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|-----------------------------------------------------------------------------------|--|--------------------------------------------------------|
| WML Consulting Ltd                                                                |  | Page 2                                                 |
| No. 8 Oak Green<br>Stanley Green Business Park<br>Earl Rd, Cheadle Hulme, SK8 6QL |  | Moss Lane East<br>Surface Water Design<br>Revision T02 |
| Date 05/04/2023<br>File Surface Design.MDX                                        |  | Designed by RH<br>Checked by RZ                        |
| Innovyze                                                                          |  | Network 2020.1.3                                       |



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) |
|---------|-----------|--------------|---------------|--------------------|-------|---------------------------|------------------------|-------|---------------------------|------------------------|---------------|
| RE01    | 100.000   | 1.050        | Open Manhole  | 150                | 1.000 | 98.950                    | 150                    |       |                           |                        |               |
| SW01    | 100.000   | 1.252        | Open Manhole  | 450                | 1.001 | 98.748                    | 150                    | 1.000 | 98.748                    | 150                    |               |
| SW02    | 100.000   | 1.352        | Open Manhole  | 450                | 1.002 | 98.648                    | 150                    | 1.001 | 98.648                    | 150                    |               |
| RE02    | 100.000   | 1.050        | Open Manhole  | 150                | 2.000 | 98.950                    | 150                    |       |                           |                        |               |
| SW03    | 100.000   | 1.209        | Open Manhole  | 450                | 2.001 | 98.791                    | 150                    | 2.000 | 98.791                    | 150                    |               |
| SW04    | 100.000   | 1.365        | Open Manhole  | 450                | 1.003 | 98.635                    | 150                    | 1.002 | 98.635                    | 150                    |               |
|         |           |              |               |                    |       |                           |                        | 2.001 | 98.635                    | 150                    |               |
| SW04    | 100.000   | 1.429        | Open Manhole  | 450                | 1.004 | 98.571                    | 150                    | 1.003 | 98.571                    | 150                    |               |
| SW05    | 100.000   | 1.477        | Open Manhole  | 450                | 1.005 | 98.523                    | 150                    | 1.004 | 98.523                    | 150                    |               |
| CW01    | 100.000   | 1.621        | Open Manhole  | 600 x 450          |       | OUTFALL                   |                        | 1.005 | 98.379                    | 150                    |               |

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|----------------|
| RE01    | 384197.059          | 395710.571           | 384197.059               | 395710.571                | Required       |                |
| SW01    | 384177.112          | 395707.379           | 384177.112               | 395707.379                | Required       |                |
| SW02    | 384177.066          | 395697.254           | 384177.066               | 395697.254                | Required       |                |
| RE02    | 384196.902          | 395699.085           | 384196.902               | 395699.085                | Required       |                |
| SW03    | 384181.224          | 395696.572           | 384181.224               | 395696.572                | Required       |                |
| SW04    | 384177.075          | 395695.907           | 384177.075               | 395695.907                | Required       |                |
| SW04    | 384176.948          | 395689.552           | 384176.948               | 395689.552                | Required       |                |
| SW05    | 384181.787          | 395689.773           | 384181.787               | 395689.773                | Required       |                |
| CW01    | 384196.232          | 395689.485           |                          |                           | No Entry       |                |

|                                                                                   |                                                        |                                                                                     |
|-----------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| WML Consulting Ltd                                                                |                                                        | Page 3                                                                              |
| No. 8 Oak Green<br>Stanley Green Business Park<br>Earl Rd, Cheadle Hulme, SK8 6QL | Moss Lane East<br>Surface Water Design<br>Revision T02 |  |
| Date 05/04/2023<br>File Surface Design.MDX                                        | Designed by RH<br>Checked by RZ                        |                                                                                     |
| Innovyze                                                                          | Network 2020.1.3                                       |                                                                                     |

  

Free Flowing Outfall Details for Storm

| Outfall<br>Pipe Number | Outfall C. Level<br>Name (m) | I. Level<br>(m) | Min<br>I. Level<br>(m) | D,L<br>(mm) | W<br>(mm) |
|------------------------|------------------------------|-----------------|------------------------|-------------|-----------|
| 1.005                  | CW01 100.000                 | 98.379          | 0.000                  | 600         | 450       |

  

Simulation Criteria for Storm

|                                 |       |                                     |               |
|---------------------------------|-------|-------------------------------------|---------------|
| Volumetric Runoff Coeff         | 0.750 | Additional Flow - % of Total Flow   | 0.000         |
| Areal Reduction Factor          | 1.000 | MADD Factor * 10m <sup>3</sup> /ha  | Storage 2.000 |
| Hot Start (mins)                | 0     | Inlet Coefficient                   | 0.800         |
| Hot Start Level (mm)            | 0     | Flow per Person per Day (l/per/day) | 0.000         |
| Manhole Headloss Coeff (Global) | 0.500 | Run Time (mins)                     | 60            |
| Foul Sewage per hectare (l/s)   | 0.000 | Output Interval (mins)              | 1             |

  

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

  

Synthetic Rainfall Details

|                       |                   |                       |        |
|-----------------------|-------------------|-----------------------|--------|
| Rainfall Model        | FSR               | Profile Type          | Summer |
| Return Period (years) | 100               | Cv (Summer)           | 0.750  |
| Region                | England and Wales | Cv (Winter)           | 0.840  |
| M5-60 (mm)            | 18.000            | Storm Duration (mins) | 30     |
| Ratio R               | 0.364             |                       |        |

  

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| WML Consulting Ltd                                                                                                                                                                                                                                                            |                                                        | Page 4                                                                              |
| No. 8 Oak Green<br>Stanley Green Business Park<br>Earl Rd, Cheadle Hulme, SK8 6QL                                                                                                                                                                                             | Moss Lane East<br>Surface Water Design<br>Revision T02 |  |
| Date 05/04/2023<br>File Surface Design.MDX                                                                                                                                                                                                                                    | Designed by RH<br>Checked by RZ                        |                                                                                     |
| Innovyze                                                                                                                                                                                                                                                                      |                                                        | Network 2020.1.3                                                                    |
| <p style="text-align: center;"><u>Online Controls for Storm</u></p> <p style="text-align: center;"><u>Orifice Manhole: SW05, DS/PN: 1.005, Volume (m³): 0.3</u></p> <p style="text-align: center;">Diameter (m) 0.068 Discharge Coefficient 0.600 Invert Level (m) 98.523</p> |                                                        |                                                                                     |
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|-----------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| WML Consulting Ltd                                                                |                                                        | Page 5                                                                              |
| No. 8 Oak Green<br>Stanley Green Business Park<br>Earl Rd, Cheadle Hulme, SK8 6QL | Moss Lane East<br>Surface Water Design<br>Revision T02 |  |
| Date 05/04/2023<br>File Surface Design.MDX                                        | Designed by RH<br>Checked by RZ                        |                                                                                     |
| Innovyze                                                                          | Network 2020.1.3                                       |                                                                                     |

### Storage Structures for Storm

#### Porous Car Park Manhole: SW04, DS/PN: 1.004

|                                      |         |                         |     |
|--------------------------------------|---------|-------------------------|-----|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Width (m)               | 5.0 |
| Membrane Percolation (mm/hr)         | 1000    | Length (m)              | 7.5 |
| Max Percolation (l/s)                | 10.4    | Slope (1:X)             | 0.0 |
| Safety Factor                        | 2.0     | Depression Storage (mm) | 5   |
| Porosity                             | 0.30    | Evaporation (mm/day)    | 3   |
| Invert Level (m)                     | 98.571  | Membrane Depth (mm)     | 0   |

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Page 6

No. 8 Oak Green

Stanley Green Business Park

Earl Rd, Cheadle Hulme, SK8 6QL

Moss Lane East

Surface Water Design

Revision T02

Date 05/04/2023

File Surface Design.MDX

Designed by RH

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Micro Drainage

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 \* 10m³/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 1

Number of Online Controls 1

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 0.364

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

Analysis Timestep 2.5 Second

Increment (Extended) DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

Water

Level

PN

US/MH

Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Level (m)

1.000

RE01

15 Summer

1

+0%

98.983

1.001

SW01

15 Summer

1

+0%

98.781

1.002

SW02

15 Summer

1

+0%

100/15 Summer

98.689

2.000

RE02

15 Summer

1

+0%

98.980

2.001

SW03

15 Summer

1

+0%

98.815

1.003

SW04

15 Summer

1

+0%

100/15 Summer

98.685

1.004

SW04

15 Winter

1

+0%

100/15 Summer

98.618

1.005

SW05

15 Winter

1

+0%

30/15 Summer

98.610

Surcharged Flooded

Half Drain Pipe

US/MH

Depth

Volume

Flow / Overflow

Time

Flow

Level

PN

Name

(m)

(m³)

Cap.

(l/s)

(mins)

(l/s)

Status

Exceeded

1.000

RE01

-0.117

0.000

0.11

1.8

OK

1.001

SW01

-0.117

0.000

0.11

1.8

OK

1.002

SW02

-0.109

0.000

0.16

1.7

OK

2.000

RE02

-0.120

0.000

0.09

1.5

OK

2.001

SW03

-0.126

0.000

0.06

1.5

OK

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|                                                                                   |                                                        |                                                                                     |
|-----------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------|
| WML Consulting Ltd                                                                |                                                        | Page 7                                                                              |
| No. 8 Oak Green<br>Stanley Green Business Park<br>Earl Rd, Cheadle Hulme, SK8 6QL | Moss Lane East<br>Surface Water Design<br>Revision T02 |  |
| Date 05/04/2023<br>File Surface Design.MDX                                        | Designed by RH<br>Checked by RZ                        |                                                                                     |
| Innovyze                                                                          | Network 2020.1.3                                       |                                                                                     |

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

| PN    | US/MH<br>Name | Surcharged Flooded |                             | Flow / Overflow |       | Half Drain     | Pipe          | Status | Level<br>Exceeded |
|-------|---------------|--------------------|-----------------------------|-----------------|-------|----------------|---------------|--------|-------------------|
|       |               | Depth<br>(m)       | Volume<br>(m <sup>3</sup> ) | Cap.            | (l/s) | Time<br>(mins) | Flow<br>(l/s) |        |                   |
| 1.003 | SW04          | -0.100             | 0.000                       | 0.23            |       |                | 3.5           | OK     |                   |
| 1.004 | SW04          | -0.103             | 0.000                       | 0.15            |       | 9              | 2.1           | OK     |                   |
| 1.005 | SW05          | -0.063             | 0.000                       | 0.13            |       |                | 2.1           | OK     |                   |

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Page 8

No. 8 Oak Green

Stanley Green Business Park

Earl Rd, Cheadle Hulme, SK8 6QL

Moss Lane East

Surface Water Design

Revision T02

Date 05/04/2023

File Surface Design.MDX

Designed by RH

Checked by RZ

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Network 2020.1.3

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 \* 10m³/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 1

Number of Online Controls 1

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 0.364

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

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 40

PN

US/MH Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level (m)

1.000

RE01

15 Summer

30

+0%

99.002

1.001

SW01

15 Summer

30

+0%

98.802

1.002

SW02

15 Summer

30

+0%

100/15 Summer

98.724

2.000

RE02

15 Summer

30

+0%

98.997

2.001

SW03

15 Summer

30

+0%

98.829

1.003

SW04

15 Summer

30

+0%

100/15 Summer

98.720

1.004

SW04

15 Winter

30

+0%

100/15 Summer

98.704

1.005

SW05

15 Winter

30

+0%

30/15 Summer

98.697

PN

US/MH Name

Depth (m)

Volume (m³)

Flow / Cap.

Overflow (l/s)

Half Drain Time (mins)

Pipe Flow (l/s)

Status

Level Exceeded

1.000

RE01

-0.098

0.000

0.26

4.4

OK

1.001

SW01

-0.096

0.000

0.27

4.3

OK

1.002

SW02

-0.074

0.000

0.39

4.2

OK

2.000

RE02

-0.103

0.000

0.22

3.6

OK

2.001

SW03

-0.112

0.000

0.14

3.6

OK

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|                                                                                               |  |  |  |                      |  |  |         |                                                                                     |  |  |
|-----------------------------------------------------------------------------------------------|--|--|--|----------------------|--|--|---------|-------------------------------------------------------------------------------------|--|--|
| WML Consulting Ltd                                                                            |  |  |  |                      |  |  | Page 11 |                                                                                     |  |  |
| No. 8 Oak Green                                                                               |  |  |  | Moss Lane East       |  |  |         |  |  |  |
| Stanley Green Business Park                                                                   |  |  |  | Surface Water Design |  |  |         |                                                                                     |  |  |
| Earl Rd, Cheadle Hulme, SK8 6QL                                                               |  |  |  | Revision T02         |  |  |         |                                                                                     |  |  |
| Date 05/04/2023                                                                               |  |  |  | Designed by RH       |  |  |         |                                                                                     |  |  |
| File Surface Design.MDX                                                                       |  |  |  | Checked by RZ        |  |  |         |                                                                                     |  |  |
| Innovyze                                                                                      |  |  |  | Network 2020.1.3     |  |  |         |                                                                                     |  |  |
| <u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u> |  |  |  |                      |  |  |         |                                                                                     |  |  |
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