



# Surface water storage volume design tool

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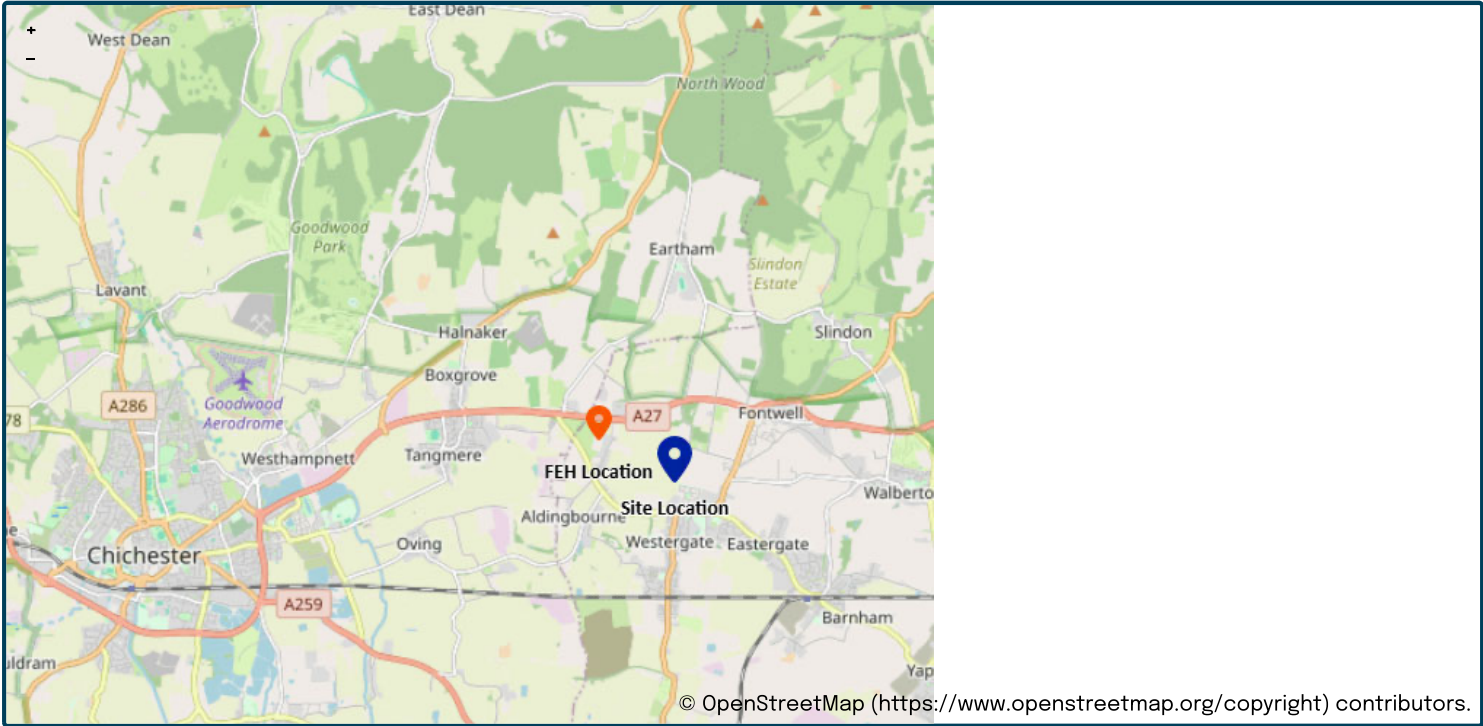
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is recommended that the total storage volume for the site is distributed across the site using multiple SuDS and that hydraulic modelling software is used to undertake and finalise the detailed design of the drainage system.

## Project details

|               |                                                    |
|---------------|----------------------------------------------------|
| Date          | 26/11/2025                                         |
| Calculated by | DO                                                 |
| Reference     | Stanwick, Northfields Lane, Westergate, Chichester |
| Model version | 2.2.2                                              |

## Location

|               |                                                    |
|---------------|----------------------------------------------------|
| Site name     | Stanwick, Northfields Lane, Westergate, Chichester |
| Site location | Stanwick, Northfields Lane, Westergate, Chichester |



|                                       |        |
|---------------------------------------|--------|
| Site easting (British National Grid)  | 493876 |
| Site northing (British National Grid) | 105722 |

## Site areas

|                      |                   |    |
|----------------------|-------------------|----|
| Total site area (ha) | <div>0.1533</div> | ha |
|----------------------|-------------------|----|

## Roof area

|                                 |                  |    |
|---------------------------------|------------------|----|
| Total roof area (ha)            | <div>.0225</div> | ha |
| Contributing roof area (ha)     | <div>.0225</div> | ha |
| Non-contributing roof area (ha) | <div>0</div>     | ha |

## Paved area

|                                  |                  |    |
|----------------------------------|------------------|----|
| Total paved area (ha)            | <div>.0067</div> | ha |
| Contributing paved area (ha)     | <div>.0067</div> | ha |
| Non-contributing paved area (ha) | <div>0</div>     | ha |

## Grass / vegetated area

|                                              |                   |    |
|----------------------------------------------|-------------------|----|
| Total grass / vegetated area (ha)            | <div>0.1241</div> | ha |
| Contributing grass / vegetated area (ha)     | <div>0.1241</div> | ha |
| Non-contributing grass / vegetated area (ha) | <div>0</div>      | ha |

## Total area

|                              |                   |    |
|------------------------------|-------------------|----|
| Total contributing area (ha) | <div>0.1533</div> | ha |
|------------------------------|-------------------|----|

## Contributing areas with urban creep allowance

|                                                                     |                    |    |
|---------------------------------------------------------------------|--------------------|----|
| Urban creep allowance factor                                        | <div>+10%</div>    |    |
| Contributing roof area (adjusted for urban creep) (ha)              | <div>0.02475</div> | ha |
| Contributing paved area (adjusted for urban creep) (ha)             | <div>0.00737</div> | ha |
| Contributing grass / vegetated area (adjusted for urban creep) (ha) | <div>0.12118</div> | ha |

## Storage design parameters

|                                             |                             |   |
|---------------------------------------------|-----------------------------|---|
| Storage base shape                          | <div>Circular</div>         |   |
| Storage design depth (m)                    | <div>0.5</div>              | m |
| Storage side slope (1 in x)                 | <div>1 in 3</div>           |   |
| Storage voids ratio (%)                     | <div>100% (all voids)</div> |   |
| Storage volume design return period (years) | <div>1:100 years</div>      |   |

## Discharge flow rate from the site

### Method

Type of site

Greenfield

Specify the method

IH124

### IH124

SAAR (mm)

My value

760

mm

Map/default value

760

How should SPR be derived?

WRAP soil type

WRAP soil type

2

2

SPR

0.3

Total area for greenfield runoff calculation (ha)

0.1533

ha

0.1533

QBar (l/s)

0.3

l/s

Hydrological region

7

7

Return period (years)

1:100 years

Growth curve factor

3.19

Flow rate (IH124) (l/s)

1

l/s

### Final discharge rate

Runoff calculation method

IH124

Design flow rate (l/s)

1

l/s

### Blockage risk

Specify the method

Flow rate

Minimum discharge flow rate to prevent blockage

1l/s

My value

Design orifice diameter (mm)

26

mm

Calculated value

26

Flow rate of orifice (l/s)

0.99

l/s

### Rainfall and runoff

Rainfall input type

FEH22 CSV file

FEH\_Point\_Rainfall\_FEH22\_AM\_492752\_106148.csv

Distance from FEH location to site (km)

1.2

km

Climate change allowance factor

145%

Specify the runoff method from grass / vegetated areas

Fixed percentage - based on rainfall event depth and SPR

My value

Map value

How should SPR be derived?

WRAP soil type

2

2

0.3

## Model results

- Maximum discharge flow rate: 1.0 (l/s)
- Outflow orifice diameter: 26 (mm)
- Storage base diameter: 11 (m)
- Storage base area: 98 (m<sup>2</sup>)
- Storage total volume: 63 (m<sup>3</sup>)
- Storage total water volume: 63 (m<sup>3</sup>)
- Storm return periods run: 1, 2, 10, 30, 100, 200 (years)
- Storm durations run: 15, 30, 60, 120, 180, 240, 360, 540, 720, 900, 1080, 1440, 1800, 2160, 2880, 3600, 4320, 5040, 5760 (minutes)

| Return Period (years) | Critical Duration (minutes) | Peak Flow Rate (l/s) | Max Depth (m) | Max water volume (m <sup>3</sup> ) | Max storage volume (m <sup>3</sup> ) |
|-----------------------|-----------------------------|----------------------|---------------|------------------------------------|--------------------------------------|
| 1                     | 720                         | 0.5                  | 0.15          | 16                                 | 16                                   |
| 2                     | 540                         | 0.6                  | 0.18          | 20                                 | 20                                   |
| 10                    | 540                         | 0.8                  | 0.31          | 36                                 | 36                                   |
| 30                    | 540                         | 0.9                  | 0.40          | 48                                 | 48                                   |
| <u>100</u>            | <u>540</u>                  | <u>1.0</u>           | <u>0.50</u>   | <u>63</u>                          | <u>63</u>                            |
| 200                   | 720                         | 1.1                  | 0.57          | 75                                 | 75                                   |

Please note runoff estimation and storage volume estimation are subject to uncertainty. Storage volume results are therefore reported to the nearest 1 m<sup>3</sup> value, unless storage volumes are less than 10 m<sup>3</sup>, in which case, storage volumes are provided to 1 decimal place.

### Disclaimer

This report was produced using the surface water storage volume design tool (2.2.2) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate surface water storage volumes for the whole site based on a limiting discharge rate from the site. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

HR Wallingford are not responsible for any rainfall data shared that is subject to licensing terms imposed by UK Centre for Ecology & Hydrology's Flood Estimation Handbook web service (<https://fehweb.ceh.ac.uk/Home/Terms> (<https://fehweb.ceh.ac.uk/Home/Terms>)).



## Appendix H

### InfoDrain Report

|                                                                                 |                               |                   |              |                                                                                     |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |  |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |                                                                                     |
| Report Details:<br>Type: Inflows<br>Storm Phase: SuDS                           | Water Design Engineers (WDE): |                   |              |                                                                                     |



Catchment Area 1

Type : Catchment Area

|           |      |
|-----------|------|
| Area (ha) | 0.01 |
|-----------|------|

#### Preliminary Sizing

|                               |       |
|-------------------------------|-------|
| Volumetric Runoff Coefficient | 0.750 |
| Percentage Impervious (%)     | 80    |
| Time of Concentration (mins)  | 5     |

#### Dynamic Sizing

| Runoff Method                | Time of Concentration |
|------------------------------|-----------------------|
| Summer Volumetric Runoff     | 0.750                 |
| Winter Volumetric Runoff     | 0.840                 |
| Time of Concentration (mins) | 5                     |
| Percentage Impervious (%)    | 80                    |



Catchment Area 2

Type : Catchment Area

|           |       |
|-----------|-------|
| Area (ha) | 0.006 |
|-----------|-------|

#### Preliminary Sizing

|                               |       |
|-------------------------------|-------|
| Volumetric Runoff Coefficient | 0.750 |
| Percentage Impervious (%)     | 80    |
| Time of Concentration (mins)  | 5     |

#### Dynamic Sizing

| Runoff Method                | Time of Concentration |
|------------------------------|-----------------------|
| Summer Volumetric Runoff     | 0.750                 |
| Winter Volumetric Runoff     | 0.840                 |
| Time of Concentration (mins) | 5                     |
| Percentage Impervious (%)    | 80                    |



Catchment Area 3

Type : Catchment Area

|           |       |
|-----------|-------|
| Area (ha) | 0.046 |
|-----------|-------|

#### Preliminary Sizing

|                               |       |
|-------------------------------|-------|
| Volumetric Runoff Coefficient | 0.750 |
| Percentage Impervious (%)     | 55    |
| Time of Concentration (mins)  | 5     |

#### Dynamic Sizing

| Runoff Method                | Time of Concentration |
|------------------------------|-----------------------|
| Summer Volumetric Runoff     | 0.750                 |
| Winter Volumetric Runoff     | 0.840                 |
| Time of Concentration (mins) | 5                     |
| Percentage Impervious (%)    | 60                    |

|                                                                                 |                               |                   |              |                                                                                     |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |  |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |                                                                                     |
| Report Details:<br>Type: Inflows<br>Storm Phase: SuDS                           | Water Design Engineers (WDE): |                   |              |                                                                                     |



Catchment Area 4

Type : Catchment Area

|           |       |
|-----------|-------|
| Area (ha) | 0.079 |
|-----------|-------|

#### Preliminary Sizing

|                               |       |
|-------------------------------|-------|
| Volumetric Runoff Coefficient | 0.750 |
| Percentage Impervious (%)     | 55    |
| Time of Concentration (mins)  | 5     |

#### Dynamic Sizing

| Runoff Method                | Time of Concentration |
|------------------------------|-----------------------|
| Summer Volumetric Runoff     | 0.750                 |
| Winter Volumetric Runoff     | 0.840                 |
| Time of Concentration (mins) | 5                     |
| Percentage Impervious (%)    | 60                    |



Catchment Area 5

Type : Catchment Area

|           |       |
|-----------|-------|
| Area (ha) | 0.012 |
|-----------|-------|

#### Preliminary Sizing

|                               |       |
|-------------------------------|-------|
| Volumetric Runoff Coefficient | 0.750 |
| Percentage Impervious (%)     | 80    |
| Time of Concentration (mins)  | 5     |

#### Dynamic Sizing

| Runoff Method                | Time of Concentration |
|------------------------------|-----------------------|
| Summer Volumetric Runoff     | 0.750                 |
| Winter Volumetric Runoff     | 0.840                 |
| Time of Concentration (mins) | 5                     |
| Percentage Impervious (%)    | 80                    |

|                                                                                 |                               |                   |              |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |
| Report Details:<br>Type: Junctions<br>Storm Phase: SuDS                         | Water Design Engineers (WDE): |                   |              |



| Name | Junction Type | Easting (m) | Northing (m) | Cover Elevation (m) | Depth (m) | Invert Elevation (m) | Chamber Shape | Diameter (m) |
|------|---------------|-------------|--------------|---------------------|-----------|----------------------|---------------|--------------|
| MH2  | Manhole       | 494267.760  | 105703.922   | 11.800              | 0.650     | 11.150               | Circular      | 1.200        |
| MH3  | Manhole       | 494234.063  | 105717.942   | 11.830              | 0.700     | 11.130               | Circular      | 1.200        |
| MH1  | Manhole       | 494240.879  | 105728.221   | 11.770              | 0.600     | 11.170               | Circular      | 1.200        |
| MH5  | Manhole       | 494248.118  | 105721.586   | 11.750              | 0.500     | 11.250               | Circular      | 1.200        |
| MH6  | Manhole       | 494245.141  | 105714.722   | 11.750              | 0.500     | 11.250               | Circular      | 1.200        |
| MH4  | Manhole       | 494234.689  | 105724.214   | 11.800              | 0.700     | 11.100               | Circular      | 1.200        |

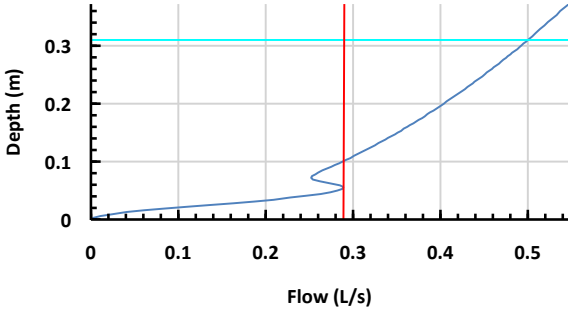
| Name | Lock |
|------|------|
| MH2  | None |
| MH3  | None |
| MH1  | None |
| MH5  | None |
| MH6  | None |
| MH4  | None |

#### Inlets

| Junction | Inlet Name | Incoming Item(s)                     | Bypass Destination | Capacity Type  |
|----------|------------|--------------------------------------|--------------------|----------------|
| MH2      | Inlet      | P3                                   | (None)             | No Restriction |
| MH3      | Inlet      | P4                                   | (None)             | No Restriction |
| MH1      | Inlet      | P1                                   | (None)             | No Restriction |
| MH5      | Inlet      | Catchment Area 5                     | (None)             | No Restriction |
| MH6      | Inlet      | Catchment Area 2<br>Catchment Area 1 | (None)             | No Restriction |
| MH4      | Inlet      | P7<br>P6<br>P5<br>P2                 | (None)             | No Restriction |

|                                                                                 |                               |                   |              |                                                                                     |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |  |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |                                                                                     |
| Report Details:<br>Type: Junctions<br>Storm Phase: SuDS                         | Water Design Engineers (WDE): |                   |              |                                                                                     |

Outlets

| Junction | Outlet Name                                                                         | Outgoing Connection                    | Outlet Type    |
|----------|-------------------------------------------------------------------------------------|----------------------------------------|----------------|
| MH2      | Outlet                                                                              | P4                                     | Free Discharge |
| MH3      | Outlet                                                                              | P5                                     | Free Discharge |
| MH1      | Outlet                                                                              | P2                                     | Free Discharge |
| MH5      | Outlet                                                                              | P7                                     | Free Discharge |
| MH6      | Outlet                                                                              | P6                                     | Free Discharge |
| MH4      | Outlet                                                                              | (None)                                 | Hydro-Brake®   |
|          | Invert Elevation (m)                                                                | 11.700                                 |                |
|          | Design Depth (m)                                                                    | 0.50                                   |                |
|          | Design Flow (L/s)                                                                   | 0.31                                   |                |
|          | Objective                                                                           | Minimize Upstream Storage Requirements |                |
|          | Application                                                                         | Surface Water Only                     |                |
|          | Sump Available                                                                      | <input checked="" type="checkbox"/>    |                |
|          | Flush Flow (L/s)                                                                    | 0.29                                   |                |
|          | Unit Reference                                                                      | CFF-0037-5000-0310-2900                |                |
|          |  |                                        |                |

|                                                                                 |                               |                   |              |                                                                                     |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |  |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |                                                                                     |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: SuDS               | Water Design Engineers (WDE): |                   |              |                                                                                     |



Bioretention 2 (shallow depression)

Type : Bioretention

### Ponding Area

|                          |             |
|--------------------------|-------------|
| Exceedance Elevation (m) | 11.800      |
| Depth (m)                | 0.550       |
| Base Elevation (m)       | 11.250      |
| Top Area (m²)            | 355.00      |
| Side Slope (1:x)         | 10.00       |
| Base Area (m²)           | 63.23       |
| Freeboard (mm)           | 100         |
| Porosity (%)             | 100         |
| Length (m)               | 26.524      |
| Long. Slope (1:x)        | 1000.00     |
| Filtration Rate (m/hr)   | 0.0768      |
| Friction Scheme          | Manning's n |
| n                        | 0.02        |
| Total Volume (m³)        | 88.489      |

### Filter Area

|                    |        |
|--------------------|--------|
| Base Elevation (m) | 11.150 |
|--------------------|--------|

### Filtration Layers

| Use                      | Name    | Filtration Layer Depth (mm) | Porosity (%) | Conductivity (m/hr) | Soil Type |
|--------------------------|---------|-----------------------------|--------------|---------------------|-----------|
| <input type="checkbox"/> | Soil    | 100                         | 100          | 0.36                | Soil Type |
|                          | Storage | 100                         | 100          | 0.36                |           |

### Inlets

#### Inlet

|                    |                  |
|--------------------|------------------|
| Inlet Type         | Point Inflow     |
| Incoming Item(s)   | Catchment Area 4 |
| Bypass Destination | (None)           |
| Inlet Destination  | Ponding Area     |
| Capacity Type      | No Restriction   |

### Outlets

#### Outlet

|                     |                |
|---------------------|----------------|
| Outgoing Connection | P3             |
| Outlet Type         | Free Discharge |

|                                                                                 |                               |                   |              |                                                                                     |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |  |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |                                                                                     |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: SuDS               | Water Design Engineers (WDE): |                   |              |                                                                                     |

#### Advanced

|               |     |
|---------------|-----|
| Safety Factor | 2.0 |
|---------------|-----|

#### Ponding Area

|                               |        |
|-------------------------------|--------|
| Side Infiltration Rate (m/hr) | 0.0768 |
| Base Perimeter (m)            | 57.817 |
| Top Perimeter (m)             | 79.817 |

#### Filter Area

|                               |        |
|-------------------------------|--------|
| Base Infiltration Rate (m/hr) | 0.0768 |
| Side Infiltration Rate (m/hr) | 0.0768 |



Bioretention1 (shallow depression)

Type : Bioretention

#### Ponding Area

|                          |             |
|--------------------------|-------------|
| Exceedance Elevation (m) | 11.700      |
| Depth (m)                | 0.400       |
| Base Elevation (m)       | 11.300      |
| Top Area (m²)            | 76.95       |
| Side Slope (1:x)         | 3.00        |
| Base Area (m²)           | 33.50       |
| Freeboard (mm)           | 100         |
| Porosity (%)             | 100         |
| Length (m)               | 18.103      |
| Long. Slope (1:x)        | 1000.00     |
| Filtration Rate (m/hr)   | 0.0768      |
| Friction Scheme          | Manning's n |
| n                        | 0.02        |
| Total Volume (m³)        | 18.289      |

#### Filter Area

|                    |        |
|--------------------|--------|
| Base Elevation (m) | 11.200 |
|--------------------|--------|

#### Filtration Layers

| Use                      | Name    | Filtration Layer Depth (mm) | Porosity (%) | Conductivity (m/hr) | Soil Type |
|--------------------------|---------|-----------------------------|--------------|---------------------|-----------|
| <input type="checkbox"/> | Soil    | 100                         | 100          | 0.36                | Soil Type |
|                          | Storage | 100                         | 100          | 0.36                |           |

#### Inlets

##### Inlet

|                    |                  |
|--------------------|------------------|
| Inlet Type         | Point Inflow     |
| Incoming Item(s)   | Catchment Area 3 |
| Bypass Destination | (None)           |
| Inlet Destination  | Ponding Area     |
| Capacity Type      | No Restriction   |

|                                                                                 |                               |                   |              |                                                                                     |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|-------------------------------------------------------------------------------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |  |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |                                                                                     |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: SuDS               | Water Design Engineers (WDE): |                   |              |                                                                                     |
|                                                                                 |                               |                   |              |                                                                                     |

Outlets

|                     |                |
|---------------------|----------------|
| Outlet              |                |
| Outgoing Connection | P1             |
| Outlet Type         | Free Discharge |

Advanced

|                               |        |
|-------------------------------|--------|
| Safety Factor                 | 2.0    |
| Ponding Area                  |        |
| Side Infiltration Rate (m/hr) | 0.0768 |
| Base Perimeter (m)            | 39.908 |
| Top Perimeter (m)             | 44.708 |
| Filter Area                   |        |
| Base Infiltration Rate (m/hr) | 0.0768 |
| Side Infiltration Rate (m/hr) | 0.0768 |

|                                                                                 |                               |                   |              |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |
| Report Details:<br>Type: Inflows Summary<br>Storm Phase: SuDS                   | Water Design Engineers (WDE): |                   |              |



**Critical Storm Per Item: Rank By: Max. Inflow**

| Inflow           | Storm Event                               | Inflow Area (ha) | Max. Inflow (L/s) | Total Inflow Volume (m³) |
|------------------|-------------------------------------------|------------------|-------------------|--------------------------|
| Catchment Area 1 | FSR: 100 years:<br>+45 %: 15 mins: Winter | 0.01             | 4.5               | 2.063                    |
| Catchment Area 2 | FSR: 100 years:<br>+45 %: 15 mins: Winter | 0.01             | 3.0               | 1.396                    |
| Catchment Area 3 | FSR: 100 years:<br>+45 %: 15 mins: Winter | 0.05             | 16.1              | 7.447                    |
| Catchment Area 4 | FSR: 100 years:<br>+45 %: 15 mins: Winter | 0.08             | 27.7              | 12.810                   |
| Catchment Area 5 | FSR: 100 years:<br>+45 %: 15 mins: Winter | 0.01             | 5.5               | 2.541                    |

|                                                                                 |                               |                   |              |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |
| Report Details:<br>Type: Junctions Summary<br>Storm Phase: SuDS                 | Water Design Engineers (WDE): |                   |              |



Critical Storm Per Item: Rank By: Max. Depth

| Junction | Storm Event                               | Cover<br>Elevati<br>on (m) | Invert<br>Elevati<br>on (m) | Max.<br>Elevati<br>on (m) | Max.<br>Depth<br>(m) | Max.<br>Inflow<br>(L/s) | Max.<br>Resident<br>Volume<br>(m³) | Max.<br>Flooded<br>Volume<br>(m³) | Max.<br>Outflow<br>(L/s) | Total<br>Discharge<br>Volume<br>(m³) | Status |
|----------|-------------------------------------------|----------------------------|-----------------------------|---------------------------|----------------------|-------------------------|------------------------------------|-----------------------------------|--------------------------|--------------------------------------|--------|
| MH2      | FSR: 100 years: +45<br>%: 15 mins: Winter | 11.800                     | 11.150                      | 11.287                    | 0.137                | 4.7                     | 0.154                              | 0.000                             | 0.0                      | 3.536                                | OK     |
| MH3      | FSR: 100 years: +45<br>%: 15 mins: Winter | 11.830                     | 11.130                      | 11.308                    | 0.178                | 5.1                     | 0.201                              | 0.000                             | 0.0                      | 3.971                                | OK     |
| MH1      | FSR: 100 years: +45<br>%: 30 mins: Winter | 11.770                     | 11.170                      | 11.304                    | 0.134                | 3.5                     | 0.152                              | 0.000                             | 0.9                      | 2.549                                | OK     |
| MH5      | FSR: 100 years: +45<br>%: 15 mins: Winter | 11.750                     | 11.250                      | 11.323                    | 0.073                | 5.5                     | 0.083                              | 0.000                             | 4.7                      | 2.543                                | OK     |
| MH6      | FSR: 100 years: +45<br>%: 15 mins: Winter | 11.750                     | 11.250                      | 11.324                    | 0.074                | 7.5                     | 0.084                              | 0.000                             | 6.4                      | 3.463                                | OK     |
| MH4      | FSR: 100 years: +45<br>%: 15 mins: Winter | 11.800                     | 11.100                      | 11.309                    | 0.209                | 11.1                    | 0.237                              | 0.000                             | 0.0                      | 6.153                                | OK     |

|                                                                                 |                               |                          |              |
|---------------------------------------------------------------------------------|-------------------------------|--------------------------|--------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br><b>05/12/2025</b>    |                          |              |
|                                                                                 | Designed by:<br><b>DO</b>     | Checked by:<br><b>JR</b> | Approved By: |
| Report Details:<br>Type: Stormwater Controls Summary<br>Storm Phase: SuDS       | Water Design Engineers (WDE): |                          |              |





**Critical Storm Per Item: Rank By: Max. US Depth**

| Stormwater Control                  | Storm Event                             | Max. US Elevation (m) | Max. DS Elevation (m) | Max. US Depth (m) | Max. DS Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Total Lost Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Percentage Available (%) | Status |
|-------------------------------------|-----------------------------------------|-----------------------|-----------------------|-------------------|-------------------|-------------------|---------------------------|--------------------------|------------------------|--------------------|-----------------------------|--------------------------|--------|
| Bioretention 2 (shallow depression) | FSR: 100 years: +45 %: 120 mins: Winter | 11.506                | 11.507                | 0.330             | 0.357             | 13.5              | 28.155                    | 0.000                    | 23.091                 | 0.0                | 0.019                       | 68.183                   | OK     |
| Bioretention 1 (shallow depression) | FSR: 100 years: +45 %: 120 mins: Winter | 11.573                | 11.573                | 0.355             | 0.373             | 5.8               | 12.795                    | 0.000                    | 8.453                  | 0.3                | 0.424                       | 30.041                   | OK     |

|                                                                                 |                               |                   |              |
|---------------------------------------------------------------------------------|-------------------------------|-------------------|--------------|
| Housing Extension and Site Drainage:<br>Stanwick, Northfields Lane, Westergate, | Date:<br>05/12/2025           |                   |              |
|                                                                                 | Designed by:<br>DO            | Checked by:<br>JR | Approved By: |
| Report Details:<br>Type: Connections Summary<br>Storm Phase: SuDS               | Water Design Engineers (WDE): |                   |              |



Critical Storm Per Item: Rank By: Max. Flow

| Connection | Storm Event                            | Connection Type | From                                | To  | Upstream Cover Elevation (m) | Max. US Water Elevation (m) | Max. Flow Depth (m) | Discharge Volume (m³) | Max. Velocity (m/s) | Flow / Capacity | Max. Flow (L/s) | Status     |
|------------|----------------------------------------|-----------------|-------------------------------------|-----|------------------------------|-----------------------------|---------------------|-----------------------|---------------------|-----------------|-----------------|------------|
| P4         | FSR: 100 years: +45 %: 30 mins: Winter | Pipe            | MH2                                 | MH3 | 11.800                       | 11.272                      | 0.149               | 0.000                 | 0.0                 | 0.08            | 0.3             | OK         |
| P3         | FSR: 100 years: +45 %: 30 mins: Winter | Pipe            | Bioretention 2 (shallow depression) | MH2 | 11.827                       | 11.438                      | 0.111               | 0.000                 | 0.0                 | 0.02            | 0.3             | Surcharged |
| P1         | FSR: 100 years: +45 %: 15 mins: Winter | Pipe            | Bioretention 1 (shallow depression) | MH1 | 11.718                       | 11.474                      | 0.113               | 0.000                 | 0.1                 | 0.1             | 1.3             | Surcharged |
| P7         | FSR: 100 years: +45 %: 15 mins: Winter | Pipe            | MH5                                 | MH4 | 11.750                       | 11.323                      | 0.141               | 2.543                 | 0.3                 | 0.25            | 4.7             | OK         |
| P6         | FSR: 100 years: +45 %: 15 mins: Summer | Pipe            | MH6                                 | MH4 | 11.750                       | 11.313                      | 0.131               | 3.090                 | 0.4                 | 0.36            | 6.7             | OK         |
| P5         | FSR: 100 years: +45 %: 30 mins: Winter | Pipe            | MH3                                 | MH4 | 11.830                       | 11.306                      | 0.192               | 0.000                 | 0.0                 | 0.01            | 0.3             | OK         |
| P2         | FSR: 100 years: +45 %: 15 mins: Winter | Pipe            | MH1                                 | MH4 | 11.770                       | 11.298                      | 0.150               | 0.000                 | 0.1                 | 0.09            | 1.5             | OK         |



## Appendix I

### Site Investigation and Construction Photographs

Trial Pits Showing standing water/high water table



Excavation and Construction of Bagwork Headwall at the ditch bank



Completed Bagwork Headwall with 150mm dia. Outlet Pipe

