

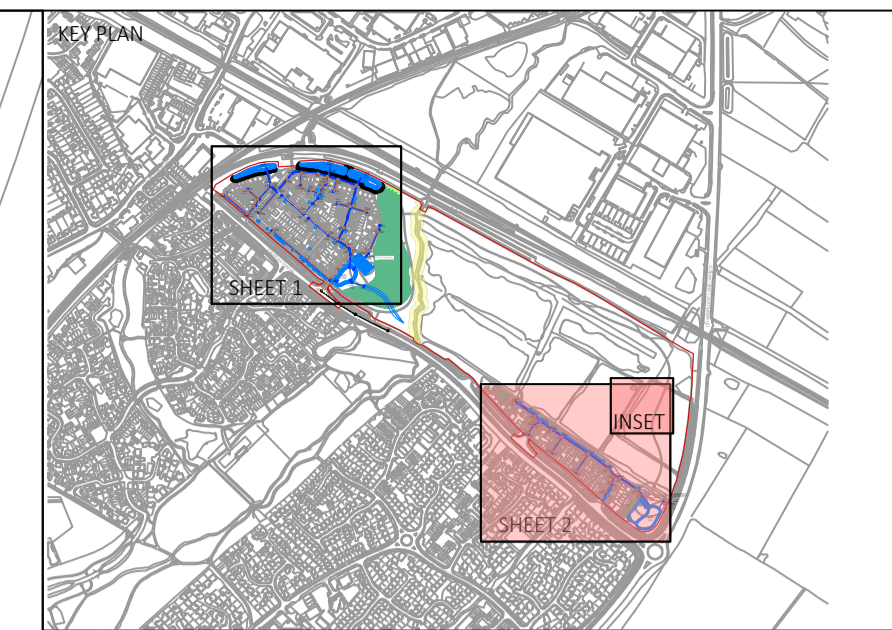
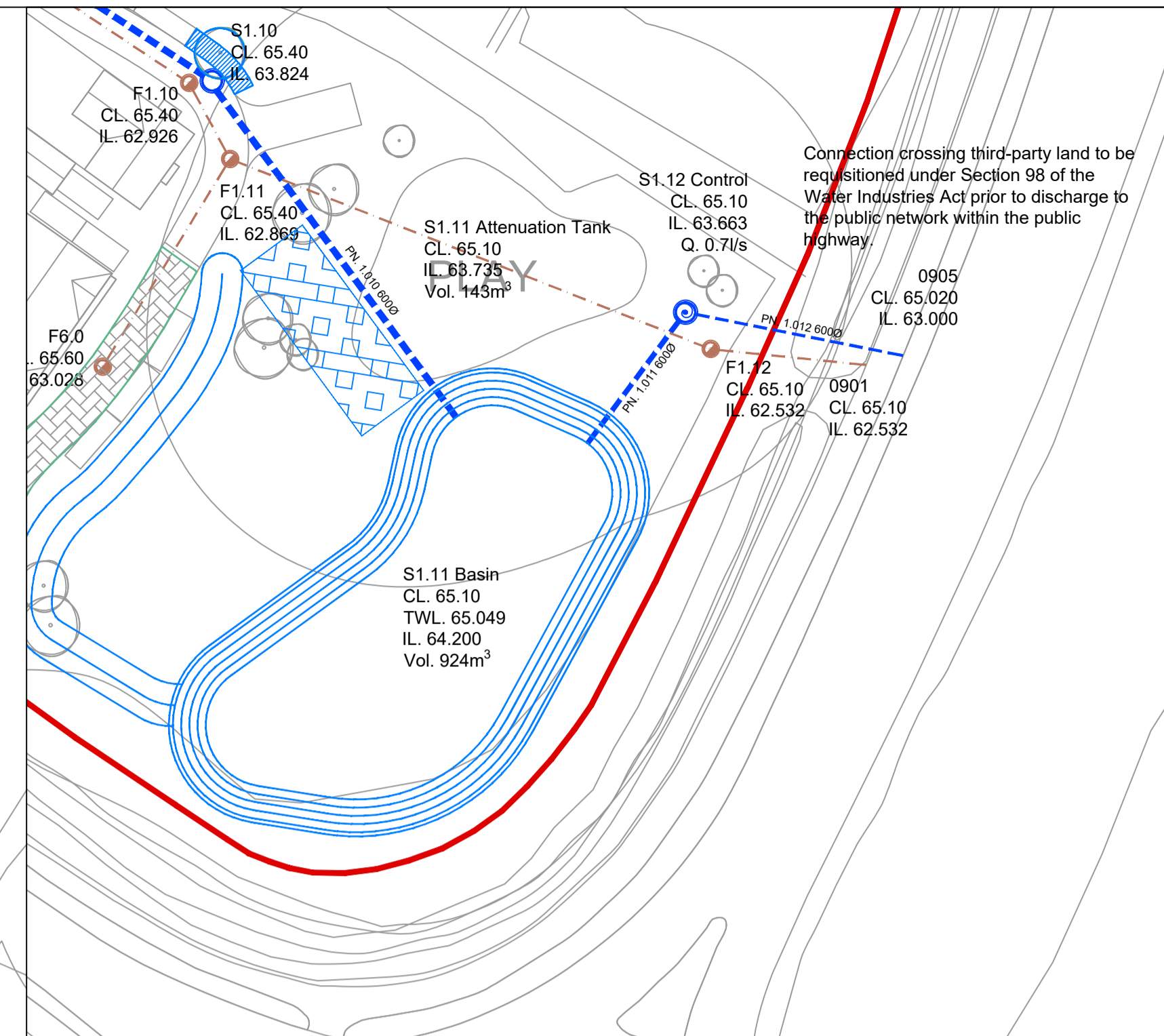
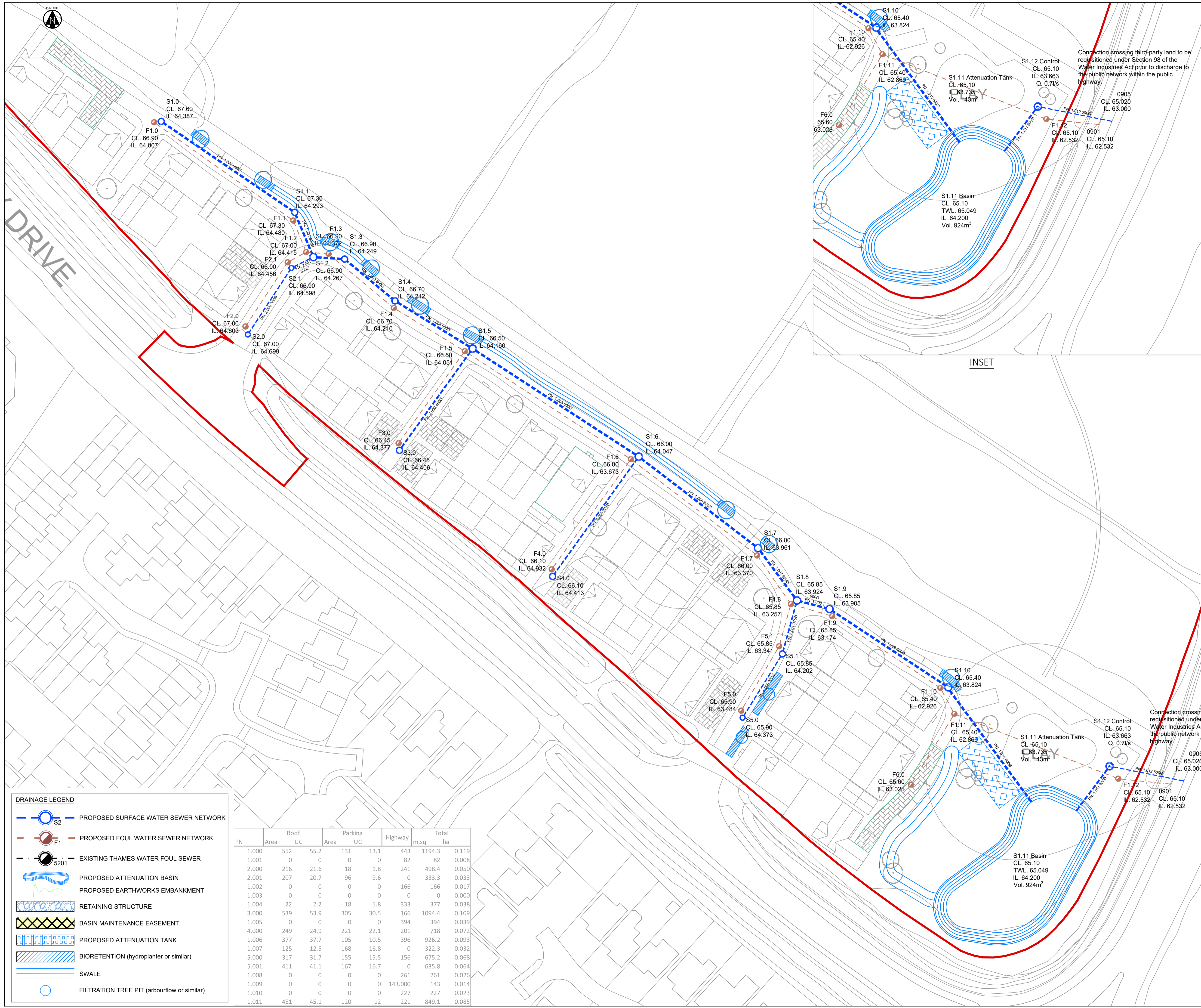
# APPENDIX B COVER SHEET



|                    |                           |          |   |
|--------------------|---------------------------|----------|---|
| Project name       | Gavray Drive, Bicester    |          |   |
| Report title       | Drainage Strategy (East)  |          |   |
| Document reference | 15114-HYD-XX-XX-RP-D-5500 |          |   |
| Author             | John Charlesworth         |          |   |
| Revision           | P04                       |          |   |
| Date               | 16 March 2022             | Approved | ✓ |

| Reference                 | Title                          | Type           | Originator   |
|---------------------------|--------------------------------|----------------|--------------|
| 15114-HYD-XX-XX-DR-D-2201 | Drainage Strategy              | Drawing        | Hydrock      |
| 15114-HYD-XX-XX-DR-D-2301 | Overland Flow                  | Drawing        | Hydrock      |
| 15114-HYD-XX-XX-DR-D-2401 | Drainage Catchment Strategy    | Drawing        | Hydrock      |
| FEH Qmed                  | Qmed MicroDrainage Calculation | Calculation    | Hydrock      |
| SW Drainage Model         | Surface Water Drainage Model   | Calculation    | Hydrock      |
| Sewer Records             | Thames Water Sewer Asset plans | Correspondence | Thames Water |





**DRAINAGE LEGEND**

- PROPOSED SURFACE WATER SEWER NETWORK (S2)
- PROPOSED FOUL WATER SEWER NETWORK (F1)
- EXISTING THAMES WATER FOUL SEWER (5201)
- PROPOSED ATTENUATION BASIN
- PROPOSED EARTHWORKS EMBANKMENT
- RETAINING STRUCTURE
- BASIN MAINTENANCE EASEMENT
- PROPOSED ATTENUATION TANK
- BIORETENTION (hydroplanter or similar)
- SWALE
- FILTRATION TREE PIT (arbourflow or similar)

| PN    | Area | Roof UC | Parking UC | Highway | Total m.sq | Total ha |
|-------|------|---------|------------|---------|------------|----------|
| 1.000 | 552  | 55.2    | 131        | 13.1    | 443        | 1194.3   |
| 1.001 | 0    | 0       | 0          | 0       | 82         | 82       |
| 2.000 | 216  | 21.6    | 18         | 1.8     | 241        | 498.4    |
| 2.001 | 207  | 20.7    | 96         | 9.6     | 0          | 333.3    |
| 1.002 | 0    | 0       | 0          | 0       | 166        | 166      |
| 1.003 | 0    | 0       | 0          | 0       | 0          | 0        |
| 1.004 | 22   | 2.2     | 18         | 1.8     | 333        | 377      |
| 3.000 | 539  | 53.9    | 305        | 30.5    | 166        | 1094.4   |
| 1.005 | 0    | 0       | 0          | 0       | 394        | 394      |
| 4.000 | 249  | 24.9    | 221        | 22.1    | 201        | 718      |
| 1.006 | 377  | 37.7    | 105        | 10.5    | 396        | 926.2    |
| 1.007 | 125  | 12.5    | 168        | 16.8    | 0          | 322.3    |
| 5.000 | 317  | 31.7    | 155        | 15.5    | 156        | 675.2    |
| 5.001 | 411  | 41.1    | 167        | 16.7    | 0          | 635.8    |
| 1.008 | 0    | 0       | 0          | 0       | 261        | 261      |
| 1.009 | 0    | 0       | 0          | 0       | 143.000    | 143      |
| 1.010 | 0    | 0       | 0          | 0       | 227        | 227      |
| 1.011 | 451  | 45.1    | 120        | 12      | 221        | 849.1    |

**REVISIONS**

| Rev | Date     | Description   | By  | Ckd | App |
|-----|----------|---|-----|-----|-----|
| P05 | 14/03/22 | Urban Creep values updated, additional SuDS features added. | JAC | RJH | SM  |
| P04 | 17/02/22 | Contributing areas tables added.                            | VL  | JAC | SM  |
| P03 | 27/09/21 | Updated to Architectural Layout issued 24/08/21             | JAC | JAC | SM  |
| P02 | 20/09/21 | Drainage layout updated                                     | SBH | JAC | JAC |
| P01 | 19/02/21 | First Issue.  | JAC | RJH | RJH |

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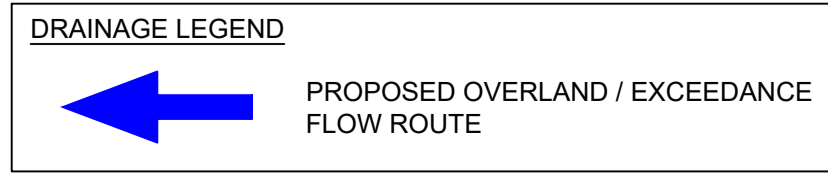
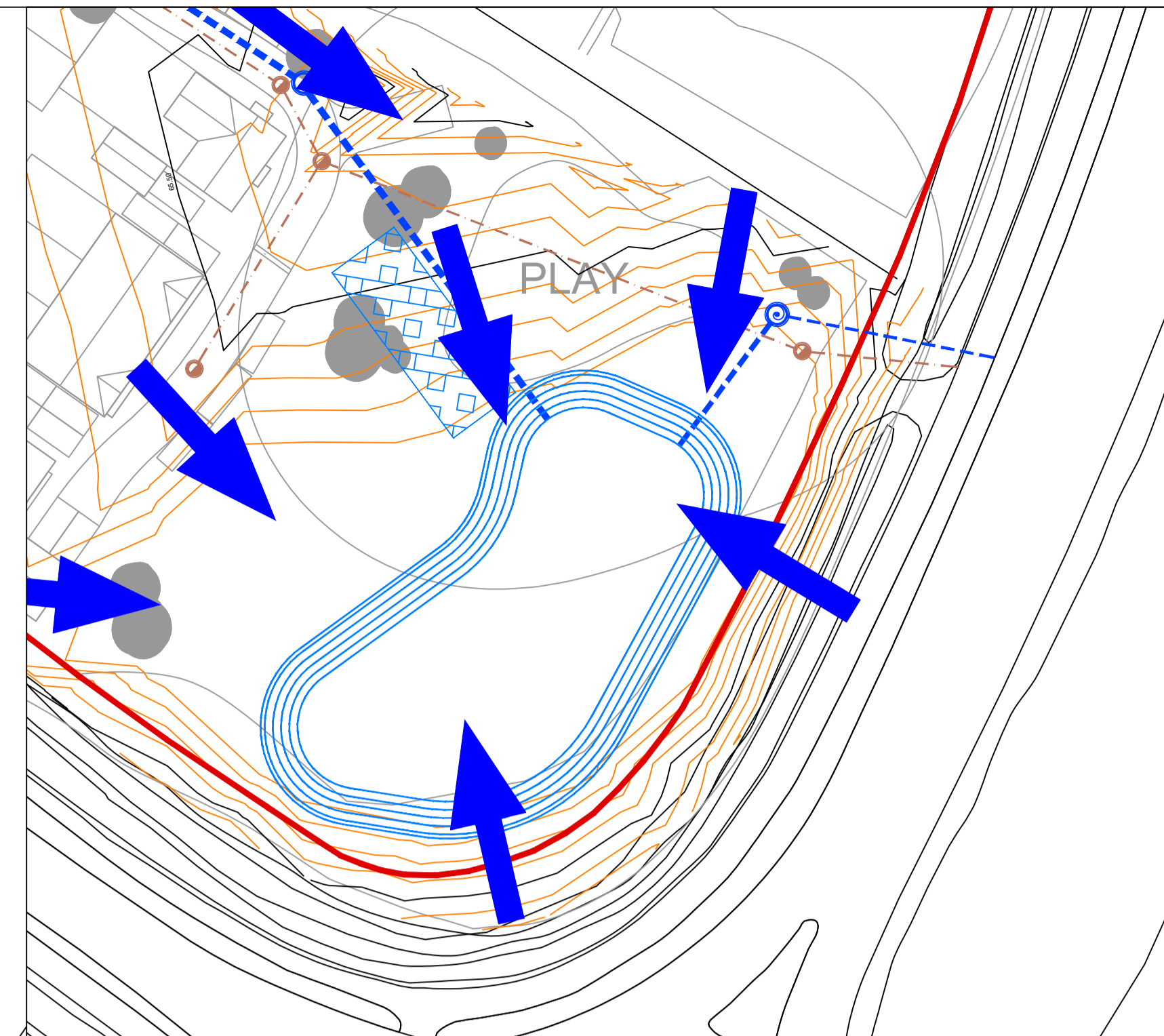
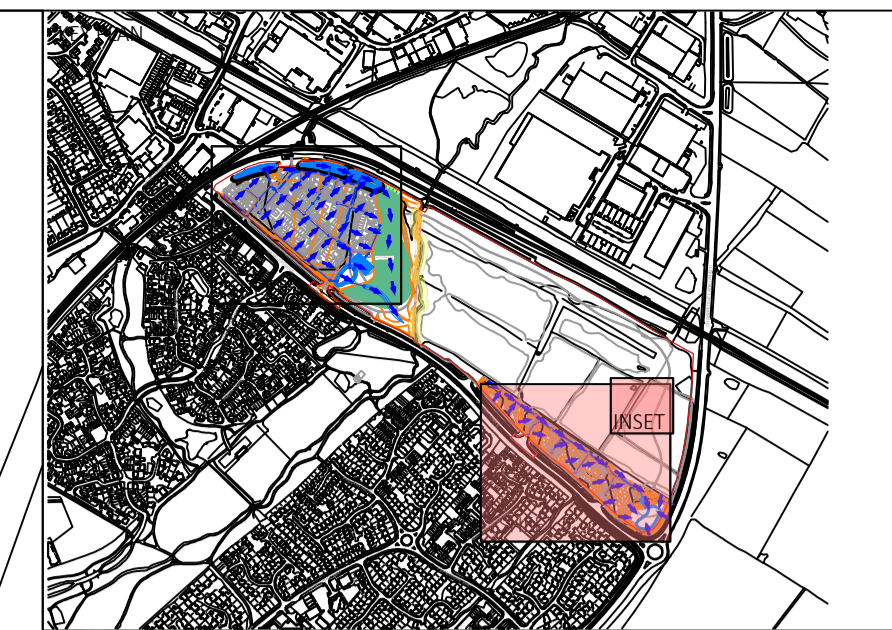
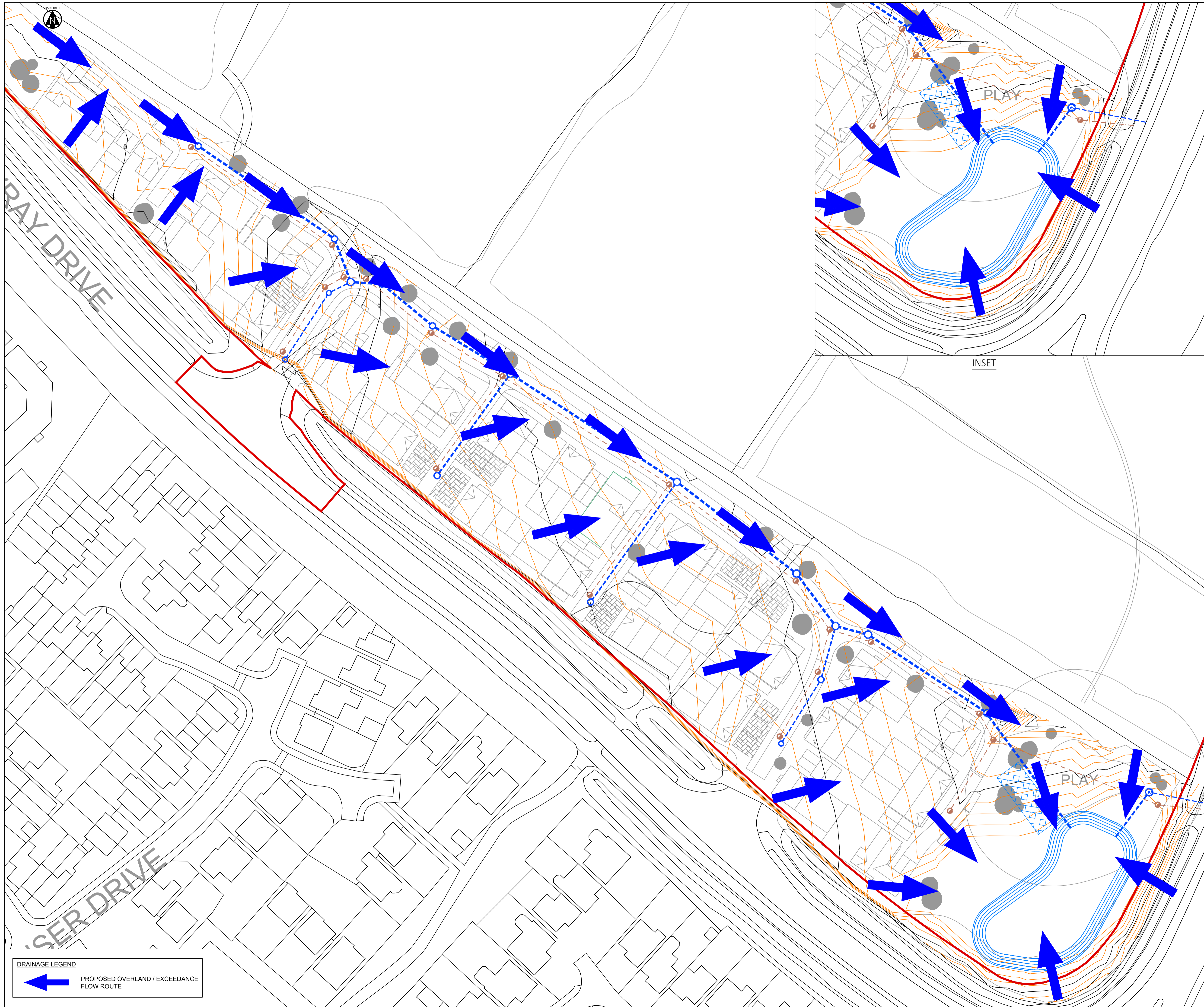
CLIENT  
**L&Q ESTATES LTD.**

PROJECT  
**GAVRAY DRIVE  
 BICESTER**

TITLE  
**DRAINAGE STRATEGY  
 SHEET 2 (EASTERN DEVELOPMENT)**

|                                   |  |                 |
|-----------------------------------|--|-----------------|
| HYDROCK PROJECT NO.<br>C-15114    | SCALE @ A1<br>1 : 500  | STATUS<br>S2    |
| STATUS DESCRIPTION<br>INFORMATION | DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)<br>15114-HYD-XX-XX-DR-D-2201 | REVISION<br>P05 |





REVISIONS

| Rev | Date     | Description                                     | By  | Ckd | App |
|-----|----------|---|-----|-----|-----|
| P02 | 27/09/21 | Updated to Architectural Layout issued 24/08/21 | JAC | JAC | SM  |
| P01 | 19/02/21 | First Issue.                                    | JAC | RJH | RJH |

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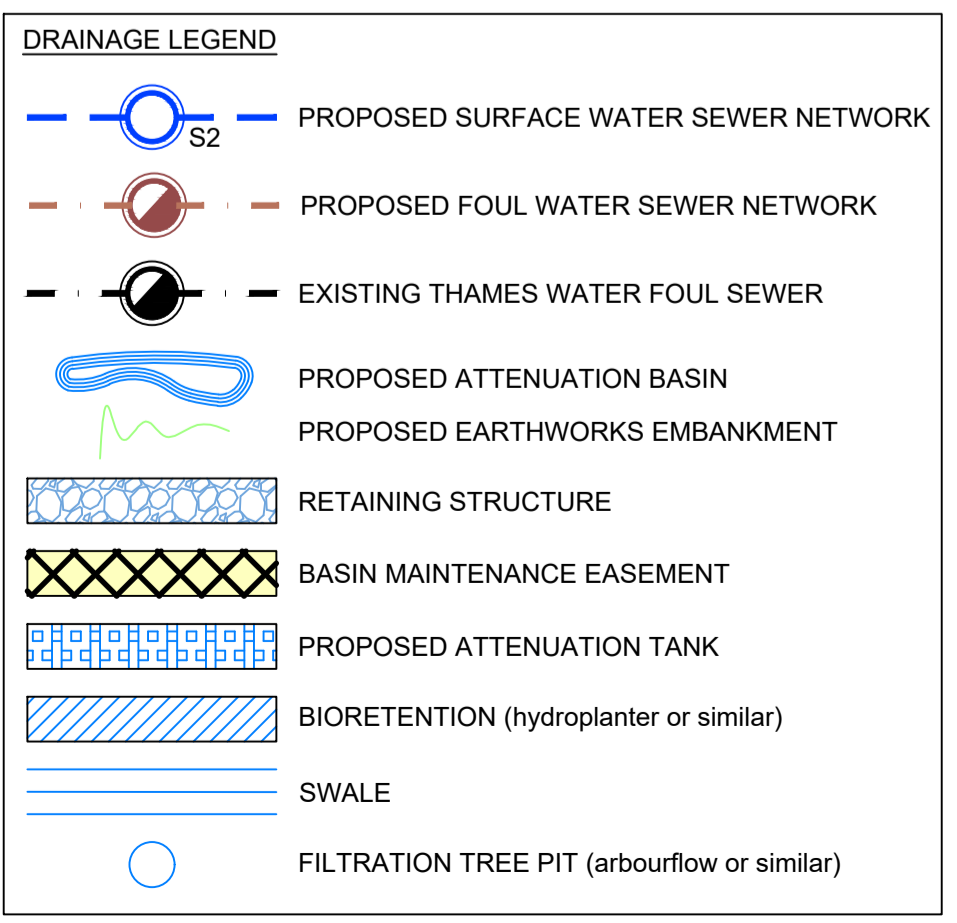
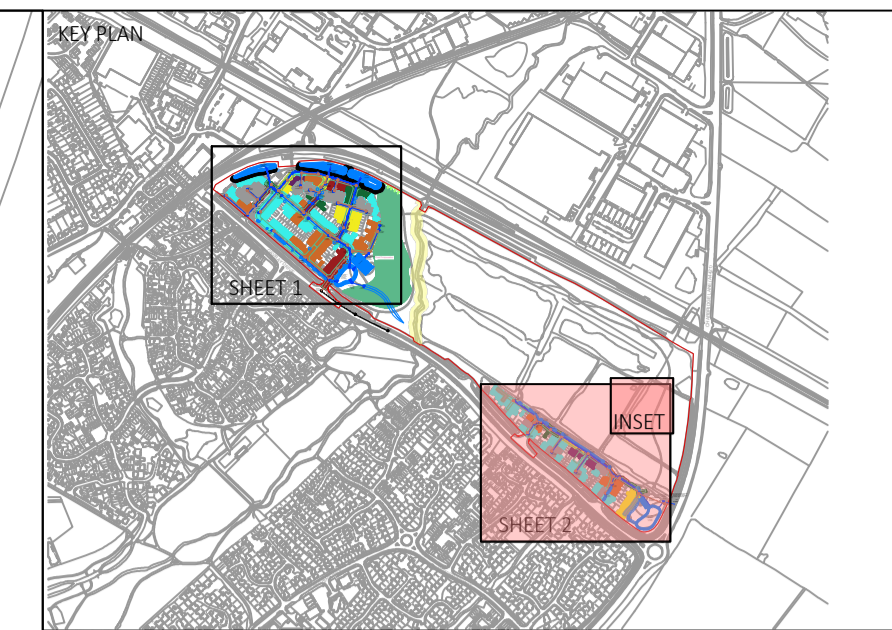
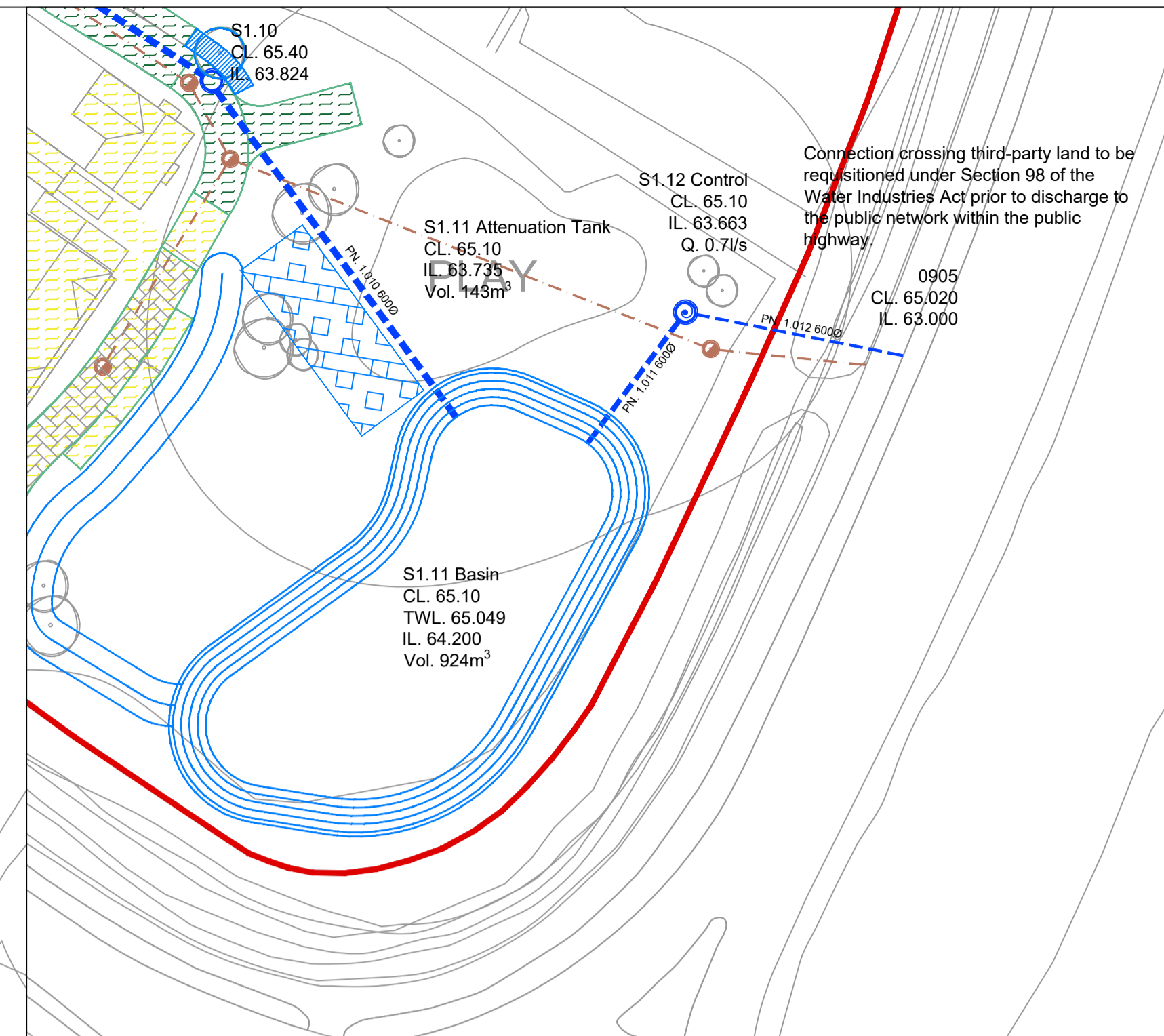
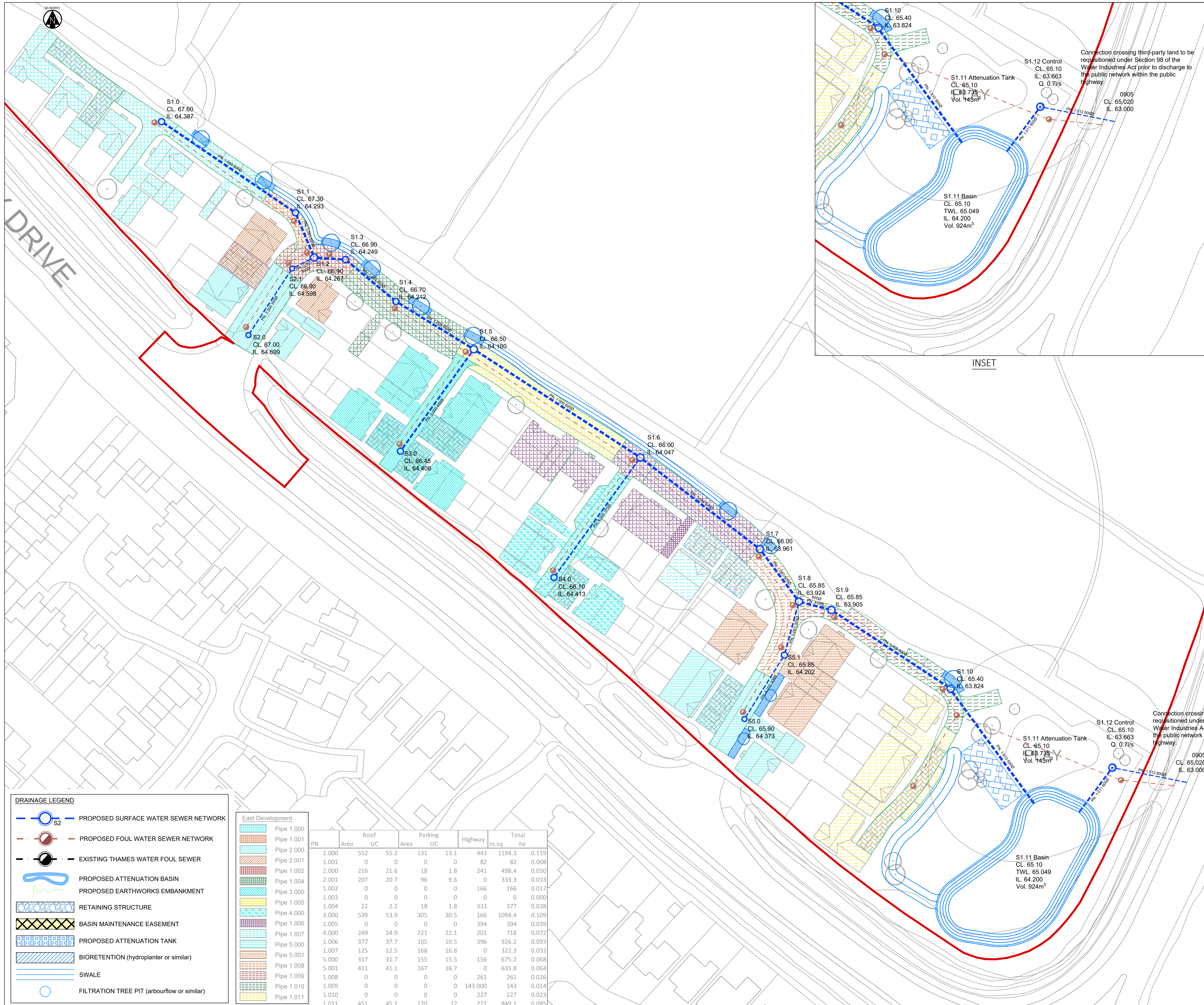
CLIENT  
L&Q ESTATES LTD.

PROJECT  
GAVRAY DRIVE  
BICESTER

TITLE  
DRAINAGE STRATEGY  
SHEET 2 (EASTERN DEVELOPMENT)

|  |                       |                 |
|--|-----------------------|-----------------|
| HYDROCK PROJECT NO.<br>C-15114   | SCALE @ A1<br>1 : 500 | STATUS<br>S2    |
| STATUS DESCRIPTION<br>INFORMATION  |                       | REVISION<br>P02 |
| DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)<br>15114-HYD-XX-XX-DR-D-2301 |                       |                 |





**East Development**

| PN    | Area | Roof UC | Parking UC | Highway | m.sq    | Total ha |
|-------|------|---------|------------|---------|---------|----------|
| 1.000 | 552  | 55.2    | 131        | 13.1    | 443     | 1194.3   |
| 1.001 | 0    | 0       | 0          | 0       | 82      | 82       |
| 1.002 | 216  | 21.6    | 18         | 1.8     | 241     | 498.4    |
| 1.004 | 207  | 20.7    | 96         | 9.6     | 0       | 333.3    |
| 1.002 | 0    | 0       | 0          | 0       | 166     | 166      |
| 1.003 | 0    | 0       | 0          | 0       | 0       | 0        |
| 1.005 | 22   | 2.2     | 18         | 1.8     | 333     | 377      |
| 3.000 | 539  | 53.9    | 305        | 30.5    | 166     | 1094.4   |
| 1.005 | 0    | 0       | 0          | 0       | 394     | 394      |
| 4.000 | 249  | 24.9    | 221        | 22.1    | 201     | 718      |
| 1.006 | 377  | 37.7    | 105        | 10.5    | 396     | 926.2    |
| 1.007 | 125  | 12.5    | 168        | 16.8    | 0       | 322.3    |
| 5.000 | 317  | 31.7    | 155        | 15.5    | 156     | 675.2    |
| 5.001 | 411  | 41.1    | 167        | 16.7    | 0       | 635.8    |
| 1.008 | 0    | 0       | 0          | 0       | 261     | 261      |
| 1.009 | 0    | 0       | 0          | 0       | 143,000 | 143      |
| 1.010 | 0    | 0       | 0          | 0       | 227     | 227      |
| 1.011 | 451  | 45.1    | 120        | 12      | 221     | 849.1    |

**REVISIONS**

| Rev | Date     | Description  | By  | Ckd | App |
|-----|----------|--------------|-----|-----|-----|
| P01 | 14/03/22 | First Issue. | JAC | RJH | SM  |

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**L&Q ESTATES LTD.**

PROJECT  
**GAVRAY DRIVE  
 BICESTER**

TITLE  
**DRAINAGE CATCHMENT STRATEGY  
 SHEET 2 (EASTERN DEVELOPMENT)**

|  |                       |
|--|-----------------------|
| HYDROCK PROJECT NO.<br>C-15114   | SCALE @ A1<br>1 : 500 |
| STATUS DESCRIPTION<br><b>INFORMATION</b>   | STATUS<br>S2          |
| DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)<br>15114-HYD-XX-XX-DR-D-2401 | REVISION<br>P01       |



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Date 22/03/2021 14:29  
File

Designed by JohnCharlesworth  
Checked by

Innovyze

Source Control 2018.1.1


FEH Mean Annual Flood

Input

Site Location GB 459350 222000 SP 59350 22000
Area (ha) 1.000
SAAR (mm) 633
URBEXT (1990) 0.0543
SPRHOST 25.220
BFIHOST 0.654
FARL 0.965

Results

QMED Rural (l/s) 0.8 QMED Urban (l/s) 0.8

|                         |                        |   |
|-------------------------|------------------------|---|
| Hydrock Consultants Ltd |                        | Page 1  |
| .                       | East (100, 30, 1)      |  |
| .                       | C-15114                |   |
| .                       | Gavray Drive, Bicester |   |
| Date 14/03/2022         | Designed by JAC        |   |
| File WEST.MDX           | Checked by             |   |
| Innovyze                | Network 2020.1.3       |   |

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for East





Pipe Sizes STANDARD Manhole Sizes STANDARD

|   |        |
|---|--------|
| FEH Rainfall Model                            |        |
| Return Period (years)                         | 100    |
| FEH Rainfall Version                          | 1999   |
| Site Location GB 459350 222000 SP 59350 22000 |        |
| C (1km)                                       | -0.022 |
| D1 (1km)                                      | 0.323  |
| D2 (1km)                                      | 0.315  |
| D3 (1km)                                      | 0.249  |
| E (1km)                                       | 0.289  |
| F (1km)                                       | 2.478  |
| Maximum Rainfall (mm/hr)                      | 50     |
| Maximum Time of Concentration (mins)          | 30     |
| Foul Sewage (l/s/ha)                          | 0.000  |
| Volumetric Runoff Coeff.                      | 0.750  |
| PIMP (%)                                      | 100    |
| Add Flow / Climate Change (%)                 | 0      |
| Minimum Backdrop Height (m)                   | 0.200  |
| Maximum Backdrop Height (m)                   | 1.500  |
| Min Design Depth for Optimisation (m)         | 1.200  |
| Min Vel for Auto Design only (m/s)            | 1.00   |
| Min Slope for Optimisation (1:X)              | 500    |

Designed with Level Soffits

Network Design Table for East

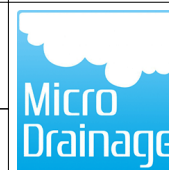
« - Indicates pipe capacity < flow

| PN     | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design   |
|--------|------------|----------|-------------|-------------|-------------|-----------------|--------|----------|----------|--------------|---|
| S1.000 | 47.040     | 0.094    | 500.4       | 0.119       | 4.00        | 0.0             | 0.600  | o        | 600      | Pipe/Conduit |  |
| S1.001 | 13.161     | 0.026    | 506.2       | 0.008       | 0.00        | 0.0             | 0.600  | o        | 600      | Pipe/Conduit |  |
| S2.000 | 22.747     | 0.101    | 225.2       | 0.050       | 4.00        | 0.0             | 0.600  | o        | 300      | Pipe/Conduit |  |
| S2.001 | 6.978      | 0.031    | 225.1       | 0.033       | 0.00        | 0.0             | 0.600  | o        | 300      | Pipe/Conduit |  |

Network Results Table

| PN     | Rain (mm/hr) | T.C. (mins) | US/IL (m) | Σ I.Area (ha) | Σ Base Flow (l/s) | Foul (l/s) | Add Flow (l/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|--------|--------------|-------------|-----------|---------------|-------------------|------------|----------------|-----------|-----------|------------|
| S1.000 | 50.00        | 4.72        | 64.387    | 0.119         | 0.0               | 0.0        | 0.0            | 1.08      | 305.9     | 16.1       |
| S1.001 | 50.00        | 4.93        | 64.293    | 0.127         | 0.0               | 0.0        | 0.0            | 1.08      | 304.1     | 17.2       |
| S2.000 | 50.00        | 4.36        | 64.699    | 0.050         | 0.0               | 0.0        | 0.0            | 1.04      | 73.8      | 6.8        |
| S2.001 | 50.00        | 4.47        | 64.598    | 0.083         | 0.0               | 0.0        | 0.0            | 1.04      | 73.8      | 11.2       |

|                                  |  |  |
|----------------------------------|--|--|
| Hydrock Consultants Ltd          |  | Page 2   |
| .<br>.<br>.                      |  | East (100, 30, 1)<br>C-15114<br>Gavray Drive, Bicester |
| Date 14/03/2022<br>File WEST.MDX |  | Designed by JAC<br>Checked by                          |
| Innovyze                         |  | Network 2020.1.3                                       |



Network Design Table for East

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|----------------|
| S1.002 | 8.984         | 0.018       | 499.1          | 0.017          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.003 | 18.695        | 0.037       | 505.3          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.004 | 26.069        | 0.052       | 501.3          | 0.038          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S3.000 | 35.833        | 0.096       | 373.3          | 0.109          | 4.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit | 🔒              |
| S1.005 | 56.666        | 0.113       | 501.5          | 0.039          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S4.000 | 42.201        | 0.141       | 299.3          | 0.072          | 4.00           | 0.0                | 0.600     | o           | 375         | Pipe/Conduit | 🔒              |
| S1.006 | 42.979        | 0.086       | 499.8          | 0.093          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.007 | 18.667        | 0.037       | 504.5          | 0.032          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S5.000 | 21.511        | 0.096       | 224.1          | 0.068          | 4.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit | 🔒              |
| S5.001 | 15.838        | 0.053       | 298.8          | 0.064          | 0.00           | 0.0                | 0.600     | o           | 375         | Pipe/Conduit | 🔒              |
| S1.008 | 9.597         | 0.019       | 505.1          | 0.026          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.009 | 40.692        | 0.081       | 502.4          | 0.014          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.010 | 45.794        | 0.092       | 497.8          | 0.023          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.011 | 34.253        | 0.069       | 496.4          | 0.085          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit | 🔒              |
| S1.012 | 21.608        | 0.663       | 32.6           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit | 🔒              |

Network Results Table

| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| S1.002 | 50.00           | 5.07           | 64.267       | 0.227            | 0.0                  | 0.0           | 0.0               | 1.08         | 306.3        | 30.7          |
| S1.003 | 50.00           | 5.36           | 64.249       | 0.227            | 0.0                  | 0.0           | 0.0               | 1.08         | 304.4        | 30.7          |
| S1.004 | 50.00           | 5.76           | 64.212       | 0.265            | 0.0                  | 0.0           | 0.0               | 1.08         | 305.6        | 35.9          |
| S3.000 | 50.00           | 4.57           | 64.406       | 0.109            | 0.0                  | 0.0           | 0.0               | 1.05         | 166.4        | 14.8          |
| S1.005 | 50.00           | 6.63           | 64.160       | 0.413            | 0.0                  | 0.0           | 0.0               | 1.08         | 305.5        | 55.9          |
| S4.000 | 50.00           | 4.67           | 64.413       | 0.072            | 0.0                  | 0.0           | 0.0               | 1.04         | 115.1        | 9.7           |
| S1.006 | 50.00           | 7.29           | 64.047       | 0.578            | 0.0                  | 0.0           | 0.0               | 1.08         | 306.1        | 78.3          |
| S1.007 | 50.00           | 7.58           | 63.961       | 0.610            | 0.0                  | 0.0           | 0.0               | 1.08         | 304.6        | 82.6          |
| S5.000 | 50.00           | 4.34           | 64.373       | 0.068            | 0.0                  | 0.0           | 0.0               | 1.05         | 74.0         | 9.2           |
| S5.001 | 50.00           | 4.60           | 64.202       | 0.132            | 0.0                  | 0.0           | 0.0               | 1.04         | 115.2        | 17.9          |
| S1.008 | 50.00           | 7.73           | 63.924       | 0.768            | 0.0                  | 0.0           | 0.0               | 1.08         | 304.4        | 104.0         |
| S1.009 | 50.00           | 8.36           | 63.905       | 0.782            | 0.0                  | 0.0           | 0.0               | 1.08         | 305.3        | 105.9         |
| S1.010 | 50.00           | 9.06           | 63.824       | 0.805            | 0.0                  | 0.0           | 0.0               | 1.08         | 306.7        | 109.0         |
| S1.011 | 50.00           | 9.59           | 63.732       | 0.890            | 0.0                  | 0.0           | 0.0               | 1.09         | 307.1        | 120.5         |
| S1.012 | 50.00           | 9.79           | 63.663       | 0.890            | 0.0                  | 0.0           | 0.0               | 1.77         | 31.3«        | 120.5         |

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East (100, 30, 1)  
C-15114  
Gavray Drive, Bicester



Date 14/03/2022  
File WEST.MDX

Designed by JAC  
Checked by


Innovyze

Network 2020.1.3

Free Flowing Outfall Details for East

| Outfall<br>Pipe Number | Outfall<br>Name | C. Level<br>(m) | I. Level<br>(m) | Min<br>I. Level<br>(m) | D,L<br>(mm) | W<br>(mm) |
|------------------------|-----------------|-----------------|-----------------|------------------------|-------------|-----------|
| S1.012                 | S0905           | 65.020          | 63.000          | 0.000                  | 0           | 0         |



|                         |                        |   |
|-------------------------|------------------------|---|
| Hydrock Consultants Ltd |                        | Page 4  |
| .                       | East (100, 30, 1)      |  |
| .                       | C-15114                |   |
| .                       | Gavray Drive, Bicester |   |
| Date 14/03/2022         | Designed by JAC        |   |
| File WEST.MDX           | Checked by             |   |
| Innovyze                | Network 2020.1.3       |   |

Online Controls for East

Hydro-Brake® Optimum Manhole: S1.12 Control, DS/PN: S1.012, Volume (m³):  
19.2

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0036-7000-1400-7000 |
| Design Head (m)                   | 1.400                      |
| Design Flow (l/s)                 | 0.7                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 36                         |
| Invert Level (m)                  | 63.663                     |
| Minimum Outlet Pipe Diameter (mm) | 75                         |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.400    | 0.7        |
| Flush-Flo™                | 0.156    | 0.4        |
| Kick-Flo®                 | 0.317    | 0.4        |
| Mean Flow over Head Range | -        | 0.5        |

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     | 0.4        | 1.200     | 0.7        | 3.000     | 1.0        | 7.000     | 1.4        |
| 0.200     | 0.4        | 1.400     | 0.7        | 3.500     | 1.1        | 7.500     | 1.5        |
| 0.300     | 0.4        | 1.600     | 0.7        | 4.000     | 1.1        | 8.000     | 1.5        |
| 0.400     | 0.4        | 1.800     | 0.8        | 4.500     | 1.2        | 8.500     | 1.6        |
| 0.500     | 0.4        | 2.000     | 0.8        | 5.000     | 1.2        | 9.000     | 1.6        |
| 0.600     | 0.5        | 2.200     | 0.9        | 5.500     | 1.3        | 9.500     | 1.7        |
| 0.800     | 0.5        | 2.400     | 0.9        | 6.000     | 1.3        |           |            |
| 1.000     | 0.6        | 2.600     | 0.9        | 6.500     | 1.4        |           |            |



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Storage Structures for East

Complex Manhole: S1.11 Basin, DS/PN: S1.011

Tank or Pond

Invert Level (m) 64.200


| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 800.3                  | 0.900     | 1271.1                 | 0.901     | 0.0                    |

Cellular Storage

Invert Level (m) 63.732 Safety Factor 2.0  
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 150.0                  | 0.0                         | 1.001     | 0.0                    | 0.0                         |
| 1.000     | 150.0                  | 0.0                         |           |                        |                             |



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

Simulation Criteria

|                                 |       |  |       |
|---------------------------------|-------|--|-------|
| Areal Reduction Factor          | 1.000 | Additional Flow - % of Total Flow          | 0.000 |
| Hot Start (mins)                | 0     | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| 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       | FEH                             |
| FEH Rainfall Version | 1999                            |
| Site Location        | GB 459350 222000 SP 59350 22000 |
| C (1km)              | -0.022                          |
| D1 (1km)             | 0.323                           |
| D2 (1km)             | 0.315                           |
| D3 (1km)             | 0.249                           |
| E (1km)              | 0.289                           |
| F (1km)              | 2.478                           |
| Cv (Summer)          | 0.750                           |
| Cv (Winter)          | 0.950                           |


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

|                          |   |
|--------------------------|---|
| Profile(s)               | Summer and Winter   |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600,<br>720, 960, 1440, 2160, 2880, 4320, 5760,<br>7200, 8640, 10080 |
| Return Period(s) (years) | 1, 30, 100  |
| Climate Change (%)       | 0, 0, 0   |

WARNING: Half Drain Time has not been calculated as the structure is too full.

| PN     | US/MH Name | Storm     | Return Period | Climate Change | First (X) Surge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|------------|-----------|---------------|----------------|-----------------|-----------------|--------------------|---------------|-----------------|
| S1.000 | S1.0       | 15 Winter | 1             | +0%            |                 |                 |                    |               | 64.517          |
| S1.001 | S1.1       | 15 Winter | 1             | +0%            | 100/15 Winter   |                 |                    |               | 64.466          |
| S2.000 | S2.0       | 15 Winter | 1             | +0%            | 100/15 Winter   |                 |                    |               | 64.770          |
| S2.001 | S2.1       | 15 Winter | 1             | +0%            | 100/15 Winter   |                 |                    |               | 64.697          |
| S1.002 | S1.2       | 15 Winter | 1             | +0%            | 100/15 Summer   |                 |                    |               | 64.452          |
| S1.003 | S1.3       | 15 Winter | 1             | +0%            |                 |                 |                    |               | 64.431          |




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

| PN     | US/MH<br>Name | Surcharged Flooded |                             |                               | Flow / Overflow<br>Cap. (l/s) | Half Drain<br>Time (mins) | Pipe<br>Flow (l/s) | Level<br>Status Exceeded |
|--------|---------------|--------------------|-----------------------------|-------------------------------|-------------------------------|---------------------------|--------------------|--------------------------|
|        |               | Depth<br>(m)       | Volume<br>(m <sup>3</sup> ) | Flow / Overflow<br>Cap. (l/s) |                               |                           |                    |                          |
| S1.000 | S1.0          | -0.470             | 0.000                       | 0.07                          |                               | 18.7                      | OK                 |                          |
| S1.001 | S1.1          | -0.427             | 0.000                       | 0.10                          |                               | 16.6                      | OK                 |                          |
| S2.000 | S2.0          | -0.229             | 0.000                       | 0.13                          |                               | 8.3                       | OK                 |                          |
| S2.001 | S2.1          | -0.201             | 0.000                       | 0.23                          |                               | 12.4                      | OK                 |                          |
| S1.002 | S1.2          | -0.415             | 0.000                       | 0.18                          |                               | 29.6                      | OK                 |                          |
| S1.003 | S1.3          | -0.418             | 0.000                       | 0.15                          |                               | 29.0                      | OK                 |                          |



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

| PN     | US/MH Name    | Storm       | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow |
|--------|---------------|-------------|---------------|----------------|--------------------|-----------------|--------------------|
| S1.004 | S1.4          | 15 Winter   | 1             | +0%            |                    |                 |                    |
| S3.000 | S3.0          | 15 Winter   | 1             | +0%            |                    |                 |                    |
| S1.005 | S1.5          | 15 Winter   | 1             | +0%            | 100/2880 Winter    |                 |                    |
| S4.000 | S4.0          | 15 Winter   | 1             | +0%            |                    |                 |                    |
| S1.006 | S1.6          | 2880 Winter | 1             | +0%            | 100/15 Summer      |                 |                    |
| S1.007 | S1.7          | 2880 Winter | 1             | +0%            | 30/1440 Winter     |                 |                    |
| S5.000 | S5.0          | 15 Winter   | 1             | +0%            | 100/15 Winter      |                 |                    |
| S5.001 | S5.1          | 2880 Winter | 1             | +0%            | 30/2160 Winter     |                 |                    |
| S1.008 | S1.8          | 2880 Winter | 1             | +0%            | 30/960 Winter      |                 |                    |
| S1.009 | S1.9          | 2880 Winter | 1             | +0%            | 30/720 Winter      |                 |                    |
| S1.010 | S1.10         | 2880 Winter | 1             | +0%            | 30/240 Winter      |                 |                    |
| S1.011 | S1.11 Basin   | 2880 Winter | 1             | +0%            | 1/2160 Winter      |                 |                    |
| S1.012 | S1.12 Control | 2880 Winter | 1             | +0%            | 1/15 Summer        |                 |                    |

| PN     | US/MH Name    | Water Overflow Act. | Surcharged Level (m) | Flooded Depth (m) | Volume (m³) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) |
|--------|---------------|---------------------|----------------------|-------------------|-------------|----------------------------|------------------------|-----------------|
| S1.004 | S1.4          |                     | 64.396               | -0.416            | 0.000       | 0.13                       |                        | 32.7            |
| S3.000 | S3.0          |                     | 64.511               | -0.345            | 0.000       | 0.12                       |                        | 18.1            |
| S1.005 | S1.5          |                     | 64.358               | -0.402            | 0.000       | 0.17                       |                        | 46.7            |
| S4.000 | S4.0          |                     | 64.497               | -0.291            | 0.000       | 0.11                       |                        | 11.9            |
| S1.006 | S1.6          |                     | 64.356               | -0.291            | 0.000       | 0.01                       |                        | 3.3             |
| S1.007 | S1.7          |                     | 64.356               | -0.205            | 0.000       | 0.02                       |                        | 3.4             |
| S5.000 | S5.0          |                     | 64.456               | -0.217            | 0.000       | 0.17                       |                        | 11.2            |
| S5.001 | S5.1          |                     | 64.356               | -0.221            | 0.000       | 0.01                       |                        | 0.8             |
| S1.008 | S1.8          |                     | 64.356               | -0.168            | 0.000       | 0.03                       |                        | 4.3             |
| S1.009 | S1.9          |                     | 64.356               | -0.149            | 0.000       | 0.02                       |                        | 4.2             |
| S1.010 | S1.10         |                     | 64.356               | -0.068            | 0.000       | 0.02                       |                        | 4.2             |
| S1.011 | S1.11 Basin   |                     | 64.356               | 0.024             | 0.000       | 0.03                       |                        | 6.5             |
| S1.012 | S1.12 Control |                     | 64.374               | 0.561             | 0.000       | 0.02                       |                        | 0.5             |

| PN     | US/MH Name | Status | Level Exceeded |
|--------|------------|--------|----------------|
| S1.004 | S1.4       | OK     |                |
| S3.000 | S3.0       | OK     |                |
| S1.005 | S1.5       | OK     |                |
| S4.000 | S4.0       | OK     |                |
| S1.006 | S1.6       | OK     |                |
| S1.007 | S1.7       | OK     |                |
| S5.000 | S5.0       | OK     |                |
| S5.001 | S5.1       | OK     |                |
| S1.008 | S1.8       | OK     |                |
| S1.009 | S1.9       | OK     |                |




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

| PN     | US/MH<br>Name | Status     | Level<br>Exceeded |
|--------|---------------|------------|-------------------|
| S1.010 | S1.10         | OK         |                   |
| S1.011 | S1.11 Basin   | SURCHARGED |                   |
| S1.012 | S1.12 Control | SURCHARGED |                   |



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

Simulation Criteria

|                                 |       |  |       |
|---------------------------------|-------|--|-------|
| Areal Reduction Factor          | 1.000 | Additional Flow - % of Total Flow          | 0.000 |
| Hot Start (mins)                | 0     | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| 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       | FEH                             |
| FEH Rainfall Version | 1999                            |
| Site Location        | GB 459350 222000 SP 59350 22000 |
| C (1km)              | -0.022                          |
| D1 (1km)             | 0.323                           |
| D2 (1km)             | 0.315                           |
| D3 (1km)             | 0.249                           |
| E (1km)              | 0.289                           |
| F (1km)              | 2.478                           |
| Cv (Summer)          | 0.750                           |
| Cv (Winter)          | 0.950                           |

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

|                          |   |
|--------------------------|---|
| Profile(s)               | Summer and Winter   |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600,<br>720, 960, 1440, 2160, 2880, 4320, 5760,<br>7200, 8640, 10080 |
| Return Period(s) (years) | 1, 30, 100  |
| Climate Change (%)       | 0, 0, 0   |

**WARNING: Half Drain Time has not been calculated as the structure is too full.**

| PN     | US/MH Name | Storm     | Return Period | Climate Change | First (X) Surge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|------------|-----------|---------------|----------------|-----------------|-----------------|--------------------|---------------|-----------------|
| S1.000 | S1.0       | 15 Winter | 30            | +0%            |                 |                 |                    |               | 64.766          |
| S1.001 | S1.1       | 15 Winter | 30            | +0%            | 100/15 Winter   |                 |                    |               | 64.747          |
| S2.000 | S2.0       | 15 Winter | 30            | +0%            | 100/15 Winter   |                 |                    |               | 64.839          |
| S2.001 | S2.1       | 15 Winter | 30            | +0%            | 100/15 Winter   |                 |                    |               | 64.794          |
| S1.002 | S1.2       | 15 Winter | 30            | +0%            | 100/15 Summer   |                 |                    |               | 64.739          |
| S1.003 | S1.3       | 15 Winter | 30            | +0%            |                 |                 |                    |               | 64.730          |

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

| PN     | US/MH<br>Name | Surcharged Flooded |                             |      | Flow /<br>Cap. | Overflow<br>(l/s) | Half Drain<br>Time<br>(mins) | Pipe<br>Flow<br>(l/s) | Status | Level<br>Exceeded |
|--------|---------------|--------------------|-----------------------------|------|----------------|-------------------|------------------------------|-----------------------|--------|-------------------|
|        |               | Depth<br>(m)       | Volume<br>(m <sup>3</sup> ) | Flow |                |                   |                              |                       |        |                   |
| S1.000 | S1.0          | -0.221             | 0.000                       | 0.21 |                |                   | 55.1                         | OK                    |        |                   |
| S1.001 | S1.1          | -0.146             | 0.000                       | 0.28 |                |                   | 45.4                         | OK                    |        |                   |
| S2.000 | S2.0          | -0.160             | 0.000                       | 0.37 |                |                   | 24.3                         | OK                    |        |                   |
| S2.001 | S2.1          | -0.104             | 0.000                       | 0.74 |                |                   | 39.7                         | OK                    |        |                   |
| S1.002 | S1.2          | -0.128             | 0.000                       | 0.53 |                |                   | 85.6                         | OK                    |        |                   |
| S1.003 | S1.3          | -0.119             | 0.000                       | 0.41 |                |                   | 80.1                         | OK                    |        |                   |



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

| PN     | US/MH Name    | Storm       | Return Period | Climate Change | First (X) Surchage | First (Y) Flood | First (Z) Overflow |
|--------|---------------|-------------|---------------|----------------|--------------------|-----------------|--------------------|
| S1.004 | S1.4          | 15 Winter   | 30            | +0%            |                    |                 |                    |
| S3.000 | S3.0          | 15 Winter   | 30            | +0%            |                    |                 |                    |
| S1.005 | S1.5          | 240 Winter  | 30            | +0%            | 100/2880 Winter    |                 |                    |
| S4.000 | S4.0          | 240 Winter  | 30            | +0%            |                    |                 |                    |
| S1.006 | S1.6          | 240 Winter  | 30            | +0%            | 100/15 Summer      |                 |                    |
| S1.007 | S1.7          | 5760 Winter | 30            | +0%            | 30/1440 Winter     |                 |                    |
| S5.000 | S5.0          | 5760 Winter | 30            | +0%            | 100/15 Winter      |                 |                    |
| S5.001 | S5.1          | 5760 Winter | 30            | +0%            | 30/2160 Winter     |                 |                    |
| S1.008 | S1.8          | 5760 Winter | 30            | +0%            | 30/960 Winter      |                 |                    |
| S1.009 | S1.9          | 5760 Winter | 30            | +0%            | 30/720 Winter      |                 |                    |
| S1.010 | S1.10         | 5760 Winter | 30            | +0%            | 30/240 Winter      |                 |                    |
| S1.011 | S1.11 Basin   | 5760 Winter | 30            | +0%            | 1/2160 Winter      |                 |                    |
| S1.012 | S1.12 Control | 5760 Winter | 30            | +0%            | 1/15 Summer        |                 |                    |

| PN     | US/MH Name    | Overflow Act. | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) |
|--------|---------------|---------------|-----------------|----------------------|---------------------|----------------------------|------------------------|-----------------|
| S1.004 | S1.4          |               | 64.705          | -0.107               | 0.000               | 0.35                       |                        | 84.3            |
| S3.000 | S3.0          |               | 64.690          | -0.166               | 0.000               | 0.36                       |                        | 52.0            |
| S1.005 | S1.5          |               | 64.676          | -0.084               | 0.000               | 0.09                       |                        | 23.9            |
| S4.000 | S4.0          |               | 64.646          | -0.142               | 0.000               | 0.05                       |                        | 5.3             |
| S1.006 | S1.6          |               | 64.644          | -0.003               | 0.000               | 0.12                       |                        | 31.9            |
| S1.007 | S1.7          |               | 64.630          | 0.069                | 0.000               | 0.02                       |                        | 3.8             |
| S5.000 | S5.0          |               | 64.630          | -0.043               | 0.000               | 0.01                       |                        | 0.4             |
| S5.001 | S5.1          |               | 64.630          | 0.053                | 0.000               | 0.01                       |                        | 0.9             |
| S1.008 | S1.8          |               | 64.630          | 0.106                | 0.000               | 0.03                       |                        | 4.8             |
| S1.009 | S1.9          |               | 64.630          | 0.125                | 0.000               | 0.02                       |                        | 4.9             |
| S1.010 | S1.10         |               | 64.630          | 0.206                | 0.000               | 0.02                       |                        | 5.1             |
| S1.011 | S1.11 Basin   |               | 64.630          | 0.298                | 0.000               | 0.03                       |                        | 8.6             |
| S1.012 | S1.12 Control |               | 64.660          | 0.847                | 0.000               | 0.02                       |                        | 0.6             |

| PN     | US/MH Name | Status     | Level Exceeded |
|--------|------------|------------|----------------|
| S1.004 | S1.4       | OK         |                |
| S3.000 | S3.0       | OK         |                |
| S1.005 | S1.5       | OK         |                |
| S4.000 | S4.0       | OK         |                |
| S1.006 | S1.6       | OK         |                |
| S1.007 | S1.7       | SURCHARGED |                |
| S5.000 | S5.0       | OK         |                |
| S5.001 | S5.1       | SURCHARGED |                |
| S1.008 | S1.8       | SURCHARGED |                |
| S1.009 | S1.9       | SURCHARGED |                |

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

Table with 4 columns: PN, US/MH Name, Status, Level Exceeded. Rows include S1.010, S1.011, and S1.012, all with SURCHARGED status.



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

Simulation Criteria

|                                 |       |  |       |
|---------------------------------|-------|--|-------|
| Areal Reduction Factor          | 1.000 | Additional Flow - % of Total Flow          | 0.000 |
| Hot Start (mins)                | 0     | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| 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                     | FEH                             |
| FEH Rainfall Version               | 1999                            |
| Site Location                      | GB 459350 222000 SP 59350 22000 |
| C (1km)                            | -0.022                          |
| D1 (1km)                           | 0.323                           |
| D2 (1km)                           | 0.315                           |
| D3 (1km)                           | 0.249                           |
| E (1km)                            | 0.289                           |
| F (1km)                            | 2.478                           |
| Cv (Summer)                        | 0.750                           |
| Cv (Winter)                        | 0.950                           |
| Margin for Flood Risk Warning (mm) | 300.0                           |
| Analysis Timestep                  | 2.5 Second Increment (Extended) |
| DTS Status                         | ON                              |
| 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, 2160, 2880, 4320, 5760, 7200, 8640, 10080 |
| Return Period(s) (years) | 1, 30, 100  |
| Climate Change (%)       | 0, 0, 0   |

**WARNING: Half Drain Time has not been calculated as the structure is too full.**

| PN     | US/MH Name | Storm     | Return Period | Climate Change | First (X) Surge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|--------|------------|-----------|---------------|----------------|-----------------|-----------------|--------------------|---------------|-----------------|
| S1.000 | S1.0       | 30 Winter | 100           | +0%            |                 |                 |                    |               | 64.987          |
| S1.001 | S1.1       | 15 Winter | 100           | +0%            | 100/15          | Winter          |                    |               | 64.923          |
| S2.000 | S2.0       | 15 Winter | 100           | +0%            | 100/15          | Winter          |                    |               | 65.049          |
| S2.001 | S2.1       | 15 Winter | 100           | +0%            | 100/15          | Winter          |                    |               | 64.967          |
| S1.002 | S1.2       | 15 Winter | 100           | +0%            | 100/15          | Summer          |                    |               | 64.902          |
| S1.003 | S1.3       | 15 Winter | 100           | +0%            |                 |                 |                    |               | 64.849          |

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

| PN     | US/MH<br>Name | Surcharged   |                             | Flooded                          | Flow /<br>Overflow<br>Cap. (l/s) | Half Drain<br>Time<br>(mins) | Pipe<br>Flow<br>(l/s) | Status     | Level<br>Exceeded |
|--------|---------------|--------------|-----------------------------|----------------------------------|----------------------------------|------------------------------|-----------------------|------------|-------------------|
|        |               | Depth<br>(m) | Volume<br>(m <sup>3</sup> ) | Flow /<br>Overflow<br>Cap. (l/s) |                                  |                              |                       |            |                   |
| S1.000 | S1.0          | 0.000        | 0.000                       | 0.20                             |                                  |                              | 54.5                  |            | OK                |
| S1.001 | S1.1          | 0.030        | 0.000                       | 0.46                             |                                  |                              | 74.0                  | SURCHARGED |                   |
| S2.000 | S2.0          | 0.050        | 0.000                       | 0.53                             |                                  |                              | 34.7                  | SURCHARGED |                   |
| S2.001 | S2.1          | 0.069        | 0.000                       | 1.00                             |                                  |                              | 53.2                  | SURCHARGED |                   |
| S1.002 | S1.2          | 0.035        | 0.000                       | 0.80                             |                                  |                              | 128.1                 | SURCHARGED |                   |
| S1.003 | S1.3          | 0.000        | 0.000                       | 0.57                             |                                  |                              | 110.4                 |            | OK                |



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

| PN     | US/MH Name    | Storm       | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow |
|--------|---------------|-------------|---------------|----------------|---------------------|-----------------|--------------------|
| S1.004 | S1.4          | 180 Winter  | 100           | +0%            |                     |                 |                    |
| S3.000 | S3.0          | 15 Winter   | 100           | +0%            |                     |                 |                    |
| S1.005 | S1.5          | 5760 Winter | 100           | +0%            | 100/2880 Winter     |                 |                    |
| S4.000 | S4.0          | 5760 Winter | 100           | +0%            |                     |                 |                    |
| S1.006 | S1.6          | 5760 Winter | 100           | +0%            | 100/15 Summer       |                 |                    |
| S1.007 | S1.7          | 5760 Winter | 100           | +0%            | 30/1440 Winter      |                 |                    |
| S5.000 | S5.0          | 5760 Winter | 100           | +0%            | 100/15 Winter       |                 |                    |
| S5.001 | S5.1          | 5760 Winter | 100           | +0%            | 30/2160 Winter      |                 |                    |
| S1.008 | S1.8          | 5760 Winter | 100           | +0%            | 30/960 Winter       |                 |                    |
| S1.009 | S1.9          | 5760 Winter | 100           | +0%            | 30/720 Winter       |                 |                    |
| S1.010 | S1.10         | 5760 Winter | 100           | +0%            | 30/240 Winter       |                 |                    |
| S1.011 | S1.11 Basin   | 5760 Winter | 100           | +0%            | 1/2160 Winter       |                 |                    |
| S1.012 | S1.12 Control | 5760 Winter | 100           | +0%            | 1/15 Summer         |                 |                    |


| PN     | US/MH Name    | Water Overflow Act. | Surcharged Level (m) | Flooded Depth (m) | Volume (m³) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) |
|--------|---------------|---------------------|----------------------|-------------------|-------------|----------------------------|------------------------|-----------------|
| S1.004 | S1.4          |                     | 64.812               | 0.000             | 0.000       | 0.10                       |                        | 24.1            |
| S3.000 | S3.0          |                     | 64.849               | -0.007            | 0.000       | 0.51                       |                        | 75.2            |
| S1.005 | S1.5          |                     | 64.782               | 0.022             | 0.000       | 0.01                       |                        | 3.3             |
| S4.000 | S4.0          |                     | 64.782               | -0.006            | 0.000       | 0.01                       |                        | 0.6             |
| S1.006 | S1.6          |                     | 64.782               | 0.135             | 0.000       | 0.02                       |                        | 4.6             |
| S1.007 | S1.7          |                     | 64.782               | 0.221             | 0.000       | 0.03                       |                        | 4.9             |
| S5.000 | S5.0          |                     | 64.782               | 0.109             | 0.000       | 0.01                       |                        | 0.5             |
| S5.001 | S5.1          |                     | 64.782               | 0.205             | 0.000       | 0.01                       |                        | 1.1             |
| S1.008 | S1.8          |                     | 64.782               | 0.258             | 0.000       | 0.04                       |                        | 6.1             |
| S1.009 | S1.9          |                     | 64.783               | 0.278             | 0.000       | 0.02                       |                        | 6.2             |
| S1.010 | S1.10         |                     | 64.783               | 0.359             | 0.000       | 0.02                       |                        | 6.4             |
| S1.011 | S1.11 Basin   |                     | 64.783               | 0.451             | 0.000       | 0.03                       |                        | 8.6             |
| S1.012 | S1.12 Control |                     | 64.812               | 0.999             | 0.000       | 0.02                       |                        | 0.6             |

| PN     | US/MH Name | Status     | Level Exceeded |
|--------|------------|------------|----------------|
| S1.004 | S1.4       | OK         |                |
| S3.000 | S3.0       | OK         |                |
| S1.005 | S1.5       | SURCHARGED |                |
| S4.000 | S4.0       | OK         |                |
| S1.006 | S1.6       | SURCHARGED |                |
| S1.007 | S1.7       | SURCHARGED |                |
| S5.000 | S5.0       | SURCHARGED |                |
| S5.001 | S5.1       | SURCHARGED |                |
| S1.008 | S1.8       | SURCHARGED |                |
| S1.009 | S1.9       | SURCHARGED |                |

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

| PN     | US/MH<br>Name | Status     | Level<br>Exceeded |
|--------|---------------|------------|-------------------|
| S1.010 | S1.10         | SURCHARGED |                   |
| S1.011 | S1.11 Basin   | SURCHARGED |                   |
| S1.012 | S1.12 Control | FLOOD RISK |                   |

|                         |                        |   |
|-------------------------|------------------------|---|
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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for East





Pipe Sizes STANDARD Manhole Sizes STANDARD

|   |        |
|---|--------|
| FEH Rainfall Model                            |        |
| Return Period (years)                         | 100    |
| FEH Rainfall Version                          | 1999   |
| Site Location GB 459350 222000 SP 59350 22000 |        |
| C (1km)                                       | -0.022 |
| D1 (1km)                                      | 0.323  |
| D2 (1km)                                      | 0.315  |
| D3 (1km)                                      | 0.249  |
| E (1km)                                       | 0.289  |
| F (1km)                                       | 2.478  |
| Maximum Rainfall (mm/hr)                      | 50     |
| Maximum Time of Concentration (mins)          | 30     |
| Foul Sewage (l/s/ha)                          | 0.000  |
| Volumetric Runoff Coeff.                      | 0.750  |
| PIMP (%)                                      | 100    |
| Add Flow / Climate Change (%)                 | 0      |
| Minimum Backdrop Height (m)                   | 0.200  |
| Maximum Backdrop Height (m)                   | 1.500  |
| Min Design Depth for Optimisation (m)         | 1.200  |
| Min Vel for Auto Design only (m/s)            | 1.00   |
| Min Slope for Optimisation (1:X)              | 500    |

Designed with Level Soffits

Network Design Table for East


« - Indicates pipe capacity < flow

| PN     | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design   |
|--------|------------|----------|-------------|-------------|-------------|-----------------|--------|----------|----------|--------------|---|
| S1.000 | 47.040     | 0.094    | 500.4       | 0.119       | 4.00        | 0.0             | 0.600  | o        | 600      | Pipe/Conduit |  |
| S1.001 | 13.161     | 0.026    | 506.2       | 0.008       | 0.00        | 0.0             | 0.600  | o        | 600      | Pipe/Conduit |  |
| S2.000 | 22.747     | 0.101    | 225.2       | 0.050       | 4.00        | 0.0             | 0.600  | o        | 300      | Pipe/Conduit |  |
| S2.001 | 6.978      | 0.031    | 225.1       | 0.033       | 0.00        | 0.0             | 0.600  | o        | 300      | Pipe/Conduit |  |
















Network Results Table

| PN     | Rain (mm/hr) | T.C. (mins) | US/IL (m) | Σ I.Area (ha) | Σ Base Flow (l/s) | Foul (l/s) | Add Flow (l/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|--------|--------------|-------------|-----------|---------------|-------------------|------------|----------------|-----------|-----------|------------|
| S1.000 | 50.00        | 4.72        | 64.387    | 0.119         | 0.0               | 0.0        | 0.0            | 1.08      | 305.9     | 16.1       |
| S1.001 | 50.00        | 4.93        | 64.293    | 0.127         | 0.0               | 0.0        | 0.0            | 1.08      | 304.1     | 17.2       |
| S2.000 | 50.00        | 4.36        | 64.699    | 0.050         | 0.0               | 0.0        | 0.0            | 1.04      | 73.8      | 6.8        |
| S2.001 | 50.00        | 4.47        | 64.598    | 0.083         | 0.0               | 0.0        | 0.0            | 1.04      | 73.8      | 11.2       |



|                         |                        |   |
|-------------------------|------------------------|---|
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Network Design Table for East

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design  |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---|
| S1.002 | 8.984         | 0.018       | 499.1          | 0.017          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |    |
| S1.003 | 18.695        | 0.037       | 505.3          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |    |
| S1.004 | 26.069        | 0.052       | 501.3          | 0.038          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |    |
| S3.000 | 35.833        | 0.096       | 373.3          | 0.109          | 4.00           | 0.0                | 0.600     | o           | 450         | Pipe/Conduit |    |
| S1.005 | 56.666        | 0.113       | 501.5          | 0.039          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |    |
| S4.000 | 42.201        | 0.141       | 299.3          | 0.072          | 4.00           | 0.0                | 0.600     | o           | 375         | Pipe/Conduit |    |
| S1.006 | 42.979        | 0.086       | 499.8          | 0.093          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |    |
| S1.007 | 18.667        | 0.037       | 504.5          | 0.032          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |    |
| S5.000 | 21.511        | 0.096       | 224.1          | 0.068          | 4.00           | 0.0                | 0.600     | o           | 300         | Pipe/Conduit |   |
| S5.001 | 15.838        | 0.053       | 298.8          | 0.064          | 0.00           | 0.0                | 0.600     | o           | 375         | Pipe/Conduit |  |
| S1.008 | 9.597         | 0.019       | 505.1          | 0.026          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |  |
| S1.009 | 40.692        | 0.081       | 502.4          | 0.014          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |  |
| S1.010 | 45.794        | 0.092       | 497.8          | 0.023          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |  |
| S1.011 | 34.253        | 0.069       | 496.4          | 0.085          | 0.00           | 0.0                | 0.600     | o           | 600         | Pipe/Conduit |  |
| S1.012 | 21.608        | 0.663       | 32.6           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |

Network Results Table


| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| S1.002 | 50.00           | 5.07           | 64.267       | 0.227            | 0.0                  | 0.0           | 0.0               | 1.08         | 306.3        | 30.7          |
| S1.003 | 50.00           | 5.36           | 64.249       | 0.227            | 0.0                  | 0.0           | 0.0               | 1.08         | 304.4        | 30.7          |
| S1.004 | 50.00           | 5.76           | 64.212       | 0.265            | 0.0                  | 0.0           | 0.0               | 1.08         | 305.6        | 35.9          |
| S3.000 | 50.00           | 4.57           | 64.406       | 0.109            | 0.0                  | 0.0           | 0.0               | 1.05         | 166.4        | 14.8          |
| S1.005 | 50.00           | 6.63           | 64.160       | 0.413            | 0.0                  | 0.0           | 0.0               | 1.08         | 305.5        | 55.9          |
| S4.000 | 50.00           | 4.67           | 64.413       | 0.072            | 0.0                  | 0.0           | 0.0               | 1.04         | 115.1        | 9.7           |
| S1.006 | 50.00           | 7.29           | 64.047       | 0.578            | 0.0                  | 0.0           | 0.0               | 1.08         | 306.1        | 78.3          |
| S1.007 | 50.00           | 7.58           | 63.961       | 0.610            | 0.0                  | 0.0           | 0.0               | 1.08         | 304.6        | 82.6          |
| S5.000 | 50.00           | 4.34           | 64.373       | 0.068            | 0.0                  | 0.0           | 0.0               | 1.05         | 74.0         | 9.2           |
| S5.001 | 50.00           | 4.60           | 64.202       | 0.132            | 0.0                  | 0.0           | 0.0               | 1.04         | 115.2        | 17.9          |
| S1.008 | 50.00           | 7.73           | 63.924       | 0.768            | 0.0                  | 0.0           | 0.0               | 1.08         | 304.4        | 104.0         |
| S1.009 | 50.00           | 8.36           | 63.905       | 0.782            | 0.0                  | 0.0           | 0.0               | 1.08         | 305.3        | 105.9         |
| S1.010 | 50.00           | 9.06           | 63.824       | 0.805            | 0.0                  | 0.0           | 0.0               | 1.08         | 306.7        | 109.0         |
| S1.011 | 50.00           | 9.59           | 63.732       | 0.890            | 0.0                  | 0.0           | 0.0               | 1.09         | 307.1        | 120.5         |
| S1.012 | 50.00           | 9.79           | 63.663       | 0.890            | 0.0                  | 0.0           | 0.0               | 1.77         | 31.3«        | 120.5         |

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Free Flowing Outfall Details for East

| Outfall<br>Pipe Number | Outfall<br>Name | C. Level<br>(m) | I. Level<br>(m) | Min<br>I. Level<br>(m) | D,L<br>(mm) | W<br>(mm) |
|------------------------|-----------------|-----------------|-----------------|------------------------|-------------|-----------|
| S1.012                 | S0905           | 65.020          | 63.000          | 0.000                  | 0           | 0         |

|                         |                        |   |
|-------------------------|------------------------|---|
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Online Controls for East

Hydro-Brake® Optimum Manhole: S1.12 Control, DS/PN: S1.012, Volume (m³):  
19.2

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0036-7000-1400-7000 |
| Design Head (m)                   | 1.400                      |
| Design Flow (l/s)                 | 0.7                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 36                         |
| Invert Level (m)                  | 63.663                     |
| Minimum Outlet Pipe Diameter (mm) | 75                         |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.400    | 0.7        |
| Flush-Flo™                | 0.156    | 0.4        |
| Kick-Flo®                 | 0.317    | 0.4        |
| Mean Flow over Head Range | -        | 0.5        |

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     | 0.4        | 1.200     | 0.7        | 3.000     | 1.0        | 7.000     | 1.4        |
| 0.200     | 0.4        | 1.400     | 0.7        | 3.500     | 1.1        | 7.500     | 1.5        |
| 0.300     | 0.4        | 1.600     | 0.7        | 4.000     | 1.1        | 8.000     | 1.5        |
| 0.400     | 0.4        | 1.800     | 0.8        | 4.500     | 1.2        | 8.500     | 1.6        |
| 0.500     | 0.4        | 2.000     | 0.8        | 5.000     | 1.2        | 9.000     | 1.6        |
| 0.600     | 0.5        | 2.200     | 0.9        | 5.500     | 1.3        | 9.500     | 1.7        |
| 0.800     | 0.5        | 2.400     | 0.9        | 6.000     | 1.3        |           |            |
| 1.000     | 0.6        | 2.600     | 0.9        | 6.500     | 1.4        |           |            |



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Storage Structures for East

Complex Manhole: S1.11 Basin, DS/PN: S1.011

Tank or Pond

Invert Level (m) 64.200

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 800.3                  | 0.900     | 1271.1                 | 0.901     | 0.0                    |

Cellular Storage

Invert Level (m) 63.732 Safety Factor 2.0  
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 150.0                  | 0.0                         | 1.001     | 0.0                    | 0.0                         |
| 1.000     | 150.0                  | 0.0                         |           |                        |                             |

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0 MADD Factor \* 10m<sup>3</sup>/ha Storage 0.000  
 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 FEH  
 FEH Rainfall Version 1999  
 Site Location GB 459350 222000 SP 59350 22000  
 C (1km) -0.022  
 D1 (1km) 0.323  
 D2 (1km) 0.315  
 D3 (1km) 0.249  
 E (1km) 0.289  
 F (1km) 2.478  
 Cv (Summer) 0.750  
 Cv (Winter) 0.950

Margin for Flood Risk Warning (mm) 300.0  
 Analysis Timestep 2.5 Second Increment (Extended)  
 DTS Status ON  
 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, 2160, 2880, 4320, 5760,  
 7200, 8640, 10080  
 Return Period(s) (years) 100  
 Climate Change (%) 40

**WARNING: Half Drain Time has not been calculated as the structure is too full.**

| US/MH<br>PN | Name | Storm     | Return<br>Period | Climate<br>Change | First (X)<br>Surcharge | First (Y)<br>Flood | First (Z)<br>Overflow | Overflow<br>Act. | Water<br>Level<br>(m) |
|-------------|------|-----------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|-----------------------|
| S1.000      | S1.0 | 15 Winter | 100              | +40%              | 100/15 Summer          |                    |                       |                  | 65.593                |
| S1.001      | S1.1 | 15 Winter | 100              | +40%              | 100/15 Summer          |                    |                       |                  | 65.575                |
| S2.000      | S2.0 | 15 Winter | 100              | +40%              | 100/15 Summer          |                    |                       |                  | 65.690                |
| S2.001      | S2.1 | 15 Winter | 100              | +40%              | 100/15 Summer          |                    |                       |                  | 65.616                |
| S1.002      | S1.2 | 15 Winter | 100              | +40%              | 100/15 Summer          |                    |                       |                  | 65.561                |
| S1.003      | S1.3 | 15 Winter | 100              | +40%              | 100/15 Summer          |                    |                       |                  | 65.545                |

|                                  |  |   |
|----------------------------------|--|---|
| .<br>.<br>.                      | East (100+CC)<br>C-15114<br>Gavray Drive, Bicester |  |
| Date 14/03/2022<br>File WEST.MDX | Designed by JAC<br>Checked by                      |   |
| Innovyze                         | Network 2020.1.3                                   |   |

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

| PN     | US/MH Name | Surcharged |             | Flooded    |                | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status     | Level Exceeded |
|--------|------------|------------|-------------|------------|----------------|----------------------------|------------------------|-----------------|------------|----------------|
|        |            | Depth (m)  | Volume (m³) | Flow (l/s) | Overflow (l/s) |                            |                        |                 |            |                |
| S1.000 | S1.0       | 0.606      | 0.000       | 0.40       |                |                            |                        | 105.2           | SURCHARGED |                |
| S1.001 | S1.1       | 0.682      | 0.000       | 0.66       |                |                            |                        | 105.3           | SURCHARGED |                |
| S2.000 | S2.0       | 0.691      | 0.000       | 0.69       |                |                            |                        | 45.2            | SURCHARGED |                |
| S2.001 | S2.1       | 0.718      | 0.000       | 1.38       |                |                            |                        | 73.8            | SURCHARGED |                |
| S1.002 | S1.2       | 0.694      | 0.000       | 1.12       |                |                            |                        | 180.7           | SURCHARGED |                |
| S1.003 | S1.3       | 0.696      | 0.000       | 0.83       |                |                            |                        | 160.7           | SURCHARGED |                |



.  
 .  
 .  
 Date 14/03/2022  
 File WEST.MDX

East (100+CC)  
 C-15114  
 Gavray Drive, Bicester

Designed by JAC  
 Checked by

Innovyze  
 Network 2020.1.3




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

| PN     | US/MH Name    | Storm       | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow |
|--------|---------------|-------------|---------------|----------------|---------------------|-----------------|--------------------|
| S1.004 | S1.4          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S3.000 | S3.0          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.005 | S1.5          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S4.000 | S4.0          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.006 | S1.6          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.007 | S1.7          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S5.000 | S5.0          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S5.001 | S5.1          | 15 Winter   | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.008 | S1.8          | 5760 Winter | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.009 | S1.9          | 5760 Winter | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.010 | S1.10         | 5760 Winter | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.011 | S1.11 Basin   | 5760 Winter | 100           | +40%           | 100/15 Summer       |                 |                    |
| S1.012 | S1.12 Control | 5760 Winter | 100           | +40%           | 100/15 Summer       | 100/4320 Winter |                    |

| PN     | US/MH Name    | Overflow Act. | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) |
|--------|---------------|---------------|-----------------|----------------------|---------------------|----------------------------|------------------------|-----------------|
| S1.004 | S1.4          |               | 65.517          | 0.705                | 0.000               | 0.74                       |                        | 180.0           |
| S3.000 | S3.0          |               | 65.513          | 0.657                | 0.000               | 0.69                       |                        | 101.2           |
| S1.005 | S1.5          |               | 65.481          | 0.721                | 0.000               | 0.98                       |                        | 265.0           |
| S4.000 | S4.0          |               | 65.454          | 0.666                | 0.000               | 0.62                       |                        | 65.5            |
| S1.006 | S1.6          |               | 65.367          | 0.720                | 0.000               | 1.35                       |                        | 354.3           |
| S1.007 | S1.7          |               | 65.198          | 0.637                | 0.000               | 1.90                       |                        | 368.9           |
| S5.000 | S5.0          |               | 65.195          | 0.522                | 0.000               | 1.00                       |                        | 65.1            |
| S5.001 | S5.1          |               | 65.116          | 0.539                | 0.000               | 1.34                       |                        | 124.5           |
| S1.008 | S1.8          |               | 65.079          | 0.555                | 0.000               | 0.06                       |                        | 8.8             |
| S1.009 | S1.9          |               | 65.079          | 0.574                | 0.000               | 0.03                       |                        | 8.9             |
| S1.010 | S1.10         |               | 65.079          | 0.655                | 0.000               | 0.03                       |                        | 9.1             |
| S1.011 | S1.11 Basin   |               | 65.079          | 0.747                | 0.000               | 0.03                       |                        | 8.7             |
| S1.012 | S1.12 Control |               | 65.100          | 1.287                | 0.097               | 0.02                       |                        | 0.7             |

| PN     | US/MH Name | Status     | Level Exceeded |
|--------|------------|------------|----------------|
| S1.004 | S1.4       | SURCHARGED |                |
| S3.000 | S3.0       | SURCHARGED |                |
| S1.005 | S1.5       | SURCHARGED |                |
| S4.000 | S4.0       | SURCHARGED |                |
| S1.006 | S1.6       | SURCHARGED |                |
| S1.007 | S1.7       | SURCHARGED |                |
| S5.000 | S5.0       | SURCHARGED |                |
| S5.001 | S5.1       | SURCHARGED |                |
| S1.008 | S1.8       | SURCHARGED |                |
| S1.009 | S1.9       | SURCHARGED |                |

|                                  |  |   |
|----------------------------------|--|---|
| .<br>.<br>.                      | East (100+CC)<br>C-15114<br>Gavray Drive, Bicester |  |
| Date 14/03/2022<br>File WEST.MDX | Designed by JAC<br>Checked by                      |   |
| Innovyze                         | Network 2020.1.3                                   |   |

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

| PN     | US/MH Name    | Status     | Level Exceeded |
|--------|---------------|------------|----------------|
| S1.010 | S1.10         | SURCHARGED |                |
| S1.011 | S1.11 Basin   | FLOOD RISK |                |
| S1.012 | S1.12 Control | FLOOD      | 5              |

# Asset location search



## Property Searches

Hydrock Consultants  
Over Court Barns Almondsbury, Over Court Barns

BRISTOL  
BS32 4DF

**Search address supplied**      1  
Heron Court  
Bicester  
OX26 6XU

**Your reference**                      15114 Gavray Drive

**Our reference**                        ALS/ALS Standard/2020\_4238759

**Search date**                            20 August 2020

### Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0845 070 9148

**Search address supplied:** 1, Heron Court, Bicester, OX26 6XU

Dear Sir / Madam

**An Asset Location Search is recommended when undertaking a site development.** It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

## **Contact Us**

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd  
Property Searches  
PO Box 3189  
Slough  
SL1 4WW

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



## Waste Water Services

**Please provide a copy extract from the public sewer map.**

The following quartiles have been printed as they fall within Thames' sewerage area:

SP6021NW  
SP5922SE  
SP5921NE  
SP6022SW

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

## Clean Water Services

**Please provide a copy extract from the public water main map.**

The following quartiles have been printed as they fall within Thames' water area:

SP5922SE  
SP5921NE

SP6022SW

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

The following quartiles have not been printed as they contain no assets:

SP6021NW

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

### **Payment for this Search**

A charge will be added to your suppliers account.

## Further contacts:

### Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

### Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)



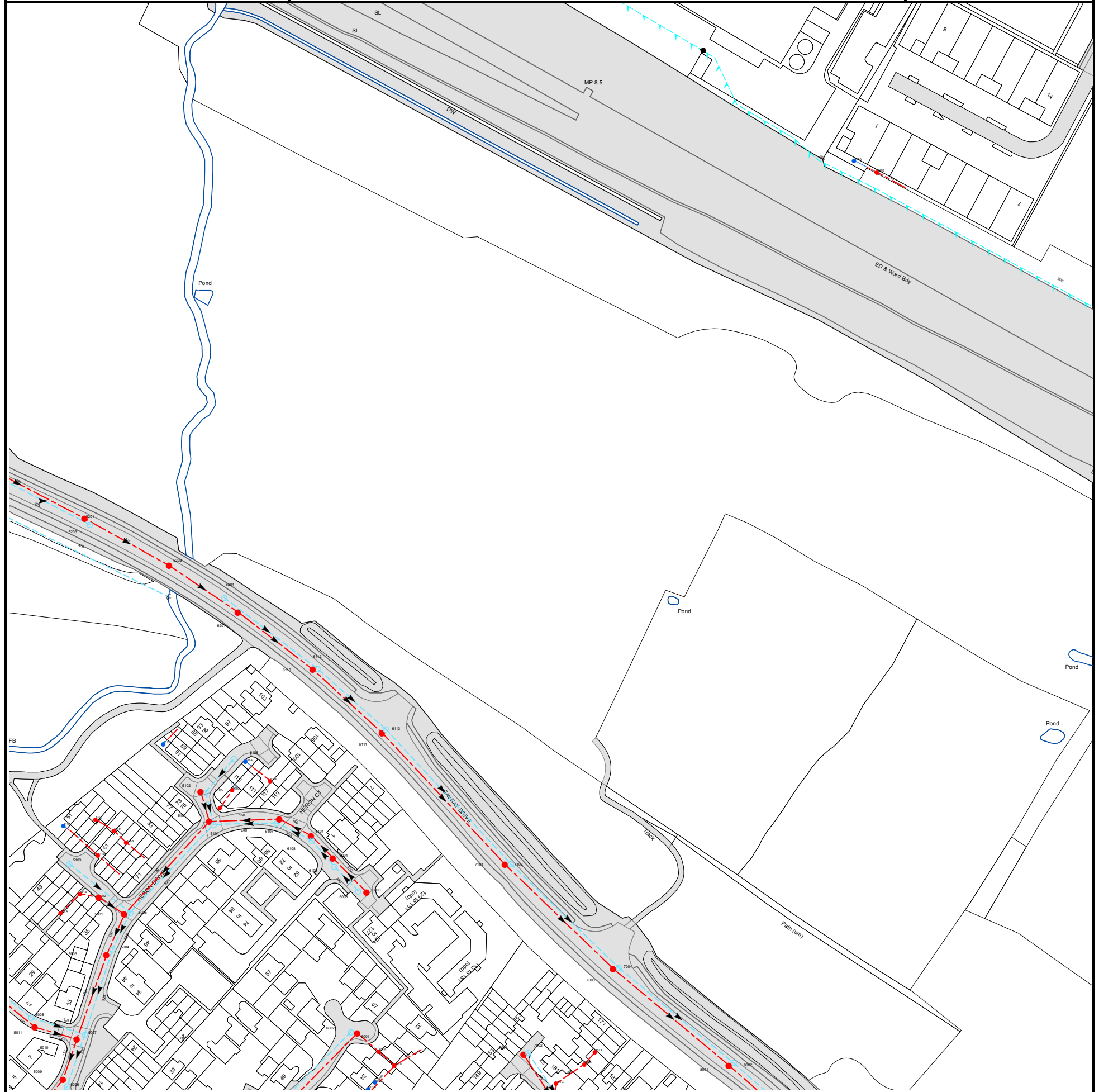
The width of the displayed area is 500m and the centre of the map is located at OS coordinates 460250,221750  
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.  
Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.



NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| <b>Manhole Reference</b> | <b>Manhole Cover Level</b> | <b>Manhole Invert Level</b> |
|--------------------------|----------------------------|-----------------------------|
| 0801                     | 65.31                      | 60.61                       |
| 0802                     | 65.5                       | 62.58                       |
| 0902                     | n/a                        | n/a                         |
| 0906                     | n/a                        | n/a                         |
| 0901                     | n/a                        | n/a                         |
| 0905                     | n/a                        | n/a                         |
| 0903                     | n/a                        | n/a                         |
| 0904                     | n/a                        | n/a                         |

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 459750,222250  
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 841B              | n/a                 | n/a                  |
| 841A              | n/a                 | n/a                  |
| 6004              | 67.55               | 64.97                |
| 6109              | 67.55               | 65.62                |
| 6002              | 67.29               | 65.57                |
| 6001              | 67.29               | 65.3                 |
| 6008              | 67.46               | 65.73                |
| 6003              | 67.5                | 65.13                |
| 601A              | n/a                 | n/a                  |
| 6111              | n/a                 | n/a                  |
| 6113              | n/a                 | n/a                  |
| 7101              | n/a                 | n/a                  |
| 7102              | n/a                 | n/a                  |
| 7002              | 66.89               | 65.41                |
| 701A              | n/a                 | n/a                  |
| 7003              | n/a                 | n/a                  |
| 7004              | n/a                 | n/a                  |
| 501A              | n/a                 | n/a                  |
| 511A              | n/a                 | n/a                  |
| 5103              | 66.94               | 65.33                |
| 501B              | n/a                 | n/a                  |
| 511E              | n/a                 | n/a                  |
| 511B              | n/a                 | n/a                  |
| 5002              | 67.24               | 64.48                |
| 5003              | 67.29               | 63.99                |
| 5004              | 67.3                | 64.88                |
| 511F              | n/a                 | n/a                  |
| 5001              | 67.36               | 64.13                |
| 511G              | n/a                 | n/a                  |
| 5005              | 67.41               | 64.95                |
| 511H              | n/a                 | n/a                  |
| 5102              | 67.02               | 64.94                |
| 5105              | 67.07               | 65.37                |
| 5101              | 67.26               | 64.54                |
| 5104              | 67.33               | 65.13                |
| 611D              | n/a                 | n/a                  |
| 611C              | n/a                 | n/a                  |
| 6106              | 67.25               | 65.79                |
| 611A              | n/a                 | n/a                  |
| 611B              | n/a                 | n/a                  |
| 6107              | 67.5                | 65.25                |
| 6105              | 67.39               | 64.7                 |
| 6101              | 67.59               | 64.87                |
| 6108              | 67.61               | 65.46                |
| 5201              | 67.92               | 63.15                |
| 5203              | 68.14               | 66.51                |
| 5202              | n/a                 | n/a                  |
| 5204              | n/a                 | n/a                  |
| 6201              | n/a                 | n/a                  |
| 6110              | 67.53               | 62.56                |
| 6112              | n/a                 | n/a                  |
| 701C              | n/a                 | n/a                  |
| 701B              | n/a                 | n/a                  |
| 8001              | 66.7                | 61.5                 |
| 8002              | n/a                 | n/a                  |
| 601B              | n/a                 | n/a                  |
| 601C              | n/a                 | n/a                  |
| 601D              | n/a                 | n/a                  |
| 7001              | 66.9                | 64.96                |
| 5006              | 67.29               | 64.71                |
| 5009              | 67.25               | 63.35                |
| 5010              | 67.2                | 63.56                |
| 5007              | 67.21               | 64.78                |
| 5011              | 67.33               | 64.39                |
| 5008              | 67.34               | 65.08                |

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 459750,221750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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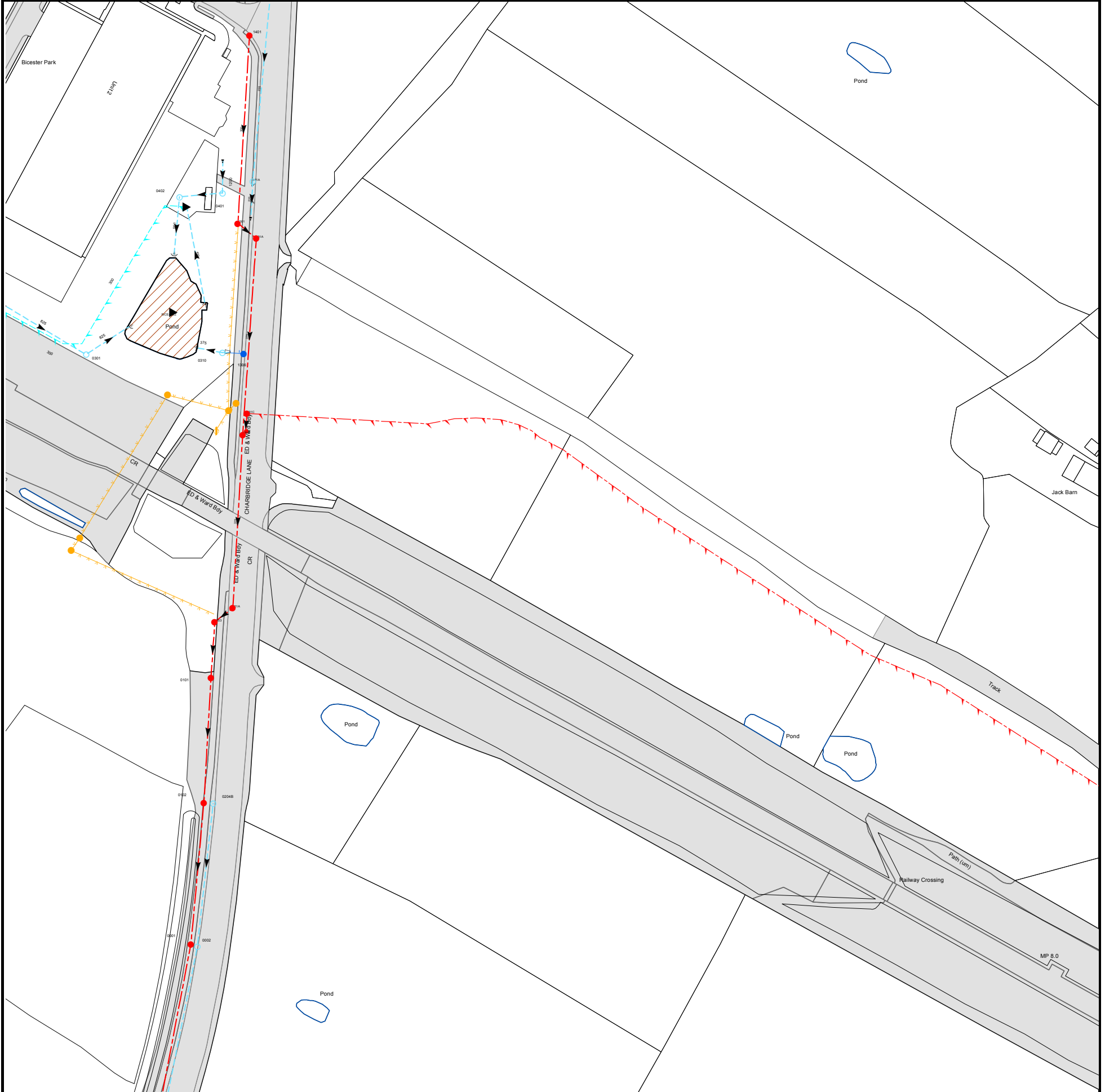
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 8802              | 65.17               | 62.6                 |
| 8905              | 66.19               | 64.23                |
| 8807              | 65.18               | 63.68                |
| 8804              | 65.01               | 61.93                |
| 8803              | 65.07               | 62.41                |
| 8808              | 65.05               | 63.64                |
| 8809              | 64.96               | 63.43                |
| 9804              | 64.86               | 62.16                |
| 9808              | 64.87               | 63.56                |
| 9809              | 64.91               | 63.36                |
| 9805              | 64.84               | 61.63                |
| 9902              | n/a                 | n/a                  |
| 9903              | 65.5                | 63.9                 |
| 9806              | 64.58               | 61.23                |
| 9810              | 64.59               | 63.27                |
| 9801              | n/a                 | n/a                  |
| 9802              | 65.34               | 52.69                |
| 9807              | 64.9                | 60.42                |
| 9803              | n/a                 | n/a                  |
| 7715              | n/a                 | n/a                  |
| 8710              | 64.85               | 63.22                |
| 8704              | 64.92               | 61.59                |
| 871A              | n/a                 | n/a                  |
| 871C              | n/a                 | n/a                  |
| 871B              | n/a                 | n/a                  |
| 871I              | n/a                 | n/a                  |
| 8711              | 64.9                | 63.13                |
| 8705              | 64.91               | 61.25                |
| 871H              | n/a                 | n/a                  |
| 8603              | n/a                 | n/a                  |
| 871G              | n/a                 | n/a                  |
| 8706              | 64.79               | 62.39                |
| 8806              | 64.8                | 63.43                |
| 8707              | 64.62               | 60.75                |
| 8712              | 64.62               | 63.01                |
| 871K              | n/a                 | n/a                  |
| 871D              | n/a                 | n/a                  |
| 871J              | n/a                 | n/a                  |
| 871E              | n/a                 | n/a                  |
| 871F              | n/a                 | n/a                  |
| 8709              | 64.47               | 59.95                |
| 8713              | 64.71               | 63.34                |
| 8708              | 64.69               | 62.04                |
| 8999              | 64.3                | 62.19                |
| 9799              | 64.34               | 62.21                |
| 9702              | 64.42               | 62.27                |
| 9703              | 64.54               | 60.22                |
| 9701              | 64.48               | 62.31                |
| 7905              | 66.74               | 65.22                |
| 781A              | n/a                 | n/a                  |
| 7812              | 65.85               | 63.95                |
| 7811              | 65.86               | 61.71                |
| 7903              | 66.51               | 63.97                |
| 7907              | 66.39               | 64.87                |
| 7902              | 66.45               | 64.1                 |
| 7906              | 66.48               | 64.97                |
| 7908              | 66.26               | 64.71                |
| 7904              | 66.31               | 63.66                |
| 791A              | n/a                 | n/a                  |
| 87810             | 65.25               | 62.81                |
| 87809             | 65.26               | 63.69                |
| 891A              | n/a                 | n/a                  |
| 8901              | 66                  | 63.4                 |
| 8903              | 66.01               | 64.57                |
| 8904              | 66.12               | 64.39                |
| 8902              | 66.07               | 62.97                |
| 8906              | 65.35               | 62.86                |
| 8907              | 65.35               | 63.82                |
| 8810              | 65.14               | 63.65                |
| 8805              | 65.12               | 62.68                |
| 9901              | n/a                 | n/a                  |
| 6613              | 64.95               | 61.16                |
| 6616              | 64.95               | 62.05                |
| 6617              | 64.92               | 62.29                |
| 6614              | 64.92               | 62.75                |
| 7711              | 65.11               | 63.49                |
| 7714              | 65.04               | 63.14                |
| 7708              | 65.49               | 63.4                 |
| 7706              | 65.51               | 60.66                |
| 7705              | 65.65               | 60.78                |
| 7707              | 65.64               | 63.45                |
| 7712              | 64.81               | 62.59                |
| 7709              | 64.78               | 62.91                |
| 7713              | 64.81               | 62.87                |
| 7710              | 64.84               | 63.28                |
| 7604              | 64.72               | 63.25                |
| 7605              | 64.79               | 62.88                |
| 771A              | n/a                 | n/a                  |
| 771B              | n/a                 | n/a                  |
| 781C              | n/a                 | n/a                  |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 761A              | n/a                 | n/a                  |
| 781B              | n/a                 | n/a                  |
| 7703              | 65.02               | 63.46                |
| 7716              | n/a                 | n/a                  |
| 7701              | 65.05               | 62.25                |
| 7609              | 64.95               | 58.34                |
| 7704              | 65.06               | 63.4                 |
| 7702              | 65.07               | 61.99                |
| 6806              | 65.87               | 64.29                |
| 6802              | 65.86               | 63.9                 |
| 6801              | 65.46               | 63.14                |
| 6805              | 65.45               | 64.1                 |
| 6807              | 65.55               | 63.99                |
| 6803              | 65.54               | 62.82                |
| 6908              | 66.39               | 64.47                |
| 6906              | 66.38               | 63.87                |
| 691A              | n/a                 | n/a                  |
| 6804              | 65.75               | 62.49                |
| 6905              | 66.12               | 63.79                |
| 6907              | 66.12               | 64.34                |
| 6808              | 65.73               | 63.86                |
| 7909              | 65.93               | 63.42                |
| 7801              | 65.29               | 62.03                |
| 7803              | 65.33               | 63.75                |
| 7911              | 65.95               | 64.16                |
| 7813              | 65.63               | 61.34                |
| 7804              | 65.67               | 63.63                |
| 7802              | 65.64               | 61.09                |
| 7910              | 66.28               | 64.1                 |
| 7912              | 66.33               | 64.39                |
| 7901              | 66.7                | 64.52                |
| 551B              | n/a                 | n/a                  |
| 5604              | 64.79               | 63.33                |
| 561J              | n/a                 | n/a                  |
| 561I              | n/a                 | n/a                  |
| 6618              | n/a                 | n/a                  |
| 6619              | n/a                 | n/a                  |
| 661A              | n/a                 | n/a                  |
| 6610              | 64.89               | 63.65                |
| 6608              | 64.87               | 63.36                |
| 5709              | n/a                 | n/a                  |
| 671C              | n/a                 | n/a                  |
| 6702              | n/a                 | n/a                  |
| 671B              | n/a                 | n/a                  |
| 6701              | n/a                 | n/a                  |
| 5706              | 65.4                | 63.56                |
| 571D              | n/a                 | n/a                  |
| 6704              | 65.49               | 63.93                |
| 6707              | 65.55               | 64.35                |
| 571C              | n/a                 | n/a                  |
| 571B              | n/a                 | n/a                  |
| 6703              | 65.74               | 63.34                |
| 6706              | 65.71               | 64.18                |
| 6705              | 65.78               | 64.06                |
| 671A              | n/a                 | n/a                  |
| 571A              | n/a                 | n/a                  |
| 6812              | n/a                 | n/a                  |
| 681A              | n/a                 | n/a                  |
| 6811              | n/a                 | n/a                  |
| 6809              | n/a                 | n/a                  |
| 6810              | n/a                 | n/a                  |
| 581A              | n/a                 | n/a                  |
| 5801              | 67.43               | 61                   |
| 5802              | 67.43               | 63.92                |
| 5901              | 66.8                | 61.3                 |
| 691D              | n/a                 | n/a                  |
| 5904              | 66.8                | 63.48                |
| 691B              | n/a                 | n/a                  |
| 691C              | n/a                 | n/a                  |
| 5916              | n/a                 | n/a                  |
| 5914              | n/a                 | n/a                  |
| 591B              | n/a                 | n/a                  |
| 5902              | 66.88               | 64.04                |
| 5903              | 66.88               | 64.66                |
| 591C              | n/a                 | n/a                  |
| 5906              | n/a                 | n/a                  |
| 5912              | n/a                 | n/a                  |
| 5905              | 67.01               | 65.58                |
| 5911              | n/a                 | n/a                  |
| 591A              | n/a                 | n/a                  |
| 5907              | 67.46               | 64.66                |
| 5915              | n/a                 | n/a                  |
| 5917              | n/a                 | n/a                  |
| 6901              | 67.05               | 64.45                |
| 6904              | 67.05               | 64.93                |
| 5918              | 67.36               | 64.63                |
| 5920              | 67.31               | 62.98                |
| 6902              | 67.25               | 64.76                |
| 6903              | 67.25               | 65.2                 |
| 561G              | n/a                 | n/a                  |
| 561H              | n/a                 | n/a                  |
| 561E              | n/a                 | n/a                  |
| 561C              | n/a                 | n/a                  |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 5607              | n/a                 | n/a                  |
| 561D              | n/a                 | n/a                  |
| 561B              | n/a                 | n/a                  |
| 5710              | n/a                 | n/a                  |
| 5708              | 65.58               | 64.15                |
| 5711              | 65.55               | 63.45                |
| 571E              | n/a                 | n/a                  |
| 5707              | 65.39               | 64.28                |
| 5702              | 65.68               | 64.72                |
| 5705              | 65.84               | 63.8                 |
| 5704              | 65.84               | 64.47                |
| 5703              | 66.01               | 64.61                |
| 5701              | 66.1                | 64.02                |
| 5803              | 65.62               | 64.78                |
| 5504              | 65.34               | 62.3                 |
| 5508              | 65.12               | 62.97                |
| 5503              | 64.93               | 62.71                |
| 5506              | 64.88               | 62.63                |
| 5502              | 65.01               | 62.87                |
| 551A              | n/a                 | n/a                  |
| 5505              | 65                  | 62.77                |
| 561A              | n/a                 | n/a                  |
| 5501              | 65.24               | 63.16                |
| 5606              | 65.23               | 63.03                |
| 5605              | 65.09               | 63.33                |
| 561F              | n/a                 | n/a                  |
| 5507              | 64.83               | 62.57                |
| 505               | 64.71               | 62.36                |
| 6501              | 64.51               | 63                   |
| 6503              | 64.49               | 63.19                |
| 6502              | 64.68               | 62.74                |
| 6504              | 64.66               | 63.19                |
| 6603              | 64.65               | 62.16                |
| 6606              | 64.66               | 63.03                |
| 5602              | n/a                 | n/a                  |
| 5601              | n/a                 | n/a                  |
| 6611              | 64.15               | 60.71                |
| 7606              | 64.76               | 61.07                |
| 7610              | n/a                 | n/a                  |
| 6601              | 64.92               | 62.61                |
| 7607              | 64.73               | 61.38                |
| 6612              | 64.6                | 60.92                |
| 6604              | 64.94               | 63.07                |
| 6602              | 64.74               | 61.81                |
| 6615              | 64.65               | 61.84                |
| 6605              | 64.72               | 62.72                |
| 761B              | n/a                 | n/a                  |
| 6609              | 64.91               | 61.44                |
| 5603              | 64.82               | 62.84                |
| 6607              | 64.9                | 62.35                |

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 460250,222250

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 1306              | n/a                 | n/a                  |
| 0310              | n/a                 | 64.2                 |
| 131A              | 66.38               | 62.44                |
| 1301              | 66.48               | 62.48                |
| 0402              | n/a                 | 62.93                |
| 0401              | n/a                 | 64                   |
| 141A              | n/a                 | n/a                  |
| 1401              | n/a                 | n/a                  |
| 0301              | n/a                 | 64                   |
| 0001              | n/a                 | n/a                  |
| 0002              | n/a                 | n/a                  |
| 0102              | n/a                 | 61.59                |
| 0101              | n/a                 | 61.71                |
| 0204B             | n/a                 | n/a                  |
| 0203              | 65.98               | 61.71                |
| 121A              | 65.88               | 61.8                 |
| 131B              | 66.05               | 62.11                |
| 131C              | 66.18               | 64                   |



















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# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

-  **Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
-  **Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  **Trunk Surface Water**
-  **Trunk Foul**
-  **Storm Relief**
-  **Trunk Combined**
-  **Vent Pipe**
-  **Bio-solids (Sludge)**
-  **Proposed Thames Surface Water Sewer**
-  **Proposed Thames Water Foul Sewer**
-  **Gallery**
-  **Foul Rising Main**
-  **Surface Water Rising Main**
-  **Combined Rising Main**
-  **Sludge Rising Main**
-  **Proposed Thames Water Rising Main**
-  **Vacuum**





## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

-  Air Valve
-  Dam Chase
-  Fitting
-  Meter
-  Vent Column




## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

-  Control Valve
-  Drop Pipe
-  Ancillary
-  Weir





## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

-  Outfall
-  Undefined End
-  Inlet






## Other Symbols

Symbols used on maps which do not fall under other general categories








-  Public/Private Pumping Station
-  Change of characteristic indicator (C.O.C.I.)
-  Invert Level
-  Summit

### Areas

Lines denoting areas of underground surveys, etc.

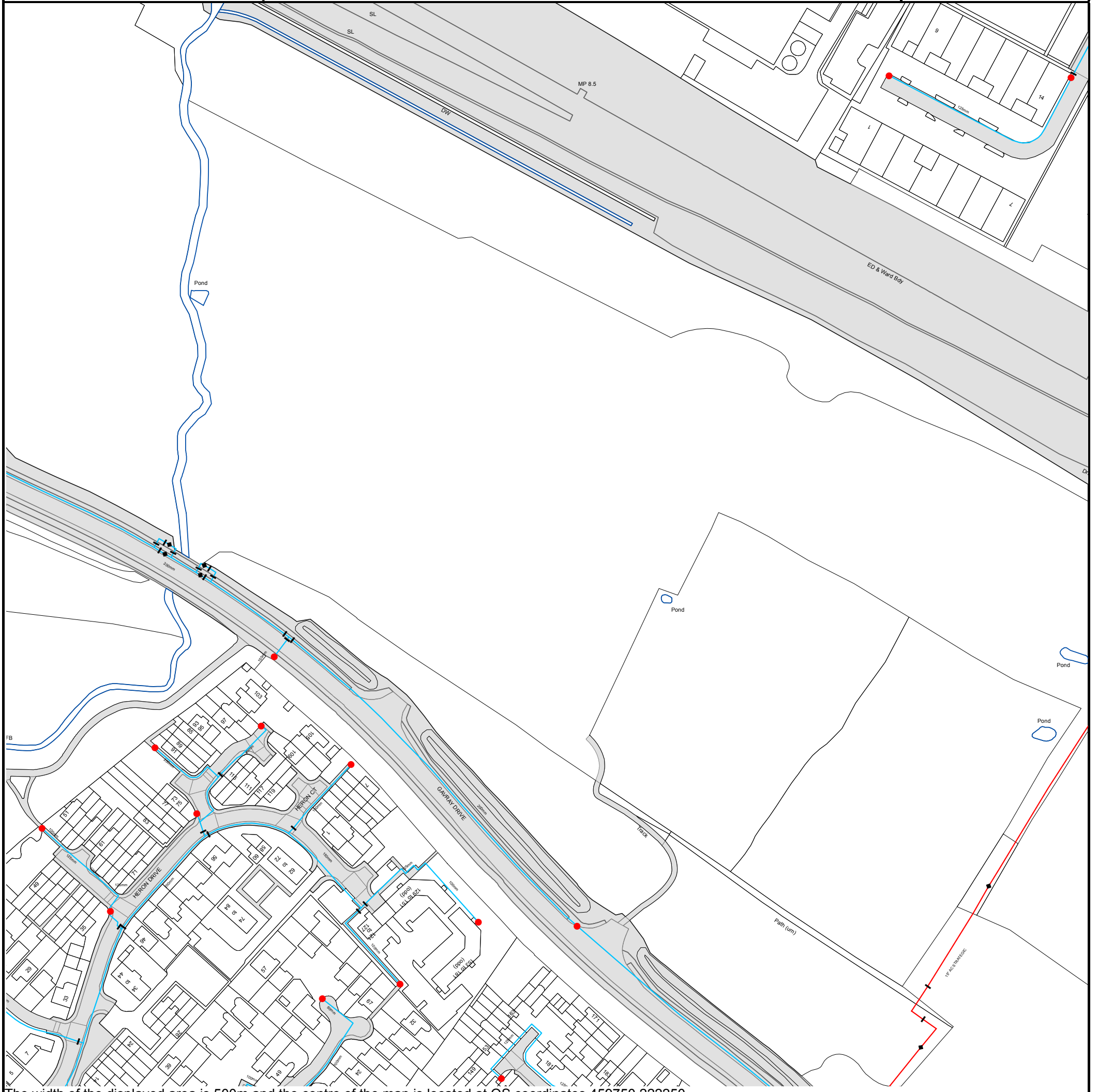
-  Agreement
-  Operational Site
-  Chamber
-  Tunnel
-  Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  Culverted Watercourse
-  Proposed
-  Abandoned Sewer

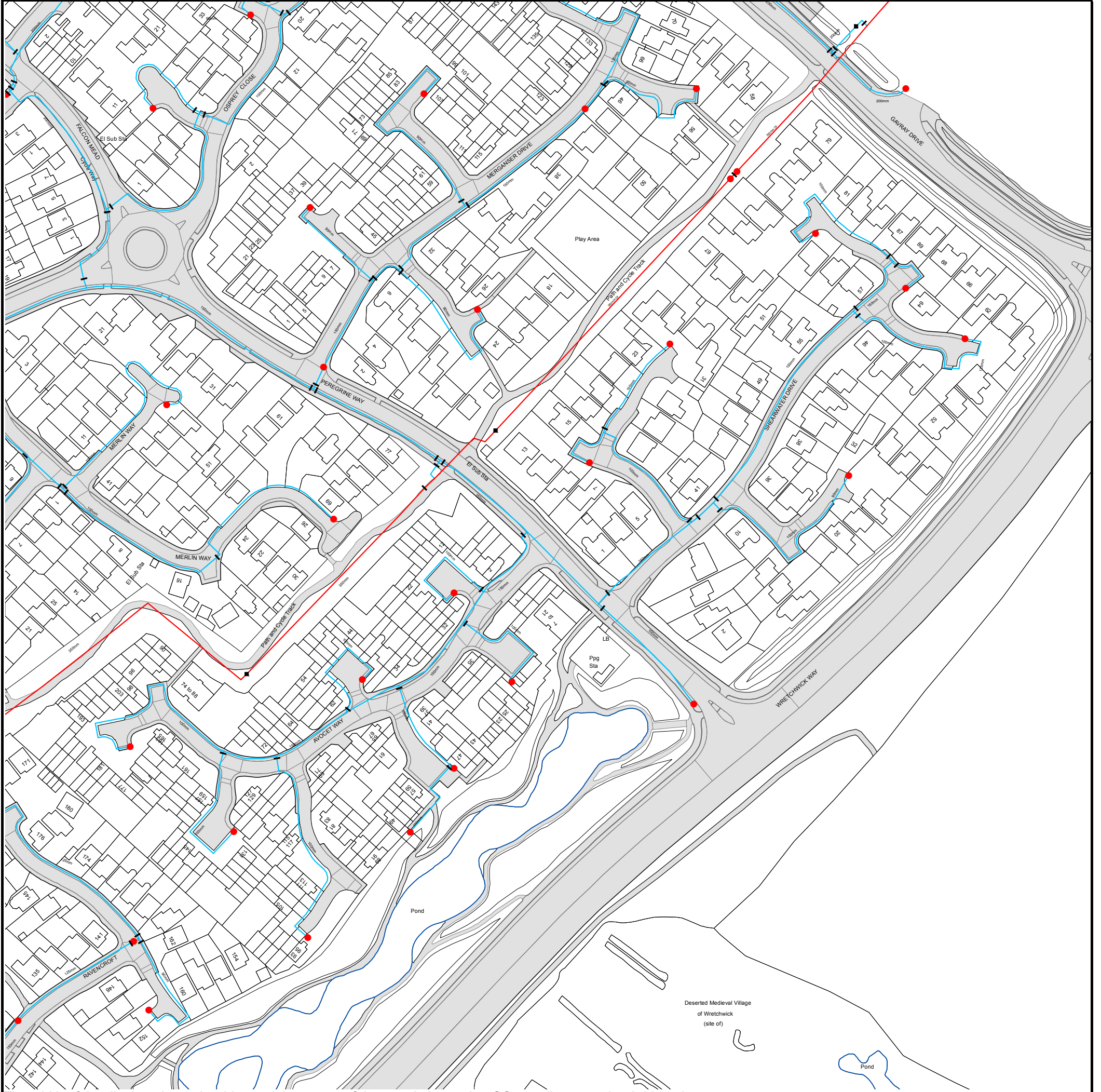
### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.
- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 459750,222250  
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.  
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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 459750,221750

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The width of the displayed area is 500m and the centre of the map is located at OS coordinates 460250,222250








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# ALS Water Map Key

## Water Pipes (Operated & Maintained by Thames Water)


- 
**Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 
**Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- 
**Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 
**Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 
**Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- 
**Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- 
**Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

| PIPE DIAMETER               | DEPTH BELOW GROUND |
|-----------------------------|--------------------|
| Up to 300mm (12")           | 900mm (3')         |
| 300mm - 600mm (12" - 24")   | 1100mm (3' 8")     |
| 600mm and bigger (24" plus) | 1200mm (4')        |

## Valves

-  General Purpose Valve
-  Air Valve
-  Pressure Control Valve
-  Customer Valve

## Hydrants








-  Single Hydrant

## Meters










-  Meter

## End Items

Symbol indicating what happens at the end of a water main.

-  Blank Flange
-  Capped End
-  Emptying Pit
-  Undefined End
-  Manifold
-  Customer Supply
-  Fire Supply



## Operational Sites

-  Booster Station
-  Other
-  Other (Proposed)
-  Pumping Station
-  Service Reservoir
-  Shaft Inspection
-  Treatment Works
-  Unknown
-  Water Tower

## Other Symbols

-  Data Logger

## Other Water Pipes (Not Operated or Maintained by Thames Water)

- 
**Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
- 
**Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.



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2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
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7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
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A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

### Ways to pay your bill

| Credit Card  | BACS Payment  | Telephone Banking   | Cheque  |
|--|---|---|---|
| <p>Call <b>0845 070 9148</b> quoting your invoice number starting CBA or ADS / OSS</p> | <p>Account number <b>90478703</b><br/>Sort code <b>60-00-01</b><br/>A remittance advice must be sent to:<br/><b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b><br/>or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a></p> | <p>By calling your bank and quoting:<br/>Account number <b>90478703</b><br/>Sort code <b>60-00-01</b> and your invoice number</p> | <p>Made payable to '<b>Thames Water Utilities Ltd</b>'<br/>Write your Thames Water account number on the back.<br/>Send to:<br/><b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b><br/>or by DX to <b>151280 Slough 13</b></p> |

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