

|                                                       |                                      |                                                                                     |
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| Canham Consulting Ltd                                 |                                      | Page 1                                                                              |
| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

### STORM SEWER DESIGN by the Modified Rational Method

#### Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

|                                      |        |                                       |       |
|--------------------------------------|--------|---------------------------------------|-------|
| Return Period (years)                | 100    | PIMP (%)                              | 100   |
| M5-60 (mm)                           | 20.000 | Add Flow / Climate Change (%)         | 0     |
| Ratio R                              | 0.405  | Minimum Backdrop Height (m)           | 0.200 |
| Maximum Rainfall (mm/hr)             | 50     | Maximum Backdrop Height (m)           | 1.500 |
| Maximum Time of Concentration (mins) | 30     | Min Design Depth for Optimisation (m) | 1.200 |
| Foul Sewage (l/s/ha)                 | 0.000  | Min Vel for Auto Design only (m/s)    | 1.00  |
| Volumetric Runoff Coeff.             | 0.750  | Min Slope for Optimisation (1:X)      | 500   |

Designed with Level Soffits

#### Time Area Diagram for Storm

| Time<br>(mins) | Area<br>(ha) | Time<br>(mins) | Area<br>(ha) |
|----------------|--------------|----------------|--------------|
| 0-4            | 0.084        | 4-8            | 0.003        |

Total Area Contributing (ha) = 0.087

Total Pipe Volume (m³) = 3.488

#### Network Design Table for Storm

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 1.000 | 0.778         | 0.008       | 97.3           | 0.005          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.001 | 7.809         | 0.079       | 98.8           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 2.000 | 1.375         | 0.086       | 16.0           | 0.004          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.002 | 8.395         | 0.084       | 99.9           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.003 | 4.793         | 0.050       | 95.9           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 3.000 | 1.310         | 0.120       | 10.9           | 0.005          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.004 | 7.256         | 0.100       | 72.6           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |

#### Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 1.000 | 50.00           | 2.02           | 31.420       | 0.005            | 0.0                  | 0.0           | 0.0               | 0.78         | 6.1          | 0.7           |
| 1.001 | 50.00           | 2.18           | 31.413       | 0.005            | 0.0                  | 0.0           | 0.0               | 0.77         | 6.1          | 0.7           |
| 2.000 | 50.00           | 2.01           | 31.420       | 0.004            | 0.0                  | 0.0           | 0.0               | 1.94         | 15.2         | 0.5           |
| 1.002 | 50.00           | 2.37           | 31.334       | 0.009            | 0.0                  | 0.0           | 0.0               | 0.77         | 6.0          | 1.2           |
| 1.003 | 50.00           | 2.47           | 31.250       | 0.009            | 0.0                  | 0.0           | 0.0               | 0.79         | 6.2          | 1.2           |
| 3.000 | 50.00           | 2.01           | 31.320       | 0.005            | 0.0                  | 0.0           | 0.0               | 2.35         | 18.5         | 0.7           |
| 1.004 | 50.00           | 2.57           | 31.150       | 0.014            | 0.0                  | 0.0           | 0.0               | 1.18         | 20.9         | 1.9           |

|                                                       |                                      |                                                                                     |
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

### Network Design Table for Storm

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                        |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|---------------------------------------------------------------------------------------|
| 4.000 | 1.137         | 0.100       | 11.4           | 0.001          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |    |
| 1.005 | 3.147         | 0.050       | 62.9           | 0.004          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |    |
| 1.006 | 9.727         | 0.100       | 97.3           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |    |
| 5.000 | 5.520         | 0.370       | 14.9           | 0.003          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |    |
| 1.007 | 8.724         | 0.090       | 96.9           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |    |
| 6.000 | 7.099         | 0.075       | 94.7           | 0.006          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |    |
| 6.001 | 4.500         | 0.440       | 10.2           | 0.005          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |    |
| 1.008 | 6.018         | 0.310       | 19.4           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |    |
| 1.009 | 8.087         | 0.775       | 10.4           | 0.009          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |    |
| 7.000 | 4.272         | 0.088       | 48.8           | 0.002          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |    |
| 8.000 | 4.746         | 0.050       | 94.9           | 0.003          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |   |
| 7.001 | 6.683         | 0.163       | 41.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 1.010 | 14.621        | 0.203       | 72.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 9.000 | 0.629         | 0.006       | 100.0          | 0.012          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 9.001 | 11.835        | 0.124       | 95.4           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |

### Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 4.000 | 50.00           | 2.01           | 31.200       | 0.001            | 0.0                  | 0.0           | 0.0               | 2.30         | 18.1         | 0.2           |
| 1.005 | 50.00           | 2.61           | 31.050       | 0.020            | 0.0                  | 0.0           | 0.0               | 1.27         | 22.4         | 2.7           |
| 1.006 | 50.00           | 2.77           | 31.000       | 0.020            | 0.0                  | 0.0           | 0.0               | 1.02         | 18.0         | 2.7           |
| 5.000 | 50.00           | 2.05           | 31.320       | 0.003            | 0.0                  | 0.0           | 0.0               | 2.01         | 15.8         | 0.4           |
| 1.007 | 50.00           | 2.91           | 30.900       | 0.022            | 0.0                  | 0.0           | 0.0               | 1.02         | 18.0         | 3.0           |
| 6.000 | 50.00           | 2.15           | 31.405       | 0.006            | 0.0                  | 0.0           | 0.0               | 0.79         | 6.2          | 0.8           |
| 6.001 | 50.00           | 2.18           | 31.300       | 0.011            | 0.0                  | 0.0           | 0.0               | 2.43         | 19.1         | 1.5           |
| 1.008 | 50.00           | 2.96           | 30.810       | 0.033            | 0.0                  | 0.0           | 0.0               | 2.30         | 40.6         | 4.5           |
| 1.009 | 50.00           | 3.00           | 30.375       | 0.042            | 0.0                  | 0.0           | 0.0               | 3.14         | 55.4         | 5.7           |
| 7.000 | 50.00           | 2.06           | 29.900       | 0.002            | 0.0                  | 0.0           | 0.0               | 1.11         | 8.7          | 0.3           |
| 8.000 | 50.00           | 2.10           | 30.000       | 0.003            | 0.0                  | 0.0           | 0.0               | 0.79         | 6.2          | 0.4           |
| 7.001 | 50.00           | 2.17           | 29.763       | 0.005            | 0.0                  | 0.0           | 0.0               | 1.58         | 27.9         | 0.7           |
| 1.010 | 50.00           | 3.21           | 29.600       | 0.047            | 0.0                  | 0.0           | 0.0               | 1.19         | 21.0         | 6.4           |
| 9.000 | 50.00           | 2.01           | 31.420       | 0.012            | 0.0                  | 0.0           | 0.0               | 0.77         | 6.0          | 1.6           |
| 9.001 | 50.00           | 2.26           | 31.414       | 0.012            | 0.0                  | 0.0           | 0.0               | 0.79         | 6.2          | 1.6           |

|                                 |                |                                                                                     |
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| Canham Consulting Ltd           |                | Page 3                                                                              |
| The Old School                  | 211200         |  |
| Thorpe St Andrew                | ONSLOW MILLS   |                                                                                     |
| Norwich NR7 0EP                 | TROUT ROAD     |                                                                                     |
| Date 30/07/2018                 | Designed by SW |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX | Checked by IG  |                                                                                     |
| XP Solutions                    | Network 2018.1 |                                                                                     |

#### Network Design Table for Storm

| PN     | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                      |
|--------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|-------------------------------------------------------------------------------------|
| 10.000 | 0.977         | 0.270       | 3.6            | 0.007          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 9.002  | 8.533         | 1.695       | 5.0            | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 11.000 | 3.124         | 0.827       | 3.8            | 0.003          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 9.003  | 13.421        | 0.067       | 200.0          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 12.000 | 1.136         | 0.014       | 81.1           | 0.005          | 2.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 12.001 | 3.934         | 0.049       | 80.0           | 0.002          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 9.004  | 16.276        | 0.081       | 200.0          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.011  | 3.185         | 0.020       | 160.0          | 0.011          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.012  | 5.298         | 0.033       | 160.0          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |
| 1.013  | 4.803         | 0.071       | 67.6           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 225         | Pipe/Conduit |  |

#### Network Results Table

| PN     | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | Σ I.Area<br>(ha) | Σ Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|--------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 10.000 | 50.00           | 2.00           | 31.420       | 0.007            | 0.0                  | 0.0           | 0.0               | 4.10         | 32.2         | 0.9           |
| 9.002  | 50.00           | 2.31           | 31.291       | 0.019            | 0.0                  | 0.0           | 0.0               | 3.47         | 27.3         | 2.5           |
| 11.000 | 50.00           | 2.01           | 30.500       | 0.003            | 0.0                  | 0.0           | 0.0               | 4.01         | 31.5         | 0.4           |
| 9.003  | 50.00           | 2.55           | 29.471       | 0.022            | 0.0                  | 0.0           | 0.0               | 0.92         | 36.6         | 3.0           |
| 12.000 | 50.00           | 2.02           | 29.592       | 0.005            | 0.0                  | 0.0           | 0.0               | 0.85         | 6.7          | 0.6           |
| 12.001 | 50.00           | 2.10           | 29.578       | 0.007            | 0.0                  | 0.0           | 0.0               | 0.86         | 6.8          | 0.9           |
| 9.004  | 50.00           | 2.84           | 29.404       | 0.029            | 0.0                  | 0.0           | 0.0               | 0.92         | 36.6         | 3.9           |
| 1.011  | 50.00           | 3.26           | 29.322       | 0.087            | 0.0                  | 0.0           | 0.0               | 1.03         | 41.0         | 11.8          |
| 1.012  | 50.00           | 3.34           | 29.302       | 0.087            | 0.0                  | 0.0           | 0.0               | 1.03         | 41.0         | 11.8          |
| 1.013  | 50.00           | 3.39           | 29.269       | 0.087            | 0.0                  | 0.0           | 0.0               | 1.59         | 63.3         | 11.8          |

|                                                       |  |                                      |
|-------------------------------------------------------|--|--------------------------------------|
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP |  | 211200<br>ONSLOW MILLS<br>TROUT ROAD |
| Date 30/07/2018<br>File 211200 SW_3.3LS_181102.MDX    |  | Designed by SW<br>Checked by IG      |
| XP Solutions                                          |  | Network 2018.1                       |



### Manhole Schedules for Storm

| 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) |
|---------|-----------|--------------|---------------|--------------------|-------------|---------------------------|------------------------|-------------|---------------------------|------------------------|---------------|
| RW1     | 33.000    | 1.580        | Open Manhole  | 150                | 1.000       | 31.420                    | 100                    |             |                           |                        |               |
| J1      | 33.000    | 1.588        | Open Manhole  | 150                | 1.001       | 31.413                    | 100                    | 1.000       | 31.412                    | 100                    |               |
| RW2     | 33.000    | 1.580        | Open Manhole  | 150                | 2.000       | 31.420                    | 100                    |             |                           |                        |               |
| J2      | 33.000    | 1.666        | Open Manhole  | 150                | 1.002       | 31.334                    | 100                    | 1.001       | 31.334                    | 100                    |               |
|         |           |              |               |                    |             |                           |                        | 2.000       | 31.334                    | 100                    |               |
| J3      | 33.000    | 1.750        | Open Manhole  | 150                | 1.003       | 31.250                    | 100                    | 1.002       | 31.250                    | 100                    |               |
| RW3     | 33.000    | 1.680        | Open Manhole  | 150                | 3.000       | 31.320                    | 100                    |             |                           |                        |               |
| J4      | 33.000    | 1.850        | Open Manhole  | 150                | 1.004       | 31.150                    | 150                    | 1.003       | 31.200                    | 100                    |               |
|         |           |              |               |                    |             |                           |                        | 3.000       | 31.200                    | 100                    |               |
| RW4     | 33.000    | 1.800        | Open Manhole  | 150                | 4.000       | 31.200                    | 100                    |             |                           |                        |               |
| J5      | 33.000    | 1.950        | Open Manhole  | 150                | 1.005       | 31.050                    | 150                    | 1.004       | 31.050                    | 150                    |               |
|         |           |              |               |                    |             |                           |                        | 4.000       | 31.100                    | 100                    |               |
| J6      | 33.000    | 2.000        | Open Manhole  | 150                | 1.006       | 31.000                    | 150                    | 1.005       | 31.000                    | 150                    |               |
| RW5     | 33.000    | 1.680        | Open Manhole  | 150                | 5.000       | 31.320                    | 100                    |             |                           |                        |               |
| J7      | 33.000    | 2.100        | Open Manhole  | 150                | 1.007       | 30.900                    | 150                    | 1.006       | 30.900                    | 150                    |               |
|         |           |              |               |                    |             |                           |                        | 5.000       | 30.950                    | 100                    |               |
| RW6     | 33.000    | 1.595        | Open Manhole  | 150                | 6.000       | 31.405                    | 100                    |             |                           |                        |               |
| J8      | 33.000    | 1.700        | Open Manhole  | 150                | 6.001       | 31.300                    | 100                    | 6.000       | 31.330                    | 100                    | 30            |
| J9      | 31.439    | 0.629        | Open Manhole  | 150                | 1.008       | 30.810                    | 150                    | 1.007       | 30.810                    | 150                    |               |
|         |           |              |               |                    |             |                           |                        | 6.001       | 30.860                    | 100                    |               |
| J10     | 31.438    | 1.063        | Open Manhole  | 150                | 1.009       | 30.375                    | 150                    | 1.008       | 30.500                    | 150                    | 125           |
| RW8     | 30.998    | 1.098        | Open Manhole  | 150                | 7.000       | 29.900                    | 100                    |             |                           |                        |               |
| RW7     | 33.000    | 3.000        | Open Manhole  | 150                | 8.000       | 30.000                    | 100                    |             |                           |                        |               |
| SW1     | 31.270    | 1.507        | Open Manhole  | 450                | 7.001       | 29.763                    | 150                    | 7.000       | 29.813                    | 100                    |               |
|         |           |              |               |                    |             |                           |                        | 8.000       | 29.950                    | 100                    | 138           |
| SW2     | 30.806    | 1.206        | Open Manhole  | 1200               | 1.010       | 29.600                    | 150                    | 1.009       | 29.600                    | 150                    |               |
|         |           |              |               |                    |             |                           |                        | 7.001       | 29.600                    | 150                    |               |
| RW9     | 33.000    | 1.580        | Open Manhole  | 150                | 9.000       | 31.420                    | 100                    |             |                           |                        |               |
| J11     | 33.000    | 1.586        | Open Manhole  | 150                | 9.001       | 31.414                    | 100                    | 9.000       | 31.414                    | 100                    |               |
| RW10    | 33.000    | 1.580        | Open Manhole  | 150                | 10.000      | 31.420                    | 100                    |             |                           |                        |               |
| J12     | 33.000    | 1.850        | Open Manhole  | 150                | 9.002       | 31.291                    | 100                    | 9.001       | 31.290                    | 100                    |               |
|         |           |              |               |                    |             |                           |                        | 10.000      | 31.150                    | 100                    |               |
| RW11    | 33.000    | 2.500        | Open Manhole  | 150                | 11.000      | 30.500                    | 100                    |             |                           |                        |               |
| SW3     | 30.200    | 0.729        | Open Manhole  | 450                | 9.003       | 29.471                    | 225                    | 9.002       | 29.596                    | 100                    |               |
|         |           |              |               |                    |             |                           |                        | 11.000      | 29.673                    | 100                    | 77            |
| RW12    | 33.000    | 3.408        | Open Manhole  | 150                | 12.000      | 29.592                    | 100                    |             |                           |                        |               |
| RW13    | 33.000    | 3.422        | Open Manhole  | 150                | 12.001      | 29.578                    | 100                    | 12.000      | 29.578                    | 100                    |               |
| SW4     | 30.153    | 0.749        | Open Manhole  | 450                | 9.004       | 29.404                    | 225                    | 9.003       | 29.404                    | 225                    |               |
|         |           |              |               |                    |             |                           |                        | 12.001      | 29.529                    | 100                    |               |
| SW5     | 30.496    | 1.174        | Open Manhole  | 1200               | 1.011       | 29.322                    | 225                    | 1.010       | 29.397                    | 150                    |               |
|         |           |              |               |                    |             |                           |                        | 9.004       | 29.322                    | 225                    |               |
| SW6     | 30.437    | 1.134        | Open Manhole  | 1200               | 1.012       | 29.302                    | 225                    | 1.011       | 29.302                    | 225                    |               |
| EX1     | 30.353    | 1.084        | Open Manhole  | 1200               | 1.013       | 29.269                    | 225                    | 1.012       | 29.269                    | 225                    |               |
|         | 30.300    | 1.102        | Open Manhole  | 0                  |             | OUTFALL                   |                        | 1.013       | 29.198                    | 225                    |               |

|                                                       |                                      |                                                                                     |
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| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          |                                      | Network 2018.1                                                                      |

PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN    | Hyd Sect | Diam (mm) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | o        | 100       | RW1     | 33.000      | 31.420      | 1.480       | Open Manhole  | 150                |
| 1.001 | o        | 100       | J1      | 33.000      | 31.413      | 1.487       | Open Manhole  | 150                |
| 2.000 | o        | 100       | RW2     | 33.000      | 31.420      | 1.480       | Open Manhole  | 150                |
| 1.002 | o        | 100       | J2      | 33.000      | 31.334      | 1.566       | Open Manhole  | 150                |
| 1.003 | o        | 100       | J3      | 33.000      | 31.250      | 1.650       | Open Manhole  | 150                |
| 3.000 | o        | 100       | RW3     | 33.000      | 31.320      | 1.580       | Open Manhole  | 150                |
| 1.004 | o        | 150       | J4      | 33.000      | 31.150      | 1.700       | Open Manhole  | 150                |
| 4.000 | o        | 100       | RW4     | 33.000      | 31.200      | 1.700       | Open Manhole  | 150                |
| 1.005 | o        | 150       | J5      | 33.000      | 31.050      | 1.800       | Open Manhole  | 150                |
| 1.006 | o        | 150       | J6      | 33.000      | 31.000      | 1.850       | Open Manhole  | 150                |
| 5.000 | o        | 100       | RW5     | 33.000      | 31.320      | 1.580       | Open Manhole  | 150                |
| 1.007 | o        | 150       | J7      | 33.000      | 30.900      | 1.950       | Open Manhole  | 150                |
| 6.000 | o        | 100       | RW6     | 33.000      | 31.405      | 1.495       | Open Manhole  | 150                |
| 6.001 | o        | 100       | J8      | 33.000      | 31.300      | 1.600       | Open Manhole  | 150                |
| 1.008 | o        | 150       | J9      | 31.439      | 30.810      | 0.479       | Open Manhole  | 150                |

Downstream Manhole

| PN    | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 0.778      | 97.3        | J1      | 33.000      | 31.412      | 1.488       | Open Manhole  | 150                |
| 1.001 | 7.809      | 98.8        | J2      | 33.000      | 31.334      | 1.566       | Open Manhole  | 150                |
| 2.000 | 1.375      | 16.0        | J2      | 33.000      | 31.334      | 1.566       | Open Manhole  | 150                |
| 1.002 | 8.395      | 99.9        | J3      | 33.000      | 31.250      | 1.650       | Open Manhole  | 150                |
| 1.003 | 4.793      | 95.9        | J4      | 33.000      | 31.200      | 1.700       | Open Manhole  | 150                |
| 3.000 | 1.310      | 10.9        | J4      | 33.000      | 31.200      | 1.700       | Open Manhole  | 150                |
| 1.004 | 7.256      | 72.6        | J5      | 33.000      | 31.050      | 1.800       | Open Manhole  | 150                |
| 4.000 | 1.137      | 11.4        | J5      | 33.000      | 31.100      | 1.800       | Open Manhole  | 150                |
| 1.005 | 3.147      | 62.9        | J6      | 33.000      | 31.000      | 1.850       | Open Manhole  | 150                |
| 1.006 | 9.727      | 97.3        | J7      | 33.000      | 30.900      | 1.950       | Open Manhole  | 150                |
| 5.000 | 5.520      | 14.9        | J7      | 33.000      | 30.950      | 1.950       | Open Manhole  | 150                |
| 1.007 | 8.724      | 96.9        | J9      | 31.439      | 30.810      | 0.479       | Open Manhole  | 150                |
| 6.000 | 7.099      | 94.7        | J8      | 33.000      | 31.330      | 1.570       | Open Manhole  | 150                |
| 6.001 | 4.500      | 10.2        | J9      | 31.439      | 30.860      | 0.479       | Open Manhole  | 150                |
| 1.008 | 6.018      | 19.4        | J10     | 31.438      | 30.500      | 0.788       | Open Manhole  | 150                |

|                                                       |                                      |                                                                                     |
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018<br>File 211200 SW_3.3LS_181102.MDX    | Designed by SW<br>Checked by IG      |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN     | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|-------------|--------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.009  | o           | 150          | J10        | 31.438         | 30.375         | 0.913          | Open Manhole     | 150                   |
| 7.000  | o           | 100          | RW8        | 30.998         | 29.900         | 0.998          | Open Manhole     | 150                   |
| 8.000  | o           | 100          | RW7        | 33.000         | 30.000         | 2.900          | Open Manhole     | 150                   |
| 7.001  | o           | 150          | SW1        | 31.270         | 29.763         | 1.357          | Open Manhole     | 450                   |
| 1.010  | o           | 150          | SW2        | 30.806         | 29.600         | 1.056          | Open Manhole     | 1200                  |
| 9.000  | o           | 100          | RW9        | 33.000         | 31.420         | 1.480          | Open Manhole     | 150                   |
| 9.001  | o           | 100          | J11        | 33.000         | 31.414         | 1.486          | Open Manhole     | 150                   |
| 10.000 | o           | 100          | RW10       | 33.000         | 31.420         | 1.480          | Open Manhole     | 150                   |
| 9.002  | o           | 100          | J12        | 33.000         | 31.291         | 1.609          | Open Manhole     | 150                   |
| 11.000 | o           | 100          | RW11       | 33.000         | 30.500         | 2.400          | Open Manhole     | 150                   |
| 9.003  | o           | 225          | SW3        | 30.200         | 29.471         | 0.504          | Open Manhole     | 450                   |
| 12.000 | o           | 100          | RW12       | 33.000         | 29.592         | 3.308          | Open Manhole     | 150                   |
| 12.001 | o           | 100          | RW13       | 33.000         | 29.578         | 3.322          | Open Manhole     | 150                   |
| 9.004  | o           | 225          | SW4        | 30.153         | 29.404         | 0.524          | Open Manhole     | 450                   |

Downstream Manhole

| PN     | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|--------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.009  | 8.087         | 10.4           | SW2        | 30.806         | 29.600         | 1.056          | Open Manhole     | 1200                  |
| 7.000  | 4.272         | 48.8           | SW1        | 31.270         | 29.813         | 1.357          | Open Manhole     | 450                   |
| 8.000  | 4.746         | 94.9           | SW1        | 31.270         | 29.950         | 1.220          | Open Manhole     | 450                   |
| 7.001  | 6.683         | 41.0           | SW2        | 30.806         | 29.600         | 1.056          | Open Manhole     | 1200                  |
| 1.010  | 14.621        | 72.0           | SW5        | 30.496         | 29.397         | 0.949          | Open Manhole     | 1200                  |
| 9.000  | 0.629         | 100.0          | J11        | 33.000         | 31.414         | 1.486          | Open Manhole     | 150                   |
| 9.001  | 11.835        | 95.4           | J12        | 33.000         | 31.290         | 1.610          | Open Manhole     | 150                   |
| 10.000 | 0.977         | 3.6            | J12        | 33.000         | 31.150         | 1.750          | Open Manhole     | 150                   |
| 9.002  | 8.533         | 5.0            | SW3        | 30.200         | 29.596         | 0.504          | Open Manhole     | 450                   |
| 11.000 | 3.124         | 3.8            | SW3        | 30.200         | 29.673         | 0.427          | Open Manhole     | 450                   |
| 9.003  | 13.421        | 200.0          | SW4        | 30.153         | 29.404         | 0.524          | Open Manhole     | 450                   |
| 12.000 | 1.136         | 81.1           | RW13       | 33.000         | 29.578         | 3.322          | Open Manhole     | 150                   |
| 12.001 | 3.934         | 80.0           | SW4        | 30.153         | 29.529         | 0.524          | Open Manhole     | 450                   |
| 9.004  | 16.276        | 200.0          | SW5        | 30.496         | 29.322         | 0.948          | Open Manhole     | 1200                  |

|                                                       |                                      |                                                                                     |
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018<br>File 211200 SW_3.3LS_181102.MDX    | Designed by SW<br>Checked by IG      |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

PIPELINE SCHEDULES for Storm

Upstream Manhole

| PN    | Hyd<br>Sect | Diam<br>(mm) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|-------|-------------|--------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.011 | o           | 225          | SW5        | 30.496         | 29.322         | 0.949          | Open Manhole     | 1200                  |
| 1.012 | o           | 225          | SW6        | 30.437         | 29.302         | 0.909          | Open Manhole     | 1200                  |
| 1.013 | o           | 225          | EX1        | 30.353         | 29.269         | 0.859          | Open Manhole     | 1200                  |

Downstream Manhole

| PN    | Length<br>(m) | Slope<br>(1:X) | MH<br>Name | C.Level<br>(m) | I.Level<br>(m) | D.Depth<br>(m) | MH<br>Connection | MH DIAM., L*W<br>(mm) |
|-------|---------------|----------------|------------|----------------|----------------|----------------|------------------|-----------------------|
| 1.011 | 3.185         | 160.0          | SW6        | 30.437         | 29.302         | 0.909          | Open Manhole     | 1200                  |
| 1.012 | 5.298         | 160.0          | EX1        | 30.353         | 29.269         | 0.859          | Open Manhole     | 1200                  |
| 1.013 | 4.803         | 67.6           |            | 30.300         | 29.198         | 0.877          | Open Manhole     | 0                     |

|                                                       |                                      |                                                                                     |
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          |                                      | Network 2018.1                                                                      |

Area Summary for Storm

| Pipe Number | PIMP Type | PIMP Name | PIMP (%) | Gross Area (ha) | Imp. Area (ha) | Pipe Total (ha) |
|-------------|-----------|-----------|----------|-----------------|----------------|-----------------|
| 1.000       | User      | -         | 100      | 0.005           | 0.005          | 0.005           |
| 1.001       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 2.000       | User      | -         | 100      | 0.004           | 0.004          | 0.004           |
| 1.002       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 1.003       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 3.000       | User      | -         | 100      | 0.005           | 0.005          | 0.005           |
| 1.004       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 4.000       | User      | -         | 100      | 0.001           | 0.001          | 0.001           |
| 1.005       | User      | -         | 100      | 0.004           | 0.004          | 0.004           |
| 1.006       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 5.000       | User      | -         | 100      | 0.003           | 0.003          | 0.003           |
| 1.007       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 6.000       | User      | -         | 100      | 0.006           | 0.006          | 0.006           |
| 6.001       | User      | -         | 100      | 0.005           | 0.005          | 0.005           |
| 1.008       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 1.009       | User      | -         | 100      | 0.009           | 0.009          | 0.009           |
| 7.000       | User      | -         | 100      | 0.002           | 0.002          | 0.002           |
| 8.000       | User      | -         | 100      | 0.003           | 0.003          | 0.003           |
| 7.001       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 1.010       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 9.000       | User      | -         | 100      | 0.012           | 0.012          | 0.012           |
| 9.001       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 10.000      | User      | -         | 100      | 0.001           | 0.001          | 0.001           |
|             | User      | -         | 100      | 0.006           | 0.006          | 0.007           |
| 9.002       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 11.000      | User      | -         | 100      | 0.003           | 0.003          | 0.003           |
| 9.003       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 12.000      | User      | -         | 100      | 0.005           | 0.005          | 0.005           |
| 12.001      | User      | -         | 100      | 0.002           | 0.002          | 0.002           |
| 9.004       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 1.011       | User      | -         | 100      | 0.006           | 0.006          | 0.006           |
|             | User      | -         | 100      | 0.005           | 0.005          | 0.011           |
| 1.012       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 1.013       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
|             |           |           |          | Total           | Total          | Total           |
|             |           |           |          | 0.087           | 0.087          | 0.087           |

|                                                       |                                      |                                                                                     |
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

### Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW5, DS/PN: 1.011, Volume (m³): 2.2

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0088-3300-0900-3300 |
| Design Head (m)                   | 0.900                      |
| Design Flow (l/s)                 | 3.3                        |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 88                         |
| Invert Level (m)                  | 29.322                     |
| Minimum Outlet Pipe Diameter (mm) | 100                        |
| Suggested Manhole Diameter (mm)   | 1200                       |

| Control Points            | Head (m) | Flow (l/s) | Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|---------------------------|----------|------------|
| Design Point (Calculated) | 0.900    | 3.3        | Kick-Flo®                 | 0.573    | 2.7        |
| Flush-Flo™                | 0.268    | 3.3        | Mean Flow over Head Range | -        | 2.9        |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 2.7        | 0.800     | 3.1        | 2.000     | 4.8        | 4.000     | 6.6        | 7.000     | 8.6        |
| 0.200     | 3.3        | 1.000     | 3.5        | 2.200     | 5.0        | 4.500     | 7.0        | 7.500     | 8.9        |
| 0.300     | 3.3        | 1.200     | 3.8        | 2.400     | 5.2        | 5.000     | 7.3        | 8.000     | 9.2        |
| 0.400     | 3.2        | 1.400     | 4.0        | 2.600     | 5.4        | 5.500     | 7.7        | 8.500     | 9.4        |
| 0.500     | 3.0        | 1.600     | 4.3        | 3.000     | 5.8        | 6.000     | 8.0        | 9.000     | 9.7        |
| 0.600     | 2.7        | 1.800     | 4.5        | 3.500     | 6.2        | 6.500     | 8.3        | 9.500     | 9.9        |

Storage Structures for Storm

Cellular Storage Manhole: SW5, DS/PN: 1.011

Invert Level (m) 29.500 Safety Factor 2.0  
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²) | Inf. Area (m²) | Depth (m) | Area (m²) | Inf. Area (m²) |
|-----------|-----------|----------------|-----------|-----------|----------------|-----------|-----------|----------------|
| 0.000     | 75.0      | 75.0           | 0.400     | 75.0      | 89.8           | 0.401     | 0.0       | 89.8           |

|                                                       |                                      |                                                                                     |
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| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

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

#### Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 0.000  
 Hot Start (mins) 0    MADD Factor \* 10m³/ha Storage 4.000  
 Hot Start Level (mm) 0    Inlet Coefficient 0.800  
 Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
 Foul Sewage per hectare (l/s) 0.000

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

#### Synthetic Rainfall Details

Rainfall Model    FSR M5-60 (mm) 21.000 Cv (Summer) 0.750  
 Region England and Wales    Ratio R 0.438 Cv (Winter) 0.840

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  
 Return Period(s) (years) 1, 30, 100  
 Climate Change (%) 0, 0, 40

|        |      |            |        |        |               |           |          |           | Water     | Surcharged |        |        |
|--------|------|------------|--------|--------|---------------|-----------|----------|-----------|-----------|------------|--------|--------|
| US/MH  |      |            |        | Return | Climate       | First (X) |          | First (Y) | First (Z) | Overflow   | Level  | Depth  |
| PN     | Name | Storm      | Period | Change | Surcharge     | Flood     | Overflow | Act.      |           |            | (m)    | (m)    |
| 1.000  | RW1  | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.666 | 0.146  |
| 1.001  | J1   | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.639 | 0.126  |
| 2.000  | RW2  | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.597 | 0.077  |
| 1.002  | J2   | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.587 | 0.153  |
| 1.003  | J3   | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.407 | 0.057  |
| 3.000  | RW3  | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.370 | -0.050 |
| 1.004  | J4   | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.277 | -0.023 |
| 4.000  | RW4  | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.230 | -0.070 |
| 1.005  | J5   | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.228 | 0.028  |
| 1.006  | J6   | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.164 | 0.014  |
| 5.000  | RW5  | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.348 | -0.072 |
| 1.007  | J7   | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 31.061 | 0.011  |
| 6.000  | RW6  | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.481 | -0.024 |
| 6.001  | J8   | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.353 | -0.047 |
| 1.008  | J9   | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 30.907 | -0.053 |
| 1.009  | J10  | 15 Summer  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.537 | 0.012  |
| 7.000  | RW8  | 15 Winter  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.241 | 0.241  |
| 8.000  | RW7  | 15 Winter  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.243 | 0.143  |
| 7.001  | SW1  | 15 Winter  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.234 | 0.322  |
| 1.010  | SW2  | 15 Winter  | 100    | +40%   | 30/15 Summer  |           |          |           |           |            | 30.227 | 0.477  |
| 9.000  | RW9  | 15 Summer  | 100    | +40%   | 30/15 Summer  |           |          |           |           |            | 31.980 | 0.460  |
| 9.001  | J11  | 15 Summer  | 100    | +40%   | 30/15 Summer  |           |          |           |           |            | 31.824 | 0.310  |
| 10.000 | RW10 | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.465 | -0.055 |
| 9.002  | J12  | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 31.351 | -0.040 |
| 11.000 | RW11 | 15 Summer  | 100    | +40%   |               |           |          |           |           |            | 30.522 | -0.078 |
| 9.003  | SW3  | 60 Winter  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.149 | 0.453  |
| 12.000 | RW12 | 60 Winter  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.149 | 0.457  |
| 12.001 | RW13 | 60 Winter  | 100    | +40%   | 100/15 Summer |           |          |           |           |            | 30.149 | 0.471  |
| 9.004  | SW4  | 60 Winter  | 100    | +40%   | 30/15 Winter  |           |          |           |           |            | 30.147 | 0.518  |
| 1.011  | SW5  | 60 Winter  | 100    | +40%   | 30/15 Summer  |           |          |           |           |            | 30.147 | 0.600  |
| 1.012  | SW6  | 240 Summer | 100    | +40%   |               |           |          |           |           |            | 29.352 | -0.176 |
| 1.013  | EX1  | 30 Summer  | 100    | +40%   |               |           |          |           |           |            | 29.314 | -0.180 |

|                                                       |                                      |                                                                                     |
|-------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------|
| Canham Consulting Ltd                                 |                                      | Page 12                                                                             |
| The Old School<br>Thorpe St Andrew<br>Norwich NR7 0EP | 211200<br>ONSLOW MILLS<br>TROUT ROAD |  |
| Date 30/07/2018                                       | Designed by SW                       |                                                                                     |
| File 211200 SW_3.3LS_181102.MDX                       | Checked by IG                        |                                                                                     |
| XP Solutions                                          | Network 2018.1                       |                                                                                     |

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

| PN     | US/MH<br>Name | Flooded                     |                | Pipe              |               | Status     | Level<br>Exceeded |
|--------|---------------|-----------------------------|----------------|-------------------|---------------|------------|-------------------|
|        |               | Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Flow<br>(l/s) |            |                   |
| 1.000  | RW1           | 0.000                       | 1.11           |                   | 4.4           | SURCHARGED |                   |
| 1.001  | J1            | 0.000                       | 0.78           |                   | 4.3           | SURCHARGED |                   |
| 2.000  | RW2           | 0.000                       | 0.43           |                   | 3.5           | SURCHARGED |                   |
| 1.002  | J2            | 0.000                       | 1.38           |                   | 7.7           | SURCHARGED |                   |
| 1.003  | J3            | 0.000                       | 1.42           |                   | 7.6           | SURCHARGED |                   |
| 3.000  | RW3           | 0.000                       | 0.50           |                   | 4.8           | OK         |                   |
| 1.004  | J4            | 0.000                       | 0.66           |                   | 11.8          | OK         |                   |
| 4.000  | RW4           | 0.000                       | 0.15           |                   | 1.3           | OK         |                   |
| 1.005  | J5            | 0.000                       | 1.12           |                   | 15.7          | SURCHARGED |                   |
| 1.006  | J6            | 0.000                       | 0.99           |                   | 15.8          | SURCHARGED |                   |
| 5.000  | RW5           | 0.000                       | 0.18           |                   | 2.4           | OK         |                   |
| 1.007  | J7            | 0.000                       | 1.09           |                   | 17.3          | SURCHARGED |                   |
| 6.000  | RW6           | 0.000                       | 0.94           |                   | 5.3           | OK         |                   |
| 6.001  | J8            | 0.000                       | 0.54           |                   | 8.9           | OK         |                   |
| 1.008  | J9            | 0.000                       | 0.74           |                   | 24.9          | OK         |                   |
| 1.009  | J10           | 0.000                       | 0.64           |                   | 31.0          | SURCHARGED |                   |
| 7.000  | RW8           | 0.000                       | 0.23           |                   | 1.7           | SURCHARGED |                   |
| 8.000  | RW7           | 0.000                       | 0.41           |                   | 2.2           | SURCHARGED |                   |
| 7.001  | SW1           | 0.000                       | 0.13           |                   | 3.1           | SURCHARGED |                   |
| 1.010  | SW2           | 0.000                       | 1.64           |                   | 31.7          | SURCHARGED |                   |
| 9.000  | RW9           | 0.000                       | 2.70           |                   | 10.6          | SURCHARGED |                   |
| 9.001  | J11           | 0.000                       | 1.80           |                   | 10.5          | SURCHARGED |                   |
| 10.000 | RW10          | 0.000                       | 0.42           |                   | 6.0           | OK         |                   |
| 9.002  | J12           | 0.000                       | 0.65           |                   | 16.3          | OK         |                   |
| 11.000 | RW11          | 0.000                       | 0.11           |                   | 2.9           | OK         |                   |
| 9.003  | SW3           | 0.000                       | 0.24           |                   | 7.5           | FLOOD RISK |                   |
| 12.000 | RW12          | 0.000                       | 0.40           |                   | 1.6           | SURCHARGED |                   |
| 12.001 | RW13          | 0.000                       | 0.39           |                   | 2.3           | SURCHARGED |                   |
| 9.004  | SW4           | 0.000                       | 0.29           |                   | 9.4           | FLOOD RISK |                   |
| 1.011  | SW5           | 0.000                       | 0.12           |                   | 3.3           | SURCHARGED |                   |
| 1.012  | SW6           | 0.000                       | 0.11           |                   | 3.3           | OK         |                   |
| 1.013  | EX1           | 0.000                       | 0.09           |                   | 3.3           | OK         |                   |