

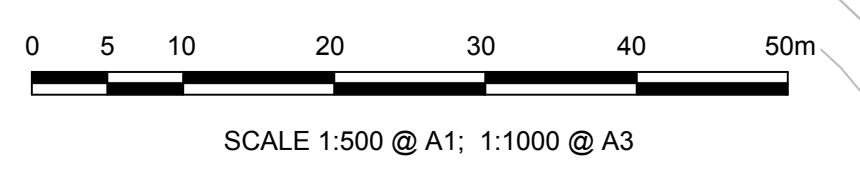
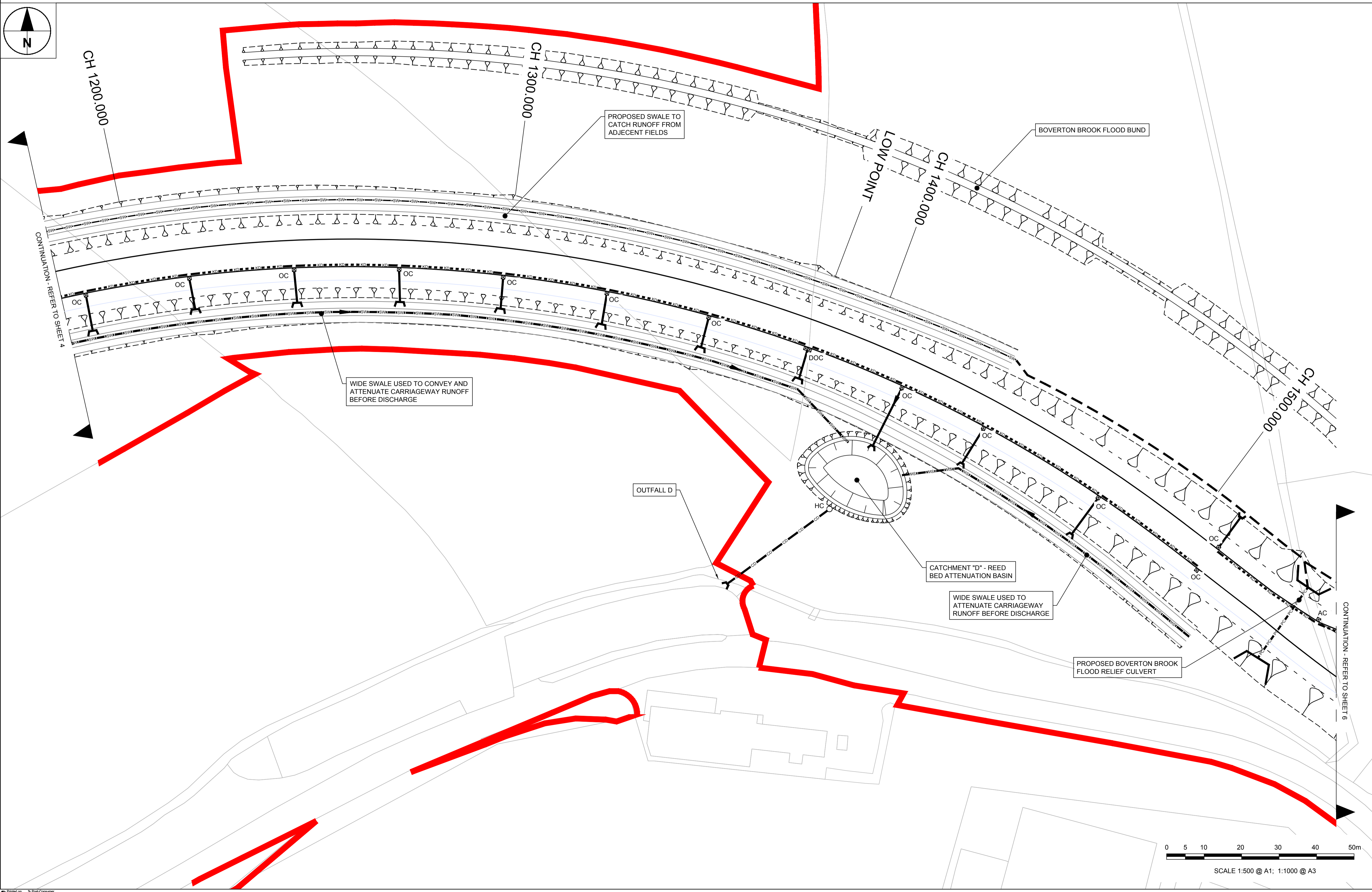
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 Approved: RM
 Checked: AT
 Designer: MH
 Project Management Initials:
 Last Printed: 2017-03-21
 Last Saved By: TAYLORD12
 Last Printed: 2017-03-21
 File Name: F:\PROJECTS\HIGHWAYS-ST ATHAN\3 EXECUTION\3 DOCUMENTS\CAD\01 WORKING\DRAWINGS\500 - DRAINAGE\60509148-SHT-30-0000-CT-0501-0507 - DRAINAGE GENERAL ARRANGEMENT.DWG
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- LOCATION OF SITE COMPOUND TO BE AGREED WITH THE LOCAL HIGHWAY AUTHORITY PRIOR TO WORKS COMMENCING. ALL MOVEMENT OF PLANT SHOULD BE IN ACCORDANCE WITH RECOGNISED GOOD INDUSTRY PRACTICE. BANKSMEN SHOULD BE PROVIDED WHEN REQUIRED.
- THE GENERAL PUBLIC SHOULD BE SEPARATED FROM THE WORKS WITH ADEQUATE LATERAL CLEARANCE AND APPROPRIATE SAFETY ZONES PROVIDED IN ACCORDANCE WITH CHAPTER 8 OF THE TRAFFIC SIGNS MANUAL.
- ACCESS TO PRIVATE PROPERTIES MUST BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE AGREED WITH THE AFFECTED PARTY AND THE LOCAL HIGHWAY AUTHORITY.
- MEASURES SHOULD BE DEPLOYED TO ENSURE NOISE, VIBRATION AND DUST IS MINIMISED.
- ALL BURIED SERVICES ARE TO BE POSITIVELY LOCATED ON SITE PRIOR TO EXCAVATION. CAT SCANS SHALL BE COMPLETED PRIOR TO EXCAVATION WITH SERVICE LOCATIONS MARKED UP ON SITE. OPERATIVES SHALL EMPLOY HAND DIGGING METHODS WHEN WORKING IN CLOSE PROXIMITY TO BURIED SERVICES. STATUTORY UNDERTAKER'S PLANT SHALL BE PROTECTED AS NECESSARY. ADDITIONAL TRIAL PITS SHALL BE EXCAVATED AS REQUIRED.

KEY

- CD — CD — CD — CD — CD — SURFACE WATER CARRIER DRAIN
- FD — FD — FD — FD — FD — FILTER DRAIN
- GULLY CONNECTION
- PC — PC — PC — PC — PC — PC — PROPOSED CULVERT
- KD — KD — KD — KD — KD — KD — COMBINED KERB DRAIN
- SW — SW — SW — SW — SW — SW — SWALE
- DITCH
- PLANNING APPLICATION BOUNDARY
- MH MANHOLE
- CP CATCHPIT
- G GULLY
- DG DOUBLE GULLY
- AC ACCESS CHAMBER
- OC OUTLET CHAMBER
- DOC DOUBLE OUTLET CHAMBER
- PE PENSTOCK
- HC HYDROBRAKE CHAMBER
- ┌ RE RODDING EYE
- └ HEADWALL



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STATUS
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ISSUE/REVISION

| IR | DATE | DESCRIPTION |
|----|------------|--------------|
| A | 20-03-2017 | FOR PLANNING |

KEY PLAN

PROJECT NUMBER
60509148

SHEET TITLE
ST.ATHAN
DRAINAGE GENERAL ARRANGEMENT
PRELIM DESIGN
SHEET 5 OF 7
SHEET NUMBER

60509148-SHT-30-0000-CT-0505

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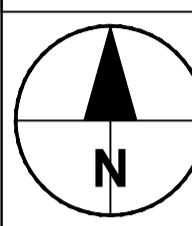
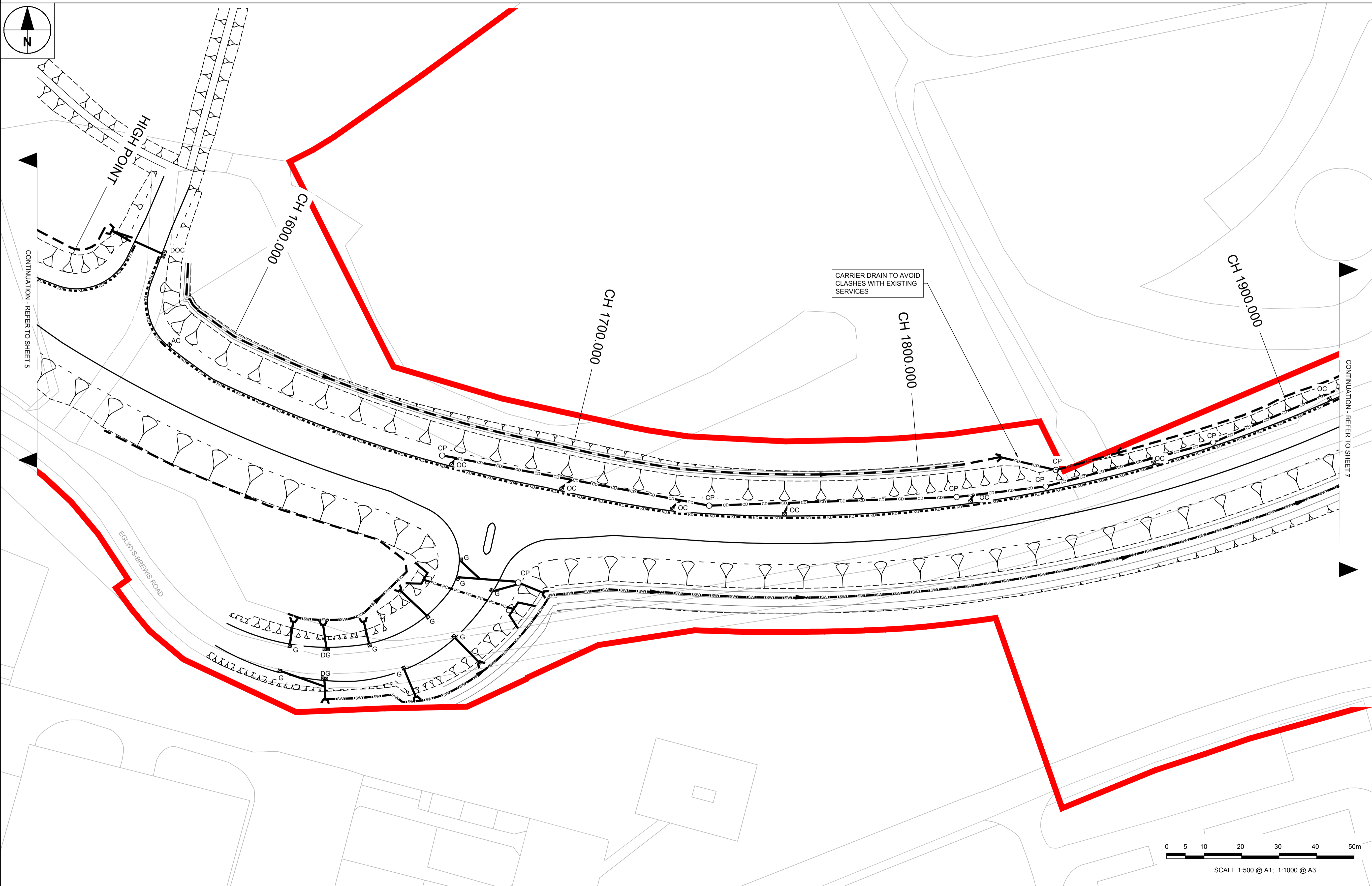
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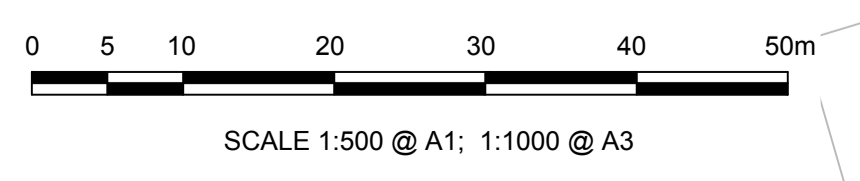
KEY

- CD — CD — CD — CD — CD — CD — SURFACE WATER CARRIER DRAIN
- FD — FD — FD — FD — FD — FD — FILTER DRAIN
- GULLY CONNECTION
- PC — PC — PC — PC — PC — PC — PROPOSED CULVERT
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- PE PENSTOCK
- HC HYDROBRAKE CHAMBER
- RE RODDING EYE
- HEADWALL



CONTINUATION - REFER TO SHEET 5

CONTINUATION - REFER TO SHEET 7



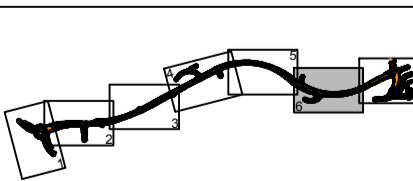
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KEY PLAN



PROJECT NUMBER

60509148

SHEET TITLE

ST.ATHAN
DRAINAGE GENERAL ARRANGEMENT
PRELIM DESIGN
SHEET 6 OF 7
SHEET NUMBER

60509148-SHT-30-0000-CT-0506

File name: F:\PROJECTS\HIGHWAYS - ST.ATHAN\3 EXECUTION\3 DOCUMENTS\308 CAD\01 WORKING\DRAWINGS\500 - DRAINAGE\60509148-SHT-30-0000-CT-0501_0507 - DRAINAGE GENERAL ARRANGEMENT.DWG
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 Project Management Initials: Designer: MHT
 Checked: RM
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 ISO A1 841mm x 641mm

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Project Management Initials: Designer: AUB Checked: TM Approved: RM



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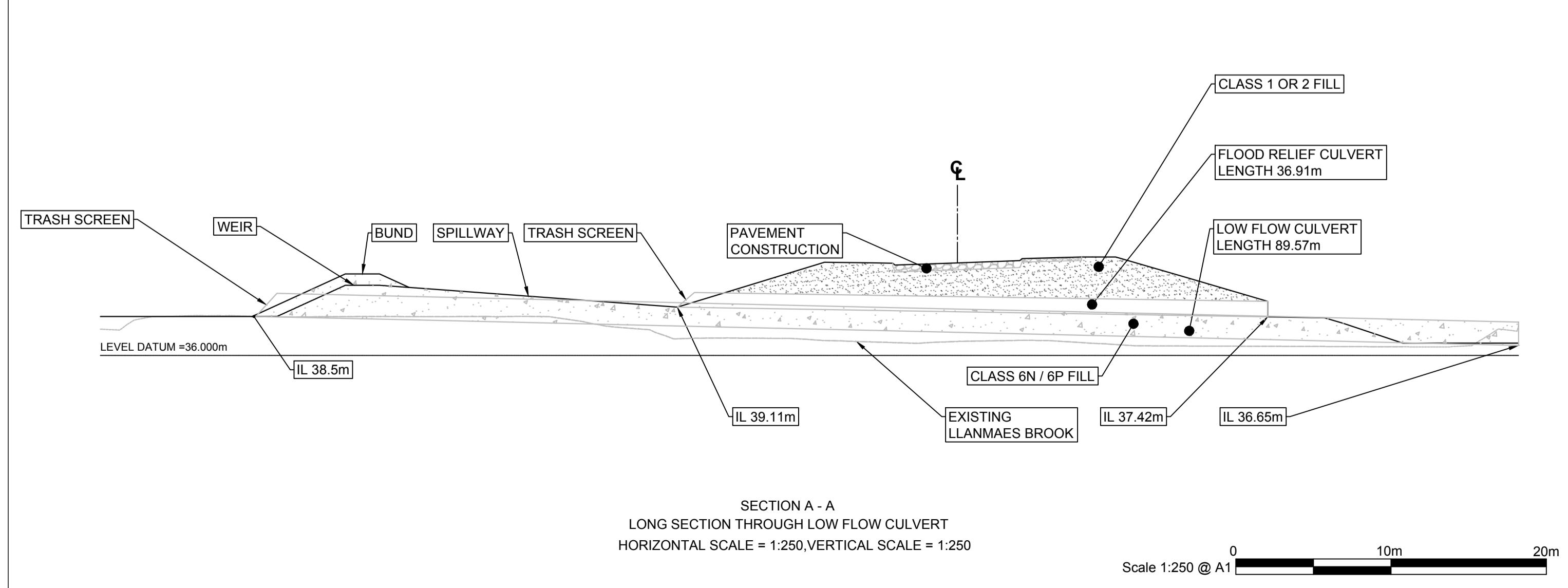
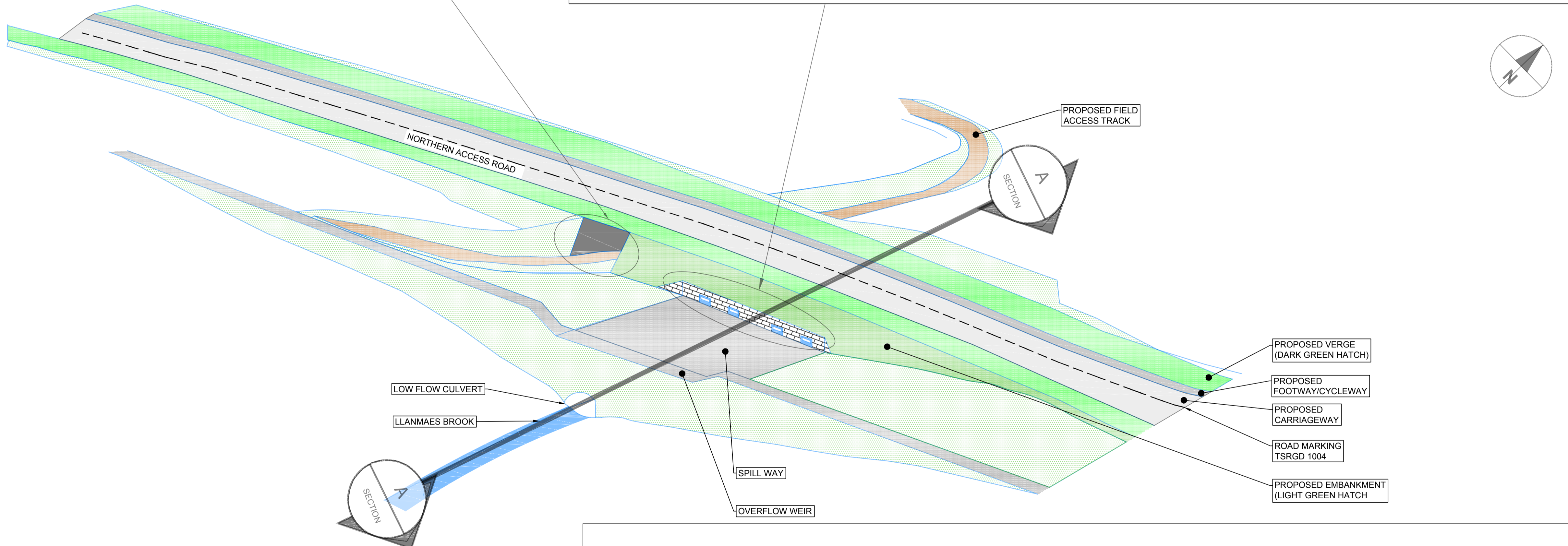
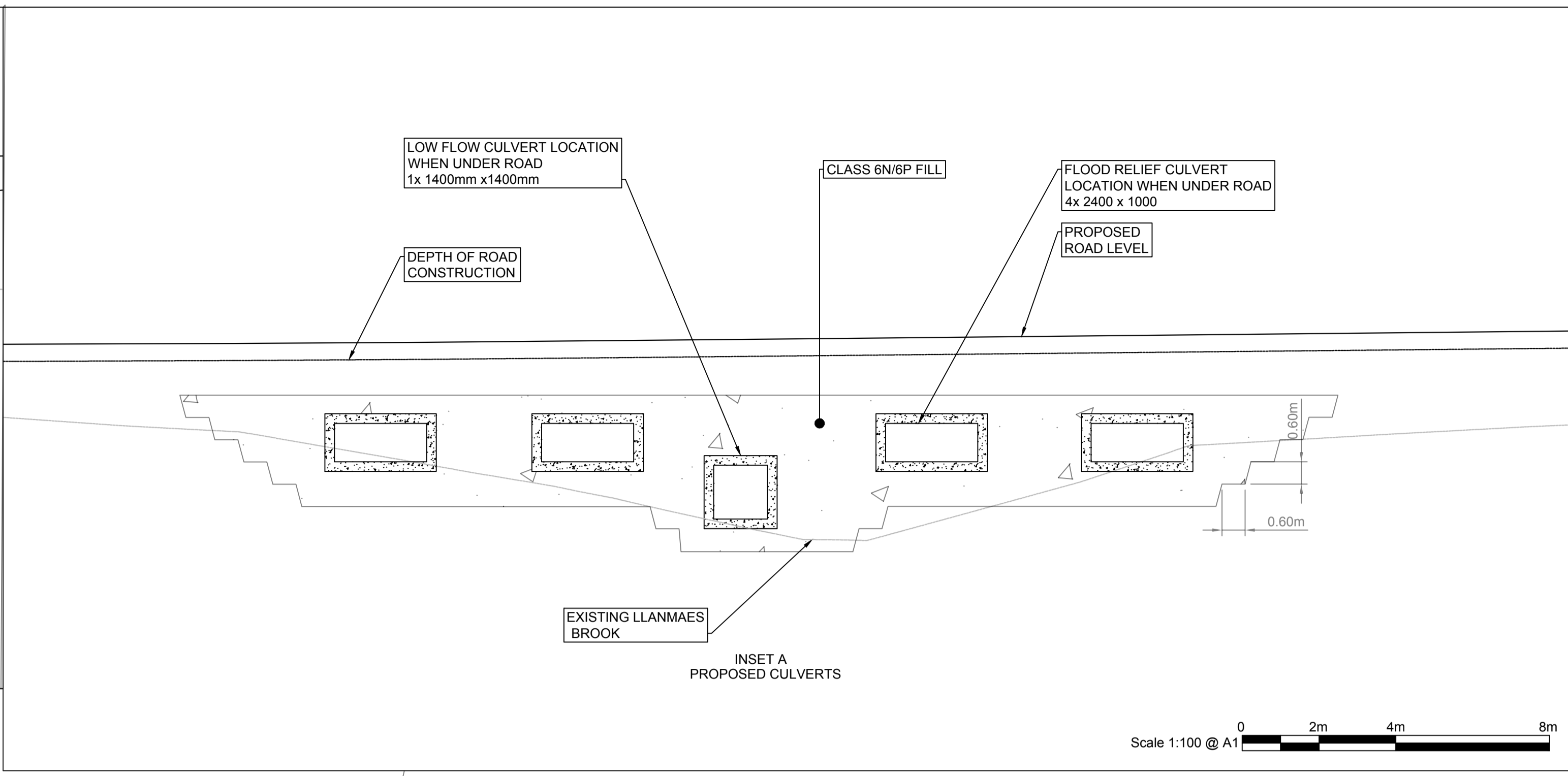
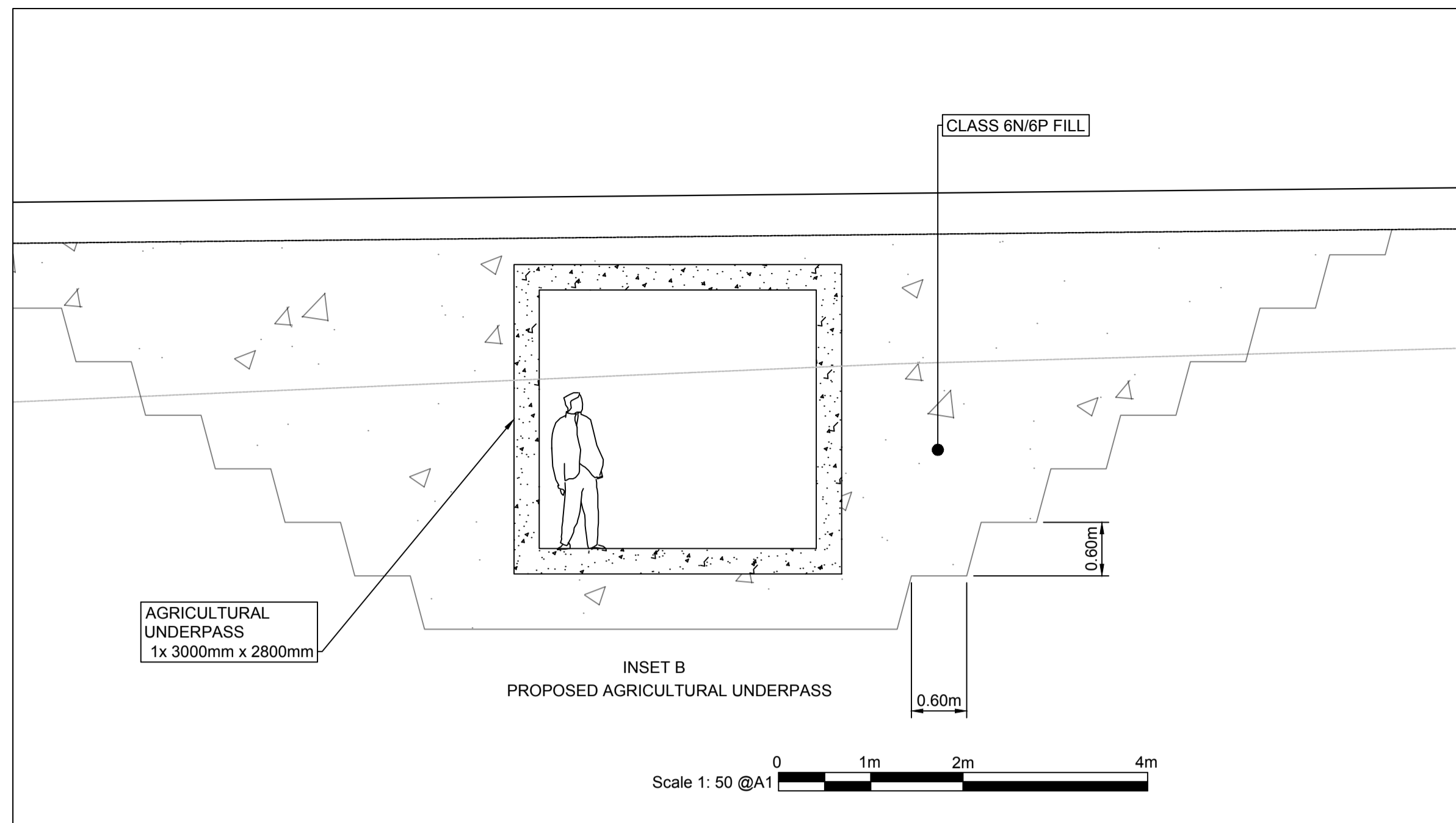
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following specific residual risks (Reference shall also be made to the Design Hazard Log)

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|--|
| Construction |
| For Hazards Refer to Document: Safety in Design - Designers Residual Hazard Register |
| |
| |
| |
| |



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KEY PLAN

PROJECT NUMBER
60509148

SHEET TITLE
ST. ATHAN
LLANMAES BROOK CULVERT DETAILS
SHEET 1 OF 1

SHEET NUMBER
60509148-SHT-30-0000-CT-0595

APPENDIX B - GRR CALCULATION

Midpoint
Alencon Link
Basingstoke



Date 21/03/2017 11:54
File

Designed by tayloraf
Checked by

XP Solutions Source Control 2015.1

IH 124 Mean Annual Flood

Input

| | | | |
|-----------------------|--------|---------------|----------|
| Return Period (years) | 100 | Soil | 0.300 |
| Area (ha) | 50.000 | Urban | 0.000 |
| SAAR (mm) | 947 | Region Number | Region 9 |

Results l/s

QBAR Rural 129.8
QBAR Urban 129.8

Q100 years 282.9

Q1 year 114.2
Q2 years 120.5
Q5 years 157.0
Q10 years 184.3
Q20 years 211.7
Q25 years 221.1
Q30 years 228.8
Q50 years 251.2
Q100 years 282.9
Q200 years 320.5
Q250 years 333.5
Q1000 years 414.0

APPENDIX C - TYPICAL DETAILS

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 Project Management Initials: Designer: MM Checker: AT
 Approved: RM
 File name: F:\PROJECTS\HIGHWAYS - ST ATHAN\03 EXECUTION\03 Documents\08 CAD\01 Working\Drawings\0500 - DRAINAGE\STANDARD DETAILS\SHEET 1.DWG Last saved by: TAYLORD12 Last Plot time: 2017-03-21
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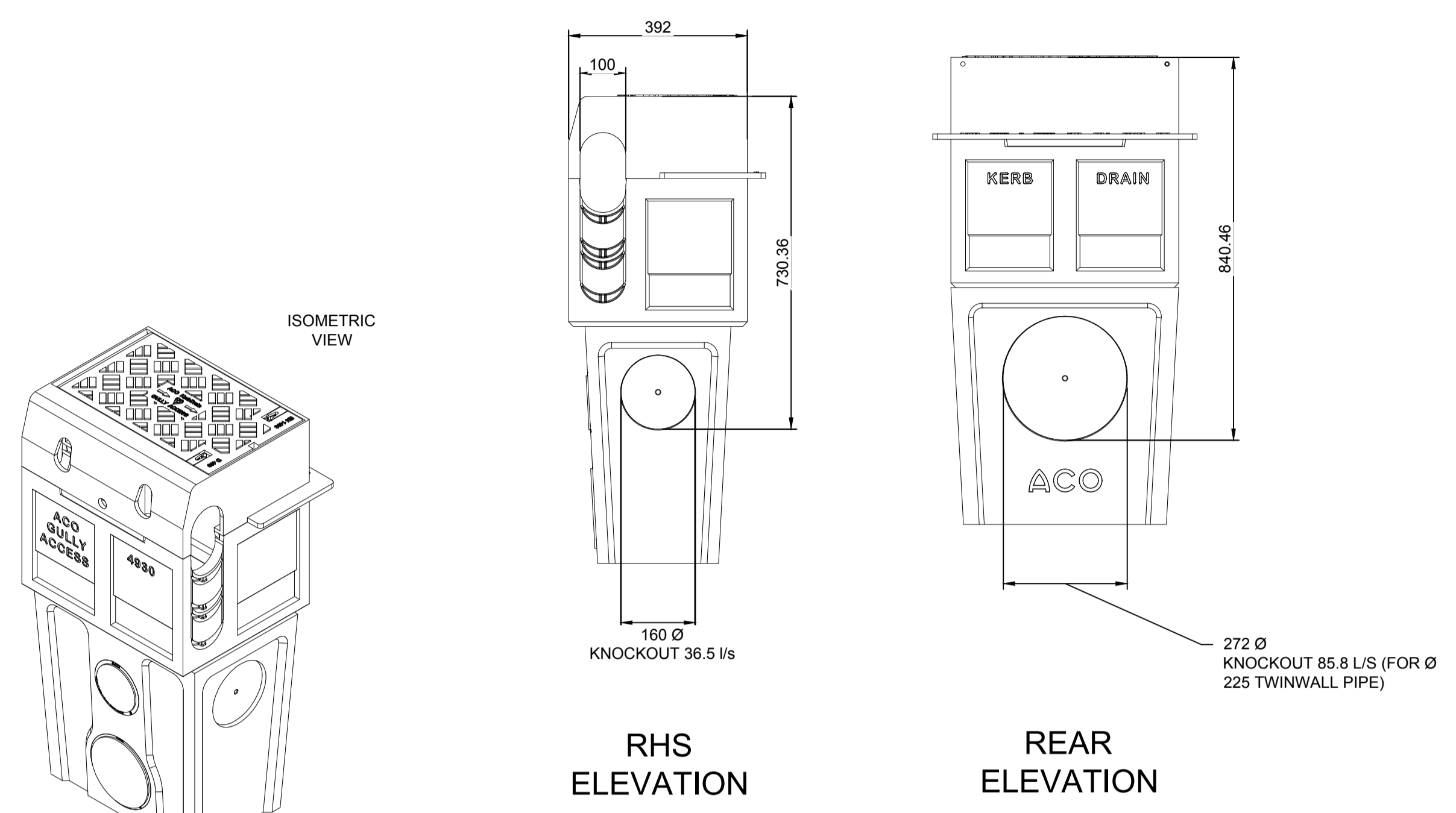
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 Welsh Government

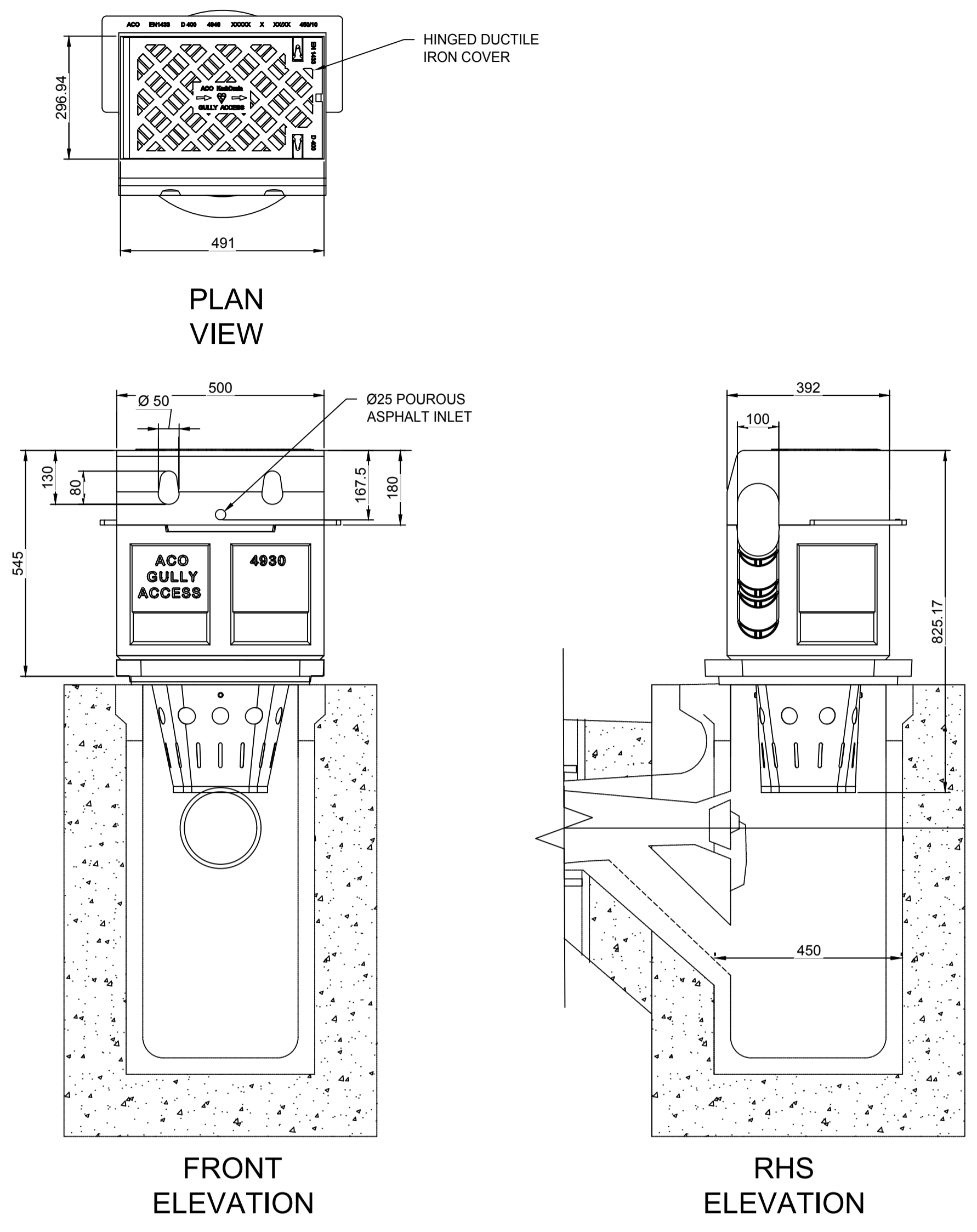
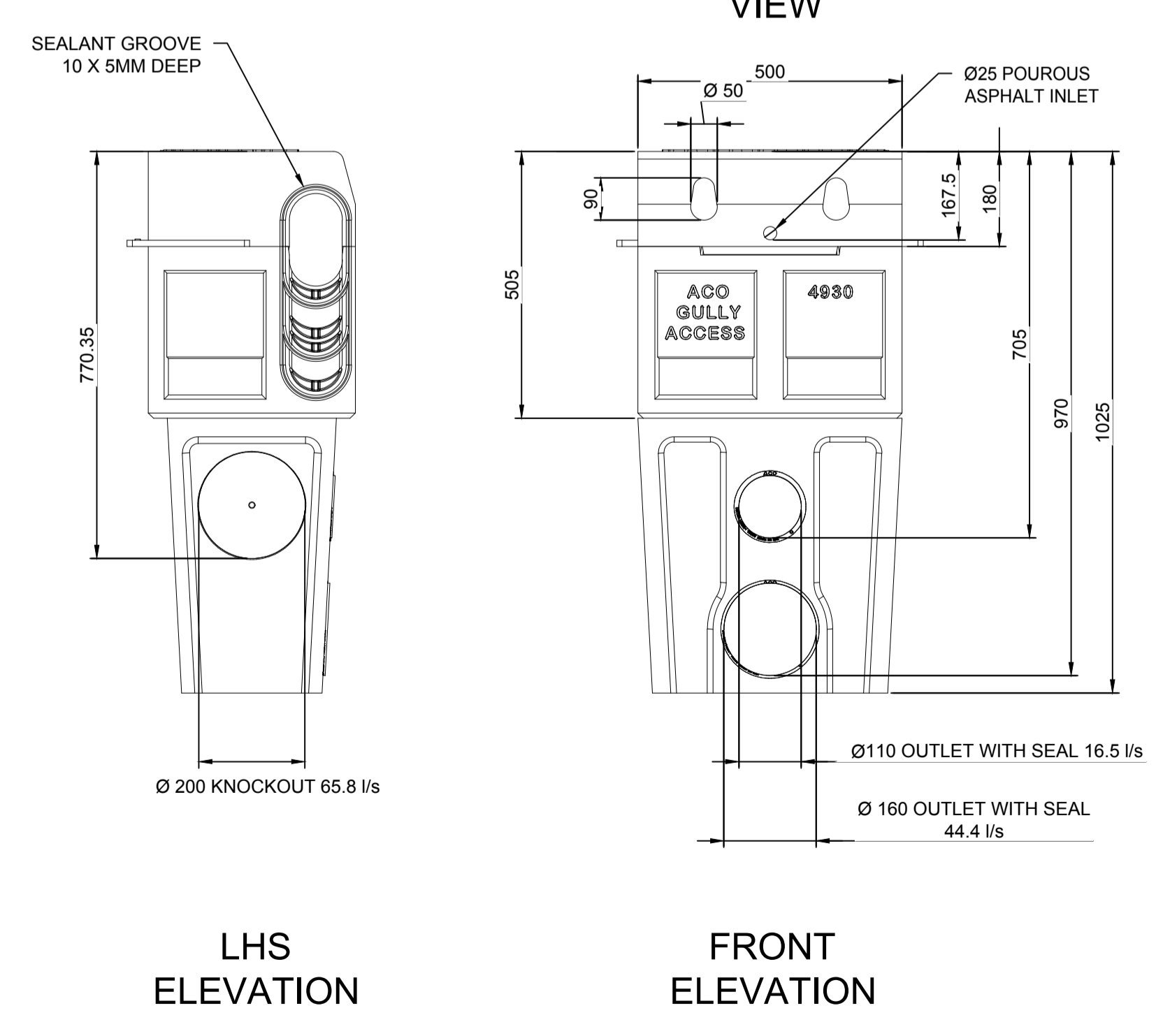
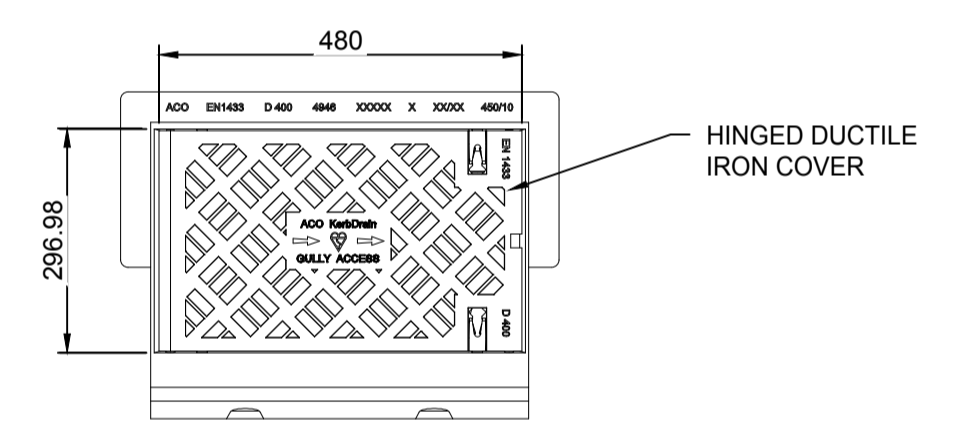
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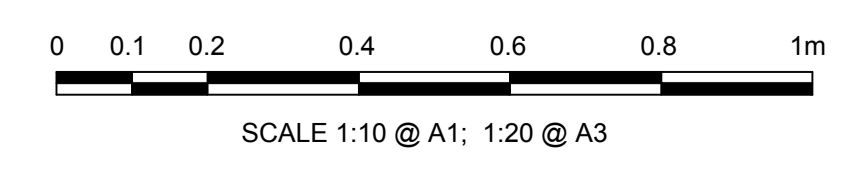
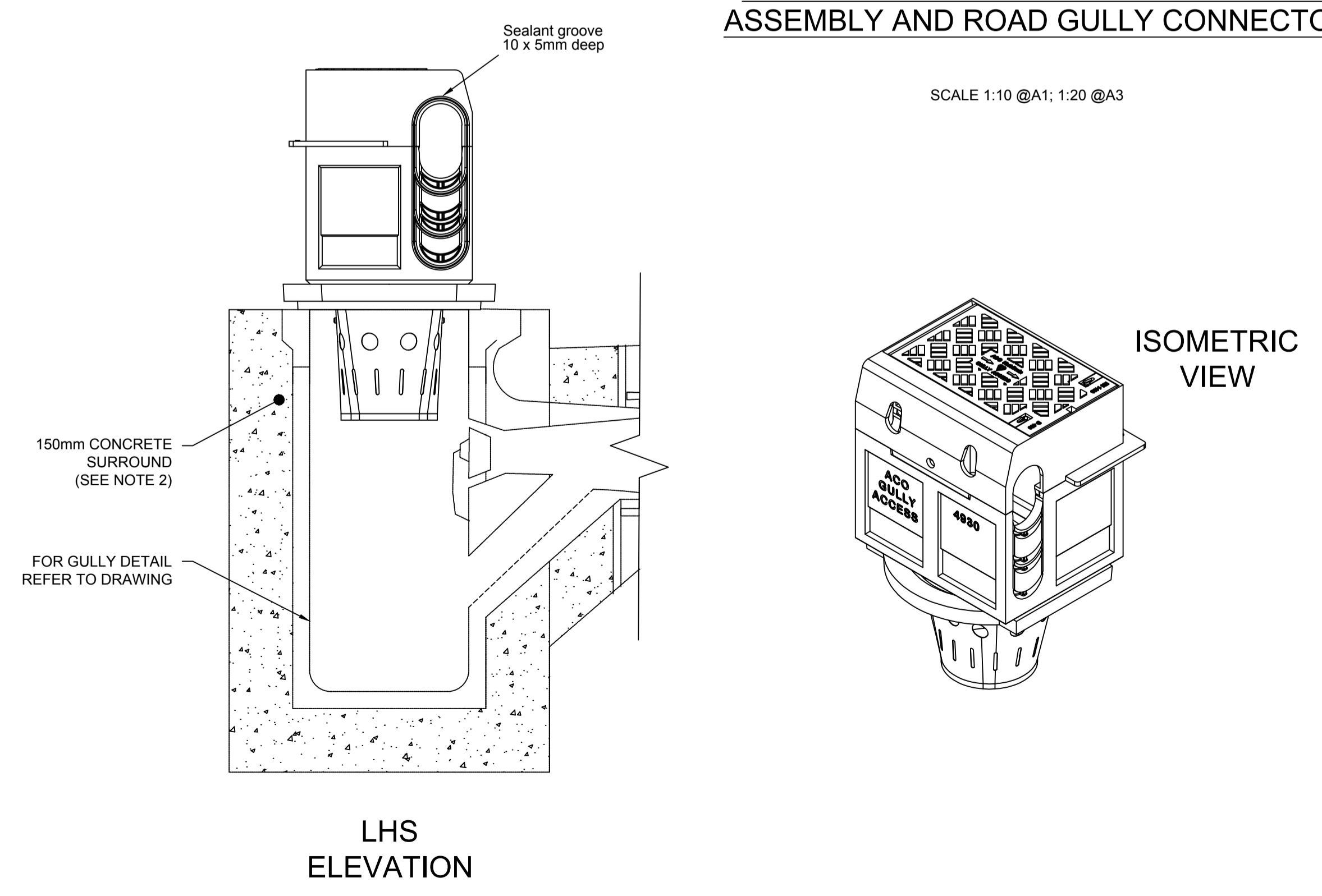
**KERBDRAIN HB611 HALF BATTERED
 GULLY ACCESS TOP WITH DEEP BASE**

SCALE 1:10 @A1; 1:20 @A3



**KERBDRAIN HB615 HALF BATTERED TOP
 ASSEMBLY AND ROAD GULLY CONNECTOR**

SCALE 1:10 @A1; 1:20 @A3



| STATUS | | |
|-----------------|------------|--------------|
| FOR INFORMATION | | |
| ISSUE/REVISION | | |
| | | |
| | | |
| | | |
| | | |
| NO | DATE | DESCRIPTION |
| A | 20-03-2017 | FOR PLANNING |

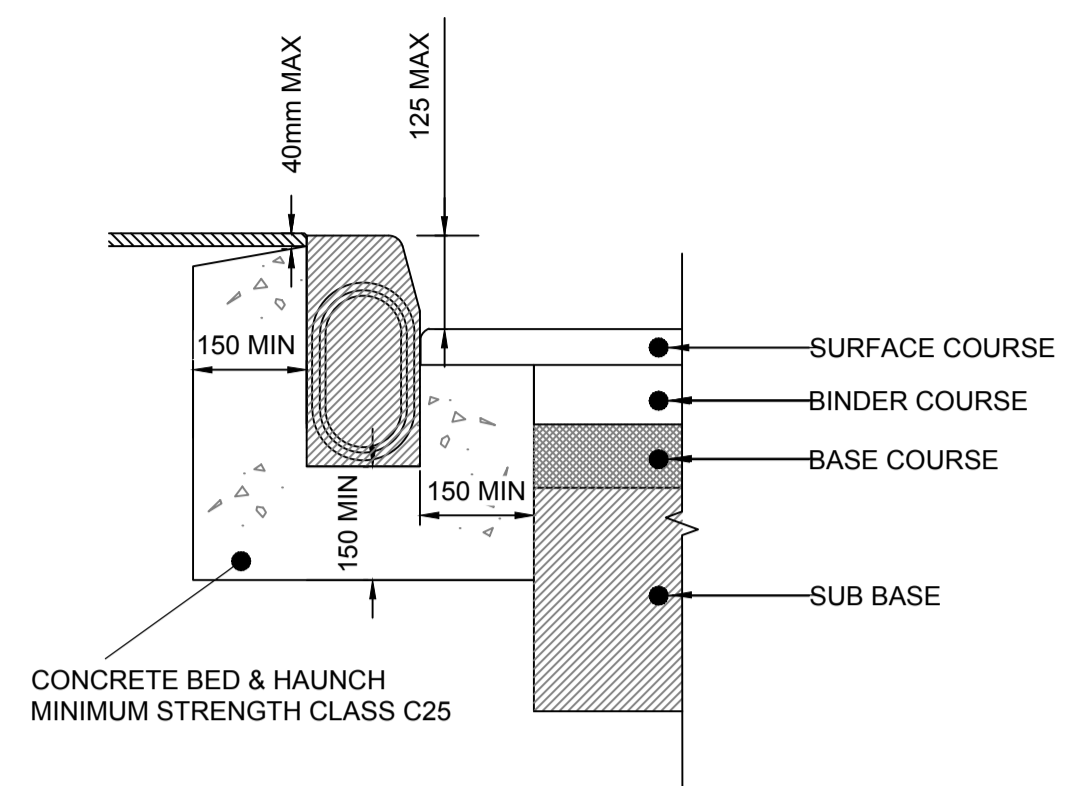
PROJECT NUMBER
 60509148

SHEET TITLE
 ST.ATHAN
 DRAINAGE TYPICAL DETAILS
 SHEET 1 OF 8

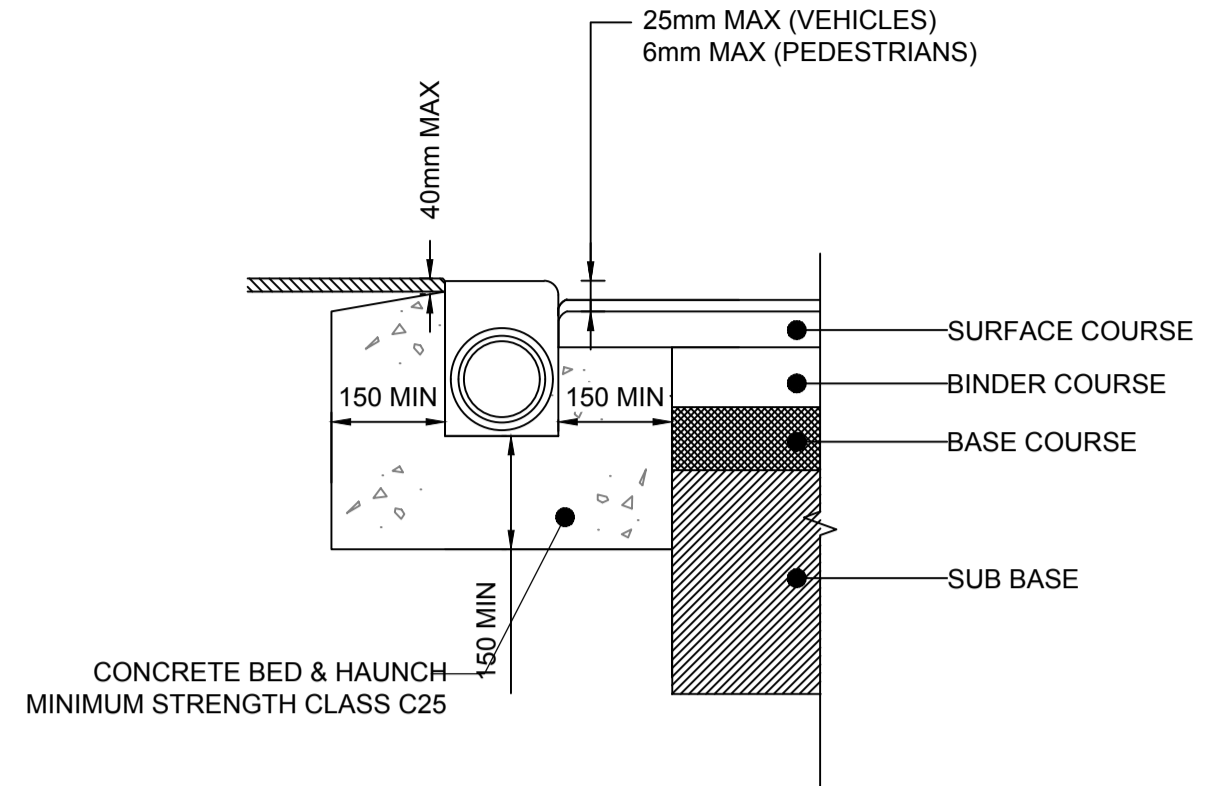
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ISO A1 84mm x 64mm
Project Management Initials: Designer: MH Checked: AT Approved: RM

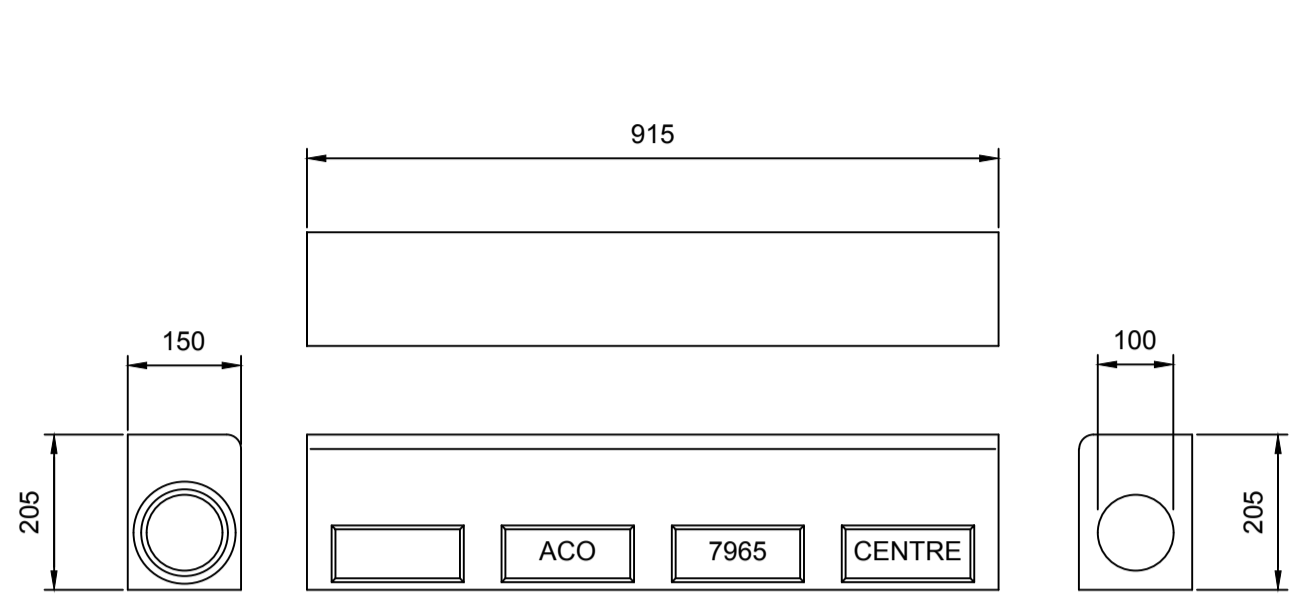
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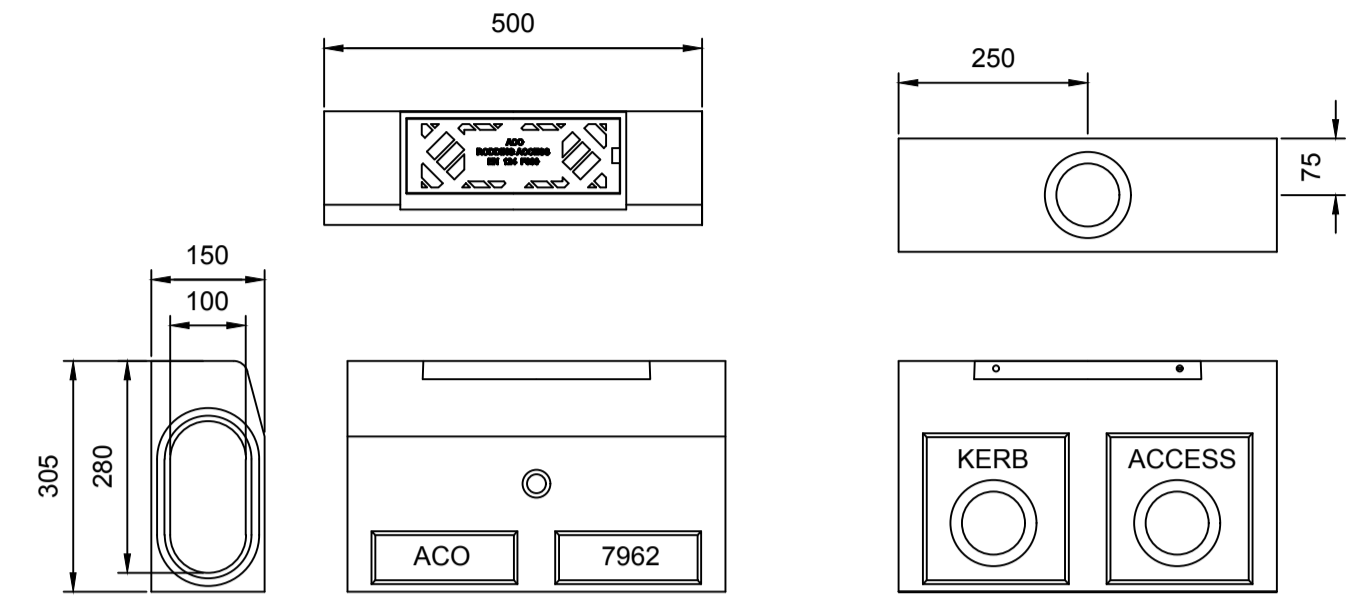
TYPICAL KERBDRAIN 305 INSTALLATION SECTION - URBAN CARRIAGEWAY
SCALE 1:10 @A1; 1:20 @A3



TYPICAL KERBDRAIN 305 CENTRE STONE INSTALLATION SECTION - URBAN CARRIAGEWAY
SCALE 1:10 @A1; 1:20 @A3



ACO KERBDRAIN HB305 CENTRE STONE
SCALE 1:10 @A1; 1:20 @A3



ACO KERBDRAIN HB305 ACCESS UNIT
SCALE 1:10 @A1; 1:20 @A3

AECOM

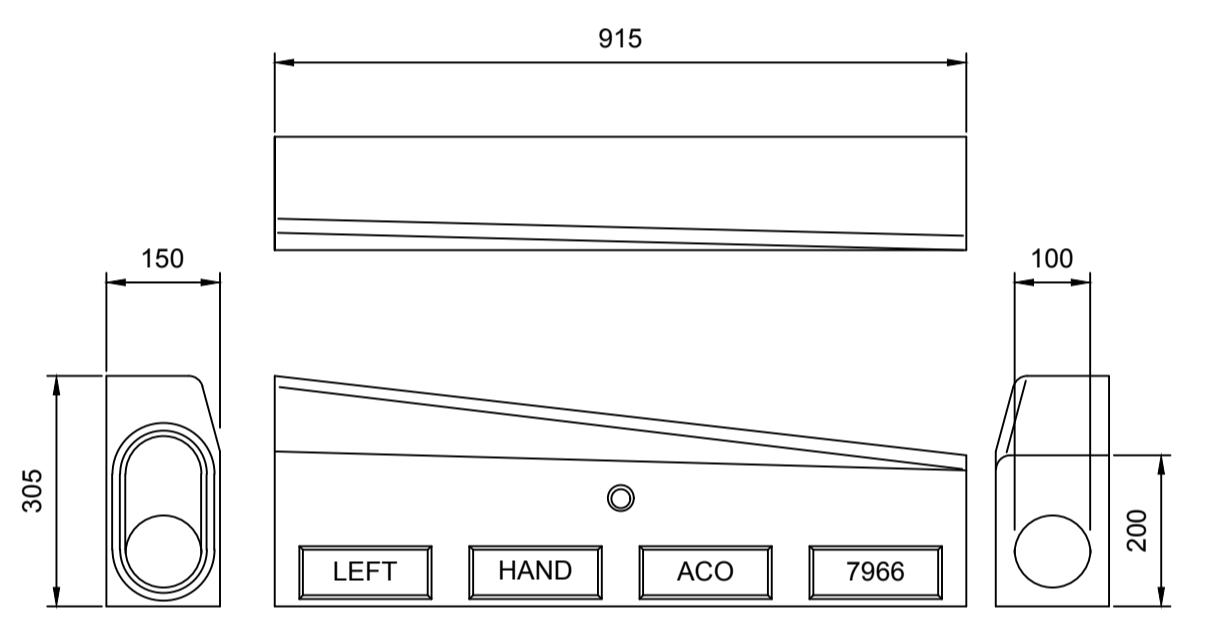
PROJECT
ST. ATHAN NORTHERN ACCESS ROAD

CLIENT
WELSH GOVERNMENT

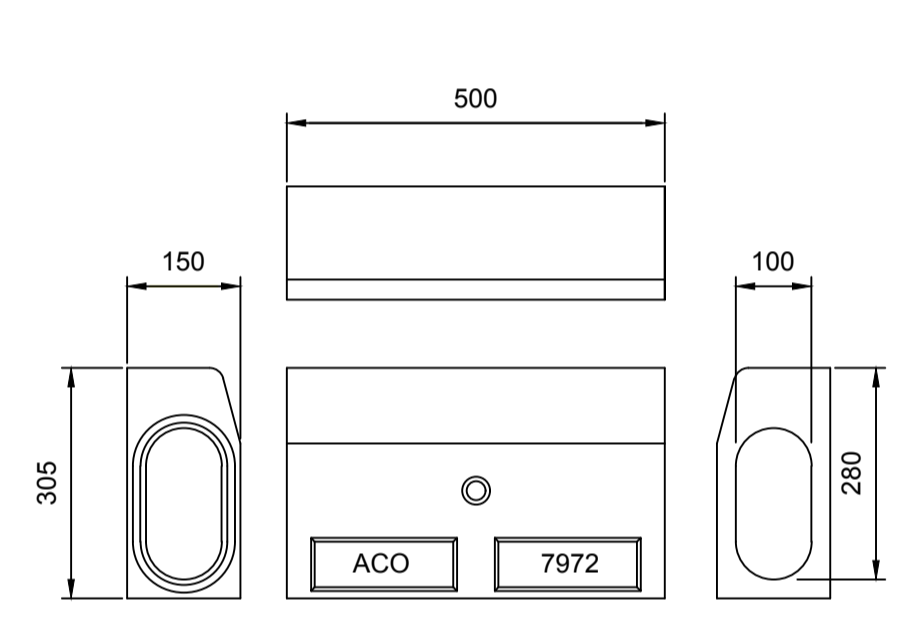
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Welsh Government

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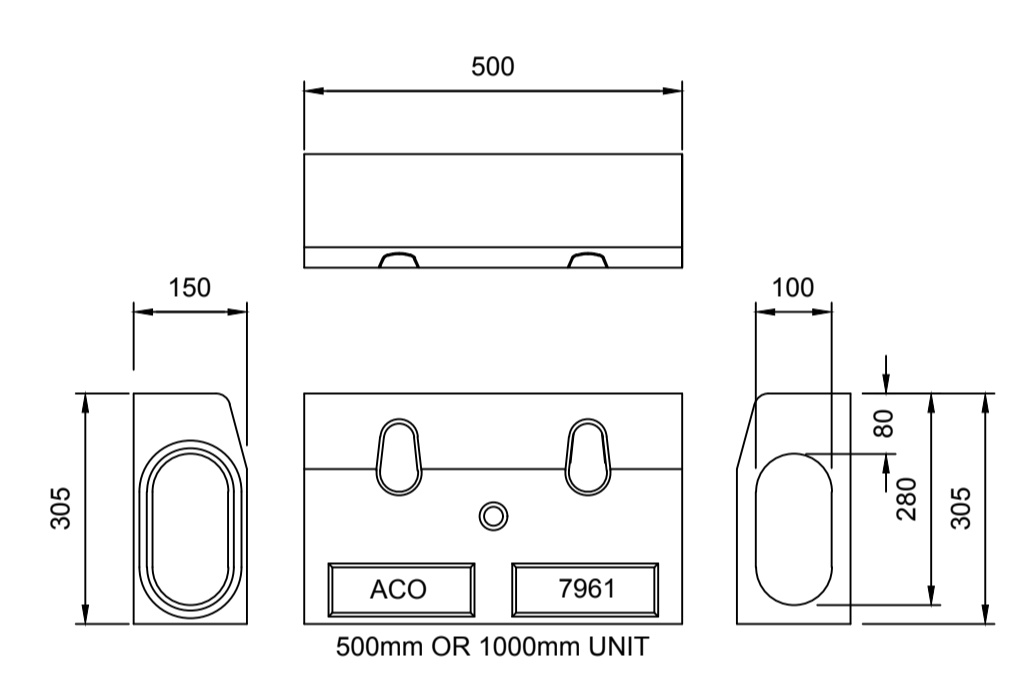
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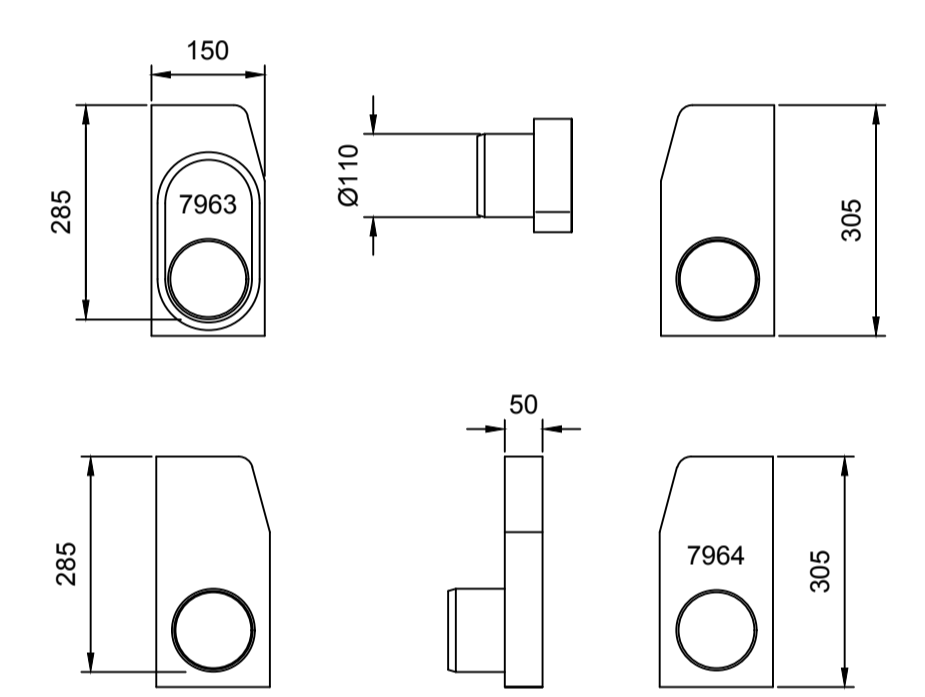
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SCALE 1:10 @A1; 1:20 @A3



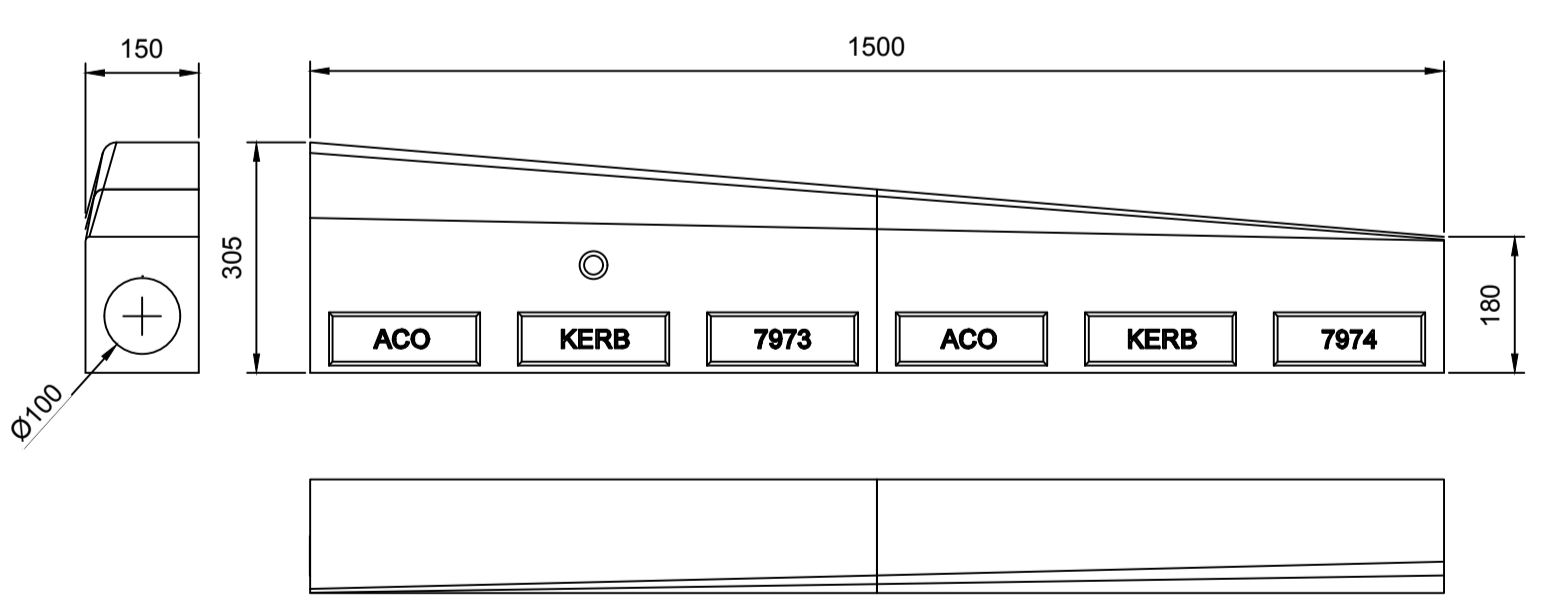
ACO KERBDRAIN HB305 BLIND UNIT
SCALE 1:10 @A1; 1:20 @A3



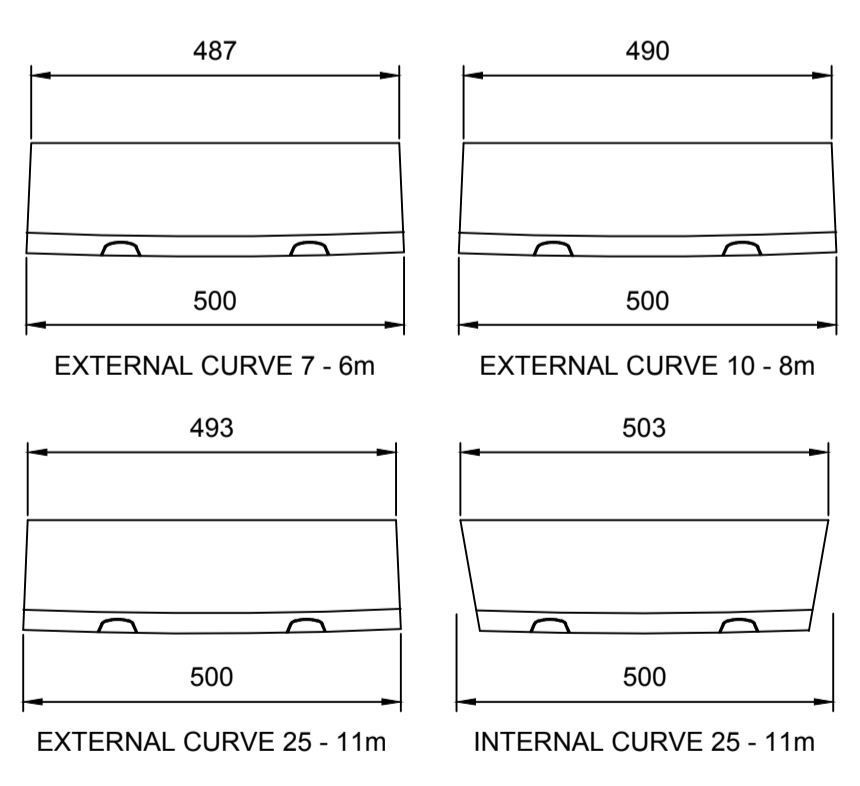
ACO KERBDRAIN HB305 KERB UNIT
SCALE 1:10 @A1; 1:20 @A3



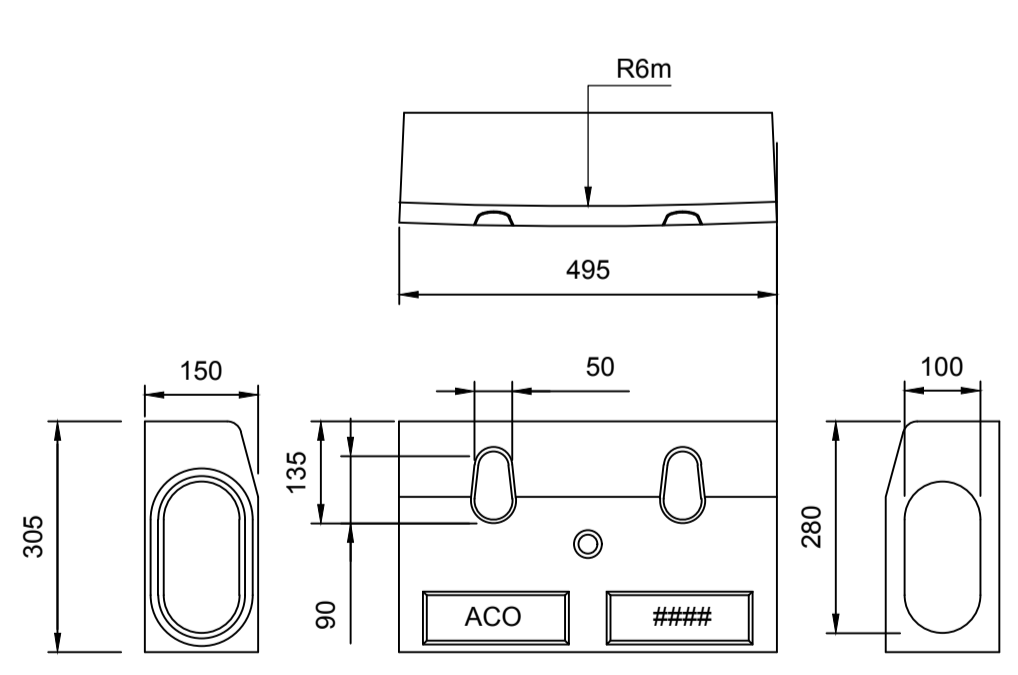
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SCALE 1:10 @A1; 1:20 @A3



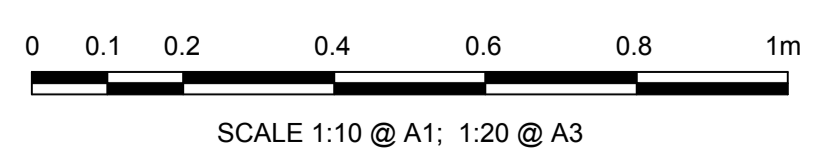
ACO KERBDRAIN HB305 CS LH DROPPER (NOTE RH DROPPER IS MIRROR IMAGE OF LH DROPPER)
SCALE 1:10 @A1; 1:20 @A3



ACO KERBDRAIN HB305 MITRE UNITS (EXTERNAL AND INTERNAL)
SCALE 1:10 @A1; 1:20 @A3



ACO KERBDRAIN HB305 6m EXTERNAL RADIUS
SCALE 1:10 @A1; 1:20 @A3

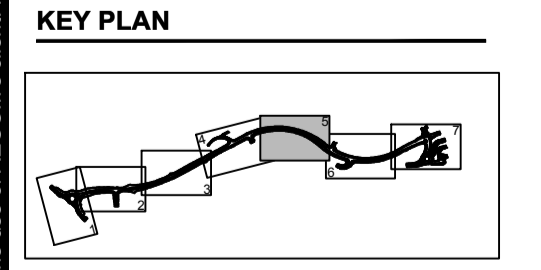


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| A | 20-03-2017 | FOR PLANNING |



PROJECT NUMBER
60509148

SHEET TITLE
ST.ATHAN DRAINAGE TYPICAL DETAILS SHEET 2 OF 8

SHEET NUMBER
60509148-SHT-30-0000-CT-0522

Filename: F:\PROJECTS\HIGHWAYS-ST.ATHAN\03 EXECUTION\03 Documents\08 CAD\01 Working\Drawings\0500 - DRAINAGE\STANDARD DETAILS\SHEET 2.DWG
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ISO A1 842mm x 641mm
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Checked: AT
Designer: MH
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PROJECT
ST. ATHAN
NORTHERN
ACCESS
ROAD

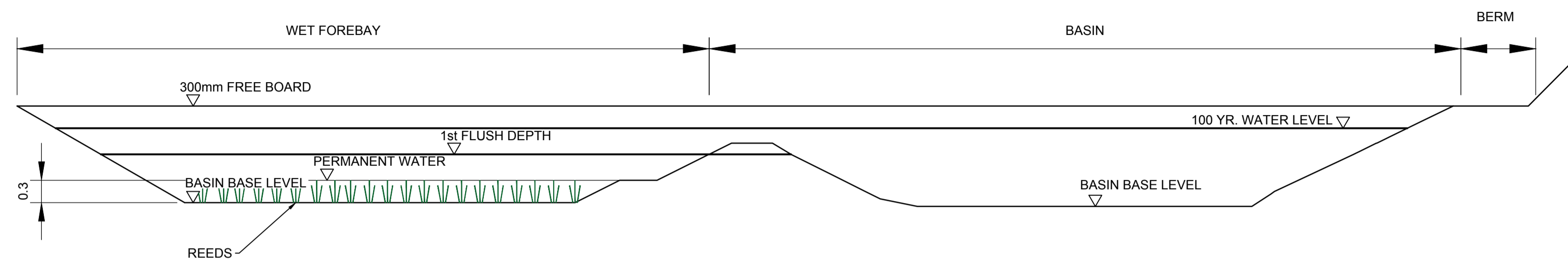
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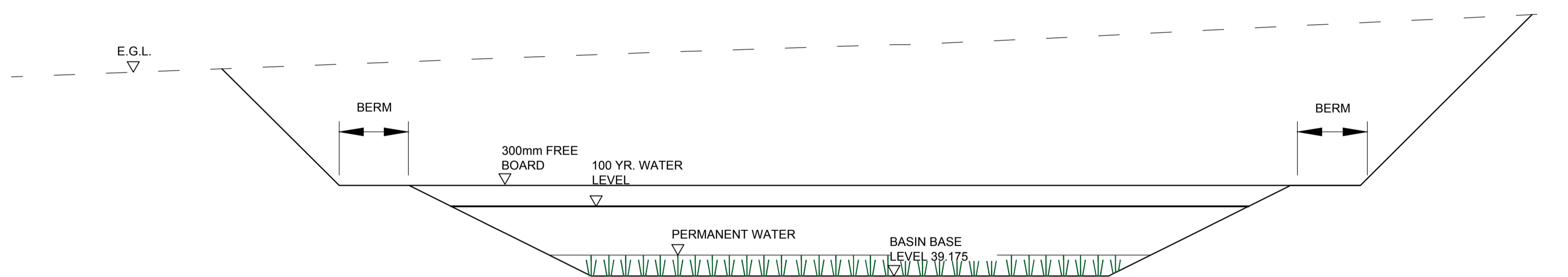
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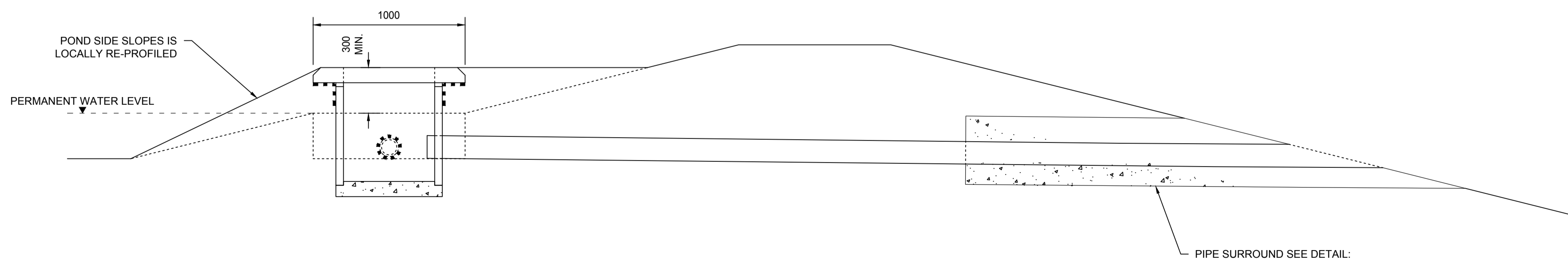
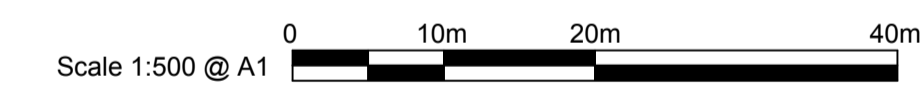
**WET FOREBAY/DRY
BASIN TYPICAL PROFILE**

SCALE 1:500@A1 ; 1:100@A3



**WET FOREBAY TYPICAL
CROSS SECTION**

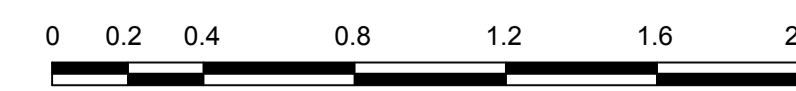
SCALE 1:500@A1 ; 1:100@A3



ELEVATION

SCALE 1:20 @ A1 / 1:40 @ A3

CATCHPIT AND FILTER DRAIN OUTLET PIPE ARRANGMENT DETAIL



ISSUE/REVISION

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| A | 20-03-2017 | FOR PLANNING |

KEY PLAN

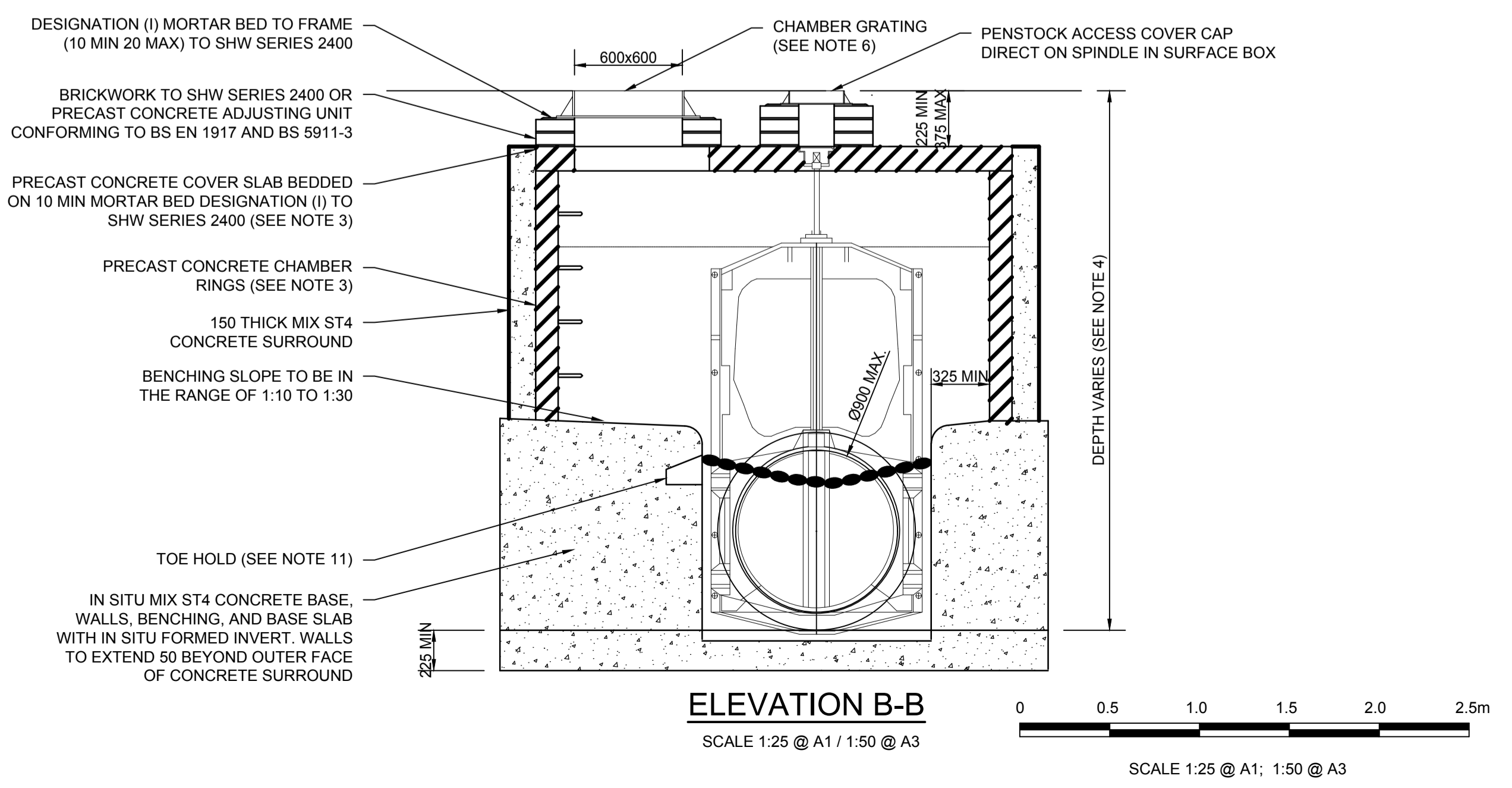
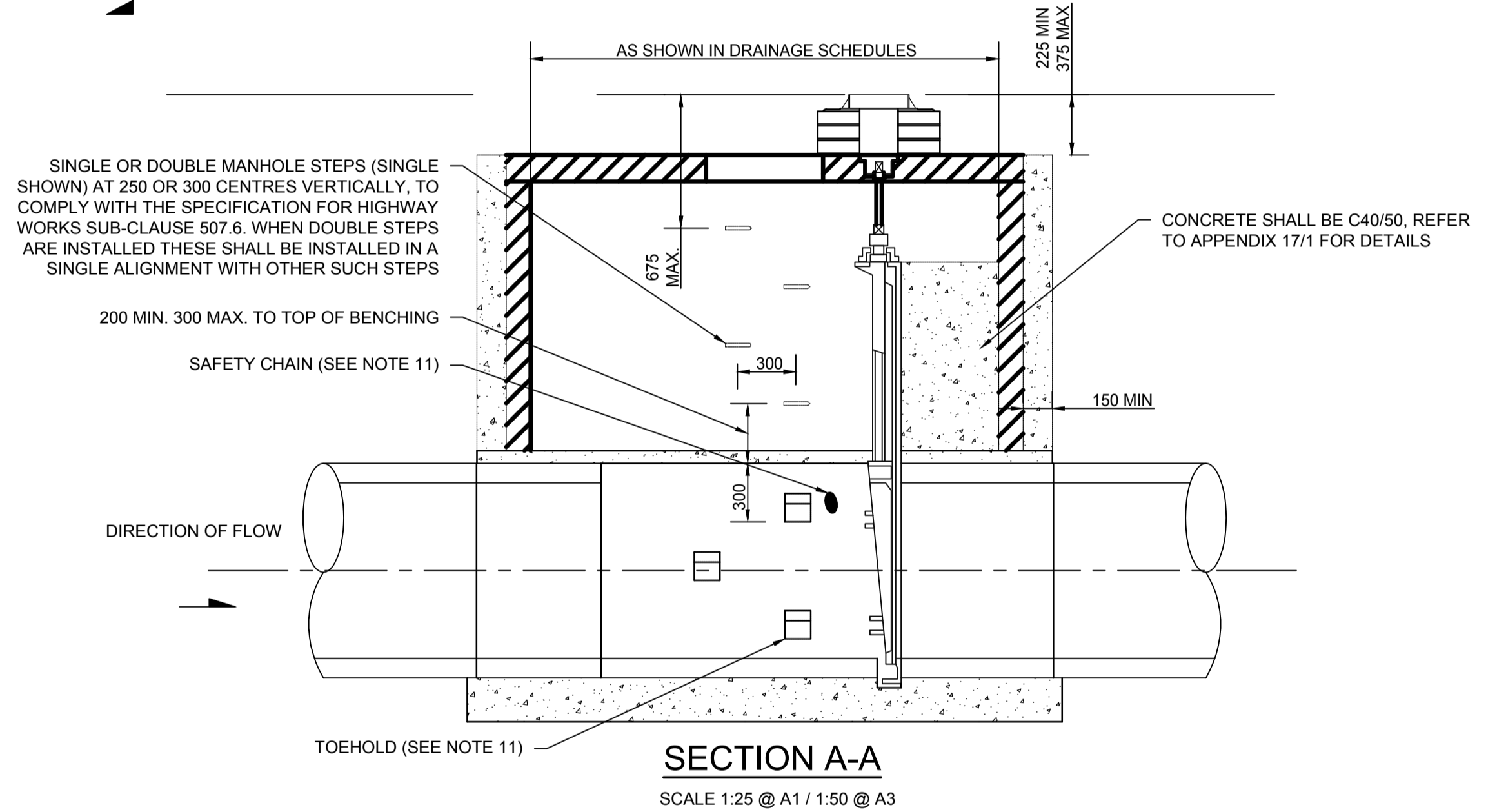
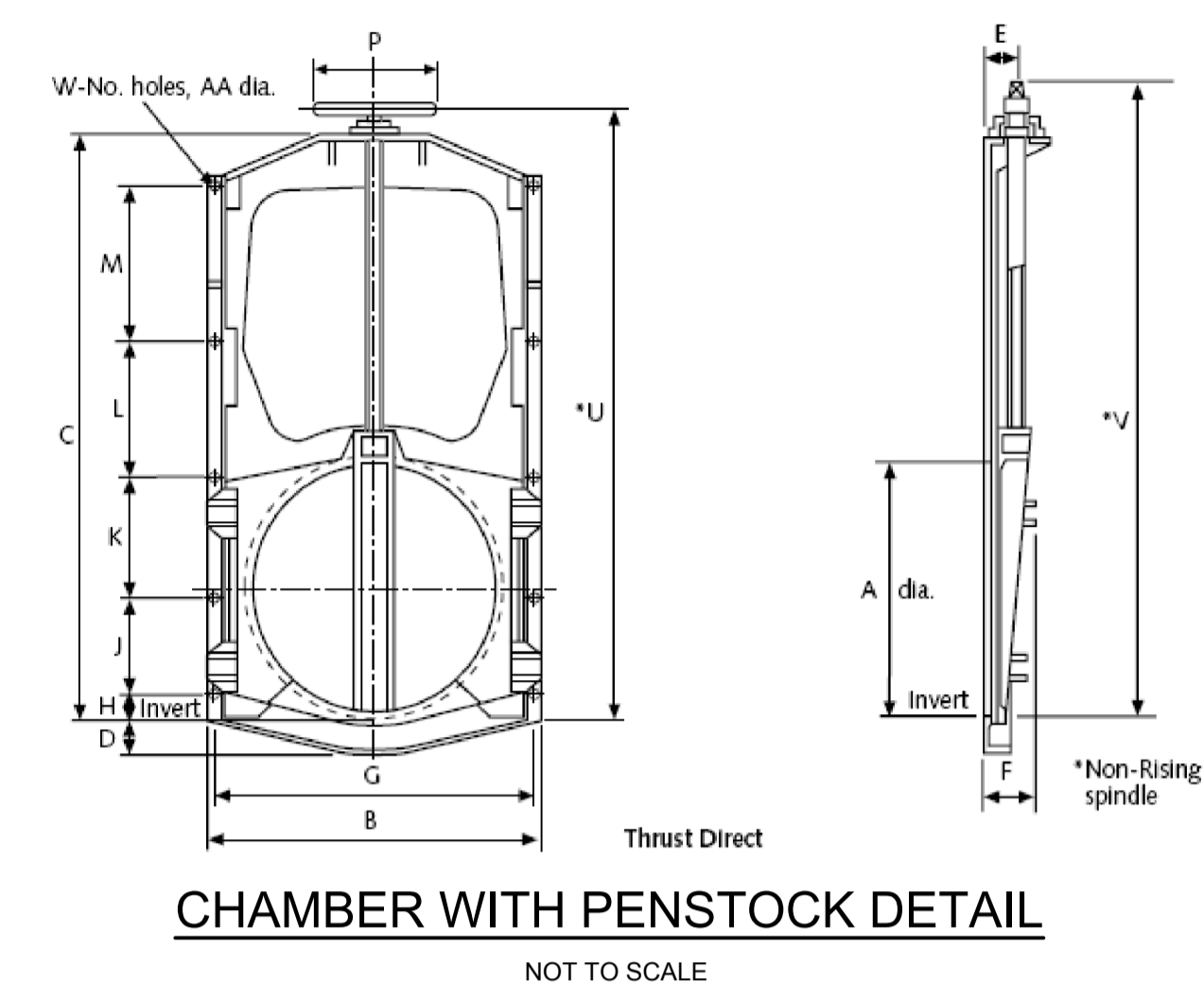
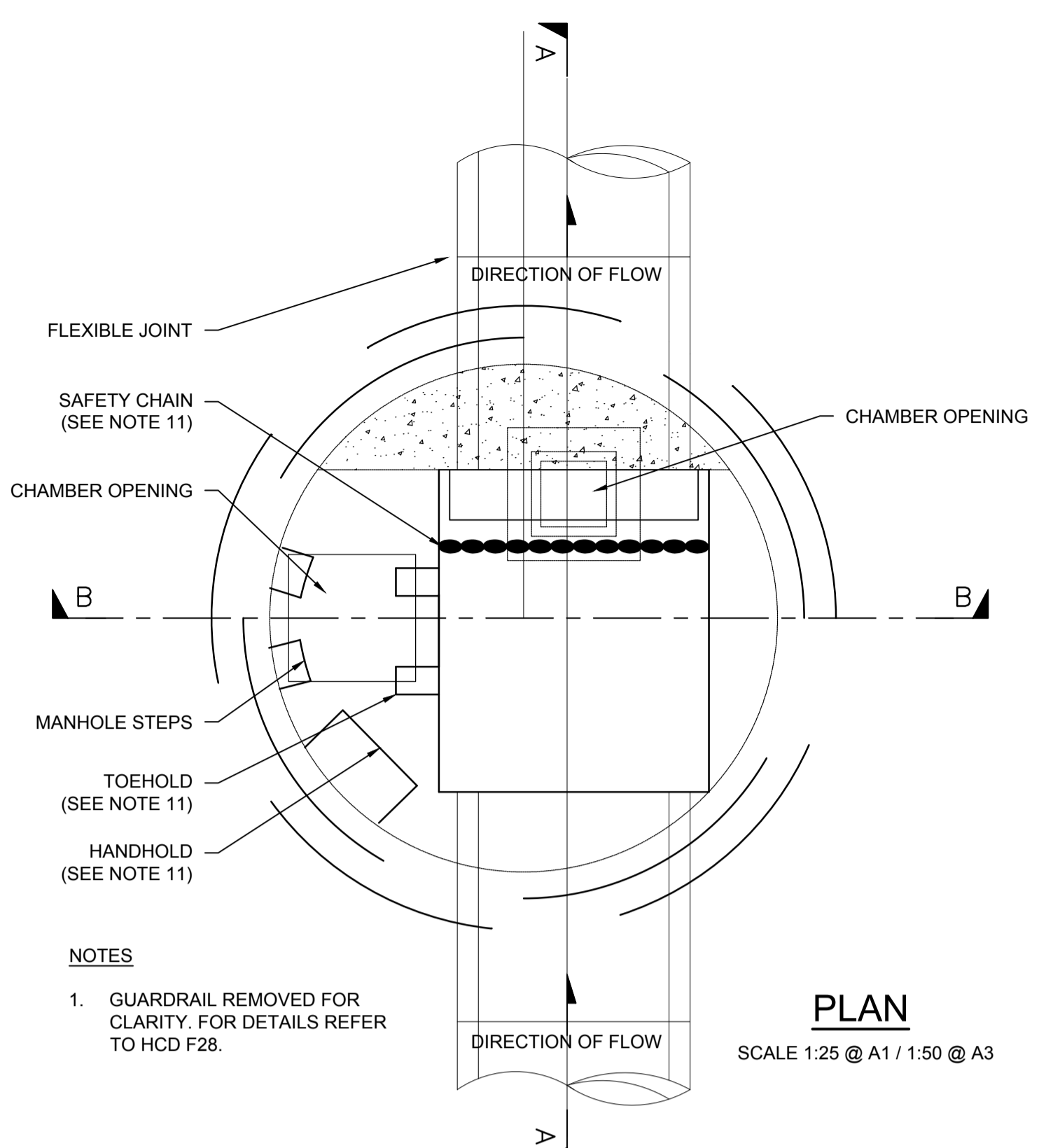
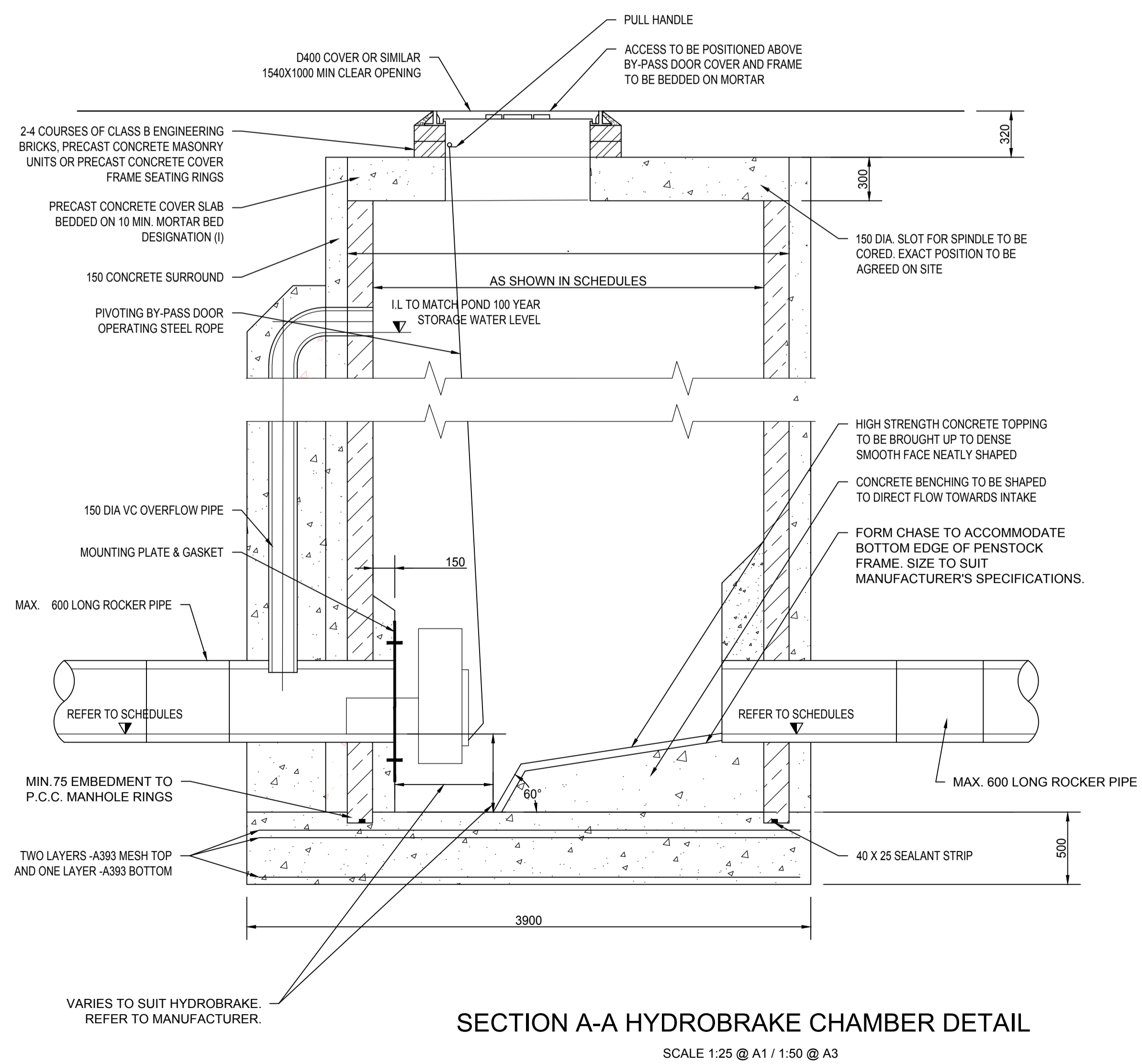
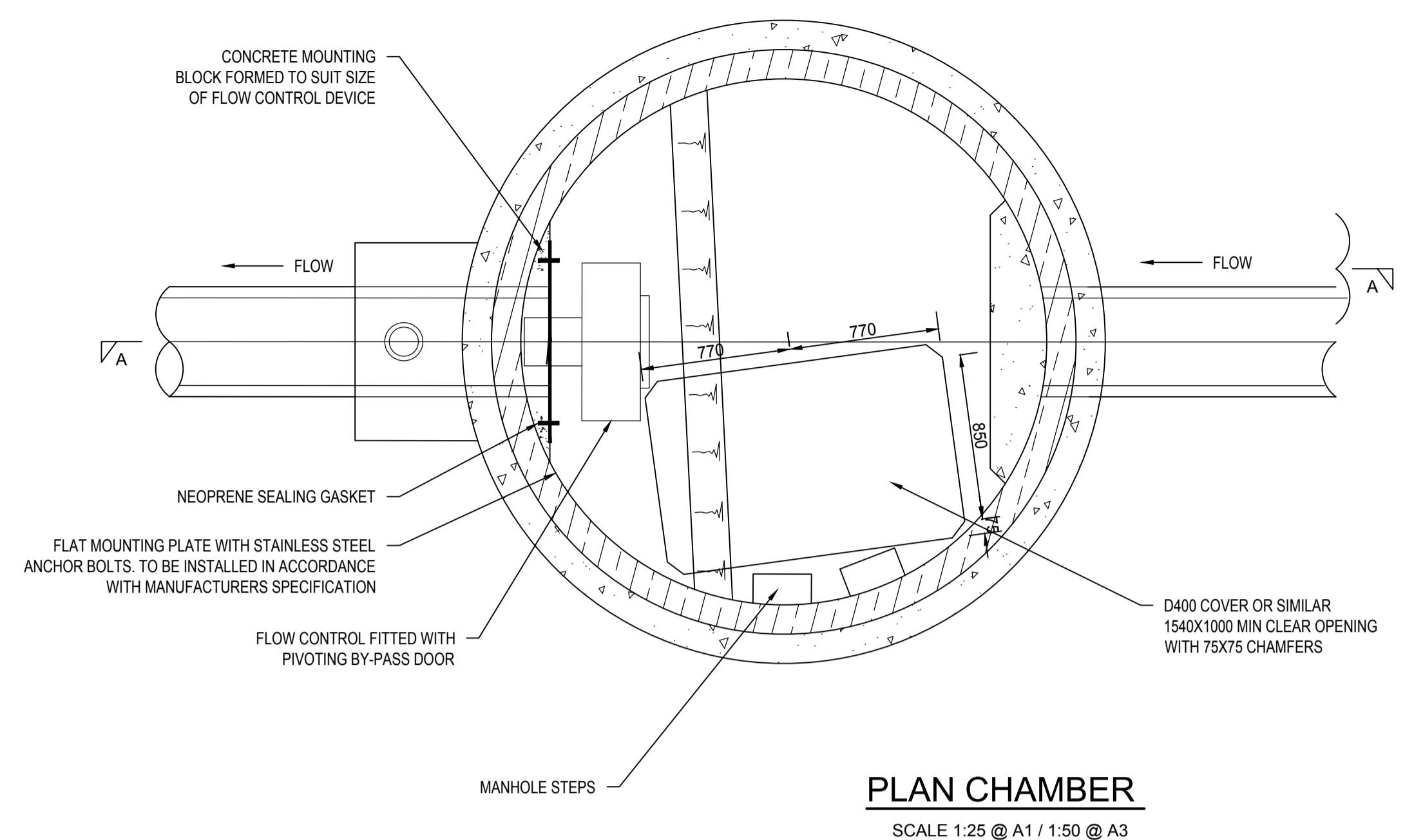
PROJECT NUMBER
60509148

SHEET TITLE
ST.ATHAN
DRAINAGE TYPICAL DETAILS
SHEET 3 OF 8

SHEET NUMBER
60509148-SHT-30-0000-CT-0523

RSD A1 594mm x 841mm
 Project Management Initials: Designer: MH Checked: AT Approved: RM
 File name: F:\PROJECTS\HIGHWAYS - ST ATHAN\03 EXECUTION\03 Documents\08 CAD\01 WorkingDrawings\0500 - DRAINAGE\STANDARD DETAILS\SH4.DWG
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PROJECT
ST. ATHAN NORTHERN ACCESS ROAD

CLIENT
WELSH GOVERNMENT

Llywodraeth Cymru
Welsh Government

CONSULTANT
AECOM
1 CALLAGHAN SQUARE
CARDIFF
CF10 5BT
TEL: (029) 20674600
FAX: (029) 20674699

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE
2. DO NOT SCALE OFF THE DRAWING.
3. CHAMBER RINGS AND COVER SLAB TO BE CONSTRUCTED IN PRECAST CONCRETE TO BS EN 1917 AND BS 5911-3.

STATUS
FOR INFORMATION

ISSUE/REVISION

| IR | DATE | DESCRIPTION |
|----|------------|--------------|
| A | 20-03-2017 | FOR PLANNING |

KEY PLAN

PROJECT NUMBER
60509148

SHEET TITLE
ST.ATHAN DRAINAGE TYPICAL DETAILS SHEET 4 OF 8

SHEET NUMBER
60509148-SHT-30-0000-CT-0524

ISO A1 842mm x 610mm
 Project Management Initials: Designer: MH Checked: AT Approved: RM
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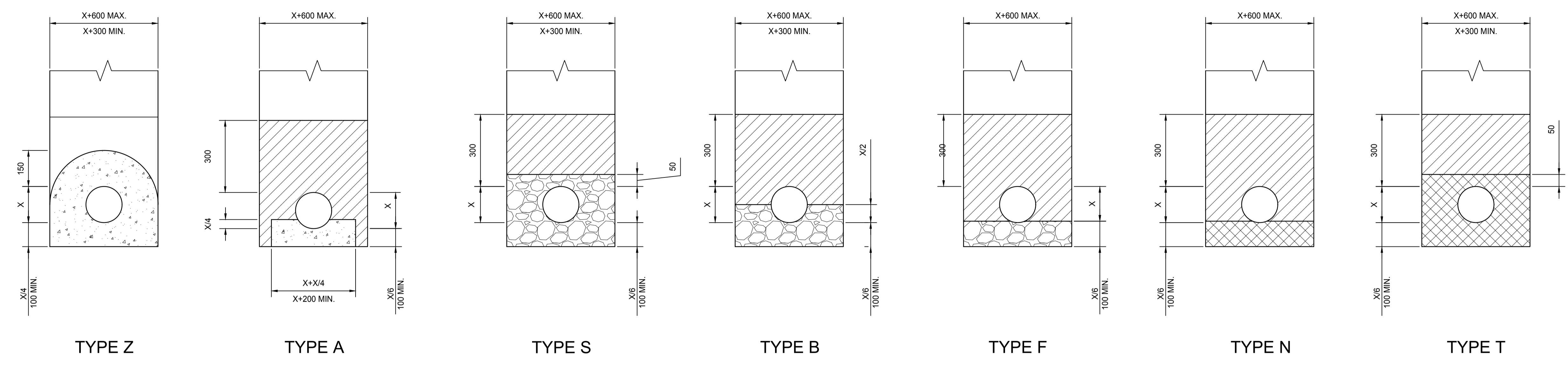
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ST. ATHAN NORTHERN ACCESS ROAD

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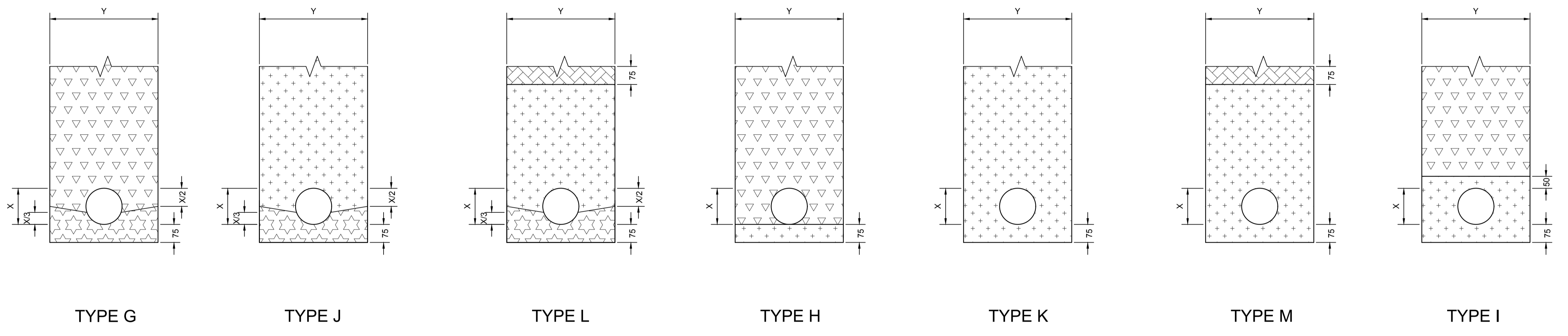
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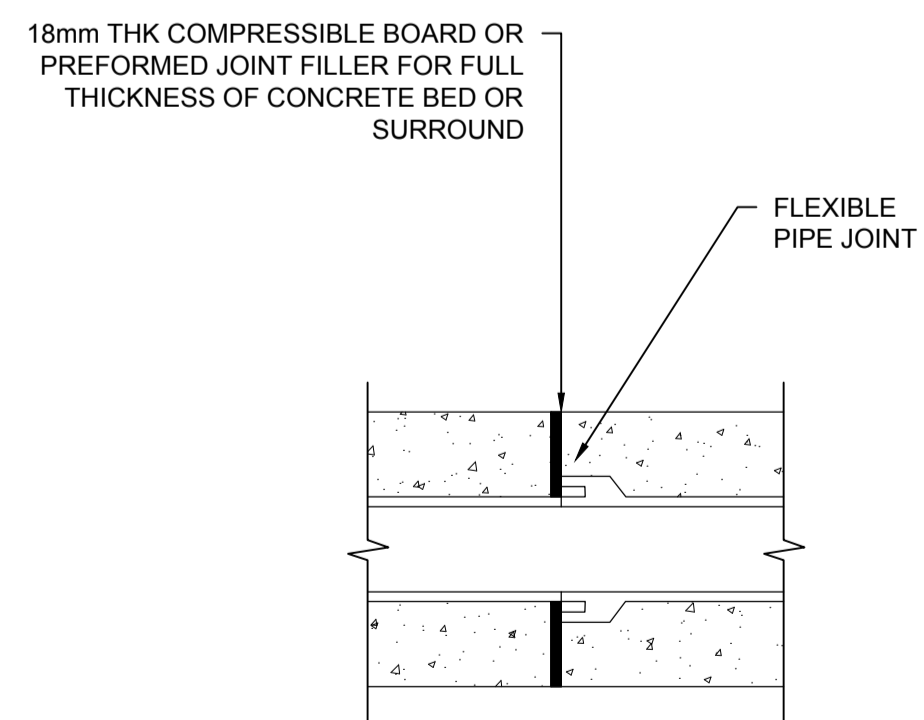
SURFACE WATER DRAINS - TRENCH AND BEDDING DETAILS

SCALE 1:10 @ A1 / 1:20 @ A3



FILTER DRAINS - TRENCH AND BEDDING DETAILS

SCALE 1:10 @ A1 / 1:20 @ A3

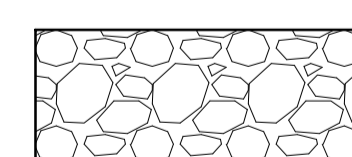
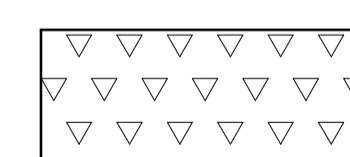
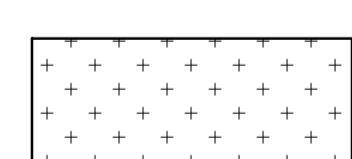
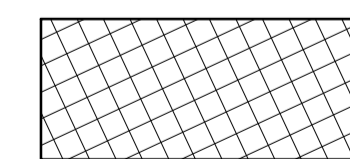
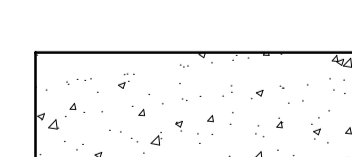
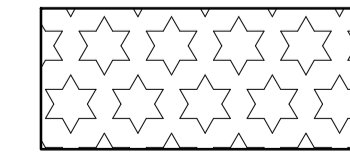
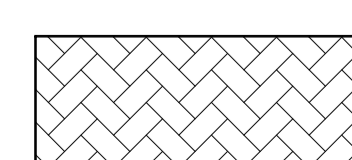



EXPANSION JOINT FOR CONCRETE SURROUND TO PIPES (TYPE Z)

(TO OCCUR AT ALL JOINTS AND NOT MORE THAN 8m APART)

SCALE 1:10 @ A1 / 1:20 @ A3

LEGEND

| | | | |
|---|---|---|---|
|  | GRANULAR MATERIAL TO S.H.W. CLAUSE 503.3 (i). |  | TYPE B FILTER MATERIAL TO S.H.W. CLAUSE 505. |
|  | TYPE A OR C FILTER MATERIAL TO S.H.W. CLAUSE 505 OR GRANULAR MATERIAL TO S.H.W. CLAUSE 503.3 (i). |  | MATERIAL TO S.H.W CLAUSE 503.3(ii) E.G. SAND. |
|  | CONCRETE TO S.H.W. CLAUSE 503.3 (iii). |  | ST2 CONCRETE TO S.H.W CLAUSE 2602. |
|  | TURF OR SEED ON TOPSOIL AS DESCRIBED IN APPENDIX 1/5. |  | CLASS 8 MATERIAL TO S.H.W. CLAUSE 503.3 (iv). |



SCALE 1:10 @ A1; 1:20 @ A3

- NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS. ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF MPT.
 - DO NOT SCALE FROM THIS DRAWING
 - ALL DIMENSIONS ON THIS DRAWING ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.
- NOTES SPECIFIC TO CARRIER DRAINS**
- DIMENSION X REFERS TO THE PIPE DIAMETER.
 - THE MINIMUM OR MAXIMUM WIDTH OF THE TRENCH APPLIES ON AND BELOW A LINE 300mm ABOVE THE OUTSIDE TOP OF THE PIPE. ABOVE THE 300mm LINE THE TRENCH BACKFILL MATERIAL SHALL BE AS DESCRIBED IN THE PAVEMENT DETAILS.
 - THE CONCRETE BED OR SURROUND MAY EXTEND TO THE SIDES OF THE TRENCH OR BE OF MINIMUM WIDTH. CLASS 8 MATERIAL IS TO BE USED TO FILL ANY VOIDS SO FORMED.
 - FOR TYPE Z TRENCH THE CONCRETE COVER MAY BE FORMED TO A RADIUS BATTER OR HORIZONTAL SURFACE. MINIMUM COVER OF CONCRETE SHALL BE 150mm.
 - PIPES WITH LESS THAN 1.2m COVER UNDER TRAFFICKED AREAS (0.9m COVER ELSEWHERE) TO HAVE CONCRETE BED AND SURROUND TYPE Z WITH EXPANSION JOINTS. PIPES IN DEPTH RANGE 1.2 - 3.0m UNDER TRAFFICKED AREAS (0.9-0.8m ELSEWHERE) TO HAVE BED AND SURROUND TYPE S (CLAY PIPES - BED TYPE F).
- NOTES SPECIFIC TO FILTER DRAINS:**
- MINIMUM DRAIN WIDTH Y=X+300 FOR DRAINS NOT EXCEEDING 1.5m COVER BELOW FINISH LEVEL. Y=X+450 FOR DRAINS EXCEEDING 1.5m COVER BELOW FINISH LEVEL.

| ISSUE/REVISION | |
|----------------|-------------|
| NO | DESCRIPTION |
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| | |

| KEY PLAN | |
|----------|-------------|
| NO | DESCRIPTION |
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| | |

| PROJECT NUMBER | |
|--|--|
| 60509148 | |
| SHEET TITLE | |
| ST.ATHAN DRAINAGE TYPICAL DETAILS SHEET 5 OF 8 | |
| SHEET NUMBER | |
| 60509148-SHT-30-0000-CT-0525 | |

ISO A1 841mm x 610mm
Project Management Initials: Designer: MH Checked: AT Approved: RM
Filename: F:\PROJECTS\HIGHWAYS - ST ATHAN\03 EXECUTION\03 Documents\08 CAD\01 Working\Drawings\0500 - DRAINAGE\STANDARD DETAILS\SHEET 6.DWG Last saved by: TAYLORD12 Last Potted: 2017-03-21

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**ST. ATHAN
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ROAD**

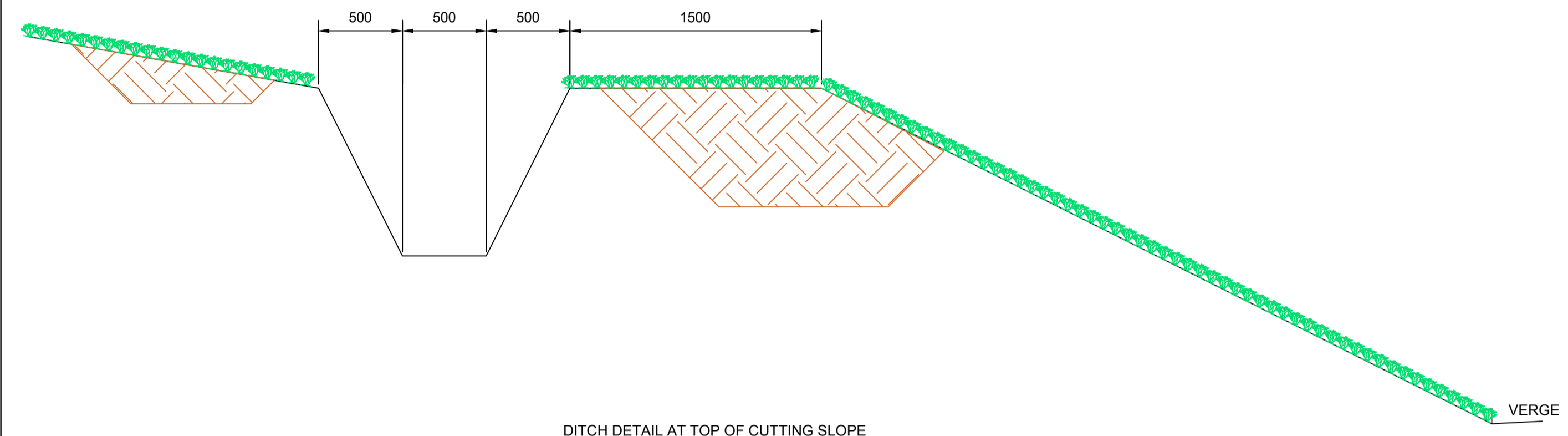
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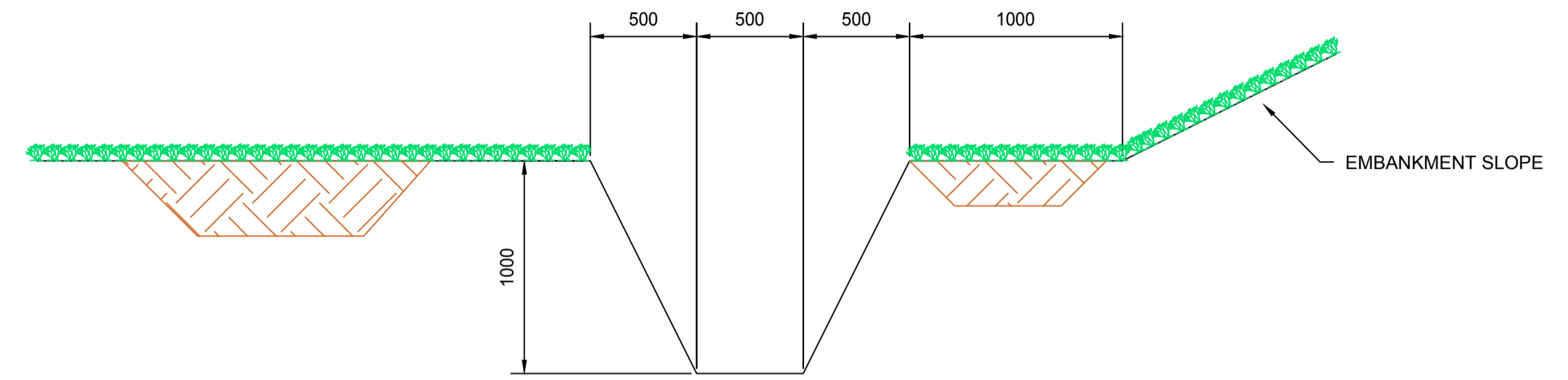
Llywodraeth Cymru
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CONSULTANT
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1 CALLAGHAN SQUARE
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TEL: (029) 20674600
FAX: (029) 20674699

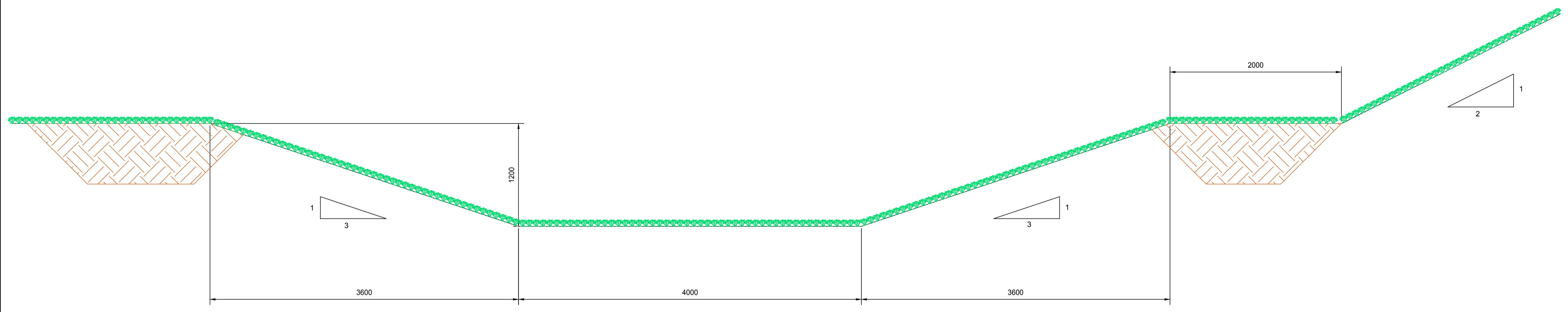
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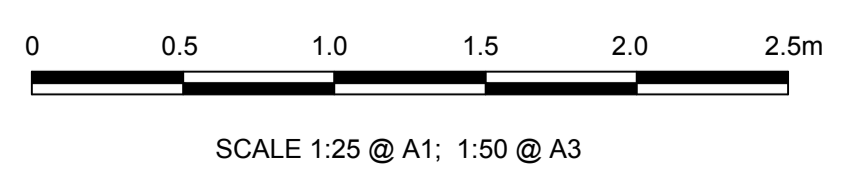
DITCH DETAIL AT TOP OF CUTTING SLOPE
SCALE 1:25 @ A1 / 1:50 @ A3



DITCH DETAIL AT TOE OF EMBANKMENT SLOPE
SCALE 1:25 @ A1 / 1:50 @ A3



SWALE DETAIL
SCALE 1:25 @ A1 / 1:50 @ A3



| ISSUE/REVISION | | |
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| IR | DATE | DESCRIPTION |
| A | 20-03-2017 | FOR PLANNING |

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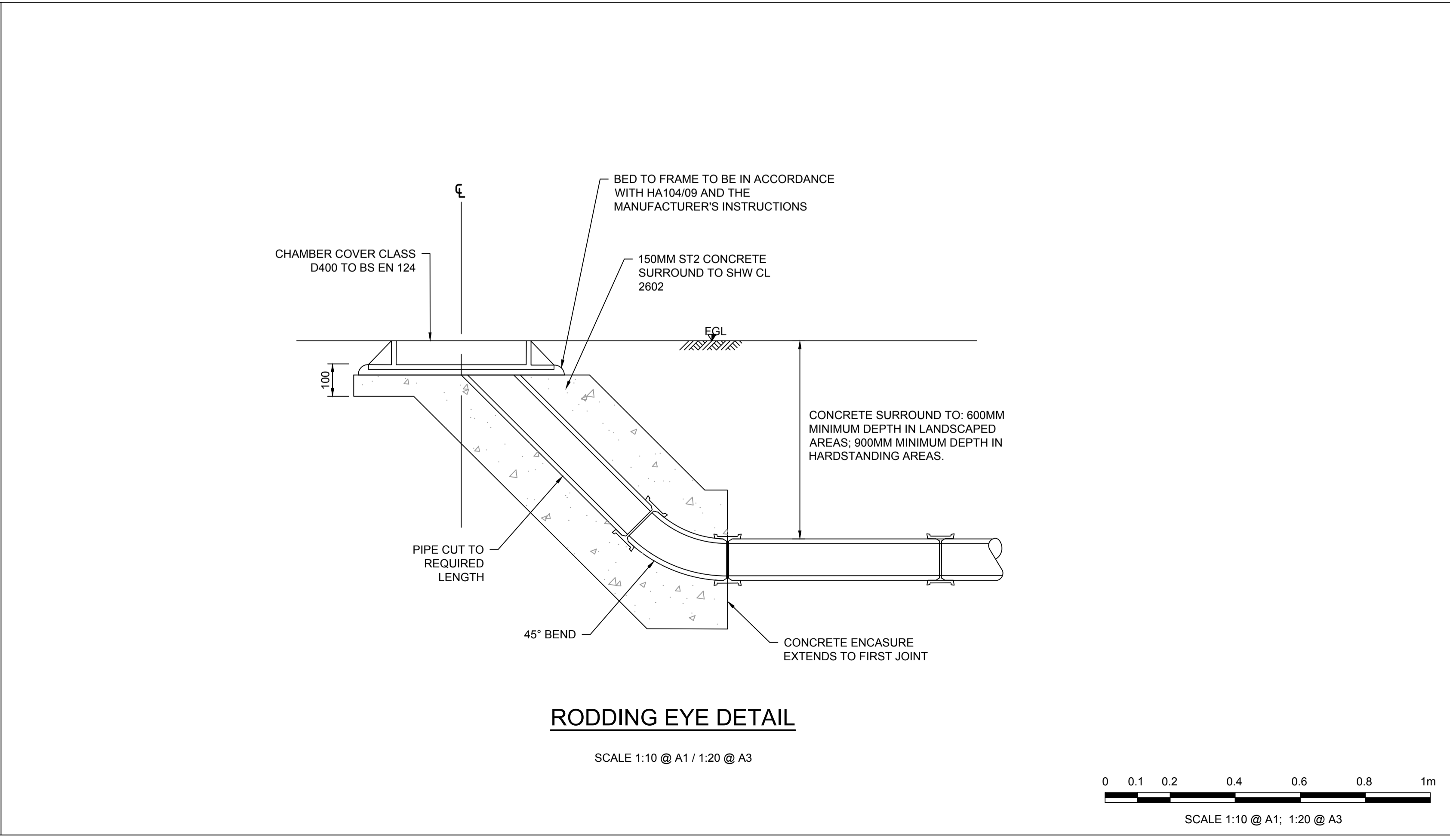
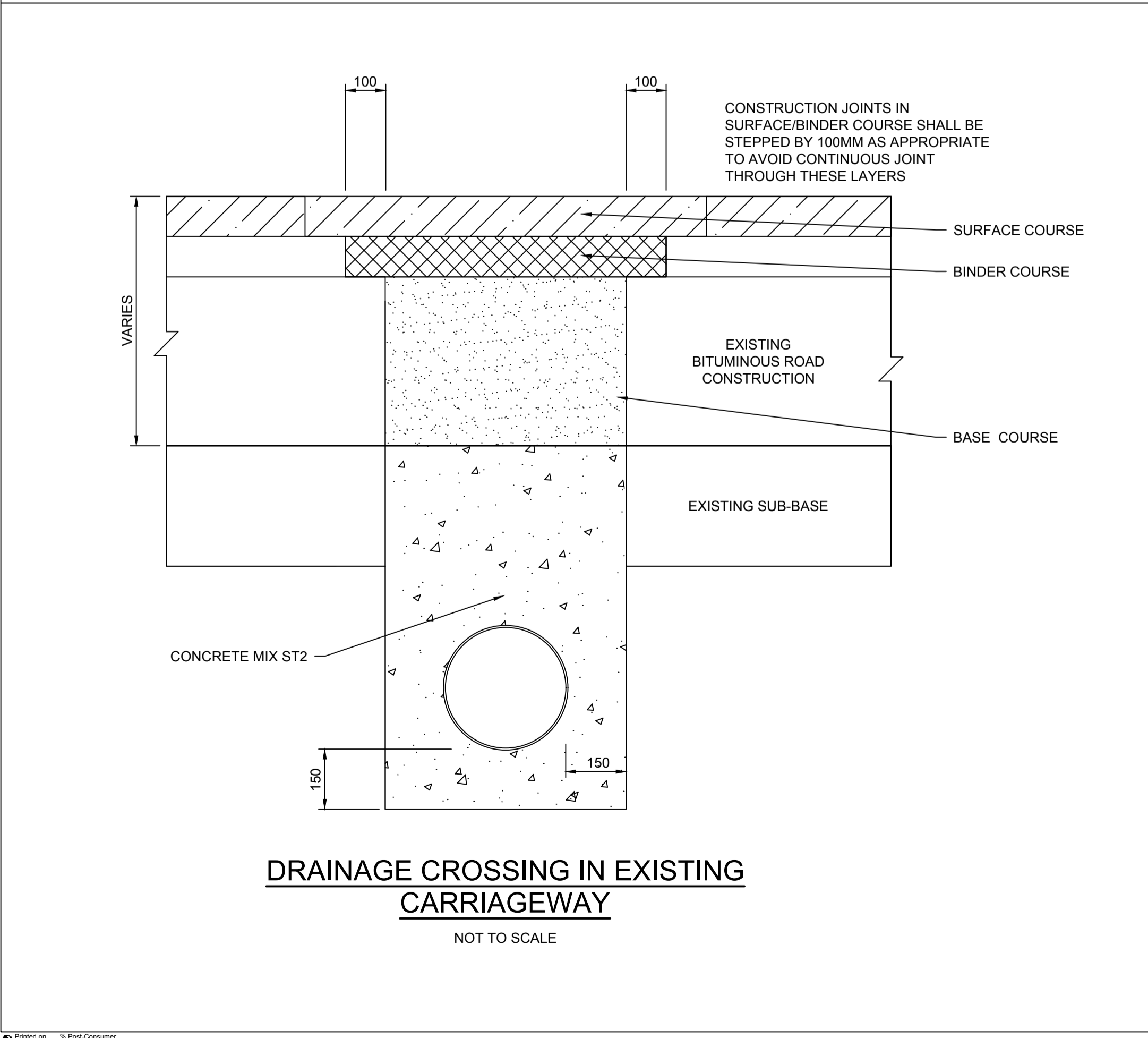
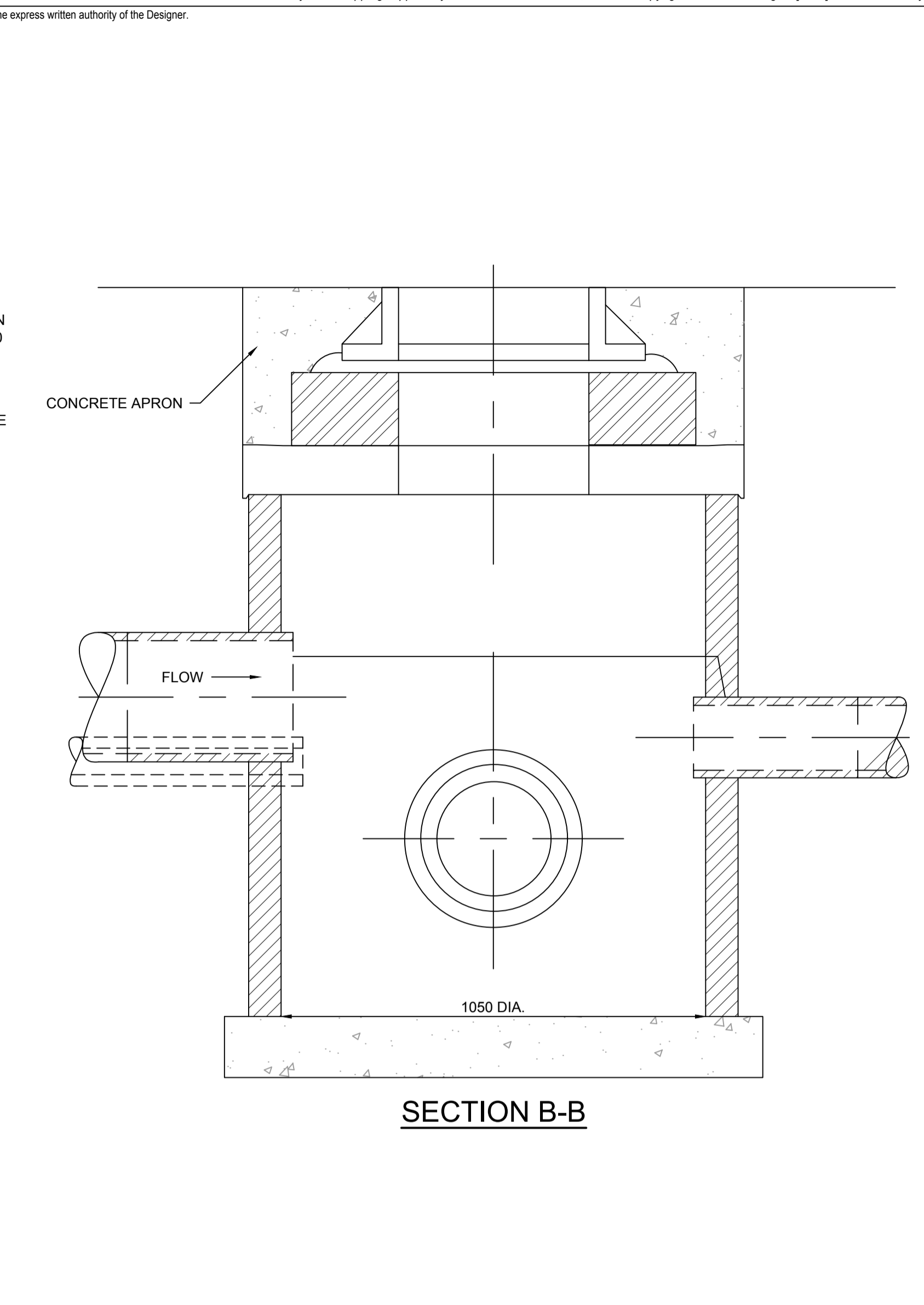
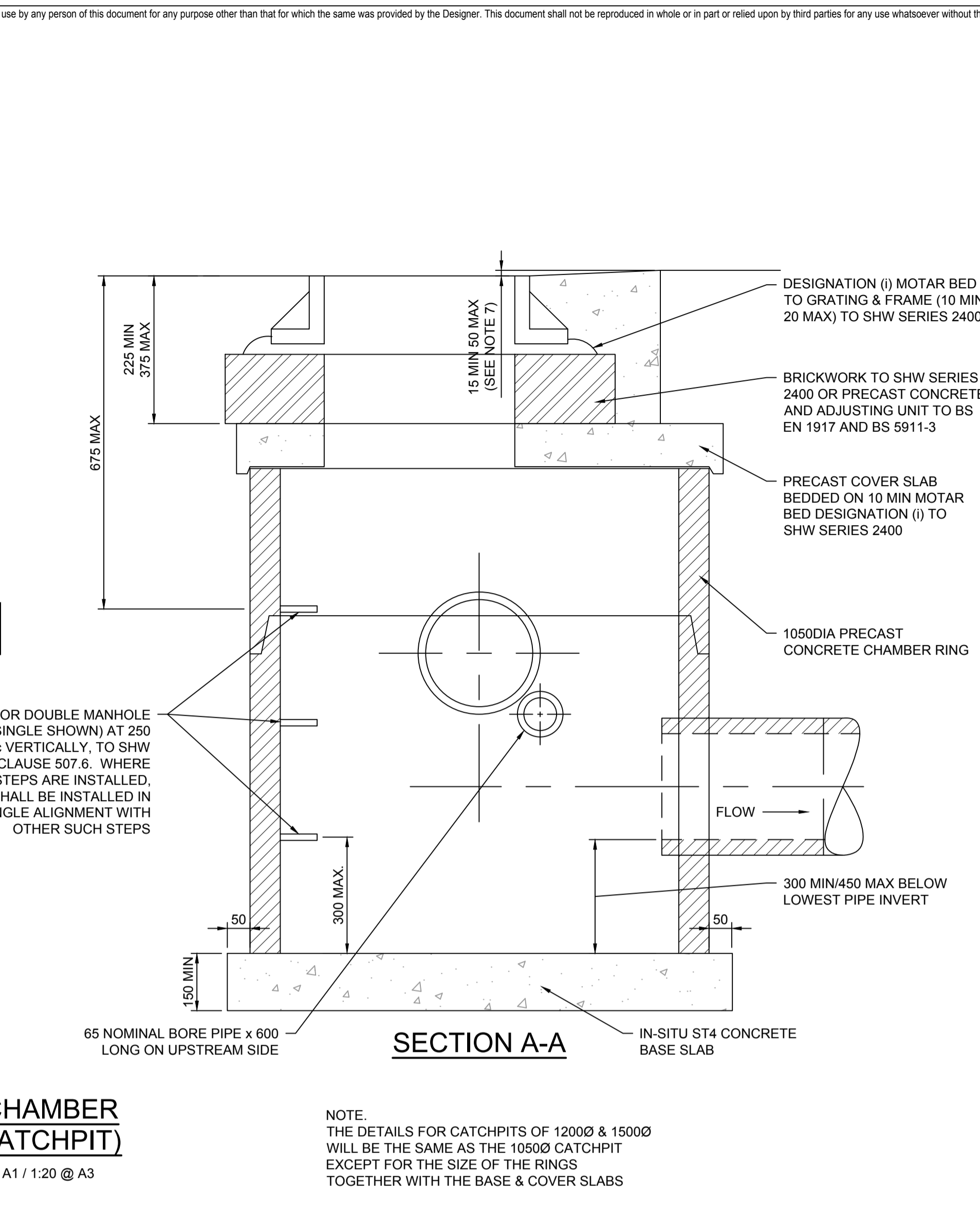
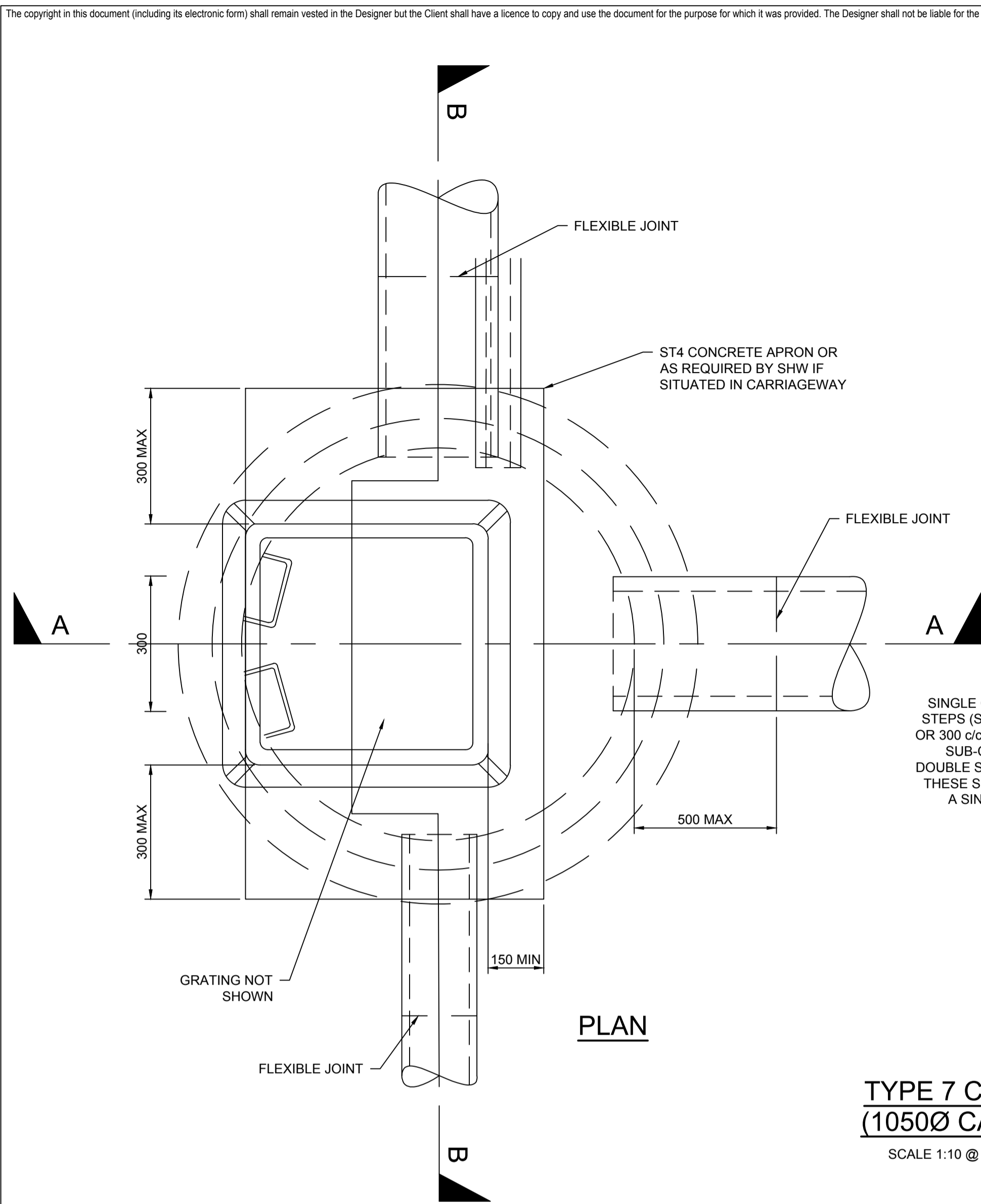
PROJECT NUMBER
60509148

SHEET TITLE
ST.ATHAN
DRAINAGE TYPICAL DETAILS
SHEET 6 OF 8

SHEET NUMBER
60509148-SHT-30-0000-CT-0526



ISO A1 84mm x 84mm
Approved: RM
Checked: AT
Designer: MH
Project Management Initials:
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SCALE 1:10 @ A1; 1:20 @ A3

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| NO | DATE | DESCRIPTION |
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KEY PLAN

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|--|--|
| PROJECT NUMBER | |
| 60509148 | |
| SHEET TITLE | |
| ST.ATHAN DRAINAGE TYPICAL DETAILS SHEET 7 OF 8 | |
| SHEET NUMBER | |
| 60509148-SHT-30-0000-CT-0527 | |

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 BSO A1 844mm x 841mm

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PROJECT
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ROAD

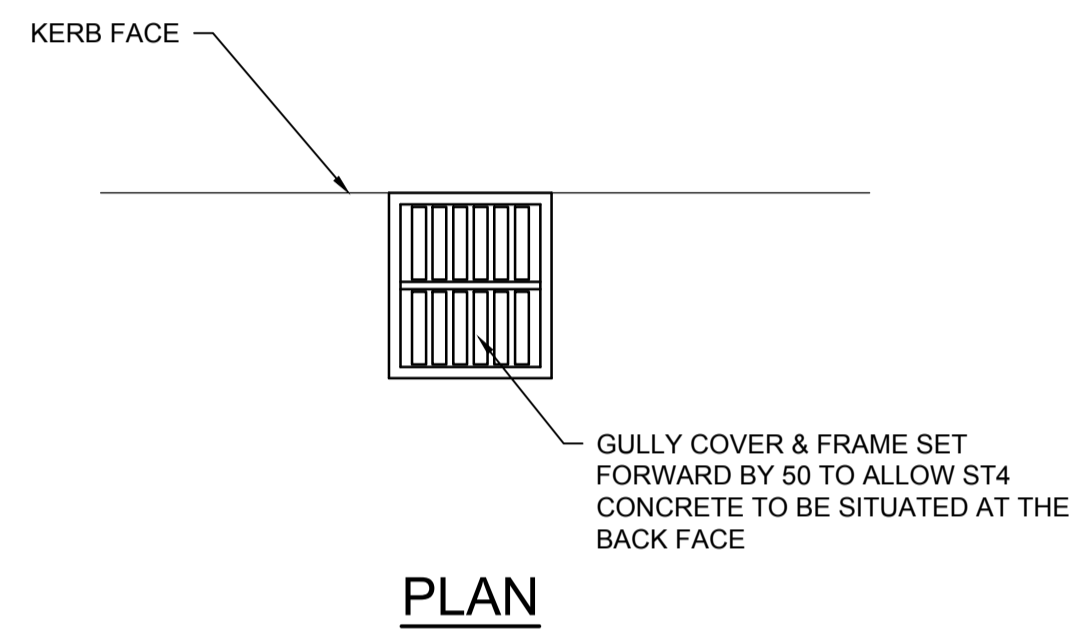
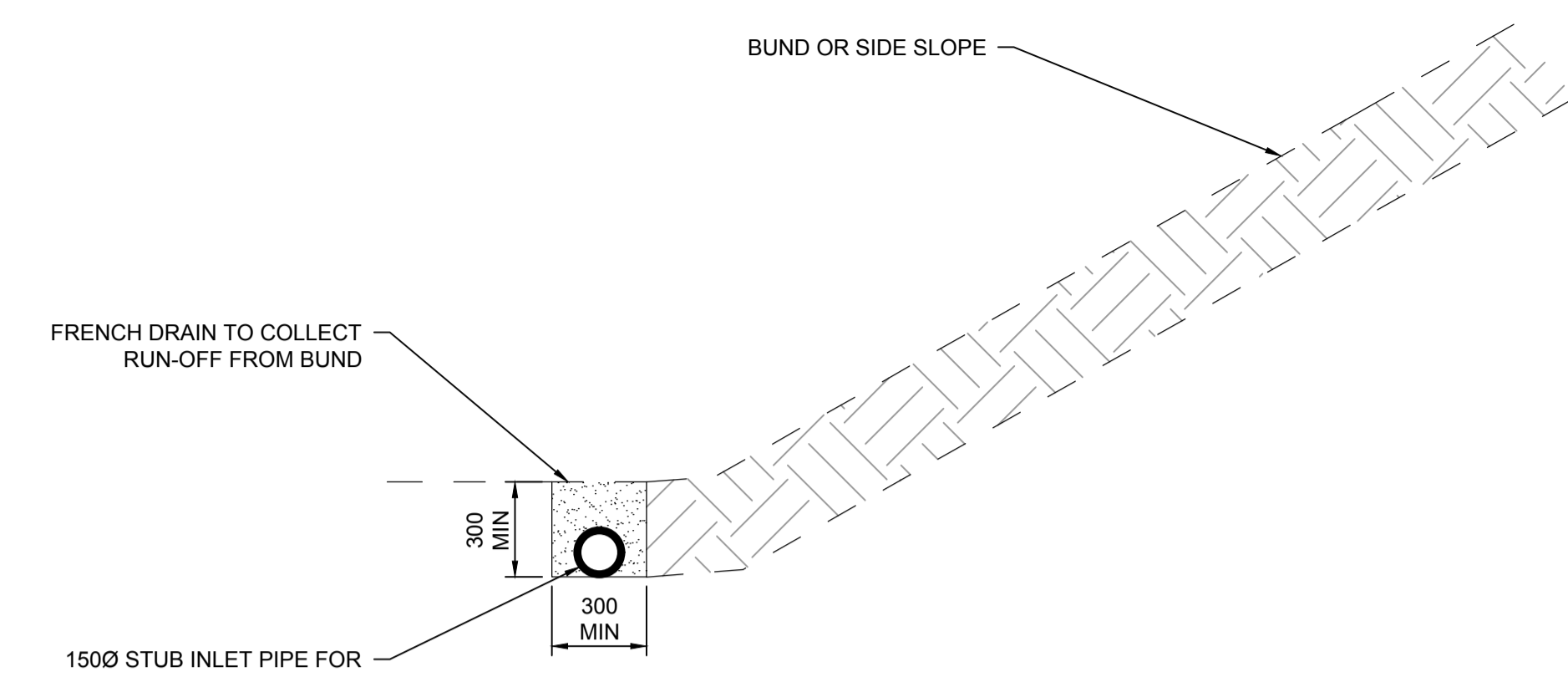
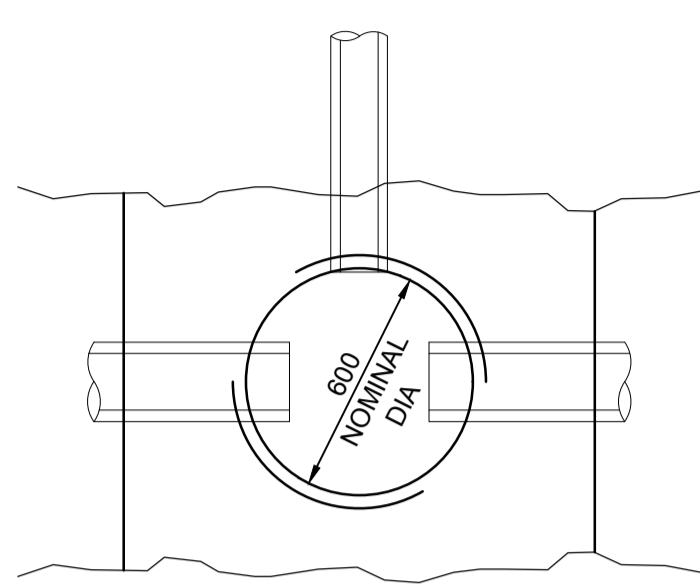
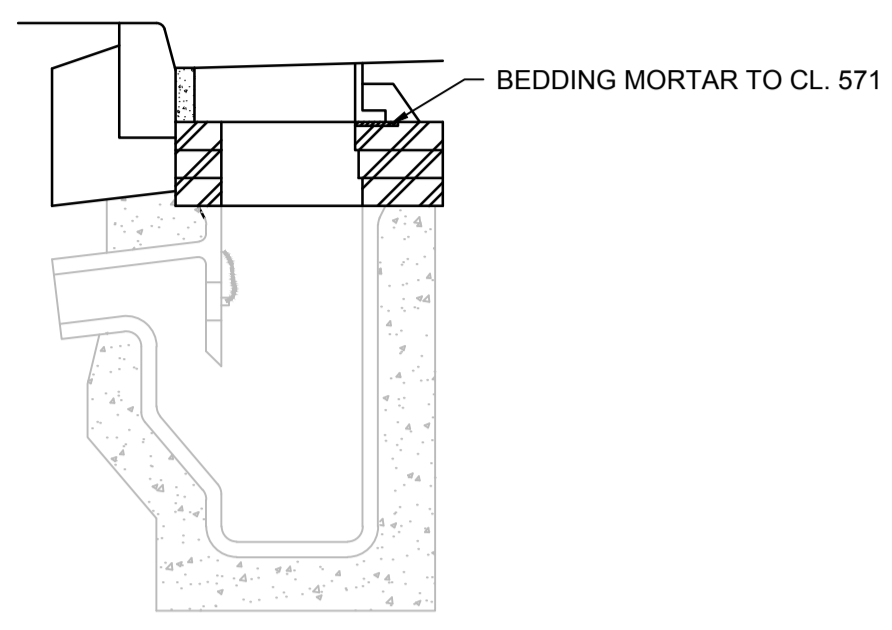
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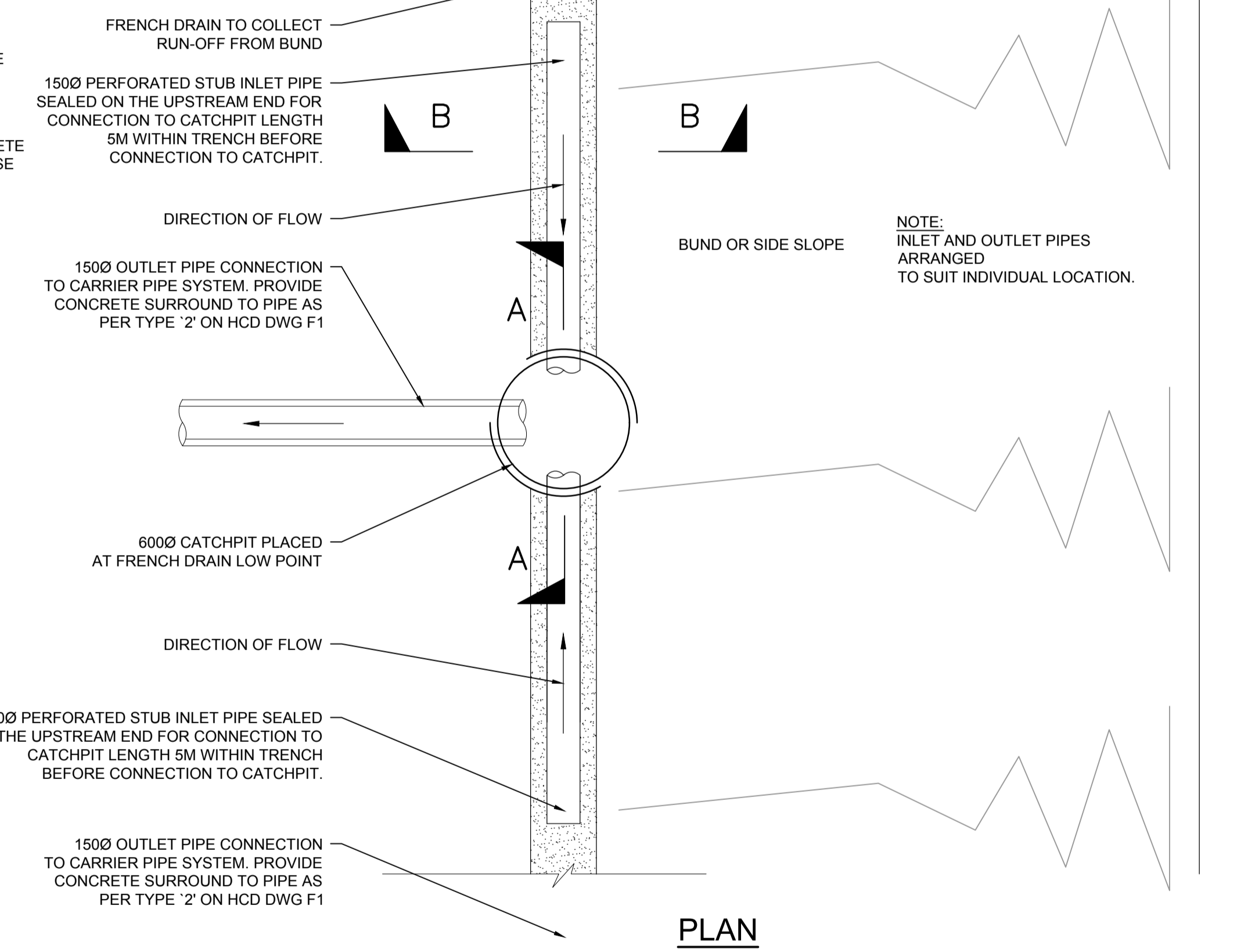
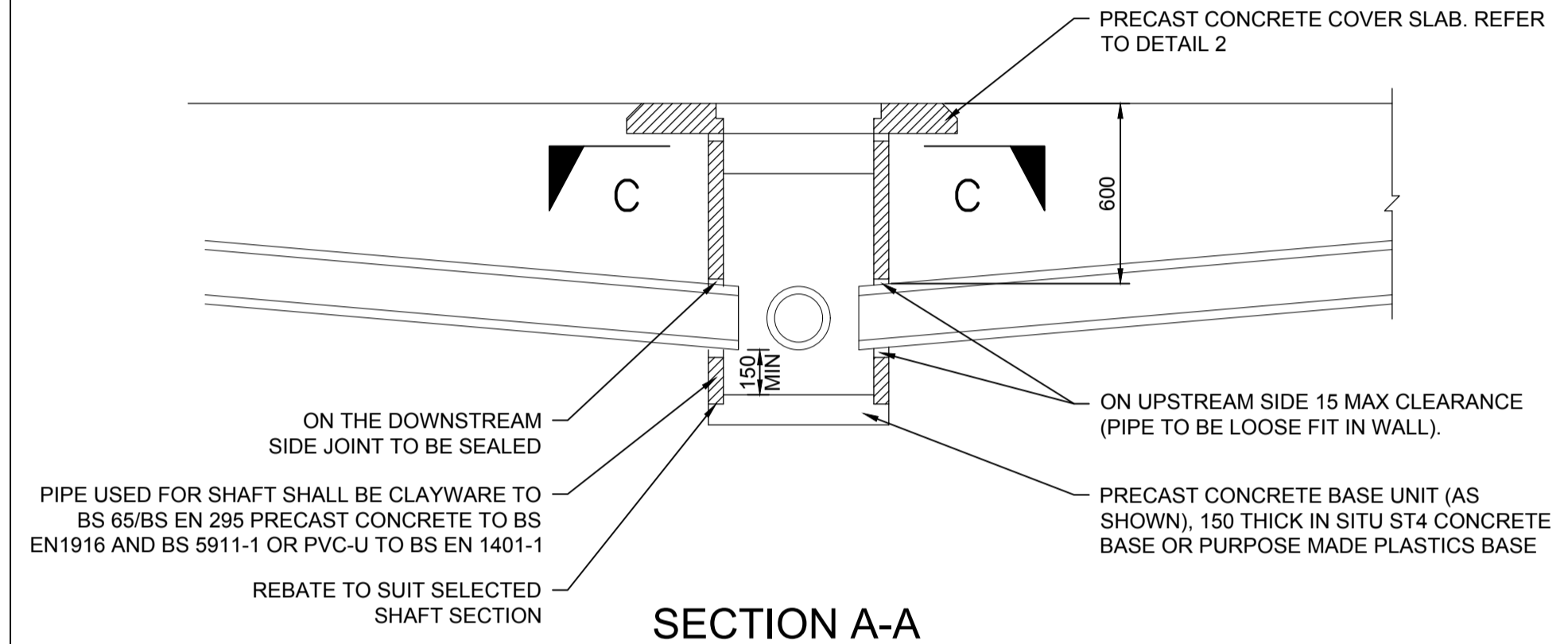
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1 CALLAGHAN SQUARE
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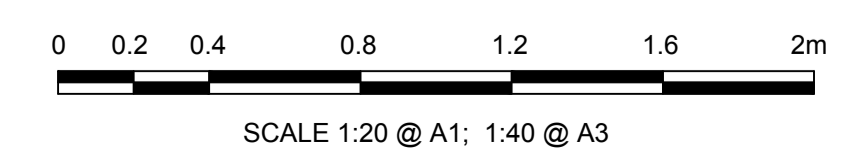
- NOTES:**
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 - DO NOT SCALE OFF THE DRAWING.
 - FOR GENERAL DRAINAGE REQUIREMENTS REFER TO THE SPECIFICATION FOR HIGHWAY WORKS APPENDIX 5 AND DRAINAGE CONSTRUCTION SERIES OF DRAWINGS.
 - FOR CATCHPIT DETAILS READ IN CONJUNCTION WITH HCD F12



GULLY COVER
SCALE 1:20 @ A1 / 1:40 @ A3



FRENCH DRAIN CONNECTION TO CATCHPIT
SCALE 1:20 @ A1 / 1:40 @ A3



| ISSUE/REVISION | DATE | DESCRIPTION |
|----------------|------------|--------------|
| A | 20-03-2017 | FOR PLANNING |

KEY PLAN

PROJECT NUMBER
60509148

SHEET TITLE
ST.ATHAN
DRAINAGE TYPICAL DETAILS
SHEET 8 OF 8

SHEET NUMBER
60509148-SHT-30-0000-CT-0528

APPENDIX D - GULLY SPACING CALCS


PROJECT: St Athan Northern Access Road
Outfall A

| | |
|------------------|------------------|
| JOB NO: 60509148 | DATE: 14/12/2016 |
| MADE BY: TM | CHECKED BY: |

Return Period: **1** years
2minM5: **4.0** mm
Manning's n for carriageway: **0.017**
Time of entry to kerb, t_s: **3.0** min

| Location, Chainage | | Grating type (P,Q,R,S or T) | S _c | | B | H | A _p | R | Q | G ₀ | η | Paved Width | Verge Width | Earthwork Width | W ₀ | T | I | m | S ₀ Uniform | Test for T | | | Comments | |
|--------------------|------------|--------------------------------|----------------|-------|------|-------|----------------|-------|-------|----------------|-------|-------------|-------------|-----------------|----------------|-----|--------|-----|------------------------|------------|-------|---|---|---|
| Start (m) | End (m) | | 1 in. | 1 in. | | | | | | | | | | | | | | | | m | m | m ² | | m |
| MCL4 LHS | | | | | | | | | | | | | | | | | | | | | | | | |
| 15.0 | 25.9 | R | 36 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 91.66 | 7.150 | 2.000 | 6.700 | 9.460 | 4.0 | 60.171 | 0.9 | 10.9 | 0.371 | 0.489 | 3.489 | Start calculations after rollover CH15 | |
| 25.9 | 36.8 | R | 36 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 91.66 | 7.150 | 2.000 | 6.700 | 9.460 | 4.0 | 60.171 | 0.9 | 10.9 | 0.371 | 0.489 | 3.489 | | |
| 36.8 | 46.9 | R | 33 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 91.29 | 7.150 | 2.000 | 10.300 | 10.540 | 4.0 | 60.171 | 0.9 | 10.2 | 0.387 | 0.437 | 3.437 | | |
| 46.9 | 57.1 | R | 32 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 91.15 | 7.150 | 2.000 | 10.600 | 10.630 | 4.0 | 60.171 | 0.9 | 10.2 | 0.393 | 0.433 | 3.433 | | |
| 57.1 | 66.6 | R | 37 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 91.77 | 7.150 | 2.000 | 11.000 | 10.750 | 4.0 | 60.171 | 0.9 | 9.5 | 0.366 | 0.431 | 3.431 | | |
| 66.6 | 76.0 | R | 37 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 91.77 | 7.150 | 2.000 | 11.000 | 10.750 | 4.0 | 60.171 | 0.9 | 9.5 | 0.366 | 0.431 | 3.431 | | |
| 76.0 | 83.3 | R | 59 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 93.49 | 7.700 | 2.000 | 11.000 | 11.300 | 4.0 | 60.171 | 0.9 | 7.3 | 0.290 | 0.418 | 3.418 | | Road widens for roundabout approach |
| 83.3 | 90.3 | R | 55 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 93.25 | 8.500 | 2.000 | 11.000 | 12.100 | 4.0 | 60.171 | 0.9 | 7.0 | 0.300 | 0.389 | 3.389 | | |
| 90.3 | 97.3 | R | 55 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 93.25 | 8.500 | 2.000 | 11.000 | 12.100 | 4.0 | 60.171 | 0.9 | 7.0 | 0.300 | 0.389 | 3.389 | | |
| 97.3 | 103.4 | R | 55 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 93.25 | 9.900 | 2.000 | 11.900 | 13.770 | 4.0 | 60.171 | 0.9 | 6.2 | 0.300 | 0.342 | 3.342 | | Gully placed between previous gully and low spot gully (8m) |
| 103.4 | 103.4 | R | | | 0.75 | | | | | 60 | | | | | | 4.0 | 60.171 | 0.9 | | | | Gully located at low spot as part of double gully | | |
| MCL4 RHS | | | | | | | | | | | | | | | | | | | | | | | | |
| 15.0 | 51.7 | R | 37 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 90.49 | 3.650 | 2.000 | 0.000 | 3.950 | 4.0 | 60.171 | 0.9 | 36.7 | 0.423 | 1.446 | 4.446 | Gully placed 21m downstream before maintenance layby CH47 | |
| 47.0 | 67.5 | R | 33 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 89.93 | 7.150 | 2.000 | 0.000 | 7.450 | 4.0 | 60.171 | 0.9 | 30.5 | 0.448 | 0.762 | 3.762 | Additional allowance for maintenance layby | |
| 67.5 | 84.4 | R | 50 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 91.82 | 7.150 | 2.000 | 0.000 | 7.450 | 4.0 | 60.171 | 0.9 | 17.0 | 0.364 | 0.778 | 3.778 | Road widening for roundabout exit | |
| 84.4 | 110.2 | R | 50 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 91.82 | 4.600 | 2.000 | 0.000 | 4.900 | 4.0 | 60.171 | 0.9 | 25.8 | 0.364 | 1.182 | 4.182 | | |
| 110.2 | 132.4 | R | 40 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 90.85 | 6.000 | 2.000 | 0.000 | 6.300 | 4.0 | 60.171 | 0.9 | 22.2 | 0.407 | 0.910 | 3.910 | | |
| 132.4 | 151.7 | R | 45 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 91.37 | 6.000 | 2.000 | 2.000 | 6.900 | 4.0 | 60.171 | 0.9 | 19.2 | 0.383 | 0.836 | 3.836 | | |
| 151.7 | 161.3 | R | 36 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 90.35 | 14.000 | 2.000 | 3.000 | 15.200 | 4.0 | 60.171 | 0.9 | 9.6 | 0.429 | 0.375 | 3.375 | Road widening for roundabout approach | |
| 161.3 | 176.6 | R | 45 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.003 | 60 | 91.37 | 7.500 | 2.000 | 3.000 | 8.700 | 4.0 | 60.171 | 0.9 | 15.2 | 0.383 | 0.663 | 3.663 | Last Gully before rollover | |
| MCL1 LHS | | | | | | | | | | | | | | | | | | | | | | | | |
| 260.0 | 253.1 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 3.650 | 4.000 | 6.400 | 6.170 | 4.0 | 60.171 | 0.9 | 6.9 | 0.115 | 0.996 | 3.996 | Road widens for roundabout approach | |
| 253.1 | 246.2 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 3.650 | 4.000 | 6.400 | 6.170 | 4.0 | 60.171 | 0.9 | 6.9 | 0.115 | 0.996 | 3.996 | | |
| 246.2 | 238.1 | R | 333 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 96.83 | 3.650 | 4.000 | 7.000 | 6.350 | 4.0 | 60.171 | 0.9 | 6.1 | 0.141 | 0.962 | 3.962 | | |
| 238.1 | 228.9 | R | 250 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 96.34 | 3.650 | 4.000 | 7.300 | 6.410 | 4.0 | 60.171 | 0.9 | 6.3 | 0.163 | 0.948 | 3.948 | | |
| 228.9 | 217.1 | R | 143 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.002 | 60 | 95.16 | 3.650 | 4.000 | 7.800 | 6.590 | 4.0 | 60.171 | 0.9 | 11.8 | 0.215 | 0.911 | 3.911 | | |
| 217.1 | 204.9 | R | 125 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.002 | 60 | 94.82 | 3.650 | 4.000 | 8.500 | 6.800 | 4.0 | 60.171 | 0.9 | 12.1 | 0.230 | 0.880 | 3.880 | | |
| 204.9 | 191.4 | R | 91 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.002 | 60 | 93.93 | 3.650 | 4.000 | 9.500 | 7.100 | 4.0 | 60.171 | 0.9 | 13.5 | 0.270 | 0.835 | 3.835 | | |
| 191.4 | 177.0 | R | 71 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.002 | 60 | 93.13 | 3.650 | 4.000 | 10.600 | 7.430 | 4.0 | 60.171 | 0.9 | 14.5 | 0.305 | 0.791 | 3.791 | | |
| 177.0 | 161.8 | R | 59 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.002 | 60 | 92.47 | 3.650 | 4.000 | 11.600 | 7.730 | 4.0 | 60.171 | 0.9 | 15.2 | 0.335 | 0.755 | 3.755 | | |
| 161.8 | 150.3 | R | 53 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 93.13 | 3.650 | 4.000 | 10.800 | 7.490 | 4.0 | 60.171 | 0.9 | 11.5 | 0.305 | 0.628 | 3.628 | | |
| 150.3 | 137.7 | R | 42 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 92.28 | 4.100 | 4.000 | 9.800 | 7.640 | 4.0 | 60.171 | 0.9 | 12.6 | 0.343 | 0.610 | 3.610 | Gully placed upstream of pedestrian crossing | |
| 137.7 | 127.3 | R | 42 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 92.28 | 5.800 | 4.000 | 9.400 | 9.220 | 4.0 | 60.171 | 0.9 | 10.4 | 0.343 | 0.505 | 3.505 | | |
| 127.3 | 120.5 | R | 42 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 92.28 | 12.000 | 2.000 | 10.000 | 15.300 | 5.0 | 55.287 | 0.9 | 6.8 | 0.343 | 0.331 | 3.331 | | |
| 120.5 | 113.0 | R | 40 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 92.09 | 10.800 | 2.000 | 10.200 | 14.160 | 5.0 | 55.287 | 0.9 | 7.5 | 0.352 | 0.357 | 3.357 | | |
| 113.0 | 104.0 | R | 48 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.002 | 60 | 92.78 | 7.500 | 2.000 | 10.600 | 10.980 | 5.0 | 55.287 | 0.9 | 6.9 | 0.321 | 0.464 | 3.464 | | |
| 104.0 | 96.5 | R | 83 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.001 | 60 | 94.51 | 6.200 | 2.000 | 12.200 | 10.160 | 5.0 | 55.287 | 0.9 | 7.5 | 0.244 | 0.511 | 3.511 | | |
| 96.5 | 90.8 | R | 142 | 50 | 0.75 | 0.015 | 0.006 | 0.007 | 0.001 | 60 | 95.80 | 6.200 | 2.000 | 12.500 | 10.250 | 5.0 | 55.287 | 0.9 | 6.8 | 0.187 | 0.513 | 3.513 | Gully located at low spot as part of double gully | |
| 260.0 | 266.9 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 3.650 | 4.000 | 6.400 | 6.170 | 4.0 | 60.171 | 0.9 | 6.9 | 0.115 | 0.996 | 3.996 | Road widens for roundabout approach | |
| 266.9 | 273.8 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 3.650 | 4.000 | 6.400 | 6.170 | 4.0 | 60.171 | 0.9 | 6.9 | 0.115 | 0.996 | 3.996 | | |
| 273.8 | 280.9 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 3.650 | 4.000 | 5.500 | 5.900 | 4.0 | 60.171 | 0.9 | 7.2 | 0.115 | 1.042 | 4.042 | | |
| 280.9 | 289.6 | R | 200 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 95.91 | 5.400 | 4.000 | 5.500 | 7.650 | 4.0 | 60.171 | 0.9 | 6.6 | 0.182 | 0.791 | 3.791 | | |
| 289.6 | 302.1 | R | 143 | 36 | 0.75 | 0.021 | 0.008 | 0.010 | 0.002 | 60 | 94.82 | 5.400 | 4.000 | 4.500 | 7.350 | 4.0 | 60.171 | 0.9 | 12.5 | 0.230 | 0.904 | 3.904 | | |
| 302.1 | 316.9 | R | 125 | 34 | 0.75 | 0.022 | 0.008 | 0.011 | 0.002 | 60 | 94.25 | 5.400 | 4.000 | 4.200 | 7.260 | 4.0 | 60.171 | 0.9 | 14.8 | 0.256 | 0.964 | 3.964 | | |
| 316.9 | 336.6 | R | 91 | 32 | 0.75 | 0.023 | 0.009 | 0.011 | 0.003 | 60 | 92.99 | 5.400 | 4.000 | 3.200 | 6.960 | 4.0 | 60.171 | 0.9 | 19.7 | 0.312 | 1.054 | 4.054 | | |
| 336.6 | 363.7 | R | 71 | 29 | 0.75 | 0.026 | 0.010 | 0.012 | 0.004 | 60 | 91.54 | 5.400 | 4.000 | 2.100 | 6.630 | 4.0 | 60.171 | 0.9 | 27.1 | 0.376 | 1.202 | 4.202 | | Gully placed before kerb drainage begins |
| MCL1 / MCL5 RHS | | | | | | | | | | | | | | | | | | | | | | | | |
| 260.0 | 255.3 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 7.150 | 2.000 | 5.100 | 8.980 | 4.0 | 60.171 | 0.9 | 6.7 | 0.115 | 0.685 | 3.685 | | Road widens for roundabout approach |
| 255.3 | 250.6 | R | 500 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 97.41 | 7.150 | 2.000 | 5.100 | 8.980 | 4.0 | 60.171 | 0.9 | 6.7 | 0.115 | 0.685 | 3.685 | | |
| 250.6 | 244.9 | R | 333 | 40 | 0.75 | 0.019 | 0.007 | 0.009 | 0.001 | 60 | 96.83 | 7.150 | 2.000 | 5.5 | | | | | | | | | | |

APPENDIX E - MODEL SIMULATIONS


| | | |
|---|---|---|
| AECOM | | Page 1 |
| Midpoint Alencon Link Basingstoke | St Athan Catchment A Summary of Results |  |
| Date 14/03/17 File Network A aft.mdx | Designed by AFT Checked by TE | |
| XP Solutions | Network 2015.1 | |

Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 5.000 | 24.064 | 0.957 | 25.1 | 0.039 | 5.00 | 0.600 | o | 150 |
| 5.001 | 25.699 | 0.804 | 32.0 | 0.040 | 0.00 | 0.600 | o | 150 |
| 5.002 | 18.082 | 0.121 | 150.0 | 0.000 | 0.00 | 0.600 | o | 150 |
| 6.000 | 45.948 | 1.315 | 34.9 | 0.062 | 5.00 | 0.600 | o | 150 |
| 6.001 | 24.553 | 0.531 | 46.2 | 0.030 | 0.00 | 0.600 | o | 225 |
| 6.002 | 18.524 | 0.367 | 50.5 | 0.028 | 0.00 | 0.600 | o | 225 |
| 6.003 | 19.667 | 0.087 | 225.0 | 0.022 | 0.00 | 0.600 | o | 225 |
| 7.000 | 65.355 | 0.464 | 140.9 | 0.044 | 5.00 | 0.600 | o | 225 |
| 7.001 | 68.680 | 1.293 | 53.1 | 0.057 | 0.00 | 0.600 | o | 225 |
| 7.002 | 32.418 | 0.662 | 49.0 | 0.045 | 0.00 | 0.600 | o | 225 |
| 6.004 | 14.291 | 0.085 | 168.1 | 0.000 | 0.00 | 0.600 | o | 225 |
| 6.005 | 22.225 | 0.248 | 89.6 | 0.022 | 0.00 | 0.600 | o | 225 |
| 8.000 | 48.295 | 0.376 | 128.4 | 0.046 | 5.00 | 0.600 | o | 225 |
| 8.001 | 53.634 | 0.970 | 55.3 | 0.057 | 0.00 | 0.600 | o | 225 |
| 8.002 | 26.275 | 0.843 | 31.2 | 0.037 | 0.00 | 0.600 | o | 225 |
| 8.003 | 9.926 | 0.454 | 21.9 | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|------|---------------|
| 5.000 | 20 | 40.019 | 38.669 | 1.200 | 39.062 | 37.712 | 1.200 | | 1200 |
| 5.001 | 21 | 39.062 | 37.712 | 1.200 | 38.258 | 36.908 | 1.200 | | 1200 |
| 5.002 | 22 | 38.258 | 36.908 | 1.200 | 37.959 | 36.787 | 1.021 | | 1200 |
| 6.000 | 1 | 42.913 | 41.563 | 1.200 | 41.523 | 40.248 | 1.125 | | 1200 |
| 6.001 | 2 | 41.523 | 40.098 | 1.200 | 40.992 | 39.567 | 1.200 | | 1200 |
| 6.002 | 3 | 40.992 | 39.567 | 1.200 | 40.625 | 39.200 | 1.200 | | 1200 |
| 6.003 | 4 | 40.625 | 39.200 | 1.200 | 40.575 | 39.113 | 1.237 | | 1200 |
| 7.000 | 5 | 42.957 | 41.532 | 1.200 | 42.493 | 41.068 | 1.200 | | 1200 |
| 7.001 | 6 | 42.493 | 41.068 | 1.200 | 41.200 | 39.775 | 1.200 | | 1200 |
| 7.002 | 7 | 41.200 | 39.775 | 1.200 | 40.575 | 39.113 | 1.237 | | 1200 |
| 6.004 | 5 | 40.575 | 39.113 | 1.237 | 40.453 | 39.028 | 1.200 | | 1200 |
| 6.005 | 9 | 40.453 | 39.028 | 1.200 | 40.354 | 38.780 | 1.349 | | 1200 |
| 8.000 | 9 | 42.995 | 41.570 | 1.200 | 42.619 | 41.194 | 1.200 | | 1200 |
| 8.001 | 10 | 42.619 | 41.194 | 1.200 | 41.649 | 40.224 | 1.200 | | 1200 |
| 8.002 | 11 | 41.649 | 40.224 | 1.200 | 40.806 | 39.381 | 1.200 | | 1200 |
| 8.003 | 12 | 40.806 | 39.381 | 1.200 | 40.352 | 38.927 | 1.200 | | 1200 |

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| AECOM | | Page 2 |
| Midpoint Alencon Link Basingstoke | St Athan Catchment A Summary of Results |  |
| Date 14/03/17 File Network A aft.mdx | Designed by AFT Checked by TE | |
| XP Solutions | | Network 2015.1 |

Existing Network Details for Storm


| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|----------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 8.004 | 16.269 | 0.147 | 110.7 | 0.000 | 0.00 | 0.600 | o | 225 |
| 6.006 | 14.004 | 0.583 | 24.0 | 0.024 | 0.00 | 0.600 | o | 300 |
| 6.007 | 14.765 | 0.049 | 300.0 | 0.016 | 0.00 | 0.600 | o | 300 |
| 6.008 | 20.840 | 0.069 | 300.0 | 0.029 | 0.00 | 0.600 | o | 300 |
| 9.000 | 79.374 | 2.271 | 35.0 | 0.115 | 5.00 | 0.600 | o | 150 |
| 6.009 | 47.456 | 1.442 | 32.9 | 0.000 | 0.00 | 0.600 | o | 300 |
| * 5.003 | 7.152 | 0.205 | 34.9 | 0.063 | 0.00 | 0.600 | o | 225 |
| * 5.004 | 26.469 | 1.300 | 20.4 | 0.000 | 0.00 | 0.600 | o | 225 |
| * 10.000 | 15.636 | 1.323 | 11.8 | 0.044 | 5.00 | 0.600 | o | 150 |
| * 11.000 | 23.973 | 0.160 | 149.8 | 0.038 | 5.00 | 0.600 | o | 150 |
| 10.001 | 13.018 | 0.087 | 149.6 | 0.000 | 0.00 | 0.600 | o | 150 |
| 5.005 | 10.003 | 0.044 | 225.0 | 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) |
|----------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 8.004 | 13 | 40.352 | 38.927 | 1.200 | 40.354 | 38.780 | 1.349 | | 1200 |
| 6.006 | 6 | 40.354 | 38.780 | 1.274 | 39.697 | 38.197 | 1.200 | | 1200 |
| 6.007 | 16 | 39.697 | 38.197 | 1.200 | 39.741 | 38.148 | 1.293 | | 1200 |
| 6.008 | 16 | 39.741 | 38.148 | 1.293 | 39.300 | 38.079 | 0.921 | | 1200 |
| 9.000 | 7 | 41.550 | 40.500 | 0.900 | 39.300 | 38.229 | 0.921 | | 1200 |
| 6.009 | 7 | 39.300 | 38.079 | 0.921 | 37.959 | 36.637 | 1.022 | | 1200 |
| * 5.003 | 23 | 37.959 | 36.637 | 1.097 | 37.782 | 36.432 | 1.125 | Hydro-Brake® | 1200 |
| * 5.004 | 24 | 37.782 | 36.432 | 1.125 | 37.467 | 35.132 | 2.110 | | 1200 |
| * 10.000 | 25 | 37.892 | 36.542 | 1.200 | 37.406 | 35.219 | 2.037 | | 1200 |
| * 11.000 | 26 | 36.729 | 35.379 | 1.200 | 37.406 | 35.219 | 2.037 | | 1200 |
| 10.001 | 26 | 37.406 | 35.219 | 2.037 | 37.467 | 35.132 | 2.185 | | 1200 |
| 5.005 | 25 | 37.467 | 35.132 | 2.110 | 37.079 | 35.088 | 1.767 | | 1200 |

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| AECOM | | Page 3 |
| Midpoint Alencon Link Basingstoke | St Athan Catchment A Summary of Results |  |
| Date 14/03/17 File Network A aft.mdx | Designed by AFT Checked by TE | |
| XP Solutions | | Network 2015.1 |

Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|--------|---------------------------|------------------------|--------|---------------------------|------------------------|---------------|
| 20 | 40.019 | 1.350 | Open Manhole | 1200 | 5.000 | 38.669 | 150 | | | | |
| 21 | 39.062 | 1.350 | Open Manhole | 1200 | 5.001 | 37.712 | 150 | 5.000 | 37.712 | 150 | |
| 22 | 38.258 | 1.350 | Open Manhole | 1200 | 5.002 | 36.908 | 150 | 5.001 | 36.908 | 150 | |
| 1 | 42.913 | 1.350 | Open Manhole | 1200 | 6.000 | 41.563 | 150 | | | | |
| 2 | 41.523 | 1.425 | Open Manhole | 1200 | 6.001 | 40.098 | 225 | 6.000 | 40.248 | 150 | 75 |
| 3 | 40.992 | 1.425 | Open Manhole | 1200 | 6.002 | 39.567 | 225 | 6.001 | 39.567 | 225 | |
| 4 | 40.625 | 1.425 | Open Manhole | 1200 | 6.003 | 39.200 | 225 | 6.002 | 39.200 | 225 | |
| 5 | 42.957 | 1.425 | Open Manhole | 1200 | 7.000 | 41.532 | 225 | | | | |
| 6 | 42.493 | 1.425 | Open Manhole | 1200 | 7.001 | 41.068 | 225 | 7.000 | 41.068 | 225 | |
| 7 | 41.200 | 1.425 | Open Manhole | 1200 | 7.002 | 39.775 | 225 | 7.001 | 39.775 | 225 | |
| 5 | 40.575 | 1.462 | Open Manhole | 1200 | 6.004 | 39.113 | 225 | 6.003 | 39.113 | 225 | |
| | | | | | | | | 7.002 | 39.113 | 225 | |
| 9 | 40.453 | 1.425 | Open Manhole | 1200 | 6.005 | 39.028 | 225 | 6.004 | 39.028 | 225 | |
| 9 | 42.995 | 1.425 | Open Manhole | 1200 | 8.000 | 41.570 | 225 | | | | |
| 10 | 42.619 | 1.425 | Open Manhole | 1200 | 8.001 | 41.194 | 225 | 8.000 | 41.194 | 225 | |
| 11 | 41.649 | 1.425 | Open Manhole | 1200 | 8.002 | 40.224 | 225 | 8.001 | 40.224 | 225 | |
| 12 | 40.806 | 1.425 | Open Manhole | 1200 | 8.003 | 39.381 | 225 | 8.002 | 39.381 | 225 | |
| 13 | 40.352 | 1.425 | Open Manhole | 1200 | 8.004 | 38.927 | 225 | 8.003 | 38.927 | 225 | |
| 6 | 40.354 | 1.574 | Open Manhole | 1200 | 6.006 | 38.780 | 300 | 6.005 | 38.780 | 225 | |
| | | | | | | | | 8.004 | 38.780 | 225 | |
| 16 | 39.697 | 1.500 | Open Manhole | 1200 | 6.007 | 38.197 | 300 | 6.006 | 38.197 | 300 | |
| 16 | 39.741 | 1.593 | Open Manhole | 1200 | 6.008 | 38.148 | 300 | 6.007 | 38.148 | 300 | |
| 7 | 41.550 | 1.050 | Open Manhole | 1200 | 9.000 | 40.500 | 150 | | | | |
| 7 | 39.300 | 1.221 | Open Manhole | 1200 | 6.009 | 38.079 | 300 | 6.008 | 38.079 | 300 | |
| | | | | | | | | 9.000 | 38.229 | 150 | |
| 23 | 37.959 | 1.322 | Open Manhole | 1200 | 5.003 | 36.637 | 225 | 5.002 | 36.787 | 150 | 75 |
| | | | | | | | | 6.009 | 36.637 | 300 | |
| 24 | 37.782 | 1.350 | Open Manhole | 1200 | 5.004 | 36.432 | 225 | 5.003 | 36.432 | 225 | |
| 25 | 37.892 | 1.350 | Open Manhole | 1200 | 10.000 | 36.542 | 150 | | | | |
| 26 | 36.729 | 1.350 | Open Manhole | 1200 | 11.000 | 35.379 | 150 | | | | |
| 26 | 37.406 | 2.187 | Open Manhole | 1200 | 10.001 | 35.219 | 150 | 10.000 | 35.219 | 150 | |
| | | | | | | | | 11.000 | 35.219 | 150 | |
| 25 | 37.467 | 2.335 | Open Manhole | 1200 | 5.005 | 35.132 | 225 | 5.004 | 35.132 | 225 | |
| | | | | | | | | 10.001 | 35.132 | 150 | |
| | 37.079 | 1.992 | Open Manhole | 0 | | OUTFALL | | 5.005 | 35.088 | 225 | |

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| AECOM | | Page 4 |
| Midpoint Alencon Link Basingstoke | St Athan Catchment A Summary of Results |  |
| Date 14/03/17 File Network A aft.mdx | Designed by AFT Checked by TE | |
| XP Solutions | Network 2015.1 | |


PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 5.000 | o | 150 | 20 | 40.019 | 38.669 | 1.200 | Open Manhole | 1200 |
| 5.001 | o | 150 | 21 | 39.062 | 37.712 | 1.200 | Open Manhole | 1200 |
| 5.002 | o | 150 | 22 | 38.258 | 36.908 | 1.200 | Open Manhole | 1200 |
| 6.000 | o | 150 | 1 | 42.913 | 41.563 | 1.200 | Open Manhole | 1200 |
| 6.001 | o | 225 | 2 | 41.523 | 40.098 | 1.200 | Open Manhole | 1200 |
| 6.002 | o | 225 | 3 | 40.992 | 39.567 | 1.200 | Open Manhole | 1200 |
| 6.003 | o | 225 | 4 | 40.625 | 39.200 | 1.200 | Open Manhole | 1200 |
| 7.000 | o | 225 | 5 | 42.957 | 41.532 | 1.200 | Open Manhole | 1200 |
| 7.001 | o | 225 | 6 | 42.493 | 41.068 | 1.200 | Open Manhole | 1200 |
| 7.002 | o | 225 | 7 | 41.200 | 39.775 | 1.200 | Open Manhole | 1200 |
| 6.004 | o | 225 | 5 | 40.575 | 39.113 | 1.237 | Open Manhole | 1200 |
| 6.005 | o | 225 | 9 | 40.453 | 39.028 | 1.200 | Open Manhole | 1200 |
| 8.000 | o | 225 | 9 | 42.995 | 41.570 | 1.200 | Open Manhole | 1200 |
| 8.001 | o | 225 | 10 | 42.619 | 41.194 | 1.200 | Open Manhole | 1200 |
| 8.002 | o | 225 | 11 | 41.649 | 40.224 | 1.200 | Open Manhole | 1200 |
| 8.003 | o | 225 | 12 | 40.806 | 39.381 | 1.200 | Open Manhole | 1200 |
| 8.004 | o | 225 | 13 | 40.352 | 38.927 | 1.200 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 5.000 | 24.064 | 25.1 | 21 | 39.062 | 37.712 | 1.200 | Open Manhole | 1200 |
| 5.001 | 25.699 | 32.0 | 22 | 38.258 | 36.908 | 1.200 | Open Manhole | 1200 |
| 5.002 | 18.082 | 150.0 | 23 | 37.959 | 36.787 | 1.021 | Open Manhole | 1200 |
| 6.000 | 45.948 | 34.9 | 2 | 41.523 | 40.248 | 1.125 | Open Manhole | 1200 |
| 6.001 | 24.553 | 46.2 | 3 | 40.992 | 39.567 | 1.200 | Open Manhole | 1200 |
| 6.002 | 18.524 | 50.5 | 4 | 40.625 | 39.200 | 1.200 | Open Manhole | 1200 |
| 6.003 | 19.667 | 225.0 | 5 | 40.575 | 39.113 | 1.237 | Open Manhole | 1200 |
| 7.000 | 65.355 | 140.9 | 6 | 42.493 | 41.068 | 1.200 | Open Manhole | 1200 |
| 7.001 | 68.680 | 53.1 | 7 | 41.200 | 39.775 | 1.200 | Open Manhole | 1200 |
| 7.002 | 32.418 | 49.0 | 5 | 40.575 | 39.113 | 1.237 | Open Manhole | 1200 |
| 6.004 | 14.291 | 168.1 | 9 | 40.453 | 39.028 | 1.200 | Open Manhole | 1200 |
| 6.005 | 22.225 | 89.6 | 6 | 40.354 | 38.780 | 1.349 | Open Manhole | 1200 |
| 8.000 | 48.295 | 128.4 | 10 | 42.619 | 41.194 | 1.200 | Open Manhole | 1200 |
| 8.001 | 53.634 | 55.3 | 11 | 41.649 | 40.224 | 1.200 | Open Manhole | 1200 |
| 8.002 | 26.275 | 31.2 | 12 | 40.806 | 39.381 | 1.200 | Open Manhole | 1200 |
| 8.003 | 9.926 | 21.9 | 13 | 40.352 | 38.927 | 1.200 | Open Manhole | 1200 |
| 8.004 | 16.269 | 110.7 | 6 | 40.354 | 38.780 | 1.349 | Open Manhole | 1200 |

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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 6.006 | o | 300 | 6 | 40.354 | 38.780 | 1.274 | Open Manhole | 1200 |
| 6.007 | o | 300 | 16 | 39.697 | 38.197 | 1.200 | Open Manhole | 1200 |
| 6.008 | o | 300 | 16 | 39.741 | 38.148 | 1.293 | Open Manhole | 1200 |
| 9.000 | o | 150 | 7 | 41.550 | 40.500 | 0.900 | Open Manhole | 1200 |
| 6.009 | o | 300 | 7 | 39.300 | 38.079 | 0.921 | Open Manhole | 1200 |
| 5.003 | o | 225 | 23 | 37.959 | 36.637 | 1.097 | Open Manhole | 1200 |
| 5.004 | o | 225 | 24 | 37.782 | 36.432 | 1.125 | Open Manhole | 1200 |
| 10.000 | o | 150 | 25 | 37.892 | 36.542 | 1.200 | Open Manhole | 1200 |
| 11.000 | o | 150 | 26 | 36.729 | 35.379 | 1.200 | Open Manhole | 1200 |
| 10.001 | o | 150 | 26 | 37.406 | 35.219 | 2.037 | Open Manhole | 1200 |
| 5.005 | o | 225 | 25 | 37.467 | 35.132 | 2.110 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 6.006 | 14.004 | 24.0 | 16 | 39.697 | 38.197 | 1.200 | Open Manhole | 1200 |
| 6.007 | 14.765 | 300.0 | 16 | 39.741 | 38.148 | 1.293 | Open Manhole | 1200 |
| 6.008 | 20.840 | 300.0 | 7 | 39.300 | 38.079 | 0.921 | Open Manhole | 1200 |
| 9.000 | 79.374 | 35.0 | 7 | 39.300 | 38.229 | 0.921 | Open Manhole | 1200 |
| 6.009 | 47.456 | 32.9 | 23 | 37.959 | 36.637 | 1.022 | Open Manhole | 1200 |
| 5.003 | 7.152 | 34.9 | 24 | 37.782 | 36.432 | 1.125 | Open Manhole | 1200 |
| 5.004 | 26.469 | 20.4 | 25 | 37.467 | 35.132 | 2.110 | Open Manhole | 1200 |
| 10.000 | 15.636 | 11.8 | 26 | 37.406 | 35.219 | 2.037 | Open Manhole | 1200 |
| 11.000 | 23.973 | 149.8 | 26 | 37.406 | 35.219 | 2.037 | Open Manhole | 1200 |
| 10.001 | 13.018 | 149.6 | 25 | 37.467 | 35.132 | 2.185 | Open Manhole | 1200 |
| 5.005 | 10.003 | 225.0 | | 37.079 | 35.088 | 1.767 | Open Manhole | 0 |


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Simulation Criteria for Storm

| | | | |
|---------------------------------|-------|--|-------|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | |
|-----------------------|---------------------------------|
| Rainfall Model | FEH |
| Return Period (years) | 1 |
| Site Location | GB 298450 168700 SS 98450 68700 |
| C (1km) | -0.025 |
| D1 (1km) | 0.403 |
| D2 (1km) | 0.318 |
| D3 (1km) | 0.301 |
| E (1km) | 0.285 |
| F (1km) | 2.515 |
| Summer Storms | Yes |
| Winter Storms | No |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Storm Duration (mins) | 30 |

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Online Controls for Storm


Hydro-Brake Optimum® Manhole: 23, DS/PN: 5.003, Volume (m³): 5.1

Unit Reference MD-SHE-0190-2000-1600-2000
 Design Head (m) 1.600
 Design Flow (l/s) 20.0
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Diameter (mm) 190
 Invert Level (m) 36.637
 Minimum Outlet Pipe Diameter (mm) 225
 Suggested Manhole Diameter (mm) 1500

| Control Points | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.600 | 20.0 |
| Flush-Flo™ | 0.472 | 20.0 |
| Kick-Flo® | 1.027 | 16.2 |
| Mean Flow over Head Range | - | 17.3 |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 6.6 | 1.200 | 17.4 | 3.000 | 27.0 | 7.000 | 40.6 |
| 0.200 | 17.5 | 1.400 | 18.8 | 3.500 | 29.1 | 7.500 | 42.0 |
| 0.300 | 19.3 | 1.600 | 20.0 | 4.000 | 31.0 | 8.000 | 43.3 |
| 0.400 | 19.9 | 1.800 | 21.2 | 4.500 | 32.8 | 8.500 | 44.6 |
| 0.500 | 20.0 | 2.000 | 22.2 | 5.000 | 34.5 | 9.000 | 45.9 |
| 0.600 | 19.8 | 2.200 | 23.3 | 5.500 | 36.2 | 9.500 | 47.1 |
| 0.800 | 19.0 | 2.400 | 24.3 | 6.000 | 37.7 | | |
| 1.000 | 16.8 | 2.600 | 25.2 | 6.500 | 39.2 | | |


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Storage Structures for Storm

Tank or Pond Manhole: 23, DS/PN: 5.003


Invert Level (m) 36.637

| Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000 | 260.0 | 0.700 | 400.0 | 1.400 | 0.0 | 2.100 | 0.0 |
| 0.100 | 280.0 | 0.800 | 420.0 | 1.500 | 0.0 | 2.200 | 0.0 |
| 0.200 | 300.0 | 0.900 | 440.0 | 1.600 | 0.0 | 2.300 | 0.0 |
| 0.300 | 320.0 | 1.000 | 460.0 | 1.700 | 0.0 | 2.400 | 0.0 |
| 0.400 | 340.0 | 1.100 | 480.0 | 1.800 | 0.0 | 2.500 | 0.0 |
| 0.500 | 360.0 | 1.200 | 500.0 | 1.900 | 0.0 | | |
| 0.600 | 380.0 | 1.300 | 0.0 | 2.000 | 0.0 | | |

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


| PN | US/MH Name | Water | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|---------------|--------------|--------------|----------------|----------------|-------------------|---------------|--------|----|-------------------|
| | | Level (m) | Depth (m) | Volume (m³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | |
| 5.000 | 20 | 38.707 | -0.112 | 0.000 | 0.14 | | 4.8 | OK | | |
| 5.001 | 21 | 37.768 | -0.094 | 0.000 | 0.30 | | 8.9 | OK | | |
| 5.002 | 22 | 36.998 | -0.060 | 0.000 | 0.67 | | 9.0 | OK | | |
| 6.000 | 1 | 41.615 | -0.098 | 0.000 | 0.26 | | 7.6 | OK | | |
| 6.001 | 2 | 40.157 | -0.166 | 0.000 | 0.15 | | 10.8 | OK | | |
| 6.002 | 3 | 39.637 | -0.155 | 0.000 | 0.21 | | 13.7 | OK | | |
| 6.003 | 4 | 39.318 | -0.107 | 0.000 | 0.50 | | 15.6 | OK | 10 | |
| 7.000 | 5 | 41.586 | -0.171 | 0.000 | 0.12 | | 5.2 | OK | | |
| 7.001 | 6 | 41.128 | -0.165 | 0.000 | 0.16 | | 10.8 | OK | | |
| 7.002 | 7 | 39.847 | -0.153 | 0.000 | 0.22 | | 15.2 | OK | | |
| 6.004 | 5 | 39.278 | -0.060 | 0.000 | 0.88 | | 30.9 | OK | 10 | |
| 6.005 | 9 | 39.161 | -0.092 | 0.000 | 0.65 | | 32.7 | OK | | |
| 8.000 | 9 | 41.624 | -0.171 | 0.000 | 0.13 | | 5.5 | OK | | |
| 8.001 | 10 | 41.256 | -0.163 | 0.000 | 0.17 | | 11.3 | OK | | |
| 8.002 | 11 | 40.287 | -0.162 | 0.000 | 0.17 | | 15.1 | OK | | |
| 8.003 | 12 | 39.446 | -0.160 | 0.000 | 0.18 | | 17.2 | OK | | |
| 8.004 | 13 | 39.025 | -0.127 | 0.000 | 0.39 | | 17.1 | OK | 1 | |
| 6.006 | 6 | 38.887 | -0.193 | 0.000 | 0.27 | | 51.9 | OK | | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|-------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 6.007 | 16 | 15 | Winter | 1 | +0% | 5/15 | Summer | |
| 6.008 | 16 | 15 | Winter | 1 | +0% | 5/15 | Summer | |
| 9.000 | 7 | 15 | Winter | 1 | +0% | 100/15 | Summer | 100/15 Summer |
| 6.009 | 7 | 15 | Winter | 1 | +0% | 100/15 | Summer | |
| 5.003 | 23 | 120 | Winter | 1 | +0% | 5/15 | Winter | |
| 5.004 | 24 | 120 | Winter | 1 | +0% | | | |
| 10.000 | 25 | 15 | Winter | 1 | +0% | 1000/15 | Winter | |
| 11.000 | 26 | 15 | Winter | 1 | +0% | 100/15 | Summer | |
| 10.001 | 26 | 15 | Winter | 1 | +0% | 5/15 | Summer | |
| 5.005 | 25 | 120 | Winter | 1 | +0% | 100/15 | Summer | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | |
|--------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|--------|----------------|--|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | Level Exceeded | |
| 6.007 | 16 | 38.439 | -0.058 | 0.000 | 0.99 | | 52.9 | OK | | |
| 6.008 | 16 | 38.387 | -0.061 | 0.000 | 0.99 | | 55.1 | OK | | |
| 9.000 | 7 | 40.573 | -0.077 | 0.000 | 0.48 | | 14.2 | OK | 10 | |
| 6.009 | 7 | 38.204 | -0.175 | 0.000 | 0.36 | | 66.4 | OK | | |
| 5.003 | 23 | 36.836 | -0.026 | 0.000 | 0.27 | | 17.4 | OK | | |
| 5.004 | 24 | 36.492 | -0.165 | 0.000 | 0.16 | | 17.4 | OK | | |
| 10.000 | 25 | 36.576 | -0.116 | 0.000 | 0.11 | | 5.4 | OK | | |
| 11.000 | 26 | 35.440 | -0.089 | 0.000 | 0.34 | | 4.6 | OK | | |
| 10.001 | 26 | 35.318 | -0.051 | 0.000 | 0.76 | | 10.0 | OK | | |
| 5.005 | 25 | 35.267 | -0.090 | 0.000 | 0.67 | | 19.2 | OK | | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------------|--------------|---------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 5.000 | 20 15 | Winter | 5 | +0% | 100/15 | Winter | | |
| 5.001 | 21 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 5.002 | 22 15 | Winter | 5 | +0% | 5/15 | Winter | | |
| 6.000 | 1 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 6.001 | 2 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 6.002 | 3 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 6.003 | 4 15 | Winter | 5 | +0% | 5/15 | Summer | 100/15 | Summer |
| 7.000 | 5 15 | Winter | 5 | +0% | 1000/15 | Winter | | |
| 7.001 | 6 15 | Winter | 5 | +0% | 100/15 | Winter | | |
| 7.002 | 7 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 6.004 | 5 15 | Winter | 5 | +0% | 5/15 | Summer | 100/15 | Summer |
| 6.005 | 9 15 | Winter | 5 | +0% | 5/15 | Winter | | |
| 8.000 | 9 15 | Winter | 5 | +0% | | | | |
| 8.001 | 10 15 | Winter | 5 | +0% | 1000/15 | Summer | | |
| 8.002 | 11 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 8.003 | 12 15 | Winter | 5 | +0% | 100/15 | Summer | | |
| 8.004 | 13 15 | Winter | 5 | +0% | 100/15 | Summer | 1000/15 | Winter |
| 6.006 | 6 15 | Winter | 5 | +0% | 100/15 | Summer | | |

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


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Cap. | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|-------------|----------------|-----------------|------------|----------------|
| 5.000 | 20 | 38.719 | -0.100 | 0.000 | 0.24 | | 8.0 | OK | |
| 5.001 | 21 | 37.788 | -0.074 | 0.000 | 0.50 | | 14.9 | OK | |
| 5.002 | 22 | 37.074 | 0.016 | 0.000 | 1.09 | | 14.8 | SURCHARGED | |
| 6.000 | 1 | 41.633 | -0.080 | 0.000 | 0.43 | | 12.6 | OK | |
| 6.001 | 2 | 40.176 | -0.147 | 0.000 | 0.25 | | 17.9 | OK | |
| 6.002 | 3 | 39.659 | -0.133 | 0.000 | 0.35 | | 22.9 | OK | |
| 6.003 | 4 | 39.488 | 0.063 | 0.000 | 0.80 | | 24.8 | SURCHARGED | 10 |
| 7.000 | 5 | 41.603 | -0.154 | 0.000 | 0.20 | | 8.6 | OK | |
| 7.001 | 6 | 41.147 | -0.146 | 0.000 | 0.26 | | 18.1 | OK | |
| 7.002 | 7 | 39.870 | -0.130 | 0.000 | 0.36 | | 25.5 | OK | |
| 6.004 | 5 | 39.424 | 0.086 | 0.000 | 1.43 | | 49.8 | SURCHARGED | 10 |
| 6.005 | 9 | 39.263 | 0.010 | 0.000 | 1.03 | | 51.9 | SURCHARGED | |
| 8.000 | 9 | 41.641 | -0.154 | 0.000 | 0.21 | | 9.2 | OK | |
| 8.001 | 10 | 41.276 | -0.143 | 0.000 | 0.28 | | 19.0 | OK | |
| 8.002 | 11 | 40.307 | -0.142 | 0.000 | 0.29 | | 25.3 | OK | |
| 8.003 | 12 | 39.467 | -0.139 | 0.000 | 0.31 | | 28.8 | OK | |
| 8.004 | 13 | 39.061 | -0.091 | 0.000 | 0.65 | | 28.6 | OK | 1 |
| 6.006 | 6 | 38.919 | -0.161 | 0.000 | 0.44 | | 82.4 | OK | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 6.007 | 16 | 15 Winter | 5 | +0% | 5/15 Summer | | | |
| 6.008 | 16 | 15 Winter | 5 | +0% | 5/15 Summer | | | |
| 9.000 | 7 | 15 Winter | 5 | +0% | 100/15 Summer | 100/15 Summer | | |
| 6.009 | 7 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 5.003 | 23 | 120 Winter | 5 | +0% | 5/15 Winter | | | |
| 5.004 | 24 | 120 Winter | 5 | +0% | | | | |
| 10.000 | 25 | 15 Winter | 5 | +0% | 1000/15 Winter | | | |
| 11.000 | 26 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 10.001 | 26 | 15 Winter | 5 | +0% | 5/15 Summer | | | |
| 5.005 | 25 | 30 Winter | 5 | +0% | 100/15 Summer | | | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|--------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|------------|------|----|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | | |
| 6.007 | 16 | 38.661 | 0.164 | 0.000 | 1.58 | | 84.3 | SURCHARGED | | | |
| 6.008 | 16 | 38.538 | 0.090 | 0.000 | 1.57 | | 87.6 | SURCHARGED | | | |
| 9.000 | 7 | 40.603 | -0.047 | 0.000 | 0.80 | | 23.8 | OK | | 10 | |
| 6.009 | 7 | 38.243 | -0.136 | 0.000 | 0.58 | | 106.1 | OK | | | |
| 5.003 | 23 | 36.955 | 0.093 | 0.000 | 0.30 | | 19.4 | SURCHARGED | | | |
| 5.004 | 24 | 36.496 | -0.161 | 0.000 | 0.18 | | 19.4 | OK | | | |
| 10.000 | 25 | 36.586 | -0.106 | 0.000 | 0.19 | | 9.1 | OK | | | |
| 11.000 | 26 | 35.461 | -0.068 | 0.000 | 0.56 | | 7.7 | OK | | | |
| 10.001 | 26 | 35.409 | 0.040 | 0.000 | 1.21 | | 16.0 | SURCHARGED | | | |
| 5.005 | 25 | 35.300 | -0.057 | 0.000 | 0.91 | | 26.1 | OK | | | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|--------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 5.000 | 20 15 | Winter | 100 | +30% | 100/15 | Winter | | |
| 5.001 | 21 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 5.002 | 22 15 | Winter | 100 | +30% | 5/15 | Winter | | |
| 6.000 | 1 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 6.001 | 2 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 6.002 | 3 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 6.003 | 4 15 | Winter | 100 | +30% | 5/15 | Summer | 100/15 | Summer |
| 7.000 | 5 15 | Winter | 100 | +30% | 1000/15 | Winter | | |
| 7.001 | 6 15 | Winter | 100 | +30% | 100/15 | Winter | | |
| 7.002 | 7 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 6.004 | 5 15 | Winter | 100 | +30% | 5/15 | Summer | 100/15 | Summer |
| 6.005 | 9 15 | Winter | 100 | +30% | 5/15 | Winter | | |
| 8.000 | 9 15 | Winter | 100 | +30% | | | | |
| 8.001 | 10 15 | Winter | 100 | +30% | 1000/15 | Summer | | |
| 8.002 | 11 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 8.003 | 12 15 | Winter | 100 | +30% | 100/15 | Summer | | |
| 8.004 | 13 15 | Winter | 100 | +30% | 100/15 | Summer | 1000/15 | Winter |
| 6.006 | 6 15 | Winter | 100 | +30% | 100/15 | Summer | | |

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


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 5.000 | 20 | 38.828 | 0.009 | 0.000 | 0.58 | 19.5 | SURCHARGED | |
| 5.001 | 21 | 38.594 | 0.732 | 0.000 | 1.11 | 33.3 | SURCHARGED | |
| 5.002 | 22 | 37.626 | 0.568 | 0.000 | 2.39 | 32.4 | SURCHARGED | |
| 6.000 | 1 | 41.960 | 0.247 | 0.000 | 0.96 | 28.1 | SURCHARGED | |
| 6.001 | 2 | 41.006 | 0.683 | 0.000 | 0.53 | 37.6 | SURCHARGED | |
| 6.002 | 3 | 40.842 | 1.050 | 0.000 | 0.73 | 48.0 | FLOOD RISK | |
| 6.003 | 4 | 40.631 | 1.206 | 6.486 | 1.73 | 53.9 | FLOOD | 10 |
| 7.000 | 5 | 41.649 | -0.108 | 0.000 | 0.50 | 21.3 | OK | |
| 7.001 | 6 | 41.358 | 0.065 | 0.000 | 0.68 | 46.9 | SURCHARGED | |
| 7.002 | 7 | 40.994 | 0.994 | 0.000 | 0.78 | 54.3 | FLOOD RISK | |
| 6.004 | 5 | 40.577 | 1.239 | 1.868 | 2.28 | 79.7 | FLOOD | 10 |
| 6.005 | 9 | 40.287 | 1.034 | 0.000 | 1.65 | 82.8 | FLOOD RISK | |
| 8.000 | 9 | 41.688 | -0.107 | 0.000 | 0.52 | 22.7 | OK | |
| 8.001 | 10 | 41.346 | -0.073 | 0.000 | 0.76 | 51.3 | OK | |
| 8.002 | 11 | 40.619 | 0.170 | 0.000 | 0.76 | 65.6 | SURCHARGED | |
| 8.003 | 12 | 40.263 | 0.657 | 0.000 | 0.69 | 63.8 | SURCHARGED | |
| 8.004 | 13 | 40.050 | 0.898 | 0.000 | 1.43 | 62.9 | SURCHARGED | 1 |
| 6.006 | 6 | 39.749 | 0.669 | 0.000 | 0.77 | 145.9 | SURCHARGED | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 6.007 | 16 | 15 Winter | 100 | +30% | 5/15 Summer | | | |
| 6.008 | 16 | 15 Winter | 100 | +30% | 5/15 Summer | | | |
| 9.000 | 7 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Summer | | |
| 6.009 | 7 | 30 Winter | 100 | +30% | 100/15 Summer | | | |
| 5.003 | 23 | 180 Winter | 100 | +30% | 5/15 Winter | | | |
| 5.004 | 24 | 720 Winter | 100 | +30% | | | | |
| 10.000 | 25 | 15 Winter | 100 | +30% | 1000/15 Winter | | | |
| 11.000 | 26 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 10.001 | 26 | 15 Winter | 100 | +30% | 5/15 Summer | | | |
| 5.005 | 25 | 15 Winter | 100 | +30% | 100/15 Summer | | | |

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|--------|------------|-----------------|----------------------|---------------------|----------------------------|-----------------|------------|----------------|
| 6.007 | 16 | 39.416 | 0.919 | 0.000 | 2.83 | 150.8 | FLOOD RISK | |
| 6.008 | 16 | 39.039 | 0.591 | 0.000 | 2.84 | 158.9 | SURCHARGED | |
| 9.000 | 7 | 41.552 | 0.902 | 2.294 | 1.17 | 34.9 | FLOOD | 10 |
| 6.009 | 7 | 38.529 | 0.150 | 0.000 | 1.02 | 185.4 | SURCHARGED | |
| 5.003 | 23 | 37.537 | 0.675 | 0.000 | 0.31 | 19.9 | SURCHARGED | |
| 5.004 | 24 | 36.497 | -0.160 | 0.000 | 0.19 | 19.9 | OK | |
| 10.000 | 25 | 36.614 | -0.078 | 0.000 | 0.46 | 22.3 | OK | |
| 11.000 | 26 | 36.261 | 0.732 | 0.000 | 1.15 | 15.8 | SURCHARGED | |
| 10.001 | 26 | 36.053 | 0.684 | 0.000 | 2.61 | 34.6 | SURCHARGED | |
| 5.005 | 25 | 35.452 | 0.095 | 0.000 | 1.83 | 52.6 | SURCHARGED | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 5.000 | 20 | 15 Winter | 1000 | +0% | 100/15 Winter | | | |
| 5.001 | 21 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 5.002 | 22 | 180 Winter | 1000 | +0% | 5/15 Winter | | | |
| 6.000 | 1 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.001 | 2 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.002 | 3 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.003 | 4 | 30 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 7.000 | 5 | 15 Winter | 1000 | +0% | 1000/15 Winter | | | |
| 7.001 | 6 | 15 Winter | 1000 | +0% | 100/15 Winter | | | |
| 7.002 | 7 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.004 | 5 | 30 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 6.005 | 9 | 15 Winter | 1000 | +0% | 5/15 Winter | | | |
| 8.000 | 9 | 15 Winter | 1000 | +0% | | | | |
| 8.001 | 10 | 15 Winter | 1000 | +0% | 1000/15 Summer | | | |
| 8.002 | 11 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 8.003 | 12 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 8.004 | 13 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 6.006 | 6 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 5.000 | 20 | 39.334 | 0.515 | 0.000 | 0.59 | 20.0 | SURCHARGED | |
| 5.001 | 21 | 39.022 | 1.160 | 0.000 | 1.24 | 37.2 | FLOOD RISK | |
| 5.002 | 22 | 37.821 | 0.763 | 0.000 | 1.00 | 13.5 | SURCHARGED | |
| 6.000 | 1 | 42.571 | 0.858 | 0.000 | 1.04 | 30.7 | SURCHARGED | |
| 6.001 | 2 | 41.179 | 0.856 | 0.000 | 0.65 | 45.6 | SURCHARGED | |
| 6.002 | 3 | 40.954 | 1.162 | 0.000 | 0.91 | 59.7 | FLOOD RISK | |
| 6.003 | 4 | 40.641 | 1.216 | 15.808 | 2.15 | 67.0 | FLOOD | 10 |
| 7.000 | 5 | 41.826 | 0.069 | 0.000 | 0.60 | 25.4 | SURCHARGED | |
| 7.001 | 6 | 41.703 | 0.410 | 0.000 | 0.70 | 48.8 | SURCHARGED | |
| 7.002 | 7 | 41.148 | 1.148 | 0.000 | 0.92 | 64.1 | FLOOD RISK | |
| 6.004 | 5 | 40.585 | 1.247 | 10.354 | 2.47 | 86.4 | FLOOD | 10 |
| 6.005 | 9 | 40.400 | 1.147 | 0.000 | 1.72 | 86.4 | FLOOD RISK | |
| 8.000 | 9 | 41.706 | -0.089 | 0.000 | 0.65 | 28.5 | OK | |
| 8.001 | 10 | 41.575 | 0.156 | 0.000 | 0.88 | 59.0 | SURCHARGED | |
| 8.002 | 11 | 41.081 | 0.632 | 0.000 | 0.80 | 68.9 | SURCHARGED | |
| 8.003 | 12 | 40.626 | 1.020 | 0.000 | 0.77 | 71.3 | FLOOD RISK | |
| 8.004 | 13 | 40.352 | 1.200 | 0.106 | 1.65 | 72.4 | FLOOD | 1 |
| 6.006 | 6 | 39.985 | 0.905 | 0.000 | 0.79 | 148.3 | SURCHARGED | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 6.007 | 16 | 15 Winter | 1000 | +0% | 5/15 Summer | | | |
| 6.008 | 16 | 30 Winter | 1000 | +0% | 5/15 Summer | | | |
| 9.000 | 7 | 15 Winter | 1000 | +0% | 100/15 Summer | 100/15 Summer | | |
| 6.009 | 7 | 30 Winter | 1000 | +0% | 100/15 Summer | | | |
| 5.003 | 23 | 180 Winter | 1000 | +0% | 5/15 Winter | | | |
| 5.004 | 24 | 960 Winter | 1000 | +0% | | | | |
| 10.000 | 25 | 15 Winter | 1000 | +0% | 1000/15 Winter | | | |
| 11.000 | 26 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 10.001 | 26 | 15 Winter | 1000 | +0% | 5/15 Summer | | | |
| 5.005 | 25 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |

| PN | US/MH Name | Water | | | Flooded | | Pipe | | Level Exceeded |
|--------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|------------|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | |
| 6.007 | 16 | 39.640 | 1.143 | 0.000 | 2.89 | | 154.3 | FLOOD RISK | |
| 6.008 | 16 | 39.256 | 0.808 | 0.000 | 2.88 | | 160.9 | SURCHARGED | |
| 9.000 | 7 | 41.557 | 0.907 | 7.259 | 1.17 | | 34.7 | FLOOD | 10 |
| 6.009 | 7 | 38.695 | 0.316 | 0.000 | 1.06 | | 193.5 | SURCHARGED | |
| 5.003 | 23 | 37.813 | 0.951 | 0.000 | 0.31 | | 19.9 | FLOOD RISK | |
| 5.004 | 24 | 36.497 | -0.160 | 0.000 | 0.19 | | 19.9 | OK | |
| 10.000 | 25 | 36.693 | 0.001 | 0.000 | 0.57 | | 27.7 | SURCHARGED | |
| 11.000 | 26 | 36.684 | 1.155 | 0.000 | 1.37 | | 18.8 | FLOOD RISK | |
| 10.001 | 26 | 36.377 | 1.008 | 0.000 | 3.16 | | 41.7 | SURCHARGED | |
| 5.005 | 25 | 35.503 | 0.146 | 0.000 | 2.12 | | 61.0 | SURCHARGED | |


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Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 1.000 | 91.118 | 0.742 | 122.8 | 0.063 | 5.00 | 0.600 | o | 150 |
| 1.001 | 40.458 | 0.270 | 150.0 | 0.054 | 0.00 | 0.600 | o | 150 |
| 2.000 | 41.808 | 0.426 | 98.1 | 0.295 | 5.00 | 0.600 | o | 225 |
| 2.001 | 61.247 | 0.351 | 174.5 | 0.074 | 0.00 | 0.600 | o | 300 |
| 1.002 | 20.207 | 1.169 | 17.3 | 0.000 | 0.00 | 0.600 | o | 300 |
| 1.003 | 76.350 | 0.726 | 105.2 | 0.000 | 0.00 | 0.600 | o | 300 |
| 3.000 | 40.810 | 0.272 | 150.0 | 0.040 | 5.00 | 0.600 | o | 150 |
| 3.001 | 16.756 | 0.123 | 136.2 | 0.025 | 0.00 | 0.600 | o | 150 |
| 3.002 | 8.216 | 0.168 | 48.9 | 0.021 | 0.00 | 0.600 | o | 150 |
| 3.003 | 32.857 | 0.052 | 631.9 | 0.029 | 0.00 | 0.600 | o | 225 |
| 4.000 | 33.807 | 0.154 | 219.5 | 0.027 | 5.00 | 0.600 | o | 150 |
| 3.004 | 16.517 | 0.180 | 91.8 | 0.000 | 0.00 | 0.600 | o | 225 |
| 5.000 | 33.796 | 0.335 | 100.9 | 0.027 | 5.00 | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|------|---------------|
| 1.000 | 1 | 42.957 | 41.607 | 1.200 | 42.215 | 40.865 | 1.200 | | 1200 |
| 1.001 | 2 | 42.215 | 40.865 | 1.200 | 41.862 | 40.595 | 1.116 | | 1200 |
| 2.000 | 3 | 42.797 | 41.372 | 1.200 | 42.371 | 40.946 | 1.200 | | 1200 |
| 2.001 | 4 | 42.371 | 40.946 | 1.125 | 41.862 | 40.595 | 0.967 | | 1200 |
| 1.002 | 3 | 41.862 | 40.595 | 0.967 | 40.926 | 39.426 | 1.200 | | 1200 |
| 1.003 | 4 | 40.926 | 39.426 | 1.200 | 40.200 | 38.700 | 1.200 | | 1200 |
| 3.000 | 5 | 42.995 | 41.645 | 1.200 | 42.840 | 41.373 | 1.317 | | 1200 |
| 3.001 | 6 | 42.840 | 41.373 | 1.317 | 42.600 | 41.250 | 1.200 | | 1200 |
| 3.002 | 7 | 42.600 | 41.250 | 1.200 | 42.432 | 41.082 | 1.200 | | 1200 |
| 3.003 | 8 | 42.432 | 41.007 | 1.200 | 42.380 | 40.955 | 1.200 | | 1200 |
| 4.000 | 9 | 42.534 | 41.184 | 1.200 | 42.380 | 41.030 | 1.200 | | 1200 |
| 3.004 | 9 | 42.380 | 40.955 | 1.200 | 42.381 | 40.775 | 1.381 | | 1200 |
| 5.000 | 11 | 42.535 | 41.185 | 1.200 | 42.381 | 40.850 | 1.381 | | 1200 |

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Existing Network Details for Storm


| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|---------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 6.000 | 33.105 | 0.221 | 150.0 | 0.059 | 5.00 | 0.600 | o | 150 |
| 3.005 | 99.974 | 2.000 | 50.0 | 0.000 | 0.00 | 0.600 | o | 300 |
| 1.004 | 56.624 | 1.770 | 32.0 | 0.000 | 0.00 | 0.600 | o | 300 |
| 1.005 | 48.427 | 1.730 | 28.0 | 0.000 | 0.00 | 0.600 | o | 300 |
| * 1.006 | 3.310 | 0.800 | 4.1 | 3.257 | 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) |
|---------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 6.000 | 12 | 42.421 | 41.071 | 1.200 | 42.381 | 40.850 | 1.381 | | 1200 |
| 3.005 | 10 | 42.381 | 40.700 | 1.381 | 40.200 | 38.700 | 1.200 | | 1200 |
| 1.004 | 5 | 40.200 | 38.700 | 1.200 | 38.430 | 36.930 | 1.200 | | 1200 |
| 1.005 | 6 | 38.430 | 36.930 | 1.200 | 36.700 | 35.200 | 1.200 | | 1200 |
| * 1.006 | 7 | 36.700 | 35.200 | 1.200 | 34.700 | 34.400 | 0.000 | Hydro-Brake® | 1200 |

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Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | Pipe Out | | Pipes In | | | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|----------|------------------|---------------|-------|------------------|---------------|
| | | | | | PN | Invert Level (m) | Diameter (mm) | PN | Invert Level (m) | |
| 1 | 42.957 | 1.350 | Open Manhole | 1200 | 1.000 | 41.607 | 150 | | | |
| 2 | 42.215 | 1.350 | Open Manhole | 1200 | 1.001 | 40.865 | 150 | 1.000 | 40.865 | 150 |
| 3 | 42.797 | 1.425 | Open Manhole | 1200 | 2.000 | 41.372 | 225 | | | |
| 4 | 42.371 | 1.425 | Open Manhole | 1200 | 2.001 | 40.946 | 300 | 2.000 | 40.946 | 225 |
| 3 | 41.862 | 1.267 | Open Manhole | 1200 | 1.002 | 40.595 | 300 | 1.001 | 40.595 | 150 |
| | | | | | | | | 2.001 | 40.595 | 300 |
| 4 | 40.926 | 1.500 | Open Manhole | 1200 | 1.003 | 39.426 | 300 | 1.002 | 39.426 | 300 |
| 5 | 42.995 | 1.350 | Open Manhole | 1200 | 3.000 | 41.645 | 150 | | | |
| 6 | 42.840 | 1.467 | Open Manhole | 1200 | 3.001 | 41.373 | 150 | 3.000 | 41.373 | 150 |
| 7 | 42.600 | 1.350 | Open Manhole | 1200 | 3.002 | 41.250 | 150 | 3.001 | 41.250 | 150 |
| 8 | 42.432 | 1.425 | Open Manhole | 1200 | 3.003 | 41.007 | 225 | 3.002 | 41.082 | 150 |
| 9 | 42.534 | 1.350 | Open Manhole | 1200 | 4.000 | 41.184 | 150 | | | |
| 9 | 42.380 | 1.425 | Open Manhole | 1200 | 3.004 | 40.955 | 225 | 3.003 | 40.955 | 225 |
| | | | | | | | | 4.000 | 41.030 | 150 |
| 11 | 42.535 | 1.350 | Open Manhole | 1200 | 5.000 | 41.185 | 150 | | | |
| 12 | 42.421 | 1.350 | Open Manhole | 1200 | 6.000 | 41.071 | 150 | | | |
| 10 | 42.381 | 1.681 | Open Manhole | 1200 | 3.005 | 40.700 | 300 | 3.004 | 40.775 | 225 |
| | | | | | | | | 5.000 | 40.850 | 150 |
| | | | | | | | | 6.000 | 40.850 | 150 |
| 5 | 40.200 | 1.500 | Open Manhole | 1200 | 1.004 | 38.700 | 300 | 1.003 | 38.700 | 300 |
| | | | | | | | | 3.005 | 38.700 | 300 |
| 6 | 38.430 | 1.500 | Open Manhole | 1200 | 1.005 | 36.930 | 300 | 1.004 | 36.930 | 300 |
| 7 | 36.700 | 1.500 | Open Manhole | 1200 | 1.006 | 35.200 | 300 | 1.005 | 35.200 | 300 |
| | 34.700 | 0.300 | Open Manhole | 0 | | OUTFALL | | 1.006 | 34.400 | 300 |

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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | o | 150 | 1 | 42.957 | 41.607 | 1.200 | Open Manhole | 1200 |
| 1.001 | o | 150 | 2 | 42.215 | 40.865 | 1.200 | Open Manhole | 1200 |
| 2.000 | o | 225 | 3 | 42.797 | 41.372 | 1.200 | Open Manhole | 1200 |
| 2.001 | o | 300 | 4 | 42.371 | 40.946 | 1.125 | Open Manhole | 1200 |
| 1.002 | o | 300 | 3 | 41.862 | 40.595 | 0.967 | Open Manhole | 1200 |
| 1.003 | o | 300 | 4 | 40.926 | 39.426 | 1.200 | Open Manhole | 1200 |
| 3.000 | o | 150 | 5 | 42.995 | 41.645 | 1.200 | Open Manhole | 1200 |
| 3.001 | o | 150 | 6 | 42.840 | 41.373 | 1.317 | Open Manhole | 1200 |
| 3.002 | o | 150 | 7 | 42.600 | 41.250 | 1.200 | Open Manhole | 1200 |
| 3.003 | o | 225 | 8 | 42.432 | 41.007 | 1.200 | Open Manhole | 1200 |
| 4.000 | o | 150 | 9 | 42.534 | 41.184 | 1.200 | Open Manhole | 1200 |
| 3.004 | o | 225 | 9 | 42.380 | 40.955 | 1.200 | Open Manhole | 1200 |
| 5.000 | o | 150 | 11 | 42.535 | 41.185 | 1.200 | Open Manhole | 1200 |
| 6.000 | o | 150 | 12 | 42.421 | 41.071 | 1.200 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 91.118 | 122.8 | 2 | 42.215 | 40.865 | 1.200 | Open Manhole | 1200 |
| 1.001 | 40.458 | 150.0 | 3 | 41.862 | 40.595 | 1.116 | Open Manhole | 1200 |
| 2.000 | 41.808 | 98.1 | 4 | 42.371 | 40.946 | 1.200 | Open Manhole | 1200 |
| 2.001 | 61.247 | 174.5 | 3 | 41.862 | 40.595 | 0.967 | Open Manhole | 1200 |
| 1.002 | 20.207 | 17.3 | 4 | 40.926 | 39.426 | 1.200 | Open Manhole | 1200 |
| 1.003 | 76.350 | 105.2 | 5 | 40.200 | 38.700 | 1.200 | Open Manhole | 1200 |
| 3.000 | 40.810 | 150.0 | 6 | 42.840 | 41.373 | 1.317 | Open Manhole | 1200 |
| 3.001 | 16.756 | 136.2 | 7 | 42.600 | 41.250 | 1.200 | Open Manhole | 1200 |
| 3.002 | 8.216 | 48.9 | 8 | 42.432 | 41.082 | 1.200 | Open Manhole | 1200 |
| 3.003 | 32.857 | 631.9 | 9 | 42.380 | 40.955 | 1.200 | Open Manhole | 1200 |
| 4.000 | 33.807 | 219.5 | 9 | 42.380 | 41.030 | 1.200 | Open Manhole | 1200 |
| 3.004 | 16.517 | 91.8 | 10 | 42.381 | 40.775 | 1.381 | Open Manhole | 1200 |
| 5.000 | 33.796 | 100.9 | 10 | 42.381 | 40.850 | 1.381 | Open Manhole | 1200 |
| 6.000 | 33.105 | 150.0 | 10 | 42.381 | 40.850 | 1.381 | Open Manhole | 1200 |

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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 3.005 | o | 300 | 10 | 42.381 | 40.700 | 1.381 | Open Manhole | 1200 |
| 1.004 | o | 300 | 5 | 40.200 | 38.700 | 1.200 | Open Manhole | 1200 |
| 1.005 | o | 300 | 6 | 38.430 | 36.930 | 1.200 | Open Manhole | 1200 |
| 1.006 | o | 300 | 7 | 36.700 | 35.200 | 1.200 | Open Manhole | 1200 |

Downstream Manhole


| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 3.005 | 99.974 | 50.0 | 5 | 40.200 | 38.700 | 1.200 | Open Manhole | 1200 |
| 1.004 | 56.624 | 32.0 | 6 | 38.430 | 36.930 | 1.200 | Open Manhole | 1200 |
| 1.005 | 48.427 | 28.0 | 7 | 36.700 | 35.200 | 1.200 | Open Manhole | 1200 |
| 1.006 | 3.310 | 4.1 | | 34.700 | 34.400 | 0.000 | Open Manhole | 0 |

Simulation Criteria for Storm

| | | | |
|---------------------------------|-------|--|-------|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |


Synthetic Rainfall Details

| | |
|-----------------------|---------------------------------|
| Rainfall Model | FEH |
| Return Period (years) | 1 |
| Site Location | GB 298450 168700 SS 98450 68700 |
| C (1km) | -0.025 |
| D1 (1km) | 0.403 |
| D2 (1km) | 0.318 |
| D3 (1km) | 0.301 |
| E (1km) | 0.285 |
| F (1km) | 2.515 |
| Summer Storms | Yes |
| Winter Storms | No |
| Cv (Summer) | 0.750 |

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Synthetic Rainfall Details

Cv (Winter) 0.840
Storm Duration (mins) 30

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Online Controls for Storm


Hydro-Brake Optimum® Manhole: 7, DS/PN: 1.006, Volume (m³): 5.0

| | |
|-----------------------------------|----------------------------|
| Unit Reference | MD-SHE-0155-1190-1200-1190 |
| Design Head (m) | 1.200 |
| Design Flow (l/s) | 11.9 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Diameter (mm) | 155 |
| Invert Level (m) | 35.200 |
| Minimum Outlet Pipe Diameter (mm) | 225 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.200 | 11.9 |
| Flush-Flo™ | 0.362 | 11.9 |
| Kick-Flo® | 0.792 | 9.8 |
| Mean Flow over Head Range | - | 10.3 |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 5.6 | 1.200 | 11.9 | 3.000 | 18.4 | 7.000 | 27.6 |
| 0.200 | 11.2 | 1.400 | 12.8 | 3.500 | 19.8 | 7.500 | 28.5 |
| 0.300 | 11.8 | 1.600 | 13.6 | 4.000 | 21.1 | 8.000 | 29.4 |
| 0.400 | 11.9 | 1.800 | 14.4 | 4.500 | 22.3 | 8.500 | 30.3 |
| 0.500 | 11.7 | 2.000 | 15.1 | 5.000 | 23.5 | 9.000 | 31.2 |
| 0.600 | 11.4 | 2.200 | 15.9 | 5.500 | 24.6 | 9.500 | 32.0 |
| 0.800 | 9.8 | 2.400 | 16.5 | 6.000 | 25.6 | | |
| 1.000 | 10.9 | 2.600 | 17.2 | 6.500 | 26.6 | | |


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Storage Structures for Storm

Tank or Pond Manhole: 7, DS/PN: 1.006

Invert Level (m) 35.200

| Depth (m) | Area (m ²) | Depth (m) | Area (m ²) |
|-----------|------------------------|-----------|------------------------|
| 0.000 | 1760.0 | 1.500 | 3423.0 |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 1 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Winter | | |
| 2.000 | 3 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 4 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 1.002 | 3 | 15 Winter | 1 | +0% | 1000/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 3.000 | 5 | 15 Winter | 1 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 3.001 | 6 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 3.002 | 7 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 3.003 | 8 | 15 Winter | 1 | +0% | 5/15 Winter | | | |
| 4.000 | 9 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 3.004 | 9 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 5.000 | 11 | 15 Winter | 1 | +0% | | | | |
| 6.000 | 12 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 3.005 | 10 | 15 Winter | 1 | +0% | | | | |
| 1.004 | 5 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 1.005 | 6 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 1.006 | 7 | 960 Winter | 1 | +0% | 1/360 Winter | | | |

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

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 41.682 | -0.075 | 0.000 | 0.44 | 6.9 | OK | 10 |
| 1.001 | 2 | 40.974 | -0.041 | 0.000 | 0.85 | 12.0 | OK | 9 |
| 2.000 | 3 | 41.516 | -0.081 | 0.000 | 0.72 | 35.8 | OK | 11 |
| 2.001 | 4 | 41.104 | -0.142 | 0.000 | 0.52 | 41.8 | OK | |
| 1.002 | 3 | 40.692 | -0.203 | 0.000 | 0.23 | 53.9 | OK | |
| 1.003 | 4 | 39.579 | -0.147 | 0.000 | 0.50 | 52.4 | OK | |
| 3.000 | 5 | 41.707 | -0.088 | 0.000 | 0.34 | 4.8 | OK | 1 |
| 3.001 | 6 | 41.450 | -0.073 | 0.000 | 0.51 | 7.2 | OK | |
| 3.002 | 7 | 41.318 | -0.082 | 0.000 | 0.42 | 9.3 | OK | |
| 3.003 | 8 | 41.139 | -0.093 | 0.000 | 0.63 | 12.0 | OK | |
| 4.000 | 9 | 41.239 | -0.095 | 0.000 | 0.29 | 3.3 | OK | |
| 3.004 | 9 | 41.041 | -0.139 | 0.000 | 0.31 | 15.2 | OK | |
| 5.000 | 11 | 41.230 | -0.105 | 0.000 | 0.19 | 3.3 | OK | |
| 6.000 | 12 | 41.149 | -0.072 | 0.000 | 0.52 | 7.3 | OK | |
| 3.005 | 10 | 40.781 | -0.219 | 0.000 | 0.16 | 24.6 | OK | |
| 1.004 | 5 | 38.834 | -0.166 | 0.000 | 0.41 | 76.5 | OK | |
| 1.005 | 6 | 37.059 | -0.171 | 0.000 | 0.38 | 75.7 | OK | |
| 1.006 | 7 | 35.542 | 0.042 | 0.000 | 0.05 | 11.7 | SURCHARGED | |

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| XP Solutions | Network 2015.1 | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 5 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 5 | +0% | 5/15 Summer | 100/15 Winter | | |
| 2.000 | 3 | 15 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 4 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.002 | 3 | 15 Winter | 5 | +0% | 1000/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.000 | 5 | 15 Winter | 5 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 3.001 | 6 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.002 | 7 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.003 | 8 | 15 Winter | 5 | +0% | 5/15 Winter | | | |
| 4.000 | 9 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.004 | 9 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 5.000 | 11 | 15 Winter | 5 | +0% | | | | |
| 6.000 | 12 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.005 | 10 | 15 Winter | 5 | +0% | | | | |
| 1.004 | 5 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.005 | 6 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.006 | 7 | 1440 Winter | 5 | +0% | 1/360 Winter | | | |

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

| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | Level Exceeded |
|-------|---------------|--------------|--------------|-----------------------------|----------------|-------------------|------------|-------------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | | |
| 1.000 | 1 | 41.712 | -0.045 | 0.000 | 0.73 | 11.6 | OK | 10 |
| 1.001 | 2 | 41.180 | 0.165 | 0.000 | 1.27 | 17.8 | SURCHARGED | 9 |
| 2.000 | 3 | 41.710 | 0.113 | 0.000 | 1.11 | 55.5 | SURCHARGED | 11 |
| 2.001 | 4 | 41.160 | -0.086 | 0.000 | 0.83 | 66.3 | OK | |
| 1.002 | 3 | 40.719 | -0.176 | 0.000 | 0.36 | 83.8 | OK | |
| 1.003 | 4 | 39.630 | -0.096 | 0.000 | 0.79 | 82.3 | OK | |
| 3.000 | 5 | 41.728 | -0.067 | 0.000 | 0.57 | 8.0 | OK | 1 |
| 3.001 | 6 | 41.481 | -0.042 | 0.000 | 0.85 | 12.1 | OK | |
| 3.002 | 7 | 41.344 | -0.056 | 0.000 | 0.70 | 15.5 | OK | |
| 3.003 | 8 | 41.232 | 0.000 | 0.000 | 1.02 | 19.6 | SURCHARGED | |
| 4.000 | 9 | 41.258 | -0.076 | 0.000 | 0.47 | 5.4 | OK | |
| 3.004 | 9 | 41.069 | -0.111 | 0.000 | 0.51 | 24.4 | OK | |
| 5.000 | 11 | 41.244 | -0.091 | 0.000 | 0.33 | 5.5 | OK | |
| 6.000 | 12 | 41.181 | -0.040 | 0.000 | 0.88 | 12.2 | OK | |
| 3.005 | 10 | 40.805 | -0.195 | 0.000 | 0.26 | 40.4 | OK | |
| 1.004 | 5 | 38.876 | -0.124 | 0.000 | 0.64 | 120.3 | OK | |
| 1.005 | 6 | 37.100 | -0.130 | 0.000 | 0.61 | 120.7 | OK | |
| 1.006 | 7 | 35.716 | 0.216 | 0.000 | 0.05 | 11.8 | SURCHARGED | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 100 | +30% | 100/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 100 | +30% | 5/15 Summer | 100/15 Winter | | |
| 2.000 | 3 | 15 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 4 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 1.002 | 3 | 15 Winter | 100 | +30% | 1000/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 3.000 | 5 | 15 Winter | 100 | +30% | 100/15 Summer | 1000/15 Winter | | |
| 3.001 | 6 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 3.002 | 7 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 3.003 | 8 | 15 Winter | 100 | +30% | 5/15 Winter | | | |
| 4.000 | 9 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 3.004 | 9 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 5.000 | 11 | 15 Winter | 100 | +30% | | | | |
| 6.000 | 12 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 3.005 | 10 | 15 Winter | 100 | +30% | | | | |
| 1.004 | 5 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 1.005 | 6 | 30 Winter | 100 | +30% | 100/15 Summer | | | |
| 1.006 | 7 | 1440 Winter | 100 | +30% | 1/360 Winter | | | |

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

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 42.959 | 1.202 | 1.489 | 1.16 | 18.3 | FLOOD | 10 |
| 1.001 | 2 | 42.215 | 1.200 | 0.362 | 2.28 | 32.0 | FLOOD | 9 |
| 2.000 | 3 | 42.807 | 1.210 | 10.496 | 1.80 | 90.0 | FLOOD | 11 |
| 2.001 | 4 | 41.686 | 0.440 | 0.000 | 1.44 | 114.8 | SURCHARGED | |
| 1.002 | 3 | 40.866 | -0.029 | 0.000 | 0.61 | 143.1 | OK | |
| 1.003 | 4 | 40.511 | 0.785 | 0.000 | 1.29 | 134.7 | SURCHARGED | |
| 3.000 | 5 | 42.474 | 0.679 | 0.000 | 1.10 | 15.5 | SURCHARGED | 1 |
| 3.001 | 6 | 42.137 | 0.614 | 0.000 | 1.67 | 23.7 | SURCHARGED | |
| 3.002 | 7 | 41.797 | 0.397 | 0.000 | 1.41 | 31.3 | SURCHARGED | |
| 3.003 | 8 | 41.461 | 0.229 | 0.000 | 2.21 | 42.3 | SURCHARGED | |
| 4.000 | 9 | 41.382 | 0.048 | 0.000 | 1.13 | 12.9 | SURCHARGED | |
| 3.004 | 9 | 41.213 | 0.033 | 0.000 | 1.11 | 53.4 | SURCHARGED | |
| 5.000 | 11 | 41.288 | -0.047 | 0.000 | 0.80 | 13.6 | OK | |
| 6.000 | 12 | 41.816 | 0.595 | 0.000 | 1.91 | 26.5 | SURCHARGED | |
| 3.005 | 10 | 40.867 | -0.133 | 0.000 | 0.59 | 90.0 | OK | |
| 1.004 | 5 | 39.398 | 0.398 | 0.000 | 1.08 | 202.1 | SURCHARGED | |
| 1.005 | 6 | 37.396 | 0.166 | 0.000 | 0.99 | 196.3 | SURCHARGED | |
| 1.006 | 7 | 36.466 | 0.966 | 0.000 | 0.05 | 12.2 | FLOOD RISK | |

| | | |
|------------------------|--------------------|---|
| AECOM | | Page 15 |
| Midpoint | St Athan |  |
| Alencon Link | Catchment B | |
| Basingstoke | Summary of Results | |
| Date 14/03/17 | Designed by AFT | |
| File Network B aft.mdx | Checked by TE | |
| XP Solutions | Network 2015.1 | |

1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 30 Winter | 1000 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 30 Winter | 1000 | +0% | 5/15 Summer | 100/15 Winter | | |
| 2.000 | 3 | 15 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 4 | 15 Summer | 1000 | +0% | 100/15 Summer | | | |
| 1.002 | 3 | 30 Winter | 1000 | +0% | 1000/15 Summer | | | |
| 1.003 | 4 | 30 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.000 | 5 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 3.001 | 6 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.002 | 7 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.003 | 8 | 15 Winter | 1000 | +0% | 5/15 Winter | | | |
| 4.000 | 9 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.004 | 9 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 5.000 | 11 | 15 Winter | 1000 | +0% | | | | |
| 6.000 | 12 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.005 | 10 | 15 Winter | 1000 | +0% | | | | |
| 1.004 | 5 | 30 Winter | 1000 | +0% | 100/15 Summer | | | |
| 1.005 | 6 | 30 Winter | 1000 | +0% | 100/15 Summer | | | |
| 1.006 | 7 | 1440 Winter | 1000 | +0% | 1/360 Winter | | | |

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|---|---|---|
| AECOM | | Page 16 |
| Midpoint Alencon Link Basingstoke | St Athan Catchment B Summary of Results |  |
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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 42.962 | 1.205 | 4.472 | 1.11 | 17.5 | FLOOD | 10 |
| 1.001 | 2 | 42.218 | 1.203 | 2.752 | 2.27 | 31.9 | FLOOD | 9 |
| 2.000 | 3 | 42.821 | 1.224 | 24.094 | 1.78 | 89.0 | FLOOD | 11 |
| 2.001 | 4 | 41.790 | 0.544 | 0.000 | 1.53 | 121.9 | SURCHARGED | |
| 1.002 | 3 | 41.219 | 0.324 | 0.000 | 0.61 | 142.9 | SURCHARGED | |
| 1.003 | 4 | 40.894 | 1.168 | 0.000 | 1.35 | 140.5 | FLOOD RISK | |
| 3.000 | 5 | 42.995 | 1.200 | 0.114 | 1.30 | 18.2 | FLOOD | 1 |
| 3.001 | 6 | 42.560 | 1.037 | 0.000 | 1.95 | 27.5 | FLOOD RISK | |
| 3.002 | 7 | 42.101 | 0.701 | 0.000 | 1.63 | 36.1 | SURCHARGED | |
| 3.003 | 8 | 41.667 | 0.435 | 0.000 | 2.57 | 49.3 | SURCHARGED | |
| 4.000 | 9 | 41.562 | 0.228 | 0.000 | 1.32 | 15.1 | SURCHARGED | |
| 3.004 | 9 | 41.309 | 0.129 | 0.000 | 1.33 | 64.1 | SURCHARGED | |
| 5.000 | 11 | 41.317 | -0.018 | 0.000 | 0.99 | 16.9 | OK | |
| 6.000 | 12 | 42.206 | 0.985 | 0.000 | 2.29 | 31.9 | FLOOD RISK | |
| 3.005 | 10 | 40.890 | -0.110 | 0.000 | 0.71 | 108.9 | OK | |
| 1.004 | 5 | 39.866 | 0.866 | 0.000 | 1.12 | 209.4 | SURCHARGED | |
| 1.005 | 6 | 37.691 | 0.461 | 0.000 | 1.04 | 206.6 | SURCHARGED | |
| 1.006 | 7 | 36.679 | 1.179 | 0.000 | 0.06 | 13.1 | FLOOD RISK | |

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|---|----------------------|---|
| AECOM | | Page 1 |
| Midpoint Alencon Link Basingstoke | |  |
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Existing Network Details for Storm

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 1.000 | 54.942 | 0.227 | 242.0 | 0.069 | 5.00 | 0.600 | o | 150 |
| 1.001 | 78.222 | 0.800 | 97.8 | 0.027 | 0.00 | 0.600 | o | 150 |
| 1.002 | 73.147 | 0.695 | 105.2 | 0.000 | 0.00 | 0.600 | o | 225 |
| 2.000 | 49.938 | 0.283 | 176.5 | 0.030 | 5.00 | 0.600 | o | 150 |
| 2.001 | 17.457 | 0.156 | 111.9 | 0.015 | 0.00 | 0.600 | o | 150 |
| 2.002 | 26.170 | 0.156 | 167.8 | 0.016 | 0.00 | 0.600 | o | 150 |
| 3.000 | 21.450 | 0.361 | 59.4 | 0.000 | 5.00 | 0.600 | o | 150 |
| 3.001 | 41.447 | 0.241 | 172.0 | 0.000 | 0.00 | 0.600 | o | 150 |
| 3.002 | 10.849 | 0.202 | 53.7 | 0.000 | 5.00 | 0.600 | o | 150 |
| 3.003 | 8.839 | 0.024 | 368.3 | 0.000 | 0.00 | 0.600 | o | 225 |
| 2.003 | 22.005 | 0.055 | 400.1 | 0.024 | 0.00 | 0.600 | o | 225 |
| 2.004 | 67.518 | 0.329 | 205.2 | 0.031 | 0.00 | 0.600 | o | 225 |
| 1.003 | 16.047 | 0.028 | 573.1 | 0.000 | 0.00 | 0.600 | o | 300 |
| 4.000 | 45.316 | 0.574 | 78.9 | 0.046 | 5.00 | 0.600 | o | 150 |
| 4.001 | 54.537 | 0.605 | 90.1 | 0.053 | 0.00 | 0.600 | o | 150 |
| 4.002 | 37.935 | 0.295 | 128.6 | 0.030 | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|------|---------------|
| 1.000 | 1 | 44.908 | 43.558 | 1.200 | 44.681 | 43.331 | 1.200 | | 1200 |
| 1.001 | 2 | 44.681 | 43.331 | 1.200 | 43.863 | 42.531 | 1.182 | | 1200 |
| 1.002 | 3 | 43.863 | 42.438 | 1.200 | 43.168 | 41.743 | 1.200 | | 1200 |
| 2.000 | 4 | 44.072 | 42.722 | 1.200 | 43.789 | 42.439 | 1.200 | | 1200 |
| 2.001 | 5 | 43.789 | 42.439 | 1.200 | 43.633 | 42.283 | 1.200 | | 1200 |
| 2.002 | 6 | 43.633 | 42.283 | 1.200 | 43.552 | 42.127 | 1.275 | | 1200 |
| 3.000 | 10 | 44.380 | 43.030 | 1.200 | 44.019 | 42.669 | 1.200 | | 1200 |
| 3.001 | 11 | 44.019 | 42.669 | 1.200 | 43.778 | 42.428 | 1.200 | | 1200 |
| 3.002 | 10 | 43.778 | 42.353 | 1.275 | 43.576 | 42.151 | 1.275 | | 1200 |
| 3.003 | 11 | 43.576 | 42.151 | 1.200 | 43.552 | 42.127 | 1.200 | | 1200 |
| 2.003 | 8 | 43.552 | 42.127 | 1.200 | 43.497 | 42.072 | 1.200 | | 1200 |
| 2.004 | 9 | 43.497 | 42.072 | 1.200 | 43.168 | 41.743 | 1.200 | | 1200 |
| 1.003 | 4 | 43.168 | 41.743 | 1.125 | 43.215 | 41.715 | 1.200 | | 1200 |
| 4.000 | 6 | 44.689 | 43.339 | 1.200 | 44.115 | 42.765 | 1.200 | | 1200 |
| 4.001 | 7 | 44.115 | 42.765 | 1.200 | 43.510 | 42.160 | 1.200 | | 1200 |
| 4.002 | 16 | 43.510 | 42.160 | 1.200 | 43.215 | 41.865 | 1.200 | | 1200 |

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| AECOM | | Page 2 |
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Existing Network Details for Storm

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 1.004 | 25.747 | 1.072 | 24.0 | 0.020 | 0.00 | 0.600 | o | 300 |
| 5.000 | 8.040 | 0.304 | 26.4 | 0.044 | 5.00 | 0.600 | o | 150 |
| 5.001 | 20.409 | 0.136 | 150.0 | 0.036 | 0.00 | 0.600 | o | 150 |
| 5.002 | 8.489 | 0.057 | 150.0 | 0.026 | 0.00 | 0.600 | o | 225 |
| 5.003 | 24.955 | 0.166 | 150.0 | 0.027 | 0.00 | 0.600 | o | 225 |
| 5.004 | 59.237 | 0.395 | 150.0 | 0.054 | 0.00 | 0.600 | o | 225 |
| 5.005 | 74.112 | 0.547 | 135.5 | 0.061 | 0.00 | 0.600 | o | 225 |
| 1.005 | 2.876 | 0.019 | 151.4 | 0.000 | 0.00 | 0.600 | o | 450 |
| 1.006 | 4.625 | 0.093 | 50.0 | 0.200 | 0.00 | 0.600 | o | 300 |

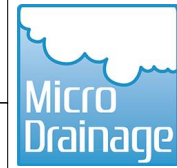
| PN | US/MH Name | US/CL (m) | US/IL (m) | US C.Depth (m) | DS/CL (m) | DS/IL (m) | DS C.Depth (m) | Ctrl | US/MH (mm) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 1.004 | 5 | 43.215 | 41.715 | 1.200 | 43.354 | 40.643 | 2.411 | | 1200 |
| 5.000 | 21 | 43.800 | 42.450 | 1.200 | 43.496 | 42.146 | 1.200 | | 1200 |
| 5.001 | 22 | 43.496 | 42.146 | 1.200 | 43.526 | 42.010 | 1.366 | | 1200 |
| 5.002 | 23 | 43.526 | 41.935 | 1.366 | 43.926 | 41.878 | 1.822 | | 1200 |
| 5.003 | 24 | 43.926 | 41.878 | 1.823 | 43.967 | 41.712 | 2.030 | | 1200 |
| 5.004 | 25 | 43.967 | 41.712 | 2.030 | 43.680 | 41.317 | 2.138 | | 1200 |
| 5.005 | 26 | 43.680 | 41.265 | 2.190 | 43.354 | 40.718 | 2.411 | | 1200 |
| 1.005 | 6 | 43.354 | 40.643 | 2.261 | 42.700 | 40.624 | 1.626 | | 1200 |
| 1.006 | 27 | 42.700 | 40.624 | 1.776 | 42.700 | 40.532 | 1.869 | Hydro-Brake® | 1200 |

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Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | Pipe Out | | Pipes In | | | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|----------|------------------|---------------|-------|------------------|---------------|
| | | | | | PN | Invert Level (m) | Diameter (mm) | PN | Invert Level (m) | |
| 1 | 44.908 | 1.350 | Open Manhole | 1200 | 1.000 | 43.558 | 150 | | | |
| 2 | 44.681 | 1.350 | Open Manhole | 1200 | 1.001 | 43.331 | 150 | 1.000 | 43.331 | 150 |
| 3 | 43.863 | 1.425 | Open Manhole | 1200 | 1.002 | 42.438 | 225 | 1.001 | 42.531 | 150 |
| 4 | 44.072 | 1.350 | Open Manhole | 1200 | 2.000 | 42.722 | 150 | | | 18 |
| 5 | 43.789 | 1.350 | Open Manhole | 1200 | 2.001 | 42.439 | 150 | 2.000 | 42.439 | 150 |
| 6 | 43.633 | 1.350 | Open Manhole | 1200 | 2.002 | 42.283 | 150 | 2.001 | 42.283 | 150 |
| 10 | 44.380 | 1.350 | Open Manhole | 1200 | 3.000 | 43.030 | 150 | | | |
| 11 | 44.019 | 1.350 | Open Manhole | 1200 | 3.001 | 42.669 | 150 | 3.000 | 42.669 | 150 |
| 10 | 43.778 | 1.425 | Open Manhole | 1200 | 3.002 | 42.353 | 150 | 3.001 | 42.428 | 150 |
| 11 | 43.576 | 1.425 | Open Manhole | 1200 | 3.003 | 42.151 | 225 | 3.002 | 42.151 | 150 |
| 8 | 43.552 | 1.425 | Open Manhole | 1200 | 2.003 | 42.127 | 225 | 2.002 | 42.127 | 150 |
| | | | | | | | | 3.003 | 42.127 | 225 |
| 9 | 43.497 | 1.425 | Open Manhole | 1200 | 2.004 | 42.072 | 225 | 2.003 | 42.072 | 225 |
| 4 | 43.168 | 1.425 | Open Manhole | 1200 | 1.003 | 41.743 | 300 | 1.002 | 41.743 | 225 |
| | | | | | | | | 2.004 | 41.743 | 225 |
| 6 | 44.689 | 1.350 | Open Manhole | 1200 | 4.000 | 43.339 | 150 | | | |
| 7 | 44.115 | 1.350 | Open Manhole | 1200 | 4.001 | 42.765 | 150 | 4.000 | 42.765 | 150 |
| 16 | 43.510 | 1.350 | Open Manhole | 1200 | 4.002 | 42.160 | 150 | 4.001 | 42.160 | 150 |
| 5 | 43.215 | 1.500 | Open Manhole | 1200 | 1.004 | 41.715 | 300 | 1.003 | 41.715 | 300 |
| | | | | | | | | 4.002 | 41.865 | 150 |
| 21 | 43.800 | 1.350 | Open Manhole | 1200 | 5.000 | 42.450 | 150 | | | |
| 22 | 43.496 | 1.350 | Open Manhole | 1200 | 5.001 | 42.146 | 150 | 5.000 | 42.146 | 150 |
| 23 | 43.526 | 1.591 | Open Manhole | 1200 | 5.002 | 41.935 | 225 | 5.001 | 42.010 | 150 |
| 24 | 43.926 | 2.048 | Open Manhole | 1200 | 5.003 | 41.878 | 225 | 5.002 | 41.878 | 225 |
| 25 | 43.967 | 2.255 | Open Manhole | 1200 | 5.004 | 41.712 | 225 | 5.003 | 41.712 | 225 |
| 26 | 43.680 | 2.415 | Open Manhole | 1200 | 5.005 | 41.265 | 225 | 5.004 | 41.317 | 225 |
| 6 | 43.354 | 2.711 | Open Manhole | 1200 | 1.005 | 40.643 | 450 | 1.004 | 40.643 | 300 |
| | | | | | | | | 5.005 | 40.718 | 225 |
| 27 | 42.700 | 2.076 | Open Manhole | 1200 | 1.006 | 40.624 | 300 | 1.005 | 40.624 | 450 |
| 7 | 42.700 | 2.169 | Open Manhole | 1200 | | OUTFALL | | 1.006 | 40.532 | 300 |

Midpoint
Alencon Link
Basingstoke



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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | o | 150 | 1 | 44.908 | 43.558 | 1.200 | Open Manhole | 1200 |
| 1.001 | o | 150 | 2 | 44.681 | 43.331 | 1.200 | Open Manhole | 1200 |
| 1.002 | o | 225 | 3 | 43.863 | 42.438 | 1.200 | Open Manhole | 1200 |
| 2.000 | o | 150 | 4 | 44.072 | 42.722 | 1.200 | Open Manhole | 1200 |
| 2.001 | o | 150 | 5 | 43.789 | 42.439 | 1.200 | Open Manhole | 1200 |
| 2.002 | o | 150 | 6 | 43.633 | 42.283 | 1.200 | Open Manhole | 1200 |
| 3.000 | o | 150 | 10 | 44.380 | 43.030 | 1.200 | Open Manhole | 1200 |
| 3.001 | o | 150 | 11 | 44.019 | 42.669 | 1.200 | Open Manhole | 1200 |
| 3.002 | o | 150 | 10 | 43.778 | 42.353 | 1.275 | Open Manhole | 1200 |
| 3.003 | o | 225 | 11 | 43.576 | 42.151 | 1.200 | Open Manhole | 1200 |
| 2.003 | o | 225 | 8 | 43.552 | 42.127 | 1.200 | Open Manhole | 1200 |
| 2.004 | o | 225 | 9 | 43.497 | 42.072 | 1.200 | Open Manhole | 1200 |
| 1.003 | o | 300 | 4 | 43.168 | 41.743 | 1.125 | Open Manhole | 1200 |
| 4.000 | o | 150 | 6 | 44.689 | 43.339 | 1.200 | Open Manhole | 1200 |
| 4.001 | o | 150 | 7 | 44.115 | 42.765 | 1.200 | Open Manhole | 1200 |
| 4.002 | o | 150 | 16 | 43.510 | 42.160 | 1.200 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 54.942 | 242.0 | 2 | 44.681 | 43.331 | 1.200 | Open Manhole | 1200 |
| 1.001 | 78.222 | 97.8 | 3 | 43.863 | 42.531 | 1.182 | Open Manhole | 1200 |
| 1.002 | 73.147 | 105.2 | 4 | 43.168 | 41.743 | 1.200 | Open Manhole | 1200 |
| 2.000 | 49.938 | 176.5 | 5 | 43.789 | 42.439 | 1.200 | Open Manhole | 1200 |
| 2.001 | 17.457 | 111.9 | 6 | 43.633 | 42.283 | 1.200 | Open Manhole | 1200 |
| 2.002 | 26.170 | 167.8 | 8 | 43.552 | 42.127 | 1.275 | Open Manhole | 1200 |
| 3.000 | 21.450 | 59.4 | 11 | 44.019 | 42.669 | 1.200 | Open Manhole | 1200 |
| 3.001 | 41.447 | 172.0 | 10 | 43.778 | 42.428 | 1.200 | Open Manhole | 1200 |
| 3.002 | 10.849 | 53.7 | 11 | 43.576 | 42.151 | 1.275 | Open Manhole | 1200 |
| 3.003 | 8.839 | 368.3 | 8 | 43.552 | 42.127 | 1.200 | Open Manhole | 1200 |
| 2.003 | 22.005 | 400.1 | 9 | 43.497 | 42.072 | 1.200 | Open Manhole | 1200 |
| 2.004 | 67.518 | 205.2 | 4 | 43.168 | 41.743 | 1.200 | Open Manhole | 1200 |
| 1.003 | 16.047 | 573.1 | 5 | 43.215 | 41.715 | 1.200 | Open Manhole | 1200 |
| 4.000 | 45.316 | 78.9 | 7 | 44.115 | 42.765 | 1.200 | Open Manhole | 1200 |
| 4.001 | 54.537 | 90.1 | 16 | 43.510 | 42.160 | 1.200 | Open Manhole | 1200 |
| 4.002 | 37.935 | 128.6 | 5 | 43.215 | 41.865 | 1.200 | Open Manhole | 1200 |

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| Midpoint Alencon Link Basingstoke | |  |
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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.004 | o | 300 | 5 | 43.215 | 41.715 | 1.200 | Open Manhole | 1200 |
| 5.000 | o | 150 | 21 | 43.800 | 42.450 | 1.200 | Open Manhole | 1200 |
| 5.001 | o | 150 | 22 | 43.496 | 42.146 | 1.200 | Open Manhole | 1200 |
| 5.002 | o | 225 | 23 | 43.526 | 41.935 | 1.366 | Open Manhole | 1200 |
| 5.003 | o | 225 | 24 | 43.926 | 41.878 | 1.823 | Open Manhole | 1200 |
| 5.004 | o | 225 | 25 | 43.967 | 41.712 | 2.030 | Open Manhole | 1200 |
| 5.005 | o | 225 | 26 | 43.680 | 41.265 | 2.190 | Open Manhole | 1200 |
| 1.005 | o | 450 | 6 | 43.354 | 40.643 | 2.261 | Open Manhole | 1200 |
| 1.006 | o | 300 | 27 | 42.700 | 40.624 | 1.776 | Open Manhole | 1200 |

Downstream Manhole

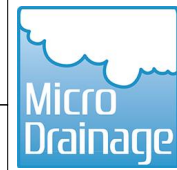
| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.004 | 25.747 | 24.0 | 6 | 43.354 | 40.643 | 2.411 | Open Manhole | 1200 |
| 5.000 | 8.040 | 26.4 | 22 | 43.496 | 42.146 | 1.200 | Open Manhole | 1200 |
| 5.001 | 20.409 | 150.0 | 23 | 43.526 | 42.010 | 1.366 | Open Manhole | 1200 |
| 5.002 | 8.489 | 150.0 | 24 | 43.926 | 41.878 | 1.822 | Open Manhole | 1200 |
| 5.003 | 24.955 | 150.0 | 25 | 43.967 | 41.712 | 2.030 | Open Manhole | 1200 |
| 5.004 | 59.237 | 150.0 | 26 | 43.680 | 41.317 | 2.138 | Open Manhole | 1200 |
| 5.005 | 74.112 | 135.5 | 6 | 43.354 | 40.718 | 2.411 | Open Manhole | 1200 |
| 1.005 | 2.876 | 151.4 | 27 | 42.700 | 40.624 | 1.626 | Open Manhole | 1200 |
| 1.006 | 4.625 | 50.0 | 7 | 42.700 | 40.532 | 1.869 | Open Manhole | 1200 |

Simulation Criteria for Storm

| | | | |
|---------------------------------|-------|--|-------|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

Midpoint
Alencon Link
Basingstoke



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Synthetic Rainfall Details

| | |
|-----------------------|---------------------------------|
| Rainfall Model | FEH |
| Return Period (years) | 1 |
| Site Location | GB 298450 168700 SS 98450 68700 |
| C (1km) | -0.025 |
| D1 (1km) | 0.403 |
| D2 (1km) | 0.318 |
| D3 (1km) | 0.301 |
| E (1km) | 0.285 |
| F (1km) | 2.515 |
| Summer Storms | Yes |
| Winter Storms | No |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Storm Duration (mins) | 30 |

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Online Controls for Storm


Hydro-Brake Optimum® Manhole: 27, DS/PN: 1.006, Volume (m³): 2.6

| | |
|-----------------------------------|----------------------------|
| Unit Reference | MD-SHE-0081-3100-1200-3100 |
| Design Head (m) | 1.200 |
| Design Flow (l/s) | 3.1 |
| Flush-Flo™ | Calculated |
| Objective | Minimise upstream storage |
| Diameter (mm) | 81 |
| Invert Level (m) | 40.624 |
| Minimum Outlet Pipe Diameter (mm) | 100 |
| Suggested Manhole Diameter (mm) | 1200 |

| Control Points | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.200 | 3.1 |
| Flush-Flo™ | 0.356 | 3.1 |
| Kick-Flo® | 0.723 | 2.5 |
| Mean Flow over Head Range | - | 2.7 |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 2.3 | 1.200 | 3.1 | 3.000 | 4.7 | 7.000 | 7.1 |
| 0.200 | 2.9 | 1.400 | 3.3 | 3.500 | 5.1 | 7.500 | 7.3 |
| 0.300 | 3.0 | 1.600 | 3.5 | 4.000 | 5.4 | 8.000 | 7.5 |
| 0.400 | 3.0 | 1.800 | 3.7 | 4.500 | 5.7 | 8.500 | 7.7 |
| 0.500 | 3.0 | 2.000 | 3.9 | 5.000 | 6.0 | 9.000 | 7.9 |
| 0.600 | 2.8 | 2.200 | 4.1 | 5.500 | 6.3 | 9.500 | 8.2 |
| 0.800 | 2.6 | 2.400 | 4.3 | 6.000 | 6.6 | | |
| 1.000 | 2.8 | 2.600 | 4.4 | 6.500 | 6.8 | | |


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Storage Structures for Storm

Tank or Pond Manhole: 27, DS/PN: 1.006

Invert Level (m) 40.624

| Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000 | 152.0 | 1.000 | 756.0 | 2.000 | 1450.0 |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 1 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 1.002 | 3 | 15 Winter | 1 | +0% | | | | |
| 2.000 | 4 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 2.001 | 5 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 2.002 | 6 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 3.000 | 10 | 120 Winter | 1 | +0% | | | | |
| 3.001 | 11 | 120 Winter | 1 | +0% | | | | |
| 3.002 | 10 | 120 Winter | 1 | +0% | 1000/15 Summer | | | |
| 3.003 | 11 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 2.003 | 8 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 2.004 | 9 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 4.000 | 6 | 15 Winter | 1 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 4.001 | 7 | 15 Winter | 1 | +0% | 5/15 Winter | 100/15 Summer | | |
| 4.002 | 16 | 15 Winter | 1 | +0% | 5/15 Summer | 1000/15 Summer | | |
| 1.004 | 5 | 15 Winter | 1 | +0% | | | | |
| 5.000 | 21 | 15 Winter | 1 | +0% | 100/15 Summer | | | |
| 5.001 | 22 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 5.002 | 23 | 15 Winter | 1 | +0% | 100/15 Summer | 1000/15 Summer | | |

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


| PN | US/MH Name | Water | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|---------------|--------------|--------------|-----------------------------|----------------|-------------------|---------------|--------|----|-------------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | |
| 1.000 | 1 | 43.658 | -0.050 | 0.000 | 0.71 | | 7.9 | OK | 10 | |
| 1.001 | 2 | 43.416 | -0.065 | 0.000 | 0.60 | | 10.6 | OK | 1 | |
| 1.002 | 3 | 42.509 | -0.154 | 0.000 | 0.21 | | 10.2 | OK | | |
| 2.000 | 4 | 42.777 | -0.095 | 0.000 | 0.27 | | 3.5 | OK | | |
| 2.001 | 5 | 42.497 | -0.092 | 0.000 | 0.32 | | 4.9 | OK | | |
| 2.002 | 6 | 42.359 | -0.074 | 0.000 | 0.50 | | 6.5 | OK | | |
| 3.000 | 10 | 43.030 | -0.150 | 0.000 | 0.00 | | 0.0 | OK | | |
| 3.001 | 11 | 42.669 | -0.150 | 0.000 | 0.00 | | 0.0 | OK | | |
| 3.002 | 10 | 42.353 | -0.150 | 0.000 | 0.00 | | 0.0 | OK | | |
| 3.003 | 11 | 42.221 | -0.155 | 0.000 | 0.01 | | 0.2 | OK | | |
| 2.003 | 8 | 42.221 | -0.131 | 0.000 | 0.36 | | 8.5 | OK | | |
| 2.004 | 9 | 42.159 | -0.138 | 0.000 | 0.31 | | 10.7 | OK | | |
| 1.003 | 4 | 41.929 | -0.114 | 0.000 | 0.70 | | 20.3 | OK | | |
| 4.000 | 6 | 43.394 | -0.095 | 0.000 | 0.29 | | 5.6 | OK | 4 | |
| 4.001 | 7 | 42.850 | -0.065 | 0.000 | 0.58 | | 10.6 | OK | 12 | |
| 4.002 | 16 | 42.271 | -0.039 | 0.000 | 0.90 | | 13.6 | OK | 4 | |
| 1.004 | 5 | 41.796 | -0.219 | 0.000 | 0.16 | | 33.2 | OK | | |
| 5.000 | 21 | 42.493 | -0.107 | 0.000 | 0.18 | | 5.4 | OK | | |
| 5.001 | 22 | 42.237 | -0.059 | 0.000 | 0.67 | | 9.1 | OK | 10 | |
| 5.002 | 23 | 42.027 | -0.133 | 0.000 | 0.35 | | 11.9 | OK | 4 | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|-------|------------|-------|---------------|----------------|---------------------|-----------------|--------------------|---------------|-----------------|
| 5.003 | 24 | 15 | Winter | 1 | +0% | 100/15 | Summer | | 41.973 |
| 5.004 | 25 | 15 | Winter | 1 | +0% | 100/15 | Summer | | 41.823 |
| 5.005 | 26 | 15 | Winter | 1 | +0% | 100/15 | Summer | | 41.388 |
| 1.005 | 6 | 480 | Winter | 1 | +0% | 5/120 | Summer | | 41.050 |
| 1.006 | 27 | 480 | Winter | 1 | +0% | 1/60 | Winter | | 41.050 |

| PN | US/MH Name | Surcharged Flooded | | | Pipe | | Status | Level Exceeded |
|-------|------------|--------------------|--------------------------|-------------------|------------|------------|--------|----------------|
| | | Depth (m) | Volume (m ³) | Flow / Cap. (l/s) | Flow (l/s) | | | |
| 5.003 | 24 | -0.130 | 0.000 | 0.37 | 14.5 | OK | | |
| 5.004 | 25 | -0.114 | 0.000 | 0.47 | 19.2 | OK | | |
| 5.005 | 26 | -0.102 | 0.000 | 0.55 | 24.0 | OK | | |
| 1.005 | 6 | -0.043 | 0.000 | 0.09 | 11.0 | OK | | |
| 1.006 | 27 | 0.126 | 0.000 | 0.04 | 3.0 | SURCHARGED | | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 5 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 1.002 | 3 | 15 Winter | 5 | +0% | | | | |
| 2.000 | 4 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.001 | 5 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.002 | 6 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.000 | 10 | 120 Winter | 5 | +0% | | | | |
| 3.001 | 11 | 120 Winter | 5 | +0% | | | | |
| 3.002 | 10 | 120 Winter | 5 | +0% | 1000/15 Summer | | | |
| 3.003 | 11 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.003 | 8 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.004 | 9 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 4.000 | 6 | 15 Winter | 5 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 4.001 | 7 | 15 Winter | 5 | +0% | 5/15 Winter | 100/15 Summer | | |
| 4.002 | 16 | 15 Winter | 5 | +0% | 5/15 Summer | 1000/15 Summer | | |
| 1.004 | 5 | 15 Winter | 5 | +0% | | | | |
| 5.000 | 21 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 5.001 | 22 | 15 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 5.002 | 23 | 15 Winter | 5 | +0% | 100/15 Summer | 1000/15 Summer | | |

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


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 43.795 | 0.087 | 0.000 | 1.14 | 12.6 | SURCHARGED | 10 |
| 1.001 | 2 | 43.446 | -0.035 | 0.000 | 0.94 | 16.6 | OK | 1 |
| 1.002 | 3 | 42.528 | -0.135 | 0.000 | 0.33 | 16.4 | OK | |
| 2.000 | 4 | 42.795 | -0.077 | 0.000 | 0.45 | 5.8 | OK | |
| 2.001 | 5 | 42.517 | -0.072 | 0.000 | 0.53 | 8.3 | OK | |
| 2.002 | 6 | 42.389 | -0.044 | 0.000 | 0.83 | 10.9 | OK | |
| 3.000 | 10 | 43.030 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.001 | 11 | 42.669 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.002 | 10 | 42.353 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.003 | 11 | 42.255 | -0.121 | 0.000 | 0.02 | 0.3 | OK | |
| 2.003 | 8 | 42.255 | -0.097 | 0.000 | 0.61 | 14.3 | OK | |
| 2.004 | 9 | 42.190 | -0.107 | 0.000 | 0.52 | 18.0 | OK | |
| 1.003 | 4 | 42.043 | 0.000 | 0.000 | 1.02 | 29.7 | OK | |
| 4.000 | 6 | 43.413 | -0.076 | 0.000 | 0.48 | 9.3 | OK | 4 |
| 4.001 | 7 | 42.951 | 0.036 | 0.000 | 0.89 | 16.3 | SURCHARGED | 12 |
| 4.002 | 16 | 42.505 | 0.195 | 0.000 | 1.30 | 19.6 | SURCHARGED | 4 |
| 1.004 | 5 | 41.817 | -0.198 | 0.000 | 0.25 | 51.0 | OK | |
| 5.000 | 21 | 42.506 | -0.094 | 0.000 | 0.30 | 9.0 | OK | |
| 5.001 | 22 | 42.316 | 0.020 | 0.000 | 1.09 | 14.8 | SURCHARGED | 10 |
| 5.002 | 23 | 42.058 | -0.102 | 0.000 | 0.57 | 19.1 | OK | 4 |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|-------|------------|-------|---------------|----------------|---------------------|-----------------|--------------------|---------------|-----------------|
| 5.003 | 24 | 15 | Winter | 5 | +0% | 100/15 | Summer | | 42.005 |
| 5.004 | 25 | 15 | Winter | 5 | +0% | 100/15 | Summer | | 41.864 |
| 5.005 | 26 | 15 | Winter | 5 | +0% | 100/15 | Summer | | 41.438 |
| 1.005 | 6 | 600 | Winter | 5 | +0% | 5/120 | Summer | | 41.234 |
| 1.006 | 27 | 600 | Winter | 5 | +0% | 1/60 | Winter | | 41.234 |

| PN | US/MH Name | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|------------|--------------------------|-------------|----------------|------------|------------|----------------|
| | | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | |
| 5.003 | 24 | -0.098 | 0.000 | 0.60 | | 23.6 | OK | |
| 5.004 | 25 | -0.073 | 0.000 | 0.77 | | 31.4 | OK | |
| 5.005 | 26 | -0.052 | 0.000 | 0.91 | | 39.4 | OK | |
| 1.005 | 6 | 0.141 | 0.000 | 0.11 | | 13.8 | SURCHARGED | |
| 1.006 | 27 | 0.310 | 0.000 | 0.04 | | 3.0 | SURCHARGED | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 100 | +30% | 100/15 Summer | 1000/15 Winter | | |
| 1.002 | 3 | 15 Winter | 100 | +30% | | | | |
| 2.000 | 4 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 2.001 | 5 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 2.002 | 6 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 3.000 | 10 | 120 Winter | 100 | +30% | | | | |
| 3.001 | 11 | 120 Winter | 100 | +30% | | | | |
| 3.002 | 10 | 15 Winter | 100 | +30% | 1000/15 Summer | | | |
| 3.003 | 11 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 2.003 | 8 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 2.004 | 9 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 4.000 | 6 | 15 Winter | 100 | +30% | 100/15 Summer | 1000/15 Summer | | |
| 4.001 | 7 | 15 Winter | 100 | +30% | 5/15 Winter | 100/15 Summer | | |
| 4.002 | 16 | 15 Winter | 100 | +30% | 5/15 Summer | 1000/15 Summer | | |
| 1.004 | 5 | 15 Winter | 100 | +30% | | | | |
| 5.000 | 21 | 15 Winter | 100 | +30% | 100/15 Summer | | | |
| 5.001 | 22 | 15 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 5.002 | 23 | 15 Winter | 100 | +30% | 100/15 Summer | 1000/15 Summer | | |

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


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 44.910 | 1.202 | 1.748 | 1.82 | 20.2 | FLOOD | 10 |
| 1.001 | 2 | 44.430 | 0.949 | 0.000 | 1.45 | 25.6 | FLOOD RISK | 1 |
| 1.002 | 3 | 42.553 | -0.110 | 0.000 | 0.51 | 25.2 | OK | |
| 2.000 | 4 | 43.233 | 0.361 | 0.000 | 0.87 | 11.3 | SURCHARGED | |
| 2.001 | 5 | 43.028 | 0.439 | 0.000 | 0.99 | 15.5 | SURCHARGED | |
| 2.002 | 6 | 42.875 | 0.442 | 0.000 | 1.55 | 20.2 | SURCHARGED | |
| 3.000 | 10 | 43.030 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.001 | 11 | 42.669 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.002 | 10 | 42.477 | -0.026 | 0.000 | 0.04 | 0.9 | OK | |
| 3.003 | 11 | 42.505 | 0.129 | 0.000 | 0.10 | 2.0 | SURCHARGED | |
| 2.003 | 8 | 42.511 | 0.159 | 0.000 | 1.15 | 27.1 | SURCHARGED | |
| 2.004 | 9 | 42.445 | 0.148 | 0.000 | 1.03 | 35.9 | SURCHARGED | |
| 1.003 | 4 | 42.067 | 0.024 | 0.000 | 2.06 | 59.9 | SURCHARGED | |
| 4.000 | 6 | 44.614 | 1.125 | 0.000 | 0.90 | 17.4 | FLOOD RISK | 4 |
| 4.001 | 7 | 44.118 | 1.203 | 2.871 | 1.38 | 25.2 | FLOOD | 12 |
| 4.002 | 16 | 43.391 | 1.081 | 0.000 | 2.14 | 32.4 | FLOOD RISK | 4 |
| 1.004 | 5 | 41.859 | -0.156 | 0.000 | 0.46 | 94.8 | OK | |
| 5.000 | 21 | 43.620 | 1.020 | 0.000 | 0.60 | 18.1 | FLOOD RISK | |
| 5.001 | 22 | 43.497 | 1.201 | 1.609 | 2.03 | 27.6 | FLOOD | 10 |
| 5.002 | 23 | 43.332 | 1.172 | 0.000 | 1.00 | 33.6 | FLOOD RISK | 4 |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|-------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|-----------------|
| 5.003 | 24 | 15 Winter | 100 | +30% | 100/15 Summer | | | | 43.305 |
| 5.004 | 25 | 15 Winter | 100 | +30% | 100/15 Summer | | | | 43.185 |
| 5.005 | 26 | 15 Winter | 100 | +30% | 100/15 Summer | | | | 42.603 |
| 1.005 | 6 | 960 Winter | 100 | +30% | 5/120 Summer | | | | 41.808 |
| 1.006 | 27 | 960 Winter | 100 | +30% | 1/60 Winter | | | | 41.807 |

| PN | US/MH Name | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|------------|--------------------------|-------------------|----------------|------------|------------|----------------|
| | | Depth (m) | Volume (m ³) | Flow / Cap. (l/s) | Overflow (l/s) | Flow (l/s) | Status | |
| 5.003 | 24 | 1.202 | 0.000 | 1.00 | | 39.2 | SURCHARGED | |
| 5.004 | 25 | 1.248 | 0.000 | 1.24 | | 50.8 | SURCHARGED | |
| 5.005 | 26 | 1.113 | 0.000 | 1.60 | | 69.2 | SURCHARGED | |
| 1.005 | 6 | 0.715 | 0.000 | 0.19 | | 23.5 | SURCHARGED | |
| 1.006 | 27 | 0.883 | 0.000 | 0.04 | | 3.1 | SURCHARGED | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 30 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 1.001 | 2 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Winter | | |
| 1.002 | 3 | 15 Winter | 1000 | +0% | | | | |
| 2.000 | 4 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 2.001 | 5 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 2.002 | 6 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.000 | 10 | 120 Winter | 1000 | +0% | | | | |
| 3.001 | 11 | 120 Winter | 1000 | +0% | | | | |
| 3.002 | 10 | 15 Winter | 1000 | +0% | 1000/15 Summer | | | |
| 3.003 | 11 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 2.003 | 8 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 2.004 | 9 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 4.000 | 6 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 4.001 | 7 | 30 Winter | 1000 | +0% | 5/15 Winter | 100/15 Summer | | |
| 4.002 | 16 | 15 Winter | 1000 | +0% | 5/15 Summer | 1000/15 Summer | | |
| 1.004 | 5 | 960 Winter | 1000 | +0% | | | | |
| 5.000 | 21 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 5.001 | 22 | 30 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 5.002 | 23 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Summer | | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 44.914 | 1.206 | 5.756 | 1.91 | 21.1 | FLOOD | 10 |
| 1.001 | 2 | 44.681 | 1.200 | 0.072 | 1.54 | 27.2 | FLOOD | 1 |
| 1.002 | 3 | 42.558 | -0.105 | 0.000 | 0.54 | 26.8 | OK | |
| 2.000 | 4 | 43.696 | 0.824 | 0.000 | 0.99 | 12.9 | SURCHARGED | |
| 2.001 | 5 | 43.394 | 0.805 | 0.000 | 1.16 | 18.1 | SURCHARGED | |
| 2.002 | 6 | 43.186 | 0.753 | 0.000 | 1.82 | 23.7 | SURCHARGED | |
| 3.000 | 10 | 43.030 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.001 | 11 | 42.669 | -0.150 | 0.000 | 0.00 | 0.0 | OK | |
| 3.002 | 10 | 42.651 | 0.148 | 0.000 | 0.15 | 3.2 | SURCHARGED | |
| 3.003 | 11 | 42.661 | 0.285 | 0.000 | 0.22 | 4.4 | SURCHARGED | |
| 2.003 | 8 | 42.669 | 0.317 | 0.000 | 1.37 | 32.2 | SURCHARGED | |
| 2.004 | 9 | 42.585 | 0.288 | 0.000 | 1.19 | 41.8 | SURCHARGED | |
| 1.003 | 4 | 42.086 | 0.043 | 0.000 | 2.33 | 67.9 | SURCHARGED | |
| 4.000 | 6 | 44.690 | 1.201 | 0.970 | 0.99 | 19.4 | FLOOD | 4 |
| 4.001 | 7 | 44.124 | 1.209 | 8.851 | 1.41 | 25.7 | FLOOD | 12 |
| 4.002 | 16 | 43.511 | 1.201 | 0.308 | 2.26 | 34.1 | FLOOD | 4 |
| 1.004 | 5 | 41.967 | -0.048 | 0.000 | 0.08 | 17.3 | OK | |
| 5.000 | 21 | 43.740 | 1.140 | 0.000 | 0.88 | 26.5 | FLOOD RISK | |
| 5.001 | 22 | 43.506 | 1.210 | 10.178 | 2.42 | 32.9 | FLOOD | 10 |
| 5.002 | 23 | 43.528 | 1.368 | 1.911 | 1.13 | 38.0 | FLOOD | 4 |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|-------|------------|-------|---------------|----------------|---------------------|-----------------|--------------------|---------------|-----------------|
| 5.003 | 24 | 15 | Winter | 1000 | +0% | 100/15 | Summer | | 43.592 |
| 5.004 | 25 | 15 | Winter | 1000 | +0% | 100/15 | Summer | | 43.577 |
| 5.005 | 26 | 15 | Winter | 1000 | +0% | 100/15 | Summer | | 43.065 |
| 1.005 | 6 | 960 | Winter | 1000 | +0% | 5/120 | Summer | | 41.965 |
| 1.006 | 27 | 960 | Winter | 1000 | +0% | 1/60 | Winter | | 41.965 |

| PN | US/MH Name | Surcharged | | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|------------|--------------------------|-------------|--------------|----------------|------------|--|----------------|
| | | Depth (m) | Volume (m ³) | Flow / Cap. | Flow / (l/s) | Overflow (l/s) | Status | | |
| 5.003 | 24 | 1.489 | 0.000 | 1.02 | 39.8 | | SURCHARGED | | |
| 5.004 | 25 | 1.640 | 0.000 | 1.26 | 51.5 | | SURCHARGED | | |
| 5.005 | 26 | 1.575 | 0.000 | 1.79 | 77.5 | | SURCHARGED | | |
| 1.005 | 6 | 0.872 | 0.000 | 0.23 | 28.6 | | SURCHARGED | | |
| 1.006 | 27 | 1.041 | 0.000 | 0.04 | 3.3 | | SURCHARGED | | |


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Existing Network Details for Storm

* - Indicates pipe has been modified outside of System 1


| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | n | HYD SECT | DIA (mm) |
|---------|---------------|-------------|----------------|----------------|----------------|-----------|-------|-------------|-------------|
| 2.000 | 41.987 | 0.304 | 138.1 | 0.000 | 5.00 | | 0.350 | 3 \=/ | 2000 |
| 2.001 | 27.842 | 0.152 | 183.2 | 0.039 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.002 | 26.506 | 0.071 | 373.3 | 0.036 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.003 | 27.201 | 0.068 | 400.0 | 0.036 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.004 | 27.212 | 0.068 | 400.2 | 0.036 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.005 | 26.840 | 0.067 | 400.6 | 0.036 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.006 | 27.178 | 0.068 | 399.7 | 0.035 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.007 | 27.131 | 0.177 | 153.3 | 0.035 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 2.008 | 27.542 | 0.335 | 82.2 | 0.035 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| * 2.009 | 26.442 | 0.088 | 300.0 | 0.070 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| * 3.000 | 9.413 | 1.457 | 6.5 | 0.029 | 5.00 | 0.600 | | o | 150 |
| * 3.001 | 8.941 | 0.100 | 89.4 | 0.000 | 0.00 | 0.600 | | o | 300 |
| 4.000 | 32.407 | 0.081 | 400.1 | 0.045 | 5.00 | | 0.350 | 3 \=/ | 2000 |
| 4.001 | 35.818 | 0.119 | 301.0 | 0.045 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| * 4.002 | 22.867 | 0.252 | 90.7 | 0.046 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| * 2.010 | 16.613 | 0.248 | 67.0 | 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) |
|---------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 2.000 | 5 | 42.811 | 42.211 | 0.450 | 42.507 | 41.907 | 0.450 | | 2000 x 2000 |
| 2.001 | 6 | 42.507 | 41.907 | 0.450 | 42.355 | 41.755 | 0.450 | | 2000 x 2000 |
| 2.002 | 7 | 42.355 | 41.755 | 0.450 | 42.284 | 41.684 | 0.450 | | 2000 x 2000 |
| 2.003 | 8 | 42.284 | 41.684 | 0.450 | 42.414 | 41.616 | 0.648 | | 2000 x 2000 |
| 2.004 | 9 | 42.414 | 41.616 | 0.648 | 42.420 | 41.548 | 0.722 | | 2000 x 2000 |
| 2.005 | 10 | 42.420 | 41.548 | 0.722 | 42.229 | 41.481 | 0.598 | | 2000 x 2000 |
| 2.006 | 11 | 42.229 | 41.481 | 0.598 | 42.083 | 41.413 | 0.520 | | 2000 x 2000 |
| 2.007 | 12 | 42.083 | 41.413 | 0.520 | 41.836 | 41.236 | 0.450 | | 2000 x 2000 |
| 2.008 | 13 | 41.836 | 41.236 | 0.450 | 41.503 | 40.901 | 0.452 | | 2000 x 2000 |
| * 2.009 | 14 | 41.503 | 40.901 | 0.452 | 41.769 | 40.813 | 0.806 | | 2000 x 2000 |
| * 3.000 | 11 | 42.720 | 42.370 | 0.200 | 41.688 | 40.913 | 0.625 | | 1200 |
| * 3.001 | 12 | 41.688 | 40.913 | 0.475 | 41.769 | 40.813 | 0.656 | | 1200 |
| 4.000 | 12 | 41.865 | 41.265 | 0.450 | 41.820 | 41.184 | 0.486 | | 2000 x 2000 |
| 4.001 | 13 | 41.820 | 41.184 | 0.486 | 41.811 | 41.065 | 0.596 | | 2000 x 2000 |
| * 4.002 | 14 | 41.811 | 41.065 | 0.596 | 41.769 | 40.813 | 0.806 | | 2000 x 2000 |
| * 2.010 | 5 | 41.769 | 40.813 | 0.731 | 41.921 | 40.565 | 1.131 | Hydro-Brake® | 1200 |

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Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | Pipe Out | | Pipes In | | | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|----------|------------------|---------------|-------|------------------|---------------|
| | | | | | PN | Invert Level (m) | Diameter (mm) | PN | Invert Level (m) | |
| 5 | 42.811 | 0.600 | Open Manhole | 2000 x 2000 | 2.000 | 42.211 | 2000 | | | |
| 6 | 42.507 | 0.600 | Open Manhole | 2000 x 2000 | 2.001 | 41.907 | 2000 | 2.000 | 41.907 | 2000 |
| 7 | 42.355 | 0.600 | Open Manhole | 2000 x 2000 | 2.002 | 41.755 | 2000 | 2.001 | 41.755 | 2000 |
| 8 | 42.284 | 0.600 | Open Manhole | 2000 x 2000 | 2.003 | 41.684 | 2000 | 2.002 | 41.684 | 2000 |
| 9 | 42.414 | 0.798 | Open Manhole | 2000 x 2000 | 2.004 | 41.616 | 2000 | 2.003 | 41.616 | 2000 |
| 10 | 42.420 | 0.872 | Open Manhole | 2000 x 2000 | 2.005 | 41.548 | 2000 | 2.004 | 41.548 | 2000 |
| 11 | 42.229 | 0.748 | Open Manhole | 2000 x 2000 | 2.006 | 41.481 | 2000 | 2.005 | 41.481 | 2000 |
| 12 | 42.083 | 0.670 | Open Manhole | 2000 x 2000 | 2.007 | 41.413 | 2000 | 2.006 | 41.413 | 2000 |
| 13 | 41.836 | 0.600 | Open Manhole | 2000 x 2000 | 2.008 | 41.236 | 2000 | 2.007 | 41.236 | 2000 |
| 14 | 41.503 | 0.602 | Open Manhole | 2000 x 2000 | 2.009 | 40.901 | 2000 | 2.008 | 40.901 | 2000 |
| 11 | 42.720 | 0.350 | Open Manhole | 1200 | 3.000 | 42.370 | 150 | | | |
| 12 | 41.688 | 0.775 | Open Manhole | 1200 | 3.001 | 40.913 | 300 | 3.000 | 40.913 | 150 |
| 12 | 41.865 | 0.600 | Open Manhole | 2000 x 2000 | 4.000 | 41.265 | 2000 | | | |
| 13 | 41.820 | 0.636 | Open Manhole | 2000 x 2000 | 4.001 | 41.184 | 2000 | 4.000 | 41.184 | 2000 |
| 14 | 41.811 | 0.746 | Open Manhole | 2000 x 2000 | 4.002 | 41.065 | 2000 | 4.001 | 41.065 | 2000 |
| 5 | 41.769 | 0.956 | Open Manhole | 1200 | 2.010 | 40.813 | 225 | 2.009 | 40.813 | 2000 |
| | | | | | | | | 3.001 | 40.813 | 300 |
| | | | | | | | | 4.002 | 40.813 | 2000 |
| | 41.921 | 1.356 | Open Manhole | 0 | | OUTFALL | | 2.010 | 40.565 | 225 |

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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 2.000 | 3 \=/ | 2000 | 5 | 42.811 | 42.211 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.001 | 3 \=/ | 2000 | 6 | 42.507 | 41.907 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.002 | 3 \=/ | 2000 | 7 | 42.355 | 41.755 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.003 | 3 \=/ | 2000 | 8 | 42.284 | 41.684 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.004 | 3 \=/ | 2000 | 9 | 42.414 | 41.616 | 0.648 | Open Manhole | 2000 x 2000 |
| 2.005 | 3 \=/ | 2000 | 10 | 42.420 | 41.548 | 0.722 | Open Manhole | 2000 x 2000 |
| 2.006 | 3 \=/ | 2000 | 11 | 42.229 | 41.481 | 0.598 | Open Manhole | 2000 x 2000 |
| 2.007 | 3 \=/ | 2000 | 12 | 42.083 | 41.413 | 0.520 | Open Manhole | 2000 x 2000 |
| 2.008 | 3 \=/ | 2000 | 13 | 41.836 | 41.236 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.009 | 3 \=/ | 2000 | 14 | 41.503 | 40.901 | 0.452 | Open Manhole | 2000 x 2000 |
| 3.000 | o | 150 | 11 | 42.720 | 42.370 | 0.200 | Open Manhole | 1200 |
| 3.001 | o | 300 | 12 | 41.688 | 40.913 | 0.475 | Open Manhole | 1200 |
| 4.000 | 3 \=/ | 2000 | 12 | 41.865 | 41.265 | 0.450 | Open Manhole | 2000 x 2000 |
| 4.001 | 3 \=/ | 2000 | 13 | 41.820 | 41.184 | 0.486 | Open Manhole | 2000 x 2000 |
| 4.002 | 3 \=/ | 2000 | 14 | 41.811 | 41.065 | 0.596 | Open Manhole | 2000 x 2000 |
| 2.010 | o | 225 | 5 | 41.769 | 40.813 | 0.731 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 2.000 | 41.987 | 138.1 | 6 | 42.507 | 41.907 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.001 | 27.842 | 183.2 | 7 | 42.355 | 41.755 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.002 | 26.506 | 373.3 | 8 | 42.284 | 41.684 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.003 | 27.201 | 400.0 | 9 | 42.414 | 41.616 | 0.648 | Open Manhole | 2000 x 2000 |
| 2.004 | 27.212 | 400.2 | 10 | 42.420 | 41.548 | 0.722 | Open Manhole | 2000 x 2000 |
| 2.005 | 26.840 | 400.6 | 11 | 42.229 | 41.481 | 0.598 | Open Manhole | 2000 x 2000 |
| 2.006 | 27.178 | 399.7 | 12 | 42.083 | 41.413 | 0.520 | Open Manhole | 2000 x 2000 |
| 2.007 | 27.131 | 153.3 | 13 | 41.836 | 41.236 | 0.450 | Open Manhole | 2000 x 2000 |
| 2.008 | 27.542 | 82.2 | 14 | 41.503 | 40.901 | 0.452 | Open Manhole | 2000 x 2000 |
| 2.009 | 26.442 | 300.0 | 5 | 41.769 | 40.813 | 0.806 | Open Manhole | 1200 |
| 3.000 | 9.413 | 6.5 | 12 | 41.688 | 40.913 | 0.625 | Open Manhole | 1200 |
| 3.001 | 8.941 | 89.4 | 5 | 41.769 | 40.813 | 0.656 | Open Manhole | 1200 |
| 4.000 | 32.407 | 400.1 | 13 | 41.820 | 41.184 | 0.486 | Open Manhole | 2000 x 2000 |
| 4.001 | 35.818 | 301.0 | 14 | 41.811 | 41.065 | 0.596 | Open Manhole | 2000 x 2000 |
| 4.002 | 22.867 | 90.7 | 5 | 41.769 | 40.813 | 0.806 | Open Manhole | 1200 |
| 2.010 | 16.613 | 67.0 | | 41.921 | 40.565 | 1.131 | Open Manhole | 0 |


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Simulation Criteria for Storm

| | | | |
|---------------------------------|-------|--|-------|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | |
|-----------------------|---------------------------------|
| Rainfall Model | FEH |
| Return Period (years) | 1 |
| Site Location | GB 298450 168700 SS 98450 68700 |
| C (1km) | -0.025 |
| D1 (1km) | 0.403 |
| D2 (1km) | 0.318 |
| D3 (1km) | 0.301 |
| E (1km) | 0.285 |
| F (1km) | 2.515 |
| Summer Storms | Yes |
| Winter Storms | No |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Storm Duration (mins) | 30 |

| | | |
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Online Controls for Storm


Hydro-Brake Optimum® Manhole: 5, DS/PN: 2.010, Volume (m³): 125.8

Unit Reference MD-SHE-0091-3000-0400-3000
Design Head (m) 0.400
Design Flow (l/s) 3.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 91
Invert Level (m) 40.813
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

| Control Points | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 0.400 | 3.0 |
| Flush-Flo™ | 0.141 | 3.0 |
| Kick-Flo® | 0.297 | 2.6 |
| Mean Flow over Head Range | - | 2.5 |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 2.8 | 1.200 | 5.0 | 3.000 | 7.7 | 7.000 | 11.6 |
| 0.200 | 2.9 | 1.400 | 5.4 | 3.500 | 8.2 | 7.500 | 12.0 |
| 0.300 | 2.6 | 1.600 | 5.7 | 4.000 | 8.8 | 8.000 | 12.4 |
| 0.400 | 3.0 | 1.800 | 6.0 | 4.500 | 9.3 | 8.500 | 12.8 |
| 0.500 | 3.3 | 2.000 | 6.3 | 5.000 | 9.8 | 9.000 | 13.1 |
| 0.600 | 3.6 | 2.200 | 6.6 | 5.500 | 10.3 | 9.500 | 13.5 |
| 0.800 | 4.1 | 2.400 | 6.9 | 6.000 | 10.7 | | |
| 1.000 | 4.6 | 2.600 | 7.2 | 6.500 | 11.2 | | |


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Storage Structures for Storm

Tank or Pond Manhole: 5, DS/PN: 2.010


Invert Level (m) 40.813

| Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000 | 145.0 | 1.400 | 0.0 | 2.800 | 0.0 | 4.200 | 0.0 |
| 0.200 | 180.0 | 1.600 | 0.0 | 3.000 | 0.0 | 4.400 | 0.0 |
| 0.400 | 220.0 | 1.800 | 0.0 | 3.200 | 0.0 | 4.600 | 0.0 |
| 0.600 | 270.0 | 2.000 | 0.0 | 3.400 | 0.0 | 4.800 | 0.0 |
| 0.800 | 320.0 | 2.200 | 0.0 | 3.600 | 0.0 | 5.000 | 0.0 |
| 1.000 | 391.0 | 2.400 | 0.0 | 3.800 | 0.0 | | |
| 1.200 | 0.0 | 2.600 | 0.0 | 4.000 | 0.0 | | |

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

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 2.000 | 5 | 42.211 | -0.600 | 0.000 | 0.00 | 0.0 | OK | |
| 2.001 | 6 | 41.957 | -0.550 | 0.000 | 0.01 | 2.9 | OK | |
| 2.002 | 7 | 41.839 | -0.516 | 0.000 | 0.02 | 4.3 | OK | |
| 2.003 | 8 | 41.781 | -0.503 | 0.000 | 0.03 | 5.1 | OK | |
| 2.004 | 9 | 41.721 | -0.693 | 0.000 | 0.02 | 6.0 | OK | |
| 2.005 | 10 | 41.657 | -0.763 | 0.000 | 0.02 | 6.8 | OK | |
| 2.006 | 11 | 41.588 | -0.641 | 0.000 | 0.03 | 7.5 | OK | |
| 2.007 | 12 | 41.499 | -0.584 | 0.000 | 0.02 | 8.2 | OK | |
| 2.008 | 13 | 41.313 | -0.523 | 0.000 | 0.02 | 9.1 | OK | |
| 2.009 | 14 | 41.052 | -0.451 | 0.000 | 0.03 | 6.9 | OK | 7 |
| 3.000 | 11 | 42.393 | -0.127 | 0.000 | 0.06 | 3.6 | OK | |
| 3.001 | 12 | 41.050 | -0.163 | 0.000 | 0.01 | 0.6 | OK | |
| 4.000 | 12 | 41.353 | -0.512 | 0.000 | 0.03 | 5.2 | OK | |
| 4.001 | 13 | 41.272 | -0.548 | 0.000 | 0.03 | 6.0 | OK | |
| 4.002 | 14 | 41.139 | -0.672 | 0.000 | 0.01 | 8.1 | OK | |
| 2.010 | 5 | 41.050 | 0.012 | 0.000 | 0.05 | 3.0 | SURCHARGED | |

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| Midpoint | St Athan |  |
| Alencon Link | Catchment D | |
| Basingstoke | Summary of Results | |
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5 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|--------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 2.000 | 5 120 | Winter | 5 | +0% | | | | |
| 2.001 | 6 15 | Winter | 5 | +0% | | | | |
| 2.002 | 7 30 | Winter | 5 | +0% | | | | |
| 2.003 | 8 30 | Winter | 5 | +0% | | | | |
| 2.004 | 9 60 | Winter | 5 | +0% | | | | |
| 2.005 | 10 60 | Winter | 5 | +0% | | | | |
| 2.006 | 11 60 | Winter | 5 | +0% | | | | |
| 2.007 | 12 60 | Winter | 5 | +0% | | | | |
| 2.008 | 13 60 | Winter | 5 | +0% | | | | |
| 2.009 | 14 360 | Winter | 5 | +0% | 1000/240 Winter | 1000/240 Winter | | |
| 3.000 | 11 15 | Winter | 5 | +0% | | | | |
| 3.001 | 12 360 | Winter | 5 | +0% | 100/30 Winter | | | |
| 4.000 | 12 15 | Winter | 5 | +0% | | | | |
| 4.001 | 13 30 | Winter | 5 | +0% | | | | |
| 4.002 | 14 30 | Winter | 5 | +0% | | | | |
| 2.010 | 5 360 | Winter | 5 | +0% | 1/180 Winter | | | |

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

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 2.000 | 5 | 42.211 | -0.600 | 0.000 | 0.00 | 0.0 | OK | |
| 2.001 | 6 | 41.978 | -0.529 | 0.000 | 0.02 | 5.3 | OK | |
| 2.002 | 7 | 41.869 | -0.486 | 0.000 | 0.04 | 7.2 | OK | |
| 2.003 | 8 | 41.809 | -0.475 | 0.000 | 0.05 | 8.1 | OK | |
| 2.004 | 9 | 41.749 | -0.665 | 0.000 | 0.03 | 9.1 | OK | |
| 2.005 | 10 | 41.685 | -0.735 | 0.000 | 0.03 | 10.1 | OK | |
| 2.006 | 11 | 41.616 | -0.613 | 0.000 | 0.04 | 11.0 | OK | |
| 2.007 | 12 | 41.521 | -0.562 | 0.000 | 0.03 | 12.2 | OK | |
| 2.008 | 13 | 41.335 | -0.501 | 0.000 | 0.04 | 14.1 | OK | |
| 2.009 | 14 | 41.159 | -0.344 | 0.000 | 0.05 | 10.3 | OK | 7 |
| 3.000 | 11 | 42.401 | -0.119 | 0.000 | 0.10 | 6.0 | OK | |
| 3.001 | 12 | 41.158 | -0.055 | 0.000 | 0.01 | 0.9 | OK | |
| 4.000 | 12 | 41.387 | -0.478 | 0.000 | 0.05 | 8.6 | OK | |
| 4.001 | 13 | 41.300 | -0.520 | 0.000 | 0.04 | 9.7 | OK | |
| 4.002 | 14 | 41.166 | -0.645 | 0.000 | 0.02 | 14.1 | OK | |
| 2.010 | 5 | 41.158 | 0.120 | 0.000 | 0.05 | 3.0 | SURCHARGED | |

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

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| | | | | | | | | |
| 2.000 | 5 | 42.211 | -0.600 | 0.000 | 0.00 | 0.0 | OK | |
| 2.001 | 6 | 42.036 | -0.471 | 0.000 | 0.06 | 14.7 | OK | |
| 2.002 | 7 | 41.951 | -0.404 | 0.000 | 0.10 | 17.9 | OK | |
| 2.003 | 8 | 41.897 | -0.387 | 0.000 | 0.11 | 19.4 | OK | |
| 2.004 | 9 | 41.842 | -0.572 | 0.000 | 0.07 | 22.7 | OK | |
| 2.005 | 10 | 41.780 | -0.640 | 0.000 | 0.07 | 25.6 | OK | |
| 2.006 | 11 | 41.711 | -0.518 | 0.000 | 0.10 | 28.1 | OK | |
| 2.007 | 12 | 41.598 | -0.485 | 0.000 | 0.09 | 30.8 | OK | |
| 2.008 | 13 | 41.454 | -0.382 | 0.000 | 0.04 | 14.5 | OK | |
| 2.009 | 14 | 41.454 | -0.049 | 0.000 | 0.07 | 15.1 | FLOOD RISK | 7 |
| 3.000 | 11 | 42.419 | -0.101 | 0.000 | 0.24 | 14.7 | OK | |
| 3.001 | 12 | 41.453 | 0.240 | 0.000 | 0.02 | 1.6 | FLOOD RISK | |
| 4.000 | 12 | 41.469 | -0.396 | 0.000 | 0.13 | 22.0 | OK | |
| 4.001 | 13 | 41.452 | -0.368 | 0.000 | 0.02 | 4.6 | OK | |
| 4.002 | 14 | 41.453 | -0.358 | 0.000 | 0.01 | 5.4 | OK | |
| 2.010 | 5 | 41.453 | 0.415 | 0.000 | 0.07 | 3.7 | SURCHARGED | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|--------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 2.000 | 5 120 | Winter | 1000 | +0% | | | | |
| 2.001 | 6 15 | Winter | 1000 | +0% | | | | |
| 2.002 | 7 30 | Winter | 1000 | +0% | | | | |
| 2.003 | 8 60 | Winter | 1000 | +0% | | | | |
| 2.004 | 9 60 | Winter | 1000 | +0% | | | | |
| 2.005 | 10 60 | Winter | 1000 | +0% | | | | |
| 2.006 | 11 60 | Winter | 1000 | +0% | | | | |
| 2.007 | 12 60 | Winter | 1000 | +0% | | | | |
| 2.008 | 13 600 | Winter | 1000 | +0% | | | | |
| 2.009 | 14 600 | Winter | 1000 | +0% | 1000/240 Winter | 1000/240 Winter | | |
| 3.000 | 11 15 | Winter | 1000 | +0% | | | | |
| 3.001 | 12 600 | Winter | 1000 | +0% | 100/30 Winter | | | |
| 4.000 | 12 600 | Winter | 1000 | +0% | | | | |
| 4.001 | 13 600 | Winter | 1000 | +0% | | | | |
| 4.002 | 14 600 | Winter | 1000 | +0% | | | | |
| 2.010 | 5 600 | Winter | 1000 | +0% | 1/180 Winter | | | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 2.000 | 5 | 42.211 | -0.600 | 0.000 | 0.00 | 0.0 | OK | |
| 2.001 | 6 | 42.053 | -0.454 | 0.000 | 0.07 | 18.2 | OK | |
| 2.002 | 7 | 41.978 | -0.377 | 0.000 | 0.12 | 22.2 | OK | |
| 2.003 | 8 | 41.930 | -0.354 | 0.000 | 0.14 | 24.5 | OK | |
| 2.004 | 9 | 41.877 | -0.537 | 0.000 | 0.09 | 29.2 | OK | |
| 2.005 | 10 | 41.817 | -0.603 | 0.000 | 0.09 | 33.2 | OK | |
| 2.006 | 11 | 41.747 | -0.482 | 0.000 | 0.13 | 36.8 | OK | |
| 2.007 | 12 | 41.628 | -0.455 | 0.000 | 0.11 | 40.4 | OK | |
| 2.008 | 13 | 41.528 | -0.308 | 0.000 | 0.05 | 17.5 | OK | |
| 2.009 | 14 | 41.527 | 0.024 | 23.995 | 0.09 | 18.2 | FLOOD | 7 |
| 3.000 | 11 | 42.426 | -0.094 | 0.000 | 0.30 | 18.4 | FLOOD RISK | |
| 3.001 | 12 | 41.525 | 0.312 | 0.000 | 0.02 | 2.0 | FLOOD RISK | |
| 4.000 | 12 | 41.525 | -0.340 | 0.000 | 0.02 | 3.1 | OK | |
| 4.001 | 13 | 41.525 | -0.295 | 0.000 | 0.02 | 5.1 | FLOOD RISK | |
| 4.002 | 14 | 41.526 | -0.285 | 0.000 | 0.01 | 5.7 | FLOOD RISK | |
| 2.010 | 5 | 41.526 | 0.488 | 0.000 | 0.07 | 3.9 | FLOOD RISK | |

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Existing Network Details for Storm


| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|
| 2.000 | 72.446 | 0.359 | 201.8 | 0.223 | 5.00 | 0.600 | o | 225 |
| 2.001 | 66.032 | 0.365 | 180.9 | 0.081 | 0.00 | 0.600 | o | 225 |
| 2.002 | 23.959 | 0.154 | 155.6 | 0.029 | 0.00 | 0.600 | o | 225 |
| 2.003 | 46.151 | 0.257 | 179.6 | 0.055 | 0.00 | 0.600 | o | 225 |
| 2.004 | 46.417 | 0.259 | 179.2 | 0.055 | 0.00 | 0.600 | o | 225 |
| 2.005 | 80.000 | 0.498 | 160.6 | 0.063 | 0.00 | 0.600 | o | 225 |
| 2.006 | 82.487 | 0.497 | 166.0 | 0.084 | 0.00 | 0.600 | o | 300 |
| 2.007 | 15.656 | 0.039 | 400.0 | 0.024 | 0.00 | 0.600 | o | 300 |
| 2.008 | 9.125 | 0.016 | 555.6 | 0.034 | 0.00 | 0.600 | o | 375 |
| 2.009 | 18.891 | 0.034 | 555.6 | 0.077 | 0.00 | 0.600 | o | 375 |
| 2.010 | 11.767 | 0.021 | 555.6 | 0.000 | 0.00 | 0.600 | o | 375 |
| 2.011 | 18.076 | 0.103 | 175.0 | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 2.000 | 2 | 43.489 | 42.664 | 0.600 | 43.130 | 42.305 | 0.600 | | 1200 |
| 2.001 | 3 | 43.130 | 42.305 | 0.600 | 42.765 | 41.940 | 0.600 | | 1200 |
| 2.002 | 4 | 42.765 | 41.940 | 0.600 | 42.611 | 41.786 | 0.600 | | 1200 |
| 2.003 | 5 | 42.611 | 41.786 | 0.600 | 42.354 | 41.529 | 0.600 | | 1200 |
| 2.004 | 6 | 42.354 | 41.529 | 0.600 | 42.095 | 41.270 | 0.600 | | 1200 |
| 2.005 | 7 | 42.095 | 41.270 | 0.600 | 41.597 | 40.772 | 0.600 | | 1200 |
| 2.006 | 8 | 41.597 | 40.697 | 0.600 | 41.100 | 40.200 | 0.600 | | 1200 |
| 2.007 | 9 | 41.100 | 40.200 | 0.600 | 41.225 | 40.161 | 0.765 | | 1200 |
| 2.008 | 10 | 41.225 | 40.086 | 0.764 | 41.536 | 40.070 | 1.091 | | 1200 |
| 2.009 | 11 | 41.536 | 40.070 | 1.091 | 41.415 | 40.036 | 1.004 | | 1200 |
| 2.010 | 12 | 41.415 | 40.036 | 1.004 | 41.448 | 40.015 | 1.058 | | 1200 |
| 2.011 | 13 | 41.448 | 40.015 | 1.283 | 41.049 | 39.912 | 0.988 | Hydro-Brake® | 1200 |

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Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|-------|---------------------------|------------------------|-------|---------------------------|------------------------|---------------|
| 2 | 43.489 | 0.825 | Open Manhole | 1200 | 2.000 | 42.664 | 225 | | | | |
| 3 | 43.130 | 0.825 | Open Manhole | 1200 | 2.001 | 42.305 | 225 | 2.000 | 42.305 | 225 | |
| 4 | 42.765 | 0.825 | Open Manhole | 1200 | 2.002 | 41.940 | 225 | 2.001 | 41.940 | 225 | |
| 5 | 42.611 | 0.825 | Open Manhole | 1200 | 2.003 | 41.786 | 225 | 2.002 | 41.786 | 225 | |
| 6 | 42.354 | 0.825 | Open Manhole | 1200 | 2.004 | 41.529 | 225 | 2.003 | 41.529 | 225 | |
| 7 | 42.095 | 0.825 | Open Manhole | 1200 | 2.005 | 41.270 | 225 | 2.004 | 41.270 | 225 | |
| 8 | 41.597 | 0.900 | Open Manhole | 1200 | 2.006 | 40.697 | 300 | 2.005 | 40.772 | 225 | |
| 9 | 41.100 | 0.900 | Open Manhole | 1200 | 2.007 | 40.200 | 300 | 2.006 | 40.200 | 300 | |
| 10 | 41.225 | 1.139 | Open Manhole | 1200 | 2.008 | 40.086 | 375 | 2.007 | 40.161 | 300 | |
| 11 | 41.536 | 1.466 | Open Manhole | 1200 | 2.009 | 40.070 | 375 | 2.008 | 40.070 | 375 | |
| 12 | 41.415 | 1.379 | Open Manhole | 1200 | 2.010 | 40.036 | 375 | 2.009 | 40.036 | 375 | |
| 13 | 41.448 | 1.433 | Open Manhole | 1200 | 2.011 | 40.015 | 150 | 2.010 | 40.015 | 375 | |
| | 41.049 | 1.138 | Open Manhole | 0 | | OUTFALL | | 2.011 | 39.912 | 150 | |

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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 2.000 | o | 225 | 2 | 43.489 | 42.664 | 0.600 | Open Manhole | 1200 |
| 2.001 | o | 225 | 3 | 43.130 | 42.305 | 0.600 | Open Manhole | 1200 |
| 2.002 | o | 225 | 4 | 42.765 | 41.940 | 0.600 | Open Manhole | 1200 |
| 2.003 | o | 225 | 5 | 42.611 | 41.786 | 0.600 | Open Manhole | 1200 |
| 2.004 | o | 225 | 6 | 42.354 | 41.529 | 0.600 | Open Manhole | 1200 |
| 2.005 | o | 225 | 7 | 42.095 | 41.270 | 0.600 | Open Manhole | 1200 |
| 2.006 | o | 300 | 8 | 41.597 | 40.697 | 0.600 | Open Manhole | 1200 |
| 2.007 | o | 300 | 9 | 41.100 | 40.200 | 0.600 | Open Manhole | 1200 |
| 2.008 | o | 375 | 10 | 41.225 | 40.086 | 0.764 | Open Manhole | 1200 |
| 2.009 | o | 375 | 11 | 41.536 | 40.070 | 1.091 | Open Manhole | 1200 |
| 2.010 | o | 375 | 12 | 41.415 | 40.036 | 1.004 | Open Manhole | 1200 |
| 2.011 | o | 150 | 13 | 41.448 | 40.015 | 1.283 | Open Manhole | 1200 |


Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 2.000 | 72.446 | 201.8 | 3 | 43.130 | 42.305 | 0.600 | Open Manhole | 1200 |
| 2.001 | 66.032 | 180.9 | 4 | 42.765 | 41.940 | 0.600 | Open Manhole | 1200 |
| 2.002 | 23.959 | 155.6 | 5 | 42.611 | 41.786 | 0.600 | Open Manhole | 1200 |
| 2.003 | 46.151 | 179.6 | 6 | 42.354 | 41.529 | 0.600 | Open Manhole | 1200 |
| 2.004 | 46.417 | 179.2 | 7 | 42.095 | 41.270 | 0.600 | Open Manhole | 1200 |
| 2.005 | 80.000 | 160.6 | 8 | 41.597 | 40.772 | 0.600 | Open Manhole | 1200 |
| 2.006 | 82.487 | 166.0 | 9 | 41.100 | 40.200 | 0.600 | Open Manhole | 1200 |
| 2.007 | 15.656 | 400.0 | 10 | 41.225 | 40.161 | 0.765 | Open Manhole | 1200 |
| 2.008 | 9.125 | 555.6 | 11 | 41.536 | 40.070 | 1.091 | Open Manhole | 1200 |
| 2.009 | 18.891 | 555.6 | 12 | 41.415 | 40.036 | 1.004 | Open Manhole | 1200 |
| 2.010 | 11.767 | 555.6 | 13 | 41.448 | 40.015 | 1.058 | Open Manhole | 1200 |
| 2.011 | 18.076 | 175.0 | | 41.049 | 39.912 | 0.988 | Open Manhole | 0 |

Simulation Criteria for Storm


| | | | |
|---------------------------------|-------|--|-------|
| Volumetric Runoff Coeff | 0.750 | Additional Flow - % of Total Flow | 0.000 |
| Areal Reduction Factor | 1.000 | MADD Factor * 10m ³ /ha Storage | 2.000 |
| Hot Start (mins) | 0 | Inlet Coefficient | 0.800 |
| Hot Start Level (mm) | 0 | Flow per Person per Day (l/per/day) | 0.000 |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins) | 60 |
| Foul Sewage per hectare (l/s) | 0.000 | Output Interval (mins) | 1 |
| Number of Input Hydrographs | 0 | Number of Storage Structures | 1 |
| Number of Online Controls | 1 | Number of Time/Area Diagrams | 0 |
| Number of Offline Controls | 0 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

| | | |
|---|---|---|
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Synthetic Rainfall Details

| | |
|-----------------------|---------------------------------|
| Rainfall Model | FEH |
| Return Period (years) | 1 |
| Site Location | GB 298450 168700 SS 98450 68700 |
| C (1km) | -0.025 |
| D1 (1km) | 0.403 |
| D2 (1km) | 0.318 |
| D3 (1km) | 0.301 |
| E (1km) | 0.285 |
| F (1km) | 2.515 |
| Summer Storms | Yes |
| Winter Storms | No |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Storm Duration (mins) | 30 |

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Online Controls for Storm


Hydro-Brake Optimum® Manhole: 13, DS/PN: 2.011, Volume (m³): 2.8

Unit Reference MD-SHE-0091-3000-0400-3000
Design Head (m) 0.400
Design Flow (l/s) 3.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 91
Invert Level (m) 40.015
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

| Control Points | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 0.400 | 3.0 |
| Flush-Flo™ | 0.141 | 3.0 |
| Kick-Flo® | 0.297 | 2.6 |
| Mean Flow over Head Range | - | 2.5 |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 2.8 | 1.200 | 5.0 | 3.000 | 7.7 | 7.000 | 11.6 |
| 0.200 | 2.9 | 1.400 | 5.4 | 3.500 | 8.2 | 7.500 | 12.0 |
| 0.300 | 2.6 | 1.600 | 5.7 | 4.000 | 8.8 | 8.000 | 12.4 |
| 0.400 | 3.0 | 1.800 | 6.0 | 4.500 | 9.3 | 8.500 | 12.8 |
| 0.500 | 3.3 | 2.000 | 6.3 | 5.000 | 9.8 | 9.000 | 13.1 |
| 0.600 | 3.6 | 2.200 | 6.6 | 5.500 | 10.3 | 9.500 | 13.5 |
| 0.800 | 4.1 | 2.400 | 6.9 | 6.000 | 10.7 | | |
| 1.000 | 4.6 | 2.600 | 7.2 | 6.500 | 11.2 | | |


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Storage Structures for Storm

Tank or Pond Manhole: 13, DS/PN: 2.011

Invert Level (m) 40.015

| Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) | Depth (m) | Area (m ²) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000 | 400.0 | 0.500 | 560.0 | 1.000 | 746.0 | 1.300 | 870.0 |

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

Simulation Criteria

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

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

Synthetic Rainfall Details


Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0


| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 2.000 | 2 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 3 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.002 | 4 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.003 | 5 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.004 | 6 | 15 Winter | 1 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.005 | 7 | 30 Winter | 1 | +0% | 5/15 Summer | 1000/15 Summer | | |
| 2.006 | 8 | 30 Winter | 1 | +0% | 100/15 Summer | | | |
| 2.007 | 9 | 30 Winter | 1 | +0% | 5/15 Summer | | | |
| 2.008 | 10 | 30 Winter | 1 | +0% | 5/15 Summer | | | |
| 2.009 | 11 | 30 Winter | 1 | +0% | 5/15 Summer | | | |
| 2.010 | 12 | 30 Winter | 1 | +0% | 100/15 Summer | | | |
| 2.011 | 13 | 720 Winter | 1 | +0% | 1/60 Winter | | | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | |
|-------|------------|-----------|-----------|--------------------------|-------------------|----------------|-----------------|--------|----------------|--|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. (l/s) | Overflow (l/s) | Pipe Flow (l/s) | Status | Level Exceeded | |
| 2.000 | 2 | 42.814 | -0.075 | 0.000 | 0.71 | | 25.1 | OK | 18 | |
| 2.001 | 3 | 42.468 | -0.062 | 0.000 | 0.84 | | 31.2 | OK | 21 | |

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

| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | Level Exceeded |
|-------|---------------|--------------|--------------|-----------------------------|----------------------------------|---------------|------------|-------------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Overflow Cap. (l/s) | Flow (l/s) | | |
| 2.002 | 4 | 42.103 | -0.062 | 0.000 | 0.87 | 33.2 | OK | 21 |
| 2.003 | 5 | 41.976 | -0.035 | 0.000 | 0.97 | 35.7 | OK | 23 |
| 2.004 | 6 | 41.747 | -0.007 | 0.000 | 1.00 | 37.0 | OK | 17 |
| 2.005 | 7 | 41.459 | -0.036 | 0.000 | 0.99 | 39.4 | OK | 6 |
| 2.006 | 8 | 40.852 | -0.145 | 0.000 | 0.52 | 43.1 | OK | |
| 2.007 | 9 | 40.495 | -0.005 | 0.000 | 1.00 | 41.2 | OK | |
| 2.008 | 10 | 40.389 | -0.072 | 0.000 | 0.78 | 42.6 | OK | |
| 2.009 | 11 | 40.371 | -0.074 | 0.000 | 0.80 | 46.1 | OK | |
| 2.010 | 12 | 40.330 | -0.081 | 0.000 | 0.97 | 46.0 | OK | |
| 2.011 | 13 | 40.246 | 0.081 | 0.000 | 0.23 | 2.9 | SURCHARGED | |

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

Simulation Criteria

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

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

Synthetic Rainfall Details


Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0


| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 2.000 | 2 | 15 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 3 | 15 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.002 | 4 | 30 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.003 | 5 | 30 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.004 | 6 | 30 Winter | 5 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.005 | 7 | 30 Winter | 5 | +0% | 5/15 Summer | 1000/15 Summer | | |
| 2.006 | 8 | 30 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.007 | 9 | 30 Winter | 5 | +0% | 5/15 Summer | | | |
| 2.008 | 10 | 30 Winter | 5 | +0% | 5/15 Summer | | | |
| 2.009 | 11 | 30 Winter | 5 | +0% | 5/15 Summer | | | |
| 2.010 | 12 | 60 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.011 | 13 | 720 Winter | 5 | +0% | 1/60 Winter | | | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | |
|-------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|--------|----------------|--|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | Level Exceeded | |
| 2.000 | 2 | 43.015 | 0.126 | 0.000 | 1.03 | 36.6 | SURCHARGED | | 18 | |
| 2.001 | 3 | 42.716 | 0.186 | 0.000 | 1.05 | 39.2 | SURCHARGED | | 21 | |

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

| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | Level Exceeded |
|-------|---------------|--------------|--------------|-----------------------------|----------------|-------------------|------------|-------------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | | |
| 2.002 | 4 | 42.406 | 0.241 | 0.000 | 0.91 | 34.8 | SURCHARGED | 21 |
| 2.003 | 5 | 42.280 | 0.269 | 0.000 | 1.04 | 38.6 | SURCHARGED | 23 |
| 2.004 | 6 | 41.998 | 0.244 | 0.000 | 1.14 | 42.3 | SURCHARGED | 17 |
| 2.005 | 7 | 41.659 | 0.164 | 0.000 | 1.16 | 46.1 | SURCHARGED | 6 |
| 2.006 | 8 | 40.873 | -0.124 | 0.000 | 0.64 | 52.8 | OK | |
| 2.007 | 9 | 40.528 | 0.028 | 0.000 | 1.34 | 55.3 | SURCHARGED | |
| 2.008 | 10 | 40.473 | 0.012 | 0.000 | 1.08 | 58.7 | SURCHARGED | |
| 2.009 | 11 | 40.451 | 0.006 | 0.000 | 1.17 | 67.3 | SURCHARGED | |
| 2.010 | 12 | 40.411 | 0.000 | 0.000 | 1.31 | 62.1 | OK | |
| 2.011 | 13 | 40.372 | 0.207 | 0.000 | 0.23 | 2.9 | SURCHARGED | |

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

Simulation Criteria

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

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

Synthetic Rainfall Details


Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0


| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 2.000 | 2 | 30 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 3 | 60 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 2.002 | 4 | 60 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 2.003 | 5 | 60 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 2.004 | 6 | 30 Winter | 100 | +30% | 5/15 Summer | 100/15 Summer | | |
| 2.005 | 7 | 30 Winter | 100 | +30% | 5/15 Summer | 1000/15 Summer | | |
| 2.006 | 8 | 30 Summer | 100 | +30% | 100/15 Summer | | | |
| 2.007 | 9 | 960 Winter | 100 | +30% | 5/15 Summer | | | |
| 2.008 | 10 | 960 Winter | 100 | +30% | 5/15 Summer | | | |
| 2.009 | 11 | 960 Winter | 100 | +30% | 5/15 Summer | | | |
| 2.010 | 12 | 960 Winter | 100 | +30% | 100/15 Summer | | | |
| 2.011 | 13 | 960 Winter | 100 | +30% | 1/60 Winter | | | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe Flow (l/s) | Pipe Status | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|-------------|----------------|---------|-------|-----------------|-------------|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | | | | | |
| 2.000 | 2 | 43.509 | 0.620 | 19.414 | 1.07 | | 37.7 | FLOOD | 18 | | |
| 2.001 | 3 | 43.146 | 0.616 | 15.756 | 1.01 | | 37.8 | FLOOD | 21 | | |

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

| PN | US/MH Name | Water | Surcharged | Flooded | Pipe | | Status | Level Exceeded |
|-------|------------|-----------|------------|--------------------------|----------------------------|------------|------------|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Overflow Cap. (l/s) | Flow (l/s) | | |
| 2.002 | 4 | 42.772 | 0.607 | 7.918 | 0.99 | 38.0 | FLOOD | 21 |
| 2.003 | 5 | 42.625 | 0.614 | 14.027 | 1.32 | 48.6 | FLOOD | 23 |
| 2.004 | 6 | 42.363 | 0.609 | 9.258 | 1.41 | 52.2 | FLOOD | 17 |
| 2.005 | 7 | 42.095 | 0.600 | 0.000 | 1.44 | 57.3 | FLOOD RISK | 6 |
| 2.006 | 8 | 41.233 | 0.236 | 0.000 | 0.96 | 79.9 | SURCHARGED | |
| 2.007 | 9 | 40.884 | 0.384 | 0.000 | 0.57 | 23.6 | FLOOD RISK | |
| 2.008 | 10 | 40.880 | 0.419 | 0.000 | 0.46 | 24.9 | SURCHARGED | |
| 2.009 | 11 | 40.879 | 0.434 | 0.000 | 0.48 | 27.8 | SURCHARGED | |
| 2.010 | 12 | 40.876 | 0.465 | 0.000 | 0.59 | 27.8 | SURCHARGED | |
| 2.011 | 13 | 40.874 | 0.709 | 0.000 | 0.34 | 4.3 | SURCHARGED | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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

Synthetic Rainfall Details


Rainfall Model FSR Ratio R 0.326
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0


| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 2.000 | 2 | 30 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.001 | 3 | 60 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.002 | 4 | 120 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.003 | 5 | 120 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.004 | 6 | 60 Winter | 1000 | +0% | 5/15 Summer | 100/15 Summer | | |
| 2.005 | 7 | 30 Winter | 1000 | +0% | 5/15 Summer | 1000/15 Summer | | |
| 2.006 | 8 | 30 Summer | 1000 | +0% | 100/15 Summer | | | |
| 2.007 | 9 | 720 Winter | 1000 | +0% | 5/15 Summer | | | |
| 2.008 | 10 | 720 Winter | 1000 | +0% | 5/15 Summer | | | |
| 2.009 | 11 | 720 Winter | 1000 | +0% | 5/15 Summer | | | |
| 2.010 | 12 | 720 Winter | 1000 | +0% | 100/15 Summer | | | |
| 2.011 | 13 | 720 Winter | 1000 | +0% | 1/60 Winter | | | |

| PN | US/MH Name | Water Surcharged Flooded | | | Pipe | | Status | Level Exceeded |
|-------|------------|--------------------------|-----------|--------------------------|----------------------------|------------|--------|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Overflow Cap. (l/s) | Flow (l/s) | | |
| 2.000 | 2 | 43.524 | 0.635 | 34.688 | 1.05 | 37.2 | FLOOD | 18 |
| 2.001 | 3 | 43.156 | 0.626 | 25.983 | 1.02 | 38.1 | FLOOD | 21 |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| | | | | | | | | |
| 2.002 | 4 | 42.779 | 0.614 | 14.172 | 0.99 | 37.9 | FLOOD | 21 |
| 2.003 | 5 | 42.633 | 0.622 | 21.598 | 1.28 | 47.4 | FLOOD | 23 |
| 2.004 | 6 | 42.370 | 0.616 | 16.921 | 1.41 | 52.3 | FLOOD | 17 |
| 2.005 | 7 | 42.103 | 0.608 | 7.610 | 1.49 | 59.4 | FLOOD | 6 |
| 2.006 | 8 | 41.454 | 0.457 | 0.000 | 1.04 | 86.4 | FLOOD RISK | |
| 2.007 | 9 | 41.057 | 0.557 | 0.000 | 0.88 | 36.2 | FLOOD RISK | |
| 2.008 | 10 | 41.053 | 0.592 | 0.000 | 0.70 | 38.1 | FLOOD RISK | |
| 2.009 | 11 | 41.051 | 0.606 | 0.000 | 0.74 | 42.6 | SURCHARGED | |
| 2.010 | 12 | 41.048 | 0.637 | 0.000 | 0.90 | 42.5 | SURCHARGED | |
| 2.011 | 13 | 41.045 | 0.880 | 0.000 | 0.37 | 4.6 | SURCHARGED | |

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Existing Network Details for Storm

| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | n | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|-------------|
| 1.000 | 12.028 | 0.367 | 32.8 | 0.021 | 4.00 | 1.500 | | o | 150 |
| 1.001 | 13.655 | 0.244 | 56.0 | 0.020 | 0.00 | 0.600 | | o | 150 |
| 1.002 | 16.324 | 0.568 | 28.7 | 0.017 | 0.00 | 0.600 | | o | 150 |
| 1.003 | 13.707 | 0.078 | 175.0 | 0.000 | 0.00 | 0.600 | | o | 150 |
| 1.004 | 13.262 | 0.355 | 37.4 | 0.034 | 0.00 | 1.500 | | o | 150 |
| 1.005 | 26.645 | 0.632 | 42.2 | 0.029 | 0.00 | 1.500 | | o | 150 |
| 1.006 | 20.968 | 0.375 | 55.9 | 0.009 | 0.00 | 1.500 | | o | 150 |
| 1.007 | 15.006 | 0.036 | 416.8 | 0.006 | 0.00 | 1.500 | | o | 225 |
| 2.000 | 23.135 | 0.381 | 60.7 | 0.029 | 4.00 | 1.500 | | o | 150 |
| 2.001 | 18.135 | 0.245 | 74.0 | 0.020 | 0.00 | 1.500 | | o | 150 |
| 1.008 | 11.049 | 0.123 | 89.8 | 0.000 | 0.00 | 0.600 | | o | 225 |
| 3.000 | 40.674 | 0.118 | 344.7 | 0.009 | 4.00 | | 0.350 3 \=/ | | 2000 |
| 4.000 | 21.590 | 0.564 | 38.3 | 0.051 | 4.00 | 1.500 | | o | 150 |
| 4.001 | 22.985 | 0.685 | 33.6 | 0.025 | 0.00 | 1.500 | | o | 150 |
| 5.000 | 13.311 | 0.099 | 134.5 | 0.036 | 4.00 | 1.500 | | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|------|---------------|
| 1.000 | 1 | 43.819 | 43.069 | 0.600 | 43.452 | 42.702 | 0.600 | | 1200 |
| 1.001 | 2 | 43.452 | 42.702 | 0.600 | 43.208 | 42.458 | 0.600 | | 1200 |
| 1.002 | 3 | 43.208 | 42.458 | 0.600 | 42.640 | 41.890 | 0.600 | | 1200 |
| 1.003 | 4 | 42.640 | 41.890 | 0.600 | 42.584 | 41.812 | 0.622 | | 1200 |
| 1.004 | 5 | 42.584 | 41.812 | 0.622 | 42.207 | 41.457 | 0.600 | | 1200 |
| 1.005 | 6 | 42.207 | 41.457 | 0.600 | 41.575 | 40.825 | 0.600 | | 1200 |
| 1.006 | 7 | 41.575 | 40.825 | 0.600 | 41.200 | 40.450 | 0.600 | | 1200 |
| 1.007 | 8 | 41.200 | 40.375 | 0.600 | 41.143 | 40.339 | 0.579 | | 1200 |
| 2.000 | 11 | 41.715 | 40.965 | 0.600 | 41.334 | 40.584 | 0.600 | | 1200 |
| 2.001 | 12 | 41.334 | 40.584 | 0.600 | 41.143 | 40.339 | 0.654 | | 1200 |
| 1.008 | 9 | 41.143 | 40.339 | 0.579 | 41.234 | 40.216 | 0.793 | | 1200 |
| 3.000 | 18 | 42.111 | 40.400 | 1.561 | 41.257 | 40.282 | 0.825 | | 0 |
| 4.000 | 15 | 42.325 | 41.575 | 0.600 | 41.761 | 41.011 | 0.600 | | 1200 |
| 4.001 | 16 | 41.761 | 41.011 | 0.600 | 41.386 | 40.326 | 0.910 | | 1200 |
| 5.000 | 17 | 41.175 | 40.425 | 0.525 | 41.386 | 40.326 | 0.835 | | 1200 |

| | | |
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Existing Network Details for Storm


| PN | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | k (mm) | n | HYD SECT | DIA (mm) |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------|-------------|-------------|
| 6.000 | 29.184 | 0.522 | 55.9 | 0.026 | 4.00 | 1.500 | | o | 150 |
| 6.001 | 13.247 | 0.425 | 31.2 | 0.019 | 0.00 | 1.500 | | o | 150 |
| 6.002 | 26.869 | 0.200 | 134.3 | 0.197 | 0.00 | 0.600 | | o | 225 |
| 4.002 | 7.671 | 0.044 | 174.3 | 0.000 | 0.00 | 0.600 | | o | 300 |
| 3.001 | 17.606 | 0.035 | 503.0 | 0.004 | 0.00 | | 0.350 | 3 \=/ | 2000 |
| 3.002 | 15.477 | 0.031 | 499.3 | 0.007 | 0.00 | | 0.350 | 3 \=/ | 10000 |
| 1.009 | 34.463 | 0.069 | 499.5 | 0.015 | 0.00 | | 0.350 | 3 \=/ | 10000 |
| 1.010 | 9.028 | 0.060 | 150.5 | 0.200 | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 6.000 | 18 | 42.298 | 41.548 | 0.600 | 41.776 | 41.026 | 0.600 | | 1200 |
| 6.001 | 19 | 41.776 | 41.026 | 0.600 | 41.351 | 40.601 | 0.600 | | 1200 |
| 6.002 | 20 | 41.351 | 40.526 | 0.600 | 41.386 | 40.326 | 0.835 | | 1200 |
| 4.002 | 17 | 41.386 | 40.326 | 0.760 | 41.257 | 40.282 | 0.675 | | 1200 |
| 3.001 | 19 | 41.257 | 40.282 | 0.825 | 41.222 | 40.247 | 0.825 | | 1700 |
| 3.002 | 18 | 41.222 | 40.247 | 0.825 | 41.234 | 40.216 | 0.868 | | 0 |
| 1.009 | 10 | 41.234 | 40.216 | 0.868 | 41.000 | 40.147 | 0.703 | | 1743 |
| 1.010 | 11 | 41.000 | 40.147 | 0.703 | 40.789 | 40.087 | 0.552 | Hydro-Brake® | 1200 |

| | | |
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Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|-------------------|-------|---------------------------|------------------------|-------|---------------------------|------------------------|---------------|
| 1 | 43.819 | 0.750 | Open Manhole | 1200 | 1.000 | 43.069 | 150 | | | | |
| 2 | 43.452 | 0.750 | Open Manhole | 1200 | 1.001 | 42.702 | 150 | 1.000 | 42.702 | 150 | |
| 3 | 43.208 | 0.750 | Open Manhole | 1200 | 1.002 | 42.458 | 150 | 1.001 | 42.458 | 150 | |
| 4 | 42.640 | 0.750 | Open Manhole | 1200 | 1.003 | 41.890 | 150 | 1.002 | 41.890 | 150 | |
| 5 | 42.584 | 0.772 | Open Manhole | 1200 | 1.004 | 41.812 | 150 | 1.003 | 41.812 | 150 | |
| 6 | 42.207 | 0.750 | Open Manhole | 1200 | 1.005 | 41.457 | 150 | 1.004 | 41.457 | 150 | |
| 7 | 41.575 | 0.750 | Open Manhole | 1200 | 1.006 | 40.825 | 150 | 1.005 | 40.825 | 150 | |
| 8 | 41.200 | 0.825 | Open Manhole | 1200 | 1.007 | 40.375 | 225 | 1.006 | 40.450 | 150 | |
| 11 | 41.715 | 0.750 | Open Manhole | 1200 | 2.000 | 40.965 | 150 | | | | |
| 12 | 41.334 | 0.750 | Open Manhole | 1200 | 2.001 | 40.584 | 150 | 2.000 | 40.584 | 150 | |
| 9 | 41.143 | 0.804 | Open Manhole | 1200 | 1.008 | 40.339 | 225 | 1.007 | 40.339 | 225 | |
| | | | | | | | | 2.001 | 40.339 | 150 | |
| 18 | 42.111 | 1.711 | Junction | 0 | 3.000 | 40.400 | 2000 | | | | |
| 15 | 42.325 | 0.750 | Open Manhole | 1200 | 4.000 | 41.575 | 150 | | | | |
| 16 | 41.761 | 0.750 | Open Manhole | 1200 | 4.001 | 41.011 | 150 | 4.000 | 41.011 | 150 | |
| 17 | 41.175 | 0.750 | Open Manhole | 1200 | 5.000 | 40.425 | 225 | | | | |
| 18 | 42.298 | 0.750 | Open Manhole | 1200 | 6.000 | 41.548 | 150 | | | | |
| 19 | 41.776 | 0.750 | Open Manhole | 1200 | 6.001 | 41.026 | 150 | 6.000 | 41.026 | 150 | |
| 20 | 41.351 | 0.825 | Open Manhole | 1200 | 6.002 | 40.526 | 225 | 6.001 | 40.601 | 150 | |
| 17 | 41.386 | 1.060 | Open Manhole | 1200 | 4.002 | 40.326 | 300 | 4.001 | 40.326 | 150 | |
| | | | | | | | | 5.000 | 40.326 | 225 | |
| | | | | | | | | 6.002 | 40.326 | 225 | |
| 19 | 41.257 | 0.975 | Open Manhole | | 3.001 | 40.282 | 2000 | 3.000 | 40.282 | 2000 | |
| | | | | | | | | 4.002 | 40.282 | 300 | |
| 18 | 41.222 | 0.975 | Junction | 0 | 3.002 | 40.247 | 10000 | 3.001 | 40.247 | 2000 | |
| 10 | 41.234 | 1.018 | Open Manhole | 1743 | 1.009 | 40.216 | 10000 | 1.008 | 40.216 | 225 | |
| | | | | | | | | 3.002 | 40.216 | 10000 | |
| 11 | 41.000 | 0.853 | Open Manhole | 1200 | 1.010 | 40.147 | 150 | 1.009 | 40.147 | 10000 | |
| | 40.789 | 0.702 | Open Manhole | 0 | | OUTFALL | | 1.010 | 40.087 | 150 | |

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|---|---|---|
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PIPELINE SCHEDULES for Storm

Upstream Manhole

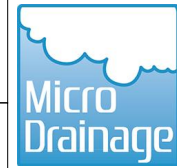
| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | o | 150 | 1 | 43.819 | 43.069 | 0.600 | Open Manhole | 1200 |
| 1.001 | o | 150 | 2 | 43.452 | 42.702 | 0.600 | Open Manhole | 1200 |
| 1.002 | o | 150 | 3 | 43.208 | 42.458 | 0.600 | Open Manhole | 1200 |
| 1.003 | o | 150 | 4 | 42.640 | 41.890 | 0.600 | Open Manhole | 1200 |
| 1.004 | o | 150 | 5 | 42.584 | 41.812 | 0.622 | Open Manhole | 1200 |
| 1.005 | o | 150 | 6 | 42.207 | 41.457 | 0.600 | Open Manhole | 1200 |
| 1.006 | o | 150 | 7 | 41.575 | 40.825 | 0.600 | Open Manhole | 1200 |
| 1.007 | o | 225 | 8 | 41.200 | 40.375 | 0.600 | Open Manhole | 1200 |
| 2.000 | o | 150 | 11 | 41.715 | 40.965 | 0.600 | Open Manhole | 1200 |
| 2.001 | o | 150 | 12 | 41.334 | 40.584 | 0.600 | Open Manhole | 1200 |
| 1.008 | o | 225 | 9 | 41.143 | 40.339 | 0.579 | Open Manhole | 1200 |
| 3.000 | 3 \=/ | 2000 | 18 | 42.111 | 40.400 | 1.561 | Junction | |
| 4.000 | o | 150 | 15 | 42.325 | 41.575 | 0.600 | Open Manhole | 1200 |
| 4.001 | o | 150 | 16 | 41.761 | 41.011 | 0.600 | Open Manhole | 1200 |
| 5.000 | o | 225 | 17 | 41.175 | 40.425 | 0.525 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 12.028 | 32.8 | 2 | 43.452 | 42.702 | 0.600 | Open Manhole | 1200 |
| 1.001 | 13.655 | 56.0 | 3 | 43.208 | 42.458 | 0.600 | Open Manhole | 1200 |
| 1.002 | 16.324 | 28.7 | 4 | 42.640 | 41.890 | 0.600 | Open Manhole | 1200 |
| 1.003 | 13.707 | 175.0 | 5 | 42.584 | 41.812 | 0.622 | Open Manhole | 1200 |
| 1.004 | 13.262 | 37.4 | 6 | 42.207 | 41.457 | 0.600 | Open Manhole | 1200 |
| 1.005 | 26.645 | 42.2 | 7 | 41.575 | 40.825 | 0.600 | Open Manhole | 1200 |
| 1.006 | 20.968 | 55.9 | 8 | 41.200 | 40.450 | 0.600 | Open Manhole | 1200 |
| 1.007 | 15.006 | 416.8 | 9 | 41.143 | 40.339 | 0.579 | Open Manhole | 1200 |
| 2.000 | 23.135 | 60.7 | 12 | 41.334 | 40.584 | 0.600 | Open Manhole | 1200 |
| 2.001 | 18.135 | 74.0 | 9 | 41.143 | 40.339 | 0.654 | Open Manhole | 1200 |
| 1.008 | 11.049 | 89.8 | 10 | 41.234 | 40.216 | 0.793 | Open Manhole | 1743 |
| 3.000 | 40.674 | 344.7 | 19 | 41.257 | 40.282 | 0.825 | Open Manhole | 1700 |
| 4.000 | 21.590 | 38.3 | 16 | 41.761 | 41.011 | 0.600 | Open Manhole | 1200 |
| 4.001 | 22.985 | 33.6 | 17 | 41.386 | 40.326 | 0.910 | Open Manhole | 1200 |
| 5.000 | 13.311 | 134.5 | 17 | 41.386 | 40.326 | 0.835 | Open Manhole | 1200 |

Midpoint
Alencon Link
Basingstoke

St Athan
Catchment F
Summary of Results



Date 15/03/17
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PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 6.000 | o | 150 | 18 | 42.298 | 41.548 | 0.600 | Open Manhole | 1200 |
| 6.001 | o | 150 | 19 | 41.776 | 41.026 | 0.600 | Open Manhole | 1200 |
| 6.002 | o | 225 | 20 | 41.351 | 40.526 | 0.600 | Open Manhole | 1200 |
| 4.002 | o | 300 | 17 | 41.386 | 40.326 | 0.760 | Open Manhole | 1200 |
| 3.001 | 3 \=/ | 2000 | 19 | 41.257 | 40.282 | 0.825 | Open Manhole | 1700 |
| 3.002 | 3 \=/ | 10000 | 18 | 41.222 | 40.247 | 0.825 | Junction | |
| 1.009 | 3 \=/ | 10000 | 10 | 41.234 | 40.216 | 0.868 | Open Manhole | 1743 |
| 1.010 | o | 150 | 11 | 41.000 | 40.147 | 0.703 | Open Manhole | 1200 |

Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 6.000 | 29.184 | 55.9 | 19 | 41.776 | 41.026 | 0.600 | Open Manhole | 1200 |
| 6.001 | 13.247 | 31.2 | 20 | 41.351 | 40.601 | 0.600 | Open Manhole | 1200 |
| 6.002 | 26.869 | 134.3 | 17 | 41.386 | 40.326 | 0.835 | Open Manhole | 1200 |
| 4.002 | 7.671 | 174.3 | 19 | 41.257 | 40.282 | 0.675 | Open Manhole | 1700 |
| 3.001 | 17.606 | 503.0 | 18 | 41.222 | 40.247 | 0.825 | Junction | |
| 3.002 | 15.477 | 499.3 | 10 | 41.234 | 40.216 | 0.868 | Open Manhole | 1743 |
| 1.009 | 34.463 | 499.5 | 11 | 41.000 | 40.147 | 0.703 | Open Manhole | 1200 |
| 1.010 | 9.028 | 150.5 | | 40.789 | 40.087 | 0.552 | Open Manhole | 0 |


Simulation Criteria for Storm

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

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


Synthetic Rainfall Details

Rainfall Model FEH
 Return Period (years) 1

| | | |
|---|---|---|
| AECOM | | Page 6 |
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Synthetic Rainfall Details

| | |
|-----------------------|---------------------------------|
| Site Location | GB 298450 168700 SS 98450 68700 |
| C (1km) | -0.025 |
| D1 (1km) | 0.403 |
| D2 (1km) | 0.318 |
| D3 (1km) | 0.301 |
| E (1km) | 0.285 |
| F (1km) | 2.515 |
| Summer Storms | Yes |
| Winter Storms | No |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Storm Duration (mins) | 30 |

| | | |
|---|---|---|
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Online Controls for Storm


Hydro-Brake Optimum® Manhole: 11, DS/PN: 1.010, Volume (m³): 439.4

Unit Reference MD-SHE-0103-4100-0500-4100
 Design Head (m) 0.500
 Design Flow (l/s) 4.1
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Diameter (mm) 103
 Invert Level (m) 40.147
 Minimum Outlet Pipe Diameter (mm) 150
 Suggested Manhole Diameter (mm) 1200

| Control Points | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 0.500 | 4.1 |
| Flush-Flo™ | 0.169 | 4.1 |
| Kick-Flo® | 0.366 | 3.6 |
| Mean Flow over Head Range | - | 3.4 |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100 | 3.5 | 1.200 | 6.2 | 3.000 | 9.5 | 7.000 | 14.2 |
| 0.200 | 4.1 | 1.400 | 6.6 | 3.500 | 10.2 | 7.500 | 14.7 |
| 0.300 | 3.9 | 1.600 | 7.0 | 4.000 | 10.9 | 8.000 | 15.2 |
| 0.400 | 3.7 | 1.800 | 7.4 | 4.500 | 11.5 | 8.500 | 15.7 |
| 0.500 | 4.1 | 2.000 | 7.8 | 5.000 | 12.1 | 9.000 | 16.2 |
| 0.600 | 4.5 | 2.200 | 8.2 | 5.500 | 12.6 | 9.500 | 16.6 |
| 0.800 | 5.1 | 2.400 | 8.5 | 6.000 | 13.2 | | |
| 1.000 | 5.7 | 2.600 | 8.9 | 6.500 | 13.7 | | |

| | | |
|---|---|---|
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| Midpoint Alencon Link Basingstoke | St Athan Catchment F Summary of Results |  |
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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.295
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.800 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|--------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 1.000 | 1 15 | Summer | 1 | +0% | 1000/15 | Summer | | |
| 1.001 | 2 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 1.002 | 3 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 1.003 | 4 15 | Winter | 1 | +0% | 100/15 | Summer | 100/15 | Summer |
| 1.004 | 5 15 | Winter | 1 | +0% | 100/15 | Summer | 100/15 | Summer |
| 1.005 | 6 15 | Winter | 1 | +0% | 100/15 | Summer | 100/15 | Summer |
| 1.006 | 7 15 | Winter | 1 | +0% | 5/15 | Summer | | |
| 1.007 | 8 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 2.000 | 11 15 | Winter | 1 | +0% | 100/15 | Winter | | |
| 2.001 | 12 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 1.008 | 9 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 3.000 | 18 30 | Winter | 1 | +0% | | | | |
| 4.000 | 15 15 | Summer | 1 | +0% | 100/15 | Summer | 1000/15 | Summer |
| 4.001 | 16 15 | Winter | 1 | +0% | 100/15 | Summer | 1000/15 | Summer |
| 5.000 | 17 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 6.000 | 18 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 6.001 | 19 15 | Winter | 1 | +0% | 100/15 | Summer | | |
| 6.002 | 20 15 | Winter | 1 | +0% | 100/15 | Summer | 100/15 | Summer |
| 4.002 | 17 30 | Winter | 1 | +0% | 100/15 | Summer | | |
| 3.001 | 19 30 | Winter | 1 | +0% | | | | |

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


| PN | US/MH Name | Water | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|---------------|--------------|--------------|----------------|----------------|-------------------|---------------|--------|----|-------------------|
| | | Level (m) | Depth (m) | Volume (m³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | |
| 1.000 | 1 | 43.101 | -0.118 | 0.000 | 0.11 | | 2.7 | OK | | |
| 1.001 | 2 | 42.749 | -0.103 | 0.000 | 0.21 | | 4.7 | OK | | |
| 1.002 | 3 | 42.504 | -0.104 | 0.000 | 0.20 | | 6.3 | OK | | |
| 1.003 | 4 | 41.967 | -0.073 | 0.000 | 0.52 | | 6.4 | OK | 12 | |
| 1.004 | 5 | 41.879 | -0.083 | 0.000 | 0.41 | | 9.7 | OK | 9 | |
| 1.005 | 6 | 41.536 | -0.071 | 0.000 | 0.54 | | 12.4 | OK | 13 | |
| 1.006 | 7 | 40.916 | -0.059 | 0.000 | 0.67 | | 13.3 | OK | | |
| 1.007 | 8 | 40.525 | -0.075 | 0.000 | 0.77 | | 13.8 | OK | | |
| 2.000 | 11 | 41.009 | -0.106 | 0.000 | 0.19 | | 3.6 | OK | | |
| 2.001 | 12 | 40.643 | -0.091 | 0.000 | 0.33 | | 5.6 | OK | | |
| 1.008 | 9 | 40.439 | -0.125 | 0.000 | 0.41 | | 18.8 | OK | | |
| 3.000 | 18 | 40.486 | -1.625 | 0.000 | 0.00 | | 0.8 | OK | | |
| 4.000 | 15 | 41.628 | -0.097 | 0.000 | 0.27 | | 6.5 | OK | 2 | |
| 4.001 | 16 | 41.072 | -0.089 | 0.000 | 0.35 | | 8.9 | OK | 4 | |
| 5.000 | 17 | 40.504 | -0.146 | 0.000 | 0.12 | | 4.2 | OK | | |
| 6.000 | 18 | 41.588 | -0.110 | 0.000 | 0.16 | | 3.3 | OK | | |
| 6.001 | 19 | 41.071 | -0.105 | 0.000 | 0.20 | | 5.1 | OK | | |
| 6.002 | 20 | 40.652 | -0.099 | 0.000 | 0.59 | | 24.7 | OK | 10 | |
| 4.002 | 17 | 40.497 | -0.129 | 0.000 | 0.51 | | 31.5 | OK | | |
| 3.001 | 19 | 40.486 | -0.771 | 0.000 | 0.06 | | 20.2 | OK | | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------|---------------|----------------|--------------------|----------------------|--------------------|---------------|
| 3.002 | 18 | 360 | Winter | 1 | +0% | | | |
| 1.009 | 10 | 360 | Winter | 1 | +0% | | | |
| 1.010 | 11 | 360 | Winter | 1 | +0% | 1/15 Summer 1000/360 | Winter | |

| PN | US/MH Name | Water | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|------------|----|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | |
| 3.002 | 18 | 40.422 | -0.800 | 0.000 | 0.01 | | 7.5 | | OK | |
| 1.009 | 10 | 40.422 | -0.812 | 0.000 | 0.01 | | 9.4 | | OK | |
| 1.010 | 11 | 40.422 | 0.125 | 0.000 | 0.32 | | 4.1 | SURCHARGED | 6 | |

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

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.295
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.800 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Summer | 5 | +0% | 100/15 Summer | | | |
| 1.001 | 2 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.002 | 3 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.003 | 4 | 15 Winter | 5 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.004 | 5 | 15 Winter | 5 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.005 | 6 | 15 Winter | 5 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.006 | 7 | 15 Winter | 5 | +0% | 5/15 Summer | | | |
| 1.007 | 8 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 2.000 | 11 | 15 Winter | 5 | +0% | 100/15 Winter | | | |
| 2.001 | 12 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 1.008 | 9 | 480 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.000 | 18 | 30 Winter | 5 | +0% | | | | |
| 4.000 | 15 | 15 Summer | 5 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 4.001 | 16 | 15 Winter | 5 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 5.000 | 17 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 6.000 | 18 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 6.001 | 19 | 15 Winter | 5 | +0% | 100/15 Summer | | | |
| 6.002 | 20 | 15 Winter | 5 | +0% | 100/15 Summer | 100/15 Summer | | |
| 4.002 | 17 | 30 Winter | 5 | +0% | 100/15 Summer | | | |
| 3.001 | 19 | 30 Winter | 5 | +0% | | | | |

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


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 43.111 | -0.108 | 0.000 | 0.18 | 4.5 | OK | |
| 1.001 | 2 | 42.764 | -0.088 | 0.000 | 0.36 | 7.8 | OK | |
| 1.002 | 3 | 42.519 | -0.089 | 0.000 | 0.34 | 10.6 | OK | |
| 1.003 | 4 | 41.999 | -0.041 | 0.000 | 0.87 | 10.6 | OK | 12 |
| 1.004 | 5 | 41.904 | -0.058 | 0.000 | 0.69 | 16.3 | OK | 9 |
| 1.005 | 6 | 41.569 | -0.038 | 0.000 | 0.90 | 20.8 | OK | 13 |
| 1.006 | 7 | 41.039 | 0.064 | 0.000 | 1.07 | 21.3 | SURCHARGED | |
| 1.007 | 8 | 40.600 | 0.000 | 0.000 | 1.25 | 22.2 | OK | |
| 2.000 | 11 | 41.023 | -0.092 | 0.000 | 0.32 | 6.1 | OK | |
| 2.001 | 12 | 40.664 | -0.070 | 0.000 | 0.54 | 9.3 | OK | |
| 1.008 | 9 | 40.524 | -0.040 | 0.000 | 0.11 | 5.2 | OK | |
| 3.000 | 18 | 40.547 | -1.564 | 0.000 | 0.00 | 1.2 | OK | |
| 4.000 | 15 | 41.646 | -0.079 | 0.000 | 0.45 | 10.8 | OK | 2 |
| 4.001 | 16 | 41.093 | -0.068 | 0.000 | 0.58 | 14.9 | OK | 4 |
| 5.000 | 17 | 40.575 | -0.075 | 0.000 | 0.20 | 6.9 | OK | |
| 6.000 | 18 | 41.601 | -0.097 | 0.000 | 0.27 | 5.5 | OK | |
| 6.001 | 19 | 41.086 | -0.090 | 0.000 | 0.33 | 8.6 | OK | |
| 6.002 | 20 | 40.747 | -0.004 | 0.000 | 0.95 | 39.6 | OK | 10 |
| 4.002 | 17 | 40.565 | -0.061 | 0.000 | 0.84 | 51.8 | OK | |
| 3.001 | 19 | 40.547 | -0.710 | 0.000 | 0.09 | 32.8 | OK | |

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


| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------|---------------|----------------|---------------------|----------------------|--------------------|---------------|
| 3.002 | 18 | 480 | Winter | 5 | +0% | | | |
| 1.009 | 10 | 480 | Winter | 5 | +0% | | | |
| 1.010 | 11 | 480 | Winter | 5 | +0% | 1/15 Summer 1000/360 | Winter | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|------------|------|----|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | | |
| 3.002 | 18 | 40.522 | -0.700 | 0.000 | 0.01 | | 8.0 | | | OK | |
| 1.009 | 10 | 40.522 | -0.712 | 0.000 | 0.01 | | 10.0 | | | OK | |
| 1.010 | 11 | 40.522 | 0.225 | 0.000 | 0.32 | | 4.1 | SURCHARGED | | 6 | |

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


| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 43.141 | -0.078 | 0.000 | 0.43 | 10.9 | OK | |
| 1.001 | 2 | 43.101 | 0.249 | 0.000 | 0.83 | 18.2 | SURCHARGED | |
| 1.002 | 3 | 42.963 | 0.355 | 0.000 | 0.74 | 22.8 | FLOOD RISK | |
| 1.003 | 4 | 42.642 | 0.602 | 2.324 | 1.49 | 18.3 | FLOOD | 12 |
| 1.004 | 5 | 42.584 | 0.622 | 0.223 | 1.03 | 24.4 | FLOOD | 9 |
| 1.005 | 6 | 42.209 | 0.602 | 2.334 | 1.15 | 26.5 | FLOOD | 13 |
| 1.006 | 7 | 41.450 | 0.475 | 0.000 | 1.44 | 28.6 | FLOOD RISK | |
| 1.007 | 8 | 40.922 | 0.322 | 0.000 | 0.39 | 6.9 | FLOOD RISK | |
| 2.000 | 11 | 41.123 | 0.008 | 0.000 | 0.72 | 13.8 | SURCHARGED | |
| 2.001 | 12 | 40.957 | 0.223 | 0.000 | 1.23 | 21.1 | SURCHARGED | |
| 1.008 | 9 | 40.920 | 0.356 | 0.000 | 0.20 | 9.2 | FLOOD RISK | |
| 3.000 | 18 | 40.918 | -1.193 | 0.000 | 0.00 | 0.4 | OK | |
| 4.000 | 15 | 42.065 | 0.340 | 0.000 | 0.83 | 19.8 | FLOOD RISK | 2 |
| 4.001 | 16 | 41.680 | 0.519 | 0.000 | 1.12 | 28.7 | FLOOD RISK | 4 |
| 5.000 | 17 | 40.920 | 0.270 | 0.000 | 0.05 | 1.7 | FLOOD RISK | |
| 6.000 | 18 | 41.766 | 0.068 | 0.000 | 0.59 | 11.8 | SURCHARGED | |
| 6.001 | 19 | 41.599 | 0.423 | 0.000 | 0.75 | 19.4 | FLOOD RISK | |
| 6.002 | 20 | 41.359 | 0.608 | 8.027 | 1.69 | 70.2 | FLOOD | 10 |
| 4.002 | 17 | 40.920 | 0.294 | 0.000 | 0.29 | 17.6 | SURCHARGED | |
| 3.001 | 19 | 40.918 | -0.339 | 0.000 | 0.03 | 12.3 | OK | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------|---------------|----------------|---------------------|----------------------|--------------------|---------------|
| 3.002 | 18 | 720 | Winter | 100 | +30% | | | |
| 1.009 | 10 | 720 | Winter | 100 | +30% | | | |
| 1.010 | 11 | 720 | Winter | 100 | +30% | 1/15 Summer 1000/360 | Winter | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|------------|------|---|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | | |
| 3.002 | 18 | 40.918 | -0.304 | 0.000 | 0.01 | | 9.7 | | OK | | |
| 1.009 | 10 | 40.918 | -0.316 | 0.000 | 0.01 | | 12.1 | | OK | | |
| 1.010 | 11 | 40.918 | 0.621 | 0.000 | 0.39 | | 5.0 | FLOOD RISK | | 6 | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

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

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


Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.295
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 18.800 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
720, 960, 1440
Return Period(s) (years) 1, 5, 100, 1000
Climate Change (%) 0, 0, 30, 0

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|-----------------|--------------------|---------------|
| 1.000 | 1 | 15 Winter | 1000 | +0% | 1000/15 Summer | | | |
| 1.001 | 2 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 1.002 | 3 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 1.003 | 4 | 30 Winter | 1000 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.004 | 5 | 15 Winter | 1000 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.005 | 6 | 30 Winter | 1000 | +0% | 100/15 Summer | 100/15 Summer | | |
| 1.006 | 7 | 120 Winter | 1000 | +0% | 5/15 Summer | | | |
| 1.007 | 8 | 720 Winter | 1000 | +0% | 100/15 Summer | | | |
| 2.000 | 11 | 15 Winter | 1000 | +0% | 100/15 Winter | | | |
| 2.001 | 12 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 1.008 | 9 | 720 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.000 | 18 | 720 Winter | 1000 | +0% | | | | |
| 4.000 | 15 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 4.001 | 16 | 15 Winter | 1000 | +0% | 100/15 Summer | 1000/15 Summer | | |
| 5.000 | 17 | 720 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.000 | 18 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.001 | 19 | 15 Winter | 1000 | +0% | 100/15 Summer | | | |
| 6.002 | 20 | 30 Winter | 1000 | +0% | 100/15 Summer | 100/15 Summer | | |
| 4.002 | 17 | 720 Winter | 1000 | +0% | 100/15 Summer | | | |
| 3.001 | 19 | 720 Winter | 1000 | +0% | | | | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| PN | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m ³) | Flow / Overflow Cap. (l/s) | Pipe Flow (l/s) | Status | Level Exceeded |
|-------|------------|-----------------|----------------------|----------------------------------|----------------------------|-----------------|------------|----------------|
| 1.000 | 1 | 43.374 | 0.155 | 0.000 | 0.51 | 12.9 | SURCHARGED | |
| 1.001 | 2 | 43.314 | 0.462 | 0.000 | 0.90 | 19.7 | FLOOD RISK | |
| 1.002 | 3 | 43.113 | 0.505 | 0.000 | 0.90 | 27.7 | FLOOD RISK | |
| 1.003 | 4 | 42.646 | 0.606 | 6.023 | 1.52 | 18.6 | FLOOD | 12 |
| 1.004 | 5 | 42.585 | 0.623 | 1.068 | 1.03 | 24.4 | FLOOD | 9 |
| 1.005 | 6 | 42.212 | 0.605 | 5.409 | 1.15 | 26.5 | FLOOD | 13 |
| 1.006 | 7 | 41.513 | 0.538 | 0.000 | 1.31 | 26.0 | FLOOD RISK | |
| 1.007 | 8 | 41.036 | 0.436 | 0.000 | 0.47 | 8.4 | FLOOD RISK | |
| 2.000 | 11 | 41.365 | 0.250 | 0.000 | 0.77 | 14.8 | SURCHARGED | |
| 2.001 | 12 | 41.136 | 0.402 | 0.000 | 1.44 | 24.5 | FLOOD RISK | |
| 1.008 | 9 | 41.033 | 0.469 | 0.000 | 0.24 | 11.3 | FLOOD RISK | |
| 3.000 | 18 | 41.031 | -1.080 | 0.000 | 0.00 | 0.5 | OK | |
| 4.000 | 15 | 42.325 | 0.600 | 0.324 | 1.00 | 24.0 | FLOOD | 2 |
| 4.001 | 16 | 41.762 | 0.601 | 1.132 | 1.16 | 29.8 | FLOOD | 4 |
| 5.000 | 17 | 41.033 | 0.383 | 0.000 | 0.06 | 2.1 | FLOOD RISK | |
| 6.000 | 18 | 41.976 | 0.278 | 0.000 | 0.68 | 13.6 | SURCHARGED | |
| 6.001 | 19 | 41.727 | 0.551 | 0.000 | 0.91 | 23.6 | FLOOD RISK | |
| 6.002 | 20 | 41.370 | 0.619 | 18.236 | 1.66 | 68.8 | FLOOD | 10 |
| 4.002 | 17 | 41.032 | 0.406 | 0.000 | 0.35 | 21.5 | SURCHARGED | |
| 3.001 | 19 | 41.031 | -0.226 | 0.000 | 0.04 | 14.1 | FLOOD RISK | |

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1000 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|-------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 3.002 | 18 | 720 | Winter | 1000 | +0% | | | |
| 1.009 | 10 | 720 | Winter | 1000 | +0% | | | |
| 1.010 | 11 | 720 | Winter | 1000 | +0% | 1/15 Summer | 1000/360 Winter | |

| PN | US/MH Name | Water | | | Surcharged | | Flooded | | Pipe | | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|-------------|----------------|------------|-------------|------|---|----------------|
| | | Level (m) | Depth (m) | Volume (m ³) | Flow / Cap. | Overflow (l/s) | Flow (l/s) | Status | | | |
| 3.002 | 18 | 41.031 | -0.191 | 0.000 | 0.01 | | 11.0 | FLOOD RISK* | | | |
| 1.009 | 10 | 41.031 | -0.203 | 0.000 | 0.01 | | 13.7 | FLOOD RISK | | | |
| 1.010 | 11 | 41.031 | 0.734 | 30.901 | 0.42 | | 5.3 | FLOOD | | 6 | |

About AECOM

AECOM (NYSE: ACM) is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries.

As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges.

From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM companies had revenue of approximately US\$19 billion during the 12 months ended June 30, 2015.

See how we deliver what others can only imagine at aecom.com and [@AECOM](https://twitter.com/AECOM).

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