



The Sizewell C Project

SZC Co.'s Response to the Secretary of State's Request for Further Information dated 18 March 2022: Appendix 3 - The Drainage Strategy Part 2 of 12

Revision: 2.0

April 2022



APPENDIX A SURFACE WATER DRAINAGE PLANS

Figure A.1 Existing Site Drainage Plan

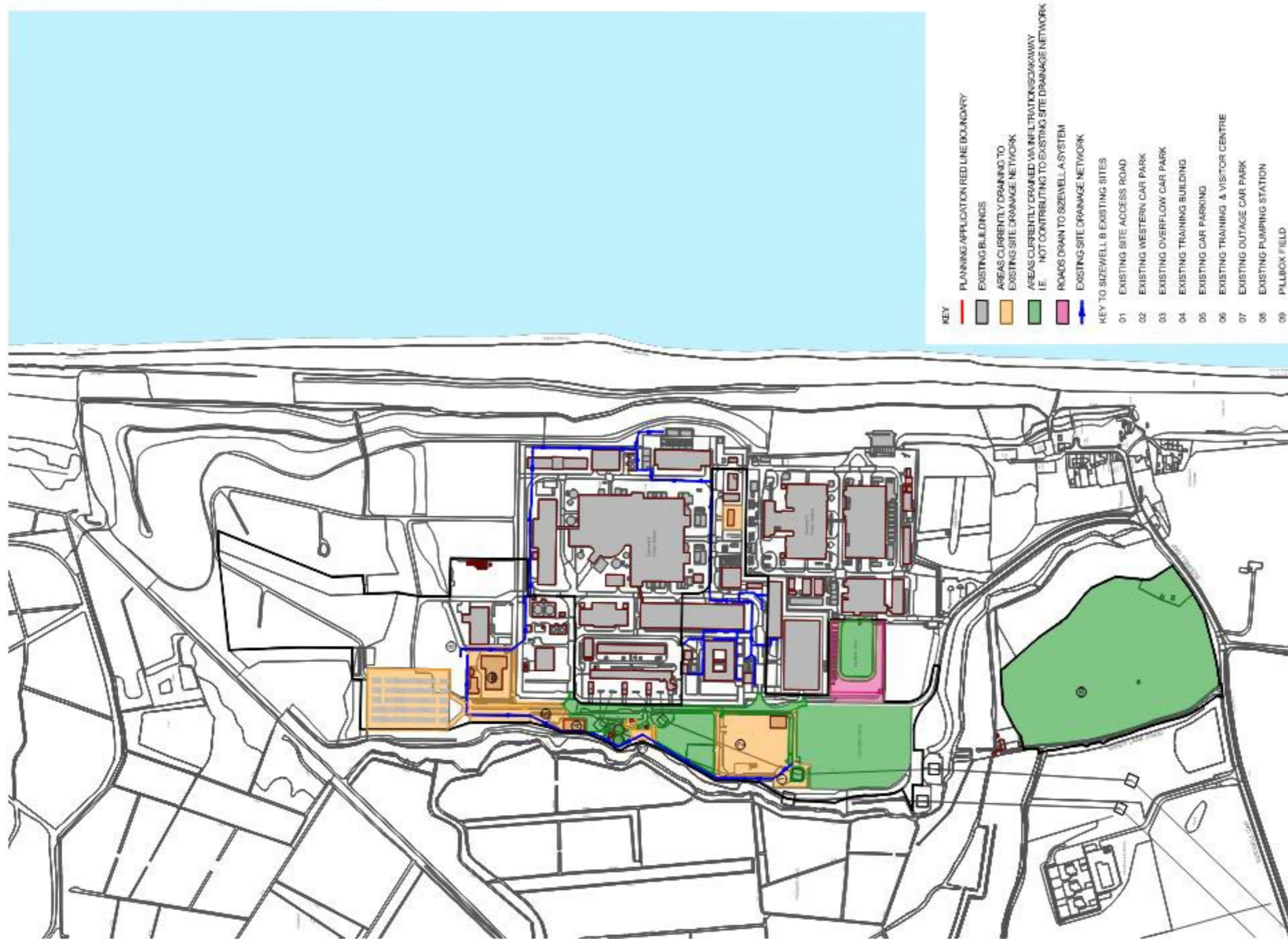


FIGURE 9.1

Figure A.2 Proposed Site Drainage Plan

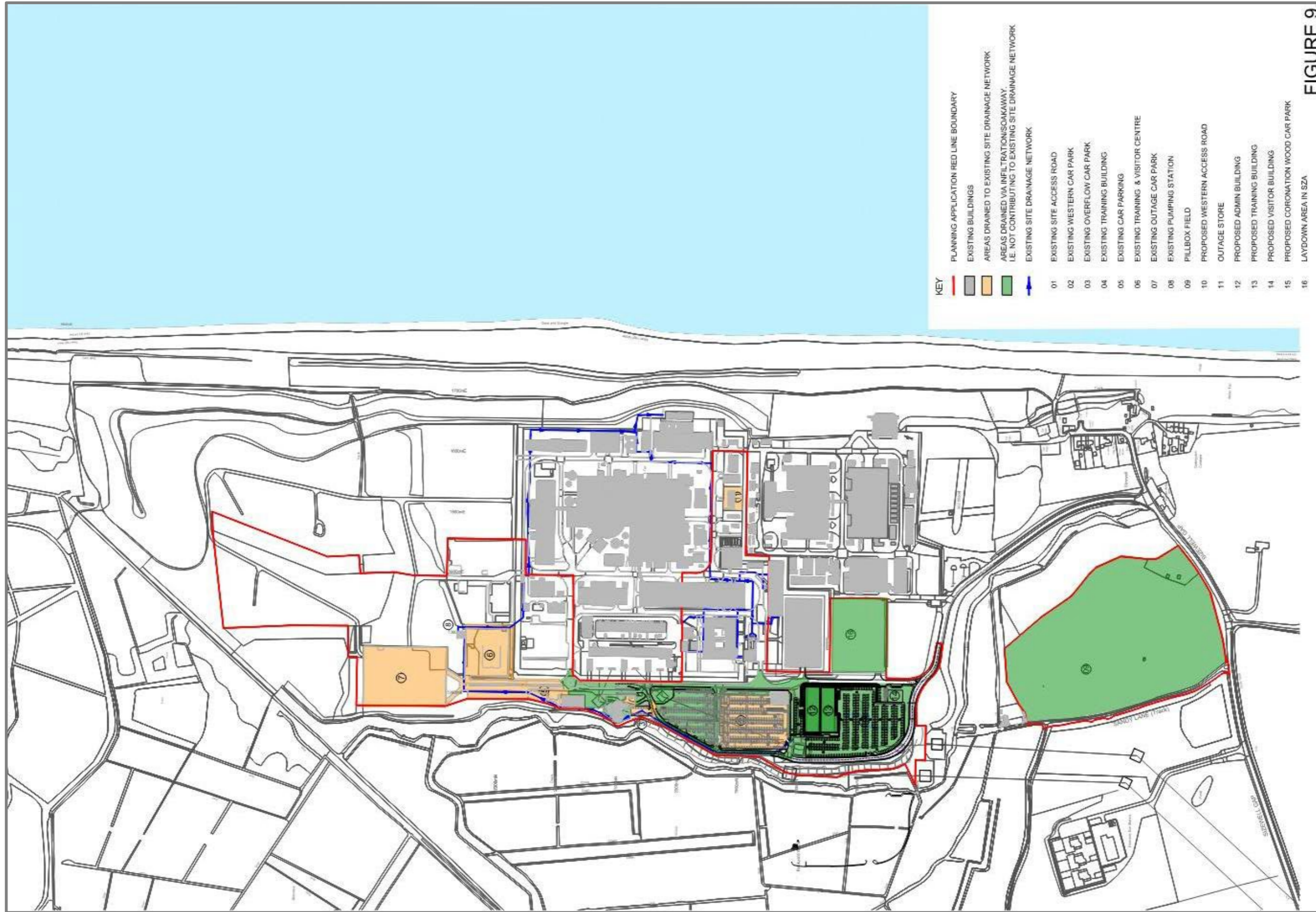


FIGURE 9.

NOT PROTECTIVELY MARKED

APPENDIX B SURFACE WATER PUMPING AND STORAGE REQUIREMENT FOR DISCHARGE TO THE NORTHERN BRANCH OF DRAINAGE NETWORK

NOT PROTECTIVELY MARKED

Design Settings

| | | | |
|-----------------------|-------------------|--------------------------------------|---------------|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 100 | Maximum Rainfall (mm/hr) | 50.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 18.200 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.400 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 10.00 | Enforce best practice design rules | x |

Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|--------|-----------|---------------|-----------------|---------------|-------------|--------------|-----------|
| 1 | 0.358 | 10.00 | 5.951 | 1200 | 647038.104 | 263361.118 | 1.701 |
| 2 | 0.299 | 10.00 | 5.897 | 1200 | 646996.808 | 263361.692 | 1.917 |
| 3 | 0.293 | 10.00 | 5.930 | 1200 | 647038.569 | 263394.615 | 1.880 |
| 4 | 0.272 | 10.00 | 5.909 | 1200 | 646997.273 | 263395.188 | 2.159 |
| 5 | 0.165 | 10.00 | 5.742 | 1200 | 646970.125 | 263346.519 | 1.897 |
| 6 | 0.040 | 10.00 | 5.684 | 1200 | 646970.709 | 263391.457 | 2.117 |
| 7 | 0.155 | 10.00 | 5.812 | 1200 | 646971.398 | 263441.546 | 2.512 |
| 8 | 0.073 | 10.00 | 5.000 | 1200 | 647004.484 | 263502.999 | 2.121 |
| 9 | 0.065 | 10.00 | 4.427 | 1200 | 647044.435 | 263536.245 | 1.217 |
| 10 | 0.075 | 10.00 | 4.424 | 1350 | 647041.642 | 263565.589 | 2.624 |
| 10_OUT | | | 4.400 | 1350 | 647034.258 | 263583.241 | 2.630 |
| 11 | | | 4.400 | 1200 | 647028.852 | 263594.749 | 1.350 |

Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|-------|---------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.000 | 1 | 2 | 41.300 | 0.600 | 4.250 | 3.980 | 0.270 | 153.0 | 150 | 10.85 | 50.0 |
| 1.001 | 2 | 4 | 33.499 | 0.600 | 3.980 | 3.750 | 0.230 | 145.6 | 150 | 11.52 | 50.0 |
| 2.000 | 3 | 4 | 41.300 | 0.600 | 4.050 | 3.750 | 0.300 | 137.7 | 150 | 10.85 | 37.2 |
| 1.002 | 4 | 6 | 26.825 | 0.600 | 3.750 | 3.567 | 0.183 | 146.6 | 150 | 11.69 | 35.7 |
| 3.000 | 5 | 6 | 44.942 | 0.600 | 3.845 | 3.567 | 0.278 | 161.7 | 250 | 10.95 | 37.0 |
| 1.003 | 6 | 7 | 50.094 | 0.600 | 3.567 | 3.300 | 0.267 | 187.6 | 250 | 12.57 | 34.3 |
| 1.004 | 7 | 8 | 69.794 | 0.600 | 3.300 | 2.879 | 0.421 | 165.8 | 250 | 13.40 | 33.1 |
| 1.005 | 8 | 10 | 72.789 | 0.600 | 2.879 | 2.319 | 0.560 | 130.0 | 250 | 14.15 | 32.1 |
| 4.000 | 9 | 10 | 29.477 | 0.600 | 3.210 | 2.859 | 0.351 | 84.0 | 250 | 10.36 | 38.1 |
| 1.006 | 10 | 10_OUT | 19.134 | 0.600 | 1.800 | 1.770 | 0.030 | 637.8 | 450 | 14.51 | 31.6 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|----------------|--------------------|
| 1.000 | 0.810 | 14.3 | 48.5 | 1.551 | 1.767 | 0.358 | 0.0 | 150 | 0.825 |
| 1.001 | 0.830 | 14.7 | 89.0 | 1.767 | 2.009 | 0.657 | 0.0 | 150 | 0.846 |
| 2.000 | 0.854 | 15.1 | 29.5 | 1.730 | 2.009 | 0.293 | 0.0 | 150 | 0.870 |
| 1.002 | 0.828 | 14.6 | 118.2 | 2.009 | 1.967 | 1.221 | 0.0 | 150 | 0.843 |
| 3.000 | 1.097 | 53.9 | 16.6 | 1.647 | 1.867 | 0.165 | 0.0 | 95 | 0.970 |
| 1.003 | 1.018 | 50.0 | 132.6 | 1.867 | 2.262 | 1.427 | 0.0 | 250 | 1.037 |
| 1.004 | 1.084 | 53.2 | 141.9 | 2.262 | 1.871 | 1.582 | 0.0 | 250 | 1.104 |
| 1.005 | 1.225 | 60.1 | 143.9 | 1.871 | 1.855 | 1.654 | 0.0 | 250 | 1.248 |
| 4.000 | 1.527 | 75.0 | 6.7 | 0.967 | 1.315 | 0.065 | 0.0 | 50 | 0.954 |
| 1.006 | 0.797 | 126.8 | 153.7 | 2.174 | 2.180 | 1.794 | 0.0 | 450 | 0.808 |

Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|-------|---------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.007 | 10_OUT | 11 | 12.715 | 0.600 | 4.250 | 3.050 | 1.200 | 10.6 | 150 | 14.58 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|----------------|--------------------|
| 1.007 | 3.113 | 55.0 | 243.1 | 0.000 | 1.200 | 1.794 | 0.0 | 150 | 3.171 |

Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|-------|------------|-------------|----------|-----------|-----------|-----------|--------------|-----------|-----------|--------------|
| 1.000 | 41.300 | 153.0 | 150 | Circular | 5.951 | 4.250 | 1.551 | 5.897 | 3.980 | 1.767 |
| 1.001 | 33.499 | 145.6 | 150 | Circular | 5.897 | 3.980 | 1.767 | 5.909 | 3.750 | 2.009 |
| 2.000 | 41.300 | 137.7 | 150 | Circular | 5.930 | 4.050 | 1.730 | 5.909 | 3.750 | 2.009 |
| 1.002 | 26.825 | 146.6 | 150 | Circular | 5.909 | 3.750 | 2.009 | 5.684 | 3.567 | 1.967 |
| 3.000 | 44.942 | 161.7 | 250 | Circular | 5.742 | 3.845 | 1.647 | 5.684 | 3.567 | 1.867 |
| 1.003 | 50.094 | 187.6 | 250 | Circular | 5.684 | 3.567 | 1.867 | 5.812 | 3.300 | 2.262 |
| 1.004 | 69.794 | 165.8 | 250 | Circular | 5.812 | 3.300 | 2.262 | 5.000 | 2.879 | 1.871 |
| 1.005 | 72.789 | 130.0 | 250 | Circular | 5.000 | 2.879 | 1.871 | 4.424 | 2.319 | 1.855 |
| 4.000 | 29.477 | 84.0 | 250 | Circular | 4.427 | 3.210 | 0.967 | 4.424 | 2.859 | 1.315 |
| 1.006 | 19.134 | 637.8 | 450 | Circular | 4.424 | 1.800 | 2.174 | 4.400 | 1.770 | 2.180 |
| 1.007 | 12.715 | 10.6 | 150 | Circular | 4.400 | 4.250 | 0.000 | 4.400 | 3.050 | 1.200 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|-------|---------|----------|-----------|-----------|---------|----------|-----------|-----------|
| 1.000 | 1 | 1200 | Manhole | Adoptable | 2 | 1200 | Manhole | Adoptable |
| 1.001 | 2 | 1200 | Manhole | Adoptable | 4 | 1200 | Manhole | Adoptable |
| 2.000 | 3 | 1200 | Manhole | Adoptable | 4 | 1200 | Manhole | Adoptable |
| 1.002 | 4 | 1200 | Manhole | Adoptable | 6 | 1200 | Manhole | Adoptable |
| 3.000 | 5 | 1200 | Manhole | Adoptable | 6 | 1200 | Manhole | Adoptable |
| 1.003 | 6 | 1200 | Manhole | Adoptable | 7 | 1200 | Manhole | Adoptable |
| 1.004 | 7 | 1200 | Manhole | Adoptable | 8 | 1200 | Manhole | Adoptable |
| 1.005 | 8 | 1200 | Manhole | Adoptable | 10 | 1350 | Manhole | Adoptable |
| 4.000 | 9 | 1200 | Manhole | Adoptable | 10 | 1350 | Manhole | Adoptable |
| 1.006 | 10 | 1350 | Manhole | Adoptable | 10_OUT | 1350 | Manhole | Adoptable |
| 1.007 | 10_OUT | 1350 | Manhole | Adoptable | 11 | 1200 | Manhole | Adoptable |

Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) |
|------|-------------|--------------|--------|-----------|----------|-------------|-------|--------|----------|
| 1 | 647038.104 | 263361.118 | 5.951 | 1.701 | 1200 | | | | |
| | | | | | | 0 | 1.000 | 4.250 | 150 |
| 2 | 646996.808 | 263361.692 | 5.897 | 1.917 | 1200 | | 1 | 1.000 | 3.980 |
| | | | | | | 0 | 1.001 | 3.980 | 150 |
| 3 | 647038.569 | 263394.615 | 5.930 | 1.880 | 1200 | | | | |
| | | | | | | 0 | 2.000 | 4.050 | 150 |

Manhole Schedule

| Node | Easting (m) | Northing (m) | CL (m) | Depth (m) | Dia (mm) | Connections | Link | IL (m) | Dia (mm) | |
|--------|-------------|--------------|--------|-----------|----------|-------------|------|--------|----------|-----|
| 4 | 646997.273 | 263395.188 | 5.909 | 2.159 | 1200 | | 1 | 2.000 | 3.750 | 150 |
| | | | | | | | 2 | 1.001 | 3.750 | 150 |
| | | | | | | | 0 | 1.002 | 3.750 | 150 |
| 5 | 646970.125 | 263346.519 | 5.742 | 1.897 | 1200 | | 0 | 3.000 | 3.845 | 250 |
| | | | | | | | 1 | 3.000 | 3.567 | 250 |
| 6 | 646970.709 | 263391.457 | 5.684 | 2.117 | 1200 | | 2 | 1.002 | 3.567 | 150 |
| | | | | | | | 0 | 1.003 | 3.567 | 250 |
| 7 | 646971.398 | 263441.546 | 5.812 | 2.512 | 1200 | | 1 | 1.003 | 3.300 | 250 |
| | | | | | | | 0 | 1.004 | 3.300 | 250 |
| 8 | 647004.484 | 263502.999 | 5.000 | 2.121 | 1200 | | 1 | 1.004 | 2.879 | 250 |
| | | | | | | | 0 | 1.005 | 2.879 | 250 |
| 9 | 647044.435 | 263536.245 | 4.427 | 1.217 | 1200 | | 0 | 4.000 | 3.210 | 250 |
| | | | | | | | 1 | 4.000 | 2.859 | 250 |
| 10 | 647041.642 | 263565.589 | 4.424 | 2.624 | 1350 | | 2 | 1.005 | 2.319 | 250 |
| | | | | | | | 0 | 1.006 | 1.800 | 450 |
| 10_OUT | 647034.258 | 263583.241 | 4.400 | 2.630 | 1350 | | 1 | 1.006 | 1.770 | 450 |
| | | | | | | | 0 | 1.007 | 4.250 | 150 |
| 11 | 647028.852 | 263594.749 | 4.400 | 1.350 | 1200 | | 1 | 1.007 | 3.050 | 150 |

Simulation Settings

| | | | |
|----------------------|-------------------|---|-----|
| Rainfall Methodology | FSR | Skip Steady State | x |
| FSR Region | England and Wales | Drain Down Time (mins) | 240 |
| M5-60 (mm) | 18.200 | Additional Storage (m ³ /ha) | 0.0 |
| Ratio-R | 0.400 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |
| Analysis Speed | Normal | | |

Storm Durations

240 | 360 | 480 | 600 | 720 | 960 | 1440

| | | | |
|------------------------------|------------------------------|------------------------------|------------------------------|
| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
| 100 | 25 | 0 | 0 |

Node 10_OUT Online Pump Control

| | | | | | |
|--------------------------|---|---------------------|-------|----------------------|-------|
| Flap Valve | x | Invert Level (m) | 0.770 | Switch off depth (m) | 0.850 |
| Replaces Downstream Link | ✓ | Switch on depth (m) | 0.900 | | |

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|
| 0.800 | 30.000 | 5.000 | 30.000 |

Node 10 Depth/Area Storage Structure

| | | | | | |
|-----------------------------|---------|---------------|------|---------------------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0 | Invert Level (m) | 1.800 |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Time to half empty (mins) | 225 |

| Depth (m) | Area (m ²) | Inf Area (m ²) | Depth (m) | Area (m ²) | Inf Area (m ²) | Depth (m) | Area (m ²) | Inf Area (m ²) |
|-----------|------------------------|----------------------------|-----------|------------------------|----------------------------|-----------|------------------------|----------------------------|
| 0.000 | 240.0 | 0.0 | 1.500 | 240.0 | 0.0 | 1.501 | 0.0 | 0.0 |

Results for 100 year +25% CC Critical Storm Duration. Lowest mass balance: 99.82%

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m ³) | Flood (m ³) | Status |
|-------------------|---------|-------------|-----------|-----------|--------------|----------------------------|-------------------------|------------|
| 240 minute winter | 1 | 84 | 5.951 | 1.701 | 34.4 | 1.9238 | 107.8362 | FLOOD |
| 240 minute winter | 2 | 84 | 5.897 | 1.917 | 34.7 | 2.1681 | 100.1531 | FLOOD |
| 240 minute winter | 3 | 92 | 5.930 | 1.880 | 28.1 | 2.1263 | 63.1137 | FLOOD |
| 240 minute winter | 4 | 132 | 5.883 | 2.133 | 42.7 | 2.4124 | 0.0000 | FLOOD RISK |
| 240 minute winter | 5 | 132 | 4.724 | 0.879 | 15.9 | 0.9936 | 0.0000 | SURCHARGED |
| 240 minute winter | 6 | 136 | 4.699 | 1.132 | 55.1 | 1.2799 | 0.0000 | SURCHARGED |
| 240 minute winter | 7 | 136 | 4.354 | 1.054 | 69.9 | 1.1924 | 0.0000 | SURCHARGED |
| 600 minute winter | 8 | 435 | 4.179 | 1.300 | 61.5 | 1.4704 | 0.0000 | SURCHARGED |
| 600 minute winter | 9 | 435 | 4.049 | 0.839 | 3.0 | 0.9487 | 0.0000 | SURCHARGED |
| 600 minute winter | 10 | 435 | 4.049 | 2.249 | 68.2 | 363.3381 | 0.0000 | SURCHARGED |
| 600 minute winter | 10_OUT | 435 | 4.046 | 2.276 | 30.7 | 3.2582 | 0.0000 | OK |
| 240 minute winter | 11 | 4 | 3.050 | 0.000 | 30.0 | 0.0000 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m ³) | Discharge Vol (m ³) |
|-----------------------------|---------|-------|---------|---------------|----------------|----------|----------------------------|---------------------------------|
| 240 minute winter | 1 | 1.000 | 2 | 11.2 | 0.639 | 0.786 | 0.7271 | |
| 240 minute winter | 2 | 1.001 | 4 | 20.4 | 1.159 | 1.390 | 0.5897 | |
| 240 minute winter | 3 | 2.000 | 4 | 13.5 | 0.766 | 0.893 | 0.7271 | |
| 240 minute winter | 4 | 1.002 | 6 | 42.2 | 2.397 | 2.884 | 0.4722 | |
| 240 minute winter | 5 | 3.000 | 6 | 15.7 | 0.322 | 0.292 | 2.1978 | |
| 240 minute winter | 6 | 1.003 | 7 | 55.0 | 1.124 | 1.100 | 2.4497 | |
| 240 minute winter | 7 | 1.004 | 8 | 69.7 | 1.426 | 1.311 | 3.4131 | |
| 600 minute winter | 8 | 1.005 | 10 | 61.7 | 1.390 | 1.025 | 3.5595 | |
| 600 minute winter | 9 | 4.000 | 10 | 3.0 | 0.749 | 0.040 | 1.4415 | |
| 600 minute winter | 10 | 1.006 | 10_OUT | 30.7 | 0.759 | 0.242 | 3.0317 | |
| 600 minute winter | 10_OUT | Pump | 11 | 30.0 | | | | 1116.8 |

NOT PROTECTIVELY MARKED

APPENDIX C SURFACE WATER INFILTRATION REQUIREMENT FOR CORONATION WOOD AREA

NOT PROTECTIVELY MARKED

Design Settings

| | | | |
|-----------------------|-------------------|--------------------------------------|---------------|
| Rainfall Methodology | FSR | Maximum Time of Concentration (mins) | 30.00 |
| Return Period (years) | 30 | Maximum Rainfall (mm/hr) | 50.0 |
| Additional Flow (%) | 0 | Minimum Velocity (m/s) | 1.00 |
| FSR Region | England and Wales | Connection Type | Level Soffits |
| M5-60 (mm) | 18.200 | Minimum Backdrop Height (m) | 0.200 |
| Ratio-R | 0.400 | Preferred Cover Depth (m) | 1.200 |
| CV | 0.750 | Include Intermediate Ground | ✓ |
| Time of Entry (mins) | 10.00 | Enforce best practice design rules | x |

Nodes

| Name | Area (ha) | T of E (mins) | Cover Level (m) | Diameter (mm) | Easting (m) | Northing (m) | Depth (m) |
|--------|-----------|---------------|-----------------|---------------|-------------|--------------|-----------|
| 1 | 0.358 | 10.00 | 5.951 | 1200 | 647038.104 | 263361.118 | 1.701 |
| 2 | 0.299 | 10.00 | 5.897 | 1200 | 646996.808 | 263361.692 | 1.917 |
| 3 | 0.293 | 10.00 | 5.930 | 1200 | 647038.569 | 263394.615 | 1.880 |
| 4 | 0.272 | 10.00 | 5.909 | 1200 | 646997.273 | 263395.188 | 2.159 |
| 5 | 0.165 | 10.00 | 5.742 | 1200 | 646970.125 | 263346.519 | 1.897 |
| 6 | 0.040 | 10.00 | 5.684 | 1200 | 646970.709 | 263391.457 | 2.117 |
| 7 | 0.155 | 10.00 | 5.812 | 1200 | 646971.398 | 263441.546 | 2.512 |
| 8 | 0.073 | 10.00 | 5.000 | 1200 | 647004.484 | 263502.999 | 2.121 |
| 9 | 0.065 | 10.00 | 4.427 | 1200 | 647044.435 | 263536.245 | 1.217 |
| 10 | 0.075 | 10.00 | 4.424 | 1350 | 647041.642 | 263565.589 | 2.624 |
| 10_OUT | | | 4.400 | 1350 | 647034.258 | 263583.241 | 2.630 |
| 11 | | | 4.400 | 1200 | 647028.852 | 263594.749 | 1.350 |

Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|-------|---------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.000 | 1 | 2 | 41.300 | 0.600 | 4.250 | 3.980 | 0.270 | 153.0 | 150 | 10.85 | 50.0 |
| 1.001 | 2 | 4 | 33.499 | 0.600 | 3.980 | 3.750 | 0.230 | 145.6 | 150 | 11.52 | 50.0 |
| 2.000 | 3 | 4 | 41.300 | 0.600 | 4.050 | 3.750 | 0.300 | 137.7 | 150 | 10.85 | 37.2 |
| 1.002 | 4 | 6 | 26.825 | 0.600 | 3.750 | 3.567 | 0.183 | 146.6 | 150 | 11.69 | 35.7 |
| 3.000 | 5 | 6 | 44.942 | 0.600 | 3.845 | 3.567 | 0.278 | 161.7 | 250 | 10.95 | 37.0 |
| 1.003 | 6 | 7 | 50.094 | 0.600 | 3.567 | 3.300 | 0.267 | 187.6 | 250 | 12.57 | 34.3 |
| 1.004 | 7 | 8 | 69.794 | 0.600 | 3.300 | 2.879 | 0.421 | 165.8 | 250 | 13.40 | 33.1 |
| 1.005 | 8 | 10 | 72.789 | 0.600 | 2.879 | 2.319 | 0.560 | 130.0 | 250 | 14.15 | 32.1 |
| 4.000 | 9 | 10 | 29.477 | 0.600 | 3.210 | 2.859 | 0.351 | 84.0 | 250 | 10.36 | 38.1 |
| 1.006 | 10 | 10_OUT | 19.134 | 0.600 | 1.800 | 1.770 | 0.030 | 637.8 | 450 | 14.51 | 31.6 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|----------------|--------------------|
| 1.000 | 0.810 | 14.3 | 48.5 | 1.551 | 1.767 | 0.358 | 0.0 | 150 | 0.825 |
| 1.001 | 0.830 | 14.7 | 89.0 | 1.767 | 2.009 | 0.657 | 0.0 | 150 | 0.846 |
| 2.000 | 0.854 | 15.1 | 29.5 | 1.730 | 2.009 | 0.293 | 0.0 | 150 | 0.870 |
| 1.002 | 0.828 | 14.6 | 118.2 | 2.009 | 1.967 | 1.221 | 0.0 | 150 | 0.843 |
| 3.000 | 1.097 | 53.9 | 16.6 | 1.647 | 1.867 | 0.165 | 0.0 | 95 | 0.970 |
| 1.003 | 1.018 | 50.0 | 132.6 | 1.867 | 2.262 | 1.427 | 0.0 | 250 | 1.037 |
| 1.004 | 1.084 | 53.2 | 141.9 | 2.262 | 1.871 | 1.582 | 0.0 | 250 | 1.104 |
| 1.005 | 1.225 | 60.1 | 143.9 | 1.871 | 1.855 | 1.654 | 0.0 | 250 | 1.248 |
| 4.000 | 1.527 | 75.0 | 6.7 | 0.967 | 1.315 | 0.065 | 0.0 | 50 | 0.954 |
| 1.006 | 0.797 | 126.8 | 153.7 | 2.174 | 2.180 | 1.794 | 0.0 | 450 | 0.808 |

Links

| Name | US Node | DS Node | Length (m) | ks (mm) / n | US IL (m) | DS IL (m) | Fall (m) | Slope (1:X) | Dia (mm) | T of C (mins) | Rain (mm/hr) |
|-------|---------|---------|------------|-------------|-----------|-----------|----------|-------------|----------|---------------|--------------|
| 1.007 | 10_OUT | 11 | 12.715 | 0.600 | 4.250 | 3.050 | 1.200 | 10.6 | 150 | 14.58 | 50.0 |

| Name | Vel (m/s) | Cap (l/s) | Flow (l/s) | US Depth (m) | DS Depth (m) | Σ Area (ha) | Σ Add Inflow (l/s) | Pro Depth (mm) | Pro Velocity (m/s) |
|-------|-----------|-----------|------------|--------------|--------------|-------------|--------------------|----------------|--------------------|
| 1.007 | 3.113 | 55.0 | 243.1 | 0.000 | 1.200 | 1.794 | 0.0 | 150 | 3.171 |

Pipeline Schedule

| Link | Length (m) | Slope (1:X) | Dia (mm) | Link Type | US CL (m) | US IL (m) | US Depth (m) | DS CL (m) | DS IL (m) | DS Depth (m) |
|-------|------------|-------------|----------|-----------|-----------|-----------|--------------|-----------|-----------|--------------|
| 1.000 | 41.300 | 153.0 | 150 | Circular | 5.951 | 4.250 | 1.551 | 5.897 | 3.980 | 1.767 |
| 1.001 | 33.499 | 145.6 | 150 | Circular | 5.897 | 3.980 | 1.767 | 5.909 | 3.750 | 2.009 |
| 2.000 | 41.300 | 137.7 | 150 | Circular | 5.930 | 4.050 | 1.730 | 5.909 | 3.750 | 2.009 |
| 1.002 | 26.825 | 146.6 | 150 | Circular | 5.909 | 3.750 | 2.009 | 5.684 | 3.567 | 1.967 |
| 3.000 | 44.942 | 161.7 | 250 | Circular | 5.742 | 3.845 | 1.647 | 5.684 | 3.567 | 1.867 |
| 1.003 | 50.094 | 187.6 | 250 | Circular | 5.684 | 3.567 | 1.867 | 5.812 | 3.300 | 2.262 |
| 1.004 | 69.794 | 165.8 | 250 | Circular | 5.812 | 3.300 | 2.262 | 5.000 | 2.879 | 1.871 |
| 1.005 | 72.789 | 130.0 | 250 | Circular | 5.000 | 2.879 | 1.871 | 4.424 | 2.319 | 1.855 |
| 4.000 | 29.477 | 84.0 | 250 | Circular | 4.427 | 3.210 | 0.967 | 4.424 | 2.859 | 1.315 |
| 1.006 | 19.134 | 637.8 | 450 | Circular | 4.424 | 1.800 | 2.174 | 4.400 | 1.770 | 2.180 |
| 1.007 | 12.715 | 10.6 | 150 | Circular | 4.400 | 4.250 | 0.000 | 4.400 | 3.050 | 1.200 |

| Link | US Node | Dia (mm) | Node Type | MH Type | DS Node | Dia (mm) | Node Type | MH Type |
|-------|---------|----------|-----------|-----------|---------|----------|-----------|-----------|
| 1.000 | 1 | 1200 | Manhole | Adoptable | 2 | 1200 | Manhole | Adoptable |
| 1.001 | 2 | 1200 | Manhole | Adoptable | 4 | 1200 | Manhole | Adoptable |
| 2.000 | 3 | 1200 | Manhole | Adoptable | 4 | 1200 | Manhole | Adoptable |
| 1.002 | 4 | 1200 | Manhole | Adoptable | 6 | 1200 | Manhole | Adoptable |
| 3.000 | 5 | 1200 | Manhole | Adoptable | 6 | 1200 | Manhole | Adoptable |
| 1.003 | 6 | 1200 | Manhole | Adoptable | 7 | 1200 | Manhole | Adoptable |
| 1.004 | 7 | 1200 | Manhole | Adoptable | 8 | 1200 | Manhole | Adoptable |
| 1.005 | 8 | 1200 | Manhole | Adoptable | 10 | 1350 | Manhole | Adoptable |
| 4.000 | 9 | 1200 | Manhole | Adoptable | 10 | 1350 | Manhole | Adoptable |
| 1.006 | 10 | 1350 | Manhole | Adoptable | 10_OUT | 1350 | Manhole | Adoptable |
| 1.007 | 10_OUT | 1350 | Manhole | Adoptable | 11 | 1200 | Manhole | Adoptable |

Simulation Settings

| | | | |
|----------------------|-------------------|----------------------------|-----|
| Rainfall Methodology | FSR | Skip Steady State | x |
| FSR Region | England and Wales | Drain Down Time (mins) | 240 |
| M5-60 (mm) | 18.200 | Additional Storage (m³/ha) | 0.0 |
| Ratio-R | 0.400 | Check Discharge Rate(s) | x |
| Winter CV | 0.840 | Check Discharge Volume | x |
| Analysis Speed | Normal | | |

Storm Durations

240 | 360 | 480 | 600 | 720 | 960 | 1440

| Return Period (years) | Climate Change (CC %) | Additional Area (A %) | Additional Flow (Q %) |
|-----------------------|-----------------------|-----------------------|-----------------------|
| 30 | 20 | 0 | 0 |

Node 10_OUT Online Pump Control

| | | | | | |
|--------------------------|---|---------------------|-------|----------------------|-------|
| Flap Valve | x | Invert Level (m) | 0.770 | Switch off depth (m) | 0.850 |
| Replaces Downstream Link | ✓ | Switch on depth (m) | 0.900 | | |

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|
| 0.800 | 20.000 | 5.000 | 20.000 |

Node 10 Depth/Area Storage Structure

| | | | | | |
|-----------------------------|---------|---------------|------|---------------------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0 | Invert Level (m) | 1.800 |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity | 1.00 | Time to half empty (mins) | 184 |

| Depth (m) | Area (m ²) | Inf Area (m ²) | Depth (m) | Area (m ²) | Inf Area (m ²) | Depth (m) | Area (m ²) | Inf Area (m ²) |
|-----------|------------------------|----------------------------|-----------|------------------------|----------------------------|-----------|------------------------|----------------------------|
| 0.000 | 360.0 | 0.0 | 1.500 | 360.0 | 0.0 | 1.501 | 0.0 | 0.0 |

Node 11 Soakaway Storage Structure

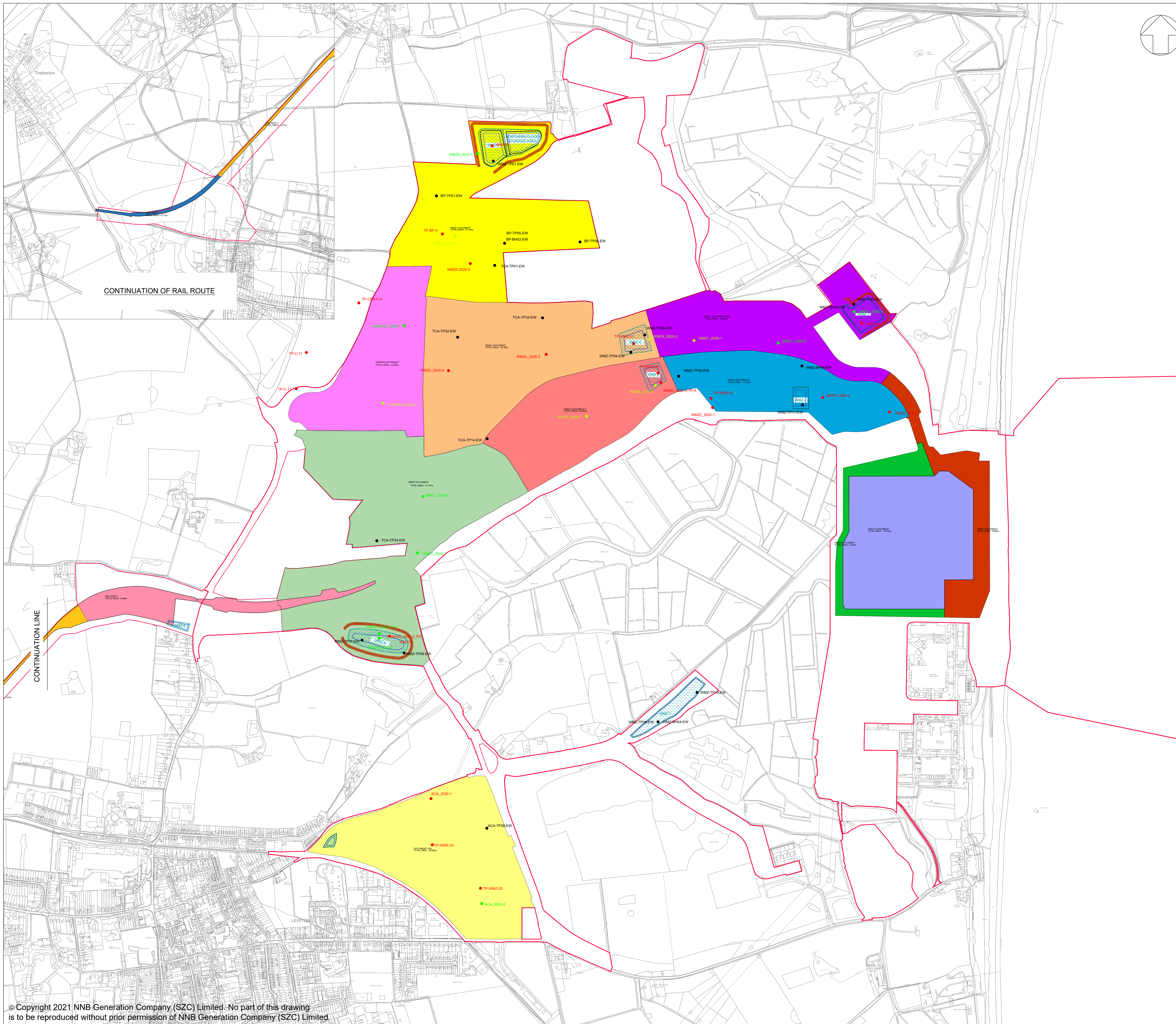
| | | | | | |
|-----------------------------|---------|---------------------------|--------|-----------------|-------|
| Base Inf Coefficient (m/hr) | 0.04680 | Invert Level (m) | 3.050 | Depth (m) | 3.000 |
| Side Inf Coefficient (m/hr) | 0.04680 | Time to half empty (mins) | 928 | Inf Depth (m) | 2.000 |
| Safety Factor | 1.5 | Pit Width (m) | 20.000 | Number Required | 1 |
| Porosity | 1.00 | Pit Length (m) | 30.000 | | |

Results for 30 year +20% CC Critical Storm Duration. Lowest mass balance: 99.89%

| Node Event | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m ³) | Flood (m ³) | Status |
|-------------------|---------|-------------|-----------|-----------|--------------|----------------------------|-------------------------|------------|
| 240 minute winter | 1 | 92 | 5.951 | 1.701 | 25.2 | 1.9238 | 63.4634 | FLOOD |
| 240 minute winter | 2 | 96 | 5.897 | 1.917 | 27.0 | 2.1681 | 43.9896 | FLOOD |
| 240 minute winter | 3 | 104 | 5.930 | 1.880 | 20.6 | 2.1263 | 21.1306 | FLOOD |
| 240 minute winter | 4 | 128 | 5.782 | 2.032 | 42.4 | 2.2980 | 0.0000 | FLOOD RISK |
| 240 minute winter | 5 | 128 | 4.299 | 0.454 | 11.6 | 0.5136 | 0.0000 | SURCHARGED |
| 240 minute winter | 6 | 128 | 4.284 | 0.717 | 53.2 | 0.8112 | 0.0000 | SURCHARGED |
| 240 minute winter | 7 | 128 | 3.938 | 0.638 | 64.0 | 0.7216 | 0.0000 | SURCHARGED |
| 240 minute winter | 8 | 128 | 3.255 | 0.376 | 69.1 | 0.4254 | 0.0000 | SURCHARGED |
| 240 minute winter | 9 | 128 | 3.252 | 0.042 | 4.5 | 0.0475 | 0.0000 | OK |
| 480 minute winter | 10 | 368 | 2.897 | 1.097 | 65.0 | 396.4155 | 0.0000 | SURCHARGED |
| 480 minute winter | 10_OUT | 368 | 2.896 | 1.126 | 20.5 | 1.6115 | 0.0000 | OK |
| 960 minute winter | 11 | 1050 | 4.159 | 1.109 | 20.0 | 666.4952 | 0.0000 | OK |

| Link Event (Upstream Depth) | US Node | Link | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m ³) |
|-----------------------------|---------|--------------|---------|---------------|----------------|----------|----------------------------|
| 240 minute winter | 1 | 1.000 | 2 | 11.0 | 0.624 | 0.767 | 0.7271 |
| 240 minute winter | 2 | 1.001 | 4 | 20.2 | 1.150 | 1.379 | 0.5897 |
| 240 minute winter | 3 | 2.000 | 4 | 13.7 | 0.776 | 0.905 | 0.7271 |
| 240 minute winter | 4 | 1.002 | 6 | 41.9 | 2.380 | 2.865 | 0.4722 |
| 240 minute winter | 5 | 3.000 | 6 | 11.6 | 0.259 | 0.215 | 2.1978 |
| 240 minute winter | 6 | 1.003 | 7 | 53.1 | 1.095 | 1.063 | 2.4497 |
| 240 minute winter | 7 | 1.004 | 8 | 64.0 | 1.309 | 1.203 | 3.4131 |
| 240 minute winter | 8 | 1.005 | 10 | 69.1 | 1.422 | 1.148 | 3.5595 |
| 240 minute winter | 9 | 4.000 | 10 | 4.5 | 0.842 | 0.060 | 0.1575 |
| 480 minute winter | 10 | 1.006 | 10_OUT | 20.5 | 0.687 | 0.162 | 3.0317 |
| 480 minute winter | 10_OUT | Pump | 11 | 20.0 | | | |
| 960 minute winter | 11 | Infiltration | | 6.2 | | | |

ANNEX 2A.2: LOCATION OF GEOTECHNICAL INVESTIGATIONS ON MDS AND INFILTRATION TESTING CONFIDENCE



NOTES:

KEY:

- PROPOSED INFILTRATION & PERMEABILITY TESTS IN UPCOMING TCA & ACA GI
- INFILTRATION TEST_CONFIDENCE CATEGORY 4
- INFILTRATION TEST_CONFIDENCE CATEGORY 3
- INFILTRATION TEST_CONFIDENCE CATEGORY 2
- INFILTRATION TEST_CONFIDENCE CATEGORY 1

NOT PROTECTIVELY MARKED

COPYRIGHT:
 Reproduced from Ordnance Survey map with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationery Office © Crown copyright (2021).
 All Rights reserved. NNB GenCo Licence: 0100060408

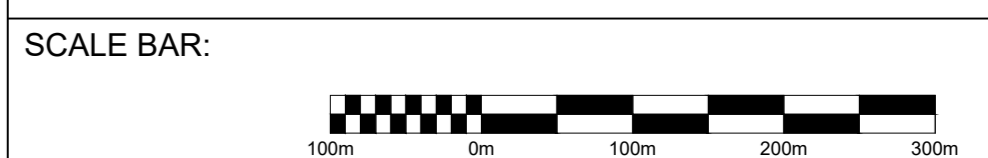


DOCUMENT:
 Annex 2A.2: Location of Geotechnical Investigations on MDS and Infiltration Testing Confidence

DRAWING TITLE:
 SIZEWELL C - GEOTECHNICAL INVESTIGATIONS - LOCATIONS

DRAWING NO:
 SZC-EW0310-ATK-XX-000-XXXXXX-DRW-CIV-000018

DATE: OCT2021 DRAWN: BM SCALE: 1:5000@A0 REV: 01



ANNEX 2A.3: MAIN DEVELOPMENT SITE WATER MANAGEMENT ZONE SUMMARY

CONTENTS

| | | |
|-----|---|----|
| 1 | INTRODUCTION..... | 1 |
| 1.2 | Background | 1 |
| 1.3 | Scope..... | 5 |
| 2 | DESIGN REQUIREMENTS..... | 6 |
| 2.2 | General Parameters | 6 |
| 2.3 | Infiltration rates..... | 8 |
| 2.4 | Water Quality | 10 |
| 2.5 | Discharge Rates..... | 11 |
| 3 | WATER MANAGEMENT ZONES | 11 |
| 3.2 | Catchment 1..... | 12 |
| 3.3 | Catchment 2..... | 14 |
| 3.4 | Catchment 3..... | 16 |
| 3.5 | Catchment 4..... | 17 |
| 3.6 | Catchment 5..... | 19 |
| 3.7 | Catchment 6 & Plaza..... | 21 |
| 3.8 | Ancillary Construction Area (ACA) | 23 |
| 3.9 | West Railway Catchment 3 - Abbey Road | 26 |
| 4 | SUMMARY | 28 |
| | REFERENCES..... | 30 |

TABLES

| | |
|--|----|
| Table 2-1 - Input parameters for MicroDrainage Source Control storage volumes..... | 7 |
| Table 2-2 - FEH 1999 rainfall parameters | 8 |
| Table 3-1 - Water Management Zone 1 - Infiltration Basin Summary | 13 |
| Table 3-2 - Water Management Zone 2 - Infiltration Basin Summary | 15 |
| Table 3-3 - Water Management Zone 3 - Infiltration Basin Summary | 17 |
| Table 3-4 - Water Management Zone 4 - Infiltration Basin Summary | 18 |
| Table 3-5 - Water Management Zone 5 - Infiltration Basin Summary | 20 |

| | |
|--|----|
| Table 3-6 - Water Management Zone 6 - Infiltration Basin Summary | 22 |
| Table 3-7 - ACA East - Infiltration Basin Summary | 24 |
| Table 3-8 - ACA West - Infiltration Basin Summary..... | 25 |
| Table 3-9 - Abbey Road WMZ - Infiltration Basin Summary..... | 27 |
| Table 4-1 - Water Management Zone - Infiltration Basin Summary | 28 |

FIGURES

| | |
|--|----|
| Figure 1-1 - Site plot plan with construction areas | 2 |
| Figure 1-2 - Existing Surface Water Drains | 3 |
| Figure 1-3 - Surface water runoff capture and discharge process..... | 5 |
| Figure 1-4 - TCA Enabling Works surface water drainage catchments..... | 5 |
| Figure 2-1 - Infiltration rates (refer to drawing SZC-EW0320-ATK-XX-000-XXXXXX-DRW-CCD-000001 in Annex A)..... | 9 |
| Figure 3-1 - Catchment 1 proposed drainage..... | 12 |
| Figure 3-2 - Catchment 2 proposed drainage..... | 14 |
| Figure 3-3 - Catchment 3 proposed drainage..... | 16 |
| Figure 3-4 - Catchment 4 proposed drainage..... | 18 |
| Figure 3-5 - Catchment 5 proposed drainage..... | 20 |
| Figure 3-6 - Catchment 6 proposed drainage..... | 22 |
| Figure 3-7 - ACA proposed drainage..... | 24 |
| Figure 3-8 - West Railway Catchment 3 – Abbey Road WMZ..... | 27 |

ANNEXES

| | |
|---------------|----|
| ANNEX A | 31 |
| ANNEX B | 33 |
| ANNEX C | 35 |

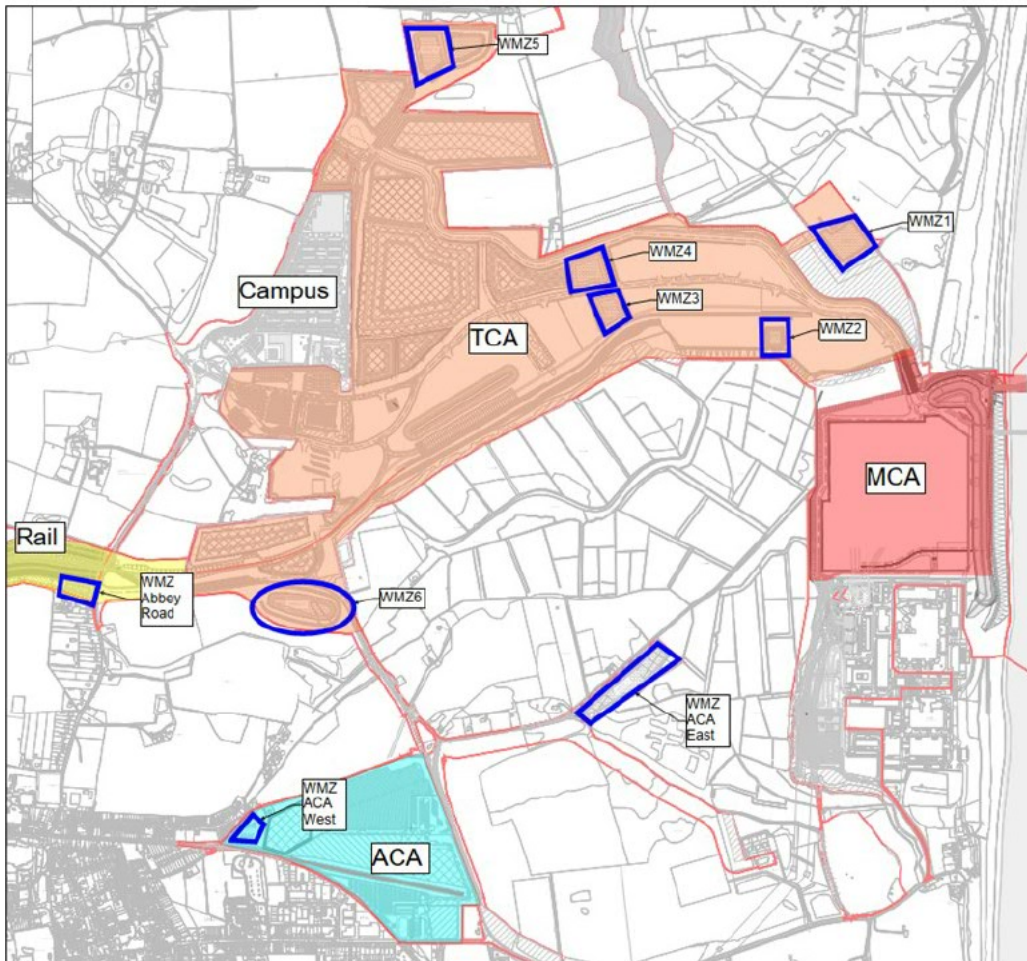
1 INTRODUCTION

- 1.1.1 This document has been prepared to provide further background to the surface water management proposals for Sizewell C (SZC) nuclear power station basic design. The surface water proposals prioritise Sustainable Drainage Systems (SuDS) which are incorporated across the site in the forms of swales, infiltration trenches, permeable pavements and infiltration basins. These have been provisioned for early in the project. This document provides an overview about the Main Development Site water management zone (WMZ) infiltration basins, identifying design parameters and providing assurance that there is adequate storage on site for various storm events throughout the power station construction duration. Infiltration basins are proposed across the site in the Temporary Construction Area (TCA), Ancillary Construction Area (ACA), and the Green Rail route. The ACA is also known as the Land East of Eastlands Industrial Estate (LEEIE). In this document this will be referred to as the ACA.
- 1.1.2 This note provides details of the WMZ infiltration basins for the established site. Temporary surface water control measures such as temporary sediment ponds will be required in areas prior to some of the WMZ infiltration basins are installed. The locations of the temporary surface water controls measures are to comply with the Code of Construction Practice (CoCP) and will be detailed alongside the construction sequencing with the Contractor.
- 1.1.3 The information presented in this report is in accordance with the overarching drainage principles that are documented in the SZC Development Consent Order (DCO) Outline Drainage Strategy at Volume 2, Chapter 2, Appendix 2A of the Environmental Statement [APP-181].

1.2 Background

- 1.2.1 The extent of the SZC Main Development Site (MDS) is set by the red line boundary shown in the Construction Site Plot Plan (CSPP). This incorporates the ACA, TCA, Main Construction Area (MCA), and Railway to the west. These areas are approximately outlined in Figure 1-1. Surface water drainage infrastructure will be required for all areas within the red line boundary and to ensure no surface water, other than at controlled greenfield runoff rates, will runoff the site up to a 1:100 year storm including climate change.

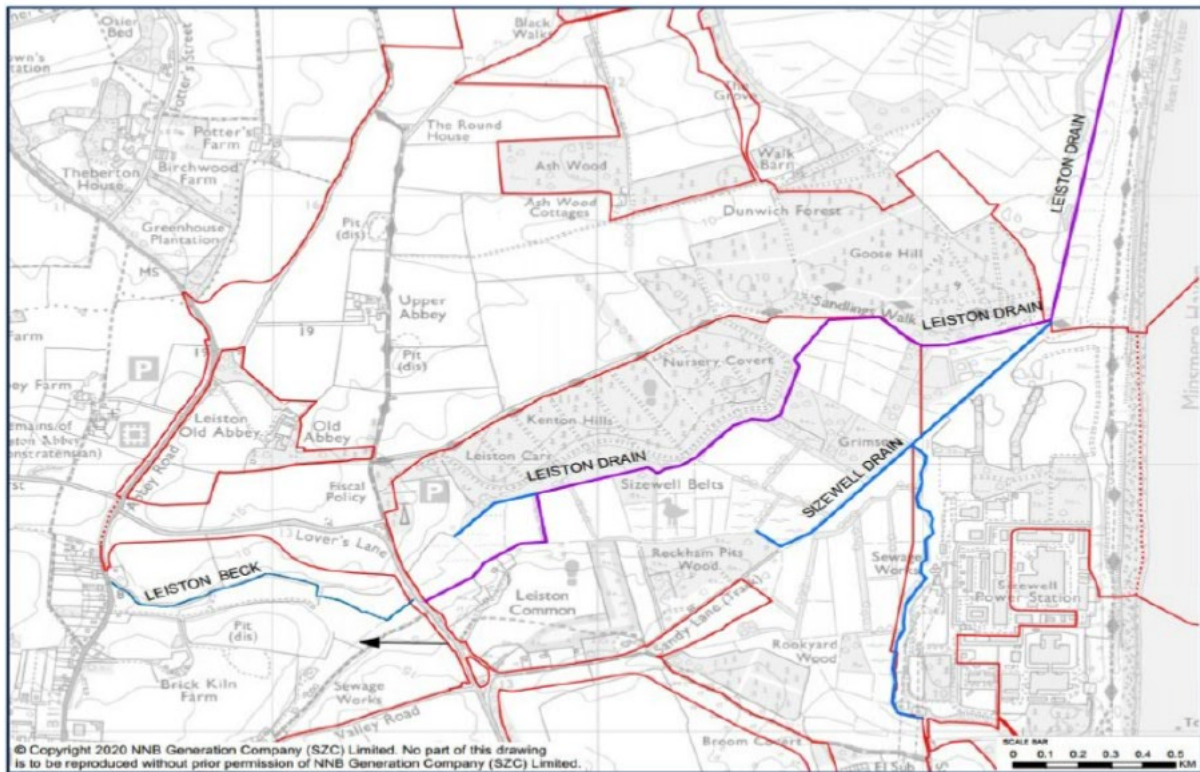
Figure 1-1 - Site plot plan with construction areas



1.2.2 Existing Site

1.2.3 The existing site is largely grassland across the TCA and the ACA. The MCA is also grassland with some ancillary Sizewell B buildings. The land to the south of the TCA is a Site of Special Scientific Interest (SSSI), which contains multiple watercourses, including two formal watercourses: the Leiston Drain and the Sizewell Drain. Surface water on the existing site currently infiltrates to ground and/or enters local watercourses which include the Leiston and Sizewell Drains and other minor tributaries – see Figure 1-2.

Figure 1-2 - Existing Surface Water Drains



1.2.4 Main Development Site Water Management Zones

1.2.5 The surface water drainage design is required to capture all surface water runoff from within the red line boundary, as defined in the Outline Drainage Strategy described in the Development Consent Order (DCO). To ensure that the construction site mimics the existing site surface water management, the runoff will be discharged through infiltration to ground where possible with some outfalls to existing watercourses or to the sea where necessary.

1.2.6 To manage the runoff across the MDS, catchments were identified across the TCA, ACA, MCA and Railway area. The following catchments were defined in the Outline Drainage Strategy:

- TCA – Catchments 1 to 6,
- ACA – Catchment ACA,
- MCA – Catchments 7 to 9,
- Railway

- 1.2.7 The surface water runoff within each catchment is proposed to infiltrate either directly through a permeable surface, or via a Sustainable Drainage System (SuDS) which will include:
- Swales;
 - Infiltrations trenches; and,
 - Infiltration basins (Water Management Zones).
- 1.2.8 Where suitable, the surfaces of the catchments are proposed to be permeable, so surface water will infiltrate to ground in the first instance. Any runoff that does not infiltrate directly will be captured through swales that border each catchment. The swales provide local source control to ensure the management of water returning to the ground to mimic the existing condition. The swales contain an infiltration trench beneath them which will encourage further infiltration, as well as provide additional storage. Any water that does not infiltrate through the infiltration trench into the surrounding ground will be captured by a perforated pipe within the trench, which will convey the flow to a Water Management Zone (WMZ) infiltration basin. This concept is shown in Figure 1-3 below. More frequent storm events will not need to overflow into the WMZ infiltration basins and surface water will be primarily discharged through infiltration at source. In less frequent storm events, the WMZ infiltration basins will be used to attenuate and infiltrate surface water and as such have been sized so they have capacity for a 1:100-year storm event including climate change.
- 1.2.9 Infiltration basins in catchments 1, 2, 3, and 6 have an outlet to nearby watercourses, restricted to greenfield runoff rates, and to be agreed with external stakeholders Suffolk County Council (SCC), Environment Agency (EA) and/or Internal Drainage Board (IDB) where applicable. As an additional backup measure, the WMZ infiltration basins for catchments 1-4 have an allowance for an overflow into a conventional drainage system (spine network) discharging to the combined drainage outfall (CDO) which discharges to the sea. Hydraulic modelling shows this network is not required; this spine network has only been included at this stage as a precaution.

Figure 1-3 - Surface water runoff capture and discharge process

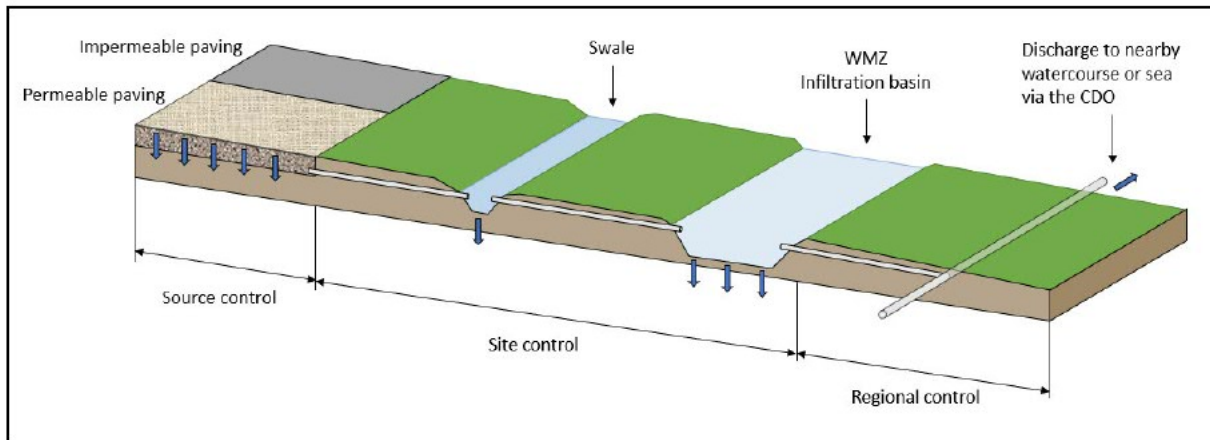
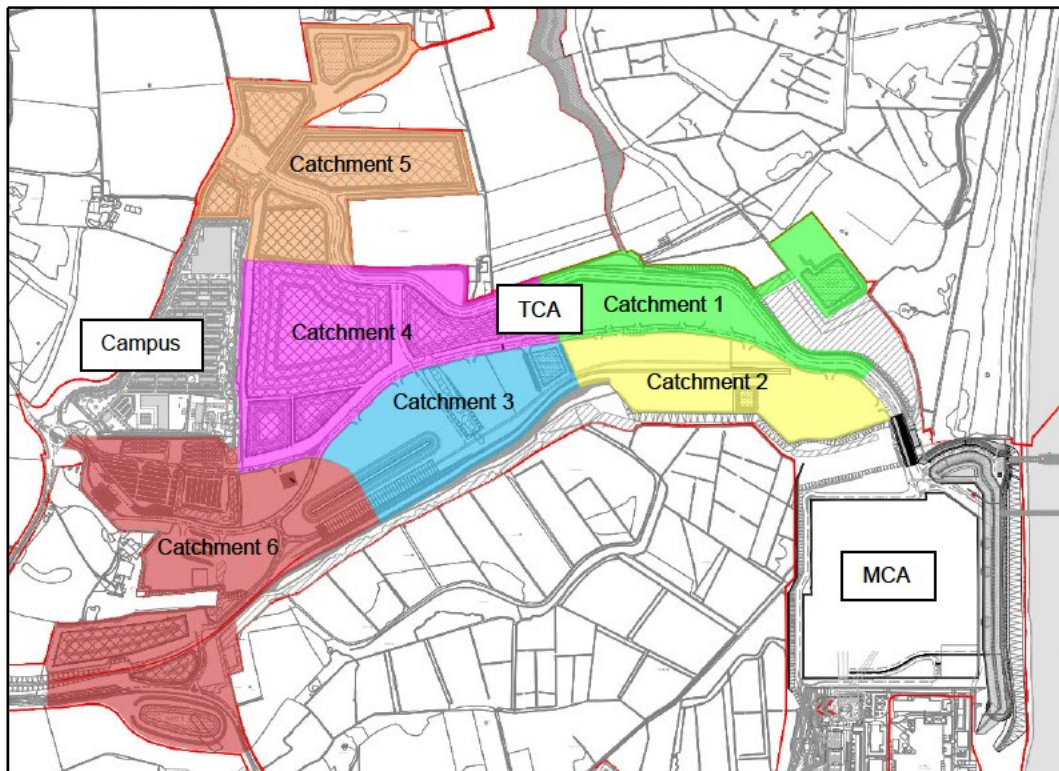


Figure 1-4 - TCA Enabling Works surface water drainage catchments



1.3 Scope

1.3.1 This document provides a summary of infiltration basins that are required to manage surface water runoff during the enabling works, in line with the Enabling Works surface water drainage strategy. The document presents the hydraulic assessment of the WMZs across the TCA, ACA and Railway area.

- 1.3.2 This document does not address the design of other minor SuDS features such as swales, infiltration trenches, and permeable paving. These features will be further detailed in future proposals, in conjunction with Contractor involvement.

2 DESIGN REQUIREMENTS

- 2.1.1 In accordance with the Outline Drainage Strategy, all infiltration basins within the MDS are designed to cater for a 100-year flood event plus a 20% allowance for climate change. This section summarises the design parameters used in the hydraulic assessment to determine the size of the WMZ infiltration basins. The volume assessment was conducted using MicroDrainage Source Control using the parameters and assumptions in the following sections. By sizing the infiltration basins using Source Control and not considering additional storage in the upstream network, the storage volumes calculated are conservative and will be able to be reduced in the next design phase.

2.2 General Parameters

- 2.2.1 The parameters in Table 2-1 were used to determine approximate storage volumes required for critical storm events for 100-year return period for a storm duration of up to 24 hours, including a 20% allowance for climate change in accordance with the Outline Drainage Strategy.

Table 2-1 - Input parameters for MicroDrainage Source Control storage volumes

| | Parameter | Notes |
|--------------------------------------|---|--|
| Rainfall-Runoff method | Flood Studies Report (FSR), Flood Estimation Handbook (FEH) 1999 and 2013 | Sensitivity check using FEH 1999 and 2013 |
| Return Period (years) | 100 | As per DCO Outline Drainage Strategy [1] |
| Storm duration (minutes) | 15 – 1440 | As per DCO Outline Drainage Strategy [1] |
| Climate Change (%) | 20 | As per DCO Outline Drainage Strategy [1] and EA guidance [2] |
| Volumetric Runoff Coefficient | Varies per catchment | Wallingford Procedure Vol 1 Equation 7.3 |
| Freeboard (mm) | 300 | CIRIA C753 – The SuDS Manual |
| Factor of Safety | 1.5 | [3] |

[1] Environmental Statement – 6.3 Volume 2 Main Development Site, Chapter 2 Description of the Permanent Development, Appendix 2A Outline Drainage Strategy (EN010012-001802-SZC_Bk6_ES_V2_Ch2_Appx2A)

[2] Environment Agency – Flood risk assessment: climate change allowances - Table 2: peak rainfall intensity allowance in small catchments (less than 5 km²) or urban drainage catchments (based on a 1961 to 1990 baseline)

[3] Table 25.2 in the CIRIA SuDS manual provides guidance on which Factor of Safety (FoS) to use given a range of areas and consequences of failure. Given this area is a temporary construction site for 10 years with infiltration basins designed for a 1:100 year return period, assuming only infiltration through the sides of the basin, and the selected infiltration rates are the worst case rates from a series of GI campaigns, it is proposed to use a FoS of 1.5 as opposed to 5 or 10. Use of a FoS of 5 or 10 would require even greater oversized infiltration basins which is not deemed necessary, especially where the basins have an overflow to the spine network.

2.2.2 All three rainfall-runoff methods were used to undertake sensitivity checks on the design volumes. It was noted that the FEH 2013 rainfall-runoff method generally provided more conservative values for greater return periods in comparison to FEH 1999 and FSR.

2.2.3 As the Sizewell development site is extensive, two FEH data sets were necessary to undertake the hydraulic modelling and are shown in Table 2-2 below. The rainfall data set used in the ACA drainage modelling was 'GB 647050, 262950', whereas all other areas used data set 'GB 647450, 264900'.

Table 2-2 - FEH 1999 rainfall parameters

| FEH Site | C (1km) | D1 (1km) | D2 (1km) | D3 (1km) | E (1km) | F (1km) |
|---------------------|---------|----------|----------|----------|---------|---------|
| GB 647050 262950 | -0.019 | 0.298 | 0.279 | 0.207 | 0.309 | 2.506 |
| GB 647450 264900 | -0.02 | 0.299 | 0.272 | 0.215 | 0.311 | 2.506 |

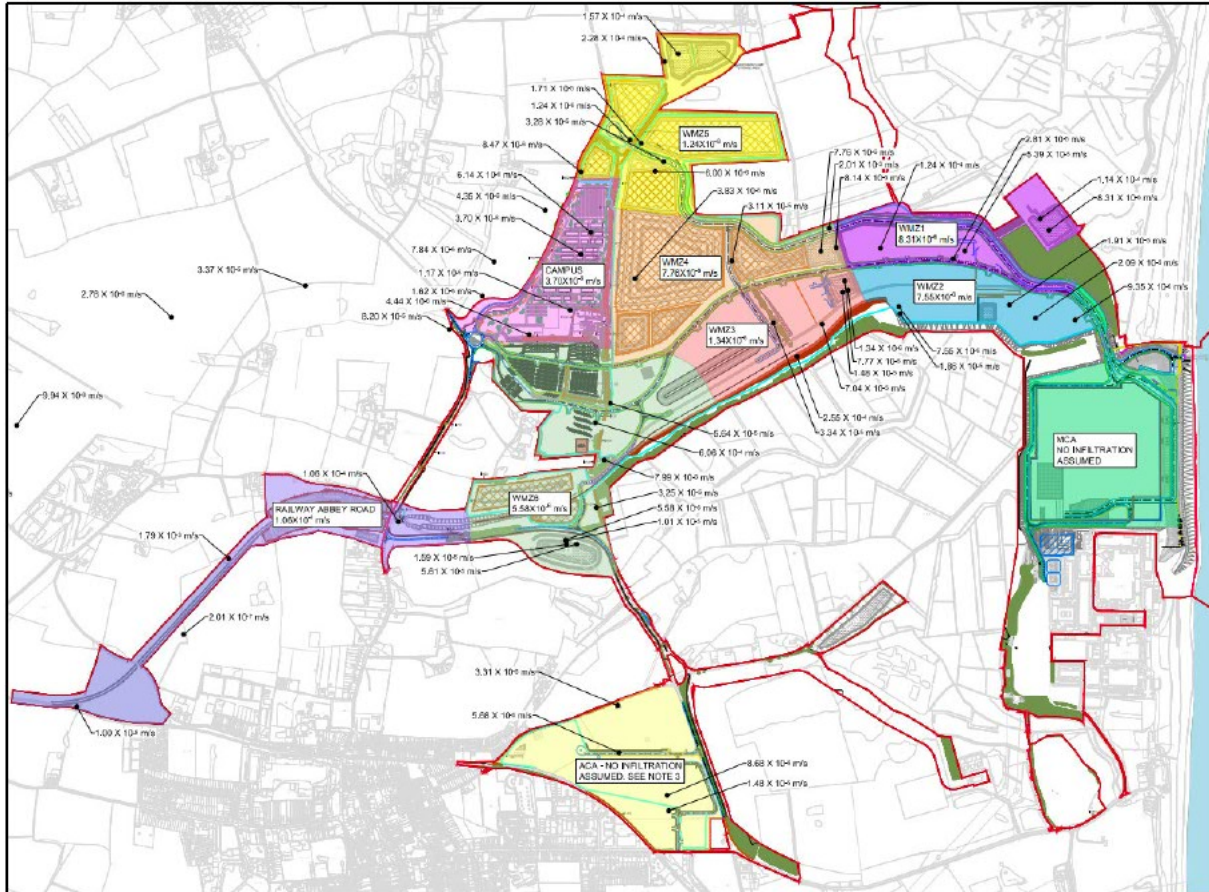
2.2.4 Using FSR, Sizewell, Suffolk was used as the location with M5-60 and 'r' ratio of 18.2 mm and 0.4 taken respectively. Storage estimates using all rainfall-runoff methods are included in this document.

2.2.5 Attenuation structures are modelled in Source Control to have side slopes of 1:3. The infiltration rate has been applied to the side walls of the attenuation structure only. No infiltration is applied to the base of the structure to account for any loss of efficiency over the design life.

2.3 Infiltration rates

2.3.1 Several ground investigation (GI) campaigns have been undertaken across the site to determine the infiltration potential across various catchment areas. The figure below summarises the range of infiltration rates recorded in four separate campaigns in 2014, 2015, 2017 and 2020. The lowest (worst-case) rate for each catchment has been used at this design stage for surface water calculations, specifically to calculate the storage volume required in infiltration basins. Further GI campaigns are planned, and results will be included during the next design stage. The geology across the site is largely sandy which provides confidence that the infiltration rates used in the surface water design are conservative.

Figure 2-1 - Infiltration rates (refer to drawing SZC-EW0320-ATK-XX-000-XXXXXX-DRW-CCD-000001 in Annex A)



2.3.2 In order to calculate the contributing areas to each of the water management zones, they have been assessed based on their land use with their appropriate percentage impermeable (PIMP) value for each area type:

- Roofed buildings: 100%
- Asphalt roads/pavements: 90%
- Gravel areas: 50%
- Road verges: 50%
- Stockpile area: 30%
- Grassed areas: 30%

2.3.3 Using the above PIMP values and known areas within each catchment, a source control model has been run to provide assurance that the design storage is able to be catered for within the WMZ infiltration basins.

2.4 Water Quality

2.4.1 The purpose of this document is to provide clarity around sizing of WMZ infiltration basins, however quality of surface water runoff from the site is also important and therefore is summarised in this section. Surface water discharges to, in order of preference, the ground, nearby watercourses, or the sea.

2.4.2 Discharges to nearby watercourses and the sea will be controlled through permit applications and ongoing monitoring to ensure the quality of the water meets the Environment Agency's (EA) criteria prior to discharge.

2.4.3 There are possible contaminants that need to be considered in surface water treatment design across the site. These are divided into:

- Sediment runoff
- Chemical spills, including concrete batching plant, waste consolidation centre and fuel farm.

2.4.4 Treatment of sediment runoff will be managed through the implementation of SuDS features on site, including:

- Swales
- Infiltration trenches
- Hay bales (around stockpiles)
- Silt fences (where suitable)
- WMZ infiltration basins

2.4.5 The positioning and location of these features will be further defined in the following design phases and will follow overarching principles in the CIRIA SuDS Manual (C753) as well as the Outline Drainage Strategy document.

2.4.6 Treatment of chemical spills will be required at source, by specific treatment systems. For example, around the fuel storage area the pavement will be impermeable to prevent fuel seeping into the groundwater. Any potential oil spills will be captured and treated via an oil interceptor sized and designed suitably for the potentially contaminated spill volumes.

2.4.7 The assessment of water quality risk management for each WMZ will be provided through the simple index approach as outlined in Section 26.7.1 of the CIRIA SuDS Manual (C753). This method will ultimately determine

what SuDS measures are required to treat different types of developments across the MDS. The steps are set out as:

Step 1 – Allocate suitable pollution hazard indices for the proposed land use

Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index

Step 3 – Where the discharge is to protected surface waters or groundwater, consider the need for a more precautionary approach

2.4.8 Proposed SuDS features within each catchment will be used to determine a total pollution mitigation index (Table 26.3 CIRIA SuDS Manual). Where additional SuDS features are not considered appropriate at this design stage, proprietary, non-SuDS treatment may be proposed. This assessment will be carried out for each WMZ in the next design phase.

2.5 Discharge Rates

2.5.1 Proposed discharge rates from infiltration basins to nearby watercourses have been defined following the Environment Agency guidance (Report SC030219 – Rainfall runoff management for developments). A Q_{bar} (peak rate of flow from a catchment for the mean annual flood - return period of approximately 1:2.3 years) greenfield runoff rate has been calculated for each catchment using UK SuDS guidance. In some cases (the ACA), this is the proposed restricting flow rate. Across the TCA however, it is noted that Q_{bar} is extremely small, and therefore the Environment Agency guidance is followed, whereby if Q_{bar} is less than 1 l/s/ha, the latter can be proposed as a limiting discharge rate. Where an outfall is proposed from an infiltration basin to nearby watercourses in the TCA and rail catchments, this is the proposed approach.

2.5.2 It is important that the SSSI is neither overwhelmed with additional surface water runoff, nor starved of surface water during the construction and operation of SZC. Maintaining the status quo of how the existing site drains is required to ensure the SSSI retains its current ecological and hydrological features. This has been reinforced by conversations with the EA and other stakeholders and is represented in both the groundwater/surface water modelling and flood risk modelling.

3 WATER MANAGEMENT ZONES

3.1.1 Generally, the surfaces of the catchments are largely permeable, so surface water will infiltrate to ground in the first instance. Any runoff that does not infiltrate directly or captured through swales with infiltration trenches will be captured by a perforated pipe within the trench, that will convey the flow to a Water Management Zone (WMZ) infiltration basin. The WMZs are

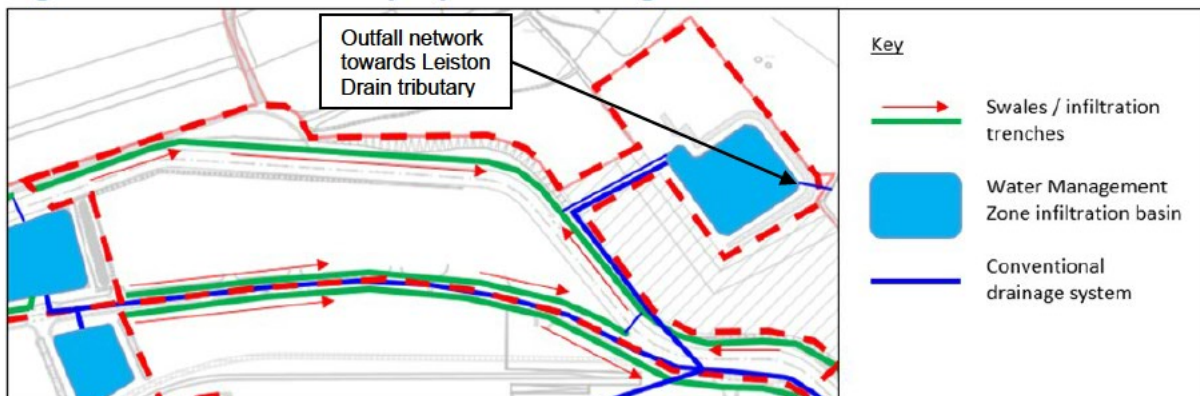
designed for 100-year return period rainfall events including climate change. In extreme rainfall events the WMZs for catchments 1-4 will overflow into a conventional drainage system (spine network) discharging to the CDO which outflows to the sea.

3.2 Catchment 1

3.2.1 Catchment 1 is located in the north eastern area of proposed TCA. This catchment houses plant and workshops such as joinery/metal workshops, a formwork factory and slurry treatment plants. It also houses the fire and rescue centre, Emergency response facility and fuel farm. The catchment encompasses sections of the site access road to the south, haul roads to north and east, and one of the Contractor's working compounds. Catchment 1 has a total area of 19.4 ha and will drain via combined swale and infiltration trenches with perforated pipes. Two main runs are proposed, north and south of the catchment, both running from the west to WMZ1 which is proposed in the east. An outfall from WMZ1 is proposed to discharge surface water to the Leiston Drain tributary east of WMZ1, at 19.4 l/s (equivalent to 1 l/s/ha). An overflow connection is also proposed from WMZ1 to the Construction Drainage Outfall (CDO).

3.2.2 Due to the nature of the use for this catchment and the risk of potential contamination, most of this area will require control and treatment of surface water runoff prior to discharge. For example, the fuel farm will be concreted, and other areas in the Contractor's compound will be hard standing if there is potential for chemical spills. A 90% PIMP factor is assumed for this catchment. The area of hardstanding may decrease in the future, however for this stage of design, a more conservative value is considered more suitable to space proof the infiltration basin.

Figure 3-1 - Catchment 1 proposed drainage



3.2.3 WMZ1

- 3.2.4 Alongside the general parameters stated in Section 2.2, the parameters in Table 3-1 were used to determine a conservative estimate for the required storage volume for WMZ1. The volume allocated for WMZ1 in the Civil 3D model exceeds this.
- 3.2.5 WMZ1 is proposed at a low point east of the TCA where the ground levels range between 2 and 3 mAOD. The groundwater contours from Winter 2018 included in the Environmental Statement showed the groundwater level is approximately 0.9 mAOD at the location of WMZ1 (see Annex B). Given the proximity to the groundwater table, infiltration from the basin is not considered feasible and the basin is assumed to be lined.
- 3.2.6 A more detailed figure showing the proposed arrangement of the WMZ1 basin is provided in Annex C.

Table 3-1 - Water Management Zone 1 - Infiltration Basin Summary

| Design Input | | Comment |
|---|------------------------------|---|
| Total catchment area | 19.430 ha | |
| Percentage of runoff | 90% | To be revised as design progresses |
| Volumetric runoff coefficient (Cv) | 0.684, 0.746 | Summer, winter respectively |
| Infiltration rate | 0 m/s | |
| Overflow allowance to nearby watercourse | 19.43 l/s | Assumed at 1 l/s/ha [1] |
| Overflow to spine network | Yes | Allowance for 200 l/s, not included in model |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 0.900 mAOD | Based on Environment Statement groundwater contours (Annex B) |
| MicroDrainage Source Control Summary | | |
| FSR | 10770.1 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 13946.6 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 14690.4 m³ | 1:100 year return period, 1440 winter storm |
| Civil 3D Model Summary | | |
| Invert level of basin | 1.200 mAOD | |
| Bottom of basin area | 10579.2 m ² | |

| | | |
|---|------------------------|-----------------------------|
| Top of basin area (excluding freeboard) | 12618.8 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 17328 m ³ | (excluding 300mm freeboard) |

[1] Based on Environment Agency guidance - Rainfall runoff management for developments ref. SC030219. Limiting discharge rates for sites should be set to Qbar or 1 l/s/ha, whichever is greater.

3.3 Catchment 2

3.3.1 Catchment 2 is south of catchment 1 and encompasses sections of the site access and haul roads at the point they converge and then cross the SSSI. It will contain Contractor compounds, including concrete batching plant, the railhead, a waste consolidation area, and several laydown areas. The catchment has a total area of approximately 17.4 ha. The majority of this area will be hardstanding and therefore a 90% PIMP factor has been assumed. The area of hardstanding may decrease in the future, however for this stage of design, a more conservative value is considered more suitable to space proof the infiltration basin.

3.3.2 The drainage in this catchment includes road edge swales to the south of the main access road collecting road runoff and runoff from the compound area north of the railhead. A separate network made up of filter drains is proposed at the compound perimeter to cater for the runoff immediately south of the railhead. The network discharges into WMZ2 to the south. An outfall from WMZ2 is proposed to discharge surface water to the Leiston Drain south of WMZ2, at 17.4 l/s (equivalent to 1 l/s/ha). An overflow connection is also proposed from WMZ2 to the Construction Drainage Outfall (CDO) via a spine network as a precaution.

Figure 3-2 - Catchment 2 proposed drainage



3.3.3 WMZ2

3.3.4 The parameters in Table 3-2 were used to determine a conservative estimate of the attenuation volume required to serve TCA Catchment 2.

Table 3-2 - Water Management Zone 2 - Infiltration Basin Summary

| Design Input | | Comment |
|--|--------------|---|
| Total catchment area | 17.370 ha | |
| Percentage of runoff | 90% | To be revised as design progresses |
| Volumetric runoff coefficient (Cv) | 0.684, 0.746 | Summer, winter respectively |
| Infiltration rate | 7.55E-06 m/s | |
| Overflow allowance to nearby watercourse | 17.37 l/s | Assumed at 1 l/s/ha [1] |
| Overflow to spine network | Yes | Allowance for 200 l/s, not included in model |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 0.800 mAOD | Based on Environment Statement groundwater contours (Annex B) |

MicroDrainage Source Control Summary

| | | |
|----------|------------------------------|---|
| FSR | 9211.2 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 12005.4 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 12663.5 m³ | 1:100 year return period, 1440 winter storm |

Civil 3D Model Summary

| | | |
|---|------------------------------|-----------------------------|
| Invert level of basin | 3.200 mAOD | |
| Bottom of basin area | 3290.1 m ² | |
| Top of basin area (excluding freeboard) | 6274.5 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 17694.5 m³ | (excluding 300mm freeboard) |

[1] Based on Environment Agency guidance - Rainfall runoff management for developments ref. SC030219. Limiting discharge rates for sites should be set to Qbar or 1 l/s/ha, whichever is greater.

3.4 Catchment 3

3.4.1 Catchment 3 is to the west of catchment 2 and is enclosed by roads on three sides and the rail to the south. It encompasses part of the combined site access road, a section of the railway and two Contractor's compounds. The catchment has a total area of approximately 21.0 ha. A 90% percentage of impermeable area has been allowed for in these areas conservatively, should the use of the Contractor compounds require hardstanding surfaces. This will likely be reduced in the future. A 50% PIMP has been applied to the railway sections.

3.4.2 The runoff is divided to drain into the road drainage swales proposed along the roads forming the perimeter drainage. A separate network has been designed to cater for the runoff from the unloading area platform and railway drainage. The perimeter drainage discharges to WMZ3 to the east of the catchment. An outfall from WMZ2 is proposed to discharge surface water to the Leiston Drain south of WMZ3, at 21.0 l/s (equivalent to 1 l/s/ha). An overflow connection is also proposed from WMZ3 to the Construction Drainage Outfall (CDO) via a spine network.

Figure 3-3 - Catchment 3 proposed drainage



3.4.3 WMZ3

3.4.4 Table 3-3 summarises the parameters used to determine a conservative estimate of the attenuation volume required and the volume space-protected for WMZ3.

3.4.5 A more detailed figure showing the proposed arrangement of the WMZ3 basin is provided in Annex C.

Table 3-3 - Water Management Zone 3 - Infiltration Basin Summary

| Design Input | | Comment |
|---|------------------------------|---|
| Total catchment area | 20.960 ha | |
| Percentage of runoff | 90% | |
| Volumetric runoff coefficient (Cv) | 0.684, 0.746 | Summer, winter respectively |
| Infiltration rate | 1.34E-06 m/s | |
| Overflow allowance to nearby watercourse | 20.96 l/s | Assumed at 1 l/s/ha [1] |
| Overflow to spine network | Yes | Allowance for 200 l/s, not included in model |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 1.200 mAOD | Based on Environment Statement groundwater contours (Annex B) |
| MicroDrainage Source Control Summary | | |
| FSR | 11458.8 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 14887.7 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 15685.8 m³ | 1:100 year return period, 1440 winter storm |
| Civil 3D Model Summary | | |
| Invert level of basin | 5.000 mAOD | |
| Bottom of basin area | 3346.8 m ² | |
| Top of basin area (excluding freeboard) | 7162.9 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 17341.0 m³ | (excluding 300mm freeboard) |

[1] Based on Environment Agency guidance - Rainfall runoff management for developments ref. SC030219. Limiting discharge rates for sites should be set to Qbar or 1 l/s/ha, whichever is greater.

3.5 Catchment 4

3.5.1 Catchment 4 is to the west of catchment 1. It encompasses part of the access and haul road but is predominantly material storage and stockpile area. The catchment has a total area of approximately 33.3 ha. This results

in a conservative percentage of impermeable area (PIMP) for the catchment to be 50%. As stockpiles are assigned a 30% PIMP, this figure may be reduced in the future, but for this design phase is considered conservative.

- 3.5.2 Perimeter road swales have been proposed along the roads to drain the runoff from the catchment. Two such networks, one from the north and the other from the south, discharge to WMZ4 located to the east of the catchment. An overflow connection is also proposed from WMZ4 to the Construction Drainage Outfall (CDO) via a spine network as a precaution.
- 3.5.3 A more detailed figure showing the proposed arrangement of the WMZ4 basin is provided in Annex C.

Figure 3-4 - Catchment 4 proposed drainage



3.5.4 **WMZ4**

3.5.5 Table 3-4 summarises the parameters used to determine a conservative estimate of the attenuation volume required and the volume space-proofed for WMZ4.

Table 3-4 - Water Management Zone 4 - Infiltration Basin Summary

| Design Input | | Comment |
|------------------------------------|--------------|-----------------------------|
| Total catchment area | 33.320 ha | |
| Percentage of runoff | 50% | |
| Volumetric runoff coefficient (Cv) | 0.568, 0.680 | Summer, winter respectively |
| Infiltration rate | 7.76E-06 m/s | |

| | | |
|--|------------|---|
| Overflow allowance to nearby watercourse | No | |
| Overflow to spine network | Yes | Allowance for 200 l/s, not included in model |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 1.200 mAOD | Based on Environment Statement groundwater contours (Annex B) |

MicroDrainage Source Control Summary

| | | |
|----------|------------------------------|---|
| FSR | 10080.8 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 12795.4 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 13422.3 m³ | 1:100 year return period, 1440 winter storm |

Civil 3D Model Summary

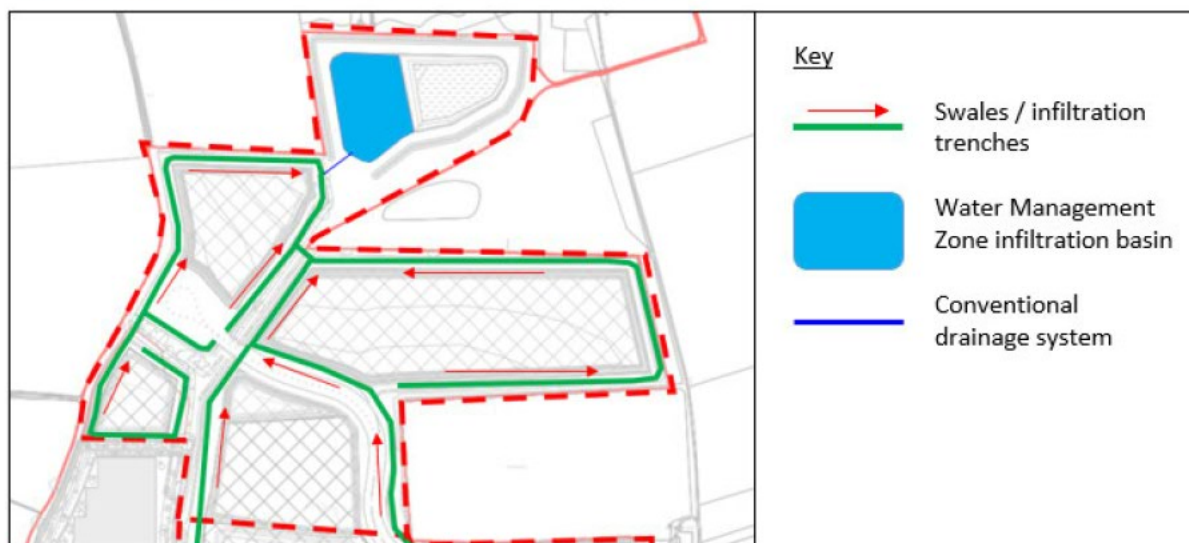
| | | |
|---|------------------------------|-----------------------------|
| Invert level of basin | 5.200 mAOD | |
| Bottom of basin area | 4916.6 m ² | |
| Top of basin area (excluding freeboard) | 9759.7 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 25688.8 m³ | (excluding 300mm freeboard) |

3.6 Catchment 5

3.6.1 Catchment 5 is to be north of catchment 4. It encompasses part of the haul road and is predominantly made up of proposed borrow pits and stockpile areas. The catchment has a total area of approximately 31.2 ha. A 50% PIMP factor has been applied to this area. As with catchment 4, this may be reduced in the future.

3.6.2 Two drainage networks along the site boundary have been designed as perimeter swales/infiltration trenches with perforated pipes, as well as a network surrounding the storage area. These networks discharge to WMZ5 located to the north of the catchment. No outfalls are proposed from WMZ5 at this stage.

Figure 3-5 - Catchment 5 proposed drainage



3.6.3 **WMZ5**

3.6.4 Table 3-5 summarises the parameters used to determine a conservative estimate of the attenuation volume required and the volume space-protected for WMZ5.

Table 3-5 - Water Management Zone 5 - Infiltration Basin Summary

| Design Input | | Comment |
|---|------------------------|---|
| Total catchment area | 31.195 ha | |
| Percentage of runoff | 50% | |
| Volumetric runoff coefficient (Cv) | 0.568, 0.680 | Summer, winter respectively |
| Infiltration rate | 1.24E-06 m/s | |
| Overflow allowance to nearby watercourse | No | |
| Overflow to spine network | No | |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 1.400 mAOD | Based on Environment Statement groundwater contours (Annex B) |
| MicroDrainage Source Control Summary | | |
| FSR | 9715.2 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 12296.3 m ³ | 1:100 year return period, 1440 winter storm |

| | | |
|----------|------------------------|---|
| FEH 2013 | 12891.1 m ³ | 1:100 year return period, 1440 winter storm |
|----------|------------------------|---|

Civil 3D Model Summary

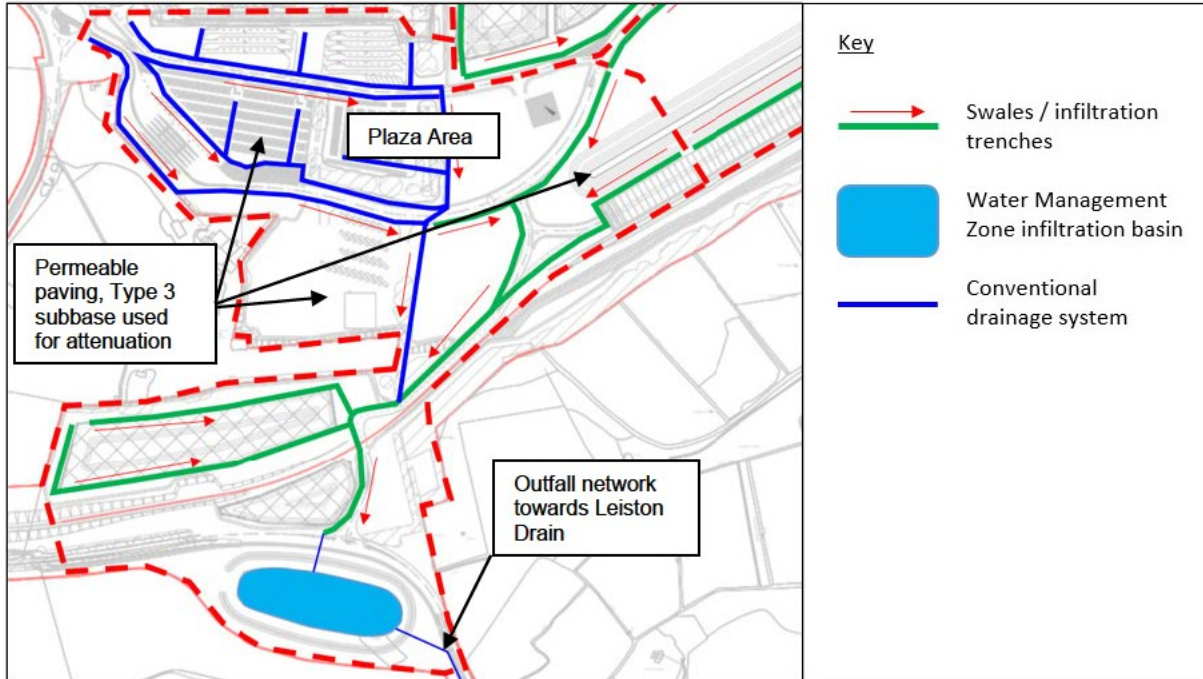
| | | |
|---|------------------------------|-----------------------------|
| Invert level of basin | 6.000 mAOD | |
| Bottom of basin area | 7658.1 m ² | |
| Top of basin area (excluding freeboard) | 9615.7 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 17223.8 m³ | (excluding 300mm freeboard) |

3.7 Catchment 6 & Plaza

3.7.1 Catchment 6 is located to the south-west of catchment 3 and encompasses site access roads, part of the railway, numerous site facilities, including rail and freight security buildings, vehicle inspection cabins, and the main TCA site offices. Catchment 6 also encompasses a sewage treatment plant, potable water storage facility and the Plaza area. The catchment has a total area of approximately 47.8 ha. A 58% PIMP has been applied to this catchment to account for stockpiles, soft landscaping and where TruckPave is proposed as hardstanding.

3.7.2 The rail drainage consists of filter drains adjacent to the track, cut off drains at the top of the cutting, and toe ditches at the bottom of the embankment. The Plaza drainage consists of filter drains along the road verges. Perimeter swales are proposed around the storage areas and adjacent to the access roads. All drainage networks discharge to WMZ6 located to the south of the catchment. An overflow is proposed to discharge runoff to the Leiston Drain near Lover's Lane.

Figure 3-6 - Catchment 6 proposed drainage



3.7.3 **WMZ6**

3.7.4 Table 3-6 summarises the parameters used to determine a conservative estimate of the attenuation volume required and the volume space-protected for WMZ6.

Table 3-6 - Water Management Zone 6 - Infiltration Basin Summary

| Design Input | | Comment |
|--|--------------|---|
| Total catchment area | 47.770 ha | |
| Percentage of runoff | 58% | |
| Volumetric runoff coefficient (Cv) | 0.604, 0.701 | Summer, winter respectively |
| Infiltration rate | 5.58E-06 m/s | |
| Overflow allowance to nearby watercourse | 47.77 l/s | Assumed at 1 l/s/ha [1] |
| Overflow to spine network | No | |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 2.100 mAOD | Based on Environment Statement groundwater contours (Annex B) |

MicroDrainage Source Control Summary

| | | |
|----------|------------------------------|---|
| FSR | 14418.3 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 19117.2 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 20216.7 m³ | 1:100 year return period, 1440 winter storm |

Civil 3D Model Summary

| | | |
|---|------------------------------|-----------------------------|
| Invert level of basin | 8.000 mAOD | |
| Bottom of basin area | 7165.8 m ² | |
| Top of basin area (excluding freeboard) | 11287.5 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 19376.0 m³ | (excluding 300mm freeboard) |

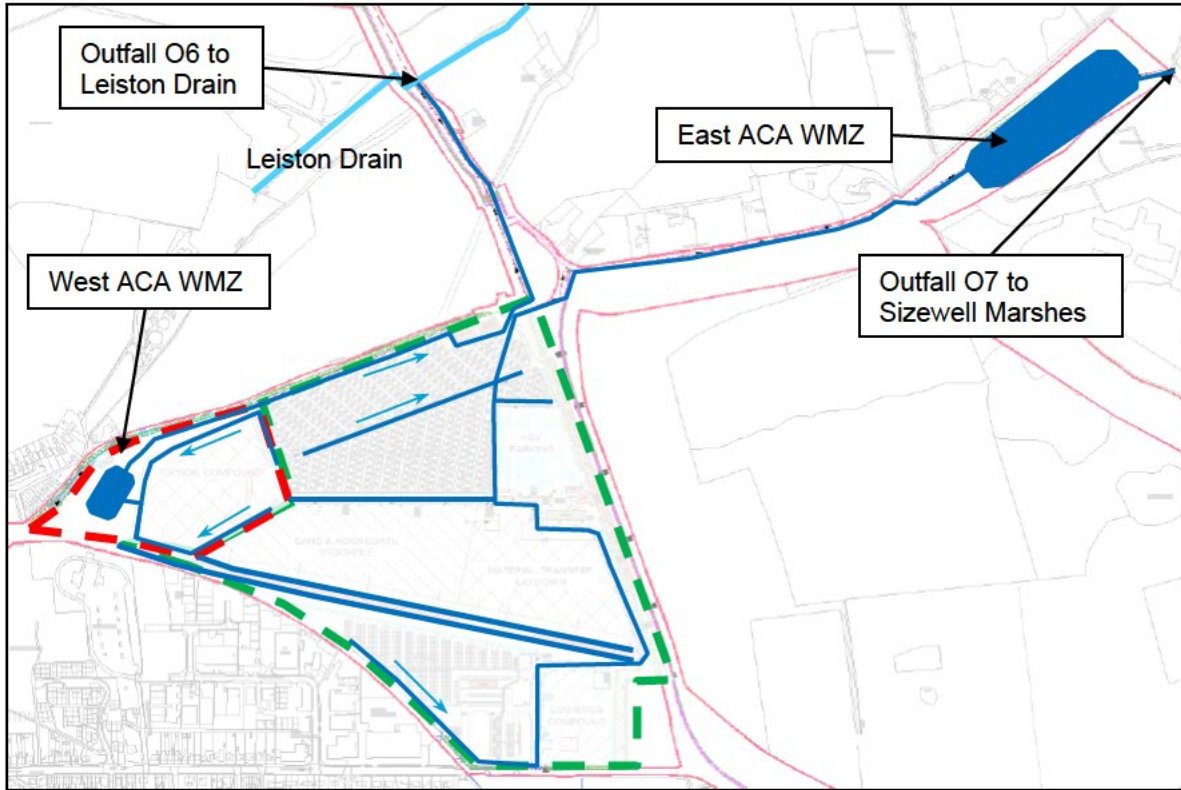
[1] Based on Environment Agency guidance - Rainfall runoff management for developments ref. SC030219. Limiting discharge rates for sites should be set to Q_{bar} or 1 l/s/ha, whichever is greater.

3.8 Ancillary Construction Area (ACA)

3.8.1 The ACA is isolated from the TCA and MCA, and therefore has an independent surface water drainage network to that serving the main construction site. The ACA has an area of approximately 29.7 ha and encompasses caravan pitches, HGV parking, topsoil compound, sand and aggregate stockpile, material transfer laydown, park and ride and logistics compound. No infiltration is assumed within the ACA as per the DCO Outline Drainage Strategy, and runoff will be collected by a variety of features including swales, permeable paving with filter drains and conventional drainage elements.

3.8.2 Two water management zone attenuation features are proposed to store runoff prior to discharge. Runoff from the topsoil compound area and the area west of this compound (dashed red line in Figure 3-7) will be captured in swales and attenuated in the West ACA WMZ, before discharging to the Leiston Drain near Lover's Lane. Surface water runoff from all other areas (dashed green line in Figure 3-7) within the ACA will be conveyed to the East ACA WMZ, before discharging to the Sizewell Marshes. The outflows will be limited to greenfield runoff rates (Q_{bar}).

Figure 3-7 - ACA proposed drainage



3.8.3 **East ACA WMZ**

3.8.4 The drainage strategy within the ACA has been modified since Basic Design following agreement with the Environment Agency and Suffolk County Council to allow more runoff to be attenuated in the East WMZ and discharge to the Sizewell Marshes. Therefore, the area currently designated for the East WMZ in the construction site plot plan is being increased to meet the required volume calculated in Table 3-7.

3.8.5 The required attenuation volume for the East ACA WMZ is conservatively estimated as 21700 m³. Further work will be undertaken during Detailed Design to determine the actual volume required, allowing for storage in the pipe network and infiltration within the WMZ.

Table 3-7 - ACA East - Infiltration Basin Summary

| Design Input | | Comment |
|------------------------------------|--------------|-----------------------------|
| Total catchment area | 25.222 ha | |
| Percentage of runoff | 100% | |
| Volumetric runoff coefficient (Cv) | 0.761, 0.817 | Summer, winter respectively |
| Infiltration rate | 0 m/s | |

| | | |
|--|------------|---|
| Overflow allowance to nearby watercourse | 59.87 l/s | Q_{bar} |
| Overflow to spine network | No | |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 1.000 mAOD | Based on Environment Statement groundwater contours (Annex B) |

MicroDrainage Source Control Summary

| | | |
|----------|------------------------------|---|
| FSR | 15381.1 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 20579.7 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 21641.3 m³ | 1:100 year return period, 1440 winter storm |

Civil 3D Model Summary

| | | |
|-----------------------|----------------------------|-----------------------------|
| Invert level of basin | 2.450 mAOD | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 22000 m³ | (excluding 300mm freeboard) |

3.8.6 West ACA WMZ

3.8.7 As stated above, the ACA drainage strategy is under development and the required attenuation volume for the West ACA WMZ is conservatively estimated as 3850 m³. The current CSPP and Civil3D model includes a significantly smaller volume based on the previous ACA drainage strategy. Further modelling will be undertaken during Detailed Design to verify the size of the attenuation basin, including allowance for storage in the pipe network. Following this, the CSPP and Civil3D model will be updated accordingly.

Table 3-8 - ACA West - Infiltration Basin Summary

| Design Input | | Comment |
|------------------------------------|--------------|-----------------------------|
| Total catchment area | 4.438 ha | |
| Percentage of runoff | 100% | |
| Volumetric runoff coefficient (Cv) | 0.761, 0.817 | Summer, winter respectively |
| Infiltration rate | 0 m/s | |

| | | |
|--|------------|---|
| Overflow allowance to nearby watercourse | 10.53 l/s | Q_{bar} |
| Overflow to spine network | Yes | Allowance for 200 l/s, not included in model |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 2.100 mAOD | Based on Environment Statement groundwater contours (Annex B) |

MicroDrainage Source Control Summary

| | | |
|----------|-----------------------------|---|
| FSR | 2698.8 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 1999 | 3623.2 m ³ | 1:100 year return period, 1440 winter storm |
| FEH 2013 | 3812.3 m³ | 1:100 year return period, 1440 winter storm |

Civil 3D Model Summary

| | | |
|-----------------------|---------------------------|--|
| Invert level of basin | 2.500 mAOD | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 4000 m³ | Still to be modelled, but this area has been space-protected for this size basin |

3.9 West Railway Catchment 3 - Abbey Road

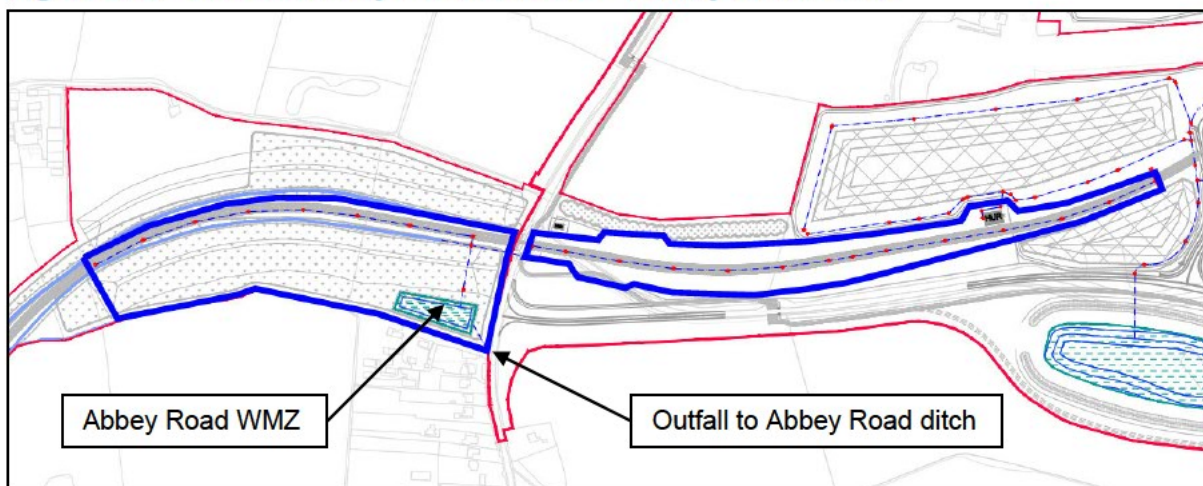
3.9.1 The West Railway Catchment 3 is one of five catchments serving the proposed Green Rail Route, which is located with the Main Development Site. The railway drainage largely relies on infiltration trenches and swales to drain the proposed track in addition to allowing continuity of existing ditches and watercourses.

3.9.2 West Railways Catchment 3 is approximately 6.5 ha and is in cutting with a level crossing at Abbey Road. Cut-off ditches are proposed on both the side of the rail cutting in order to capture the runoff from the landscape bund. A filter drain is proposed at the downside of the embankment to drain the railway runoff. A WMZ basin coupled with hydro-brake is proposed to limit the discharge as required. Runoff that does not infiltrate at source will convey to a WMZ infiltration basin and overflow to the Abbey Road ditch.

3.9.3 Figure 3-8 shows the currently proposed Abbey Road WMZ basin location. This location may be updated in the future to account for emerging flood

modelling information and existing known flooding issues in the vicinity of the current proposed WMZ basin.

Figure 3-8 - West Railway Catchment 3 – Abbey Road WMZ



3.9.4 Abbey Road WMZ

3.9.5 Table 3-9 summarises the parameters used to determine a conservative estimate of the attenuation volume required and the volume space-protected for the Abbey Road WMZ.

Table 3-9 - Abbey Road WMZ - Infiltration Basin Summary

| Design Input | | Comment |
|--|-----------------------|---|
| Total catchment area | 6.478 ha | |
| Percentage of runoff | 50% | |
| Volumetric runoff coefficient (Cv) | 0.568, 0.680 | Summer, winter respectively |
| Infiltration rate | 1.06E-04 m/s | |
| Overflow allowance to nearby watercourse | 6.50 l/s | Assumed at 1 l/s/ha [1] |
| Overflow to spine network | No | |
| Sediment forebay | Included | To be detailed in next design phase |
| Access ramp | Included | To be detailed in next design phase |
| Groundwater level | 3.000 mAOD | Based on Environment Statement groundwater contours (Annex B) |
| MicroDrainage Source Control Summary | | |
| FSR | 1048.1 m ³ | 1:100 year return period, 240 winter storm |

| | | |
|----------|-----------------------|--|
| FEH 1999 | 1413.5 m ³ | 1:100 year return period, 240 winter storm |
| FEH 2013 | 1338.8 m ³ | 1:100 year return period, 600 winter storm |

Civil 3D Model Summary

| | | |
|---|-----------------------|-----------------------------|
| Invert level of basin | 6.742 mAOD | |
| Bottom of basin area | 1268.6 m ² | |
| Top of basin area (excluding freeboard) | 1964.5 m ² | |
| Freeboard allowance | 300mm | |
| Side slopes | 1:3 | |
| Total volume provided | 1872.0 m ³ | (excluding 300mm freeboard) |

[1] Based on Environment Agency guidance - Rainfall runoff management for developments ref. SC030219. Limiting discharge rates for sites should be set to Qbar or 1 l/s/ha, whichever is greater.

4 SUMMARY

4.1.1 This technical note summarises the required storage volumes for each WMZ attenuation basin across the SZC enabling works site. The volumes calculated are conservative and based on several assumptions. Further hydraulic modelling will be undertaken during Detailed Design which will decrease the required storage volumes. Table 4-1 provides a summary of the worst-case hydraulic model required storage volumes against the volumes currently provided for on the CSPP.

Table 4-1 - Water Management Zone - Infiltration Basin Summary

| Design Input | Design Volume (m ³) (worst case) | CAD Modelled Volume (m ³) | Comment |
|----------------|--|---------------------------------------|------------------------------------|
| WMZ1 | 14690.4 | 17328 | Sufficient volume provided |
| WMZ2 | 12663.5 | 17694.5 | Sufficient volume provided |
| WMZ3 | 15685.8 | 17341 | Sufficient volume provided |
| WMZ4 | 13422.3 | 25688.8 | Sufficient volume provided |
| WMZ5 | 12891.1 | 17223.8 | Sufficient volume provided |
| WMZ6 | 20216.7 | 19376 | Sufficient volume provided [3] |
| WMZ – ACA west | 3812.3 | 4000 | [1],[2] Sufficient volume provided |

| | | | |
|------------------|---------|-------|------------------------------------|
| WMZ – ACA east | 21641.3 | 22000 | [1],[2] Sufficient volume provided |
| WMZ – Abbey Road | 1413.5 | 1872 | Sufficient volume provided |

[1] Construction site plot plan is being updated to include additional volume as necessary to account for updated discharge strategy at the ACA in accordance with recent discussions with the EA and SCC.

[2] All WMZ infiltration basins have been sized based on source control models which do not consider additional storage volume in the network. Sizing the basins in this way allows space allocation on the plot plan, so that basin volumes and footprints can likely be downsized in the next design phase.

[3] Additional storage is provided in the Type 3 subbase of the permeable paving within the carpark of the plaza to provide the required design volume.

REFERENCES

1. Outline Drainage Strategy at Volume 2, Chapter 2, Appendix 2A of the Environmental Statement [APP-181]
2. Environment Agency – Climate change allowances, Table 2. Flood risk assessments: climate change allowances - GOV.UK (www.gov.uk)
3. CIRIA - The SuDS Manual 2015. CIRIA C753
4. Fugro - Sizewell C Infiltration Testing Report on Ground Investigation without Geotechnical Evaluation. G200003U_GIR Rev 02
5. Environment Agency - Rainfall Runoff Management for Development. SC030219