

**Design Settings**

|                       |                   |                                      |               |
|-----------------------|-------------------|--------------------------------------|---------------|
| Rainfall Methodology  | FSR               | Maximum Time of Concentration (mins) | 30.00         |
| Return Period (years) | 2                 | 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)            | 20.000            | 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)  | 5.00              | Enforce best practice design rules   | x             |

**Nodes**

| Name    | Area<br>(ha) | T of E<br>(mins) | Cover<br>Level<br>(m) | Diameter<br>(mm) | Depth<br>(m) |
|---------|--------------|------------------|-----------------------|------------------|--------------|
| RE1     | 0.040        | 5.00             | 110.800               | 225              | 0.600        |
| MH1     | 0.006        | 5.00             | 110.750               | 1200             | 0.850        |
| MH2     | 0.030        | 5.00             | 110.750               | 1200             | 1.180        |
| RE2     | 0.043        | 5.00             | 110.880               | 225              | 0.600        |
| MH3     |              |                  | 110.550               | 1200             | 0.592        |
| MH4     |              |                  | 110.700               | 1200             | 0.865        |
| MH5     | 0.023        | 5.00             | 110.630               | 1200             | 1.242        |
| MH6     | 0.036        | 5.00             | 110.820               | 1200             | 1.567        |
| MH7     | 0.094        | 5.00             | 111.100               | 450              | 0.450        |
| TANK    |              |                  | 111.100               | 1200             | 2.180        |
| MH8     |              |                  | 111.100               | 1200             | 1.950        |
| MH9     | 0.018        | 5.00             | 110.850               | 450              | 0.450        |
| MH10    | 0.037        | 5.00             | 110.950               | 1200             | 0.450        |
| MH11    | 0.011        | 5.00             | 111.400               | 450              | 0.450        |
| MH12    |              |                  | 111.300               | 1200             | 1.300        |
| MH13 PC |              |                  | 111.000               | 1200             | 2.155        |
| MH14    |              |                  | 110.870               | 1200             | 1.300        |

**Pipeline Schedule**

| Link  | Length<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | US CL<br>(m) | US IL<br>(m) | US Depth<br>(m) | DS CL<br>(m) | DS IL<br>(m) | DS Depth<br>(m) |
|-------|---------------|----------------|-------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| 1.000 | 28.336        | 94.5           | 225         | 110.800      | 110.200      | 0.375           | 110.750      | 109.900      | 0.625           |
| 1.001 | 27.651        | 83.8           | 225         | 110.750      | 109.900      | 0.625           | 110.750      | 109.570      | 0.955           |
| 1.002 | 25.083        | 150.0          | 225         | 110.750      | 109.570      | 0.955           | 110.630      | 109.403      | 1.002           |
| 2.000 | 32.231        | 100.0          | 225         | 110.880      | 110.280      | 0.375           | 110.550      | 109.958      | 0.367           |
| 2.001 | 12.387        | 100.7          | 225         | 110.550      | 109.958      | 0.367           | 110.700      | 109.835      | 0.640           |
| 2.002 | 10.415        | 23.3           | 225         | 110.700      | 109.835      | 0.640           | 110.630      | 109.388      | 1.017           |
| 1.003 | 22.810        | 169.0          | 225         | 110.630      | 109.388      | 1.017           | 110.820      | 109.253      | 1.342           |
| 1.004 | 17.413        | 169.1          | 225         | 110.820      | 109.253      | 1.342           | 111.100      | 109.150      | 1.725           |
| 3.000 | 6.153         | 150.0          | 150         | 111.100      | 110.650      | 0.300           | 111.100      | 110.609      | 0.341           |
| 1.005 | 3.580         | 71.6           | 225         | 111.100      | 109.150      | 1.725           | 111.100      | 109.100      | 1.775           |
| 4.000 | 14.297        | 17.2           | 150         | 110.850      | 110.400      | 0.300           | 111.100      | 109.570      | 1.380           |

| Link  | US<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type | DS<br>Node | Dia<br>(mm) | Node<br>Type | MH<br>Type |
|-------|------------|-------------|--------------|------------|------------|-------------|--------------|------------|
| 1.000 | RE1        | 225         | Manhole      | Adoptable  | MH1        | 1200        | Manhole      | Adoptable  |
| 1.001 | MH1        | 1200        | Manhole      | Adoptable  | MH2        | 1200        | Manhole      | Adoptable  |
| 1.002 | MH2        | 1200        | Manhole      | Adoptable  | MH5        | 1200        | Manhole      | Adoptable  |
| 2.000 | RE2        | 225         | Manhole      | Adoptable  | MH3        | 1200        | Manhole      | Adoptable  |
| 2.001 | MH3        | 1200        | Manhole      | Adoptable  | MH4        | 1200        | Manhole      | Adoptable  |
| 2.002 | MH4        | 1200        | Manhole      | Adoptable  | MH5        | 1200        | Manhole      | Adoptable  |
| 1.003 | MH5        | 1200        | Manhole      | Adoptable  | MH6        | 1200        | Manhole      | Adoptable  |
| 1.004 | MH6        | 1200        | Manhole      | Adoptable  | MH8        | 1200        | Manhole      | Adoptable  |
| 3.000 | MH7        | 450         | Manhole      | Adoptable  | MH8        | 1200        | Manhole      | Adoptable  |
| 1.005 | MH8        | 1200        | Manhole      | Adoptable  | TANK       | 1200        | Manhole      | Adoptable  |
| 4.000 | MH9        | 450         | Manhole      | Adoptable  | TANK       | 1200        | Manhole      | Adoptable  |

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Redmoor Acadamy Sports Hall  
Surface Water Drainage Calcs

| Link  | Length<br>(m) | Slope<br>(1:X) | Dia<br>(mm) | US CL<br>(m) | US IL<br>(m) | US Depth<br>(m) | DS CL<br>(m) | DS IL<br>(m) | DS Depth<br>(m) |
|-------|---------------|----------------|-------------|--------------|--------------|-----------------|--------------|--------------|-----------------|
| 5.000 | 11.992        | 12.9           | 150         | 110.950      | 110.500      | 0.300           | 111.100      | 109.570      | 1.380           |
| 6.000 | 4.580         | 4.8            | 150         | 111.400      | 110.950      | 0.300           | 111.300      | 110.000      | 1.150           |
| 6.001 | 11.975        | 27.8           | 150         | 111.300      | 110.000      | 1.150           | 111.100      | 109.570      | 1.380           |
| 1.006 | 7.459         | 100.0          | 225         | 111.100      | 108.920      | 1.955           | 111.000      | 108.845      | 1.930           |
| 1.007 | 3.463         | -4.8           | 100         | 111.000      | 108.845      | 2.055           | 110.870      | 109.570      | 1.200           |

| Link  | US Node | Dia (mm) | Node Type | MH Type   | DS Node | Dia (mm) | Node Type | MH Type   |
|-------|---------|----------|-----------|-----------|---------|----------|-----------|-----------|
| 5.000 | MH10    | 1200     | Manhole   | Adoptable | TANK    | 1200     | Manhole   | Adoptable |
| 6.000 | MH11    | 450      | Manhole   | Adoptable | MH12    | 1200     | Manhole   | Adoptable |
| 6.001 | MH12    | 1200     | Manhole   | Adoptable | TANK    | 1200     | Manhole   | Adoptable |
| 1.006 | TANK    | 1200     | Manhole   | Adoptable | MH13 PC | 1200     | Manhole   | Adoptable |
| 1.007 | MH13 PC | 1200     | Manhole   | Adoptable | MH14    | 1200     | Manhole   | Adoptable |

|                      |                   |                                         |        |
|----------------------|-------------------|-----------------------------------------|--------|
| Rainfall Methodology | FSR               | Analysis Speed                          | Normal |
| FSR Region           | England and Wales | Skip Steady State                       | x      |
| M5-60 (mm)           | 20.000            | Drain Down Time (mins)                  | 240    |
| Ratio-R              | 0.400             | Additional Storage (m <sup>3</sup> /ha) | 0.0    |
| Summer CV            | 0.750             | Check Discharge Rate(s)                 | x      |
| Winter CV            | 0.840             | Check Discharge Volume                  | x      |

|    |    |    |     |     |     |     |     |     |     |     |      |
|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440 |
|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|------|

| Return Period<br>(years) | Climate Change<br>(CC %) | Additional Area<br>(A %) | Additional Flow<br>(Q %) | Return Period<br>(years) | Climate Change<br>(CC %) | Additional Area<br>(A %) | Additional Flow<br>(Q %) |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 0                        | 0                        | 0                        | 30                       | 0                        | 0                        | 0                        |
| 2                        | 0                        | 0                        | 0                        | 100                      | 40                       | 0                        | 0                        |

|                          |         |                     |       |                      |       |
|--------------------------|---------|---------------------|-------|----------------------|-------|
| Flap Valve               | x       | Design Depth (m)    | 0.800 | Switch off depth (m) | 0.100 |
| Replaces Downstream Link | ✓       | Design Flow (l/s)   | 5.0   |                      |       |
| Invert Level (m)         | 108.845 | Switch on depth (m) | 0.200 |                      |       |

| Depth<br>(m) | Flow<br>(l/s) | Depth<br>(m) | Flow<br>(l/s) | Depth<br>(m) | Flow<br>(l/s) | Depth<br>(m) | Flow<br>(l/s) | Depth<br>(m) | Flow<br>(l/s) |
|--------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|
| 0.001        | 5.000         | 0.200        | 5.000         | 0.400        | 5.000         | 0.600        | 5.000         | 0.800        | 5.000         |
| 0.100        | 5.000         | 0.300        | 5.000         | 0.500        | 5.000         | 0.700        | 5.000         |              |               |

|                          |         |                   |       |                       |       |
|--------------------------|---------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x       | Design Depth (m)  | 0.340 | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓       | Design Flow (l/s) | 5.0   |                       |       |
| Invert Level (m)         | 110.650 | Diameter (m)      | 0.065 |                       |       |

|                          |         |                   |       |                       |       |
|--------------------------|---------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x       | Design Depth (m)  | 0.340 | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓       | Design Flow (l/s) | 5.0   |                       |       |
| Invert Level (m)         | 110.400 | Diameter (m)      | 0.065 |                       |       |

|                          |         |                   |       |                       |       |
|--------------------------|---------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x       | Design Depth (m)  | 0.340 | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓       | Design Flow (l/s) | 10.0  |                       |       |
| Invert Level (m)         | 110.500 | Diameter (m)      | 0.094 |                       |       |

|                                                                                                       |                 |                                                                                           |                                                                       |
|-------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <div><div>GMB</div><div>Consultancy</div></div> <div>Structural<br/>Engineering<br/>Consultants</div> | GMB Consultancy | File: Surface Water - Sports Hall.pfd<br>Network: Storm Network<br>C.Noonan<br>10/03/2024 | Page 3<br>Redmoor Academy Sports Hall<br>Surface Water Drainage Calcs |
|-------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|

Node MH11 Online Orifice Control

|                          |         |                   |       |                       |       |
|--------------------------|---------|-------------------|-------|-----------------------|-------|
| Flap Valve               | x       | Design Depth (m)  | 0.340 | Discharge Coefficient | 0.600 |
| Replaces Downstream Link | ✓       | Design Flow (l/s) | 5.0   |                       |       |
| Invert Level (m)         | 110.950 | Diameter (m)      | 0.065 |                       |       |

Node TANK Depth/Area Storage Structure

|                             |         |               |      |                           |         |
|-----------------------------|---------|---------------|------|---------------------------|---------|
| Base Inf Coefficient (m/hr) | 0.00000 | Safety Factor | 2.0  | Invert Level (m)          | 108.920 |
| Side Inf Coefficient (m/hr) | 0.00000 | Porosity      | 0.95 | Time to half empty (mins) |         |

|           |           |               |           |           |               |           |           |               |           |           |               |
|-----------|-----------|---------------|-----------|-----------|---------------|-----------|-----------|---------------|-----------|-----------|---------------|
| Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) | Depth (m) | Area (m²) | Inf Area (m²) |
| 0.000     | 210.0     | 0.0           | 0.300     | 210.0     | 0.0           | 0.600     | 210.0     | 0.0           | 0.801     | 0.0       | 0.0           |
| 0.100     | 210.0     | 0.0           | 0.400     | 210.0     | 0.0           | 0.700     | 210.0     | 0.0           |           |           |               |
| 0.200     | 210.0     | 0.0           | 0.500     | 210.0     | 0.0           | 0.800     | 210.0     | 0.0           |           |           |               |

Node MH7 Carpark Storage Structure

|                             |         |                           |         |               |       |
|-----------------------------|---------|---------------------------|---------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 110.650 | Slope (1:X)   | 500.0 |
| Side Inf Coefficient (m/hr) | 0.00000 | Time to half empty (mins) | 158     | Depth (m)     | 0.340 |
| Safety Factor               | 2.0     | Width (m)                 | 10.000  | Inf Depth (m) |       |
| Porosity                    | 0.30    | Length (m)                | 51.250  |               |       |

Node MH9 Carpark Storage Structure

|                             |         |                           |         |               |       |
|-----------------------------|---------|---------------------------|---------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 110.400 | Slope (1:X)   | 500.0 |
| Side Inf Coefficient (m/hr) | 0.00000 | Time to half empty (mins) | 19      | Depth (m)     | 0.340 |
| Safety Factor               | 2.0     | Width (m)                 | 5.000   | Inf Depth (m) |       |
| Porosity                    | 0.30    | Length (m)                | 15.000  |               |       |

Node MH10 Carpark Storage Structure

|                             |         |                           |         |               |       |
|-----------------------------|---------|---------------------------|---------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 110.500 | Slope (1:X)   | 500.0 |
| Side Inf Coefficient (m/hr) | 0.00000 | Time to half empty (mins) | 14      | Depth (m)     | 0.340 |
| Safety Factor               | 2.0     | Width (m)                 | 2.400   | Inf Depth (m) |       |
| Porosity                    | 0.30    | Length (m)                | 24.000  |               |       |

Node MH11 Carpark Storage Structure

|                             |         |                           |         |               |       |
|-----------------------------|---------|---------------------------|---------|---------------|-------|
| Base Inf Coefficient (m/hr) | 0.00000 | Invert Level (m)          | 110.950 | Slope (1:X)   | 500.0 |
| Side Inf Coefficient (m/hr) | 0.00000 | Time to half empty (mins) | 4       | Depth (m)     | 0.340 |
| Safety Factor               | 2.0     | Width (m)                 | 5.000   | Inf Depth (m) |       |
| Porosity                    | 0.30    | Length (m)                | 22.600  |               |       |

Other (defaults)

|                      |       |                       |       |                          |       |
|----------------------|-------|-----------------------|-------|--------------------------|-------|
| Entry Loss (manhole) | 0.250 | Entry Loss (junction) | 0.000 | Apply Recommended Losses | x     |
| Exit Loss (manhole)  | 0.250 | Exit Loss (junction)  | 0.000 | Flood Risk (m)           | 0.300 |

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**Results for 1 year Critical Storm Duration. Lowest mass balance: 99.90%**

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | RE1     | 10          | 110.249   | 0.049     | 5.6          | 0.0020        | 0.0000     | OK         |
| 15 minute winter  | MH1     | 11          | 109.950   | 0.050     | 6.3          | 0.0568        | 0.0000     | OK         |
| 15 minute winter  | MH2     | 11          | 109.645   | 0.075     | 10.3         | 0.0850        | 0.0000     | OK         |
| 15 minute winter  | RE2     | 10          | 110.332   | 0.052     | 6.1          | 0.0021        | 0.0000     | OK         |
| 15 minute winter  | MH3     | 11          | 110.013   | 0.055     | 6.0          | 0.0624        | 0.0000     | OK         |
| 15 minute winter  | MH4     | 11          | 109.871   | 0.036     | 6.0          | 0.0405        | 0.0000     | OK         |
| 15 minute winter  | MH5     | 11          | 109.503   | 0.115     | 19.4         | 0.1300        | 0.0000     | OK         |
| 15 minute winter  | MH6     | 11          | 109.386   | 0.133     | 24.1         | 0.1501        | 0.0000     | OK         |
| 60 minute winter  | MH7     | 46          | 110.740   | 0.090     | 6.9          | 6.0458        | 0.0000     | OK         |
| 240 minute winter | TANK    | 172         | 109.068   | 0.148     | 8.9          | 29.7177       | 0.0000     | OK         |
| 15 minute winter  | MH8     | 11          | 109.270   | 0.120     | 25.6         | 0.1356        | 0.0000     | OK         |
| 30 minute winter  | MH9     | 23          | 110.448   | 0.048     | 2.0          | 0.7417        | 0.0000     | OK         |
| 15 minute winter  | MH10    | 13          | 110.580   | 0.080     | 5.2          | 1.0604        | 0.0000     | OK         |
| 30 minute winter  | MH11    | 23          | 110.984   | 0.034     | 1.2          | 0.4397        | 0.0000     | OK         |
| 30 minute winter  | MH12    | 23          | 110.014   | 0.014     | 0.6          | 0.0159        | 0.0000     | OK         |
| 180 minute winter | MH13 PC | 124         | 109.086   | 0.241     | 11.7         | 0.2728        | 0.0000     | SURCHARGED |
| 15 minute summer  | MH14    | 1           | 109.570   | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |

  

| Link Event<br>(Upstream Depth) | US Node | Link    | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|---------|---------|---------------|----------------|----------|---------------|--------------------|
| 15 minute winter               | RE1     | 1.000   | MH1     | 5.5           | 0.855          | 0.103    | 0.1831        |                    |
| 15 minute winter               | MH1     | 1.001   | MH2     | 6.3           | 0.695          | 0.110    | 0.2514        |                    |
| 15 minute winter               | MH2     | 1.002   | MH5     | 10.3          | 0.733          | 0.244    | 0.3589        |                    |
| 15 minute winter               | RE2     | 2.000   | MH3     | 6.0           | 0.837          | 0.115    | 0.2308        |                    |
| 15 minute winter               | MH3     | 2.001   | MH4     | 6.0           | 1.040          | 0.115    | 0.0717        |                    |
| 15 minute winter               | MH4     | 2.002   | MH5     | 6.0           | 0.514          | 0.055    | 0.1272        |                    |
| 15 minute winter               | MH5     | 1.003   | MH6     | 19.3          | 0.864          | 0.485    | 0.5102        |                    |
| 15 minute winter               | MH6     | 1.004   | MH8     | 23.9          | 1.042          | 0.599    | 0.3993        |                    |
| 60 minute winter               | MH7     | Orifice | MH8     | 2.1           |                |          |               |                    |
| 240 minute winter              | TANK    | 1.006   | MH13 PC | 10.3          | 0.516          | 0.198    | 0.2516        |                    |
| 15 minute winter               | MH8     | 1.005   | TANK    | 25.3          | 1.318          | 0.412    | 0.0689        |                    |
| 30 minute winter               | MH9     | Orifice | TANK    | 1.0           |                |          |               |                    |
| 15 minute winter               | MH10    | Orifice | TANK    | 3.1           |                |          |               |                    |
| 30 minute winter               | MH11    | Orifice | MH12    | 0.6           |                |          |               |                    |
| 30 minute winter               | MH12    | 6.001   | TANK    | 0.6           | 0.727          | 0.018    | 0.0099        |                    |
| 180 minute winter              | MH13 PC | Pump    | MH14    | 5.0           |                |          |               | 42.0               |

**Results for 2 year Critical Storm Duration. Lowest mass balance: 99.90%**

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | RE1     | 10          | 110.257   | 0.057     | 7.3          | 0.0023        | 0.0000     | OK         |
| 15 minute winter  | MH1     | 11          | 109.957   | 0.057     | 8.3          | 0.0648        | 0.0000     | OK         |
| 15 minute winter  | MH2     | 11          | 109.656   | 0.086     | 13.6         | 0.0976        | 0.0000     | OK         |
| 15 minute winter  | RE2     | 10          | 110.339   | 0.059     | 7.8          | 0.0024        | 0.0000     | OK         |
| 15 minute winter  | MH3     | 11          | 110.021   | 0.063     | 7.7          | 0.0709        | 0.0000     | OK         |
| 15 minute winter  | MH4     | 11          | 109.876   | 0.040     | 7.6          | 0.0458        | 0.0000     | OK         |
| 15 minute winter  | MH5     | 11          | 109.524   | 0.136     | 25.0         | 0.1538        | 0.0000     | OK         |
| 15 minute winter  | MH6     | 11          | 109.412   | 0.159     | 31.2         | 0.1797        | 0.0000     | OK         |
| 60 minute winter  | MH7     | 47          | 110.753   | 0.103     | 8.7          | 7.9794        | 0.0000     | OK         |
| 240 minute winter | TANK    | 176         | 109.100   | 0.180     | 10.2         | 36.0165       | 0.0000     | OK         |
| 15 minute winter  | MH8     | 11          | 109.291   | 0.141     | 32.9         | 0.1594        | 0.0000     | OK         |
| 30 minute winter  | MH9     | 23          | 110.457   | 0.057     | 2.5          | 0.9483        | 0.0000     | OK         |
| 15 minute winter  | MH10    | 13          | 110.597   | 0.096     | 6.7          | 1.3638        | 0.0000     | OK         |
| 30 minute winter  | MH11    | 23          | 110.989   | 0.039     | 1.5          | 0.5785        | 0.0000     | OK         |
| 30 minute winter  | MH12    | 23          | 110.016   | 0.016     | 0.7          | 0.0176        | 0.0000     | OK         |
| 240 minute winter | MH13 PC | 176         | 109.099   | 0.254     | 11.4         | 0.2870        | 0.0000     | SURCHARGED |
| 15 minute summer  | MH14    | 1           | 109.570   | 0.000     | 0.0          | 0.0000        | 0.0000     | OK         |

  

| Link Event<br>(Upstream Depth) | US Node | Link    | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|--------------------------------|---------|---------|---------|---------------|----------------|----------|---------------|--------------------|
| 15 minute winter               | RE1     | 1.000   | MH1     | 7.2           | 0.919          | 0.135    | 0.2223        |                    |
| 15 minute winter               | MH1     | 1.001   | MH2     | 8.2           | 0.749          | 0.143    | 0.3033        |                    |
| 15 minute winter               | MH2     | 1.002   | MH5     | 13.4          | 0.766          | 0.317    | 0.4483        |                    |
| 15 minute winter               | RE2     | 2.000   | MH3     | 7.7           | 0.895          | 0.148    | 0.2776        |                    |
| 15 minute winter               | MH3     | 2.001   | MH4     | 7.6           | 1.117          | 0.148    | 0.0858        |                    |
| 15 minute winter               | MH4     | 2.002   | MH5     | 7.7           | 0.537          | 0.071    | 0.1558        |                    |
| 15 minute winter               | MH5     | 1.003   | MH6     | 25.0          | 0.908          | 0.628    | 0.6279        |                    |
| 15 minute winter               | MH6     | 1.004   | MH8     | 31.0          | 1.104          | 0.778    | 0.4887        |                    |
| 60 minute winter               | MH7     | Orifice | MH8     | 2.3           |                |          |               |                    |
| 240 minute winter              | TANK    | 1.006   | MH13 PC | 11.4          | 0.565          | 0.220    | 0.2750        |                    |
| 15 minute winter               | MH8     | 1.005   | TANK    | 32.6          | 1.397          | 0.530    | 0.0836        |                    |
| 30 minute winter               | MH9     | Orifice | TANK    | 1.3           |                |          |               |                    |
| 15 minute winter               | MH10    | Orifice | TANK    | 4.1           |                |          |               |                    |
| 30 minute winter               | MH11    | Orifice | MH12    | 0.7           |                |          |               |                    |
| 30 minute winter               | MH12    | 6.001   | TANK    | 0.7           | 0.773          | 0.022    | 0.0114        |                    |
| 240 minute winter              | MH13 PC | Pump    | MH14    | 5.0           |                |          |               | 58.8               |

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.90%

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | RE1     | 10          | 110.279   | 0.079     | 13.8         | 0.0032        | 0.0000     | OK         |
| 15 minute winter  | MH1     | 11          | 109.980   | 0.080     | 15.7         | 0.0900        | 0.0000     | OK         |
| 15 minute winter  | MH2     | 12          | 109.833   | 0.263     | 25.8         | 0.2977        | 0.0000     | SURCHARGED |
| 15 minute winter  | RE2     | 10          | 110.363   | 0.083     | 14.9         | 0.0033        | 0.0000     | OK         |
| 15 minute winter  | MH3     | 10          | 110.046   | 0.088     | 14.7         | 0.0996        | 0.0000     | OK         |
| 15 minute winter  | MH4     | 11          | 109.891   | 0.056     | 14.5         | 0.0629        | 0.0000     | OK         |
| 15 minute winter  | MH5     | 12          | 109.775   | 0.387     | 42.0         | 0.4372        | 0.0000     | SURCHARGED |
| 15 minute winter  | MH6     | 12          | 109.585   | 0.332     | 52.4         | 0.3750        | 0.0000     | SURCHARGED |
| 60 minute winter  | MH7     | 51          | 110.812   | 0.162     | 16.6         | 17.0493       | 0.0000     | FLOOD RISK |
| 180 minute winter | TANK    | 180         | 109.283   | 0.362     | 21.6         | 72.7257       | 0.0000     | SURCHARGED |
| 15 minute winter  | MH8     | 12          | 109.360   | 0.210     | 55.2         | 0.2376        | 0.0000     | OK         |
| 30 minute winter  | MH9     | 23          | 110.498   | 0.098     | 4.8          | 1.8822        | 0.0000     | OK         |
| 15 minute winter  | MH10    | 13          | 110.674   | 0.174     | 12.8         | 2.7971        | 0.0000     | FLOOD RISK |
| 30 minute winter  | MH11    | 23          | 111.007   | 0.057     | 2.9          | 1.1799        | 0.0000     | OK         |
| 30 minute winter  | MH12    | 24          | 110.021   | 0.021     | 1.3          | 0.0232        | 0.0000     | OK         |
| 180 minute winter | MH13 PC | 180         | 109.281   | 0.436     | 10.2         | 0.4935        | 0.0000     | SURCHARGED |
| 15 minute summer  | MH14    | 1           | 109.570   | 0.000     | 5.0          | 0.0000        | 0.0000     | OK         |

  

| Link Event (Upstream Depth) | US Node | Link    | DS Node | Outflow (l/s) | Velocity (m/s) | Flow/Cap | Link Vol (m³) | Discharge Vol (m³) |
|-----------------------------|---------|---------|---------|---------------|----------------|----------|---------------|--------------------|
| 15 minute winter            | RE1     | 1.000   | MH1     | 13.6          | 1.090          | 0.255    | 0.3546        |                    |
| 15 minute winter            | MH1     | 1.001   | MH2     | 15.4          | 0.865          | 0.272    | 0.7208        |                    |
| 15 minute winter            | MH2     | 1.002   | MH5     | 23.4          | 0.804          | 0.553    | 0.9976        |                    |
| 15 minute winter            | RE2     | 2.000   | MH3     | 14.7          | 1.061          | 0.283    | 0.4466        |                    |
| 15 minute winter            | MH3     | 2.001   | MH4     | 14.5          | 1.334          | 0.280    | 0.1361        |                    |
| 15 minute winter            | MH4     | 2.002   | MH5     | 14.6          | 0.568          | 0.135    | 0.2468        |                    |
| 15 minute winter            | MH5     | 1.003   | MH6     | 42.7          | 1.073          | 1.070    | 0.9072        |                    |
| 15 minute winter            | MH6     | 1.004   | MH8     | 52.7          | 1.324          | 1.321    | 0.6824        |                    |
| 60 minute winter            | MH7     | Orifice | MH8     | 3.2           |                |          |               |                    |
| 180 minute winter           | TANK    | 1.006   | MH13 PC | 10.2          | 0.520          | 0.196    | 0.2967        |                    |
| 15 minute winter            | MH8     | 1.005   | TANK    | 55.3          | 1.564          | 0.899    | 0.1249        |                    |
| 30 minute winter            | MH9     | Orifice | TANK    | 2.3           |                |          |               |                    |
| 15 minute winter            | MH10    | Orifice | TANK    | 6.6           |                |          |               |                    |
| 30 minute winter            | MH11    | Orifice | MH12    | 1.3           |                |          |               |                    |
| 30 minute winter            | MH12    | 6.001   | TANK    | 1.3           | 0.918          | 0.039    | 0.0171        |                    |
| 180 minute winter           | MH13 PC | Pump    | MH14    | 5.0           |                |          |               | 102.6              |

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.90%**

| Node Event        | US Node | Peak (mins) | Level (m) | Depth (m) | Inflow (l/s) | Node Vol (m³) | Flood (m³) | Status     |
|-------------------|---------|-------------|-----------|-----------|--------------|---------------|------------|------------|
| 15 minute winter  | RE1     | 12          | 110.695   | 0.494     | 25.1         | 0.0198        | 0.0000     | FLOOD RISK |
| 15 minute winter  | MH1     | 12          | 110.649   | 0.749     | 26.9         | 0.8469        | 0.0000     | FLOOD RISK |
| 15 minute winter  | MH2     | 12          | 110.587   | 1.017     | 37.1         | 1.1503        | 0.0000     | FLOOD RISK |
| 15 minute winter  | RE2     | 12          | 110.531   | 0.251     | 27.0         | 0.0100        | 0.0000     | SURCHARGED |
| 15 minute winter  | MH3     | 13          | 110.480   | 0.522     | 27.3         | 0.5903        | 0.0000     | FLOOD RISK |
| 15 minute winter  | MH4     | 13          | 110.458   | 0.623     | 23.1         | 0.7042        | 0.0000     | FLOOD RISK |
| 15 minute winter  | MH5     | 12          | 110.435   | 1.047     | 62.0         | 1.1842        | 0.0000     | FLOOD RISK |
| 15 minute winter  | MH6     | 12          | 110.040   | 0.787     | 78.8         | 0.8901        | 0.0000     | SURCHARGED |
| 120 minute winter | MH7     | 94          | 110.928   | 0.278     | 18.7         | 34.9226       | 0.0000     | FLOOD RISK |
| 360 minute winter | TANK    | 352         | 109.670   | 0.750     | 23.6         | 150.4931      | 0.0000     | SURCHARGED |
| 360 minute winter | MH8     | 352         | 109.671   | 0.521     | 18.5         | 0.5890        | 0.0000     | SURCHARGED |
| 30 minute winter  | MH9     | 24          | 110.581   | 0.181     | 8.8          | 3.7685        | 0.0000     | FLOOD RISK |
| 15 minute winter  | MH10    | 14          | 110.835   | 0.335     | 23.3         | 5.7545        | 0.0000     | FLOOD RISK |
| 30 minute winter  | MH11    | 24          | 111.041   | 0.091     | 5.4          | 2.3166        | 0.0000     | OK         |
| 30 minute winter  | MH12    | 24          | 110.026   | 0.026     | 2.1          | 0.0295        | 0.0000     | OK         |
| 360 minute winter | MH13 PC | 352         | 109.669   | 0.824     | 9.3          | 0.9319        | 0.0000     | SURCHARGED |
| 15 minute summer  | MH14    | 1           | 109.570   | 0.000     | 5.0          | 0.0000        | 0.0000     | OK         |

| Link Event<br>(Upstream Depth) | US<br>Node | Link    | DS<br>Node | Outflow<br>(l/s) | Velocity<br>(m/s) | Flow/Cap | Link<br>Vol (m³) | Discharge<br>Vol (m³) |
|--------------------------------|------------|---------|------------|------------------|-------------------|----------|------------------|-----------------------|
| 15 minute winter               | RE1        | 1.000   | MH1        | 23.3             | 1.193             | 0.435    | 1.1270           |                       |
| 15 minute winter               | MH1        | 1.001   | MH2        | 22.4             | 0.864             | 0.394    | 1.0997           |                       |
| 15 minute winter               | MH2        | 1.002   | MH5        | 36.8             | 0.925             | 0.868    | 0.9976           |                       |
| 15 minute winter               | RE2        | 2.000   | MH3        | 27.3             | 1.209             | 0.525    | 1.2819           |                       |
| 15 minute winter               | MH3        | 2.001   | MH4        | 23.1             | 1.406             | 0.446    | 0.4926           |                       |
| 15 minute winter               | MH4        | 2.002   | MH5        | 24.0             | 0.604             | 0.222    | 0.4142           |                       |
| 15 minute winter               | MH5        | 1.003   | MH6        | 63.2             | 1.590             | 1.586    | 0.9072           |                       |
| 15 minute winter               | MH6        | 1.004   | MH8        | 78.8             | 1.983             | 1.978    | 0.6925           |                       |
| 120 minute winter              | MH7        | Orifice | MH8        | 4.4              |                   |          |                  |                       |
| 360 minute winter              | TANK       | 1.006   | MH13 PC    | 9.3              | 0.313             | 0.178    | 0.2967           |                       |
| 360 minute winter              | MH8        | 1.005   | TANK       | 18.2             | 1.137             | 0.296    | 0.1424           |                       |
| 30 minute winter               | MH9        | Orifice | TANK       | 3.4              |                   |          |                  |                       |
| 15 minute winter               | MH10       | Orifice | TANK       | 9.9              |                   |          |                  |                       |
| 30 minute winter               | MH11       | Orifice | MH12       | 2.1              |                   |          |                  |                       |
| 30 minute winter               | MH12       | 6.001   | TANK       | 2.1              | 1.056             | 0.063    | 0.0241           |                       |
| 360 minute winter              | MH13 PC    | Pump    | MH14       | 5.0              |                   |          |                  | 150.0                 |