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

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| SW-1.017 | SW-30 | 0.253 | 0.000 | 0.25 | | | 47.0 | SURCHARGED | |
| SW-1.018 | SW-31 | 0.250 | 0.000 | 0.17 | | | 48.8 | SURCHARGED | |
| SW-9.000 | SW-32 | 0.635 | 0.000 | 0.55 | | | 37.2 | SURCHARGED | |
| SW-9.001 | SW-33 | 0.801 | 0.000 | 1.31 | | | 112.6 | SURCHARGED | |
| SW-9.002 | SW-34 | 0.666 | 0.000 | 1.57 | | | 136.2 | SURCHARGED | |
| SW-1.019 | SW-35 | 0.381 | 0.000 | 1.37 | | | 187.0 | SURCHARGED | |
| SW-1.020 | SW-36 | 0.405 | 0.000 | 0.48 | | | 62.9 | SURCHARGED | |
| SW-1.021 | SW-37 | 0.441 | 0.000 | 0.48 | | | 64.3 | SURCHARGED | |
| SW-1.022 | SW-38 | 0.487 | 0.000 | 0.45 | | | 64.2 | SURCHARGED | |
| SW-10.000 | SW-39 | 0.366 | 0.000 | 0.86 | | | 36.4 | SURCHARGED | |
| SW-10.001 | SW-40 | 0.415 | 0.000 | 1.28 | | | 84.0 | SURCHARGED | |
| SW-10.002 | SW-41 | 0.269 | 0.000 | 1.78 | | | 101.4 | SURCHARGED | |
| SW-10.003 | SW-42 | 0.145 | 0.000 | 1.85 | | | 110.6 | SURCHARGED | |
| SW-10.004 | SW-43 | -0.082 | 0.000 | 0.86 | | | 133.7 | OK | |
| SW-1.023 | SW-44 | 0.813 | 0.000 | 0.66 | | | 53.2 | SURCHARGED | |
| SW-1.024 | SW-45 | 0.793 | 0.000 | 0.81 | | | 49.1 | SURCHARGED | |
| SW-1.025 | SW-46 | 0.810 | 0.000 | 0.95 | | | 49.0 | SURCHARGED | |
| SW-11.000 | SW-47 | 0.400 | 0.000 | 0.02 | | | 0.2 | FLOOD RISK | |
| SW-11.001 | SW-48 | 0.450 | 0.000 | 0.53 | | 38 | 18.3 | FLOOD RISK | |
| SW-11.002 | SW-49 | 0.364 | 0.000 | 1.23 | | | 33.6 | SURCHARGED | |
| SW-11.003 | SW-50 | -0.066 | 0.000 | 0.81 | | | 56.5 | OK | |
| SW-11.004 | SW-51 | -0.005 | 0.000 | 0.08 | | | 6.9 | OK | |
| SW-1.026 | SW-52 | 0.894 | 0.000 | 0.49 | | | 32.9 | SURCHARGED | |
| SW-12.000 | SW-53 | 0.764 | 0.000 | 2.00 | | | 62.9 | SURCHARGED | |
| SW-12.001 | SW-54 | 0.648 | 0.000 | 1.16 | | | 114.8 | SURCHARGED | |
| SW-12.002 | SW-55 | 0.581 | 0.000 | 0.59 | | | 165.9 | SURCHARGED | |
| SW-1.027 | SW-56 | 2.014 | 0.000 | 2.20 | | | 220.0 | SURCHARGED | |
| SW-1.028 | SW-57 | 1.605 | 0.000 | 2.02 | | | 283.6 | SURCHARGED | |
| SW-1.029 | SW-58 | 1.309 | 0.000 | 2.31 | | | 312.0 | SURCHARGED | |
| SW-13.000 | SW-59 | 1.166 | 0.000 | 0.96 | | | 106.3 | FLOOD RISK | |
| SW-13.001 | SW-60 | 1.200 | 0.142 | 1.83 | | | 174.1 | FLOOD | 1 |
| SW-13.002 | SW-61 | 0.809 | 0.000 | 1.00 | | | 582.0 | SURCHARGED | |
| SW-14.000 | SW-62 | 0.933 | 0.000 | 0.86 | | | 31.8 | FLOOD RISK | |
| SW-13.003 | SW-63 | 0.962 | 0.000 | 1.53 | | | 598.7 | SURCHARGED | |
| SW-13.004 | SW-64 | 0.641 | 0.000 | 0.81 | | | 630.3 | SURCHARGED | |
| SW-1.030 | SW-65 | 1.067 | 0.000 | 3.52 | | | 920.8 | SURCHARGED | |
| SW-1.031 | SW-66 | 0.670 | 0.000 | 1.10 | | | 198.3 | SURCHARGED | |
| SW-15.000 | SW-67 | 0.395 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |
| SW-15.001 | SW-68 | 0.445 | 0.000 | 0.03 | | 220 | 1.4 | FLOOD RISK | |
| SW-15.002 | SW-69 | 0.529 | 0.000 | 1.15 | | | 65.6 | SURCHARGED | |
| SW-1.032 | SW-70 | 0.362 | 0.000 | 0.51 | | | 91.4 | SURCHARGED | |
| SW-1.033 | SW-71 | 0.407 | 0.000 | 0.17 | | | 95.0 | SURCHARGED | |
| SW-16.000 | SW-72 | 0.396 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |
| SW-16.001 | SW-73 | 0.446 | 0.000 | 0.19 | | 246 | 10.5 | FLOOD RISK | |
| SW-1.034 | SW-74 | 1.079 | 0.000 | 0.42 | | 2064 | 57.2 | SURCHARGED | |
| SW-17.000 | SW-75 | 0.399 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |
| SW-17.001 | SW-76 | 0.449 | 0.000 | 0.05 | | 348 | 2.5 | FLOOD RISK | |
| SW-1.035 | SW-77 | 1.117 | 0.000 | 0.52 | | 1800 | 52.7 | SURCHARGED | |
| SW-1.036 | SW-78 | 0.604 | 0.000 | 0.48 | | | 52.7 | SURCHARGED | |
| SW-1.037 | SW-79 | 0.625 | 0.000 | 0.50 | | | 52.9 | SURCHARGED | |
| SW-1.038 | SW-80 | 0.644 | 0.000 | 0.36 | | | 53.1 | SURCHARGED | |
| SW-18.000 | SW-81 | 0.398 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |
| SW-18.001 | SW-82 | 0.448 | 0.000 | 0.33 | | 360 | 5.1 | FLOOD RISK | |
| SW-18.002 | SW-83 | -0.022 | 0.000 | 0.18 | | | 5.0 | OK | |

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

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume ($m^3$) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| SW-1.039 | SW-84 | 0.777 | 0.000 | 0.31 | 39.6 | 2448 | 18.5 | FLOOD RISK | |

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

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) | Surcharged Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| SW-19.000 | SW-86 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 63.837 | 0.787 |
| SW-19.001 | SW-87 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 63.135 | 0.485 |
| SW-19.002 | SW-88 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 63.037 | 0.587 |
| SW-20.000 | SW-89 | 360 Summer | 100 | +45% | 30/60 Summer | | | | 63.050 | 0.400 |
| SW-20.001 | SW-90 | 360 Summer | 100 | +45% | 30/15 Summer | | | | 63.050 | 0.450 |
| SW-19.003 | SW-91 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 62.720 | 0.820 |
| SW-21.000 | SW-92 | 360 Winter | 100 | +45% | 30/60 Summer | | | | 62.797 | 0.397 |
| SW-21.001 | SW-93 | 360 Winter | 100 | +45% | 30/30 Summer | | | | 62.797 | 0.447 |
| SW-19.004 | SW-94 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 62.519 | 0.919 |
| SW-22.000 | SW-95 | 120 Summer | 100 | +45% | 30/15 Summer | | | | 62.099 | 0.399 |
| SW-22.001 | SW-96 | 120 Summer | 100 | +45% | 30/15 Summer | | | | 62.099 | 0.449 |
| SW-23.000 | SW-97 | 120 Summer | 100 | +45% | 30/15 Summer | | | | 60.295 | 0.395 |
| SW-23.001 | SW-98 | 120 Summer | 100 | +45% | 30/15 Summer | | | | 60.295 | 0.445 |
| SW-22.002 | SW-99 | 15 Summer | 100 | +45% | 30/15 Summer | | | | 60.498 | 0.781 |
| SW-22.003 | SW-100 | 15 Summer | 100 | +45% | 30/15 Summer | | | | 60.237 | 0.726 |
| SW-19.005 | SW-101 | 15 Summer | 100 | +45% | 30/15 Summer | | | | 60.175 | 0.735 |
| SW-19.006 | SW-102 | 15 Summer | 100 | +45% | 30/15 Summer | | | | 60.009 | 0.607 |
| SW-24.000 | SW-103 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 60.312 | 0.262 |
| SW-24.001 | SW-104 | 15 Summer | 100 | +45% | 30/15 Summer | | | | 60.313 | 0.313 |
| SW-19.007 | SW-105 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 59.543 | 0.222 |
| SW-25.000 | SW-106 | 360 Summer | 100 | +45% | 30/60 Summer | | | | 59.648 | 0.398 |
| SW-25.001 | SW-107 | 360 Summer | 100 | +45% | 30/15 Summer | | | | 59.648 | 0.448 |
| SW-19.008 | SW-108 | 960 Winter | 100 | +45% | 100/15 Summer | | | | 59.001 | 0.401 |
| SW-26.000 | SW-109 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 59.245 | 0.295 |
| SW-26.001 | SW-110 | 15 Summer | 100 | +45% | 100/15 Summer | | | | 59.245 | 0.345 |
| SW-26.002 | SW-111 | 15 Summer | 100 | +45% | 30/15 Summer | | | | 59.278 | 0.443 |
| SW-26.003 | SW-112 | 960 Winter | 100 | +45% | 30/15 Summer | | | | 58.999 | 0.549 |
| SW-19.009 | SW-113 | 960 Winter | 100 | +45% | 30/15 Summer | | | | 58.998 | 0.644 |
| SW-19.010 | SW-114 | 960 Winter | 100 | +45% | 2/120 Summer | | 30/240 Summer | 80 | 58.995 | 0.970 |

| PN | US/MH Name | Flooded Volume ($m^3$) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| SW-19.000 | SW-86 | 0.000 | 1.42 | | | 26.5 | SURCHARGED | |
| SW-19.001 | SW-87 | 0.000 | 0.76 | | | 41.7 | SURCHARGED | |
| SW-19.002 | SW-88 | 0.000 | 0.81 | | | 61.9 | SURCHARGED | |
| SW-20.000 | SW-89 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |
| SW-20.001 | SW-90 | 0.000 | 0.10 | | 270 | 4.4 | FLOOD RISK | |
| SW-19.003 | SW-91 | 0.000 | 1.08 | | | 83.7 | SURCHARGED | |
| SW-21.000 | SW-92 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |
| SW-21.001 | SW-93 | 0.000 | 0.03 | | 468 | 1.3 | FLOOD RISK | |
| SW-19.004 | SW-94 | 0.000 | 1.04 | | | 140.4 | FLOOD RISK | |
| SW-22.000 | SW-95 | 0.000 | 0.01 | | | 0.2 | FLOOD RISK | |
| SW-22.001 | SW-96 | 0.000 | 0.13 | | 52 | 7.9 | FLOOD RISK | |
| SW-23.000 | SW-97 | 0.000 | 0.01 | | | 0.1 | FLOOD RISK | |
| SW-23.001 | SW-98 | 0.000 | 0.35 | | 80 | 5.6 | FLOOD RISK | |
| SW-22.002 | SW-99 | 0.000 | 1.17 | | | 44.2 | SURCHARGED | |
| SW-22.003 | SW-100 | 0.000 | 0.94 | | | 56.6 | SURCHARGED | |
| SW-19.005 | SW-101 | 0.000 | 2.27 | | | 240.3 | SURCHARGED | |
| SW-19.006 | SW-102 | 0.000 | 2.39 | | | 332.5 | SURCHARGED | |
| SW-24.000 | SW-103 | 0.000 | 0.07 | | | 1.0 | SURCHARGED | |
| SW-24.001 | SW-104 | 0.000 | 1.20 | | 8 | 42.0 | SURCHARGED | |
| SW-19.007 | SW-105 | 0.000 | 1.11 | | | 444.2 | SURCHARGED | |
| SW-25.000 | SW-106 | 0.000 | 0.00 | | | 0.0 | FLOOD RISK | |

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

| PN | US/MH Name | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| SW-25.001 | SW-107 | 0.000 | 0.15 | | 306 | 4.9 | FLOOD RISK | |
| SW-19.008 | SW-108 | 0.000 | 0.10 | | 720 | 36.5 | SURCHARGED | |
| SW-26.000 | SW-109 | 0.000 | 0.07 | | | 1.0 | SURCHARGED | |
| SW-26.001 | SW-110 | 0.000 | 2.21 | | 7 | 33.2 | SURCHARGED | |
| SW-26.002 | SW-111 | 0.000 | 1.16 | | | 79.7 | SURCHARGED | |
| SW-26.003 | SW-112 | 0.000 | 0.13 | | | 12.8 | SURCHARGED | |
| SW-19.009 | SW-113 | 0.000 | 0.40 | | | 49.2 | SURCHARGED | |
| SW-19.010 | SW-114 | 0.000 | 0.18 | 8.0 | | 5.8 | SURCHARGED | |

## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

### Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 2 Number of Time/Area Diagrams 0
Number of Online Controls 21 Number of Storage Structures 25 Number of Real Time Controls 0

### Synthetic Rainfall Details

| | | | |
|---|---|---|---|
| Rainfall Model | | FEH Data Type | Point |
| FEH Rainfall Version | | 2013 Cv (Summer) | 1.000 |
| Site Location | GB 561730 195989 TQ 61730 95989 | Cv (Winter) | 1.000 |

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

| | |
|---|---|
| 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) | 2, 30, 100, 101 |
| Climate Change (%) | 0, 0, 45, 0 |

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) | Surcharged Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| SW-1.000 | SW-1 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.849 | 0.199 |
| SW-2.000 | SW-2 | 30 Summer | 101 | +0% | 30/15 Summer | | | | 63.456 | 0.156 |
| SW-2.001 | SW-3 | 30 Summer | 101 | +0% | 30/15 Summer | | | | 63.457 | 0.207 |
| SW-1.001 | SW-4 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.722 | 0.172 |
| SW-1.002 | SW-5 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.660 | 0.210 |
| SW-1.003 | SW-6 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.615 | 0.265 |
| SW-1.004 | SW-7 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.434 | 0.334 |
| SW-3.000 | SW-8 | 15 Summer | 101 | +0% | 30/15 Summer | 100/15 Summer | | | 62.329 | 0.379 |
| SW-1.005 | SW-9 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 62.227 | 0.377 |
| SW-4.000 | SW-10 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.238 | -0.012 |
| SW-1.006 | SW-11 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 62.101 | 0.399 |
| SW-5.000 | SW-12 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.237 | -0.113 |
| SW-1.007 | SW-13 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 61.967 | 0.375 |
| SW-1.008 | SW-14 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 61.709 | 0.232 |
| SW-1.009 | SW-15 | 180 Summer | 101 | +0% | 30/15 Summer | | | | 61.620 | 0.190 |
| SW-1.010 | SW-16 | 180 Summer | 101 | +0% | 30/15 Summer | | | | 61.611 | 0.511 |
| SW-1.011 | SW-17 | 360 Summer | 101 | +0% | 100/15 Summer | | | | 61.274 | 0.248 |
| SW-1.012 | SW-18 | 15 Summer | 101 | +0% | 30/180 Summer | | | | 61.251 | 0.470 |
| SW-1.013 | SW-19 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 61.330 | 0.796 |
| SW-6.000 | SW-20 | 30 Summer | 101 | +0% | 30/15 Summer | | | | 63.597 | 0.197 |
| SW-6.001 | SW-21 | 30 Summer | 101 | +0% | 30/15 Summer | | | | 63.597 | 0.247 |
| SW-1.014 | SW-22 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 61.372 | 0.878 |
| SW-7.000 | SW-23 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.640 | -0.060 |
| SW-7.001 | SW-24 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.573 | 0.023 |
| SW-7.002 | SW-25 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 61.785 | -0.265 |
| SW-1.015 | SW-26 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 61.213 | 0.933 |
| SW-8.000 | SW-27 | 360 Summer | 101 | +0% | 30/60 Summer | | | | 61.794 | 0.194 |
| SW-8.001 | SW-28 | 360 Summer | 101 | +0% | 30/15 Summer | | | | 61.794 | 0.244 |
| SW-1.016 | SW-29 | 360 Summer | 101 | +0% | 30/30 Summer | | | | 60.833 | 0.734 |

## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

| PN | US/MH Name | Flooded Volume ($m^3$) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| SW-1.000 | SW-1 | 0.000 | 0.76 | | | 49.2 | SURCHARGED | |
| SW-2.000 | SW-2 | 0.000 | 0.02 | | | 0.3 | SURCHARGED | |
| SW-2.001 | SW-3 | 0.000 | 0.57 | | 16 | 21.9 | SURCHARGED | |
| SW-1.001 | SW-4 | 0.000 | 0.66 | | | 82.2 | SURCHARGED | |
| SW-1.002 | SW-5 | 0.000 | 0.94 | | | 137.6 | SURCHARGED | |
| SW-1.003 | SW-6 | 0.000 | 0.83 | | | 237.9 | SURCHARGED | |
| SW-1.004 | SW-7 | 0.000 | 0.55 | | | 211.7 | SURCHARGED | |
| SW-3.000 | SW-8 | 0.000 | 0.48 | | | 38.1 | SURCHARGED | 1 |
| SW-1.005 | SW-9 | 0.000 | 0.67 | | | 257.3 | SURCHARGED | |
| SW-4.000 | SW-10 | 0.000 | 0.49 | | | 69.3 | OK | |
| SW-1.006 | SW-11 | 0.000 | 1.08 | | | 293.5 | SURCHARGED | |
| SW-5.000 | SW-12 | 0.000 | 0.70 | | | 98.1 | OK | |
| SW-1.007 | SW-13 | 0.000 | 1.43 | | | 388.7 | SURCHARGED | |
| SW-1.008 | SW-14 | 0.000 | 1.70 | | | 400.8 | SURCHARGED | |
| SW-1.009 | SW-15 | 0.000 | 1.37 | | | 226.5 | SURCHARGED | |
| SW-1.010 | SW-16 | 0.000 | 0.77 | | | 46.8 | SURCHARGED | |
| SW-1.011 | SW-17 | 0.000 | 0.69 | | | 46.7 | SURCHARGED | |
| SW-1.012 | SW-18 | 0.000 | 0.69 | | | 46.5 | SURCHARGED | |
| SW-1.013 | SW-19 | 0.000 | 0.98 | | | 54.5 | SURCHARGED | |
| SW-6.000 | SW-20 | 0.000 | 0.02 | | | 0.3 | SURCHARGED | |
| SW-6.001 | SW-21 | 0.000 | 0.21 | | 18 | 15.3 | SURCHARGED | |
| SW-1.014 | SW-22 | 0.000 | 0.76 | | | 80.0 | SURCHARGED | |
| SW-7.000 | SW-23 | 0.000 | 0.67 | | | 82.9 | OK | |
| SW-7.001 | SW-24 | 0.000 | 0.99 | | | 235.6 | SURCHARGED | |
| SW-7.002 | SW-25 | 0.000 | 0.35 | | | 263.8 | OK | |
| SW-1.015 | SW-26 | 0.000 | 2.36 | | | 370.5 | SURCHARGED | |
| SW-8.000 | SW-27 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-8.001 | SW-28 | 0.000 | 0.08 | | 234 | 4.0 | SURCHARGED | |
| SW-1.016 | SW-29 | 0.000 | 0.31 | | 276 | 45.7 | SURCHARGED | |

## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) |
|---|---|---|---|---|---|---|---|---|---|
| SW-1.017 | SW-30 | 720 Winter | 101 | +0% | 100/15 Summer | | | | 59.818 |
| SW-1.018 | SW-31 | 720 Winter | 101 | +0% | 100/15 Summer | | | | 59.795 |
| SW-9.000 | SW-32 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.199 |
| SW-9.001 | SW-33 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.169 |
| SW-9.002 | SW-34 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 59.988 |
| SW-1.019 | SW-35 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.745 |
| SW-1.020 | SW-36 | 960 Summer | 101 | +0% | 100/15 Summer | | | | 59.722 |
| SW-1.021 | SW-37 | 960 Summer | 101 | +0% | 100/15 Summer | | | | 59.707 |
| SW-1.022 | SW-38 | 960 Summer | 101 | +0% | 100/15 Summer | | | | 59.690 |
| SW-10.000 | SW-39 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.475 |
| SW-10.001 | SW-40 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.423 |
| SW-10.002 | SW-41 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.283 |
| SW-10.003 | SW-42 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.203 |
| SW-10.004 | SW-43 | 15 Summer | 101 | +0% | | | | | 59.979 |
| SW-1.023 | SW-44 | 960 Summer | 101 | +0% | 2/120 Summer | | | | 59.675 |
| SW-1.024 | SW-45 | 960 Summer | 101 | +0% | 30/120 Summer | | | | 59.558 |
| SW-1.025 | SW-46 | 960 Summer | 101 | +0% | 30/120 Summer | | | | 59.539 |
| SW-11.000 | SW-47 | 60 Summer | 101 | +0% | 30/15 Summer | | | | 62.250 |
| SW-11.001 | SW-48 | 60 Summer | 101 | +0% | 30/15 Summer | | | | 62.250 |
| SW-11.002 | SW-49 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.922 |
| SW-11.003 | SW-50 | 15 Summer | 101 | +0% | | | | | 60.207 |
| SW-11.004 | SW-51 | 15 Summer | 101 | +0% | | | | | 59.687 |
| SW-1.026 | SW-52 | 960 Summer | 101 | +0% | 30/60 Summer | | | | 59.526 |
| SW-12.000 | SW-53 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 61.188 |
| SW-12.001 | SW-54 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 61.030 |
| SW-12.002 | SW-55 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.701 |
| SW-1.027 | SW-56 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.707 |
| SW-1.028 | SW-57 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.415 |
| SW-1.029 | SW-58 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.190 |
| SW-13.000 | SW-59 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.491 |
| SW-13.001 | SW-60 | 15 Summer | 101 | +0% | 30/15 Summer | 100/15 Summer | | | 62.332 |
| SW-13.002 | SW-61 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 61.789 |
| SW-14.000 | SW-62 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.114 |
| SW-13.003 | SW-63 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.014 |
| SW-13.004 | SW-64 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 59.542 |
| SW-1.030 | SW-65 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 58.978 |
| SW-1.031 | SW-66 | 120 Summer | 101 | +0% | 30/15 Summer | | | | 58.637 |
| SW-15.000 | SW-67 | 240 Summer | 101 | +0% | 30/30 Summer | | | | 60.692 |
| SW-15.001 | SW-68 | 240 Summer | 101 | +0% | 30/15 Summer | | | | 60.692 |
| SW-15.002 | SW-69 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 59.659 |
| SW-1.032 | SW-70 | 2160 Summer | 101 | +0% | 100/15 Winter | | | | 58.213 |
| SW-1.033 | SW-71 | 2160 Winter | 101 | +0% | 100/240 Summer | | | | 58.156 |
| SW-16.000 | SW-72 | 240 Summer | 101 | +0% | 30/30 Summer | | | | 58.696 |
| SW-16.001 | SW-73 | 240 Summer | 101 | +0% | 30/15 Summer | | | | 58.696 |
| SW-1.034 | SW-74 | 2160 Winter | 101 | +0% | 2/240 Summer | | | | 58.098 |
| SW-17.000 | SW-75 | 360 Summer | 101 | +0% | 30/60 Summer | | | | 58.796 |
| SW-17.001 | SW-76 | 360 Summer | 101 | +0% | 30/30 Summer | | | | 58.796 |
| SW-1.035 | SW-77 | 2160 Winter | 101 | +0% | 2/180 Summer | | | | 58.080 |
| SW-1.036 | SW-78 | 2160 Winter | 101 | +0% | 2/360 Summer | | | | 57.747 |
| SW-1.037 | SW-79 | 2160 Winter | 101 | +0% | 2/360 Summer | | | | 57.732 |
| SW-1.038 | SW-80 | 2160 Winter | 101 | +0% | 2/240 Summer | | | | 57.718 |
| SW-18.000 | SW-81 | 360 Summer | 101 | +0% | 30/60 Summer | | | | 58.097 |
| SW-18.001 | SW-82 | 360 Summer | 101 | +0% | 30/30 Summer | | | | 58.097 |
| SW-18.002 | SW-83 | 15 Summer | 101 | +0% | | | | | 57.684 |
| SW-1.039 | SW-84 | 2160 Winter | 101 | +0% | 2/15 Summer | | 30/60 Summer | 107 | 57.627 |

## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| SW-1.017 | SW-30 | -0.191 | 0.000 | 0.25 | | | 46.8 | OK | |
| SW-1.018 | SW-31 | -0.105 | 0.000 | 0.17 | | | 48.4 | OK | |
| SW-9.000 | SW-32 | -0.101 | 0.000 | 0.36 | | | 24.2 | OK | |
| SW-9.001 | SW-33 | 0.119 | 0.000 | 0.98 | | | 84.5 | SURCHARGED | |
| SW-9.002 | SW-34 | 0.138 | 0.000 | 1.14 | | | 99.0 | SURCHARGED | |
| SW-1.019 | SW-35 | 0.095 | 0.000 | 1.07 | | | 146.0 | SURCHARGED | |
| SW-1.020 | SW-36 | 0.141 | 0.000 | 0.48 | | | 62.3 | SURCHARGED | |
| SW-1.021 | SW-37 | 0.176 | 0.000 | 0.47 | | | 63.2 | SURCHARGED | |
| SW-1.022 | SW-38 | 0.223 | 0.000 | 0.44 | | | 62.6 | SURCHARGED | |
| SW-10.000 | SW-39 | -0.075 | 0.000 | 0.61 | | | 25.8 | OK | |
| SW-10.001 | SW-40 | 0.023 | 0.000 | 0.90 | | | 59.2 | SURCHARGED | |
| SW-10.002 | SW-41 | 0.061 | 0.000 | 1.20 | | | 68.7 | SURCHARGED | |
| SW-10.003 | SW-42 | 0.028 | 0.000 | 1.25 | | | 74.5 | SURCHARGED | |
| SW-10.004 | SW-43 | -0.132 | 0.000 | 0.57 | | | 88.7 | OK | |
| SW-1.023 | SW-44 | 0.550 | 0.000 | 0.68 | | | 54.9 | SURCHARGED | |
| SW-1.024 | SW-45 | 0.524 | 0.000 | 0.90 | | | 54.7 | SURCHARGED | |
| SW-1.025 | SW-46 | 0.541 | 0.000 | 1.06 | | | 54.6 | SURCHARGED | |
| SW-11.000 | SW-47 | 0.200 | 0.000 | 0.01 | | | 0.2 | SURCHARGED | |
| SW-11.001 | SW-48 | 0.250 | 0.000 | 0.42 | | 36 | 14.6 | SURCHARGED | |
| SW-11.002 | SW-49 | -0.028 | 0.000 | 0.96 | | | 26.2 | OK | |
| SW-11.003 | SW-50 | -0.093 | 0.000 | 0.62 | | | 43.5 | OK | |
| SW-11.004 | SW-51 | -0.113 | 0.000 | 0.48 | | | 43.0 | OK | |
| SW-1.026 | SW-52 | 0.626 | 0.000 | 0.49 | | | 32.9 | SURCHARGED | |
| SW-12.000 | SW-53 | 0.038 | 0.000 | 1.39 | | | 43.8 | SURCHARGED | |
| SW-12.001 | SW-54 | -0.070 | 0.000 | 0.93 | | | 91.6 | OK | |
| SW-12.002 | SW-55 | -0.149 | 0.000 | 0.50 | | | 141.9 | OK | |
| SW-1.027 | SW-56 | 1.041 | 0.000 | 1.74 | | | 174.8 | SURCHARGED | |
| SW-1.028 | SW-57 | 0.863 | 0.000 | 1.52 | | | 213.3 | SURCHARGED | |
| SW-1.029 | SW-58 | 0.732 | 0.000 | 1.74 | | | 234.5 | SURCHARGED | |
| SW-13.000 | SW-59 | 0.041 | 0.000 | 0.66 | | | 73.7 | SURCHARGED | |
| SW-13.001 | SW-60 | 0.182 | 0.000 | 1.37 | | | 130.7 | SURCHARGED | 1 |
| SW-13.002 | SW-61 | -0.161 | 0.000 | 0.77 | | | 448.1 | OK | |
| SW-14.000 | SW-62 | 0.064 | 0.000 | 0.75 | | | 27.8 | SURCHARGED | |
| SW-13.003 | SW-63 | 0.154 | 0.000 | 1.28 | | | 498.7 | SURCHARGED | |
| SW-13.004 | SW-64 | -0.058 | 0.000 | 0.68 | | | 525.4 | OK | |
| SW-1.030 | SW-65 | 0.585 | 0.000 | 3.06 | | | 801.4 | SURCHARGED | |
| SW-1.031 | SW-66 | 0.362 | 0.000 | 0.93 | | | 167.8 | SURCHARGED | |
| SW-15.000 | SW-67 | 0.192 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-15.001 | SW-68 | 0.242 | 0.000 | 0.02 | | 192 | 1.2 | SURCHARGED | |
| SW-15.002 | SW-69 | -0.041 | 0.000 | 0.88 | | | 49.9 | OK | |
| SW-1.032 | SW-70 | 0.000 | 0.000 | 0.43 | | | 77.9 | OK | |
| SW-1.033 | SW-71 | 0.000 | 0.000 | 0.12 | | | 65.5 | OK | |
| SW-16.000 | SW-72 | 0.196 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-16.001 | SW-73 | 0.246 | 0.000 | 0.15 | | 196 | 8.4 | SURCHARGED | |
| SW-1.034 | SW-74 | 0.748 | 0.000 | 0.30 | | 1224 | 40.4 | SURCHARGED | |
| SW-17.000 | SW-75 | 0.196 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-17.001 | SW-76 | 0.246 | 0.000 | 0.04 | | 306 | 2.0 | SURCHARGED | |
| SW-1.035 | SW-77 | 0.802 | 0.000 | 0.41 | | 1152 | 41.1 | SURCHARGED | |
| SW-1.036 | SW-78 | 0.499 | 0.000 | 0.38 | | | 41.3 | SURCHARGED | |
| SW-1.037 | SW-79 | 0.524 | 0.000 | 0.39 | | | 41.3 | SURCHARGED | |
| SW-1.038 | SW-80 | 0.546 | 0.000 | 0.28 | | | 41.4 | SURCHARGED | |
| SW-18.000 | SW-81 | 0.197 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-18.001 | SW-82 | 0.247 | 0.000 | 0.27 | | 324 | 4.1 | SURCHARGED | |
| SW-18.002 | SW-83 | -0.090 | 0.000 | 0.33 | | | 9.3 | OK | |

## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

| PN | US/MH Name | Surcharged Depth (m) | Flooded Volume ($m^3$) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|---|
| SW-1.039 | SW-84 | 0.677 | 0.000 | 0.30 | 25.9 | 1608 | 17.7 | SURCHARGED | |

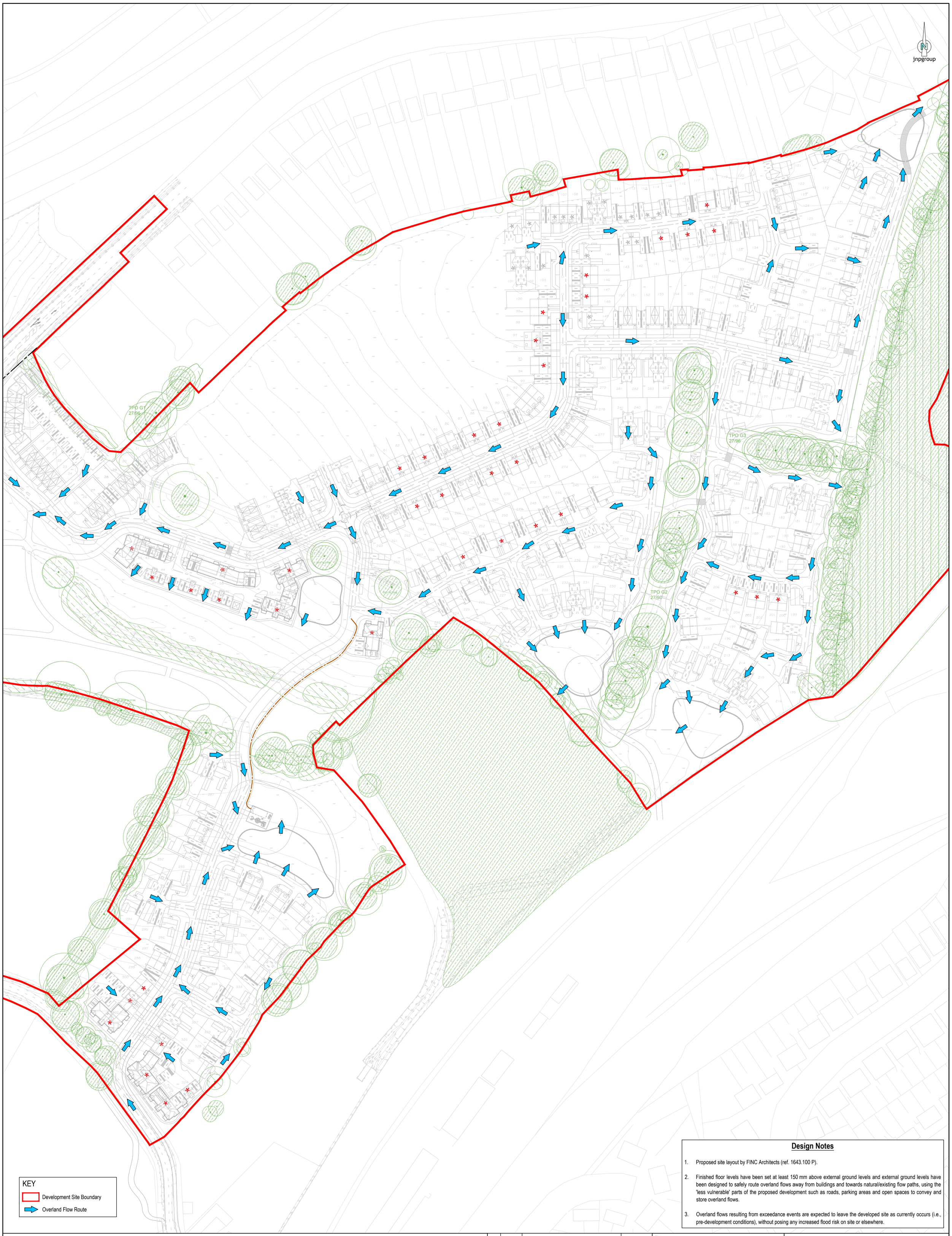
## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

| PN | US/MH Name | Storm | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. | Water Level (m) | Surcharged Depth (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| SW-19.000 | SW-86 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 63.154 | 0.104 |
| SW-19.001 | SW-87 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.537 | -0.113 |
| SW-19.002 | SW-88 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 62.360 | -0.090 |
| SW-20.000 | SW-89 | 360 Summer | 101 | +0% | 30/60 Summer | | | | 62.846 | 0.196 |
| SW-20.001 | SW-90 | 360 Summer | 101 | +0% | 30/15 Summer | | | | 62.846 | 0.246 |
| SW-19.003 | SW-91 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 61.839 | -0.061 |
| SW-21.000 | SW-92 | 360 Winter | 101 | +0% | 30/60 Summer | | | | 62.593 | 0.193 |
| SW-21.001 | SW-93 | 360 Winter | 101 | +0% | 30/30 Summer | | | | 62.593 | 0.243 |
| SW-19.004 | SW-94 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 61.657 | 0.057 |
| SW-22.000 | SW-95 | 60 Summer | 101 | +0% | 30/15 Summer | | | | 61.895 | 0.195 |
| SW-22.001 | SW-96 | 60 Summer | 101 | +0% | 30/15 Summer | | | | 61.896 | 0.246 |
| SW-23.000 | SW-97 | 120 Summer | 101 | +0% | 30/15 Summer | | | | 60.091 | 0.191 |
| SW-23.001 | SW-98 | 120 Summer | 101 | +0% | 30/15 Summer | | | | 60.091 | 0.241 |
| SW-22.002 | SW-99 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 60.018 | 0.301 |
| SW-22.003 | SW-100 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.835 | 0.323 |
| SW-19.005 | SW-101 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.753 | 0.313 |
| SW-19.006 | SW-102 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 59.623 | 0.221 |
| SW-24.000 | SW-103 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 60.110 | 0.060 |
| SW-24.001 | SW-104 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 60.112 | 0.112 |
| SW-19.007 | SW-105 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 59.200 | -0.121 |
| SW-25.000 | SW-106 | 360 Summer | 101 | +0% | 30/60 Summer | | | | 59.446 | 0.196 |
| SW-25.001 | SW-107 | 360 Summer | 101 | +0% | 30/15 Summer | | | | 59.446 | 0.246 |
| SW-19.008 | SW-108 | 720 Winter | 101 | +0% | 100/15 Summer | | | | 58.715 | 0.115 |
| SW-26.000 | SW-109 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 58.990 | 0.040 |
| SW-26.001 | SW-110 | 15 Summer | 101 | +0% | 100/15 Summer | | | | 58.992 | 0.092 |
| SW-26.002 | SW-111 | 15 Summer | 101 | +0% | 30/15 Summer | | | | 58.972 | 0.137 |
| SW-26.003 | SW-112 | 720 Winter | 101 | +0% | 30/15 Summer | | | | 58.713 | 0.263 |
| SW-19.009 | SW-113 | 720 Winter | 101 | +0% | 30/15 Summer | | | | 58.712 | 0.358 |
| SW-19.010 | SW-114 | 720 Winter | 101 | +0% | 2/120 Summer | | 30/240 Summer | 80 | 58.709 | 0.683 |

| PN | US/MH Name | Flooded Volume (m³) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| SW-19.000 | SW-86 | 0.000 | 1.11 | | | 20.8 | SURCHARGED | |
| SW-19.001 | SW-87 | 0.000 | 0.48 | | | 26.6 | OK | |
| SW-19.002 | SW-88 | 0.000 | 0.65 | | | 49.8 | OK | |
| SW-20.000 | SW-89 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-20.001 | SW-90 | 0.000 | 0.08 | | 240 | 3.6 | SURCHARGED | |
| SW-19.003 | SW-91 | 0.000 | 0.80 | | | 61.7 | OK | |
| SW-21.000 | SW-92 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |
| SW-21.001 | SW-93 | 0.000 | 0.02 | | 396 | 1.1 | SURCHARGED | |
| SW-19.004 | SW-94 | 0.000 | 0.93 | | | 125.7 | SURCHARGED | |
| SW-22.000 | SW-95 | 0.000 | 0.01 | | | 0.2 | SURCHARGED | |
| SW-22.001 | SW-96 | 0.000 | 0.10 | | 38 | 6.3 | SURCHARGED | |
| SW-23.000 | SW-97 | 0.000 | 0.01 | | | 0.1 | SURCHARGED | |
| SW-23.001 | SW-98 | 0.000 | 0.28 | | 72 | 4.5 | SURCHARGED | |
| SW-22.002 | SW-99 | 0.000 | 0.91 | | | 34.1 | SURCHARGED | |
| SW-22.003 | SW-100 | 0.000 | 0.73 | | | 44.0 | SURCHARGED | |
| SW-19.005 | SW-101 | 0.000 | 1.90 | | | 200.9 | SURCHARGED | |
| SW-19.006 | SW-102 | 0.000 | 1.91 | | | 265.1 | SURCHARGED | |
| SW-24.000 | SW-103 | 0.000 | 0.05 | | | 0.7 | SURCHARGED | |
| SW-24.001 | SW-104 | 0.000 | 1.08 | | 7 | 37.7 | SURCHARGED | |
| SW-19.007 | SW-105 | 0.000 | 0.88 | | | 351.5 | OK | |
| SW-25.000 | SW-106 | 0.000 | 0.00 | | | 0.0 | SURCHARGED | |

## 101 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Water

| PN | US/MH Name | Flooded Volume ($m^3$) | Flow / Cap. | Overflow (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status | Level Exceeded |
|---|---|---|---|---|---|---|---|---|
| SW-25.001 | SW-107 | 0.000 | 0.12 | | 264 | 4.0 | SURCHARGED | |
| SW-19.008 | SW-108 | 0.000 | 0.11 | | 480 | 40.0 | SURCHARGED | |
| SW-26.000 | SW-109 | 0.000 | 0.04 | | | 0.5 | SURCHARGED | |
| SW-26.001 | SW-110 | 0.000 | 1.49 | | 7 | 22.3 | SURCHARGED | |
| SW-26.002 | SW-111 | 0.000 | 1.00 | | | 68.4 | SURCHARGED | |
| SW-26.003 | SW-112 | 0.000 | 0.12 | | | 11.5 | SURCHARGED | |
| SW-19.009 | SW-113 | 0.000 | 0.41 | | | 50.9 | SURCHARGED | |
| SW-19.010 | SW-114 | 0.000 | 0.16 | 8.0 | | 5.1 | SURCHARGED | |




## Design Notes

1. Proposed site layout by FINC Architects (ref. 1643.100 P).
2. Finished floor levels have been set at least 150 mm above external ground levels and external ground levels have been designed to safely route overland flows away from buildings and towards natural/existing flow paths, using the 'less vulnerable' parts of the proposed development such as roads, parking areas and open spaces to convey and store overland flows.
3. Overland flows resulting from exceedance events are expected to leave the developed site as currently occurs (i.e., pre-development conditions), without posing any increased flood risk on site or elsewhere.

## General Notes

1. Where this drawing has been issued in electronic .dwg format, it has been done so in good faith. JNP Group do not take any responsibility for any inaccuracies in the electronic data, which should be checked against the paper (or .pdf) drawing issue. Any apparent discrepancies should be immediately reported to JNP Group. The electronic .dwg file should not be assumed to be to scale and should not be used for 'overlaying', setting out or checking of any third party information. All dimensions should be taken from the paper (or .pdf) version of the drawing. Electronic drawings may contain third party information. JNP Group take no responsibility for this information, which should be checked against the originators paper drawing(s).
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| Rev. | Date | Description | Drn / Chk'd / App'd |
|---|---|---|---|
| P02 | 05/09/2023 | Updated site layout (Rev P) | RM / RM / RM |
| P01 | 17/08/2023 | First issue. | RM / RM / RM |

Suitability: S2 - Suitable for Information

Client: Croudace Homes

Job: Officers' Meadow, Shenfield

Title: Sustainable Drainage Strategy
Overland Flow Routes

Classification: FI_60_20

Scale @ A1: 1:1000

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Project - Originator - Volume/System - Level/Location - Type - Discipline - Number: C86054 - JNP-XX-XX- DR -C- 2003 (Document/Drawing Number)

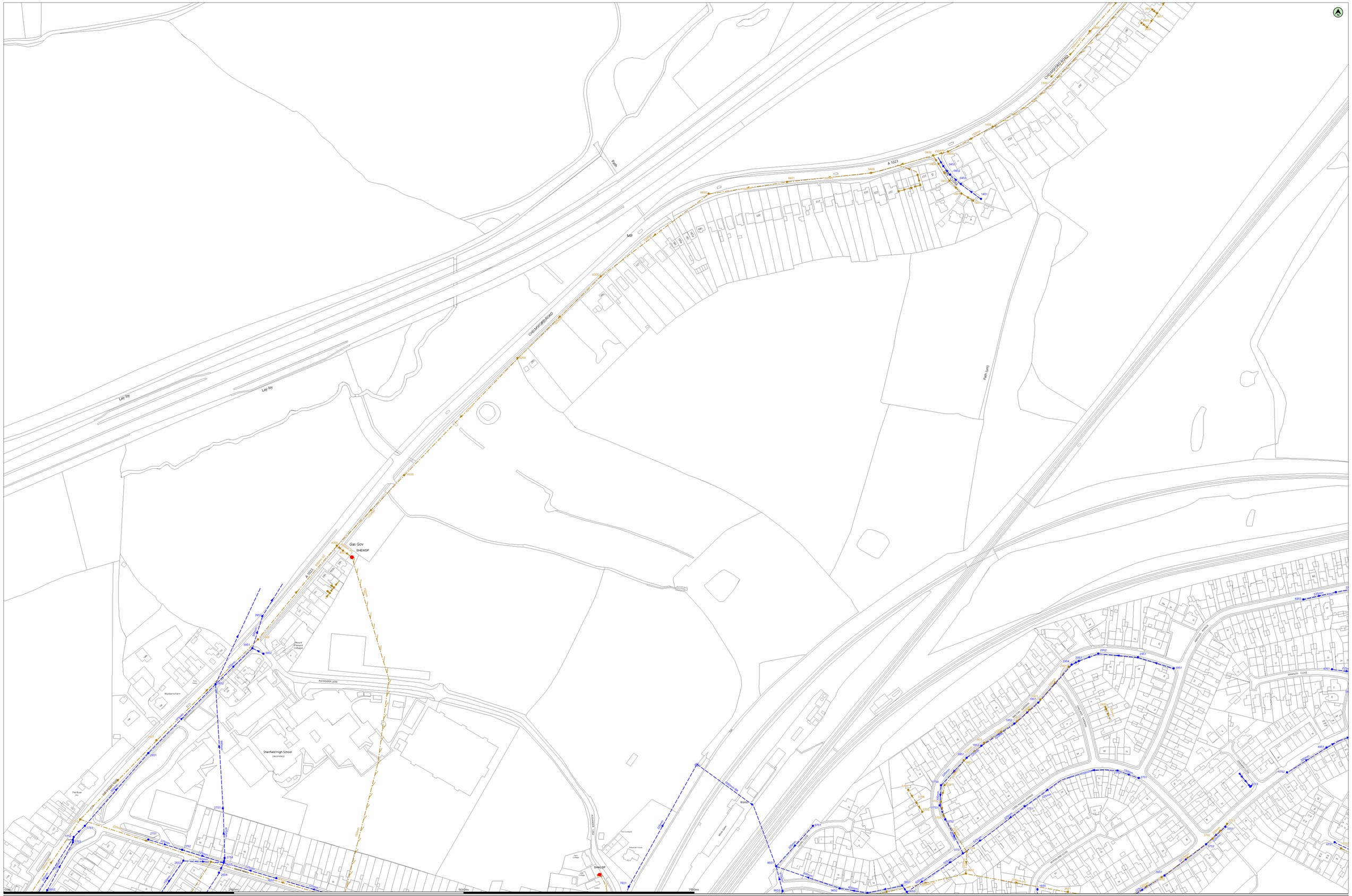
Revision: P02



JNP Group Internal Project Number: C86054

# APPENDIX F

## FOUL WATER DRAINAGE STRATEGY






Date: 08/03/19

Scale: 1:1250

Map Centre: 561779,196147

Data updated: 29/01/19

Our Ref: 301735 - 1

Wastewater Plan A0



| | | | |
|---|---|---|---|
| Foul Sewer | | Outfall* | Sewage Treatment Works |
| Surface Sewer | | | |
| Combined Sewer | | Inlet* | Public Pumping Station |
| Final Effluent | | | |
| Rising Main* | | Manhole* | Decommissioned Pumping Station |
| Private Sewer* | | | |
| Decommissioned Sewer* | | | |

*(Colour denotes effluent type)

jacob.cronin@jpgroup.co.uk

Shenfield

love every drop
anglianwater

| Manhole Reference | Easting | Northing | Liquid Type | Cover Level | Invert Level | Depth to Invert |
|---|---|---|---|---|---|---|
| 0400 | 562075 | 196470 | F | - | - | - |
| 0401 | 562089 | 196424 | F | - | - | - |
| 0402 | 562058 | 196466 | F | 62.957 | 60.412 | 2.545 |
| 0403 | 562076 | 196438 | F | - | - | - |
| 0404 | 562065 | 196456 | F | - | - | - |
| 0601 | 562008 | 195665 | F | 62.92 | 60.31 | 2.61 |
| 0602 | 562094 | 195685 | F | 63.06 | 60.05 | 3.01 |
| 0701 | 562071 | 195781 | F | 62.76 | 61.26 | 1.5 |
| 0702 | 562067 | 195763 | F | 62.38 | 61.06 | 1.32 |
| 0703 | 562070 | 195748 | F | 62.48 | 60.93 | 1.55 |
| 0704 | 562095 | 195709 | F | 63.06 | 60.82 | 2.24 |
| 0705 | 562047 | 195752 | F | - | - | - |
| 0706 | 562041 | 195762 | F | - | - | - |
| 0707 | 562031 | 195776 | F | - | - | - |
| 0801 | 562092 | 195808 | F | 63.27 | 61.67 | 1.6 |
| 1400 | 562123 | 196497 | F | 62.731 | 61.366 | 1.365 |
| 1401 | 562102 | 196417 | F | - | - | - |
| 1500 | 562187 | 196551 | F | - | - | 2.05 |
| 1701 | 561132 | 195744 | F | - | - | 2.94 |
| 1801 | 562175 | 195874 | F | 66.46 | 64.88 | 1.58 |
| 1802 | 562150 | 195851 | F | 65.22 | 63.54 | 1.68 |
| 1803 | 562114 | 195827 | F | 63.88 | 62.41 | 1.47 |
| 2600 | 562229 | 196600 | F | - | - | 1.95 |
| 2601 | 561274 | 195698 | F | 63.14 | 61.35 | 1.79 |
| 2601 | 562205 | 195665 | F | 65.41 | 59.58 | 5.83 |
| 2601 | 562297 | 196624 | F | - | - | - |
| 2603 | 562285 | 196609 | F | - | - | - |
| 2604 | 562291 | 196605 | F | - | - | - |
| 2800 | 562247 | 195863 | F | - | - | - |
| 2801 | 561215 | 195830 | F | - | - | 2.6 |
| 2901 | 562206 | 195910 | F | 66.75 | 65.12 | 1.63 |
| 3601 | 562302 | 196620 | F | - | - | - |
| 3602 | 562307 | 195681 | F | - | - | - |
| 3701 | 562378 | 195739 | F | - | - | 1.676 |
| 3702 | 562362 | 195723 | F | - | - | - |
| 3900 | 561325 | 195940 | F | - | - | - |
| 4000 | 561411 | 196041 | F | 58.215 | 55.26 | 2.955 |
| 4001 | 561418 | 196036 | F | - | - | - |
| 4100 | 561484 | 196118 | F | 57.536 | 55.614 | 1.922 |
| 5701 | 562502 | 195712 | F | 70.01 | - | - |
| 6200 | 561607 | 196245 | F | 58.525 | 56.215 | 2.31 |
| 6300 | 561698 | 196334 | F | 59.54 | 57.035 | 2.505 |
| 8400 | 561815 | 196424 | F | 60.233 | 58.308 | 1.925 |
| 8401 | 561900 | 196437 | F | 62.789 | 59.024 | 3.765 |
| 9400 | 561991 | 196447 | F | 63.309 | 59.794 | 3.515 |
| 0451 | 562070 | 196454 | S | - | - | - |
| 0452 | 562077 | 196445 | S | - | - | - |
| 0453 | 562089 | 196434 | S | - | - | - |
| 0651 | 562025 | 195672 | S | 62.94 | 60.89 | 2.05 |
| 0652 | 561096 | 195667 | S | - | - | - |
| 0655 | 562030 | 195665 | S | 62.93 | 60.89 | 2.04 |
| 0751 | 562091 | 195707 | S | - | - | - |
| 0752 | 562072 | 195744 | S | 62.54 | 61.34 | 1.2 |
| 0753 | 562066 | 195759 | S | 62.41 | 61.46 | 0.95 |
| 0754 | 562067 | 195781 | S | 62.79 | 61.63 | 1.16 |
| 0851 | 562095 | 195811 | S | - | - | - |
| 1451 | 562111 | 196418 | S | - | - | - |
| 1655 | 562172 | 195668 | S | - | - | 1.32 |
| 1751 | 561137 | 195737 | S | - | - | - |
| 1751 | 562158 | 195758 | S | 65.61 | 64.24 | 1.37 |
| 1752 | 561125 | 195725 | S | - | - | - |
| 1753 | 561124 | 195719 | S | - | - | - |
| 1851 | 562173 | 195871 | S | - | - | - |
| 1852 | 562147 | 195848 | S | - | - | - |
| 1853 | 562111 | 195824 | S | - | - | - |
| 2652 | 561244 | 195699 | S | - | - | - |
| 2653 | 561288 | 195697 | S | - | - | - |
| 2654 | 561283 | 195686 | S | - | - | - |
| 2751 | 561206 | 195722 | S | - | - | - |
| 2751 | 562282 | 195789 | S | 70.87 | 69.69 | 1.18 |
| 2752 | 561243 | 195711 | S | - | - | - |
| 2752 | 562259 | 195797 | S | 69.51 | 68.18 | 1.33 |
| 2753 | 561287 | 195756 | S | - | - | - |
| 2754 | 561289 | 195702 | S | - | - | - |
| 2851 | 561206 | 195816 | S | - | - | 1.94 |
| 2852 | 561279 | 195891 | S | - | - | 1.54 |
| 2951 | 562281 | 195920 | S | - | - | - |
| 2952 | 562238 | 195924 | S | - | - | - |
| 2953 | 562217 | 195916 | S | - | - | - |
| 2954 | 562209 | 195912 | S | - | - | - |
| 3651 | 562310 | 195683 | S | - | - | - |
| 3652 | 561345 | 195680 | S | - | - | - |
| 3751 | 562376 | 195736 | S | 63.39 | 61.54 | 1.85 |
| 3752 | 562355 | 195717 | S | - | - | - |
| 3753 | 562393 | 195791 | S | - | - | - |
| 3754 | 562393 | 195788 | S | - | - | - |
| 3951 | 561319 | 195930 | S | - | - | - |
| 3951 | 562320 | 195908 | S | - | - | - |
| 3952 | 561331 | 195924 | S | - | - | - |
| 3953 | 561330 | 195965 | S | - | - | - |
| 4751 | 562495 | 195719 | S | 64.31 | 63.39 | 0.92 |
| 4752 | 562443 | 195795 | S | 63.64 | 61.92 | 1.72 |
| 4753 | 562403 | 195780 | S | - | - | - |
| 4754 | 562401 | 195779 | S | - | - | - |
| 4851 | 562486 | 195822 | S | 63.85 | 62.38 | 1.47 |
| 4951 | 562492 | 195907 | S | - | - | - |
| 4952 | 562496 | 195991 | S | - | - | - |
| 4953 | 562461 | 195983 | S | - | - | - |
| 7651 | 561728 | 195671 | S | 64.82 | 60.99 | 3.83 |
| 8651 | 561888 | 195693 | S | 61.85 | 60.04 | 1.81 |
| 8652 | 561895 | 195666 | S | 61.91 | 60.36 | 1.55 |
| 9651 | 561987 | 195664 | S | 62.87 | 60.68 | 2.19 |
| 9652 | 561957 | 195669 | S | 62.67 | 60.55 | 2.12 |
| 9751 | 561928 | 195737 | S | 61.69 | 60.7 | 0.99 |

# Pre-Planning Assessment Report

## Officers Meadow (Croudace Homes)

## InFlow Reference: PPE-0136407

## Assessment Type: Used Water

## Report published: 26/01/2022

Thank you for submitting a pre-planning enquiry.

This has been produced for Croudace Homes.

Your reference number is **PPE-0136407**.

This report can be submitted as a drainage strategy for the development should it seek planning permission.

If you have any questions upon receipt of this report, you can submit a further question via InFlow. Alternatively, please contact the Planning & Capacity team on **07929 786 955** or email planningliaison@anglianwater.co.uk

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## Section 1 - Proposed development

The response within this report has been based on the following information which was submitted as part of your application:

| List of planned developments | |
|---|---|
| **Type of development** | **No. Of units** |
| Dwellings | 400 |

**The anticipated residential build rate is:**

| Year | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 |
|---|---|---|---|---|---|---|---|---|
| Build rate | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |

**Development type:** Greenfield

**Planning application status:** Unknown

**Site grid reference number:** TQ6182596088

The comments contained within this report relate to the public water mains and sewers indicated on our records.

Your attention is drawn to the disclaimer in the useful information section of this report.

## Section 2 - Assets affected

Our records indicate that there are no public water mains/public sewers or other assets owned by Anglian Water within the boundary of your development site. However, it is highly recommended that you carry out a thorough investigation of your proposed working area to establish whether any unmapped public or private sewers and lateral drains are in existence.

Due to the private sewer transfer in October 2011 many newly adopted public used water assets and their history are not indicated on our records. You also need to be aware that your development site may contain private water mains, drains or other assets not shown on our records. These are private assets and not the responsibility of Anglian Water but that of the landowner.

## Section 3 - Water recycling services

In examining the used water system we assess the ability for your site to connect to the public sewerage network without causing a detriment to the operation of the system. We also assess the receiving water recycling centre and determine whether the water recycling centre can cope with the increased flow and effluent quality arising from your development.

#### Water recycling centre

The foul drainage from the proposed development is in the catchment of Shenfield And Hutton Water Recycling Centre, which currently has capacity to treat the flows from your development site. Anglian Water cannot reserve capacity and the available capacity at the water recycling centre can be reduced at any time due to growth, environmental and regulation driven changes.

**Used water network**

Our assessment has been based on development flows connecting to the nearest foul water sewer of the same size or greater pipe diameter to that required to drain the site. The infrastructure to convey foul water flows to the receiving sewerage network is assumed to be the responsibility of the developer. Conveyance to the connection point is considered as Onsite Work and includes all work carried out upstream from of the point of connection, including making the connection to our existing network. This connection point has been determined in reference to the calculated discharge flow and on this basis, a 225mm internal diameter pipe is required to drain the development site. The nearest practicable connection is to the 225mm diameter sewer at manhole 6200 in Chelmsford Road at National Grid Reference NGR TQ6156496218. Anglian water has assessed the impact of gravity flows from the planned development to the public foul sewerage network. We can confirm that this is acceptable as the foul sewerage system, at present, has available capacity for your site. Please note that Anglian Water will request a suitably worded condition at planning application stage to ensure this strategy is implemented to mitigate the risk of flooding.

It is assumed that the developer will provide the necessary infrastructure to convey flows from the site to the network. Consequently, this report does not include any costs for the conveyance of flows.

**Surface water disposal**

You indicated on the Pre-Planning Application form that a connection to the public surface water sewer network is not required. Therefore a capacity assessment has not been made on the public surface water network.

As you may be aware, Anglian Water will consider the adoption of SuDs provided that they meet the criteria outline in our SuDs adoption manual. This can be found on our website. We will adopt features located in public open space that are designed and constructed, in conjunction with the Local Authority and Lead Local Flood Authority (LLFA), to the criteria within our SuDs adoption manual. Specifically, developers must be able to demonstrate:

1. Effective upstream source control,
2. Effective exceedance design, and
3. Effective maintenance schedule demonstrating than the assets can be maintained both now and in the future with adequate access.

If you wish to look at the adoption of any SuDs then an expression of interest form can be found on our website

As the proposed method of surface water disposal is not relevant to Anglian Water; we suggest that you contact the relevant Local Authority, Lead Local Flood Authority, the Environment Agency or the Internal Drainage Board, as appropriate.

**Trade Effluent**

We note that you do not have any trade effluent requirements. Should this be required in the future you will need our written formal consent. This is in accordance with Section 118 of the Water Industry Act (1991).

**Used Water Budget Costs**

Your development site will be required to pay an infrastructure charge for each new property connecting to the public sewer that benefits from Full planning permission.

You will be required to pay an infrastructure charge upon connection for each new plot on your development site. The infrastructure charge are types of charges set out in Section 146(2) of the Water Industry Act 1991

The charge should be paid by anyone who wishes to build or develop a property and is payable upon request of connection.

Payment of the infrastructure charge must be made before premises are connected to the public sewer.

| | |
|---|---|
| Infrastructure charge for water recycling: | **£ 573.00** |

**The Water Recyling Infrastructure charge for your dwellings is:**

| Infrastructure charge | Number of units | Total |
|---|---|---|
| £ 573.00 | 400 | £ 229200 |

Infrastructure charges are raised on a standard basis of one charge per new connection (one for water and one for sewerage). However, if the new connection is to non- household premises, the fixed element is calculated according to the number and type of water fittings in the premises. This is called the "relevant multiplier" method of calculating the charge.

Details of the relevant multiplier for each fitting can be found at our website.

It has been assumed that the onsite used water network will be provided under Section 104 of the Water Industry Act

It is recommended that you also budget for connection costs.

Please note that we offer alternative types of connections depending on your needs and these costs are available at our website.

**Section 4 - Map of Proposed Connection Points**

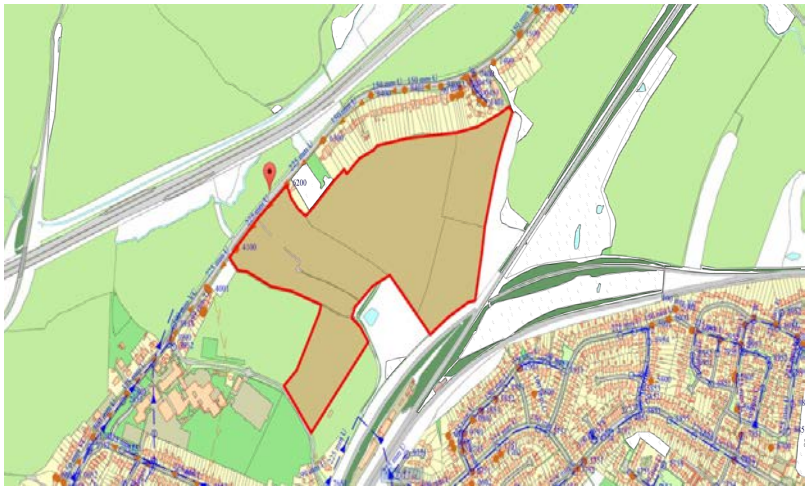


**Figure 1:Showing your used water point of connection**

## Section 5 - Useful information

**Water Industry Act – Key used water sections**

**Section 98:**

This provides you with the right to requisition a new public sewer. The new public sewer can be constructed by Anglian Water on your behalf. Alternatively, you can construct the sewer yourself under section 30 of the Anglian Water Authority Act 1977.

**Section 102:**

This provides you with the right to have an existing sewerage asset vested by us. It is your responsibility to bring the infrastructure to an adoptable condition ahead of the asset being vested.

**Section 104:**

This provides you with the right to have a design technically vetted and an agreement reached that will see us adopt your assets following their satisfactory construction and connection to the public sewer.

**Section 106:**

This provides you with the right to have your constructed sewer connected to the public sewer.

**Section 185**

This provides you with the right to have a public sewerage asset diverted.

Details on how to make a formal application for a new sewer, new connection or diversion are available on our website or via our Development Services team on **0345 60 66 087**.

**Sustainable drainage systems**

Many existing urban drainage systems can cause problems of flooding, pollution or damage to the environment and are not resilient to climate change in the long term. .

Our preferred method of surface water disposal is through the use of Sustainable Drainage Systems or SuDS.

SuDS are a range of techniques that aim to mimic the way surface water drains in natural systems within urban areas. For more information on SuDS, please visit our website

We recommend that you contact the Local Authority and Lead Local Flood Authority (LLFA) for your site to discuss your application.

**Private sewer transfers**

Sewers and lateral drains connected to the public sewer on the 1 July 2011 transferred into Water Company ownership on the 1 October 2011. This follows the implementation of the Floods and Water Management Act (FWMA). This included sewers and lateral drains that were subject to an existing Section 104 Adoption Agreement and those that were not. There were exemptions and the main non-transferable assets were as follows:

Surface water sewers and lateral drains that do not discharge to the public sewer, e.g. those that discharged to a watercourse.

Foul sewers and lateral drains that discharged to a privately owned sewage treatment/collection facility.

Pumping stations and rising mains will transfer between 1 October 2011 and 1 October 2016.

The implementation of Section 42 of the FWMA will ensure that future private sewers will not be created. It is anticipated that all new sewer applications will need to have an approved section 104 application ahead of a section 106 connection.

It is anticipated that all new sewer applications will need to have an approved Section104 application ahead of a Section 106 connection

**Encroachment**

Anglian Water operates a risk based approach to development encroaching close to our used water infrastructure. We assess the issue of encroachment if you are planning to build within 400 metres of a water recycling centre or, within 15 metres to 100 metres of a pumping station. We have more information available on our website

**Locating our assets**

Maps detailing the location of our water and used water infrastructure including both underground assets and above ground assets such as pumping stations and recycling centres are available from digdat

All requests from members of the public or non-statutory bodies for maps showing the location of our assets will be subject to an appropriate administrative charge.

We have more information on our website

### Charging arrangements

Our charging arrangements and summary for this year's water and used water connection and infrastructure charges can be found on our website

## Section 6 - Disclaimer

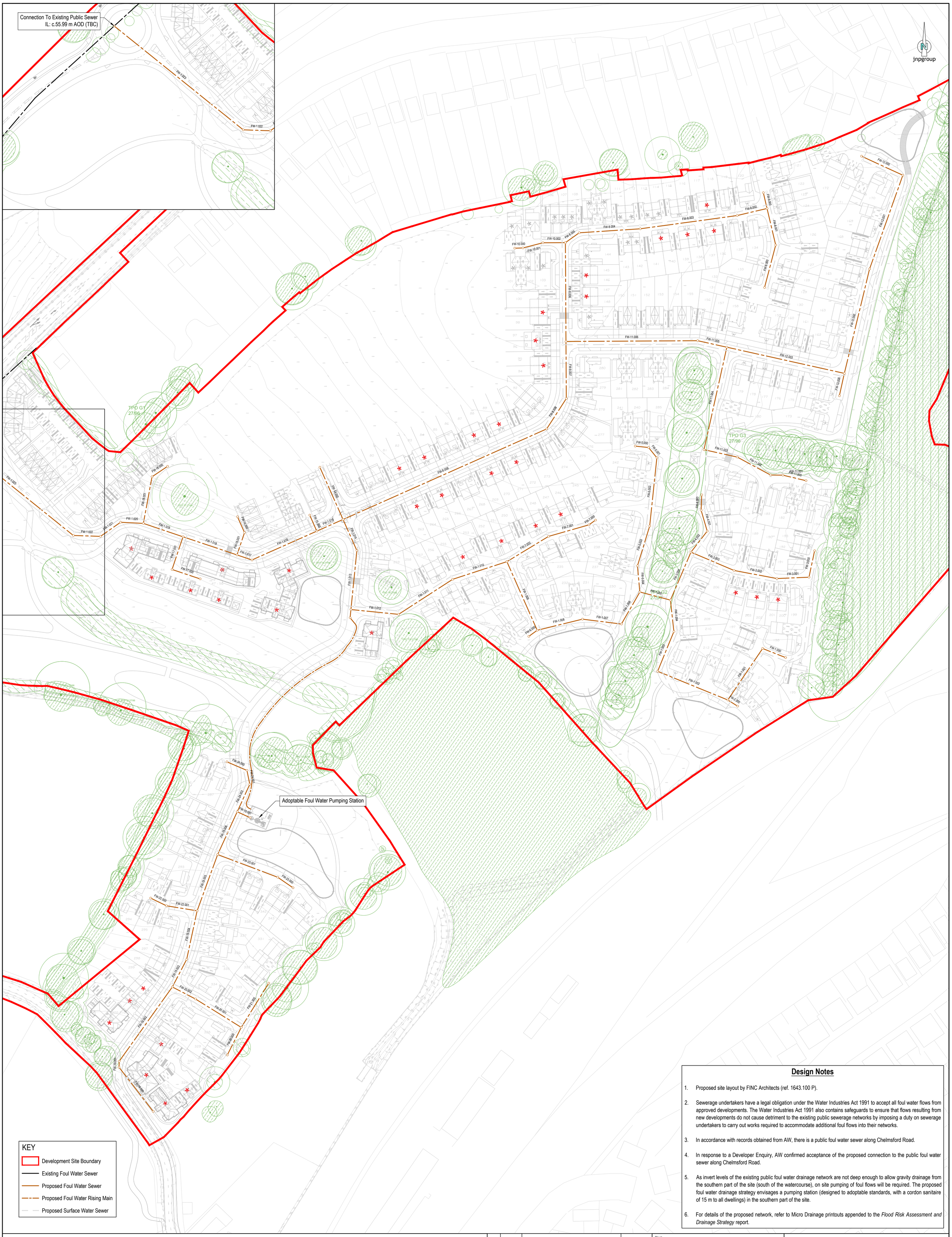
The information provided in this report is based on data currently held by Anglian Water Services Limited ('Anglian Water') or provided by a third party. Accordingly, the information in this report is provided with no guarantee of accuracy, timeliness, completeness and is without indemnity or warranty of any kind (express or implied).

This report should not be considered in isolation and does not nullify the need for the enquirer to make additional appropriate searches, inspections and enquiries. Anglian Water supports the plan led approach to sustainable development that is set out in the National Planning Policy Framework ('NPPF') and any infrastructure needs identified in this report must be considered in the context of current, adopted and/or emerging local plans. Where local plans are absent, silent or have expired these needs should be considered against the definition of sustainability holistically as set out in the NPPF.

Whilst the information in this report is based on the presumption that proposed development obtains planning permission, nothing in this report confirms that planning permission will be granted or that Anglian Water will be bound to carry out the works/proposals contained within this report.

No liability whatsoever, including liability for negligence is accepted by Anglian Water or its partners, employees or agents, for any error or omission, or for the results obtained from the use of this report and/or its content. Furthermore, in no event will any of those parties be liable to the applicant or any third party for any decision made or action taken as a result of reliance on this report.

**This report is valid for the date printed and the enquirer is advised to resubmit their request for an up to date report should there be a delay in submitting any subsequent application for water supply/sewer connection(s).**




## Design Notes

1. Proposed site layout by FINC Architects (ref. 1643.100 P).
2. Sewerage undertakers have a legal obligation under the Water Industries Act 1991 to accept all foul water flows from approved developments. The Water Industries Act 1991 also contains safeguards to ensure that flows resulting from new developments do not cause detriment to the existing public sewerage networks by imposing a duty on sewerage undertakers to carry out works required to accommodate additional foul flows into their networks.
3. In accordance with records obtained from AW, there is a public foul water sewer along Chelmsford Road.
4. In response to a Developer Enquiry, AW confirmed acceptance of the proposed connection to the public foul water sewer along Chelmsford Road.
5. As invert levels of the existing public foul water drainage network are not deep enough to allow gravity drainage from the southern part of the site (south of the watercourse), on site pumping of foul flows will be required. The proposed foul water drainage strategy envisages a pumping station (designed to adoptable standards, with a cordon sanitaire of 15 m to all dwellings) in the southern part of the site.
6. For details of the proposed network, refer to Micro Drainage printouts appended to the *Flood Risk Assessment and Drainage Strategy* report.

## General Notes

1. Where this drawing has been issued in electronic .dwg format, it has been done so in good faith. JNP Group do not take any responsibility for any inaccuracies in the electronic data, which should be checked against the paper (or .pdf) drawing issue. Any apparent discrepancies should be immediately reported to JNP Group. The electronic .dwg file should not be assumed to be to scale and should not be used for 'overlaying', setting out or checking of any third party information. All dimensions should be taken from the paper (or .pdf) version of the drawing. Electronic drawings may contain third party information. JNP Group take no responsibility for this information, which should be checked against the originators paper drawing(s).
2. All dimensions are millimetres (mm), and levels are in metres (m) unless noted otherwise and should be checked on site prior to construction/fabrication.
3. Do not scale from this drawing. Only figured dimensions are to be relied upon. Don't hesitate to get in touch with JNP Group if additional information is required.
4. Any discrepancies between drawings of different scales and between drawings and specifications, where appropriate, to be reported to JNP Group for decision.
5. 
6. This drawing should only be used for construction if the drawing status is "A4 - Approved/Stage Complete". JNP Group takes no responsibility for construction works undertaken to drawings that are not marked with this status.

| Rev. | Date | Description | Drn / Chk'd / App'd |
|---|---|---|---|
| P02 | 05/09/2023 | Updated site layout (Rev P) | RM / RM / RM |
| P01 | 17/08/2023 | First issue. | RM / RM / RM |

Suitability: S2 - Suitable for Information

Client: Croudace Homes

Job: Officers' Meadow, Shenfield

Title: Sustainable Drainage Strategy Foul Water

Classification: FI_60_20

Scale @ A1: 1:1000

JNP GROUP
CONSULTING ENGINEERS
● Amersham ● Brighouse ● Bristol ● Glasgow
● Hartlepool ● Sheffield ● Warwick
www.jnpgroup.co.uk

Project - Originator - Volume/System - Level/Location - Type - Discipline - Number: C86054 - JNP - XX - XX - DR - C - 2004

Document/Drawing Number

Revision: P02



JNP Group Internal Project Number: C86054

## FOUL SEWERAGE DESIGN

### Design Criteria for Foul Water

Pipe Sizes Standard Manhole Sizes STANDARD

| | | | |
|---|---|---|---|
| Industrial Flow (l/s/ha) | 0.00 | Add Flow / Climate Change (%) | 0 |
| Industrial Peak Flow Factor | 0.00 | Minimum Backdrop Height (m) | 0.000 |
| Flow Per Person (l/per/day) | 222.00 | Maximum Backdrop Height (m) | 0.001 |
| Persons per House | 3.00 | Min Design Depth for Optimisation (m) | 1.200 |
| Domestic (l/s/ha) | 0.00 | Min Vel for Auto Design only (m/s) | 1.00 |
| Domestic Peak Flow Factor | 6.00 | Min Slope for Optimisation (1:X) | 500 |

Designed with Level Soffits

### Network Design Table for Foul Water

| PN | Length (m) | Fall (m) | Slope (1:X) | Area (ha) | Houses | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-1.000 | 14.958 | 0.200 | 74.8 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.001 | 37.677 | 0.507 | 74.3 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-2.000 | 6.976 | 0.087 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.002 | 45.978 | 0.307 | 150.0 | 0.000 | 4 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.003 | 26.042 | 0.174 | 150.0 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.004 | 19.184 | 0.128 | 150.0 | 0.000 | 2 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-3.000 | 16.417 | 0.205 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-3.001 | 19.482 | 0.295 | 66.0 | 0.000 | 4 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-3.002 | 26.473 | 0.200 | 132.4 | 0.000 | 6 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-3.003 | 28.349 | 0.200 | 141.7 | 0.000 | 1 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-4.000 | 9.362 | 0.450 | 20.8 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-4.001 | 13.191 | 0.500 | 26.4 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-4.002 | 16.095 | 0.250 | 64.4 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |

### Network Results Table

| PN | US/IL (m) | Σ Area (ha) | Σ Base Flow (l/s) | Σ Hse | Add Flow (l/s) | P.Dep (mm) | P.Vel (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| FW-1.000 | 60.650 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.27 | 0.77 | 6.0 | 0.1 |
| FW-1.001 | 60.450 | 0.000 | 0.0 | 4 | 0.0 | 12 | 0.33 | 0.77 | 6.1 | 0.2 |
| FW-2.000 | 60.030 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-1.002 | 59.893 | 0.000 | 0.0 | 10 | 0.0 | 20 | 0.33 | 0.71 | 12.6 | 0.5 |
| FW-1.003 | 59.586 | 0.000 | 0.0 | 10 | 0.0 | 20 | 0.33 | 0.71 | 12.6 | 0.5 |
| FW-1.004 | 59.413 | 0.000 | 0.0 | 12 | 0.0 | 22 | 0.35 | 0.71 | 12.6 | 0.6 |
| FW-3.000 | 60.450 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-3.001 | 60.245 | 0.000 | 0.0 | 6 | 0.0 | 14 | 0.40 | 0.82 | 6.4 | 0.3 |
| FW-3.002 | 59.900 | 0.000 | 0.0 | 12 | 0.0 | 21 | 0.37 | 0.76 | 13.4 | 0.6 |
| FW-3.003 | 59.700 | 0.000 | 0.0 | 13 | 0.0 | 22 | 0.37 | 0.73 | 13.0 | 0.6 |
| FW-4.000 | 60.750 | 0.000 | 0.0 | 2 | 0.0 | 7 | 0.41 | 1.46 | 11.5 | 0.1 |
| FW-4.001 | 60.300 | 0.000 | 0.0 | 3 | 0.0 | 8 | 0.43 | 1.30 | 10.2 | 0.1 |
| FW-4.002 | 59.800 | 0.000 | 0.0 | 4 | 0.0 | 12 | 0.35 | 0.83 | 6.5 | 0.2 |

## Network Design Table for Foul Water

| PN | Length (m) | Fall (m) | Slope (1:X) | Area (ha) | Houses | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-3.004 | 31.633 | 0.215 | 147.1 | 0.000 | 2 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.005 | 19.174 | 0.128 | 150.0 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-5.000 | 8.144 | 0.102 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-5.001 | 8.000 | 0.348 | 23.0 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-5.002 | 41.642 | 0.600 | 69.4 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-5.003 | 25.232 | 0.650 | 38.8 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-5.004 | 15.941 | 0.993 | 16.1 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.006 | 22.424 | 0.149 | 150.0 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.007 | 23.839 | 0.159 | 150.0 | 0.000 | 1 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.008 | 28.231 | 0.188 | 150.0 | 0.000 | 3 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-6.000 | 6.349 | 0.440 | 14.4 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.009 | 45.501 | 0.303 | 150.0 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-7.000 | 4.909 | 0.061 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-7.001 | 25.443 | 0.318 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-7.002 | 29.534 | 2.264 | 13.0 | 0.000 | 5 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.010 | 34.603 | 0.231 | 150.0 | 0.000 | 7 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.011 | 39.090 | 0.261 | 150.0 | 0.000 | 6 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.012 | 29.017 | 0.193 | 150.0 | 0.000 | 6 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |

## Network Results Table

| PN | US/IL (m) | Σ Area (ha) | Σ Base Flow (l/s) | Σ Hse | Add Flow (l/s) | P.Dep (mm) | P.Vel (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| FW-3.004 | 59.500 | 0.000 | 0.0 | 19 | 0.0 | 27 | 0.41 | 0.72 | 12.7 | 0.9 |
| FW-1.005 | 59.285 | 0.000 | 0.0 | 31 | 0.0 | 34 | 0.47 | 0.71 | 12.6 | 1.4 |
| FW-5.000 | 61.900 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-5.001 | 61.798 | 0.000 | 0.0 | 3 | 0.0 | 8 | 0.45 | 1.39 | 10.9 | 0.1 |
| FW-5.002 | 61.450 | 0.000 | 0.0 | 5 | 0.0 | 13 | 0.37 | 0.80 | 6.3 | 0.2 |
| FW-5.003 | 60.850 | 0.000 | 0.0 | 7 | 0.0 | 14 | 0.50 | 1.07 | 8.4 | 0.3 |
| FW-5.004 | 60.200 | 0.000 | 0.0 | 8 | 0.0 | 12 | 0.71 | 1.67 | 13.1 | 0.4 |
| FW-1.006 | 59.157 | 0.000 | 0.0 | 39 | 0.0 | 38 | 0.50 | 0.71 | 12.6 | 1.8 |
| FW-1.007 | 59.007 | 0.000 | 0.0 | 40 | 0.0 | 39 | 0.51 | 0.71 | 12.6 | 1.9 |
| FW-1.008 | 58.849 | 0.000 | 0.0 | 43 | 0.0 | 40 | 0.52 | 0.71 | 12.6 | 2.0 |
| FW-6.000 | 59.150 | 0.000 | 0.0 | 2 | 0.0 | 6 | 0.46 | 1.76 | 13.8 | 0.1 |
| FW-1.009 | 58.660 | 0.000 | 0.0 | 45 | 0.0 | 41 | 0.53 | 0.71 | 12.6 | 2.1 |
| FW-7.000 | 61.050 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-7.001 | 60.989 | 0.000 | 0.0 | 5 | 0.0 | 14 | 0.35 | 0.74 | 5.8 | 0.2 |
| FW-7.002 | 60.621 | 0.000 | 0.0 | 10 | 0.0 | 11 | 0.77 | 2.43 | 43.0 | 0.5 |
| FW-1.010 | 58.357 | 0.000 | 0.0 | 62 | 0.0 | 49 | 0.58 | 0.71 | 12.6 | 2.9 |
| FW-1.011 | 58.126 | 0.000 | 0.0 | 68 | 0.0 | 51 | 0.59 | 0.71 | 12.6 | 3.1 |
| FW-1.012 | 57.865 | 0.000 | 0.0 | 74 | 0.0 | 53 | 0.61 | 0.71 | 12.6 | 3.4 |

## Network Design Table for Foul Water

| PN | Length (m) | Fall (m) | Slope (1:X) | Area (ha) | Houses | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-1.013 | 35.978 | 0.240 | 150.0 | 0.000 | 60 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.014 | 20.615 | 0.137 | 150.0 | 0.000 | 1 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.000 | 26.581 | 0.332 | 80.0 | 0.000 | 7 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-8.001 | 22.803 | 0.152 | 150.0 | 0.000 | 4 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-9.000 | 9.793 | 0.184 | 53.2 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-8.002 | 18.732 | 0.125 | 150.0 | 0.000 | 1 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.003 | 59.201 | 0.395 | 150.0 | 0.000 | 14 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.004 | 37.074 | 0.247 | 150.0 | 0.000 | 6 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.005 | 10.298 | 0.069 | 150.0 | 0.000 | 2 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-10.000 | 4.961 | 0.062 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-10.001 | 12.509 | 0.156 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-10.002 | 13.651 | 1.552 | 8.8 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-8.006 | 59.915 | 2.197 | 27.3 | 0.000 | 10 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-11.000 | 14.384 | 0.180 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-11.001 | 7.452 | 0.093 | 80.0 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-11.002 | 22.990 | 0.287 | 80.0 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-11.003 | 20.617 | 0.258 | 80.0 | 0.000 | 0 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-11.004 | 63.670 | 0.796 | 80.0 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-12.000 | 27.612 | 0.345 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |

## Network Results Table

| PN | US/IL (m) | Σ Area (ha) | Σ Base Flow (l/s) | Σ Hse | Add Flow (l/s) | P.Dep (mm) | P.Vel (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| FW-1.013 | 57.672 | 0.000 | 0.0 | 134 | 0.0 | 74 | 0.71 | 0.71 | 12.6 | 6.2 |
| FW-1.014 | 57.432 | 0.000 | 0.0 | 135 | 0.0 | 75 | 0.71 | 0.71 | 12.6 | 6.2 |
| FW-8.000 | 62.150 | 0.000 | 0.0 | 7 | 0.0 | 16 | 0.39 | 0.74 | 5.8 | 0.3 |
| FW-8.001 | 61.768 | 0.000 | 0.0 | 11 | 0.0 | 21 | 0.34 | 0.71 | 12.6 | 0.5 |
| FW-9.000 | 61.850 | 0.000 | 0.0 | 3 | 0.0 | 10 | 0.34 | 0.91 | 7.2 | 0.1 |
| FW-8.002 | 61.616 | 0.000 | 0.0 | 15 | 0.0 | 24 | 0.38 | 0.71 | 12.6 | 0.7 |
| FW-8.003 | 61.491 | 0.000 | 0.0 | 29 | 0.0 | 33 | 0.46 | 0.71 | 12.6 | 1.3 |
| FW-8.004 | 61.096 | 0.000 | 0.0 | 35 | 0.0 | 36 | 0.49 | 0.71 | 12.6 | 1.6 |
| FW-8.005 | 60.849 | 0.000 | 0.0 | 37 | 0.0 | 37 | 0.50 | 0.71 | 12.6 | 1.7 |
| FW-10.000 | 62.600 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-10.001 | 62.538 | 0.000 | 0.0 | 4 | 0.0 | 13 | 0.33 | 0.74 | 5.8 | 0.2 |
| FW-10.002 | 62.382 | 0.000 | 0.0 | 5 | 0.0 | 8 | 0.74 | 2.25 | 17.7 | 0.2 |
| FW-8.006 | 60.780 | 0.000 | 0.0 | 52 | 0.0 | 29 | 1.00 | 1.68 | 29.7 | 2.4 |
| FW-11.000 | 60.900 | 0.000 | 0.0 | 3 | 0.0 | 11 | 0.30 | 0.74 | 5.8 | 0.1 |
| FW-11.001 | 60.720 | 0.000 | 0.0 | 4 | 0.0 | 13 | 0.33 | 0.74 | 5.8 | 0.2 |
| FW-11.002 | 60.627 | 0.000 | 0.0 | 5 | 0.0 | 14 | 0.35 | 0.74 | 5.8 | 0.2 |
| FW-11.003 | 60.340 | 0.000 | 0.0 | 5 | 0.0 | 14 | 0.35 | 0.74 | 5.8 | 0.2 |
| FW-11.004 | 60.082 | 0.000 | 0.0 | 6 | 0.0 | 15 | 0.37 | 0.74 | 5.8 | 0.3 |
| FW-12.000 | 61.550 | 0.000 | 0.0 | 3 | 0.0 | 11 | 0.30 | 0.74 | 5.8 | 0.1 |

## Network Design Table for Foul Water

| PN | Length (m) | Fall (m) | Slope (1:X) | Area (ha) | Houses | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-12.001 | 60.338 | 0.754 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-12.002 | 65.108 | 0.434 | 150.0 | 0.000 | 5 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-13.000 | 13.947 | 2.683 | 5.2 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-12.003 | 72.998 | 0.731 | 99.9 | 0.000 | 9 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-11.005 | 18.136 | 0.121 | 150.0 | 0.000 | 2 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-11.006 | 79.824 | 0.532 | 150.0 | 0.000 | 10 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.007 | 34.581 | 0.231 | 150.0 | 0.000 | 6 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.008 | 21.990 | 0.147 | 150.0 | 0.000 | 7 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-8.009 | 135.100 | 0.911 | 148.3 | 0.000 | 27 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-14.000 | 34.620 | 2.605 | 13.3 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-1.015 | 17.416 | 0.077 | 225.0 | 0.000 | 1 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-15.000 | 10.582 | 2.533 | 4.2 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.016 | 43.027 | 0.191 | 225.0 | 0.000 | 15 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-1.017 | 9.577 | 0.043 | 225.0 | 0.000 | 0 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-16.000 | 10.481 | 0.131 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-16.001 | 14.288 | 1.886 | 7.6 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |

## Network Results Table

| PN | US/IL (m) | Σ Area (ha) | Σ Base Flow (l/s) | Σ Hse | Add Flow (l/s) | P.Dep (mm) | P.Vel (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| FW-12.001 | 61.205 | 0.000 | 0.0 | 6 | 0.0 | 15 | 0.37 | 0.74 | 5.8 | 0.3 |
| FW-12.002 | 60.401 | 0.000 | 0.0 | 11 | 0.0 | 21 | 0.34 | 0.71 | 12.6 | 0.5 |
| FW-13.000 | 62.700 | 0.000 | 0.0 | 2 | 0.0 | 5 | 0.65 | 2.93 | 23.0 | 0.1 |
| FW-12.003 | 59.967 | 0.000 | 0.0 | 22 | 0.0 | 26 | 0.49 | 0.88 | 15.5 | 1.0 |
| FW-11.005 | 59.236 | 0.000 | 0.0 | 30 | 0.0 | 34 | 0.47 | 0.71 | 12.6 | 1.4 |
| FW-11.006 | 59.115 | 0.000 | 0.0 | 40 | 0.0 | 39 | 0.51 | 0.71 | 12.6 | 1.9 |
| FW-8.007 | 58.583 | 0.000 | 0.0 | 98 | 0.0 | 62 | 0.66 | 0.71 | 12.6 | 4.5 |
| FW-8.008 | 58.352 | 0.000 | 0.0 | 105 | 0.0 | 65 | 0.67 | 0.71 | 12.6 | 4.9 |
| FW-8.009 | 58.205 | 0.000 | 0.0 | 132 | 0.0 | 73 | 0.71 | 0.72 | 12.7 | 6.1 |
| FW-14.000 | 59.900 | 0.000 | 0.0 | 0 | 0.0 | 0 | 0.00 | 2.41 | 42.6 | 0.0 |
| FW-1.015 | 57.219 | 0.000 | 0.0 | 268 | 0.0 | 100 | 0.73 | 0.76 | 30.4 | 12.4 |
| FW-15.000 | 59.800 | 0.000 | 0.0 | 2 | 0.0 | 5 | 0.70 | 3.27 | 25.7 | 0.1 |
| FW-1.016 | 57.142 | 0.000 | 0.0 | 285 | 0.0 | 104 | 0.74 | 0.76 | 30.4 | 13.2 |
| FW-1.017 | 56.951 | 0.000 | 0.0 | 285 | 0.0 | 104 | 0.74 | 0.76 | 30.4 | 13.2 |
| FW-16.000 | 59.050 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-16.001 | 58.919 | 0.000 | 0.0 | 3 | 0.0 | 6 | 0.66 | 2.43 | 19.1 | 0.1 |

## Network Design Table for Foul Water

| PN | Length (m) | Fall (m) | Slope (1:X) | Area (ha) | Houses | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-1.018 | 34.523 | 0.153 | 225.0 | 0.000 | 10 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-17.000 | 17.988 | 0.225 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-17.001 | 20.919 | 0.695 | 30.1 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.019 | 25.380 | 0.113 | 225.0 | 0.000 | 10 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-18.000 | 11.307 | 0.650 | 17.4 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-18.001 | 28.792 | 1.133 | 25.4 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-1.020 | 13.873 | 0.062 | 225.0 | 0.000 | 0 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-1.021 | 14.874 | 0.066 | 225.0 | 0.000 | 2 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-1.022 | 16.428 | 0.073 | 225.0 | 0.000 | 1 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-1.023 | 100.415 | 0.446 | 225.0 | 0.000 | 24 | 0.0 | 1.500 | o | 225 | Pipe/Conduit | |
| FW-19.000 | 33.839 | 0.226 | 150.0 | 0.000 | 14 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-19.001 | 3.642 | 0.024 | 150.0 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-19.002 | 55.393 | 3.701 | 15.0 | 0.000 | 15 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-20.000 | 31.544 | 0.394 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-21.000 | 18.776 | 1.794 | 10.5 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-20.001 | 32.692 | 0.409 | 80.0 | 0.000 | 1 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-20.002 | 15.806 | 0.198 | 80.0 | 0.000 | 0 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |

## Network Results Table

| PN | US/IL (m) | Σ Area (ha) | Σ Base Flow (l/s) | Σ Hse | Add Flow (l/s) | P.Dep (mm) | P.Vel (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| FW-1.018 | 56.908 | 0.000 | 0.0 | 298 | 0.0 | 106 | 0.74 | 0.76 | 30.4 | 13.8 |
| FW-17.000 | 57.800 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-17.001 | 57.575 | 0.000 | 0.0 | 3 | 0.0 | 9 | 0.41 | 1.22 | 9.6 | 0.1 |
| FW-1.019 | 56.755 | 0.000 | 0.0 | 311 | 0.0 | 109 | 0.75 | 0.76 | 30.4 | 14.4 |
| FW-18.000 | 58.550 | 0.000 | 0.0 | 3 | 0.0 | 8 | 0.50 | 1.60 | 12.6 | 0.1 |
| FW-18.001 | 57.900 | 0.000 | 0.0 | 6 | 0.0 | 12 | 0.55 | 1.32 | 10.4 | 0.3 |
| FW-1.020 | 56.642 | 0.000 | 0.0 | 317 | 0.0 | 110 | 0.76 | 0.76 | 30.4 | 14.7 |
| FW-1.021 | 56.580 | 0.000 | 0.0 | 319 | 0.0 | 111 | 0.76 | 0.76 | 30.4 | 14.8 |
| FW-1.022 | 56.514 | 0.000 | 0.0 | 320 | 0.0 | 111 | 0.76 | 0.76 | 30.4 | 14.8 |
| FW-1.023 | 56.441 | 0.000 | 0.0 | 344 | 0.0 | 116 | 0.77 | 0.76 | 30.4 | 15.9 |
| FW-19.000 | 62.600 | 0.000 | 0.0 | 14 | 0.0 | 23 | 0.37 | 0.71 | 12.6 | 0.6 |
| FW-19.001 | 62.374 | 0.000 | 0.0 | 14 | 0.0 | 23 | 0.37 | 0.71 | 12.6 | 0.6 |
| FW-19.002 | 62.350 | 0.000 | 0.0 | 29 | 0.0 | 19 | 1.03 | 2.27 | 40.2 | 1.3 |
| FW-20.000 | 59.700 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-21.000 | 61.100 | 0.000 | 0.0 | 3 | 0.0 | 7 | 0.59 | 2.07 | 16.2 | 0.1 |
| FW-20.001 | 59.306 | 0.000 | 0.0 | 6 | 0.0 | 15 | 0.37 | 0.74 | 5.8 | 0.3 |
| FW-20.002 | 58.897 | 0.000 | 0.0 | 6 | 0.0 | 15 | 0.37 | 0.74 | 5.8 | 0.3 |

## Network Design Table for Foul Water

| PN | Length (m) | Fall (m) | Slope (1:X) | Area (ha) | Houses | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-19.003 | 18.836 | 0.126 | 150.0 | 0.000 | 3 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-19.004 | 30.138 | 0.201 | 150.0 | 0.000 | 3 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-22.000 | 10.668 | 0.133 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-22.001 | 18.826 | 1.294 | 14.5 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-19.005 | 36.291 | 0.251 | 144.6 | 0.000 | 2 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-23.000 | 11.295 | 0.141 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-23.001 | 38.911 | 0.486 | 80.0 | 0.000 | 3 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-19.006 | 28.565 | 0.223 | 128.1 | 0.000 | 3 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |
| FW-24.000 | 13.196 | 0.165 | 80.0 | 0.000 | 2 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-24.001 | 8.600 | 0.108 | 80.0 | 0.000 | 0 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-24.002 | 18.268 | 0.228 | 80.0 | 0.000 | 0 | 0.0 | 1.500 | o | 100 | Pipe/Conduit | |
| FW-19.007 | 8.629 | 0.058 | 150.0 | 0.000 | 0 | 0.0 | 1.500 | o | 150 | Pipe/Conduit | |

## Network Results Table

| PN | US/IL (m) | Σ Area (ha) | Σ Base Flow (l/s) | Σ Hse | Add Flow (l/s) | P.Dep (mm) | P.Vel (m/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|---|---|---|---|---|---|---|---|---|---|---|
| FW-19.003 | 58.649 | 0.000 | 0.0 | 38 | 0.0 | 38 | 0.50 | 0.71 | 12.6 | 1.8 |
| FW-19.004 | 58.524 | 0.000 | 0.0 | 41 | 0.0 | 39 | 0.51 | 0.71 | 12.6 | 1.9 |
| FW-22.000 | 59.800 | 0.000 | 0.0 | 3 | 0.0 | 11 | 0.30 | 0.74 | 5.8 | 0.1 |
| FW-22.001 | 59.667 | 0.000 | 0.0 | 5 | 0.0 | 9 | 0.63 | 1.75 | 13.8 | 0.2 |
| FW-19.005 | 58.323 | 0.000 | 0.0 | 48 | 0.0 | 42 | 0.54 | 0.73 | 12.9 | 2.2 |
| FW-23.000 | 58.750 | 0.000 | 0.0 | 3 | 0.0 | 11 | 0.30 | 0.74 | 5.8 | 0.1 |
| FW-23.001 | 58.609 | 0.000 | 0.0 | 6 | 0.0 | 15 | 0.37 | 0.74 | 5.8 | 0.3 |
| FW-19.006 | 58.072 | 0.000 | 0.0 | 57 | 0.0 | 45 | 0.60 | 0.77 | 13.7 | 2.6 |
| FW-24.000 | 58.400 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-24.001 | 58.235 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-24.002 | 58.128 | 0.000 | 0.0 | 2 | 0.0 | 9 | 0.26 | 0.74 | 5.8 | 0.1 |
| FW-19.007 | 57.849 | 0.000 | 0.0 | 59 | 0.0 | 47 | 0.57 | 0.71 | 12.6 | 2.7 |

## Manhole Schedules for Foul Water

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | PN | Pipe Out Invert Level (m) | Diameter (mm) | PN | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-1 | 61.950 | 1.300 | Open Manhole | 1200 | FW-1.000 | 60.650 | 100 | | | | |
| FW-2 | 61.750 | 1.300 | Open Manhole | 1200 | FW-1.001 | 60.450 | 100 | FW-1.000 | 60.450 | 100 | |
| FW-3 | 61.330 | 1.300 | Open Manhole | 1200 | FW-2.000 | 60.030 | 100 | | | | |
| FW-4 | 61.650 | 1.757 | Open Manhole | 1200 | FW-1.002 | 59.893 | 150 | FW-1.001 | 59.943 | 100 | |
| | | | | | | | | FW-2.000 | 59.943 | 100 | |
| FW-5 | 60.950 | 1.364 | Open Manhole | 1200 | FW-1.003 | 59.586 | 150 | FW-1.002 | 59.586 | 150 | |
| FW-6 | 60.900 | 1.487 | Open Manhole | 1200 | FW-1.004 | 59.413 | 150 | FW-1.003 | 59.413 | 150 | |
| FW-7 | 61.750 | 1.300 | Open Manhole | 1200 | FW-3.000 | 60.450 | 100 | | | | |
| FW-8 | 61.600 | 1.355 | Open Manhole | 1200 | FW-3.001 | 60.245 | 100 | FW-3.000 | 60.245 | 100 | |
| FW-9 | 61.250 | 1.350 | Open Manhole | 1200 | FW-3.002 | 59.900 | 150 | FW-3.001 | 59.950 | 100 | |
| FW-10 | 61.050 | 1.350 | Open Manhole | 1200 | FW-3.003 | 59.700 | 150 | FW-3.002 | 59.700 | 150 | |
| FW-11 | 62.050 | 1.300 | Open Manhole | 1200 | FW-4.000 | 60.750 | 100 | | | | |
| FW-12 | 61.600 | 1.300 | Open Manhole | 1200 | FW-4.001 | 60.300 | 100 | FW-4.000 | 60.300 | 100 | |
| FW-13 | 61.100 | 1.300 | Open Manhole | 1200 | FW-4.002 | 59.800 | 100 | FW-4.001 | 59.800 | 100 | |
| FW-14 | 60.850 | 1.350 | Open Manhole | 1200 | FW-3.004 | 59.500 | 150 | FW-3.003 | 59.500 | 150 | |
| | | | | | | | | FW-4.002 | 59.550 | 100 | |
| FW-15 | 60.950 | 1.665 | Open Manhole | 1200 | FW-1.005 | 59.285 | 150 | FW-1.004 | 59.285 | 150 | |
| | | | | | | | | FW-3.004 | 59.285 | 150 | |
| FW-16 | 63.200 | 1.300 | Open Manhole | 1200 | FW-5.000 | 61.900 | 100 | | | | |
| FW-17 | 63.100 | 1.302 | Open Manhole | 1200 | FW-5.001 | 61.798 | 100 | FW-5.000 | 61.798 | 100 | |
| FW-18 | 62.750 | 1.300 | Open Manhole | 1200 | FW-5.002 | 61.450 | 100 | FW-5.001 | 61.450 | 100 | |
| FW-19 | 62.150 | 1.300 | Open Manhole | 1200 | FW-5.003 | 60.850 | 100 | FW-5.002 | 60.850 | 100 | |
| FW-20 | 61.500 | 1.300 | Open Manhole | 1200 | FW-5.004 | 60.200 | 100 | FW-5.003 | 60.200 | 100 | |
| FW-21 | 61.250 | 2.093 | Open Manhole | 1200 | FW-1.006 | 59.157 | 150 | FW-1.005 | 59.157 | 150 | |
| | | | | | | | | FW-5.004 | 59.207 | 100 | |
| FW-22 | 60.600 | 1.593 | Open Manhole | 1200 | FW-1.007 | 59.007 | 150 | FW-1.006 | 59.007 | 150 | |
| FW-23 | 60.750 | 1.901 | Open Manhole | 1200 | FW-1.008 | 58.849 | 150 | FW-1.007 | 58.849 | 150 | |
| FW-24 | 60.450 | 1.300 | Open Manhole | 1200 | FW-6.000 | 59.150 | 100 | | | | |
| FW-25 | 60.550 | 1.890 | Open Manhole | 1200 | FW-1.009 | 58.660 | 150 | FW-1.008 | 58.660 | 150 | |
| | | | | | | | | FW-6.000 | 58.710 | 100 | |
| FW-26 | 62.350 | 1.300 | Open Manhole | 1200 | FW-7.000 | 61.050 | 100 | | | | |
| FW-27 | 62.300 | 1.311 | Open Manhole | 1200 | FW-7.001 | 60.989 | 100 | FW-7.000 | 60.989 | 100 | |
| FW-28 | 62.050 | 1.429 | Open Manhole | 1200 | FW-7.002 | 60.621 | 150 | FW-7.001 | 60.671 | 100 | |
| FW-29 | 61.750 | 3.393 | Open Manhole | 1200 | FW-1.010 | 58.357 | 150 | FW-1.009 | 58.357 | 150 | |
| | | | | | | | | FW-7.002 | 58.357 | 150 | |
| FW-30 | 61.200 | 3.074 | Open Manhole | 1200 | FW-1.011 | 58.126 | 150 | FW-1.010 | 58.126 | 150 | |
| FW-31 | 60.400 | 2.535 | Open Manhole | 1200 | FW-1.012 | 57.865 | 150 | FW-1.011 | 57.865 | 150 | |
| FW-32 | 59.850 | 2.178 | Open Manhole | 1200 | FW-1.013 | 57.672 | 150 | FW-1.012 | 57.672 | 150 | |
| FW-33 | 60.800 | 3.368 | Open Manhole | 1200 | FW-1.014 | 57.432 | 150 | FW-1.013 | 57.432 | 150 | |
| FW-34 | 63.450 | 1.300 | Open Manhole | 1200 | FW-8.000 | 62.150 | 100 | | | | |
| FW-35 | 63.300 | 1.532 | Open Manhole | 1200 | FW-8.001 | 61.768 | 150 | FW-8.000 | 61.818 | 100 | |
| FW-36 | 63.150 | 1.300 | Open Manhole | 1200 | FW-9.000 | 61.850 | 100 | | | | |
| FW-37 | 63.150 | 1.534 | Open Manhole | 1200 | FW-8.002 | 61.616 | 150 | FW-8.001 | 61.616 | 150 | |
| | | | | | | | | FW-9.000 | 61.666 | 100 | |

## Manhole Schedules for Foul Water

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | Pipe Out PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | Pipes In PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-38 | 63.300 | 1.809 | Open Manhole | 1200 | FW-8.003 | 61.491 | 150 | FW-8.002 | 61.491 | 150 | |
| FW-39 | 63.900 | 2.804 | Open Manhole | 1200 | FW-8.004 | 61.096 | 150 | FW-8.003 | 61.096 | 150 | |
| FW-40 | 63.650 | 2.801 | Open Manhole | 1200 | FW-8.005 | 60.849 | 150 | FW-8.004 | 60.849 | 150 | |
| FW-41 | 63.900 | 1.300 | Open Manhole | 1200 | FW-10.000 | 62.600 | 100 | | | | |
| FW-42 | 63.900 | 1.362 | Open Manhole | 1200 | FW-10.001 | 62.538 | 100 | FW-10.000 | 62.538 | 100 | |
| FW-43 | 63.900 | 1.518 | Open Manhole | 1200 | FW-10.002 | 62.382 | 100 | FW-10.001 | 62.382 | 100 | |
| FW-44 | 63.750 | 2.970 | Open Manhole | 1200 | FW-8.006 | 60.780 | 150 | FW-8.005 | 60.780 | 150 | 1 |
| | | | | | | | | FW-10.002 | 60.830 | 100 | |
| FW-45 | 62.200 | 1.300 | Open Manhole | 1200 | FW-11.000 | 60.900 | 100 | | | | |
| FW-46 | 62.600 | 1.880 | Open Manhole | 1200 | FW-11.001 | 60.720 | 100 | FW-11.000 | 60.720 | 100 | |
| FW-47 | 62.750 | 2.123 | Open Manhole | 1200 | FW-11.002 | 60.627 | 100 | FW-11.001 | 60.627 | 100 | |
| FW-48 | 62.950 | 2.610 | Open Manhole | 1200 | FW-11.003 | 60.340 | 100 | FW-11.002 | 60.340 | 100 | |
| FW-49 | 63.050 | 2.968 | Open Manhole | 1200 | FW-11.004 | 60.082 | 100 | FW-11.003 | 60.082 | 100 | |
| FW-50 | 62.850 | 1.300 | Open Manhole | 1200 | FW-12.000 | 61.550 | 100 | | | | |
| FW-51 | 63.050 | 1.845 | Open Manhole | 1200 | FW-12.001 | 61.205 | 100 | FW-12.000 | 61.205 | 100 | |
| FW-52 | 63.650 | 3.249 | Open Manhole | 1200 | FW-12.002 | 60.401 | 150 | FW-12.001 | 60.451 | 100 | |
| FW-53 | 64.000 | 1.300 | Open Manhole | 1200 | FW-13.000 | 62.700 | 100 | | | | |
| FW-54 | 63.850 | 3.883 | Open Manhole | 1200 | FW-12.003 | 59.967 | 150 | FW-12.002 | 59.967 | 150 | |
| | | | | | | | | FW-13.000 | 60.017 | 100 | |
| FW-55 | 63.100 | 3.864 | Open Manhole | 1200 | FW-11.005 | 59.236 | 150 | FW-11.004 | 59.286 | 100 | |
| | | | | | | | | FW-12.003 | 59.236 | 150 | |
| FW-56 | 63.250 | 4.135 | Open Manhole | 1200 | FW-11.006 | 59.115 | 150 | FW-11.005 | 59.115 | 150 | |
| FW-57 | 63.750 | 5.167 | Open Manhole | 1200 | FW-8.007 | 58.583 | 150 | FW-8.006 | 58.583 | 150 | |
| | | | | | | | | FW-11.006 | 58.583 | 150 | |
| FW-58 | 63.350 | 4.998 | Open Manhole | 1200 | FW-8.008 | 58.352 | 150 | FW-8.007 | 58.352 | 150 | |
| FW-59 | 63.150 | 4.945 | Open Manhole | 1200 | FW-8.009 | 58.205 | 150 | FW-8.008 | 58.205 | 150 | |
| FW-60 | 61.250 | 1.350 | Open Manhole | 1200 | FW-14.000 | 59.900 | 150 | | | | |
| FW-61 | 61.250 | 4.031 | Open Manhole | 1200 | FW-1.015 | 57.219 | 225 | FW-1.014 | 57.295 | 150 | |
| | | | | | | | | FW-8.009 | 57.294 | 150 | |
| | | | | | | | | FW-14.000 | 57.295 | 150 | 1 |
| FW-62 | 61.100 | 1.300 | Open Manhole | 1200 | FW-15.000 | 59.800 | 100 | | | | |
| FW-63 | 60.900 | 3.758 | Open Manhole | 1200 | FW-1.016 | 57.142 | 225 | FW-1.015 | 57.142 | 225 | |
| | | | | | | | | FW-15.000 | 57.267 | 100 | |
| FW-64 | 60.000 | 3.049 | Open Manhole | 1200 | FW-1.017 | 56.951 | 225 | FW-1.016 | 56.951 | 225 | |
| FW-65 | 60.350 | 1.300 | Open Manhole | 1200 | FW-16.000 | 59.050 | 100 | | | | |
| FW-66 | 60.300 | 1.381 | Open Manhole | 1200 | FW-16.001 | 58.919 | 100 | FW-16.000 | 58.919 | 100 | |
| FW-67 | 59.950 | 3.042 | Open Manhole | 1200 | FW-1.018 | 56.908 | 225 | FW-1.017 | 56.908 | 225 | |
| | | | | | | | | FW-16.001 | 57.033 | 100 | |
| FW-68 | 59.100 | 1.300 | Open Manhole | 1200 | FW-17.000 | 57.800 | 100 | | | | |
| FW-69 | 59.100 | 1.525 | Open Manhole | 1200 | FW-17.001 | 57.575 | 100 | FW-17.000 | 57.575 | 100 | |
| FW-70 | 60.000 | 3.245 | Open Manhole | 1200 | FW-1.019 | 56.755 | 225 | FW-1.018 | 56.755 | 225 | |
| | | | | | | | | FW-17.001 | 56.880 | 100 | 1 |
| FW-71 | 59.850 | 1.300 | Open Manhole | 1200 | FW-18.000 | 58.550 | 100 | | | | |
| FW-72 | 59.200 | 1.300 | Open Manhole | 1200 | FW-18.001 | 57.900 | 100 | FW-18.000 | 57.900 | 100 | |

## Manhole Schedules for Foul Water

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam.,L*W (mm) | PN | Pipe Out Invert Level (m) | Diameter (mm) | PN | Pipes In Invert Level (m) | Diameter (mm) | Backdrop (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FW-73 | 60.050 | 3.408 | Open Manhole | 1200 | FW-1.020 | 56.642 | 225 | FW-1.019 | 56.642 | 225 | |
| | | | | | | | | FW-18.001 | 56.767 | 100 | |
| FW-74 | 59.900 | 3.320 | Open Manhole | 1200 | FW-1.021 | 56.580 | 225 | FW-1.020 | 56.580 | 225 | |
| FW-75 | 59.600 | 3.086 | Open Manhole | 1200 | FW-1.022 | 56.514 | 225 | FW-1.021 | 56.514 | 225 | |
| FW-76 | 58.950 | 2.509 | Open Manhole | 1200 | FW-1.023 | 56.441 | 225 | FW-1.022 | 56.441 | 225 | |
| FW-77 | 57.560 | 1.565 | Open Manhole | 0 | | OUTFALL | | FW-1.023 | 55.995 | 225 | |
| FW-78 | 63.950 | 1.350 | Open Manhole | 1200 | FW-19.000 | 62.600 | 150 | | | | |
| FW-79 | 63.750 | 1.376 | Open Manhole | 1200 | FW-19.001 | 62.374 | 150 | FW-19.000 | 62.374 | 150 | |
| FW-80 | 63.700 | 1.350 | Open Manhole | 1200 | FW-19.002 | 62.350 | 150 | FW-19.001 | 62.350 | 150 | |
| FW-81 | 61.000 | 1.300 | Open Manhole | 1200 | FW-20.000 | 59.700 | 100 | | | | |
| FW-82 | 62.400 | 1.300 | Open Manhole | 1200 | FW-21.000 | 61.100 | 100 | | | | |
| FW-83 | 62.050 | 2.744 | Open Manhole | 1200 | FW-20.001 | 59.306 | 100 | FW-20.000 | 59.306 | 100 | |
| | | | | | | | | FW-21.000 | 59.306 | 100 | |
| FW-84 | 62.200 | 3.303 | Open Manhole | 1200 | FW-20.002 | 58.897 | 100 | FW-20.001 | 58.897 | 100 | |
| FW-85 | 61.950 | 3.301 | Open Manhole | 1200 | FW-19.003 | 58.649 | 150 | FW-19.002 | 58.649 | 150 | |
| | | | | | | | | FW-20.002 | 58.699 | 100 | |
| FW-86 | 61.450 | 2.926 | Open Manhole | 1200 | FW-19.004 | 58.524 | 150 | FW-19.003 | 58.524 | 150 | |
| FW-87 | 61.100 | 1.300 | Open Manhole | 1200 | FW-22.000 | 59.800 | 100 | | | | |
| FW-88 | 61.200 | 1.533 | Open Manhole | 1200 | FW-22.001 | 59.667 | 100 | FW-22.000 | 59.667 | 100 | |
| FW-89 | 60.750 | 2.427 | Open Manhole | 1200 | FW-19.005 | 58.323 | 150 | FW-19.004 | 58.323 | 150 | |
| | | | | | | | | FW-22.001 | 58.373 | 100 | |
| FW-90 | 60.050 | 1.300 | Open Manhole | 1200 | FW-23.000 | 58.750 | 100 | | | | |
| FW-91 | 60.100 | 1.491 | Open Manhole | 1200 | FW-23.001 | 58.609 | 100 | FW-23.000 | 58.609 | 100 | |
| FW-92 | 59.850 | 1.778 | Open Manhole | 1200 | FW-19.006 | 58.072 | 150 | FW-19.005 | 58.072 | 150 | |
| | | | | | | | | FW-23.001 | 58.122 | 100 | 1 |
| FW-93 | 59.700 | 1.300 | Open Manhole | 1200 | FW-24.000 | 58.400 | 100 | | | | |
| FW-94 | 59.850 | 1.615 | Open Manhole | 1200 | FW-24.001 | 58.235 | 100 | FW-24.000 | 58.235 | 100 | |
| FW-95 | 59.700 | 1.573 | Open Manhole | 1200 | FW-24.002 | 58.128 | 100 | FW-24.001 | 58.128 | 100 | |
| FW-96 | 59.500 | 1.651 | Open Manhole | 1200 | FW-19.007 | 57.849 | 150 | FW-19.006 | 57.849 | 150 | |
| | | | | | | | | FW-24.002 | 57.899 | 100 | 1 |
| FW-97 | 59.500 | 1.709 | Open Manhole | 0 | | OUTFALL | | FW-19.007 | 57.791 | 150 | |

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| FW-1 | 562063.149 | 196059.866 | 562063.149 | 196059.866 | Required | |
| FW-2 | 562049.235 | 196065.355 | 562049.235 | 196065.355 | Required | |
| FW-3 | 562034.035 | 196030.424 | 562034.035 | 196030.424 | Required | |

## Manhole Schedules for Foul Water

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| FW-4 | 562028.133 | 196034.143 | 562028.133 | 196034.143 | Required | |
| FW-5 | 561985.572 | 196051.537 | 561985.572 | 196051.537 | Required | |
| FW-6 | 561995.424 | 196075.643 | 561995.424 | 196075.643 | Required | |
| FW-7 | 562080.763 | 196124.649 | 562080.763 | 196124.649 | Required | |
| FW-8 | 562077.351 | 196108.590 | 562077.351 | 196108.590 | Required | |
| FW-9 | 562057.885 | 196107.780 | 562057.885 | 196107.780 | Required | |
| FW-10 | 562031.874 | 196112.703 | 562031.874 | 196112.703 | Required | |
| FW-11 | 562012.291 | 196158.543 | 562012.291 | 196158.543 | Required | |
| FW-12 | 562011.971 | 196149.187 | 562011.971 | 196149.187 | Required | |
| FW-13 | 562015.644 | 196136.518 | 562015.644 | 196136.518 | Required | |
| FW-14 | 562005.784 | 196123.795 | 562005.784 | 196123.795 | Required | |
| FW-15 | 561993.340 | 196094.713 | 561993.340 | 196094.713 | Required | |
| FW-16 | 561971.983 | 196188.096 | 561971.983 | 196188.096 | Required | |
| FW-17 | 561980.083 | 196187.244 | 561980.083 | 196187.244 | Required | |
| FW-18 | 561985.117 | 196181.027 | 561985.117 | 196181.027 | Required | |
| FW-19 | 561980.765 | 196139.614 | 561980.765 | 196139.614 | Required | |
| FW-20 | 561973.340 | 196115.500 | 561973.340 | 196115.500 | Required | |
| FW-21 | 561974.806 | 196099.626 | 561974.806 | 196099.626 | Required | |
| FW-22 | 561963.631 | 196080.185 | 561963.631 | 196080.185 | Required | |

## Manhole Schedules for Foul Water

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| FW-23 | 561939.976 | 196083.141 | 561939.976 | 196083.141 | Required | |
| FW-24 | 561907.425 | 196072.675 | 561907.425 | 196072.675 | Required | |
| FW-25 | 561912.559 | 196076.410 | 561912.559 | 196076.410 | Required | |
| FW-26 | 561947.885 | 196143.210 | 561947.885 | 196143.210 | Required | |
| FW-27 | 561943.910 | 196140.329 | 561943.910 | 196140.329 | Required | |
| FW-28 | 561919.442 | 196133.356 | 561919.442 | 196133.356 | Required | |
| FW-29 | 561894.190 | 196118.038 | 561894.190 | 196118.038 | Required | |
| FW-30 | 561861.287 | 196107.326 | 561861.287 | 196107.326 | Required | |
| FW-31 | 561828.481 | 196086.072 | 561828.481 | 196086.072 | Required | |
| FW-32 | 561799.610 | 196088.977 | 561799.610 | 196088.977 | Required | |
| FW-33 | 561803.210 | 196124.774 | 561803.210 | 196124.774 | Required | |
| FW-34 | 562050.546 | 196284.258 | 562050.546 | 196284.258 | Required | |
| FW-35 | 562057.159 | 196310.003 | 562057.159 | 196310.003 | Required | |
| FW-36 | 562049.676 | 196341.728 | 562049.676 | 196341.728 | Required | |
| FW-37 | 562051.924 | 196332.197 | 562051.924 | 196332.197 | Required | |
| FW-38 | 562033.692 | 196327.896 | 562033.692 | 196327.896 | Required | |
| FW-39 | 561975.038 | 196319.866 | 561975.038 | 196319.866 | Required | |
| FW-40 | 561938.043 | 196317.446 | 561938.043 | 196317.446 | Required | |
| FW-41 | 561898.944 | 196308.083 | 561898.944 | 196308.083 | Required | |

## Manhole Schedules for Foul Water

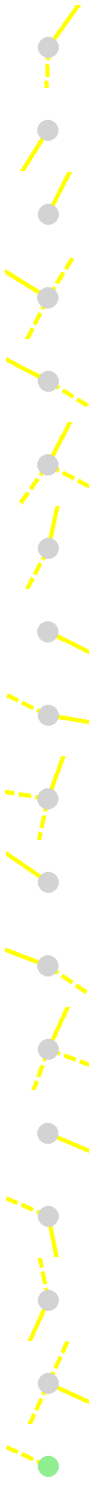
| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| FW-42 | 561903.902 | 196308.247 | 561903.902 | 196308.247 | Required | |
| FW-43 | 561916.011 | 196311.384 | 561916.011 | 196311.384 | Required | |
| FW-44 | 561929.662 | 196311.463 | 561929.662 | 196311.463 | Required | |
| FW-45 | 562075.527 | 196167.147 | 562075.527 | 196167.147 | Required | |
| FW-46 | 562061.529 | 196170.459 | 562061.529 | 196170.459 | Required | |
| FW-47 | 562054.078 | 196170.557 | 562054.078 | 196170.557 | Required | |
| FW-48 | 562033.829 | 196181.443 | 562033.829 | 196181.443 | Required | |
| FW-49 | 562013.704 | 196185.921 | 562013.704 | 196185.921 | Required | |
| FW-50 | 562109.178 | 196363.883 | 562109.178 | 196363.883 | Required | |
| FW-51 | 562134.270 | 196352.360 | 562134.270 | 196352.360 | Required | |
| FW-52 | 562114.082 | 196295.500 | 562114.082 | 196295.500 | Required | |
| FW-53 | 562095.761 | 196218.599 | 562095.761 | 196218.599 | Required | |
| FW-54 | 562098.790 | 196232.213 | 562098.790 | 196232.213 | Required | |
| FW-55 | 562027.536 | 196248.071 | 562027.536 | 196248.071 | Required | |
| FW-56 | 562009.832 | 196252.011 | 562009.832 | 196252.011 | Required | |
| FW-57 | 561930.009 | 196251.548 | 561930.009 | 196251.548 | Required | |
| FW-58 | 561930.210 | 196216.968 | 561930.210 | 196216.968 | Required | |
| FW-59 | 561918.288 | 196198.490 | 561918.288 | 196198.490 | Required | |
| FW-60 | 561780.773 | 196175.247 | 561780.773 | 196175.247 | Required | |

## Manhole Schedules for Foul Water

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| FW-61 | 561794.836 | 196143.612 | 561794.836 | 196143.612 | Required | |
| FW-62 | 561774.623 | 196146.207 | 561774.623 | 196146.207 | Required | |
| FW-63 | 561778.922 | 196136.537 | 561778.922 | 196136.537 | Required | |
| FW-64 | 561739.604 | 196119.059 | 561739.604 | 196119.059 | Required | |
| FW-65 | 561730.821 | 196145.230 | 561730.821 | 196145.230 | Required | |
| FW-66 | 561735.082 | 196135.654 | 561735.082 | 196135.654 | Required | |
| FW-67 | 561730.527 | 196122.112 | 561730.527 | 196122.112 | Required | |
| FW-68 | 561708.188 | 196107.563 | 561708.188 | 196107.563 | Required | |
| FW-69 | 561691.136 | 196113.290 | 561691.136 | 196113.290 | Required | |
| FW-70 | 561697.805 | 196133.118 | 561697.805 | 196133.118 | Required | |
| FW-71 | 561688.413 | 196175.799 | 561688.413 | 196175.799 | Required | |
| FW-72 | 561679.012 | 196169.516 | 561679.012 | 196169.516 | Required | |
| FW-73 | 561673.749 | 196141.209 | 561673.749 | 196141.209 | Required | |
| FW-74 | 561659.893 | 196141.884 | 561659.893 | 196141.884 | Required | |
| FW-75 | 561647.711 | 196133.350 | 561647.711 | 196133.350 | Required | |
| FW-76 | 561631.292 | 196133.897 | 561631.292 | 196133.897 | Required | |
| FW-77 | 561553.067 | 196196.858 | | | No Entry | |
| FW-78 | 561679.673 | 195784.646 | 561679.673 | 195784.646 | Required | |
| FW-79 | 561658.974 | 195811.416 | 561658.974 | 195811.416 | Required | |

## Manhole Schedules for Foul Water

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---|---|---|---|---|---|---|
| FW-80 | 561659.112 | 195815.056 | 561659.112 | 195815.056 | Required | |
| FW-81 | 561749.745 | 195862.410 | 561749.745 | 195862.410 | Required | |
| FW-82 | 561724.653 | 195818.843 | 561724.653 | 195818.843 | Required | |
| FW-83 | 561733.121 | 195835.601 | 561733.121 | 195835.601 | Required | |
| FW-84 | 561705.337 | 195852.830 | 561705.337 | 195852.830 | Required | |
| FW-85 | 561691.316 | 195860.126 | 561691.316 | 195860.126 | Required | |
| FW-86 | 561700.010 | 195876.835 | 561700.010 | 195876.835 | Required | |
| FW-87 | 561678.169 | 195913.985 | 561678.169 | 195913.985 | Required | |
| FW-88 | 561687.769 | 195909.330 | 561687.769 | 195909.330 | Required | |
| FW-89 | 561706.349 | 195906.298 | 561706.349 | 195906.298 | Required | |
| FW-90 | 561764.491 | 195920.241 | 561764.491 | 195920.241 | Required | |
| FW-91 | 561755.191 | 195926.649 | 561755.191 | 195926.649 | Required | |
| FW-92 | 561718.787 | 195940.392 | 561718.787 | 195940.392 | Required | |
| FW-93 | 561724.444 | 195996.640 | 561724.444 | 195996.640 | Required | |
| FW-94 | 561736.563 | 195991.419 | 561736.563 | 195991.419 | Required | |
| FW-95 | 561738.255 | 195982.987 | 561738.255 | 195982.987 | Required | |
| FW-96 | 561730.661 | 195966.372 | 561730.661 | 195966.372 | Required | |
| FW-97 | 561738.501 | 195962.766 | | | No Entry | |



## PIPELINE SCHEDULES for Foul Water

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-1.000 | o | 100 | FW-1 | 61.950 | 60.650 | 1.200 | Open Manhole | 1200 |
| FW-1.001 | o | 100 | FW-2 | 61.750 | 60.450 | 1.200 | Open Manhole | 1200 |
| FW-2.000 | o | 100 | FW-3 | 61.330 | 60.030 | 1.200 | Open Manhole | 1200 |
| FW-1.002 | o | 150 | FW-4 | 61.650 | 59.893 | 1.607 | Open Manhole | 1200 |
| FW-1.003 | o | 150 | FW-5 | 60.950 | 59.586 | 1.214 | Open Manhole | 1200 |
| FW-1.004 | o | 150 | FW-6 | 60.900 | 59.413 | 1.337 | Open Manhole | 1200 |
| FW-3.000 | o | 100 | FW-7 | 61.750 | 60.450 | 1.200 | Open Manhole | 1200 |
| FW-3.001 | o | 100 | FW-8 | 61.600 | 60.245 | 1.255 | Open Manhole | 1200 |
| FW-3.002 | o | 150 | FW-9 | 61.250 | 59.900 | 1.200 | Open Manhole | 1200 |
| FW-3.003 | o | 150 | FW-10 | 61.050 | 59.700 | 1.200 | Open Manhole | 1200 |
| FW-4.000 | o | 100 | FW-11 | 62.050 | 60.750 | 1.200 | Open Manhole | 1200 |
| FW-4.001 | o | 100 | FW-12 | 61.600 | 60.300 | 1.200 | Open Manhole | 1200 |
| FW-4.002 | o | 100 | FW-13 | 61.100 | 59.800 | 1.200 | Open Manhole | 1200 |
| FW-3.004 | o | 150 | FW-14 | 60.850 | 59.500 | 1.200 | Open Manhole | 1200 |
| FW-1.005 | o | 150 | FW-15 | 60.950 | 59.285 | 1.515 | Open Manhole | 1200 |
| FW-5.000 | o | 100 | FW-16 | 63.200 | 61.900 | 1.200 | Open Manhole | 1200 |
| FW-5.001 | o | 100 | FW-17 | 63.100 | 61.798 | 1.202 | Open Manhole | 1200 |
| FW-5.002 | o | 100 | FW-18 | 62.750 | 61.450 | 1.200 | Open Manhole | 1200 |

### Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-1.000 | 14.958 | 74.8 | FW-2 | 61.750 | 60.450 | 1.200 | Open Manhole | 1200 |
| FW-1.001 | 37.677 | 74.3 | FW-4 | 61.650 | 59.943 | 1.607 | Open Manhole | 1200 |
| FW-2.000 | 6.976 | 80.0 | FW-4 | 61.650 | 59.943 | 1.607 | Open Manhole | 1200 |
| FW-1.002 | 45.978 | 150.0 | FW-5 | 60.950 | 59.586 | 1.214 | Open Manhole | 1200 |
| FW-1.003 | 26.042 | 150.0 | FW-6 | 60.900 | 59.413 | 1.337 | Open Manhole | 1200 |
| FW-1.004 | 19.184 | 150.0 | FW-15 | 60.950 | 59.285 | 1.515 | Open Manhole | 1200 |
| FW-3.000 | 16.417 | 80.0 | FW-8 | 61.600 | 60.245 | 1.255 | Open Manhole | 1200 |
| FW-3.001 | 19.482 | 66.0 | FW-9 | 61.250 | 59.950 | 1.200 | Open Manhole | 1200 |
| FW-3.002 | 26.473 | 132.4 | FW-10 | 61.050 | 59.700 | 1.200 | Open Manhole | 1200 |
| FW-3.003 | 28.349 | 141.7 | FW-14 | 60.850 | 59.500 | 1.200 | Open Manhole | 1200 |
| FW-4.000 | 9.362 | 20.8 | FW-12 | 61.600 | 60.300 | 1.200 | Open Manhole | 1200 |
| FW-4.001 | 13.191 | 26.4 | FW-13 | 61.100 | 59.800 | 1.200 | Open Manhole | 1200 |
| FW-4.002 | 16.095 | 64.4 | FW-14 | 60.850 | 59.550 | 1.200 | Open Manhole | 1200 |
| FW-3.004 | 31.633 | 147.1 | FW-15 | 60.950 | 59.285 | 1.515 | Open Manhole | 1200 |
| FW-1.005 | 19.174 | 150.0 | FW-21 | 61.250 | 59.157 | 1.943 | Open Manhole | 1200 |
| FW-5.000 | 8.144 | 80.0 | FW-17 | 63.100 | 61.798 | 1.202 | Open Manhole | 1200 |
| FW-5.001 | 8.000 | 23.0 | FW-18 | 62.750 | 61.450 | 1.200 | Open Manhole | 1200 |
| FW-5.002 | 41.642 | 69.4 | FW-19 | 62.150 | 60.850 | 1.200 | Open Manhole | 1200 |

## PIPELINE SCHEDULES for Foul Water

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-5.003 | o | 100 | FW-19 | 62.150 | 60.850 | 1.200 | Open Manhole | 1200 |
| FW-5.004 | o | 100 | FW-20 | 61.500 | 60.200 | 1.200 | Open Manhole | 1200 |
| FW-1.006 | o | 150 | FW-21 | 61.250 | 59.157 | 1.943 | Open Manhole | 1200 |
| FW-1.007 | o | 150 | FW-22 | 60.600 | 59.007 | 1.443 | Open Manhole | 1200 |
| FW-1.008 | o | 150 | FW-23 | 60.750 | 58.849 | 1.751 | Open Manhole | 1200 |
| FW-6.000 | o | 100 | FW-24 | 60.450 | 59.150 | 1.200 | Open Manhole | 1200 |
| FW-1.009 | o | 150 | FW-25 | 60.550 | 58.660 | 1.740 | Open Manhole | 1200 |
| FW-7.000 | o | 100 | FW-26 | 62.350 | 61.050 | 1.200 | Open Manhole | 1200 |
| FW-7.001 | o | 100 | FW-27 | 62.300 | 60.989 | 1.211 | Open Manhole | 1200 |
| FW-7.002 | o | 150 | FW-28 | 62.050 | 60.621 | 1.279 | Open Manhole | 1200 |
| FW-1.010 | o | 150 | FW-29 | 61.750 | 58.357 | 3.243 | Open Manhole | 1200 |
| FW-1.011 | o | 150 | FW-30 | 61.200 | 58.126 | 2.924 | Open Manhole | 1200 |
| FW-1.012 | o | 150 | FW-31 | 60.400 | 57.865 | 2.385 | Open Manhole | 1200 |
| FW-1.013 | o | 150 | FW-32 | 59.850 | 57.672 | 2.028 | Open Manhole | 1200 |
| FW-1.014 | o | 150 | FW-33 | 60.800 | 57.432 | 3.218 | Open Manhole | 1200 |
| FW-8.000 | o | 100 | FW-34 | 63.450 | 62.150 | 1.200 | Open Manhole | 1200 |
| FW-8.001 | o | 150 | FW-35 | 63.300 | 61.768 | 1.382 | Open Manhole | 1200 |
| FW-9.000 | o | 100 | FW-36 | 63.150 | 61.850 | 1.200 | Open Manhole | 1200 |

### Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-5.003 | 25.232 | 38.8 | FW-20 | 61.500 | 60.200 | 1.200 | Open Manhole | 1200 |
| FW-5.004 | 15.941 | 16.1 | FW-21 | 61.250 | 59.207 | 1.943 | Open Manhole | 1200 |
| FW-1.006 | 22.424 | 150.0 | FW-22 | 60.600 | 59.007 | 1.443 | Open Manhole | 1200 |
| FW-1.007 | 23.839 | 150.0 | FW-23 | 60.750 | 58.849 | 1.751 | Open Manhole | 1200 |
| FW-1.008 | 28.231 | 150.0 | FW-25 | 60.550 | 58.660 | 1.740 | Open Manhole | 1200 |
| FW-6.000 | 6.349 | 14.4 | FW-25 | 60.550 | 58.710 | 1.740 | Open Manhole | 1200 |
| FW-1.009 | 45.501 | 150.0 | FW-29 | 61.750 | 58.357 | 3.243 | Open Manhole | 1200 |
| FW-7.000 | 4.909 | 80.0 | FW-27 | 62.300 | 60.989 | 1.211 | Open Manhole | 1200 |
| FW-7.001 | 25.443 | 80.0 | FW-28 | 62.050 | 60.671 | 1.279 | Open Manhole | 1200 |
| FW-7.002 | 29.534 | 13.0 | FW-29 | 61.750 | 58.357 | 3.243 | Open Manhole | 1200 |
| FW-1.010 | 34.603 | 150.0 | FW-30 | 61.200 | 58.126 | 2.924 | Open Manhole | 1200 |
| FW-1.011 | 39.090 | 150.0 | FW-31 | 60.400 | 57.865 | 2.385 | Open Manhole | 1200 |
| FW-1.012 | 29.017 | 150.0 | FW-32 | 59.850 | 57.672 | 2.028 | Open Manhole | 1200 |
| FW-1.013 | 35.978 | 150.0 | FW-33 | 60.800 | 57.432 | 3.218 | Open Manhole | 1200 |
| FW-1.014 | 20.615 | 150.0 | FW-61 | 61.250 | 57.295 | 3.805 | Open Manhole | 1200 |
| FW-8.000 | 26.581 | 80.0 | FW-35 | 63.300 | 61.818 | 1.382 | Open Manhole | 1200 |
| FW-8.001 | 22.803 | 150.0 | FW-37 | 63.150 | 61.616 | 1.384 | Open Manhole | 1200 |
| FW-9.000 | 9.793 | 53.2 | FW-37 | 63.150 | 61.666 | 1.384 | Open Manhole | 1200 |

## PIPELINE SCHEDULES for Foul Water

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-8.002 | o | 150 | FW-37 | 63.150 | 61.616 | 1.384 | Open Manhole | 1200 |
| FW-8.003 | o | 150 | FW-38 | 63.300 | 61.491 | 1.659 | Open Manhole | 1200 |
| FW-8.004 | o | 150 | FW-39 | 63.900 | 61.096 | 2.654 | Open Manhole | 1200 |
| FW-8.005 | o | 150 | FW-40 | 63.650 | 60.849 | 2.651 | Open Manhole | 1200 |
| FW-10.000 | o | 100 | FW-41 | 63.900 | 62.600 | 1.200 | Open Manhole | 1200 |
| FW-10.001 | o | 100 | FW-42 | 63.900 | 62.538 | 1.262 | Open Manhole | 1200 |
| FW-10.002 | o | 100 | FW-43 | 63.900 | 62.382 | 1.418 | Open Manhole | 1200 |
| FW-8.006 | o | 150 | FW-44 | 63.750 | 60.780 | 2.820 | Open Manhole | 1200 |
| FW-11.000 | o | 100 | FW-45 | 62.200 | 60.900 | 1.200 | Open Manhole | 1200 |
| FW-11.001 | o | 100 | FW-46 | 62.600 | 60.720 | 1.780 | Open Manhole | 1200 |
| FW-11.002 | o | 100 | FW-47 | 62.750 | 60.627 | 2.023 | Open Manhole | 1200 |
| FW-11.003 | o | 100 | FW-48 | 62.950 | 60.340 | 2.510 | Open Manhole | 1200 |
| FW-11.004 | o | 100 | FW-49 | 63.050 | 60.082 | 2.868 | Open Manhole | 1200 |
| FW-12.000 | o | 100 | FW-50 | 62.850 | 61.550 | 1.200 | Open Manhole | 1200 |
| FW-12.001 | o | 100 | FW-51 | 63.050 | 61.205 | 1.745 | Open Manhole | 1200 |
| FW-12.002 | o | 150 | FW-52 | 63.650 | 60.401 | 3.099 | Open Manhole | 1200 |
| FW-13.000 | o | 100 | FW-53 | 64.000 | 62.700 | 1.200 | Open Manhole | 1200 |
| FW-12.003 | o | 150 | FW-54 | 63.850 | 59.967 | 3.733 | Open Manhole | 1200 |

### Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-8.002 | 18.732 | 150.0 | FW-38 | 63.300 | 61.491 | 1.659 | Open Manhole | 1200 |
| FW-8.003 | 59.201 | 150.0 | FW-39 | 63.900 | 61.096 | 2.654 | Open Manhole | 1200 |
| FW-8.004 | 37.074 | 150.0 | FW-40 | 63.650 | 60.849 | 2.651 | Open Manhole | 1200 |
| FW-8.005 | 10.298 | 150.0 | FW-44 | 63.750 | 60.780 | 2.820 | Open Manhole | 1200 |
| FW-10.000 | 4.961 | 80.0 | FW-42 | 63.900 | 62.538 | 1.262 | Open Manhole | 1200 |
| FW-10.001 | 12.509 | 80.0 | FW-43 | 63.900 | 62.382 | 1.418 | Open Manhole | 1200 |
| FW-10.002 | 13.651 | 8.8 | FW-44 | 63.750 | 60.830 | 2.820 | Open Manhole | 1200 |
| FW-8.006 | 59.915 | 27.3 | FW-57 | 63.750 | 58.583 | 5.017 | Open Manhole | 1200 |
| FW-11.000 | 14.384 | 80.0 | FW-46 | 62.600 | 60.720 | 1.780 | Open Manhole | 1200 |
| FW-11.001 | 7.452 | 80.0 | FW-47 | 62.750 | 60.627 | 2.023 | Open Manhole | 1200 |
| FW-11.002 | 22.990 | 80.0 | FW-48 | 62.950 | 60.340 | 2.510 | Open Manhole | 1200 |
| FW-11.003 | 20.617 | 80.0 | FW-49 | 63.050 | 60.082 | 2.868 | Open Manhole | 1200 |
| FW-11.004 | 63.670 | 80.0 | FW-55 | 63.100 | 59.286 | 3.714 | Open Manhole | 1200 |
| FW-12.000 | 27.612 | 80.0 | FW-51 | 63.050 | 61.205 | 1.745 | Open Manhole | 1200 |
| FW-12.001 | 60.338 | 80.0 | FW-52 | 63.650 | 60.451 | 3.099 | Open Manhole | 1200 |
| FW-12.002 | 65.108 | 150.0 | FW-54 | 63.850 | 59.967 | 3.733 | Open Manhole | 1200 |
| FW-13.000 | 13.947 | 5.2 | FW-54 | 63.850 | 60.017 | 3.733 | Open Manhole | 1200 |
| FW-12.003 | 72.998 | 99.9 | FW-55 | 63.100 | 59.236 | 3.714 | Open Manhole | 1200 |

## PIPELINE SCHEDULES for Foul Water

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-11.005 | o | 150 | FW-55 | 63.100 | 59.236 | 3.714 | Open Manhole | 1200 |
| FW-11.006 | o | 150 | FW-56 | 63.250 | 59.115 | 3.985 | Open Manhole | 1200 |
| FW-8.007 | o | 150 | FW-57 | 63.750 | 58.583 | 5.017 | Open Manhole | 1200 |
| FW-8.008 | o | 150 | FW-58 | 63.350 | 58.352 | 4.848 | Open Manhole | 1200 |
| FW-8.009 | o | 150 | FW-59 | 63.150 | 58.205 | 4.795 | Open Manhole | 1200 |
| FW-14.000 | o | 150 | FW-60 | 61.250 | 59.900 | 1.200 | Open Manhole | 1200 |
| FW-1.015 | o | 225 | FW-61 | 61.250 | 57.219 | 3.806 | Open Manhole | 1200 |
| FW-15.000 | o | 100 | FW-62 | 61.100 | 59.800 | 1.200 | Open Manhole | 1200 |
| FW-1.016 | o | 225 | FW-63 | 60.900 | 57.142 | 3.533 | Open Manhole | 1200 |
| FW-1.017 | o | 225 | FW-64 | 60.000 | 56.951 | 2.824 | Open Manhole | 1200 |
| FW-16.000 | o | 100 | FW-65 | 60.350 | 59.050 | 1.200 | Open Manhole | 1200 |
| FW-16.001 | o | 100 | FW-66 | 60.300 | 58.919 | 1.281 | Open Manhole | 1200 |
| FW-1.018 | o | 225 | FW-67 | 59.950 | 56.908 | 2.817 | Open Manhole | 1200 |
| FW-17.000 | o | 100 | FW-68 | 59.100 | 57.800 | 1.200 | Open Manhole | 1200 |
| FW-17.001 | o | 100 | FW-69 | 59.100 | 57.575 | 1.425 | Open Manhole | 1200 |

### Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-11.005 | 18.136 | 150.0 | FW-56 | 63.250 | 59.115 | 3.985 | Open Manhole | 1200 |
| FW-11.006 | 79.824 | 150.0 | FW-57 | 63.750 | 58.583 | 5.017 | Open Manhole | 1200 |
| FW-8.007 | 34.581 | 150.0 | FW-58 | 63.350 | 58.352 | 4.848 | Open Manhole | 1200 |
| FW-8.008 | 21.990 | 150.0 | FW-59 | 63.150 | 58.205 | 4.795 | Open Manhole | 1200 |
| FW-8.009 | 135.100 | 148.3 | FW-61 | 61.250 | 57.294 | 3.806 | Open Manhole | 1200 |
| FW-14.000 | 34.620 | 13.3 | FW-61 | 61.250 | 57.295 | 3.805 | Open Manhole | 1200 |
| FW-1.015 | 17.416 | 225.0 | FW-63 | 60.900 | 57.142 | 3.533 | Open Manhole | 1200 |
| FW-15.000 | 10.582 | 4.2 | FW-63 | 60.900 | 57.267 | 3.533 | Open Manhole | 1200 |
| FW-1.016 | 43.027 | 225.0 | FW-64 | 60.000 | 56.951 | 2.824 | Open Manhole | 1200 |
| FW-1.017 | 9.577 | 225.0 | FW-67 | 59.950 | 56.908 | 2.817 | Open Manhole | 1200 |
| FW-16.000 | 10.481 | 80.0 | FW-66 | 60.300 | 58.919 | 1.281 | Open Manhole | 1200 |
| FW-16.001 | 14.288 | 7.6 | FW-67 | 59.950 | 57.033 | 2.817 | Open Manhole | 1200 |
| FW-1.018 | 34.523 | 225.0 | FW-70 | 60.000 | 56.755 | 3.020 | Open Manhole | 1200 |
| FW-17.000 | 17.988 | 80.0 | FW-69 | 59.100 | 57.575 | 1.425 | Open Manhole | 1200 |
| FW-17.001 | 20.919 | 30.1 | FW-70 | 60.000 | 56.880 | 3.020 | Open Manhole | 1200 |

## PIPELINE SCHEDULES for Foul Water

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-1.019 | o | 225 | FW-70 | 60.000 | 56.755 | 3.020 | Open Manhole | 1200 |
| FW-18.000 | o | 100 | FW-71 | 59.850 | 58.550 | 1.200 | Open Manhole | 1200 |
| FW-18.001 | o | 100 | FW-72 | 59.200 | 57.900 | 1.200 | Open Manhole | 1200 |
| FW-1.020 | o | 225 | FW-73 | 60.050 | 56.642 | 3.183 | Open Manhole | 1200 |
| FW-1.021 | o | 225 | FW-74 | 59.900 | 56.580 | 3.095 | Open Manhole | 1200 |
| FW-1.022 | o | 225 | FW-75 | 59.600 | 56.514 | 2.861 | Open Manhole | 1200 |
| FW-1.023 | o | 225 | FW-76 | 58.950 | 56.441 | 2.284 | Open Manhole | 1200 |
| FW-19.000 | o | 150 | FW-78 | 63.950 | 62.600 | 1.200 | Open Manhole | 1200 |
| FW-19.001 | o | 150 | FW-79 | 63.750 | 62.374 | 1.226 | Open Manhole | 1200 |
| FW-19.002 | o | 150 | FW-80 | 63.700 | 62.350 | 1.200 | Open Manhole | 1200 |
| FW-20.000 | o | 100 | FW-81 | 61.000 | 59.700 | 1.200 | Open Manhole | 1200 |
| FW-21.000 | o | 100 | FW-82 | 62.400 | 61.100 | 1.200 | Open Manhole | 1200 |
| FW-20.001 | o | 100 | FW-83 | 62.050 | 59.306 | 2.644 | Open Manhole | 1200 |
| FW-20.002 | o | 100 | FW-84 | 62.200 | 58.897 | 3.203 | Open Manhole | 1200 |
| FW-19.003 | o | 150 | FW-85 | 61.950 | 58.649 | 3.151 | Open Manhole | 1200 |
| FW-19.004 | o | 150 | FW-86 | 61.450 | 58.524 | 2.776 | Open Manhole | 1200 |
| FW-22.000 | o | 100 | FW-87 | 61.100 | 59.800 | 1.200 | Open Manhole | 1200 |

### Downstream Manhole

| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-1.019 | 25.380 | 225.0 | FW-73 | 60.050 | 56.642 | 3.183 | Open Manhole | 1200 |
| FW-18.000 | 11.307 | 17.4 | FW-72 | 59.200 | 57.900 | 1.200 | Open Manhole | 1200 |
| FW-18.001 | 28.792 | 25.4 | FW-73 | 60.050 | 56.767 | 3.183 | Open Manhole | 1200 |
| FW-1.020 | 13.873 | 225.0 | FW-74 | 59.900 | 56.580 | 3.095 | Open Manhole | 1200 |
| FW-1.021 | 14.874 | 225.0 | FW-75 | 59.600 | 56.514 | 2.861 | Open Manhole | 1200 |
| FW-1.022 | 16.428 | 225.0 | FW-76 | 58.950 | 56.441 | 2.284 | Open Manhole | 1200 |
| FW-1.023 | 100.415 | 225.0 | FW-77 | 57.560 | 55.995 | 1.340 | Open Manhole | 0 |
| FW-19.000 | 33.839 | 150.0 | FW-79 | 63.750 | 62.374 | 1.226 | Open Manhole | 1200 |
| FW-19.001 | 3.642 | 150.0 | FW-80 | 63.700 | 62.350 | 1.200 | Open Manhole | 1200 |
| FW-19.002 | 55.393 | 15.0 | FW-85 | 61.950 | 58.649 | 3.151 | Open Manhole | 1200 |
| FW-20.000 | 31.544 | 80.0 | FW-83 | 62.050 | 59.306 | 2.644 | Open Manhole | 1200 |
| FW-21.000 | 18.776 | 10.5 | FW-83 | 62.050 | 59.306 | 2.644 | Open Manhole | 1200 |
| FW-20.001 | 32.692 | 80.0 | FW-84 | 62.200 | 58.897 | 3.203 | Open Manhole | 1200 |
| FW-20.002 | 15.806 | 80.0 | FW-85 | 61.950 | 58.699 | 3.151 | Open Manhole | 1200 |
| FW-19.003 | 18.836 | 150.0 | FW-86 | 61.450 | 58.524 | 2.776 | Open Manhole | 1200 |
| FW-19.004 | 30.138 | 150.0 | FW-89 | 60.750 | 58.323 | 2.277 | Open Manhole | 1200 |
| FW-22.000 | 10.668 | 80.0 | FW-88 | 61.200 | 59.667 | 1.433 | Open Manhole | 1200 |

## PIPELINE SCHEDULES for Foul Water

### Upstream Manhole

| PN | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-22.001 | o | 100 | FW-88 | 61.200 | 59.667 | 1.433 | Open Manhole | 1200 |
| FW-19.005 | o | 150 | FW-89 | 60.750 | 58.323 | 2.277 | Open Manhole | 1200 |
| FW-23.000 | o | 100 | FW-90 | 60.050 | 58.750 | 1.200 | Open Manhole | 1200 |
| FW-23.001 | o | 100 | FW-91 | 60.100 | 58.609 | 1.391 | Open Manhole | 1200 |
| FW-19.006 | o | 150 | FW-92 | 59.850 | 58.072 | 1.628 | Open Manhole | 1200 |
| FW-24.000 | o | 100 | FW-93 | 59.700 | 58.400 | 1.200 | Open Manhole | 1200 |
| FW-24.001 | o | 100 | FW-94 | 59.850 | 58.235 | 1.515 | Open Manhole | 1200 |
| FW-24.002 | o | 100 | FW-95 | 59.700 | 58.128 | 1.473 | Open Manhole | 1200 |
| FW-19.007 | o | 150 | FW-96 | 59.500 | 57.849 | 1.501 | Open Manhole | 1200 |

### Downstream Manhole

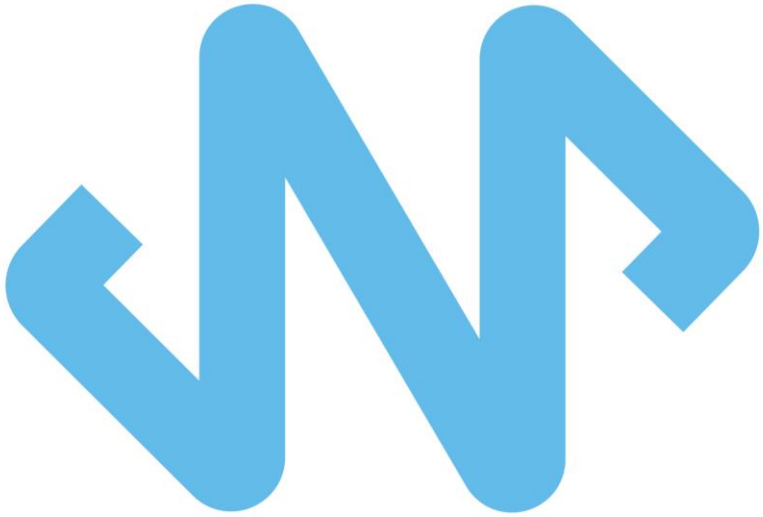
| PN | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|---|---|---|---|---|---|---|---|---|
| FW-22.001 | 18.826 | 14.5 | FW-89 | 60.750 | 58.373 | 2.277 | Open Manhole | 1200 |
| FW-19.005 | 36.291 | 144.6 | FW-92 | 59.850 | 58.072 | 1.628 | Open Manhole | 1200 |
| FW-23.000 | 11.295 | 80.0 | FW-91 | 60.100 | 58.609 | 1.391 | Open Manhole | 1200 |
| FW-23.001 | 38.911 | 80.0 | FW-92 | 59.850 | 58.122 | 1.628 | Open Manhole | 1200 |
| FW-19.006 | 28.565 | 128.1 | FW-96 | 59.500 | 57.849 | 1.501 | Open Manhole | 1200 |
| FW-24.000 | 13.196 | 80.0 | FW-94 | 59.850 | 58.235 | 1.515 | Open Manhole | 1200 |
| FW-24.001 | 8.600 | 80.0 | FW-95 | 59.700 | 58.128 | 1.473 | Open Manhole | 1200 |
| FW-24.002 | 18.268 | 80.0 | FW-96 | 59.500 | 57.899 | 1.501 | Open Manhole | 1200 |
| FW-19.007 | 8.629 | 150.0 | FW-97 | 59.500 | 57.791 | 1.559 | Open Manhole | 0 |

### Free Flowing Outfall Details for Foul Water

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---|---|---|---|---|---|---|
| FW-1.023 | FW-77 | 57.560 | 55.995 | 55.995 | 0 | 0 |

### Free Flowing Outfall Details for Foul Water

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---|---|---|---|---|---|---|
| FW-19.007 | FW-97 | 59.500 | 57.791 | 0.000 | 0 | 0 |



# JNP GROUP

## CONSULTING ENGINEERS


**Brighouse**
Woodvale House
Woodvale Road
Brighouse
West Yorkshire
HD6 4AB

**telephone**
01484 400691

**email**
brighouse@jnpgroup.co.uk

**Bristol**
33 Colston Ave
Bristol
BS1 4UA

**telephone**
01174 721705

**email**
bristol@jnpgroup.co.uk

**Chesham (HQ)**
Link House
St Mary's Way Chesham
Buckinghamshire
HP5 1HR

**telephone**
01494 771221

**email**
chesham@jnpgroup.co.uk

**Glasgow**
Orient Building
16 McPhater Street
Glasgow
G4 0HW

**telephone**
0141 378 0808

**email**
glasgow@jnpgroup.co.uk

**Hartlepool**
The Innovation Centre
Venture Court
Queens Meadow Business Park
Hartlepool
TS25 5TG

**telephone**
01429 239539

**email**
hartlepool@jnpgroup.co.uk

**Leamington Spa**
Portobello House
Portobello Way
Warwick
Warwickshire
CV34 5GJ

**telephone**
01926 889955

**email**
leamingtonspa@jnpgroup.co.uk

**Sheffield**
MBP2 Meadowhall Business Park
Carbrook Hall Road
Sheffield
South Yorkshire
S9 2EQ

**telephone**
0114 244 3500

**email**
sheffield@jnpgroup.co.uk