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| Unit 16<br>St Asaph Business Park<br>St Asaph Denbighshire LL17... | Coedmawr Bangor<br>Existing Drainage |  |
| Date 21/02/2024<br>File Existing Drainage Calcu...                 | Designed by NWO<br>Checked by        |   |
| XP Solutions   | Network 2017.1.2                     |   |

Existing Network Details for Storm


| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|
| 1.000 | 32.342        | 1.570       | 20.6           | 0.000          | 5.00           | 0.600     | o           | 150         | Pipe/Conduit |
| 1.001 | 29.266        | 1.230       | 23.8           | 0.213          | 0.00           | 0.600     | o           | 150         | Pipe/Conduit |

| PN    | US/MH<br>Name | US/CL<br>(m) | US/IL<br>(m) | US<br>C.Depth<br>(m) | DS/CL<br>(m) | DS/IL<br>(m) | DS<br>C.Depth<br>(m) | Ctrl | US/MH<br>(mm) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|------|---------------|
| 1.000 | mh1           | 52.250       | 51.000       | 1.100                | 50.660       | 49.430       | 1.080                |      | 1200          |
| 1.001 | mh2           | 50.660       | 49.430       | 1.080                | 49.500       | 48.200       | 1.150                |      | 1200          |

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Manhole Schedules for Storm

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN    | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | PN    | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|------------------------|-------|---------------------------|------------------------|---------------|
| mh1     | 52.250    | 1.250        | Open Manhole  | 1200               | 1.000 | 51.000                    | 150                    |       |                           |                        |               |
| mh2     | 50.660    | 1.230        | Open Manhole  | 1200               | 1.001 | 49.430                    | 150                    | 1.000 | 49.430                    | 150                    |               |
| mh3     | 49.500    | 1.300        | Open Manhole  | 0                  |       | OUTFALL                   |                        | 1.001 | 48.200                    | 150                    |               |

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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        | 150       | mh1     | 52.250      | 51.000      | 1.100       | Open Manhole  | 1200               |
| 1.001 | o        | 150       | mh2     | 50.660      | 49.430      | 1.080       | Open Manhole  | 1200               |

Downstream Manhole

| PN    | Length (m) | Slope (1:X) | MH Name | C.Level (m) | I.Level (m) | D.Depth (m) | MH Connection | MH DIAM., L*W (mm) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 1.000 | 32.342     | 20.6        | mh2     | 50.660      | 49.430      | 1.080       | Open Manhole  | 1200               |
| 1.001 | 29.266     | 23.8        | mh3     | 49.500      | 48.200      | 1.150       | Open Manhole  | 0                  |

Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
| 1.001               | mh3          | 49.500       | 48.200       | 0.000            | 0        | 0      |

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1 year Return Period 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 \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details


Rainfall Model    FSR    Ratio R 0.272  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)    18.000 Cv (Winter) 0.840

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

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

| PN    | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 1.000 | mh1        | 360 Winter | 1             | +0%            |                     |                 |                    |               |
| 1.001 | mh2        | 15 Winter  | 1             | +0%            | 30/15 Summer        | 100/15 Summer   |                    |               |

| PN    | US/MH Name | Water     |           |                          | Flow / Overflow Cap. | Pipe Flow (l/s) | Pipe Status | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|----------------------|-----------------|-------------|----------------|
|       |            | Level (m) | Depth (m) | Volume (m <sup>3</sup> ) |                      |                 |             |                |
| 1.000 | mh1        | 51.000    | -0.150    | 0.000                    | 0.00                 | 0.0             | OK          |                |
| 1.001 | mh2        | 49.511    | -0.069    | 0.000                    | 0.57                 | 19.9            | OK          | 3              |

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30 year Return Period 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 \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details


Rainfall Model    FSR    Ratio R 0.272  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)    18.000 Cv (Winter) 0.840

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

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

| PN    | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 1.000 | mh1        | 360 Winter | 30            | +0%            |                     |                 |                    |               |
| 1.001 | mh2        | 15 Winter  | 30            | +0%            | 30/15 Summer        | 100/15 Summer   |                    |               |

| PN    | US/MH Name | Water     |           |                          | Pipe              |            | Status     | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|-------------------|------------|------------|----------------|
|       |            | Level (m) | Depth (m) | Volume (m <sup>3</sup> ) | Flow / Cap. (l/s) | Flow (l/s) |            |                |
| 1.000 | mh1        | 51.000    | -0.150    | 0.000                    | 0.00              | 0.0        | OK         |                |
| 1.001 | mh2        | 50.293    | 0.713     | 0.000                    | 1.25              | 43.9       | SURCHARGED | 3              |

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100 year Return Period 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 \* 10m<sup>3</sup>/ha Storage 2.000  
Hot Start Level (mm) 0      Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500      Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model      FSR      Ratio R 0.272  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)      18.000 Cv (Winter) 0.840

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

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

| PN    | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 1.000 | mh1        | 360 Winter | 100           | +0%            |                     |                 |                    |               |
| 1.001 | mh2        | 15 Winter  | 100           | +0%            | 30/15 Summer        | 100/15 Summer   |                    |               |

| PN    | US/MH Name | Water     |           |                          | Flow / Overflow Cap. | Pipe Flow (l/s) | Pipe Status | Level Exceeded |
|-------|------------|-----------|-----------|--------------------------|----------------------|-----------------|-------------|----------------|
|       |            | Level (m) | Depth (m) | Volume (m <sup>3</sup> ) |                      |                 |             |                |
| 1.000 | mh1        | 51.000    | -0.150    | 0.000                    | 0.00                 | 0.0             | OK          |                |
| 1.001 | mh2        | 50.662    | 1.082     | 1.538                    | 1.37                 | 48.2            | FLOOD       | 3              |