000	0.22	0.0	10.0	SURCHARGED
400.010	52	88.745	-0.131	0.000	0.33	0.0	10.4	OK

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

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
400.000	30 Winter	30	0%	100/15 Summer				
401.000	15 Summer	30	0%					
400.001	30 Winter	30	0%	30/15 Summer				
402.000	15 Summer	30	0%					
400.002	15 Summer	30	0%					
400.003	15 Summer	30	0%					
400.004	240 Winter	30	0%	100/120 Winter				
403.000	15 Summer	30	0%					
403.001	15 Winter	30	0%					
400.005	240 Winter	30	0%	30/15 Summer				
400.006	15 Winter	30	0%					
400.007	15 Winter	30	0%					
404.000	960 Winter	30	0%					
405.000	15 Summer	30	0%	30/15 Summer				
405.001	15 Summer	30	0%					
405.002	15 Summer	30	0%	100/15 Summer				
406.000	120 Winter	30	0%	30/15 Winter				
405.003	120 Winter	30	0%	1/60 Winter				
404.001	960 Winter	30	0%	100/120 Winter				
400.008	960 Winter	30	0%	1/15 Winter				
407.000	15 Summer	30	0%	30/15 Summer				
407.001	15 Winter	30	0%					
408.000	15 Summer	30	0%	100/15 Summer				
408.001	15 Summer	30	0%	100/15 Winter				
407.002	15 Winter	30	0%	30/15 Summer				
407.003	15 Winter	30	0%					
409.000	15 Summer	30	0%	100/15 Summer				
410.000	15 Summer	30	0%	30/15 Summer				
410.001	15 Summer	30	0%	100/15 Summer				
409.001	15 Summer	30	0%	100/15 Summer				
411.000	15 Summer	30	0%					
409.002	15 Summer	30	0%	100/15 Summer				
409.003	15 Summer	30	0%	100/15 Summer				
407.004	15 Winter	30	0%					
412.000	15 Summer	30	0%					
412.001	15 Summer	30	0%					
412.002	15 Summer	30	0%					
412.003	15 Summer	30	0%					
407.005	15 Winter	30	0%					
407.006	15 Winter	30	0%					
413.000	480 Winter	30	0%	30/30 Winter				
407.007	480 Winter	30	0%	1/15 Summer	100/120 Summer			
407.008	480 Winter	30	0%	30/120 Summer				
407.009	480 Winter	30	0%	30/60 Winter				
414.000	15 Summer	30	0%					
415.000	15 Summer	30	0%					
415.001	15 Summer	30	0%					
416.000	15 Summer	30	0%					
415.002	120 Winter	30	0%	1/60 Winter				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
414.001	480 Winter	30	0%	30/120 Summer				
407.010	480 Winter	30	0%	1/15 Summer				
400.009	480 Winter	30	0%	1/15 Summer				
400.010	480 Winter	30	0%					

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
400.000	1	99.844	-0.081	0.000	0.37	0.0	18.3	OK
401.000	2	100.259	-0.091	0.000	0.32	0.0	17.2	OK
400.001	3	99.836	0.325	0.000	0.24	0.0	4.0	SURCHARGED
402.000	4	100.048	-0.102	0.000	0.22	0.0	8.9	OK
400.002	5	99.246	-0.096	0.000	0.58	0.0	29.3	OK
400.003	6	98.604	-0.106	0.000	0.54	0.0	29.0	OK
400.004	7	98.429	-0.045	0.000	0.06	0.0	2.1	OK
403.000	8	99.132	-0.093	0.000	0.59	0.0	34.3	OK
403.001	9	98.476	-0.524	0.000	0.04	0.0	85.2	OK
400.005	10	98.426	0.052	0.000	0.03	0.0	3.7	SURCHARGED
400.006	11	96.941	-0.183	0.000	0.07	0.0	11.9	OK
400.007	12	92.155	-0.695	0.000	0.02	0.0	24.0	OK
404.000	13	91.840	-0.510	0.000	0.00	0.0	0.6	OK
405.000	14	95.754	0.029	0.000	1.06	0.0	40.8	SURCHARGED
405.001	15	95.480	-0.107	0.000	0.54	0.0	66.9	OK
405.002	16	93.745	-0.063	0.000	0.87	0.0	92.5	OK
406.000	17	93.239	0.114	0.000	0.08	0.0	5.1	SURCHARGED
405.003	18	93.238	0.372	0.000	0.11	0.0	4.1	SURCHARGED
404.001	19	91.840	-0.110	0.000	0.01	0.0	4.1	OK
400.008	20	91.840	0.545	0.000	0.10	0.0	8.1	SURCHARGED
407.000	21	105.598	0.298	0.000	1.23	0.0	64.0	SURCHARGED
407.001	22	104.628	-0.622	0.000	0.11	0.0	118.3	OK
408.000	23	105.542	-0.058	0.000	0.83	0.0	50.8	OK
408.001	24	104.482	-0.118	0.000	0.66	0.0	83.7	OK
407.002	25	103.909	0.109	0.000	1.37	0.0	125.9	SURCHARGED
407.003	26	103.442	-0.658	0.000	0.07	0.0	167.5	OK
409.000	27	101.048	-0.152	0.000	0.18	0.0	5.3	OK
410.000	28	102.697	0.197	0.000	1.54	0.0	49.5	SURCHARGED
410.001	29	102.288	-0.087	0.000	0.70	0.0	78.6	OK
409.001	30	101.023	-0.117	0.000	0.68	0.0	82.9	OK
411.000	31	102.243	-0.132	0.000	0.35	0.0	35.1	OK
409.002	32	100.768	-0.132	0.000	0.59	0.0	124.0	OK
409.003	33	99.810	-0.090	0.000	0.89	0.0	191.1	OK
407.004	34	98.836	-0.464	0.000	0.12	0.0	391.8	OK
412.000	35	103.122	-0.078	0.000	0.44	0.0	9.5	OK
412.001	36	102.608	-0.092	0.000	0.30	0.0	9.7	OK
412.002	37	101.870	-0.130	0.000	0.37	0.0	40.2	OK
412.003	38	99.685	-0.115	0.000	0.48	0.0	47.6	OK
407.005	39	98.482	-0.518	0.000	0.07	0.0	459.9	OK
407.006	40	97.421	-0.254	0.000	0.51	0.0	458.8	OK

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

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
413.000	41	96.724	0.325	0.000	0.04	0.0	11.1	SURCHARGED
407.007	42	96.918	0.893	0.000	0.09	0.0	4.0	SURCHARGED
407.008	42	90.264	0.301	0.000	0.01	0.0	4.9	SURCHARGED
407.009	43	90.264	0.380	0.000	0.01	0.0	6.7	SURCHARGED
414.000	44	91.040	-0.110	0.000	0.16	0.0	5.5	OK
415.000	45	96.467	-0.158	0.000	0.19	0.0	21.7	OK
415.001	46	95.202	-0.193	0.000	0.27	0.0	88.6	OK
416.000	47	92.560	-0.165	0.000	0.16	0.0	22.8	OK
415.002	48	91.534	0.384	0.000	0.11	0.0	4.1	SURCHARGED
414.001	49	90.268	0.293	0.000	0.06	0.0	5.3	SURCHARGED
407.010	50	90.264	1.039	0.000	0.37	0.0	12.8	SURCHARGED
400.009	51	90.253	1.143	0.000	0.28	0.0	12.9	SURCHARGED
400.010	52	88.751	-0.126	0.000	0.41	0.0	12.9	OK

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

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
400.000	30 Winter	100	0%	100/15 Summer				
401.000	15 Summer	100	0%					
400.001	30 Winter	100	0%	30/15 Summer				
402.000	15 Summer	100	0%					
400.002	15 Summer	100	0%					
400.003	15 Summer	100	0%					
400.004	240 Winter	100	0%	100/120 Winter				
403.000	15 Summer	100	0%					
403.001	15 Winter	100	0%					
400.005	360 Winter	100	0%	30/15 Summer				
400.006	15 Winter	100	0%					
400.007	15 Winter	100	0%					
404.000	240 Winter	100	0%					
405.000	15 Summer	100	0%	30/15 Summer				
405.001	15 Summer	100	0%					
405.002	15 Summer	100	0%	100/15 Summer				
406.000	120 Winter	100	0%	30/15 Winter				
405.003	120 Winter	100	0%	1/60 Winter				
404.001	240 Winter	100	0%	100/120 Winter				
400.008	240 Winter	100	0%	1/15 Winter				
407.000	15 Summer	100	0%	30/15 Summer				
407.001	15 Winter	100	0%					
408.000	15 Summer	100	0%	100/15 Summer				
408.001	15 Winter	100	0%	100/15 Winter				
407.002	15 Winter	100	0%	30/15 Summer				
407.003	15 Winter	100	0%					
409.000	15 Winter	100	0%	100/15 Summer				
410.000	15 Summer	100	0%	30/15 Summer				
410.001	15 Summer	100	0%	100/15 Summer				
409.001	15 Winter	100	0%	100/15 Summer				
411.000	15 Summer	100	0%					
409.002	15 Winter	100	0%	100/15 Summer				
409.003	15 Winter	100	0%	100/15 Summer				
407.004	15 Winter	100	0%					
412.000	15 Summer	100	0%					
412.001	15 Summer	100	0%					
412.002	15 Summer	100	0%					
412.003	15 Summer	100	0%					
407.005	15 Winter	100	0%					
407.006	15 Winter	100	0%					
413.000	1440 Winter	100	0%	30/30 Winter				
407.007	360 Winter	100	0%	1/15 Summer	100/120 Summer			
407.008	960 Winter	100	0%	30/120 Summer				
407.009	960 Winter	100	0%	30/60 Winter				
414.000	15 Summer	100	0%					
415.000	15 Summer	100	0%					
415.001	15 Summer	100	0%					
416.000	15 Summer	100	0%					
415.002	120 Winter	100	0%	1/60 Winter				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
414.001	960 Winter	100	0%	30/120 Summer				
407.010	960 Winter	100	0%	1/15 Summer				
400.009	960 Winter	100	0%	1/15 Summer				
400.010	960 Winter	100	0%					

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
400.000	1	100.123	0.198	0.000	0.53	0.0	26.0	SURCHARGED
401.000	2	100.275	-0.075	0.000	0.49	0.0	26.1	OK
400.001	3	100.115	0.604	0.000	0.27	0.0	4.4	SURCHARGED
402.000	4	100.060	-0.090	0.000	0.33	0.0	13.4	OK
400.002	5	99.283	-0.059	0.000	0.84	0.0	42.4	OK
400.003	6	98.637	-0.073	0.000	0.77	0.0	41.8	OK
400.004	7	98.506	0.031	0.000	0.10	0.0	3.3	SURCHARGED
403.000	8	99.176	-0.049	0.000	0.90	0.0	51.8	OK
403.001	9	98.521	-0.479	0.000	0.07	0.0	137.4	OK
400.005	10	98.503	0.128	0.000	0.03	0.0	3.7	SURCHARGED
400.006	11	96.952	-0.173	0.000	0.12	0.0	18.6	OK
400.007	12	92.178	-0.672	0.000	0.02	0.0	36.9	OK
404.000	13	91.995	-0.355	0.000	0.00	0.0	2.2	OK
405.000	14	95.978	0.253	0.000	1.62	0.0	62.2	SURCHARGED
405.001	15	95.518	-0.069	0.000	0.81	0.0	101.2	OK
405.002	16	94.440	0.633	0.000	1.22	0.0	130.1	SURCHARGED
406.000	17	93.508	0.383	0.000	0.12	0.0	7.2	FLOOD RISK
405.003	18	93.507	0.641	0.000	0.12	0.0	4.5	SURCHARGED
404.001	19	91.995	0.045	0.000	0.01	0.0	4.9	SURCHARGED
400.008	20	91.995	0.700	0.000	0.10	0.0	8.9	FLOOD RISK
407.000	21	106.389	1.089	0.000	1.71	0.0	88.6	FLOOD RISK
407.001	22	104.671	-0.579	0.000	0.16	0.0	174.3	OK
408.000	23	106.044	0.444	0.000	1.16	0.0	71.1	SURCHARGED
408.001	24	104.618	0.018	0.000	0.91	0.0	115.4	SURCHARGED
407.002	25	104.130	0.330	0.000	1.86	0.0	171.6	SURCHARGED
407.003	26	103.468	-0.632	0.000	0.10	0.0	234.9	OK
409.000	27	101.247	0.047	0.000	0.25	0.0	7.5	SURCHARGED
410.000	28	103.082	0.582	0.000	2.27	0.0	73.1	SURCHARGED
410.001	29	102.397	0.022	0.000	0.99	0.0	111.4	SURCHARGED
409.001	30	101.239	0.099	0.000	0.93	0.0	114.0	SURCHARGED
411.000	31	102.268	-0.107	0.000	0.53	0.0	53.0	OK
409.002	32	101.051	0.151	0.000	0.80	0.0	166.0	SURCHARGED
409.003	33	100.439	0.539	0.000	1.23	0.0	266.1	SURCHARGED
407.004	34	98.884	-0.416	0.000	0.17	0.0	561.8	OK
412.000	35	103.144	-0.056	0.000	0.66	0.0	14.4	OK
412.001	36	102.623	-0.077	0.000	0.45	0.0	14.6	OK
412.002	37	101.895	-0.105	0.000	0.56	0.0	60.8	OK
412.003	38	99.717	-0.083	0.000	0.72	0.0	72.0	OK
407.005	39	98.511	-0.489	0.000	0.10	0.0	657.4	OK
407.006	40	97.597	-0.078	0.000	0.68	0.0	605.0	OK

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

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
413.000	41	97.052	0.653	0.000	0.03	0.0	8.3	SURCHARGED
407.007	42	97.341	1.316	0.000	0.11	0.0	4.9	FLOOD RISK
407.008	42	90.531	0.568	0.000	0.01	0.0	5.1	SURCHARGED
407.009	43	90.531	0.647	0.000	0.01	0.0	6.8	SURCHARGED
414.000	44	91.050	-0.100	0.000	0.24	0.0	8.4	OK
415.000	45	96.483	-0.142	0.000	0.29	0.0	32.8	OK
415.001	46	95.229	-0.166	0.000	0.41	0.0	133.7	OK
416.000	47	92.575	-0.150	0.000	0.24	0.0	34.5	OK
415.002	48	91.811	0.661	0.000	0.12	0.0	4.6	SURCHARGED
414.001	49	90.535	0.560	0.000	0.06	0.0	4.9	SURCHARGED
407.010	50	90.531	1.306	0.000	0.31	0.0	10.7	SURCHARGED
400.009	51	90.518	1.408	0.000	0.30	0.0	14.1	SURCHARGED
400.010	52	88.756	-0.120	0.000	0.44	0.0	14.1	OK

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

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

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
400.000	30 Winter	100	+30%	100/15 Summer				
401.000	30 Winter	100	+30%	100/30 Winter				
400.001	30 Winter	100	+30%	100/15 Summer				
402.000	15 Summer	100	+30%					
400.002	15 Summer	100	+30%	100/15 Summer				
400.003	15 Summer	100	+30%					
400.004	360 Winter	100	+30%	100/30 Winter				
403.000	15 Summer	100	+30%	100/15 Summer				
403.001	360 Winter	100	+30%					
400.005	360 Winter	100	+30%	100/15 Summer				
400.006	15 Winter	100	+30%					
400.007	240 Winter	100	+30%					
404.000	240 Winter	100	+30%					
405.000	15 Summer	100	+30%	100/15 Summer				
405.001	15 Summer	100	+30%	100/15 Summer				
405.002	15 Winter	100	+30%	100/15 Summer				
406.000	120 Winter	100	+30%	100/15 Summer				
405.003	120 Winter	100	+30%	100/15 Summer				
404.001	240 Winter	100	+30%	100/15 Winter				
400.008	240 Winter	100	+30%	100/15 Summer	100/120 Winter			3
407.000	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
407.001	15 Winter	100	+30%					
408.000	15 Summer	100	+30%	100/15 Summer	100/15 Summer			2
408.001	15 Winter	100	+30%	100/15 Summer				
407.002	15 Winter	100	+30%	100/15 Summer				
407.003	15 Winter	100	+30%					
409.000	15 Winter	100	+30%	100/15 Summer				
410.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
410.001	15 Summer	100	+30%	100/15 Summer				
409.001	15 Winter	100	+30%	100/15 Summer				
411.000	15 Summer	100	+30%					
409.002	15 Winter	100	+30%	100/15 Summer				
409.003	15 Winter	100	+30%	100/15 Summer				
407.004	15 Winter	100	+30%					
412.000	15 Summer	100	+30%					
412.001	15 Summer	100	+30%					
412.002	15 Summer	100	+30%					
412.003	15 Summer	100	+30%					
407.005	15 Winter	100	+30%					
407.006	15 Winter	100	+30%	100/15 Summer				
413.000	960 Winter	100	+30%	100/15 Summer				
407.007	1440 Winter	100	+30%	100/15 Summer	100/120 Summer			7
407.008	960 Winter	100	+30%	100/15 Winter				
407.009	960 Winter	100	+30%	100/15 Summer				
414.000	15 Summer	100	+30%					
415.000	15 Summer	100	+30%					
415.001	15 Summer	100	+30%					
416.000	15 Summer	100	+30%					
415.002	120 Winter	100	+30%	100/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
414.001	960 Winter	100	+30%	100/15 Winter				
407.010	960 Winter	100	+30%	100/15 Summer				
400.009	960 Winter	100	+30%	100/15 Summer				
400.010	960 Winter	100	+30%					

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
400.000	1	100.377	0.452	0.000	0.65	0.0	31.6	FLOOD RISK
401.000	2	100.372	0.022	0.000	0.37	0.0	19.9	SURCHARGED
400.001	3	100.366	0.855	0.000	0.31	0.0	5.1	SURCHARGED
402.000	4	100.070	-0.080	0.000	0.43	0.0	17.5	OK
400.002	5	99.439	0.097	0.000	1.05	0.0	52.6	SURCHARGED
400.003	6	98.661	-0.049	0.000	0.97	0.0	52.6	OK
400.004	7	98.587	0.112	0.000	0.09	0.0	2.9	SURCHARGED
403.000	8	99.484	0.259	0.000	1.15	0.0	66.3	SURCHARGED
403.001	9	98.581	-0.419	0.000	0.01	0.0	17.2	OK
400.005	10	98.581	0.206	0.000	0.03	0.0	3.7	SURCHARGED
400.006	11	96.960	-0.165	0.000	0.16	0.0	24.8	OK
400.007	12	92.202	-0.648	0.000	0.01	0.0	9.4	OK
404.000	13	92.202	-0.148	0.000	0.00	0.0	2.9	OK
405.000	14	96.648	0.923	0.000	1.90	0.0	73.2	SURCHARGED
405.001	15	96.245	0.658	0.000	0.86	0.0	107.8	SURCHARGED
405.002	16	94.937	1.129	0.000	1.40	0.0	148.9	SURCHARGED
406.000	17	93.778	0.653	0.000	0.15	0.0	9.3	FLOOD RISK
405.003	18	93.776	0.910	0.000	0.14	0.0	5.2	FLOOD RISK
404.001	19	92.202	0.252	0.000	0.01	0.0	6.0	FLOOD RISK
400.008	20	92.202	0.907	1.518	0.12	0.0	9.8	FLOOD
407.000	21	106.504	1.204	3.974	1.85	0.0	96.0	FLOOD
407.001	22	104.699	-0.551	0.000	0.20	0.0	213.1	OK
408.000	23	106.800	1.200	0.236	1.35	0.0	83.4	FLOOD
408.001	24	105.020	0.420	0.000	1.05	0.0	133.9	FLOOD RISK
407.002	25	104.324	0.524	0.000	2.20	0.0	202.8	FLOOD RISK
407.003	26	103.487	-0.613	0.000	0.12	0.0	288.6	OK
409.000	27	102.003	0.803	0.000	0.33	0.0	10.1	SURCHARGED
410.000	28	103.702	1.202	1.626	2.44	0.0	78.6	FLOOD
410.001	29	103.329	0.954	0.000	1.05	0.0	118.0	FLOOD RISK
409.001	30	101.990	0.850	0.000	1.09	0.0	133.7	SURCHARGED
411.000	31	102.290	-0.085	0.000	0.69	0.0	68.9	OK
409.002	32	101.765	0.865	0.000	0.88	0.0	184.1	SURCHARGED
409.003	33	101.014	1.114	0.000	1.44	0.0	309.9	FLOOD RISK
407.004	34	98.918	-0.382	0.000	0.21	0.0	678.5	OK
412.000	35	103.163	-0.037	0.000	0.86	0.0	18.7	OK
412.001	36	102.636	-0.064	0.000	0.59	0.0	19.0	OK
412.002	37	101.918	-0.082	0.000	0.72	0.0	79.0	OK
412.003	38	99.747	-0.053	0.000	0.94	0.0	93.6	OK
407.005	39	98.532	-0.468	0.000	0.12	0.0	804.4	OK
407.006	40	97.862	0.187	0.000	0.75	0.0	666.7	FLOOD RISK

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

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
413.000	41	97.477	1.078	0.000	0.03	0.0	6.3	SURCHARGED
407.007	42	97.602	1.577	2.498	0.12	0.0	5.2	FLOOD
407.008	42	90.765	0.802	0.000	0.01	0.0	5.7	SURCHARGED
407.009	43	90.765	0.881	0.000	0.02	0.0	7.2	SURCHARGED
414.000	44	91.058	-0.092	0.000	0.31	0.0	10.9	OK
415.000	45	96.497	-0.128	0.000	0.37	0.0	42.7	OK
415.001	46	95.252	-0.143	0.000	0.53	0.0	173.7	OK
416.000	47	92.587	-0.138	0.000	0.31	0.0	44.9	OK
415.002	48	92.092	0.942	0.000	0.14	0.0	5.3	SURCHARGED
414.001	49	90.771	0.796	0.000	0.06	0.0	5.1	FLOOD RISK
407.010	50	90.765	1.540	0.000	0.35	0.0	12.0	FLOOD RISK
400.009	51	90.749	1.639	0.000	0.32	0.0	15.1	SURCHARGED
400.010	52	88.760	-0.116	0.000	0.47	0.0	15.1	OK

Microdrainage Calculations for Residential Area 5

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
500.000	9.703	0.250	38.8	0.090	2.00	0.600	o	300
501.000	4.209	0.028	150.3	0.010	2.00	0.600	o	150
500.001	14.962	0.500	29.9	0.015	0.00	0.600	o	300
502.000	3.362	0.022	152.8	0.010	2.00	0.600	o	150
500.002	14.551	0.600	24.3	0.019	0.00	0.600	o	300
503.000	3.191	0.021	152.0	0.010	2.00	0.600	o	150
500.003	15.204	0.650	23.4	0.000	0.00	0.600	o	300
500.004	29.687	1.750	17.0	0.016	0.00	0.600	o	300
500.005	29.225	1.750	16.7	0.014	0.00	0.600	o	300
500.006	17.395	1.000	17.4	0.013	0.00	0.600	o	300
500.007	20.683	0.850	24.3	0.011	0.00	0.600	o	300
500.008	17.592	1.000	17.6	0.010	0.00	0.600	o	450
500.009	8.458	0.400	21.1	0.000	0.00	0.600	o	300
504.000	33.455	0.028	1194.8	0.045	2.00	0.600	[]	13
505.000	24.161	1.800	13.4	0.029	2.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
500.000	1	106.500	105.300	0.900	106.250	105.050	0.900		1050
501.000	2	106.250	105.078	1.022	106.250	105.050	1.050		1050
500.001	3	106.250	105.000	0.950	105.750	104.500	0.950		1050
502.000	4	105.750	104.572	1.028	105.750	104.550	1.050		1050
500.002	5	105.750	104.500	0.950	105.510	103.900	1.310		1050
503.000	6	105.150	103.971	1.029	105.510	103.950	1.410		1050
500.003	7	105.510	103.825	1.385	104.500	103.175	1.025		1050
500.004	8	104.500	103.175	1.025	102.750	101.425	1.025		1050
500.005	9	102.750	101.425	1.025	101.000	99.675	1.025		1050
500.006	10	101.000	99.675	1.025	100.000	98.675	1.025		1050
500.007	11	100.000	98.675	1.025	99.150	97.825	1.025		1050
500.008	12	99.150	97.825	0.875	98.150	96.825	0.875		1050
500.009	13	98.150	96.825	1.025	97.650	96.425	0.925		1050
504.000	14	100.350	95.493	3.657	98.450	95.465	1.785		1050
505.000	15	102.500	101.500	0.850	100.700	99.700	0.850		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
505.001	2.578	0.900	2.9	0.017	0.00	0.600	o	150
506.000	4.322	0.029	149.0	0.018	2.00	0.600	o	150
507.000	5.755	0.038	151.4	0.039	2.00	0.600	o	150
505.002	6.967	0.050	139.3	0.000	0.00	0.600	o	150
505.003	18.373	2.235	8.2	0.000	0.00	0.600	o	150
504.001	17.430	0.015	1162.0	0.000	0.00	0.600	[]	13
508.000	10.430	0.020	521.5	0.021	2.00	0.600	[]	13
500.010	61.887	1.450	42.7	0.026	0.00	0.600	o	225
509.000	37.172	2.600	14.3	0.041	2.00	0.600	o	225
510.000	10.000	0.067	149.3	0.054	2.00	0.600	o	225
511.000	5.911	0.039	151.6	0.037	2.00	0.600	o	150
512.000	7.670	0.051	150.4	0.037	2.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
505.001	16	100.700	99.700	0.850	100.500	98.800	1.550		1050
506.000	17	100.200	98.829	1.221	100.500	98.800	1.550		1050
507.000	18	100.500	98.838	1.512	100.500	98.800	1.550		1050
505.002	19	100.500	98.800	1.550	99.750	98.750	0.850		1200
505.003	20	99.750	98.750	0.850	98.450	96.515	1.785	Hydro-Brake®	1050
504.001	21	98.450	95.465	1.785	97.650	95.450	1.000		1050
508.000	22	97.800	95.470	1.130	97.650	95.450	1.000		1050
500.010	23	97.650	95.450	1.975	95.000	94.000	0.775	Hydro-Brake®	1050
509.000	24	98.500	97.500	0.775	95.900	94.900	0.775		1050
510.000	25	97.600	95.367	2.008	97.000	95.300	1.475		1050
511.000	26	96.600	95.339	1.111	97.000	95.300	1.550		1050
512.000	27	96.800	95.351	1.299	97.000	95.300	1.550		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
510.001	5.249	0.050	105.0	0.000	0.00	0.600	o	150
510.002	10.312	0.275	37.5	0.000	0.00	0.600	o	225
509.001	19.967	0.900	22.2	0.028	0.00	0.600	o	225
500.011	62.086	0.125	496.7	0.037	0.00	0.600	[]	13
513.000	54.144	0.046	1177.0	0.047	2.00	0.600	[]	13
514.000	17.422	1.150	15.1	0.016	2.00	0.600	o	150
515.000	4.413	0.050	88.3	0.028	2.00	0.600	o	225
514.001	22.826	2.250	10.1	0.012	0.00	0.600	o	225
516.000	8.599	0.400	21.5	0.019	2.00	0.600	o	225
517.000	3.441	0.050	68.8	0.006	2.00	0.600	o	300
514.002	11.214	0.700	16.0	0.012	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
510.001	28	97.000	95.300	1.550	96.500	95.250	1.100		1200
510.002	29	96.500	95.250	1.025	95.900	94.975	0.700	Hydro-Brake®	1050
509.001	30	95.900	94.900	0.775	95.000	94.000	0.775		1050
500.011	31	95.000	91.225	2.575	93.000	91.100	0.700		1050
513.000	32	98.250	91.796	5.254	93.650	91.750	0.700		1050
514.000	33	98.400	97.400	0.850	97.250	96.250	0.850		1050
515.000	34	97.300	96.300	0.775	97.250	96.250	0.775		1050
514.001	35	97.250	96.250	0.775	95.400	94.000	1.175		1050
516.000	36	95.400	94.400	0.775	95.400	94.000	1.175		1050
517.000	37	95.000	94.050	0.650	95.400	94.000	1.100		1050
514.002	38	95.400	94.000	1.250	95.000	93.300	1.550		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
518.000	14.923	2.000	7.5	0.048	2.00	0.600	o	150
519.000	4.006	0.200	20.0	0.025	2.00	0.600	o	150
514.003	1.000	0.010	100.0	0.000	0.00	0.600	o	150
514.004	13.797	0.534	25.8	0.000	0.00	0.600	o	150
513.001	17.057	0.075	227.4	0.017	0.00	0.600	o	225
520.000	21.035	1.500	14.0	0.015	2.00	0.600	o	225
520.001	13.880	0.950	14.6	0.011	0.00	0.600	o	225
520.002	20.107	1.030	19.5	0.026	0.00	0.600	o	225
521.000	4.697	0.692	6.8	0.012	2.00	0.600	o	150
522.000	13.772	0.092	149.7	0.022	2.00	0.600	o	150
521.001	6.106	1.458	4.2	0.011	0.00	0.600	o	150
523.000	9.152	0.700	13.1	0.050	2.00	0.600	o	225
524.000	3.695	0.650	5.7	0.024	2.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
518.000	39	96.300	95.300	0.850	95.000	93.300	1.550		1050
519.000	40	94.500	93.500	0.850	95.000	93.300	1.550		1050
514.003	41	95.000	93.300	1.550	94.400	93.290	0.960		1200
514.004	42	94.400	93.290	0.960	93.650	92.756	0.744	Hydro-Brake®	1050
513.001	43	93.650	91.750	1.675	93.000	91.675	1.100	Hydro-Brake®	1050
520.000	44	97.250	96.250	0.775	95.750	94.750	0.775		1050
520.001	45	95.750	94.750	0.775	94.800	93.800	0.775		1050
520.002	46	94.800	93.800	0.775	94.300	92.770	1.305		1050
521.000	47	97.200	96.200	0.850	96.600	95.508	0.942		1050
522.000	48	96.600	95.600	0.850	96.600	95.508	0.942		1050
521.001	49	96.600	95.508	0.942	95.750	94.050	1.550		1050
523.000	50	95.750	94.750	0.775	95.750	94.050	1.475		1050
524.000	51	95.700	94.700	0.850	95.750	94.050	1.550		1050

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
521.002	4.753	0.050	95.1	0.000	0.00	0.600	o	150
521.003	13.720	1.230	11.2	0.000	0.00	0.600	o	150
520.003	21.107	0.020	1055.3	0.000	0.00	0.600	[]	11
525.000	26.396	4.491	5.9	0.043	2.00	0.600	o	225
526.000	9.091	2.416	3.8	0.027	2.00	0.600	o	150
525.001	35.534	0.034	1045.1	0.052	0.00	0.600	[]	11
520.004	22.380	0.175	127.9	0.000	0.00	0.600	o	300
500.012	10.000	0.100	100.0	0.000	0.00	0.600	o	450
500.013	10.000	0.050	200.0	0.000	0.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
521.002	52	95.750	94.050	1.550	95.000	94.000	0.850		1200
521.003	53	95.000	94.000	0.850	94.300	92.770	1.380	Hydro-Brake®	1050
520.003	54	94.300	91.870	1.430	93.050	91.850	0.200		1050
525.000	55	98.200	97.200	0.775	96.000	92.709	3.066		1050
526.000	56	96.200	95.200	0.850	96.000	92.784	3.066		1050
525.001	57	96.000	91.884	3.116	93.050	91.850	0.200		1050
520.004	58	93.050	91.850	0.900	93.000	91.675	1.025	Hydro-Brake®	1050
500.012	59	93.000	91.100	1.450	92.700	91.000	1.250		1050
500.013	60	92.700	91.000	1.400	92.000	90.950	0.750	Complex	1050

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
500.013	Area 5 Outfall	92.000	90.950	90.950	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	5
Number of Online Controls	8	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	No
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: 20, DS/PN: 505.003, Volume (m³): 1.0

Design Head (m) 1.050 Hydro-Brake® Type Md2 Invert Level (m) 98.750
Design Flow (l/s) 5.0 Diameter (mm) 69

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.2	1.200	5.4	3.000	8.6	7.000	13.1
0.200	2.3	1.400	5.9	3.500	9.3	7.500	13.6
0.300	2.7	1.600	6.3	4.000	9.9	8.000	14.1
0.400	3.1	1.800	6.7	4.500	10.5	8.500	14.5
0.500	3.5	2.000	7.0	5.000	11.1	9.000	14.9
0.600	3.8	2.200	7.4	5.500	11.7	9.500	15.3
0.800	4.4	2.400	7.7	6.000	12.2		
1.000	5.0	2.600	8.0	6.500	12.7		

Hydro-Brake® Manhole: 23, DS/PN: 500.010, Volume (m³): 56.5

Design Head (m) 1.000 Hydro-Brake® Type Md6 SW Only Invert Level (m) 95.450
Design Flow (l/s) 12.0 Diameter (mm) 143

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.7	1.200	12.8	3.000	20.2	7.000	30.9
0.200	10.3	1.400	13.8	3.500	21.8	7.500	32.0
0.300	11.6	1.600	14.8	4.000	23.3	8.000	33.0
0.400	11.4	1.800	15.7	4.500	24.7	8.500	34.0
0.500	11.0	2.000	16.5	5.000	26.1	9.000	35.0
0.600	10.7	2.200	17.3	5.500	27.4	9.500	36.0
0.800	11.0	2.400	18.1	6.000	28.6		
1.000	11.9	2.600	18.8	6.500	29.7		

Hydro-Brake® Manhole: 29, DS/PN: 510.002, Volume (m³): 1.2

Design Head (m) 1.050 Hydro-Brake® Type Md6 SW Only Invert Level (m) 95.250
Design Flow (l/s) 5.0 Diameter (mm) 93

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.4	3.000	8.5	7.000	13.1
0.200	4.0	1.400	5.8	3.500	9.2	7.500	13.5
0.300	3.8	1.600	6.2	4.000	9.9	8.000	14.0
0.400	3.7	1.800	6.6	4.500	10.5	8.500	14.4
0.500	3.7	2.000	7.0	5.000	11.0	9.000	14.8
0.600	3.9	2.200	7.3	5.500	11.6	9.500	15.2
0.800	4.4	2.400	7.6	6.000	12.1		
1.000	4.9	2.600	8.0	6.500	12.6		

Hydro-Brake® Manhole: 42, DS/PN: 514.004, Volume (m³): 1.0

Design Head (m) 1.010 Design Flow (l/s) 5.0 Hydro-Brake® Type Md6 SW Only

Hydro-Brake® Manhole: 42, DS/PN: 514.004, Volume (m³): 1.0

Diameter (mm) 94 Invert Level (m) 93.290

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.5	3.000	8.7	7.000	13.3
0.200	4.1	1.400	6.0	3.500	9.4	7.500	13.8
0.300	3.9	1.600	6.4	4.000	10.1	8.000	14.3
0.400	3.8	1.800	6.8	4.500	10.7	8.500	14.7
0.500	3.8	2.000	7.1	5.000	11.3	9.000	15.1
0.600	4.0	2.200	7.5	5.500	11.8	9.500	15.5
0.800	4.5	2.400	7.8	6.000	12.3		
1.000	5.0	2.600	8.1	6.500	12.9		

Hydro-Brake® Manhole: 43, DS/PN: 513.001, Volume (m³): 113.3

Design Head (m) 1.200 Hydro-Brake® Type Md6 SW Only Invert Level (m) 91.750
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		

Hydro-Brake® Manhole: 53, DS/PN: 521.003, Volume (m³): 0.9

Design Head (m) 1.050 Hydro-Brake® Type Md6 SW Only Invert Level (m) 94.000
Design Flow (l/s) 5.0 Diameter (mm) 93

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.8	1.200	5.4	3.000	8.5	7.000	13.1
0.200	4.0	1.400	5.8	3.500	9.2	7.500	13.5
0.300	3.8	1.600	6.2	4.000	9.9	8.000	14.0
0.400	3.7	1.800	6.6	4.500	10.5	8.500	14.4
0.500	3.7	2.000	7.0	5.000	11.0	9.000	14.8
0.600	3.9	2.200	7.3	5.500	11.6	9.500	15.2
0.800	4.4	2.400	7.6	6.000	12.1		
1.000	4.9	2.600	8.0	6.500	12.6		

Hydro-Brake® Manhole: 58, DS/PN: 520.004, Volume (m³): 112.2

Design Head (m) 1.100 Hydro-Brake® Type Md6 SW Only Invert Level (m) 91.850
Design Flow (l/s) 10.0 Diameter (mm) 129

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.200	8.4	0.300	9.0	0.400	8.7

Hydro-Brake® Manhole: 58, DS/PN: 520.004, Volume (m³): 112.2

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.500	8.3	1.800	12.7	4.000	19.0	7.500	26.0
0.600	8.3	2.000	13.4	4.500	20.1	8.000	26.9
0.800	8.8	2.200	14.1	5.000	21.2	8.500	27.7
1.000	9.6	2.400	14.7	5.500	22.3	9.000	28.5
1.200	10.4	2.600	15.3	6.000	23.3	9.500	29.3
1.400	11.2	3.000	16.4	6.500	24.2		
1.600	12.0	3.500	17.8	7.000	25.1		

Complex Manhole: 60, DS/PN: 500.013, Volume (m³): 2.9

Hydro-Brake®

Design Head (m) 0.550 Hydro-Brake® Type Md5 SW Only Invert Level (m) 91.000
Design Flow (l/s) 5.4 Diameter (mm) 109

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.3	1.200	7.8	3.000	12.4	7.000	18.9
0.200	4.9	1.400	8.5	3.500	13.4	7.500	19.6
0.300	4.9	1.600	9.0	4.000	14.3	8.000	20.2
0.400	4.9	1.800	9.6	4.500	15.2	8.500	20.8
0.500	5.2	2.000	10.1	5.000	16.0	9.000	21.5
0.600	5.6	2.200	10.6	5.500	16.8	9.500	22.0
0.800	6.4	2.400	11.1	6.000	17.5		
1.000	7.2	2.600	11.5	6.500	18.2		

Hydro-Brake®

Design Head (m) 0.340 Hydro-Brake® Type Md1 Invert Level (m) 91.560
Design Flow (l/s) 6.0 Diameter (mm) 97

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.9	1.200	11.5	3.000	18.1	7.000	27.7
0.200	5.9	1.400	12.4	3.500	19.6	7.500	28.7
0.300	5.8	1.600	13.2	4.000	20.9	8.000	29.6
0.400	6.6	1.800	14.1	4.500	22.2	8.500	30.5
0.500	7.4	2.000	14.8	5.000	23.4	9.000	31.4
0.600	8.1	2.200	15.5	5.500	24.6	9.500	32.3
0.800	9.4	2.400	16.2	6.000	25.7		
1.000	10.5	2.600	16.9	6.500	26.7		

Storage Structures for Storm

Tank or Pond Manhole: 19, DS/PN: 505.002

Invert Level (m) 98.800

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

Tank or Pond Manhole: 28, DS/PN: 510.001

Invert Level (m) 95.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	50.0	0.100	50.0

Tank or Pond Manhole: 41, DS/PN: 514.003

Invert Level (m) 93.300

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	75.0	1.000	75.0

Tank or Pond Manhole: 52, DS/PN: 521.002

Invert Level (m) 94.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	45.0	1.000	45.0

Tank or Pond Manhole: 60, DS/PN: 500.013

Invert Level (m) 91.000

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

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

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
500.000	15 Summer	1	0%					
501.000	15 Summer	1	0%					
500.001	15 Summer	1	0%					
502.000	15 Summer	1	0%					
500.002	15 Summer	1	0%					
503.000	15 Summer	1	0%					
500.003	15 Summer	1	0%					
500.004	15 Summer	1	0%					
500.005	15 Summer	1	0%					
500.006	15 Summer	1	0%					
500.007	15 Summer	1	0%					
500.008	15 Summer	1	0%					
500.009	15 Summer	1	0%	100/15 Summer				
504.000	30 Winter	1	0%					
505.000	15 Summer	1	0%					
505.001	15 Summer	1	0%					
506.000	30 Winter	1	0%	30/15 Summer				
507.000	30 Winter	1	0%	30/15 Summer				
505.002	30 Winter	1	0%	30/15 Summer				
505.003	30 Winter	1	0%	1/15 Summer				
504.001	30 Winter	1	0%					
508.000	30 Winter	1	0%					
500.010	30 Winter	1	0%	1/15 Summer				
509.000	15 Summer	1	0%					
510.000	15 Summer	1	0%	30/15 Summer				
511.000	30 Winter	1	0%	30/15 Summer				
512.000	15 Summer	1	0%	30/15 Summer				
510.001	30 Winter	1	0%	30/15 Summer				
510.002	30 Winter	1	0%	30/15 Summer				
509.001	15 Summer	1	0%					
500.011	360 Winter	1	0%					
513.000	30 Winter	1	0%					
514.000	15 Summer	1	0%					
515.000	15 Summer	1	0%					
514.001	15 Summer	1	0%					
516.000	15 Summer	1	0%	100/15 Summer				
517.000	15 Summer	1	0%	30/15 Summer	100/15 Summer			2
514.002	15 Summer	1	0%	30/15 Summer				
518.000	15 Summer	1	0%					
519.000	15 Summer	1	0%	30/15 Summer				

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
514.003	60 Winter	1	0%	30/15 Summer				
514.004	60 Winter	1	0%	30/15 Summer				
513.001	30 Winter	1	0%	30/15 Summer				
520.000	15 Summer	1	0%					
520.001	15 Summer	1	0%					
520.002	15 Summer	1	0%					
521.000	15 Summer	1	0%					
522.000	15 Summer	1	0%	100/15 Summer				
521.001	15 Summer	1	0%					
523.000	15 Summer	1	0%					
524.000	15 Summer	1	0%					
521.002	30 Winter	1	0%	30/15 Summer				
521.003	30 Winter	1	0%	1/15 Summer				
520.003	30 Winter	1	0%					
525.000	15 Summer	1	0%					
526.000	15 Summer	1	0%					
525.001	30 Winter	1	0%					
520.004	30 Winter	1	0%	30/15 Summer				
500.012	360 Winter	1	0%	30/60 Summer				
500.013	360 Winter	1	0%	1/30 Summer				

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
500.000	1	105.374	-0.226	0.000	0.14	0.0	17.6	OK
501.000	2	105.121	-0.107	0.000	0.18	0.0	2.0	OK
500.001	3	105.070	-0.230	0.000	0.12	0.0	21.3	OK
502.000	4	104.615	-0.107	0.000	0.18	0.0	2.0	OK
500.002	5	104.573	-0.227	0.000	0.13	0.0	25.3	OK
503.000	6	104.015	-0.106	0.000	0.18	0.0	2.0	OK
500.003	7	103.900	-0.225	0.000	0.14	0.0	27.1	OK
500.004	8	103.243	-0.232	0.000	0.11	0.0	28.2	OK
500.005	9	101.495	-0.230	0.000	0.12	0.0	30.5	OK
500.006	10	99.750	-0.225	0.000	0.14	0.0	32.3	OK
500.007	11	98.758	-0.217	0.000	0.17	0.0	33.6	OK
500.008	12	97.897	-0.378	0.000	0.06	0.0	34.6	OK
500.009	13	96.920	-0.205	0.000	0.22	0.0	34.1	OK
504.000	14	95.729	-0.964	0.000	0.00	0.0	4.7	OK
505.000	15	101.535	-0.115	0.000	0.12	0.0	5.7	OK
505.001	16	99.735	-0.115	0.000	0.13	0.0	7.6	OK
506.000	17	98.933	-0.046	0.000	0.18	0.0	1.9	OK
507.000	18	98.934	-0.054	0.000	0.37	0.0	4.4	OK
505.002	19	98.932	-0.018	0.000	0.21	0.0	2.7	OK
505.003	20	98.926	0.026	0.000	0.04	0.0	2.4	SURCHARGED
504.001	21	95.729	-0.936	0.000	0.01	0.0	7.2	OK
508.000	22	95.729	-0.941	0.000	0.00	0.0	2.0	OK
500.010	23	95.729	0.054	0.000	0.15	0.0	11.6	SURCHARGED
509.000	24	97.536	-0.189	0.000	0.06	0.0	8.0	OK
510.000	25	95.451	-0.141	0.000	0.30	0.0	10.6	OK
511.000	26	95.427	-0.062	0.000	0.35	0.0	4.2	OK
512.000	27	95.434	-0.067	0.000	0.58	0.0	7.3	OK
510.001	28	95.424	-0.026	0.000	0.28	0.0	3.9	OK

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

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
510.002	29	95.416	-0.059	0.000	0.05	0.0	3.8	OK
509.001	30	94.956	-0.169	0.000	0.14	0.0	13.6	OK
500.011	31	91.538	-0.887	0.000	0.00	0.0	12.1	OK
513.000	32	91.881	-1.115	0.000	0.00	0.0	5.2	OK
514.000	33	97.427	-0.123	0.000	0.07	0.0	3.1	OK
515.000	34	96.363	-0.162	0.000	0.17	0.0	5.5	OK
514.001	35	96.288	-0.187	0.000	0.07	0.0	10.0	OK
516.000	36	94.429	-0.196	0.000	0.04	0.0	3.7	OK
517.000	37	94.077	-0.273	0.000	0.02	0.0	1.2	OK
514.002	38	94.066	-0.084	0.000	0.40	0.0	16.1	OK
518.000	39	95.339	-0.111	0.000	0.16	0.0	9.4	OK
519.000	40	93.542	-0.108	0.000	0.17	0.0	4.9	OK
514.003	41	93.438	-0.012	0.000	0.35	0.0	3.8	OK
514.004	42	93.436	-0.004	0.000	0.12	0.0	3.8	OK
513.001	43	91.881	-0.094	0.000	0.18	0.0	5.7	OK
520.000	44	96.273	-0.202	0.000	0.02	0.0	2.9	OK
520.001	45	94.777	-0.198	0.000	0.03	0.0	4.2	OK
520.002	46	93.838	-0.187	0.000	0.06	0.0	7.0	OK
521.000	47	96.220	-0.130	0.000	0.05	0.0	2.3	OK
522.000	48	95.659	-0.091	0.000	0.32	0.0	4.3	OK
521.001	49	95.541	-0.117	0.000	0.11	0.0	7.8	OK
523.000	50	94.793	-0.182	0.000	0.08	0.0	9.8	OK
524.000	51	94.731	-0.119	0.000	0.09	0.0	4.7	OK
521.002	52	94.180	-0.020	0.000	0.29	0.0	4.0	OK
521.003	53	94.172	0.022	0.000	0.08	0.0	3.9	SURCHARGED
520.003	54	92.044	-0.826	0.000	0.01	0.0	8.7	OK
525.000	55	97.229	-0.196	0.000	0.04	0.0	8.4	OK
526.000	56	95.225	-0.125	0.000	0.06	0.0	5.3	OK
525.001	57	92.044	-0.840	0.000	0.01	0.0	12.4	OK
520.004	58	92.044	-0.106	0.000	0.10	0.0	8.3	OK
500.012	59	91.538	-0.012	0.000	0.09	0.0	16.0	OK
500.013	60	91.531	0.231	0.000	0.09	0.0	5.3	SURCHARGED

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

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
500.000	15 Summer	30	0%					
501.000	15 Summer	30	0%					
500.001	15 Summer	30	0%					
502.000	15 Summer	30	0%					
500.002	15 Summer	30	0%					
503.000	15 Summer	30	0%					
500.003	15 Summer	30	0%					
500.004	15 Summer	30	0%					
500.005	15 Summer	30	0%					
500.006	15 Summer	30	0%					
500.007	15 Summer	30	0%					
500.008	15 Summer	30	0%					
500.009	15 Summer	30	0%	100/15 Summer				
504.000	60 Winter	30	0%					
505.000	15 Summer	30	0%					
505.001	15 Summer	30	0%					
506.000	30 Winter	30	0%	30/15 Summer				
507.000	30 Winter	30	0%	30/15 Summer				
505.002	30 Winter	30	0%	30/15 Summer				
505.003	30 Winter	30	0%	1/15 Summer				
504.001	60 Winter	30	0%					
508.000	60 Winter	30	0%					
500.010	60 Winter	30	0%	1/15 Summer				
509.000	15 Summer	30	0%					
510.000	30 Winter	30	0%	30/15 Summer				
511.000	30 Winter	30	0%	30/15 Summer				
512.000	30 Winter	30	0%	30/15 Summer				
510.001	30 Winter	30	0%	30/15 Summer				
510.002	30 Winter	30	0%	30/15 Summer				
509.001	15 Summer	30	0%					
500.011	360 Winter	30	0%					
513.000	360 Winter	30	0%					
514.000	15 Summer	30	0%					
515.000	15 Summer	30	0%					
514.001	15 Summer	30	0%					
516.000	15 Summer	30	0%	100/15 Summer				
517.000	15 Summer	30	0%	30/15 Summer	100/15 Summer			2
514.002	15 Summer	30	0%	30/15 Summer				
518.000	15 Summer	30	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
519.000	60 Winter	30	0%	30/15 Summer				
514.003	60 Winter	30	0%	30/15 Summer				
514.004	60 Winter	30	0%	30/15 Summer				
513.001	360 Winter	30	0%	30/15 Summer				
520.000	15 Summer	30	0%					
520.001	15 Summer	30	0%					
520.002	15 Summer	30	0%					
521.000	15 Summer	30	0%					
522.000	15 Summer	30	0%	100/15 Summer				
521.001	15 Summer	30	0%					
523.000	15 Summer	30	0%					
524.000	15 Summer	30	0%					
521.002	30 Winter	30	0%	30/15 Summer				
521.003	30 Winter	30	0%	1/15 Summer				
520.003	60 Winter	30	0%					
525.000	15 Summer	30	0%					
526.000	15 Summer	30	0%					
525.001	60 Winter	30	0%					
520.004	60 Winter	30	0%	30/15 Summer				
500.012	360 Winter	30	0%	30/60 Summer				
500.013	360 Winter	30	0%	1/30 Summer				

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
500.000	1	105.439	-0.161	0.000	0.44	0.0	55.5	OK
501.000	2	105.159	-0.069	0.000	0.57	0.0	6.2	OK
500.001	3	105.132	-0.168	0.000	0.40	0.0	68.9	OK
502.000	4	104.654	-0.068	0.000	0.58	0.0	6.2	OK
500.002	5	104.640	-0.160	0.000	0.45	0.0	84.1	OK
503.000	6	104.053	-0.068	0.000	0.58	0.0	6.2	OK
500.003	7	103.971	-0.154	0.000	0.46	0.0	89.6	OK
500.004	8	103.307	-0.168	0.000	0.39	0.0	95.4	OK
500.005	9	101.561	-0.164	0.000	0.42	0.0	103.5	OK
500.006	10	99.823	-0.152	0.000	0.48	0.0	111.0	OK
500.007	11	98.842	-0.133	0.000	0.59	0.0	116.7	OK
500.008	12	97.967	-0.308	0.000	0.22	0.0	121.3	OK
500.009	13	97.023	-0.102	0.000	0.76	0.0	120.0	OK
504.000	14	96.192	-0.501	0.000	0.01	0.0	8.4	OK
505.000	15	101.564	-0.086	0.000	0.39	0.0	17.9	OK
505.001	16	99.770	-0.080	0.000	0.44	0.0	26.0	OK
506.000	17	99.273	0.294	0.000	0.49	0.0	5.3	SURCHARGED
507.000	18	99.276	0.288	0.000	1.02	0.0	12.2	SURCHARGED
505.002	19	99.272	0.322	0.000	0.28	0.0	3.6	SURCHARGED
505.003	20	99.263	0.363	0.000	0.06	0.0	3.6	SURCHARGED
504.001	21	96.192	-0.473	0.000	0.01	0.0	7.5	OK
508.000	22	96.192	-0.478	0.000	0.00	0.0	3.7	OK
500.010	23	96.192	0.517	0.000	0.15	0.0	11.7	SURCHARGED
509.000	24	97.567	-0.158	0.000	0.19	0.0	25.3	OK
510.000	25	95.766	0.174	0.000	0.48	0.0	17.1	SURCHARGED
511.000	26	95.766	0.277	0.000	0.95	0.0	11.4	SURCHARGED

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

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
512.000	27	95.768	0.267	0.000	0.92	0.0	11.5	SURCHARGED
510.001	28	95.763	0.313	0.000	0.32	0.0	4.5	SURCHARGED
510.002	29	95.755	0.280	0.000	0.05	0.0	3.9	SURCHARGED
509.001	30	95.002	-0.123	0.000	0.42	0.0	42.4	OK
500.011	31	92.054	-0.371	0.000	0.01	0.0	20.6	OK
513.000	32	92.133	-0.863	0.000	0.00	0.0	2.3	OK
514.000	33	97.449	-0.101	0.000	0.23	0.0	9.9	OK
515.000	34	96.419	-0.106	0.000	0.55	0.0	17.3	OK
514.001	35	96.321	-0.154	0.000	0.22	0.0	32.9	OK
516.000	36	94.454	-0.171	0.000	0.13	0.0	11.7	OK
517.000	37	94.419	0.069	0.000	0.08	0.0	4.7	SURCHARGED
514.002	38	94.418	0.268	0.000	1.12	0.0	45.2	SURCHARGED
518.000	39	95.374	-0.076	0.000	0.49	0.0	29.6	OK
519.000	40	93.784	0.134	0.000	0.17	0.0	4.8	SURCHARGED
514.003	41	93.782	0.332	0.000	0.40	0.0	4.4	SURCHARGED
514.004	42	93.790	0.350	0.000	0.13	0.0	4.1	SURCHARGED
513.001	43	92.133	0.158	0.000	0.22	0.0	6.8	SURCHARGED
520.000	44	96.290	-0.185	0.000	0.07	0.0	9.2	OK
520.001	45	94.802	-0.173	0.000	0.12	0.0	14.5	OK
520.002	46	93.877	-0.148	0.000	0.25	0.0	26.7	OK
521.000	47	96.237	-0.113	0.000	0.14	0.0	7.4	OK
522.000	48	95.740	-0.010	0.000	1.00	0.0	13.2	OK
521.001	49	95.570	-0.088	0.000	0.35	0.0	25.8	OK
523.000	50	94.828	-0.147	0.000	0.26	0.0	30.8	OK
524.000	51	94.755	-0.095	0.000	0.29	0.0	14.8	OK
521.002	52	94.557	0.357	0.000	0.33	0.0	4.6	SURCHARGED
521.003	53	94.550	0.400	0.000	0.08	0.0	4.0	SURCHARGED
520.003	54	92.282	-0.588	0.000	0.01	0.0	13.8	OK
525.000	55	97.254	-0.171	0.000	0.13	0.0	26.5	OK
526.000	56	95.246	-0.104	0.000	0.20	0.0	16.6	OK
525.001	57	92.282	-0.602	0.000	0.02	0.0	23.7	OK
520.004	58	92.281	0.131	0.000	0.10	0.0	9.0	SURCHARGED
500.012	59	92.049	0.499	0.000	0.17	0.0	29.5	SURCHARGED
500.013	60	92.045	0.745	0.000	0.24	0.0	14.6	SURCHARGED

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

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
500.000	15 Summer	100	0%					
501.000	15 Summer	100	0%					
500.001	15 Summer	100	0%					
502.000	15 Summer	100	0%					
500.002	15 Summer	100	0%					
503.000	15 Summer	100	0%					
500.003	15 Summer	100	0%					
500.004	15 Summer	100	0%					
500.005	15 Summer	100	0%					
500.006	15 Summer	100	0%					
500.007	15 Summer	100	0%					
500.008	15 Summer	100	0%					
500.009	15 Summer	100	0%	100/15 Summer				
504.000	60 Winter	100	0%					
505.000	15 Summer	100	0%					
505.001	15 Summer	100	0%					
506.000	60 Winter	100	0%	30/15 Summer				
507.000	60 Winter	100	0%	30/15 Summer				
505.002	60 Winter	100	0%	30/15 Summer				
505.003	60 Winter	100	0%	1/15 Summer				
504.001	60 Winter	100	0%					
508.000	60 Winter	100	0%					
500.010	60 Winter	100	0%	1/15 Summer				
509.000	15 Summer	100	0%					
510.000	60 Winter	100	0%	30/15 Summer				
511.000	60 Winter	100	0%	30/15 Summer				
512.000	60 Winter	100	0%	30/15 Summer				
510.001	60 Winter	100	0%	30/15 Summer				
510.002	60 Winter	100	0%	30/15 Summer				
509.001	15 Summer	100	0%					
500.011	480 Winter	100	0%					
513.000	480 Winter	100	0%					
514.000	15 Summer	100	0%					
515.000	15 Summer	100	0%					
514.001	15 Summer	100	0%					
516.000	15 Summer	100	0%	100/15 Summer				
517.000	15 Summer	100	0%	30/15 Summer	100/15 Summer			2
514.002	15 Summer	100	0%	30/15 Summer				
518.000	15 Summer	100	0%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
519.000	60 Winter	100	0%	30/15 Summer				
514.003	60 Winter	100	0%	30/15 Summer				
514.004	120 Winter	100	0%	30/15 Summer				
513.001	480 Winter	100	0%	30/15 Summer				
520.000	15 Summer	100	0%					
520.001	15 Summer	100	0%					
520.002	15 Summer	100	0%					
521.000	15 Summer	100	0%					
522.000	15 Summer	100	0%	100/15 Summer				
521.001	15 Summer	100	0%					
523.000	15 Summer	100	0%					
524.000	30 Winter	100	0%					
521.002	60 Winter	100	0%	30/15 Summer				
521.003	60 Winter	100	0%	1/15 Summer				
520.003	60 Winter	100	0%					
525.000	15 Summer	100	0%					
526.000	15 Summer	100	0%					
525.001	60 Winter	100	0%					
520.004	60 Winter	100	0%	30/15 Summer				
500.012	480 Winter	100	0%	30/60 Summer				
500.013	480 Winter	100	0%	1/30 Summer				

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
500.000	1	105.480	-0.120	0.000	0.67	0.0	83.8	OK
501.000	2	105.190	-0.038	0.000	0.87	0.0	9.4	OK
500.001	3	105.169	-0.131	0.000	0.61	0.0	104.1	OK
502.000	4	104.701	-0.021	0.000	0.87	0.0	9.4	OK
500.002	5	104.681	-0.119	0.000	0.67	0.0	126.9	OK
503.000	6	104.080	-0.041	0.000	0.88	0.0	9.3	OK
500.003	7	104.013	-0.112	0.000	0.70	0.0	135.1	OK
500.004	8	103.344	-0.131	0.000	0.59	0.0	144.0	OK
500.005	9	101.601	-0.124	0.000	0.63	0.0	156.3	OK
500.006	10	99.868	-0.107	0.000	0.73	0.0	167.7	OK
500.007	11	98.897	-0.078	0.000	0.89	0.0	176.3	OK
500.008	12	98.002	-0.273	0.000	0.32	0.0	183.1	OK
500.009	13	97.262	0.137	0.000	1.12	0.0	177.6	SURCHARGED
504.000	14	96.549	-0.144	0.000	0.01	0.0	12.1	OK
505.000	15	101.582	-0.068	0.000	0.58	0.0	27.0	OK
505.001	16	99.790	-0.060	0.000	0.66	0.0	39.2	OK
506.000	17	99.528	0.549	0.000	0.41	0.0	4.5	SURCHARGED
507.000	18	99.531	0.543	0.000	0.87	0.0	10.4	SURCHARGED
505.002	19	99.527	0.577	0.000	0.34	0.0	4.4	SURCHARGED
505.003	20	99.515	0.615	0.000	0.07	0.0	4.3	FLOOD RISK
504.001	21	96.549	-0.116	0.000	0.01	0.0	8.7	OK
508.000	22	96.549	-0.121	0.000	0.00	0.0	5.3	OK
500.010	23	96.549	0.874	0.000	0.16	0.0	12.3	SURCHARGED
509.000	24	97.583	-0.142	0.000	0.29	0.0	38.2	OK
510.000	25	96.033	0.441	0.000	0.42	0.0	14.7	SURCHARGED
511.000	26	96.034	0.545	0.000	0.81	0.0	9.7	SURCHARGED

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

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
512.000	27	96.034	0.533	0.000	0.78	0.0	9.8	SURCHARGED
510.001	28	96.030	0.580	0.000	0.31	0.0	4.4	SURCHARGED
510.002	29	96.021	0.546	0.000	0.06	0.0	4.4	SURCHARGED
509.001	30	95.029	-0.096	0.000	0.62	0.0	62.0	OK
500.011	31	92.283	-0.142	0.000	0.01	0.0	21.1	OK
513.000	32	92.347	-0.649	0.000	0.00	0.0	2.5	OK
514.000	33	97.461	-0.089	0.000	0.35	0.0	14.9	OK
515.000	34	96.457	-0.068	0.000	0.83	0.0	26.1	OK
514.001	35	96.339	-0.136	0.000	0.33	0.0	49.7	OK
516.000	36	95.068	0.443	0.000	0.16	0.0	13.9	SURCHARGED
517.000	37	95.001	0.651	0.662	0.20	0.0	12.4	FLOOD
514.002	38	95.046	0.896	0.000	1.40	0.0	56.2	SURCHARGED
518.000	39	95.396	-0.054	0.000	0.74	0.0	44.7	OK
519.000	40	94.039	0.389	0.000	0.23	0.0	6.4	SURCHARGED
514.003	41	94.038	0.588	0.000	0.41	0.0	4.4	SURCHARGED
514.004	42	94.025	0.585	0.000	0.13	0.0	4.3	SURCHARGED
513.001	43	92.347	0.372	0.000	0.22	0.0	6.8	SURCHARGED
520.000	44	96.299	-0.176	0.000	0.11	0.0	14.0	OK
520.001	45	94.815	-0.160	0.000	0.18	0.0	21.9	OK
520.002	46	93.897	-0.128	0.000	0.38	0.0	40.3	OK
521.000	47	96.247	-0.103	0.000	0.21	0.0	11.2	OK
522.000	48	95.868	0.118	0.000	1.49	0.0	19.8	SURCHARGED
521.001	49	95.587	-0.071	0.000	0.53	0.0	38.5	OK
523.000	50	94.848	-0.127	0.000	0.40	0.0	46.6	OK
524.000	51	94.834	-0.016	0.000	0.24	0.0	12.1	OK
521.002	52	94.832	0.632	0.000	0.32	0.0	4.5	SURCHARGED
521.003	53	94.824	0.674	0.000	0.09	0.0	4.5	FLOOD RISK
520.003	54	92.478	-0.392	0.000	0.02	0.0	18.2	OK
525.000	55	97.268	-0.157	0.000	0.20	0.0	40.1	OK
526.000	56	95.257	-0.093	0.000	0.31	0.0	25.2	OK
525.001	57	92.478	-0.406	0.000	0.02	0.0	34.4	OK
520.004	58	92.477	0.327	0.000	0.10	0.0	8.9	SURCHARGED
500.012	59	92.263	0.713	0.000	0.15	0.0	26.5	SURCHARGED
500.013	60	92.259	0.959	0.000	0.27	0.0	16.8	SURCHARGED

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

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
500.000	15 Summer	100	+30%					
501.000	15 Summer	100	+30%					
500.001	15 Summer	100	+30%					
502.000	15 Summer	100	+30%					
500.002	15 Summer	100	+30%					
503.000	15 Summer	100	+30%					
500.003	15 Summer	100	+30%					
500.004	15 Summer	100	+30%					
500.005	15 Summer	100	+30%					
500.006	15 Summer	100	+30%					
500.007	15 Summer	100	+30%					
500.008	15 Summer	100	+30%					
500.009	60 Winter	100	+30%					
504.000	60 Winter	100	+30%	100/15 Winter				
505.000	15 Summer	100	+30%					
505.001	15 Summer	100	+30%					
506.000	60 Winter	100	+30%					
507.000	15 Summer	100	+30%					
505.002	60 Winter	100	+30%					
505.003	60 Winter	100	+30%		100/30 Winter			1
504.001	60 Winter	100	+30%	100/15 Winter				
508.000	60 Winter	100	+30%	100/15 Winter				
500.010	60 Winter	100	+30%		100/60 Winter			1
509.000	15 Summer	100	+30%					
510.000	60 Winter	100	+30%					
511.000	60 Winter	100	+30%					
512.000	15 Summer	100	+30%					
510.001	60 Winter	100	+30%					
510.002	60 Winter	100	+30%					
509.001	15 Summer	100	+30%					
500.011	480 Winter	100	+30%	100/360 Winter				
513.000	480 Winter	100	+30%					
514.000	15 Summer	100	+30%					
515.000	15 Summer	100	+30%					
514.001	15 Summer	100	+30%					
516.000	15 Winter	100	+30%					
517.000	15 Winter	100	+30%					3
514.002	15 Winter	100	+30%					
518.000	15 Summer	100	+30%					
519.000	60 Winter	100	+30%					

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
514.003	60 Winter	100	+30%					
514.004	120 Winter	100	+30%					
513.001	480 Winter	100	+30%					
520.000	15 Summer	100	+30%					
520.001	15 Summer	100	+30%					
520.002	15 Summer	100	+30%					
521.000	15 Summer	100	+30%					
522.000	15 Summer	100	+30%					
521.001	15 Summer	100	+30%					
523.000	30 Winter	100	+30%	100/15 Winter				
524.000	30 Winter	100	+30%					
521.002	30 Winter	100	+30%					
521.003	60 Winter	100	+30%		100/30 Winter			3
520.003	120 Winter	100	+30%					
525.000	15 Summer	100	+30%					
526.000	15 Summer	100	+30%					
525.001	120 Winter	100	+30%					
520.004	120 Winter	100	+30%					
500.012	480 Winter	100	+30%					
500.013	480 Winter	100	+30%					

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
500.000	1	105.517	-0.083	0.000	0.87	0.0	109.0	OK
501.000	2	105.247	0.019	0.000	1.13	0.0	12.3	SURCHARGED
500.001	3	105.203	-0.097	0.000	0.79	0.0	135.4	OK
502.000	4	104.760	0.038	0.000	1.13	0.0	12.1	SURCHARGED
500.002	5	104.718	-0.082	0.000	0.87	0.0	164.9	OK
503.000	6	104.134	0.013	0.000	1.15	0.0	12.2	SURCHARGED
500.003	7	104.051	-0.074	0.000	0.91	0.0	175.3	OK
500.004	8	103.377	-0.098	0.000	0.76	0.0	186.3	OK
500.005	9	101.636	-0.089	0.000	0.82	0.0	204.2	OK
500.006	10	100.091	0.116	0.000	0.93	0.0	213.4	SURCHARGED
500.007	11	99.233	0.258	0.000	1.11	0.0	219.4	SURCHARGED
500.008	12	98.027	-0.248	0.000	0.40	0.0	227.2	OK
500.009	13	97.661	0.536	0.000	0.51	0.0	81.0	SURCHARGED
504.000	14	97.653	0.960	0.000	0.01	0.0	15.8	SURCHARGED
505.000	15	101.598	-0.052	0.000	0.76	0.0	35.1	OK
505.001	16	99.883	0.033	0.000	0.83	0.0	49.4	SURCHARGED
506.000	17	99.770	0.791	0.000	0.54	0.0	5.8	SURCHARGED
507.000	18	99.797	0.809	0.000	3.61	0.0	43.1	SURCHARGED
505.002	19	99.768	0.818	0.000	0.53	0.0	6.7	SURCHARGED
505.003	20	99.751	0.851	0.743	0.09	0.0	5.0	FLOOD
504.001	21	97.653	0.988	0.000	0.01	0.0	10.1	SURCHARGED
508.000	22	97.653	0.983	0.000	0.01	0.0	6.8	FLOOD RISK
500.010	23	97.653	1.978	3.480	0.22	0.0	17.3	FLOOD
509.000	24	97.596	-0.129	0.000	0.38	0.0	49.6	OK
510.000	25	96.293	0.701	0.000	0.54	0.0	19.1	SURCHARGED
511.000	26	96.294	0.805	0.000	1.05	0.0	12.6	SURCHARGED
512.000	27	96.349	0.848	0.000	3.20	0.0	40.0	SURCHARGED

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

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
510.001	28	96.290	0.840	0.000	0.36	0.0	5.0	SURCHARGED
510.002	29	96.279	0.804	0.000	0.07	0.0	5.0	FLOOD RISK
509.001	30	95.053	-0.072	0.000	0.79	0.0	79.4	OK
500.011	31	92.463	0.038	0.000	0.01	0.0	22.1	SURCHARGED
513.000	32	92.550	-0.446	0.000	0.00	0.0	3.2	OK
514.000	33	97.471	-0.079	0.000	0.45	0.0	19.4	OK
515.000	34	96.525	0.000	0.000	1.08	0.0	33.9	OK
514.001	35	96.353	-0.122	0.000	0.43	0.0	64.6	OK
516.000	36	95.121	0.496	0.000	0.23	0.0	20.8	FLOOD RISK
517.000	37	95.006	0.656	5.645	0.44	0.0	26.9	FLOOD
514.002	38	95.061	0.911	0.000	1.40	0.0	56.5	SURCHARGED
518.000	39	95.470	0.020	0.000	0.96	0.0	58.2	SURCHARGED
519.000	40	94.276	0.626	0.000	0.30	0.0	8.3	FLOOD RISK
514.003	41	94.274	0.824	0.000	0.46	0.0	5.0	SURCHARGED
514.004	42	94.277	0.837	0.000	0.15	0.0	5.0	FLOOD RISK
513.001	43	92.550	0.575	0.000	0.23	0.0	6.9	SURCHARGED
520.000	44	96.306	-0.169	0.000	0.14	0.0	18.2	OK
520.001	45	94.825	-0.150	0.000	0.24	0.0	28.4	OK
520.002	46	93.913	-0.112	0.000	0.49	0.0	52.4	OK
521.000	47	96.254	-0.096	0.000	0.28	0.0	14.5	OK
522.000	48	96.014	0.264	0.000	1.91	0.0	25.3	SURCHARGED
521.001	49	95.601	-0.057	0.000	0.68	0.0	49.5	OK
523.000	50	95.045	0.070	0.000	0.28	0.0	32.7	SURCHARGED
524.000	51	95.042	0.192	0.000	0.31	0.0	15.7	SURCHARGED
521.002	52	95.038	0.838	0.000	0.85	0.0	11.9	SURCHARGED
521.003	53	95.004	0.854	4.345	0.10	0.0	4.9	FLOOD
520.003	54	92.666	-0.204	0.000	0.02	0.0	14.8	OK
525.000	55	97.278	-0.147	0.000	0.26	0.0	52.1	OK
526.000	56	95.266	-0.084	0.000	0.40	0.0	32.7	OK
525.001	57	92.666	-0.218	0.000	0.02	0.0	25.7	OK
520.004	58	92.665	0.515	0.000	0.10	0.0	9.0	SURCHARGED
500.012	59	92.463	0.913	0.000	0.15	0.0	27.2	SURCHARGED
500.013	60	92.459	1.159	0.000	0.30	0.0	18.6	FLOOD RISK

Microdrainage Calculations for Residential Area 6

Existing Network Details for Area6.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
600.000	120.600	0.240	502.5	0.185	3.00	0.600	\/	-3
601.000	97.500	1.100	88.6	0.084	3.00	0.600	o	225
600.001	23.600	0.080	295.0	0.052	0.00	0.600	o	300
602.000	43.900	0.800	54.9	0.055	3.00	0.600	o	150
600.002	22.300	0.080	278.7	0.028	0.00	0.600	o	300
603.000	25.800	0.200	129.0	0.053	3.00	0.600	o	225
603.001	25.000	0.120	208.3	0.053	0.00	0.600	o	300
603.002	20.300	0.180	112.8	0.047	0.00	0.600	o	300
603.003	22.900	0.100	229.0	0.011	0.00	0.600	o	300
600.003	7.800	0.050	156.0	0.000	0.00	0.600	o	300
600.004	9.600	0.050	192.0	0.000	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
600.000	1	105.400	104.400	0.700	106.500	104.160	2.040		0
601.000	2	107.600	106.250	1.125	106.500	105.150	1.125		1050
600.001	3	106.500	104.160	2.040	105.900	104.080	1.520		10000
602.000	4	106.700	105.350	1.200	105.900	104.550	1.200		1050
600.002	5	105.900	104.080	1.520	105.600	104.000	1.300		1200
603.000	6	106.000	104.650	1.125	105.800	104.450	1.125		1050
603.001	7	105.800	104.375	1.125	105.700	104.255	1.145		1050
603.002	8	105.700	104.255	1.145	105.500	104.075	1.125		1050
603.003	9	105.500	104.075	1.125	105.600	103.975	1.325		1050
600.003	10	105.600	103.900	1.400	104.800	103.850	0.650		1050
600.004	11	104.800	103.350	1.225	104.400	103.300	0.875	Depth/Flow Relationship	1050

Free Flowing Outfall Details for Area6.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
600.004		104.400	103.300	0.000	0	0

Simulation Criteria for Area6.SWS

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Area6.SWS

Depth/Flow Relationship Manhole: 11, DS/PN: 600.004, Volume (m³): 1.7

Invert Level (m) 103.350

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.6000	0.500	5.6000	0.900	12.7000	1.600	18.8000
0.200	3.6000	0.600	8.6000	1.000	13.7000		
0.300	3.5000	0.700	10.3000	1.200	15.6000		
0.400	3.7000	0.800	11.5000	1.400	17.3000		

Storage Structures for Area6.SWS

Tank or Pond Manhole: 11, DS/PN: 600.004

Invert Level (m) 103.350

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	167.0	1.200	654.0

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area6.SWS

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
600.000	15 Summer	1	0%					
601.000	15 Summer	1	0%	100/15 Summer				
600.001	15 Winter	1	0%	30/15 Winter				
602.000	15 Summer	1	0%	30/15 Summer				
600.002	15 Winter	1	0%	30/15 Summer				
603.000	15 Summer	1	0%	100/15 Summer				
603.001	15 Summer	1	0%	100/15 Summer				
603.002	15 Winter	1	0%	30/15 Summer				
603.003	15 Winter	1	0%	30/15 Summer				
600.003	15 Winter	1	0%	30/15 Summer				
600.004	240 Winter	1	0%	1/120 Winter				

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
600.000	1	104.477	-0.673	0.000	0.01	0.0	31.3	OK
601.000	2	106.331	-0.144	0.000	0.27	0.0	14.6	OK
600.001	3	104.287	-0.173	0.000	0.38	0.0	21.5	OK
602.000	4	105.418	-0.082	0.000	0.41	0.0	9.5	OK
600.002	5	104.222	-0.158	0.000	0.46	0.0	26.7	OK
603.000	6	104.722	-0.153	0.000	0.21	0.0	9.0	OK
603.001	7	104.472	-0.203	0.000	0.22	0.0	15.4	OK
603.002	8	104.352	-0.203	0.000	0.23	0.0	20.7	OK
603.003	9	104.197	-0.178	0.000	0.34	0.0	22.1	OK
600.003	10	104.095	-0.105	0.000	0.74	0.0	45.7	OK
600.004	11	103.600	0.025	0.000	0.12	0.0	3.6	SURCHARGED

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area6.SWS

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
600.000	15 Winter	30	0%					
601.000	15 Summer	30	0%	100/15 Summer				
600.001	15 Winter	30	0%	30/15 Winter				
602.000	15 Summer	30	0%	30/15 Summer				
600.002	15 Winter	30	0%	30/15 Summer				
603.000	15 Summer	30	0%	100/15 Summer				
603.001	15 Winter	30	0%	100/15 Summer				
603.002	15 Winter	30	0%	30/15 Summer				
603.003	15 Winter	30	0%	30/15 Summer				
600.003	15 Winter	30	0%	30/15 Summer				
600.004	240 Winter	30	0%	1/120 Winter				

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
600.000	1	104.531	-0.619	0.000	0.02	0.0	89.1	OK
601.000	2	106.415	-0.060	0.000	0.85	0.0	46.1	OK
600.001	3	104.471	0.011	0.000	0.88	0.0	50.4	SURCHARGED
602.000	4	105.755	0.255	0.000	1.14	0.0	26.5	SURCHARGED
600.002	5	104.417	0.037	0.000	1.05	0.0	61.6	SURCHARGED
603.000	6	104.792	-0.083	0.000	0.66	0.0	28.0	OK
603.001	7	104.618	-0.057	0.000	0.75	0.0	51.3	OK
603.002	8	104.565	0.010	0.000	0.71	0.0	65.2	SURCHARGED
603.003	9	104.447	0.072	0.000	1.07	0.0	69.3	SURCHARGED
600.003	10	104.336	0.136	0.000	1.84	0.0	113.1	SURCHARGED
600.004	11	103.914	0.339	0.000	0.24	0.0	7.5	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area6.SWS

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
600.000	15 Winter	100	0%					
601.000	15 Summer	100	0%	100/15 Summer				
600.001	15 Winter	100	0%	30/15 Winter				
602.000	15 Summer	100	0%	30/15 Summer				
600.002	15 Winter	100	0%	30/15 Summer				
603.000	15 Winter	100	0%	100/15 Summer				
603.001	15 Winter	100	0%	100/15 Summer				
603.002	15 Winter	100	0%	30/15 Summer				
603.003	15 Winter	100	0%	30/15 Summer				
600.003	15 Winter	100	0%	30/15 Summer				
600.004	120 Winter	100	0%	1/120 Winter				

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
600.000	1	104.623	-0.527	0.000	0.04	0.0	134.0	OK
601.000	2	106.884	0.409	0.000	1.17	0.0	63.4	SURCHARGED
600.001	3	104.589	0.129	0.000	1.07	0.0	61.3	SURCHARGED
602.000	4	106.613	1.113	0.000	1.52	0.0	35.6	FLOOD RISK
600.002	5	104.546	0.166	0.000	1.27	0.0	74.1	SURCHARGED
603.000	6	105.203	0.328	0.000	0.88	0.0	37.2	SURCHARGED
603.001	7	105.066	0.391	0.000	0.99	0.0	68.1	SURCHARGED
603.002	8	104.940	0.385	0.000	1.08	0.0	98.8	SURCHARGED
603.003	9	104.723	0.348	0.000	1.62	0.0	104.7	SURCHARGED
600.003	10	104.465	0.265	0.000	2.33	0.0	142.7	SURCHARGED
600.004	11	104.065	0.490	0.000	0.34	0.0	10.5	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Area6.SWS

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
600.000	15 Winter	100	+30%					
601.000	15 Summer	100	+30%					1
600.001	15 Winter	100	+30%					
602.000	15 Winter	100	+30%					2
600.002	15 Winter	100	+30%					
603.000	15 Winter	100	+30%					
603.001	15 Winter	100	+30%					
603.002	15 Winter	100	+30%					
603.003	15 Winter	100	+30%					
600.003	15 Winter	100	+30%					
600.004	240 Winter	100	+30%					

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
600.000	1	104.736	-0.414	0.000	0.05	0.0	173.8	OK
601.000	2	107.600	1.125	0.110	1.41	0.0	76.3	FLOOD
600.001	3	104.682	0.222	0.000	1.11	0.0	63.6	SURCHARGED
602.000	4	106.702	1.202	2.020	1.58	0.0	37.0	FLOOD
600.002	5	104.651	0.271	0.000	1.46	0.0	85.0	SURCHARGED
603.000	6	105.787	0.912	0.000	1.03	0.0	43.3	FLOOD RISK
603.001	7	105.565	0.890	0.000	1.28	0.0	87.9	FLOOD RISK
603.002	8	105.358	0.803	0.000	1.40	0.0	127.4	SURCHARGED
603.003	9	105.006	0.631	0.000	2.09	0.0	135.0	SURCHARGED
600.003	10	104.571	0.371	0.000	2.67	0.0	163.9	SURCHARGED
600.004	11	104.206	0.631	0.000	0.39	0.0	12.2	SURCHARGED

Microdrainage Calculations for Residential Area 7

Existing Network Details for AREA7.SIM

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
700.000	37.400	0.075	498.7	0.043	3.00	0.600	o	900
700.001	80.200	0.160	501.3	0.078	0.00	0.600	o	900
700.002	23.800	0.050	476.0	0.037	0.00	0.600	o	900
700.003	28.600	0.060	476.7	0.073	0.00	0.600	o	900
700.004	12.300	0.070	175.7	0.015	0.00	0.600	o	900
701.000	33.000	0.400	82.5	0.086	3.00	0.600	o	225
701.001	28.900	0.800	36.1	0.085	0.00	0.600	o	225
701.002	36.600	0.600	61.0	0.057	0.00	0.600	o	300
700.005	13.700	0.300	45.7	0.000	0.00	0.600	o	375
700.006	11.000	0.115	95.7	0.015	0.00	0.600	o	375
700.007	56.800	0.080	710.0	0.100	0.00	0.600	o	375
702.000	40.400	0.800	50.5	0.118	3.00	0.600	o	300
702.001	32.100	0.700	45.9	0.086	0.00	0.600	o	300
700.008	47.500	1.080	44.0	0.112	0.00	0.600	o	450
700.009	32.700	0.600	54.5	0.067	0.00	0.600	o	450
703.000	12.300	0.200	61.5	0.023	3.00	0.600	o	225
703.001	38.300	1.300	29.5	0.134	0.00	0.600	o	225
703.002	22.300	0.500	44.6	0.015	0.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
700.000	1	107.600	103.315	3.385	107.200	103.240	3.060		1800
700.001	2	107.200	103.240	3.060	105.500	103.080	1.520		1800
700.002	3	105.500	103.080	1.520	105.200	103.030	1.270		1800
700.003	4	105.200	103.030	1.270	105.200	102.970	1.330		1800
700.004	5	105.200	102.970	1.330	105.000	102.900	1.200		1800
701.000	6	106.800	105.375	1.200	106.400	104.975	1.200		1050
701.001	7	106.400	104.975	1.200	105.600	104.175	1.200		1050
701.002	8	105.600	104.100	1.200	105.000	103.500	1.200		1050
700.005	9	105.000	102.900	1.725	104.700	102.600	1.725	Hydro-Brake®	1800
700.006	11	104.700	102.600	1.725	105.000	102.485	2.140		1350
700.007	12	105.000	102.485	2.140	104.200	102.405	1.420		1350
702.000	13	105.700	104.200	1.200	104.900	103.400	1.200		1050
702.001	14	104.900	103.400	1.200	104.200	102.700	1.200		1050
700.008	15	104.200	102.330	1.420	102.900	101.250	1.200		1350
700.009	16	102.900	101.250	1.200	102.300	100.650	1.200		1350
703.000	17	104.300	102.875	1.200	104.100	102.675	1.200		1050
703.001	18	104.100	102.675	1.200	102.800	101.375	1.200		1050
703.002	18	102.800	101.300	1.200	102.300	100.800	1.200		1050

Existing Network Details for AREA7.SIM

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
700.010	23.000	0.200	115.0	0.030	0.00	0.600	o	450
700.011	14.200	0.700	20.3	0.087	0.00	0.600	o	450
704.000	31.000	0.900	34.4	0.039	3.00	0.600	o	150
704.001	66.700	2.100	31.8	0.063	0.00	0.600	o	225
704.002	17.800	0.800	22.2	0.000	0.00	0.600	o	225
700.012	30.100	1.350	22.3	0.000	0.00	0.600	o	225
705.000	15.100	0.100	151.0	0.015	3.00	0.600	o	150
705.001	49.200	1.000	49.2	0.065	0.00	0.600	o	225
705.002	31.500	0.500	63.0	0.046	0.00	0.600	o	225
705.003	22.700	0.700	32.4	0.011	0.00	0.600	o	225
706.000	58.400	0.120	486.7	0.112	3.00	0.600	o	1200
706.001	14.300	0.030	476.7	0.022	0.00	0.600	o	1200
706.002	29.100	0.060	485.0	0.059	0.00	0.600	o	1200
706.003	21.400	0.050	428.0	0.057	0.00	0.600	o	1200
706.004	12.200	0.030	406.7	0.016	0.00	0.600	o	1200
705.004	11.900	0.050	238.0	0.020	0.00	0.600	o	375

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
700.010	19	102.300	100.650	1.200	102.100	100.450	1.200		1350
700.011	20	102.100	100.450	1.200	101.400	99.750	1.200		1350
704.000	21	105.200	103.850	1.200	104.300	102.950	1.200		1050
704.001	22	104.300	102.875	1.200	102.200	100.775	1.200		1050
704.002	23	102.200	100.775	1.200	101.400	99.975	1.200		1050
700.012	24	101.400	99.750	1.425	99.900	98.400	1.275	Hydro-Brake®	1350
705.000	25	105.100	103.750	1.200	105.000	103.650	1.200		1050
705.001	26	105.000	103.575	1.200	104.000	102.575	1.200		1050
705.002	27	104.000	102.575	1.200	103.500	102.075	1.200		1050
705.003	28	103.500	102.075	1.200	102.800	101.375	1.200		1050
706.000	29	104.300	100.650	2.450	103.200	100.530	1.470		1800
706.001	30	103.200	100.530	1.470	102.900	100.500	1.200		1800
706.002	31	102.900	100.500	1.200	102.700	100.440	1.060		1800
706.003	32	102.700	100.440	1.060	102.800	100.390	1.210		1800
706.004	33	102.800	100.390	1.210	102.800	100.360	1.240		1800
705.004	34	102.800	100.360	2.065	102.700	100.310	2.015	Hydro-Brake®	1800

Existing Network Details for AREA7.SIM

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
707.000	36.700	0.250	146.8	0.026	3.00	0.600	o	150
705.005	14.900	0.050	298.0	0.013	0.00	0.600	o	375
705.006	21.200	0.235	90.2	0.034	0.00	0.600	o	375
705.007	37.400	0.400	93.5	0.046	0.00	0.600	o	375
705.008	60.300	0.700	86.1	0.063	0.00	0.600	o	375
705.009	6.500	0.600	10.8	0.000	0.00	0.600	o	375
708.000	72.100	0.150	480.7	0.034	3.00	0.600	o	600
708.001	32.100	0.065	493.8	0.017	0.00	0.600	o	600
708.002	45.900	0.095	483.2	0.017	0.00	0.600	o	600
708.003	9.600	0.020	480.0	0.006	0.00	0.600	o	600
708.004	27.900	0.055	507.3	0.000	0.00	0.600	o	1200
709.000	52.200	0.800	65.3	0.095	3.00	0.600	o	225
709.001	7.000	0.100	70.0	0.000	0.00	0.600	o	225
708.005	76.000	0.150	506.7	0.066	0.00	0.600	o	1200
710.000	46.000	0.900	51.1	0.146	3.00	0.600	o	300

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
707.000	35	102.900	101.550	1.200	102.700	101.300	1.250		1050
705.005	36	102.700	100.310	2.015	102.300	100.260	1.665		1350
705.006	37	102.300	100.260	1.665	101.900	100.025	1.500		1350
705.007	38	101.900	100.025	1.500	101.200	99.625	1.200		1350
705.008	39	101.200	99.625	1.200	100.500	98.925	1.200		1350
705.009	40	100.500	98.925	1.200	99.900	98.325	1.200		1350
708.000	41	103.300	100.330	2.370	102.900	100.180	2.120		1500
708.001	42	102.900	100.180	2.120	102.300	100.115	1.585		1500
708.002	43	102.300	100.115	1.585	101.900	100.020	1.280		1500
708.003	44	101.900	100.020	1.280	101.800	100.000	1.200		1500
708.004	45	101.800	98.455	2.145	101.700	98.400	2.100	Hydro-Brake®	1800
709.000	46	102.600	101.175	1.200	101.800	100.375	1.200		1050
709.001	47	101.800	100.375	1.200	101.700	100.275	1.200		1050
708.005	48	101.700	98.400	2.100	100.900	98.250	1.450		1800
710.000	49	101.800	100.375	1.125	100.900	99.475	1.125		1050

Existing Network Details for AREA7.SIM

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
708.006	51.500	0.100	515.0	0.042	0.00	0.600	o	1200
708.007	43.500	0.090	483.4	0.032	0.00	0.600	o	1200
708.008	4.800	0.010	479.5	0.000	0.00	0.600	o	1200
700.013	5.600	0.030	186.7	0.000	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
708.006	50	100.900	98.250	1.450	100.100	98.150	0.750		1800
708.007	51	100.100	98.150	0.750	99.800	98.060	0.540		1800
708.008	52	99.800	98.060	0.540	99.900	98.050	0.650		1800
700.013	53	99.900	98.050	1.625	98.545	98.020	0.300	Complex	1800

Free Flowing Outfall Details for AREA7.SIM

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
700.013		98.545	98.020	0.000	1200	0

Simulation Criteria for AREA7.SIM

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	5	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	Yes
Winter Storms	No

Synthetic Rainfall Details

Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for AREA7.SIM

Hydro-Brake® Manhole: 9, DS/PN: 700.005, Volume (m³): 14.5

Design Head (m) 1.500 Hydro-Brake® Type Md5 SW Only Invert Level (m) 102.900
Design Flow (l/s) 100.0 Diameter (mm) 359

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	13.0	1.200	95.9	3.000	134.4	7.000	205.2
0.200	35.4	1.400	98.1	3.500	145.1	7.500	212.4
0.300	58.5	1.600	101.7	4.000	155.1	8.000	219.4
0.400	77.3	1.800	106.1	4.500	164.5	8.500	226.1
0.500	88.3	2.000	110.8	5.000	173.4	9.000	232.7
0.600	94.2	2.200	115.7	5.500	181.9	9.500	239.1
0.800	96.9	2.400	120.5	6.000	190.0		
1.000	95.7	2.600	125.3	6.500	197.8		

Hydro-Brake® Manhole: 24, DS/PN: 700.012, Volume (m³): 5.1

Design Head (m) 1.000 Hydro-Brake® Type Md5 SW Only Invert Level (m) 99.750
Design Flow (l/s) 5.0 Diameter (mm) 92

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.5	1.200	5.6	3.000	8.8	7.000	13.5
0.200	3.2	1.400	6.0	3.500	9.5	7.500	14.0
0.300	3.2	1.600	6.4	4.000	10.2	8.000	14.4
0.400	3.4	1.800	6.8	4.500	10.8	8.500	14.9
0.500	3.6	2.000	7.2	5.000	11.4	9.000	15.3
0.600	4.0	2.200	7.6	5.500	11.9	9.500	15.7
0.800	4.6	2.400	7.9	6.000	12.5		
1.000	5.1	2.600	8.2	6.500	13.0		

Hydro-Brake® Manhole: 34, DS/PN: 705.004, Volume (m³): 18.8

Design Head (m) 1.500 Hydro-Brake® Type Md5 SW Only Invert Level (m) 100.360
Design Flow (l/s) 20.0 Diameter (mm) 165

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.7	1.200	18.0	3.000	28.4	7.000	43.4
0.200	11.8	1.400	19.4	3.500	30.7	7.500	44.9
0.300	13.7	1.600	20.7	4.000	32.8	8.000	46.3
0.400	13.8	1.800	22.0	4.500	34.8	8.500	47.8
0.500	13.7	2.000	23.2	5.000	36.6	9.000	49.2
0.600	13.9	2.200	24.3	5.500	38.4	9.500	50.5
0.800	15.0	2.400	25.4	6.000	40.1		
1.000	16.5	2.600	26.4	6.500	41.8		

Hydro-Brake® Manhole: 45, DS/PN: 708.004, Volume (m³): 10.8

Design Head (m) 1.500 Design Flow (l/s) 10.0 Hydro-Brake® Type Md5 SW Only

Hydro-Brake® Manhole: 45, DS/PN: 708.004, Volume (m³): 10.8

Diameter (mm) 117 Invert Level (m) 98.455

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	1.200	9.0	3.000	14.3	7.000	21.8
0.200	5.7	1.400	9.7	3.500	15.4	7.500	22.6
0.300	5.8	1.600	10.4	4.000	16.5	8.000	23.3
0.400	5.8	1.800	11.1	4.500	17.5	8.500	24.0
0.500	6.1	2.000	11.7	5.000	18.4	9.000	24.7
0.600	6.5	2.200	12.2	5.500	19.3	9.500	25.4
0.800	7.4	2.400	12.8	6.000	20.2		
1.000	8.2	2.600	13.3	6.500	21.0		

Complex Manhole: 53, DS/PN: 700.013, Volume (m³): 9.8

Depth/Flow Relationship

Invert Level (m) 98.050

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.4036	0.500	8.4903	0.900	20.8166	1.600	44.6253
0.200	7.7704	0.600	8.8702	1.000	23.9221	1.800	48.8861
0.300	8.4143	0.700	11.5263	1.200	33.9602	2.000	52.8376
0.400	8.3533	0.800	16.4185	1.400	39.9278		

Storage Structures for AREA7.SIM

Tank or Pond Manhole: 24, DS/PN: 700.012

Invert Level (m) 99.900

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	579.0	0.400	774.0	0.800	986.0	1.200	1014.0
0.100	626.0	0.500	825.0	0.900	1042.0	1.300	0.0
0.200	675.0	0.600	878.0	1.000	1098.0		
0.300	724.0	0.700	932.0	1.100	956.0		

Tank or Pond Manhole: 53, DS/PN: 700.013

Invert Level (m) 98.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	86.0	0.400	149.0	0.800	228.0	1.200	323.0
0.100	101.0	0.500	167.0	0.900	250.0	1.300	0.0
0.200	116.0	0.600	186.0	1.000	273.0		
0.300	132.0	0.700	207.0	1.100	297.0		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.000	15 Summer	1	0%					
700.001	15 Winter	1	0%					
700.002	15 Winter	1	0%					
700.003	15 Winter	1	0%					
700.004	15 Winter	1	0%					
701.000	15 Summer	1	0%	100/15 Summer				
701.001	15 Summer	1	0%	30/15 Summer				
701.002	15 Summer	1	0%	100/15 Summer				
700.005	15 Winter	1	0%	30/15 Summer				
700.006	15 Winter	1	0%	30/15 Summer				
700.007	15 Winter	1	0%	30/15 Summer				
702.000	15 Summer	1	0%					
702.001	15 Summer	1	0%	100/15 Summer				
700.008	15 Winter	1	0%	100/15 Summer				
700.009	15 Winter	1	0%	100/15 Summer				
703.000	15 Summer	1	0%	100/15 Summer				26
703.001	15 Winter	1	0%	100/15 Summer				
703.002	15 Winter	1	0%	100/15 Summer				
700.010	15 Winter	1	0%	30/15 Summer				
700.011	15 Winter	1	0%	100/15 Summer				
704.000	15 Summer	1	0%	100/15 Summer				
704.001	15 Summer	1	0%					
704.002	15 Winter	1	0%					
700.012	360 Winter	1	0%					
705.000	15 Summer	1	0%					
705.001	15 Winter	1	0%	100/15 Summer				
705.002	15 Winter	1	0%	100/15 Summer				
705.003	15 Winter	1	0%	100/15 Summer				
706.000	15 Winter	1	0%					
706.001	15 Winter	1	0%					
706.002	15 Winter	1	0%					
706.003	15 Winter	1	0%					
706.004	15 Winter	1	0%					
705.004	15 Winter	1	0%					
707.000	15 Summer	1	0%	100/15 Summer				
705.005	15 Winter	1	0%					
705.006	15 Winter	1	0%					
705.007	15 Winter	1	0%					
705.008	15 Winter	1	0%					
705.009	15 Winter	1	0%					
708.000	15 Summer	1	0%					
708.001	15 Winter	1	0%					
708.002	15 Winter	1	0%					
708.003	15 Winter	1	0%					
708.004	15 Winter	1	0%	30/15 Summer				
709.000	15 Summer	1	0%	100/15 Summer				
709.001	15 Summer	1	0%	30/15 Summer				
708.005	240 Winter	1	0%					
710.000	15 Summer	1	0%					
708.006	240 Winter	1	0%					
708.007	240 Winter	1	0%					
708.008	240 Winter	1	0%					

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.013	240 Winter	1	0%					

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
700.000	1	103.384	-0.831	0.000	0.01	0.0	7.1	OK
700.001	2	103.335	-0.805	0.000	0.02	0.0	15.1	OK
700.002	3	103.207	-0.773	0.000	0.03	0.0	17.2	OK
700.003	4	103.183	-0.747	0.000	0.04	0.0	24.2	OK
700.004	5	103.157	-0.713	0.000	0.03	0.0	27.4	OK
701.000	6	105.457	-0.143	0.000	0.27	0.0	14.4	OK
701.001	7	105.061	-0.139	0.000	0.31	0.0	24.8	OK
701.002	8	104.199	-0.201	0.000	0.24	0.0	31.5	OK
700.005	9	103.153	-0.122	0.000	0.22	0.0	47.7	OK
700.006	11	102.777	-0.198	0.000	0.37	0.0	49.3	OK
700.007	12	102.753	-0.107	0.000	0.83	0.0	57.4	OK
702.000	13	104.276	-0.224	0.000	0.14	0.0	20.2	OK
702.001	14	103.492	-0.208	0.000	0.20	0.0	30.3	OK
700.008	15	102.465	-0.315	0.000	0.20	0.0	86.4	OK
700.009	16	101.401	-0.299	0.000	0.25	0.0	93.9	OK
703.000	17	102.915	-0.185	0.000	0.07	0.0	4.0	OK
703.001	18	102.746	-0.154	0.000	0.22	0.0	20.2	OK
703.002	18	101.377	-0.223	0.000	0.15	0.0	22.0	OK
700.010	19	100.868	-0.232	0.000	0.47	0.0	117.4	OK
700.011	20	100.609	-0.291	0.000	0.27	0.0	127.5	OK
704.000	21	103.900	-0.100	0.000	0.23	0.0	6.7	OK
704.001	22	102.935	-0.165	0.000	0.16	0.0	14.0	OK
704.002	23	100.831	-0.169	0.000	0.14	0.0	13.9	OK
700.012	24	100.163	0.188	0.000	0.03	0.0	3.4	SURCHARGED
705.000	25	103.796	-0.104	0.000	0.19	0.0	2.5	OK
705.001	26	103.632	-0.168	0.000	0.14	0.0	10.3	OK
705.002	27	102.653	-0.147	0.000	0.26	0.0	16.0	OK
705.003	28	102.144	-0.156	0.000	0.21	0.0	17.3	OK
706.000	29	100.766	-1.084	0.000	0.01	0.0	17.8	OK
706.001	30	100.765	-0.965	0.000	0.02	0.0	12.7	OK
706.002	31	100.765	-0.935	0.000	0.01	0.0	15.5	OK
706.003	32	100.765	-0.875	0.000	0.01	0.0	10.6	OK
706.004	33	100.764	-0.826	0.000	0.01	0.0	12.0	OK
705.004	34	100.764	0.029	0.000	0.14	0.0	13.8	SURCHARGED
707.000	35	101.610	-0.090	0.000	0.33	0.0	4.6	OK
705.005	36	100.423	-0.262	0.000	0.20	0.0	18.2	OK
705.006	37	100.348	-0.287	0.000	0.12	0.0	22.2	OK
705.007	38	100.121	-0.279	0.000	0.15	0.0	27.4	OK
705.008	39	99.730	-0.270	0.000	0.17	0.0	34.7	OK
705.009	40	99.009	-0.291	0.000	0.11	0.0	34.7	OK
708.000	41	100.391	-0.539	0.000	0.02	0.0	5.7	OK
708.001	42	100.253	-0.527	0.000	0.03	0.0	6.8	OK
708.002	43	100.192	-0.523	0.000	0.03	0.0	8.3	OK
708.003	44	100.113	-0.507	0.000	0.06	0.0	8.9	OK
708.004	45	98.939	-0.716	0.000	0.00	0.0	6.0	OK
709.000	46	101.256	-0.144	0.000	0.26	0.0	15.9	OK
709.001	47	100.470	-0.130	0.000	0.36	0.0	16.2	OK
708.005	48	98.584	-1.016	0.000	0.00	0.0	6.0	OK
710.000	49	100.461	-0.214	0.000	0.17	0.0	24.8	OK
708.006	50	98.584	-0.866	0.000	0.01	0.0	8.9	OK
708.007	51	98.584	-0.766	0.000	0.01	0.0	7.7	OK

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
708.008	52	98.584	-0.676	0.000	0.01	0.0	5.0	OK
700.013	53	98.584	0.309	0.000	0.30	0.0	8.6	SURCHARGED

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.000	15 Winter	30	0%					
700.001	15 Winter	30	0%					
700.002	15 Winter	30	0%					
700.003	15 Winter	30	0%					
700.004	15 Winter	30	0%					
701.000	15 Summer	30	0%	100/15 Summer				
701.001	15 Summer	30	0%	30/15 Summer				
701.002	15 Summer	30	0%	100/15 Summer				
700.005	15 Winter	30	0%	30/15 Summer				
700.006	15 Winter	30	0%	30/15 Summer				
700.007	15 Winter	30	0%	30/15 Summer				
702.000	15 Summer	30	0%					
702.001	15 Summer	30	0%	100/15 Summer				
700.008	15 Winter	30	0%	100/15 Summer				
700.009	15 Winter	30	0%	100/15 Summer				
703.000	15 Summer	30	0%	100/15 Summer				26
703.001	15 Summer	30	0%	100/15 Summer				
703.002	15 Winter	30	0%	100/15 Summer				
700.010	15 Winter	30	0%	30/15 Summer				
700.011	15 Winter	30	0%	100/15 Summer				
704.000	15 Summer	30	0%	100/15 Summer				
704.001	15 Summer	30	0%					
704.002	15 Summer	30	0%					
700.012	480 Winter	30	0%					
705.000	15 Summer	30	0%					
705.001	15 Summer	30	0%	100/15 Summer				
705.002	15 Summer	30	0%	100/15 Summer				
705.003	15 Winter	30	0%	100/15 Summer				
706.000	30 Winter	30	0%					
706.001	30 Winter	30	0%					
706.002	30 Winter	30	0%					
706.003	30 Winter	30	0%					
706.004	30 Winter	30	0%					
705.004	30 Winter	30	0%					
707.000	15 Summer	30	0%	100/15 Summer				
705.005	15 Summer	30	0%					
705.006	15 Summer	30	0%					
705.007	15 Summer	30	0%					
705.008	15 Summer	30	0%					
705.009	15 Winter	30	0%					
708.000	15 Summer	30	0%					
708.001	15 Winter	30	0%					
708.002	15 Winter	30	0%					
708.003	15 Winter	30	0%					
708.004	15 Winter	30	0%	30/15 Summer				
709.000	15 Summer	30	0%	100/15 Summer				
709.001	15 Summer	30	0%	30/15 Summer				
708.005	360 Winter	30	0%					
710.000	15 Summer	30	0%					
708.006	360 Winter	30	0%					
708.007	360 Winter	30	0%					
708.008	360 Winter	30	0%					

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.013	360 Winter	30	0%					

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
700.000	1	103.577	-0.638	0.000	0.03	0.0	20.8	OK
700.001	2	103.577	-0.563	0.000	0.06	0.0	44.0	OK
700.002	3	103.566	-0.414	0.000	0.08	0.0	48.1	OK
700.003	4	103.557	-0.373	0.000	0.09	0.0	57.8	OK
700.004	5	103.538	-0.332	0.000	0.08	0.0	68.5	OK
701.000	6	105.546	-0.054	0.000	0.84	0.0	45.4	OK
701.001	7	105.263	0.063	0.000	1.03	0.0	83.4	SURCHARGED
701.002	8	104.313	-0.087	0.000	0.84	0.0	110.3	OK
700.005	9	103.536	0.261	0.000	0.38	0.0	81.0	SURCHARGED
700.006	11	103.117	0.142	0.000	0.64	0.0	85.3	SURCHARGED
700.007	12	103.000	0.140	0.000	1.64	0.0	113.5	SURCHARGED
702.000	13	104.343	-0.157	0.000	0.44	0.0	63.8	OK
702.001	14	103.591	-0.109	0.000	0.70	0.0	105.6	OK
700.008	15	102.578	-0.202	0.000	0.57	0.0	253.1	OK
700.009	16	101.644	-0.056	0.000	0.74	0.0	281.4	OK
703.000	17	102.948	-0.152	0.000	0.22	0.0	12.8	OK
703.001	18	102.837	-0.063	0.000	0.86	0.0	78.0	OK
703.002	18	101.473	-0.127	0.000	0.58	0.0	84.9	OK
700.010	19	101.317	0.217	0.000	1.49	0.0	370.2	SURCHARGED
700.011	20	100.774	-0.126	0.000	0.86	0.0	405.5	OK
704.000	21	103.949	-0.051	0.000	0.72	0.0	21.0	OK
704.001	22	103.000	-0.100	0.000	0.58	0.0	51.7	OK
704.002	23	100.890	-0.110	0.000	0.52	0.0	51.6	OK
700.012	24	100.576	0.601	0.000	0.04	0.0	4.6	SURCHARGED
705.000	25	103.838	-0.062	0.000	0.60	0.0	8.0	OK
705.001	26	103.696	-0.104	0.000	0.56	0.0	39.7	OK
705.002	27	102.770	-0.030	0.000	0.99	0.0	60.8	OK
705.003	28	102.227	-0.073	0.000	0.78	0.0	65.7	OK
706.000	29	101.187	-0.663	0.000	0.02	0.0	34.0	OK
706.001	30	101.186	-0.544	0.000	0.01	0.0	7.1	OK
706.002	31	101.186	-0.514	0.000	0.01	0.0	10.8	OK
706.003	32	101.185	-0.455	0.000	0.01	0.0	11.1	OK
706.004	33	101.184	-0.406	0.000	0.01	0.0	13.3	OK
705.004	34	101.183	0.448	0.000	0.15	0.0	14.8	SURCHARGED
707.000	35	101.699	-0.001	0.000	1.00	0.0	14.1	OK
705.005	36	100.468	-0.217	0.000	0.37	0.0	33.8	OK
705.006	37	100.396	-0.239	0.000	0.28	0.0	49.9	OK
705.007	38	100.187	-0.213	0.000	0.38	0.0	70.5	OK
705.008	39	99.815	-0.185	0.000	0.49	0.0	98.7	OK
705.009	40	99.073	-0.227	0.000	0.33	0.0	99.8	OK
708.000	41	100.435	-0.495	0.000	0.06	0.0	16.6	OK
708.001	42	100.316	-0.464	0.000	0.08	0.0	21.3	OK
708.002	43	100.259	-0.456	0.000	0.10	0.0	26.5	OK
708.003	44	100.246	-0.374	0.000	0.17	0.0	25.8	OK
708.004	45	100.245	0.590	0.000	0.01	0.0	10.5	SURCHARGED
709.000	46	101.338	-0.062	0.000	0.81	0.0	50.1	OK
709.001	47	100.621	0.021	0.000	1.14	0.0	50.8	SURCHARGED
708.005	48	98.964	-0.636	0.000	0.01	0.0	9.1	OK
710.000	49	100.538	-0.137	0.000	0.54	0.0	78.6	OK
708.006	50	98.964	-0.486	0.000	0.01	0.0	11.0	OK
708.007	51	98.963	-0.387	0.000	0.01	0.0	7.6	OK

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
708.008	52	98.962	-0.298	0.000	0.01	0.0	7.2	OK
700.013	53	98.962	0.687	0.000	0.75	0.0	21.2	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 0

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.000	15 Winter	100	0%					
700.001	15 Winter	100	0%					
700.002	15 Winter	100	0%					
700.003	15 Winter	100	0%					
700.004	15 Winter	100	0%					
701.000	15 Summer	100	0%	100/15 Summer				
701.001	15 Summer	100	0%	30/15 Summer				
701.002	15 Summer	100	0%	100/15 Summer				
700.005	15 Winter	100	0%	30/15 Summer				
700.006	15 Winter	100	0%	30/15 Summer				
700.007	15 Winter	100	0%	30/15 Summer				
702.000	15 Summer	100	0%					
702.001	15 Summer	100	0%	100/15 Summer				
700.008	15 Winter	100	0%	100/15 Summer				
700.009	15 Winter	100	0%	100/15 Summer				
703.000	15 Winter	100	0%	100/15 Summer				26
703.001	15 Winter	100	0%	100/15 Summer				
703.002	15 Winter	100	0%	100/15 Summer				
700.010	15 Winter	100	0%	30/15 Summer				
700.011	15 Winter	100	0%	100/15 Summer				
704.000	15 Summer	100	0%	100/15 Summer				
704.001	15 Summer	100	0%					
704.002	15 Summer	100	0%					
700.012	480 Winter	100	0%					
705.000	15 Winter	100	0%					
705.001	15 Winter	100	0%	100/15 Summer				
705.002	15 Winter	100	0%	100/15 Summer				
705.003	15 Winter	100	0%	100/15 Summer				
706.000	30 Winter	100	0%					
706.001	30 Winter	100	0%					
706.002	30 Winter	100	0%					
706.003	30 Winter	100	0%					
706.004	30 Winter	100	0%					
705.004	30 Winter	100	0%					
707.000	15 Summer	100	0%	100/15 Summer				
705.005	15 Summer	100	0%					
705.006	15 Summer	100	0%					
705.007	15 Summer	100	0%					
705.008	15 Winter	100	0%					
705.009	480 Winter	100	0%					
708.000	15 Summer	100	0%					
708.001	15 Winter	100	0%					
708.002	15 Winter	100	0%					
708.003	15 Winter	100	0%					
708.004	15 Winter	100	0%	30/15 Summer				
709.000	15 Summer	100	0%	100/15 Summer				
709.001	15 Summer	100	0%	30/15 Summer				
708.005	480 Winter	100	0%					
710.000	15 Summer	100	0%					
708.006	480 Winter	100	0%					
708.007	480 Winter	100	0%					
708.008	480 Winter	100	0%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.013	480 Winter	100	0%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
700.000	1	103.848	-0.367	0.000	0.04	0.0	30.7	OK
700.001	2	103.846	-0.294	0.000	0.07	0.0	53.4	OK
700.002	3	103.833	-0.147	0.000	0.10	0.0	62.9	OK
700.003	4	103.825	-0.105	0.000	0.11	0.0	70.3	OK
700.004	5	103.809	-0.061	0.000	0.10	0.0	86.9	OK
701.000	6	106.439	0.839	0.000	1.04	0.0	56.1	SURCHARGED
701.001	7	106.026	0.826	0.000	1.35	0.0	109.2	SURCHARGED
701.002	8	104.536	0.136	0.000	1.11	0.0	145.7	SURCHARGED
700.005	9	103.810	0.535	0.000	0.44	0.0	94.8	SURCHARGED
700.006	11	103.338	0.363	0.000	0.75	0.0	99.9	SURCHARGED
700.007	12	103.226	0.366	0.000	1.99	0.0	138.3	SURCHARGED
702.000	13	104.385	-0.115	0.000	0.66	0.0	96.4	OK
702.001	14	103.742	0.042	0.000	1.04	0.0	156.8	SURCHARGED
700.008	15	102.895	0.115	0.000	0.74	0.0	327.7	SURCHARGED
700.009	16	102.303	0.603	0.000	0.94	0.0	357.2	SURCHARGED
703.000	17	103.500	0.400	0.000	0.27	0.0	15.6	SURCHARGED
703.001	18	103.480	0.580	0.000	1.08	0.0	98.0	SURCHARGED
703.002	18	102.025	0.425	0.000	0.71	0.0	104.1	SURCHARGED
700.010	19	101.776	0.676	0.000	1.91	0.0	475.7	SURCHARGED
700.011	20	101.048	0.148	0.000	1.10	0.0	518.7	SURCHARGED
704.000	21	104.106	0.106	0.000	1.05	0.0	30.6	SURCHARGED
704.001	22	103.036	-0.064	0.000	0.85	0.0	76.4	OK
704.002	23	100.925	-0.075	0.000	0.77	0.0	75.9	OK
700.012	24	100.793	0.818	0.000	0.05	0.0	5.2	SURCHARGED
705.000	25	103.890	-0.010	0.000	0.87	0.0	11.6	OK
705.001	26	103.838	0.038	0.000	0.78	0.0	55.7	SURCHARGED
705.002	27	103.266	0.466	0.000	1.35	0.0	82.8	SURCHARGED
705.003	28	102.374	0.074	0.000	1.05	0.0	88.3	SURCHARGED
706.000	29	101.487	-0.363	0.000	0.03	0.0	50.4	OK
706.001	30	101.486	-0.244	0.000	0.01	0.0	8.8	OK
706.002	31	101.486	-0.214	0.000	0.01	0.0	11.9	OK
706.003	32	101.484	-0.156	0.000	0.01	0.0	13.1	OK
706.004	33	101.481	-0.109	0.000	0.02	0.0	15.3	OK
705.004	34	101.478	0.743	0.000	0.17	0.0	16.8	SURCHARGED
707.000	35	101.966	0.266	0.000	1.40	0.0	19.8	SURCHARGED
705.005	36	100.492	-0.193	0.000	0.46	0.0	42.7	OK
705.006	37	100.421	-0.214	0.000	0.37	0.0	66.0	OK
705.007	38	100.222	-0.178	0.000	0.52	0.0	97.6	OK
705.008	39	99.862	-0.138	0.000	0.70	0.0	141.5	OK
705.009	40	99.107	-0.193	0.000	0.08	0.0	23.6	OK
708.000	41	100.461	-0.469	0.000	0.09	0.0	25.1	OK
708.001	42	100.359	-0.421	0.000	0.13	0.0	31.8	OK
708.002	43	100.357	-0.358	0.000	0.14	0.0	38.1	OK
708.003	44	100.353	-0.267	0.000	0.22	0.0	34.3	OK
708.004	45	100.352	0.697	0.000	0.01	0.0	10.4	SURCHARGED
709.000	46	101.819	0.419	0.000	1.14	0.0	70.7	SURCHARGED
709.001	47	100.743	0.143	0.000	1.58	0.0	70.2	SURCHARGED
708.005	48	99.107	-0.493	0.000	0.01	0.0	10.1	OK
710.000	49	100.590	-0.085	0.000	0.81	0.0	118.6	OK
708.006	50	99.107	-0.343	0.000	0.01	0.0	13.5	OK
708.007	51	99.105	-0.245	0.000	0.01	0.0	11.3	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
708.008	52	99.103	-0.157	0.000	0.01	0.0	8.6	OK
700.013	53	99.103	0.828	0.000	0.94	0.0	26.6	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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

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

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.000	15 Winter	100	+30%	100/15 Winter				
700.001	15 Winter	100	+30%	100/15 Winter				
700.002	15 Winter	100	+30%	100/15 Summer				
700.003	15 Winter	100	+30%	100/15 Summer				
700.004	15 Winter	100	+30%	100/15 Summer				
701.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
701.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
701.002	15 Winter	100	+30%	100/15 Summer				
700.005	15 Winter	100	+30%	100/15 Summer				
700.006	15 Winter	100	+30%	100/15 Summer				
700.007	15 Winter	100	+30%	100/15 Summer				
702.000	15 Summer	100	+30%	100/15 Summer				
702.001	15 Winter	100	+30%	100/15 Summer				
700.008	15 Winter	100	+30%	100/15 Summer				
700.009	15 Winter	100	+30%	100/15 Summer	100/15 Summer			
703.000	15 Summer	100	+30%	100/15 Summer				13
703.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
703.002	15 Winter	100	+30%	100/15 Summer				
700.010	15 Winter	100	+30%	100/15 Summer				
700.011	15 Winter	100	+30%	100/15 Summer				
704.000	15 Summer	100	+30%	100/15 Summer				
704.001	15 Summer	100	+30%	100/15 Summer				
704.002	960 Winter	100	+30%	100/480 Winter				
700.012	960 Winter	100	+30%	100/15 Summer				
705.000	15 Winter	100	+30%	100/15 Summer				
705.001	15 Winter	100	+30%	100/15 Summer				
705.002	15 Winter	100	+30%	100/15 Summer				
705.003	15 Winter	100	+30%	100/15 Summer				
706.000	60 Winter	100	+30%	100/30 Winter				
706.001	60 Winter	100	+30%	100/15 Winter				
706.002	60 Winter	100	+30%	100/15 Winter				
706.003	60 Winter	100	+30%	100/15 Winter				
706.004	60 Winter	100	+30%	100/15 Winter				
705.004	60 Winter	100	+30%	100/15 Summer				
707.000	15 Summer	100	+30%	100/15 Summer				
705.005	15 Summer	100	+30%					
705.006	15 Summer	100	+30%					
705.007	15 Winter	100	+30%					
705.008	15 Winter	100	+30%					
705.009	240 Winter	100	+30%					
708.000	15 Summer	100	+30%					
708.001	15 Winter	100	+30%					
708.002	15 Winter	100	+30%					
708.003	15 Winter	100	+30%					
708.004	15 Winter	100	+30%	100/15 Summer				
709.000	15 Summer	100	+30%	100/15 Summer				
709.001	15 Summer	100	+30%	100/15 Summer				
708.005	360 Winter	100	+30%					
710.000	15 Summer	100	+30%	100/15 Summer				
708.006	360 Winter	100	+30%					
708.007	360 Winter	100	+30%					
708.008	240 Winter	100	+30%					

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
700.013	240 Winter	100	+30%	100/15 Summer				

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
700.000	1	104.764	0.549	0.000	0.06	0.0	38.9	SURCHARGED
700.001	2	104.764	0.624	0.000	0.08	0.0	60.8	SURCHARGED
700.002	3	104.762	0.782	0.000	0.10	0.0	65.8	SURCHARGED
700.003	4	104.761	0.831	0.000	0.13	0.0	83.4	SURCHARGED
700.004	5	104.759	0.889	0.000	0.11	0.0	94.2	SURCHARGED
701.000	6	106.803	1.203	2.984	1.07	0.0	57.7	FLOOD
701.001	7	106.402	1.202	2.141	1.44	0.0	116.3	FLOOD
701.002	8	105.034	0.634	0.000	1.25	0.0	164.7	SURCHARGED
700.005	9	104.758	1.483	0.000	0.47	0.0	101.6	FLOOD RISK
700.006	11	103.925	0.950	0.000	0.83	0.0	109.6	SURCHARGED
700.007	12	103.837	0.977	0.000	1.98	0.0	137.5	SURCHARGED
702.000	13	104.692	0.192	0.000	0.81	0.0	118.4	SURCHARGED
702.001	14	104.404	0.704	0.000	1.15	0.0	172.4	SURCHARGED
700.008	15	103.643	0.863	0.000	0.83	0.0	364.5	SURCHARGED
700.009	16	102.901	1.201	1.238	1.06	0.0	402.6	FLOOD
703.000	17	104.151	1.051	0.000	0.33	0.0	18.7	FLOOD RISK
703.001	18	104.104	1.204	3.594	1.19	0.0	108.3	FLOOD
703.002	18	102.552	0.952	0.000	0.78	0.0	115.4	FLOOD RISK
700.010	19	102.259	1.159	0.000	2.14	0.0	533.3	FLOOD RISK
700.011	20	101.350	0.450	0.000	1.26	0.0	594.7	SURCHARGED
704.000	21	104.615	0.615	0.000	1.23	0.0	36.0	SURCHARGED
704.001	22	103.256	0.156	0.000	1.03	0.0	92.2	SURCHARGED
704.002	23	101.043	0.043	0.000	0.04	0.0	4.0	SURCHARGED
700.012	24	101.042	1.067	0.000	0.06	0.0	5.8	SURCHARGED
705.000	25	104.582	0.682	0.000	0.92	0.0	12.3	SURCHARGED
705.001	26	104.534	0.734	0.000	0.86	0.0	61.5	SURCHARGED
705.002	27	103.823	1.023	0.000	1.54	0.0	94.4	FLOOD RISK
705.003	28	102.609	0.309	0.000	1.21	0.0	101.1	SURCHARGED
706.000	29	102.207	0.357	0.000	0.03	0.0	38.6	SURCHARGED
706.001	30	102.207	0.477	0.000	0.01	0.0	11.3	SURCHARGED
706.002	31	102.207	0.507	0.000	0.01	0.0	13.9	SURCHARGED
706.003	32	102.207	0.567	0.000	0.01	0.0	16.9	SURCHARGED
706.004	33	102.206	0.616	0.000	0.02	0.0	18.0	SURCHARGED
705.004	34	102.206	1.471	0.000	0.22	0.0	21.7	SURCHARGED
707.000	35	102.249	0.549	0.000	1.78	0.0	25.1	SURCHARGED
705.005	36	100.511	-0.174	0.000	0.55	0.0	50.8	OK
705.006	37	100.440	-0.195	0.000	0.45	0.0	80.1	OK
705.007	38	100.251	-0.149	0.000	0.65	0.0	122.1	OK
705.008	39	99.906	-0.094	0.000	0.88	0.0	178.8	OK
705.009	40	99.247	-0.053	0.000	0.12	0.0	36.8	OK
708.000	41	100.480	-0.450	0.000	0.12	0.0	32.6	OK
708.001	42	100.433	-0.347	0.000	0.16	0.0	41.5	OK
708.002	43	100.431	-0.284	0.000	0.18	0.0	47.8	OK
708.003	44	100.425	-0.195	0.000	0.23	0.0	35.8	OK
708.004	45	100.424	0.769	0.000	0.01	0.0	10.4	SURCHARGED
709.000	46	102.519	1.119	0.000	1.39	0.0	86.1	FLOOD RISK
709.001	47	100.866	0.266	0.000	1.94	0.0	86.4	SURCHARGED
708.005	48	99.274	-0.326	0.000	0.01	0.0	16.1	OK
710.000	49	100.817	0.142	0.000	1.06	0.0	154.2	SURCHARGED
708.006	50	99.272	-0.178	0.000	0.02	0.0	22.2	OK
708.007	51	99.262	-0.088	0.000	0.01	0.0	18.8	OK

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA7.SIM

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
708.008	52	99.249	-0.011	0.000	0.02	0.0	17.7	OK
700.013	53	99.240	0.965	0.000	1.18	0.0	33.4	SURCHARGED

Microdrainage Calculations for Residential Area 8

Existing Network Details for AREA8.SIM

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
800.000	22.000	1.000	22.0	0.109	3.00	0.600	o	225
800.001	80.900	6.000	13.5	0.153	0.00	0.600	o	300
800.002	61.100	1.750	34.9	0.037	0.00	0.600	\/	-3
801.000	105.000	7.250	14.5	0.267	3.00	0.600	o	300
800.003	60.700	1.950	31.1	0.011	0.00	0.600	\/	-3
802.000	104.200	7.150	14.6	0.278	3.00	0.600	o	300
800.004	52.900	1.500	35.3	0.009	0.00	0.600	\/	-3
803.000	113.100	7.600	14.9	0.280	3.00	0.600	o	300
800.005	26.200	0.300	87.3	0.000	0.00	0.600	\/	-3
804.000	131.600	3.600	36.6	0.068	3.00	0.600	_/	-4
804.001	101.400	3.200	31.7	0.069	0.00	0.600	_/	-4
804.002	87.800	6.880	12.8	0.114	0.00	0.600	o	300
805.000	26.100	0.180	145.0	0.033	3.00	0.600	o	150
805.001	11.000	0.080	137.5	0.010	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
800.000	1	97.500	96.075	1.200	96.500	95.075	1.200		1050
800.001	2	96.500	95.000	1.200	90.500	89.000	1.200		1050
800.002	3	90.500	89.000	1.200	88.250	87.250	0.700		10000
801.000	4	95.800	94.300	1.200	88.250	87.050	0.900		1050
800.003	5	88.250	87.050	0.900	86.300	85.100	0.900	Hydro-Brake®	10000
802.000	6	93.750	92.250	1.200	86.300	85.100	0.900		1050
800.004	7	86.300	85.100	0.900	84.800	83.600	0.900	Hydro-Brake®	10000
803.000	8	92.400	90.900	1.200	84.800	83.300	1.200		1050
800.005	9	84.800	83.300	1.200	84.000	83.000	0.700		10000
804.000	10	97.800	96.800	0.700	94.200	93.200	0.700		0
804.001	11	94.200	93.200	0.700	91.000	90.000	0.700		0
804.002	12	91.000	90.000	0.700	84.500	83.120	1.080		10000
805.000	13	84.600	83.550	0.900	84.500	83.370	0.980		1050
805.001	14	84.500	83.370	0.980	84.800	83.290	1.360		1050

Existing Network Details for AREA8.SIM

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
805.002	2.500	0.020	125.0	0.000	0.00	0.600	o	150
804.003	3.500	0.020	175.1	0.000	0.00	0.600	o	300
800.006	10.000	0.050	200.0	0.000	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
805.002	15	84.800	83.290	1.360	84.500	83.270	1.080		1050
804.003	16	84.500	83.120	1.080	84.000	83.100	0.600		1050
800.006	17	84.000	83.000	0.775	83.475	82.950	0.300	Complex	10000

Free Flowing Outfall Details for AREA8.SIM

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
800.006		83.475	82.950	0.000	1200	0

Simulation Criteria for AREA8.SIM

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	3
Number of Online Controls	3	Number of Time/Area Diagrams	0
Number of Offline Controls	0		

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	1
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	Yes
Winter Storms	No

Synthetic Rainfall Details

Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for AREA8.SIM

Hydro-Brake® Manhole: 5, DS/PN: 800.003, Volume (m³): 208.9

Design Head (m) 1.000 Hydro-Brake® Type Md5 SW Only Invert Level (m) 87.050
Design Flow (l/s) 10.0 Diameter (mm) 129

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	1.200	11.0	3.000	17.3	7.000	26.5
0.200	7.1	1.400	11.9	3.500	18.7	7.500	27.4
0.300	7.5	1.600	12.7	4.000	20.0	8.000	28.3
0.400	7.4	1.800	13.4	4.500	21.2	8.500	29.2
0.500	7.6	2.000	14.2	5.000	22.4	9.000	30.0
0.600	8.0	2.200	14.9	5.500	23.5	9.500	30.9
0.800	9.0	2.400	15.5	6.000	24.5		
1.000	10.0	2.600	16.1	6.500	25.5		

Hydro-Brake® Manhole: 7, DS/PN: 800.004, Volume (m³): 208.0

Design Head (m) 1.000 Hydro-Brake® Type Md5 SW Only Invert Level (m) 85.100
Design Flow (l/s) 10.0 Diameter (mm) 129

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	1.200	11.0	3.000	17.3	7.000	26.5
0.200	7.1	1.400	11.9	3.500	18.7	7.500	27.4
0.300	7.5	1.600	12.7	4.000	20.0	8.000	28.3
0.400	7.4	1.800	13.4	4.500	21.2	8.500	29.2
0.500	7.6	2.000	14.2	5.000	22.4	9.000	30.0
0.600	8.0	2.200	14.9	5.500	23.5	9.500	30.9
0.800	9.0	2.400	15.5	6.000	24.5		
1.000	10.0	2.600	16.1	6.500	25.5		

Complex Manhole: 17, DS/PN: 800.006, Volume (m³): 112.5

Depth/Flow Relationship

Invert Level (m) 83.000

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.3581	0.400	8.0827	0.700	18.2115	1.000	20.8162
0.200	7.6565	0.500	13.1207	0.800	18.8958	1.200	30.0263
0.300	7.2037	0.600	16.8903	0.900	19.7558		

Storage Structures for AREA8.SIM

Tank or Pond Manhole: 5, DS/PN: 800.003

Invert Level (m) 87.050

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	109.0	0.400	198.0	0.800	303.0	1.200	424.0
0.100	130.0	0.500	223.0	0.900	332.0	1.300	0.0
0.200	152.0	0.600	248.0	1.000	361.0		
0.300	174.0	0.700	275.0	1.100	392.0		

Tank or Pond Manhole: 7, DS/PN: 800.004

Invert Level (m) 85.100

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	72.0	0.400	142.0	0.800	228.0	1.200	331.0
0.100	88.0	0.500	162.0	0.900	252.0	1.300	0.0
0.200	105.0	0.600	183.0	1.000	278.0		
0.300	123.0	0.700	205.0	1.100	304.0		

Tank or Pond Manhole: 17, DS/PN: 800.006

Invert Level (m) 83.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	367.0	0.400	528.0	0.800	704.0	1.200	897.0
0.100	406.0	0.500	570.0	0.900	751.0	1.300	0.0
0.200	445.0	0.600	614.0	1.000	799.0		
0.300	486.0	0.700	659.0	1.100	847.0		

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA8.SIM

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
800.000	15 Summer	1	0%					
800.001	15 Summer	1	0%					
800.002	15 Winter	1	0%					
801.000	15 Summer	1	0%					
800.003	120 Winter	1	0%	100/60 Winter				
802.000	15 Summer	1	0%					
800.004	240 Winter	1	0%					
803.000	15 Summer	1	0%					
800.005	15 Summer	1	0%					
804.000	15 Summer	1	0%					
804.001	15 Summer	1	0%					
804.002	15 Winter	1	0%					
805.000	15 Summer	1	0%	30/15 Summer	100/15 Summer			1
805.001	15 Summer	1	0%	30/15 Summer				
805.002	15 Summer	1	0%	30/15 Summer				
804.003	15 Winter	1	0%	30/15 Summer				
800.006	480 Winter	1	0%	1/480 Winter				

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
800.000	1	96.142	-0.158	0.000	0.19	0.0	19.1	OK
800.001	2	95.071	-0.229	0.000	0.12	0.0	36.5	OK
800.002	3	89.026	-0.724	0.000	0.00	0.0	39.9	OK
801.000	4	94.383	-0.217	0.000	0.16	0.0	44.9	OK
800.003	5	87.269	-0.531	0.000	0.00	0.0	7.3	OK
802.000	6	92.335	-0.215	0.000	0.17	0.0	47.1	OK
800.004	7	85.347	-0.503	0.000	0.00	0.0	7.5	OK
803.000	8	90.985	-0.215	0.000	0.17	0.0	47.4	OK
800.005	9	83.347	-0.703	0.000	0.01	0.0	43.9	OK
804.000	10	96.811	-0.739	0.000	0.01	0.0	11.5	OK
804.001	11	93.217	-0.733	0.000	0.01	0.0	20.1	OK
804.002	12	90.062	-0.238	0.000	0.10	0.0	28.8	OK
805.000	13	83.618	-0.082	0.000	0.40	0.0	5.6	OK
805.001	14	83.445	-0.075	0.000	0.50	0.0	6.8	OK
805.002	15	83.376	-0.064	0.000	0.61	0.0	6.7	OK
804.003	16	83.304	-0.116	0.000	0.69	0.0	34.4	OK
800.006	17	83.229	0.004	0.000	0.25	0.0	7.5	SURCHARGED

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA8.SIM

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
800.000	15 Summer	30	0%					
800.001	15 Summer	30	0%					
800.002	15 Summer	30	0%					
801.000	15 Summer	30	0%					
800.003	120 Winter	30	0%	100/60 Winter				
802.000	15 Summer	30	0%					
800.004	480 Winter	30	0%					
803.000	15 Summer	30	0%					
800.005	960 Winter	30	0%					
804.000	15 Summer	30	0%					
804.001	15 Summer	30	0%					
804.002	15 Summer	30	0%					
805.000	15 Winter	30	0%	30/15 Summer	100/15 Summer			1
805.001	15 Winter	30	0%	30/15 Summer				
805.002	15 Winter	30	0%	30/15 Summer				
804.003	15 Winter	30	0%	30/15 Summer				
800.006	960 Winter	30	0%	1/480 Winter				

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
800.000	1	96.202	-0.098	0.000	0.60	0.0	60.6	OK
800.001	2	95.144	-0.156	0.000	0.45	0.0	133.0	OK
800.002	3	89.083	-0.667	0.000	0.02	0.0	152.1	OK
801.000	4	94.456	-0.144	0.000	0.50	0.0	142.1	OK
800.003	5	87.639	-0.161	0.000	0.00	0.0	7.9	OK
802.000	6	92.411	-0.139	0.000	0.52	0.0	148.0	OK
800.004	7	85.684	-0.166	0.000	0.00	0.0	7.9	OK
803.000	8	91.062	-0.138	0.000	0.52	0.0	147.7	OK
800.005	9	83.446	-0.604	0.000	0.00	0.0	13.5	OK
804.000	10	96.835	-0.715	0.000	0.02	0.0	36.3	OK
804.001	11	93.260	-0.690	0.000	0.04	0.0	71.2	OK
804.002	12	90.131	-0.169	0.000	0.39	0.0	117.1	OK
805.000	13	84.005	0.305	0.000	0.96	0.0	13.4	SURCHARGED
805.001	14	83.863	0.343	0.000	1.22	0.0	16.5	SURCHARGED
805.002	15	83.741	0.301	0.000	1.59	0.0	17.2	SURCHARGED
804.003	16	83.666	0.246	0.000	2.67	0.0	133.1	SURCHARGED
800.006	17	83.446	0.221	0.000	0.34	0.0	10.4	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA8.SIM

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
800.000	15 Summer	100	0%					
800.001	15 Summer	100	0%					
800.002	15 Summer	100	0%					
801.000	15 Summer	100	0%					
800.003	120 Winter	100	0%	100/60 Winter				
802.000	15 Summer	100	0%					
800.004	480 Winter	100	0%					
803.000	15 Summer	100	0%					
800.005	960 Winter	100	0%					
804.000	15 Summer	100	0%					
804.001	15 Summer	100	0%					
804.002	15 Summer	100	0%					
805.000	15 Winter	100	0%	30/15 Summer	100/15 Summer			1
805.001	15 Winter	100	0%	30/15 Summer				
805.002	15 Winter	100	0%	30/15 Summer				
804.003	15 Winter	100	0%	30/15 Summer				
800.006	960 Winter	100	0%	1/480 Winter				

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
800.000	1	96.245	-0.055	0.000	0.90	0.0	91.5	OK
800.001	2	95.187	-0.113	0.000	0.69	0.0	200.9	OK
800.002	3	89.099	-0.651	0.000	0.02	0.0	231.3	OK
801.000	4	94.506	-0.094	0.000	0.75	0.0	214.7	OK
800.003	5	87.838	0.038	0.000	0.00	0.0	8.9	SURCHARGED
802.000	6	92.462	-0.088	0.000	0.79	0.0	223.5	OK
800.004	7	85.842	-0.008	0.000	0.00	0.0	8.7	OK
803.000	8	91.115	-0.085	0.000	0.79	0.0	223.0	OK
800.005	9	83.516	-0.534	0.000	0.00	0.0	14.5	OK
804.000	10	96.852	-0.698	0.000	0.03	0.0	55.2	OK
804.001	11	93.285	-0.665	0.000	0.06	0.0	106.4	OK
804.002	12	90.169	-0.131	0.000	0.59	0.0	178.5	OK
805.000	13	84.600	0.900	0.203	1.27	0.0	17.8	FLOOD
805.001	14	84.381	0.861	0.000	1.71	0.0	23.3	FLOOD RISK
805.002	15	84.155	0.715	0.000	2.38	0.0	25.8	SURCHARGED
804.003	16	84.015	0.595	0.000	4.00	0.0	199.1	SURCHARGED
800.006	17	83.515	0.290	0.000	0.45	0.0	13.7	SURCHARGED

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for AREA8.SIM

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
800.000	15 Summer	100	+30%	100/15 Summer				
800.001	15 Summer	100	+30%					
800.002	15 Summer	100	+30%					
801.000	15 Summer	100	+30%	100/15 Summer				
800.003	120 Winter	100	+30%	100/15 Winter				
802.000	15 Summer	100	+30%	100/15 Summer				
800.004	480 Winter	100	+30%	100/120 Winter				
803.000	15 Summer	100	+30%	100/15 Summer				
800.005	480 Winter	100	+30%					
804.000	15 Summer	100	+30%					
804.001	15 Summer	100	+30%					
804.002	15 Summer	100	+30%					
805.000	15 Winter	100	+30%	100/15 Summer	100/15 Summer			3
805.001	15 Winter	100	+30%	100/15 Summer	100/15 Summer			2
805.002	15 Winter	100	+30%	100/15 Summer				
804.003	15 Winter	100	+30%	100/15 Summer				
800.006	480 Winter	100	+30%	100/15 Summer				

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
800.000	1	96.607	0.307	0.000	1.12	0.0	113.7	SURCHARGED
800.001	2	95.221	-0.079	0.000	0.89	0.0	260.9	OK
800.002	3	89.112	-0.638	0.000	0.03	0.0	294.2	OK
801.000	4	94.703	0.103	0.000	0.98	0.0	280.5	SURCHARGED
800.003	5	88.008	0.208	0.000	0.00	0.0	9.8	FLOOD RISK
802.000	6	92.766	0.216	0.000	1.01	0.0	286.0	SURCHARGED
800.004	7	85.999	0.149	0.000	0.00	0.0	9.5	SURCHARGED
803.000	8	91.459	0.259	0.000	1.01	0.0	284.6	SURCHARGED
800.005	9	83.604	-0.446	0.000	0.01	0.0	23.3	OK
804.000	10	96.868	-0.682	0.000	0.04	0.0	70.7	OK
804.001	11	93.302	-0.648	0.000	0.07	0.0	138.1	OK
804.002	12	90.202	-0.098	0.000	0.77	0.0	231.7	OK
805.000	13	84.603	0.903	3.093	1.75	0.0	24.5	FLOOD
805.001	14	84.501	0.981	0.559	1.95	0.0	26.4	FLOOD
805.002	15	84.415	0.975	0.000	2.61	0.0	28.3	SURCHARGED
804.003	16	84.363	0.943	0.000	4.97	0.0	247.4	FLOOD RISK
800.006	17	83.601	0.376	0.000	0.55	0.0	16.9	SURCHARGED

Microdrainage Calculations for Residential Area 9

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
900.000	20.222	1.000	20.2	0.009	3.00	0.600	o	150
900.001	23.620	0.236	100.1	0.023	0.00	0.600	o	225
900.002	39.515	3.000	13.2	0.029	0.00	0.600	o	225
900.003	51.991	3.650	14.2	0.057	0.00	0.600	o	300
900.004	8.377	0.134	62.5	0.000	0.00	0.600	o	225

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
900.000	1	97.300	96.400	0.750	96.200	95.400	0.650		1050
900.001	2	96.200	95.325	0.650	96.200	95.089	0.886		1050
900.002	3	96.200	95.089	0.886	92.800	92.089	0.486		1050
900.003	4	92.800	92.014	0.486	89.500	88.364	0.836		1050
900.004	6	89.500	88.364	0.911	89.200	88.230	0.745	Hydro-Brake®	1050

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
900.004	ditch	89.200	88.230	88.230	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	30.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306

Synthetic Rainfall Details

F (1km)	2.501
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Manhole: 6, DS/PN: 900.004, Volume (m³): 4.6

Design Head (m) 0.500 Diameter (mm) 107
Design Flow (l/s) 5.0 Invert Level (m) 88.364
Hydro-Brake® Type Md5 SW Only

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.2	1.200	7.5	3.000	11.9	7.000	18.2
0.200	4.7	1.400	8.2	3.500	12.9	7.500	18.9
0.300	4.6	1.600	8.7	4.000	13.8	8.000	19.5
0.400	4.7	1.800	9.2	4.500	14.6	8.500	20.1
0.500	5.0	2.000	9.7	5.000	15.4	9.000	20.7
0.600	5.4	2.200	10.2	5.500	16.2	9.500	21.2
0.800	6.2	2.400	10.7	6.000	16.9		
1.000	6.9	2.600	11.1	6.500	17.6		

Storage Structures for Storm

Tank or Pond Manhole: 6, DS/PN: 900.004

Invert Level (m) 88.364

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	0.500	100.0

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
900.000	15 Summer	1	0%					
900.001	15 Summer	1	0%					
900.002	15 Winter	1	0%					
900.003	15 Winter	1	0%					
900.004	60 Winter	1	0%	30/15 Summer				

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
900.000	1	96.423	-0.127	0.000	0.05	0.0	2.0	OK
900.001	2	95.376	-0.174	0.000	0.12	0.0	5.5	OK
900.002	3	95.130	-0.184	0.000	0.07	0.0	10.2	OK
900.003	4	92.066	-0.248	0.000	0.07	0.0	19.2	OK
900.004	6	88.468	-0.121	0.000	0.06	0.0	3.3	OK

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
900.000	15 Summer	30	0%					
900.001	15 Summer	30	0%					
900.002	15 Summer	30	0%					
900.003	15 Summer	30	0%					
900.004	60 Winter	30	0%	30/15 Summer				

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
900.000	1	96.442	-0.108	0.000	0.17	0.0	6.5	OK
900.001	2	95.430	-0.120	0.000	0.44	0.0	20.9	OK
900.002	3	95.172	-0.142	0.000	0.29	0.0	39.5	OK
900.003	4	92.120	-0.194	0.000	0.27	0.0	75.9	OK
900.004	6	88.693	0.104	0.000	0.09	0.0	4.7	SURCHARGED

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
900.000	15 Summer	100	0%					
900.001	15 Summer	100	0%					
900.002	15 Summer	100	0%					
900.003	15 Summer	100	0%					
900.004	60 Winter	100	0%	30/15 Summer				

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
900.000	1	96.453	-0.097	0.000	0.26	0.0	9.8	OK
900.001	2	95.461	-0.089	0.000	0.66	0.0	31.6	OK
900.002	3	95.193	-0.121	0.000	0.44	0.0	59.7	OK
900.003	4	92.148	-0.166	0.000	0.41	0.0	114.6	OK
900.004	6	88.873	0.284	0.000	0.10	0.0	5.0	SURCHARGED

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

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
900.000	15 Summer	100	+30%					
900.001	15 Summer	100	+30%					
900.002	15 Summer	100	+30%					
900.003	15 Summer	100	+30%					
900.004	60 Winter	100	+30%	100/15 Summer				

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
900.000	1	96.461	-0.089	0.000	0.34	0.0	12.8	OK
900.001	2	95.489	-0.061	0.000	0.86	0.0	41.0	OK
900.002	3	95.211	-0.103	0.000	0.57	0.0	77.6	OK
900.003	4	92.170	-0.144	0.000	0.53	0.0	149.1	OK
900.004	6	89.047	0.458	0.000	0.11	0.0	5.7	SURCHARGED

Microdrainage Calculations for Residential Area 10

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	T.E. (mins)	k (mm)	HYD SECT	DIA (mm)
950.000	56.716	1.500	37.8	0.033	3.00	0.600	\/	-9
950.001	26.105	0.970	26.9	0.000	0.00	0.600	o	150

PN	US/MH Name	US/CL (m)	US/IL (m)	US C.Depth (m)	DS/CL (m)	DS/IL (m)	DS C.Depth (m)	Ctrl	US/MH (mm)
950.000	1	94.000	93.250	0.425	92.500	91.750	0.425		0
950.001	2	92.500	91.750	0.600	91.880	90.780	0.950	Orifice	10000

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
950.001	DITCH	91.880	90.780	90.780	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
PIMP (% impervious)	100	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
Site Location	GB 566600 246500 TL 66600 46500
C (1km)	-0.024
D1 (1km)	0.297
D2 (1km)	0.282
D3 (1km)	0.285
E (1km)	0.306
F (1km)	2.501
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Orifice Manhole: 2, DS/PN: 950.001, Volume (m³): 146.8

Diameter (m) 0.023 Discharge Coefficient 0.600 Invert Level (m) 91.750

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
950.000	15 Summer	1	0%					
950.001	360 Winter	1	0%	100/60 Winter				

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
950.000	1	93.254	-0.746	0.000	0.00	0.0	5.8	OK
950.001	2	91.800	-0.100	0.000	0.01	0.0	0.2	OK

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
950.000	15 Summer	30	0%					
950.001	240 Winter	30	0%	100/60 Winter				

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
950.000	1	93.263	-0.737	0.000	0.00	0.0	18.4	OK
950.001	2	91.875	-0.025	0.000	0.01	0.0	0.4	OK

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

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 0

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
950.000	15 Summer	100	0%					
950.001	240 Winter	100	0%	100/60 Winter				

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
950.000	1	93.269	-0.731	0.000	0.00	0.0	27.9	OK
950.001	2	91.927	0.027	0.000	0.01	0.0	0.4	SURCHARGED

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

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

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

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
950.000	15 Summer	100	+30%					
950.001	240 Winter	100	+30%	100/15 Summer				

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
950.000	1	93.275	-0.725	0.000	0.00	0.0	36.2	OK
950.001	2	91.982	0.082	0.000	0.02	0.0	0.5	SURCHARGED

Appendix C - Correspondence

Letter MLM to Bidwells	12 March 2010
Email EA to MLM	19 March 2010
Email MLM to EA	29 March 2010
Letter EA to SEBC	14 April 2010
Letter MLM to AW	15 September 2010

www.mlm.uk.com

Our Ref: JJH/612263/JDP

12 March 2010

Marcia Whitehead
Bidwells Property Consultants
Trumpington Road
Cambridge
CB2 2LD

Dear Marcia

North West Haverhill
Surface Water Design for Residential Area and Relief Road

A Masterplan planning application has been submitted for 1150 residential units and a new relief road to the north of the development area. The Environment Agency (EA) have objected to the development (ref AC/2009/110413/02-L01) as the surface water drainage proposals were not sufficiently developed to demonstrate how the run off from the proposed development will be attenuated on site and discharged at or below existing run off rates.

Microdrainage calculations have been undertaken for the proposed residential development area and the relief road to the north of the development to demonstrate that the surface water run off can be managed on site.

Attached are Microdrainage calculations and drawings 612263/530 P1 to 612263/539 P1 inclusive for North West Haverhill surface water drainage.

Residential Area
The attached drawings show main pipe runs for the development along with details of attenuation features (ponds, crates), other transportation features (swales, rills), flow control devices and overflows within the system.

A summary of each area is shown adjacent to the discharge location for each area which indicates the size of the contributing area and the allowable discharge rates based on previously agreed green-field run-off rates of

- 1 year 1.99 l/s/ha
- 30 year 5.41 l/s/ha
- 100 year 7.43 l/s/ha

The Microdrainage calculations show a solution for the surface water drainage for each area that does not exceed the maximum allowable discharge rates. However, it is not intended to limit the discharge rate from the site to that shown in the Microdrainage calculations (as these show betterment to the existing green-field run off rates) only to demonstrate that the green-field run-off rates as shown on the

drawing can be met. Future development on the site would still be able to discharge at existing green-field run off rates.

Relief Road
The drawings also show the highway drainage for the proposed relief road to the north of the development. Microdrainage calculations for the relief road drainage are also included within this package.

The EA letter also comments on Anglian Water (AW) needing sufficient capacity within its surface water network to accommodate the flows. The surface water is discharging into ditches within the site which are currently connected into the AW network, which we brought to AW's attention in January 2008. As the discharge rates will be no greater than existing, there will be no increase in pressure on the AW sewers.

AW has previously indicated that as the surface water discharges into a watercourse that it is outside of its jurisdiction to comment. However, AW has since indicated that it needs to assess the downstream capacity of its surface water sewerage network and we have sent details of the scheme to allow them to do this, although as the scheme would not decrease flows in its network we do not envisage any problems with this.

We look forward to your positive response to the Planning Application. If you have any other queries please contact the undersigned.

Yours sincerely

James Calvert
Chartered Engineer
T: 01473 381980
E: james.calvert@mlm.uk.com
Please respond to our Ipswich address

Enclosed: 1 x CD

Copied to: Nicole Ager, EA Ipswich

James Calvert

From: Palmer, Sarah [sarah.palmer@environment-agency.gov.uk]
Sent: 19 March 2010 15:11
To: James Calvert
Subject: North West Haverhill - surface water design

Dear James,

Thank you for sending us the additional information for the surface water design for North West Haverhill. I have reviewed the design information and it includes most of the additional information we require. However I do have some questions for you on areas that require clarification.

1. In residential area 4, the area of the pond on pipe 59.0 is modelled as 950m² but the plan shows it as 850m². Also in area 4, it is unclear how the areas of the storage area for pipe 50.007 shown on the plan tally with the areas given in the Microdrainage calculations. Please could you clarify it for me?

2. The Microdrainage calculations show pipes flooding in the 1 in 100 year rainfall event including climate change. While it is acceptable for above ground flooding in the 1 in 100 year rainfall event, PPS25 Practice Guide paragraph 5.51 requires that there is no flooding of property. To demonstrate that no property would flood, it should be shown on the plan where the surface water flooding from each pipe would flow and be stored, depending on the local topography and volume of flooding.

3.On the plan it is shown that a 5 litre per second input from the undeveloped area has been included for pipe 2.000 in Area A, to account for future development. Please can you show where this has been taken into account in the Microdrainage calculations?

4. In the road drainage calculations it appears that some of the discharge rates into the watercourses in the 1 in 1 year rainfall event are higher than the corresponding greenfield runoff rates (as calculated by multiplying the contributing areas by the greenfield runoff rates per hectare stated on the covering letter). This seemed to be the case for areas HA1 to Rbt West, HA combined to LP, and HA3 to Rbt Lower.

5. You state that the actual surface water system will not be restricted to the runoff rates specified in this system design as they are below the greenfield runoff rates. Is there any reason why this system is not going to be the actual system that will be built, and why the final surface water system has not been finalised?

It would be helpful if you could provide me with further details on the above points. Please contact me if you have any questions.

Kind regards,

Sarah

Sarah Palmer
Development and Flood Risk Engineer - Norfolk

Environment Agency - Ipswich Office
01473 706721
sarah.palmer@environment-agency.gov.uk

James Calvert

From: James Calvert
Sent: 29 March 2010 16:58
To: 'Palmer, Sarah'
Cc: 'Marcia Whitehead'; 'neil.waterson@bidwells.co.uk'; John Hawkins
Subject: RE: North West Haverhill - surface water design

Sarah,

Further to the submission of the drainage information in relation to North West Haverhill and you queries below we now submit our responses to your queries. If you require any further clarification of any of your points please contact me.

Regards,

James Calvert
Chartered Engineer
E: james.calvert@mlm.uk.com

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VAT No: 665 8111 25

From: Palmer, Sarah [mailto:sarah.palmer@environment-agency.gov.uk]
Sent: 19 March 2010 15:11
To: James Calvert
Subject: North West Haverhill - surface water design

Dear James,

Thank you for sending us the additional information for the surface water design for North West Haverhill. I have reviewed the design information and it includes most of the additional information we require. However I do have some questions for you on areas that require clarification.

1. In residential area 4, the area of the pond on pipe 59.0 is modelled as 950m² but the plan shows it as 850m². I have checked the drawing and the microdrainage calcs submitted to you, both appear to show 850m2, please can you clarify if this is not the case. Also in area 4, it is unclear how the areas of the storage area for pipe 50.007 shown on the plan tally with the areas given in the Microdrainage calculations. Please could you clarify it for me? The idea is that the crates are below the pond and will fill up first, the pond would only fill in an extreme event. I have also noticed an error in the calcs in that the pond areas show the 450m2 (crates) going through to the full depth whereas they stop at 600mm deep with the pond above, I have amended the calcs for Area 4 and attach the revised calcs to show the new pond layout.

2. The Microdrainage calculations show pipes flooding in the 1 in 100 year rainfall event including climate change. While it is acceptable for above ground flooding in the 1 in 100 year rainfall event, PPS25 Practice Guide paragraph 5.51 requires that there is no flooding of property. To demonstrate that no property would flood, it should be shown on the plan where the surface water flooding from each pipe would flow and be

stored, depending on the local topography and volume of flooding. The site is situated in an area where the lie of the land is relatively steep. To prevent any internal flooding in the 100 year event the dwellings would be raised 150mm (good practice) above surround ground levels. In addition the roads would be designed so that any flooding from the manholes, which would be in the roads, would be contained within the roads and routed along the roads towards the ponds lower down the site. We trust this information is sufficient and that a plan is not required at this stage.

3.On the plan it is shown that a 5 litre per second input from the undeveloped area has been included for pipe 2.000 in Area A, to account for future development. Please can you show where this has been taken into account in the Microdrainage calculations? Attached print out shows a base flow (DWF) of 5 l/s at pipe 2.000. The base flow does not appear to print from the Simulation (results) module, as issued on CD on 12 March 2010, and so I have printed it from the System 1 (input) module.

4. In the road drainage calculations it appears that some of the discharge rates into the watercourses in the 1 in 1 year rainfall event are higher than the corresponding greenfield runoff rates (as calculated by multiplying the contributing areas by the greenfield runoff rates per hectare stated on the covering letter). This seemed to be the case for areas HA1 to Rbt West, HA combined to LP, and HA3 to Rbt Lower. This is because the catchment areas in the microdrainage calcs are for the road surface only and do not include for areas where you get run-off from cuttings / embankments which would also drain into the ponds. If these areas are taken into account and multiplied by the greenfield run-off rates then the greenfield rates are met. I have measured the total areas for each section of the road and tabulated it in the attached spreadsheet.

5. You state that the actual surface water system will not be restricted to the runoff rates specified in this system design as they are below the greenfield runoff rates. Is there any reason why this system is not going to be the actual system that will be built, and why the final surface water system has not been finalised? The submission is for a masterplan development and as such is unlikely to be built exactly in its current form. The masterplan approval is to demonstrate how the development can work in terms of numbers of units, highways, drainage etc. The surface water drainage strategy therefore shows how the greenfield run-off rates can be met within the current layout. If this was the final design we would refine it to meet the greenfield run-off rates (i.e. minimising the storage) but we only intend to show it can be achieved in this instance. Therefore we have shown how the greenfield run-off can be met but are not limiting whoever are the final developers to rates below the greenfield run-off rates.

It would be helpful if you could provide me with further details on the above points. Please contact me if you have any questions.

Kind regards,

Sarah

Sarah Palmer
Development and Flood Risk Engineer - Norfolk

Environment Agency - Ipswich Office
01473 706721
sarah.palmer@environment-agency.gov.uk

Head of Planning
St Edmundsbury Borough Council
West Suffolk House
Western Way
Bury St. Edmunds
Suffolk
IP33 3YU

Our ref: AC/2009/110413/03-L01
Your ref: SE/09/1283

Date: 14 April 2010

F.A.O. Rona Hopkinson

Dear Ms Hopkinson

Proposed mixed-use development
Land at North West Haverhill

Further to our letter dated 18 January 2010, we have received a letter from James Calvert dated 12 March 2010 and email dated 29 March 2010 with attached additional information regarding surface water drainage, including surface water drainage plans and Microdrainage calculations.

Having reviewed this additional information, we wish to **maintain our objection** to the proposed development on the grounds that the Flood Risk Assessment (FRA) and additional information submitted with this application do not comply with the requirements set out in Annex E, paragraph E3 of Planning Policy Statement 25 (PPS 25).

The submitted FRA fails to be supported by appropriate data and information, in particular information from Anglian Water regarding the acceptability of the proposed discharge from the development at greenfield runoff rates into Anglian Water sewers.

Technical Explanation

The proposed surface water scheme involves the discharge of surface water into three ditches on the site, of which the western two then drain into Anglian Water surface water sewers. The surface water draining into the ditches will be restricted to a maximum of the current greenfield runoff rates in the 1 in 1 year, 1 in 30 year and 1 in 100 year rainfall events.

As the surface water is to drain into Anglian Water surface water sewers we require confirmation from Anglian Water of the acceptability of the proposed discharge rates, to ensure that the proposed surface water scheme is viable. Anglian Water have been consulted by MLM to determine whether they are in agreement with the

proposed rates of discharge. Until Anglian Water have agreed in writing that the discharge rates are acceptable, we will maintain our objection to the proposed application.

The discharge of the surface water into the ditches that drain into the Anglian Water sewers is a crucial element of the surface water scheme, which needs to be agreed as part of an outline planning application. If Anglian Water do not agree with the discharge rates then alternative surface water drainage arrangements will need to be designed.

Comments on the Surface Water Scheme

The proposed scheme includes the attenuation of surface water in below ground cellular storage systems and above ground swales and attenuation basins, before being discharged at a restricted rate into the ditches on the site. The surface water storage areas, together with the piped and swale networks, have been designed to ensure there is no above ground flooding in the 1 in 30 year rainfall event. This meets the requirements of PPS25 Practice Guide (paragraph 5.51).

In the 1 in 100 year rainfall event including climate change there will be limited surface water flooding from the manholes in the roads, with a maximum volume of $7m^3$. Supplementary information from MLM states that the roads will be designed to route this water downhill towards the surface water ponds. The floor level of the houses will also be designed to be 150mm above ground level to ensure they do not flood, as required in PPS25 (paragraph 5.51).

As this is an outline planning application for a major development and the final layout has not yet been decided, the information submitted is sufficient. However, at the reserved matters stage, detailed plans showing which manholes will flood and where the flooded volume of water will flow and be stored, to prevent the buildings flooding, should be submitted.

The original FRA states that the northern ditch continues as an open ditch and does not drain into the Anglian Water sewer. It should be ensured that the ditch is free flowing and not blocked anywhere along its length and so is able to accept the surface water flows. The local authority should also ensure the acceptability of the proposals to drain surface water into this ditch, particularly due to the history of surface water flooding in Haverhill.

Section 106 Contributions

We have also reviewed the email sent to us on the 31 March 2010 regarding S106 requirements for the proposed development and wish to make the following comments:

Surface water drainage scheme

If our objection to this application were to be resolved, we feel that the inclusion of planning conditions on both the outline and reserved matters planning permissions would be sufficient to ensure an appropriate surface water scheme can be designed and implemented on site.

Surface water drainage adoption and maintenance

Section 3.9 of The Interim Code of Practice for Sustainable Drainage Systems (National SUDS Working Group, 2004) states that Section 106 agreements are often required by the local planning authority to clarify and establish appropriate mechanisms for the adoption and maintenance of SUDS systems. In some instances, it will be necessary to provide a guaranteed or bonded maintenance agreement or to secure a commuted sum to fund maintenance by another agency, such as the local authority.

The original FRA states that the attenuation basins incorporated in the surface water scheme for the new highway will be offered for adoption to Suffolk County Council. The SUDS features for the residential development will be situated in open spaces and will be offered to the local authority for adoption. In both cases, it is likely that a commuted sum will be required to facilitate the future maintenance of the SUDS features. Therefore, we recommend that a Section 106 agreement is entered into to ensure the future adoption and maintenance of the surface water features.

The model agreements found in CIRIA guidance C625 'Model agreements for sustainable water management systems' can be used as a basis if required. The guidance can be found at: http://www.ciria.org/service/AM/ContentManagerNet/Search/SearchRedirect.aspx?Section=Search1&content=product_excerpts&template=/contentmanagernet/contentdisplay.aspx&contentfileid=1418.

I hope this is of assistance to you. Should you have any queries regarding the above, do not hesitate to contact myself or Sarah Palmer (Development and Flood Risk Engineer) on 01473 706721.

Yours faithfully

Miss Louise Best
Planning Liaison Officer

Direct dial 01480 483898
Direct fax 01480 435193
Direct e-mail Planning_Liaison.Anglian_Central@environment-agency.gov.uk

cc James Calvert - MLM Consulting Engineers

End

Our ref: JJH/612263/JRC

Your ref: DS/E10177

15 September 2010

Carly Summers
Planning & Equivalence
Anglian Water Services Ltd
PO Box 1067
Peterborough
PE1 9JG

Dear Carly,

North West Haverhill, Suffolk - Planning ref: SE/09/1283

Further to previous correspondence dated 3rd February 2010 in response to the submission of the planning application for this site, we have undertaken further liaison with yourselves and a CCTV survey of the watercourses at the locations they are piped to confirm that they connect to AW sewers. We also understand that further investigation of the watercourses has been undertaken by AW to determine whether the watercourses currently discharge to your sewers. We understand that the findings of this match our own in that the watercourses do connect to the AW sewers. I attach a DVD containing the information supplied to us from our CCTV surveyors.

The surface water drainage proposal is to discharge to the watercourses at a rate not greater than the existing equivalent greenfield run-off rates, see table below.

Return Period (years)	Green-field Run-off Rate (l/s/ha)
1	1.99
30	5.41
100	7.43

The table below summarises the proposed discharge rates into watercourses A and B and the attached plan shows the catchment areas and discharge locations for each of the watercourses. These areas include the residential development area and the proposed relief road to the north. Please note that the drawing also shows a watercourse C, however, this does not connect to AW sewers.

		Existing Watercourse		Proposed Watercourse	
		A	B	A	B
Contributing Area (ha)		19.1	14.3	19.1	14.3
Proposed Discharge Rate (l/s)	1 yr	38.0	28.5	38.0	28.5
	30 yr	103.3	77.4	103.3	77.4
	100 yr	141.9	106.2	141.9	106.2
	100 yr + cc	N/A	N/A	141.9	106.2

Our ref: JJH/612263/JRC
15 September 2010
Anglian Water Services Ltd

The proposed discharges will be no greater than the existing run-off into the watercourse and as it is proposed to limit the 100 year climate change run-off to the existing 100 year run-off rate, it will be a betterment of the existing.

On this basis we trust that you now agree that the proposals will not give rise to discharges greater than the existing run-off and that you will now be able to comment favourably on this development in terms of surface water run-off.

Yours sincerely

James Calvert
Chartered Engineer
T: 01473 381980
E: james.calvert@mlm.uk.com
Please respond to our Ipswich address

Enc: Plan
DVD

Copied to: Neil Waterson – Bidwells
Rona Hopkinson – SEBC (not DVD)
Louise Best – Environment Agency (not DVD)