

# FLOOD RISK ASSESSMENT

GRID REF: 528027E, 193454N

**NORTH LONDON BUSINESS PARK**  
BRUNSWICK PARK ROAD, LONDON, N11 1GN

prepared for  
**COMER HOMES GROUP**

**July 2021**

REFERENCE: ST3013/FRA-2107  
REVISION 2



This report has been prepared by Stomor Ltd. based upon information obtained from others. Stomor Ltd cannot be held responsible for inaccuracies in this information.

This report has been prepared for the Client for their sole and specific use. No professional liability or warranty shall be extended to other parties in connection with this report without the explicit written agreement of Stomor Ltd and payment of the appropriate fee.

Drawings contained in this report are based upon information available at the time of production and serve to assess the likely flooding and flood risk implications arising from delivery of the proposed development. The information produced by Stomor Ltd for this report should not be used as detailed design for construction purposes.

Should the Client wish to pass copies of this report to others for information, the entire report should be copied.

| <i>Revision</i> | <i>Author</i> | <i>Checked by</i> | <i>Issue Date</i> |
|-----------------|---------------|-------------------|-------------------|
| <i>0</i>        | <i>JD</i>     | <i>SJB</i>        | <i>05.07.21</i>   |
| <i>1</i>        | <i>JD</i>     | <i>SJB</i>        | <i>06.08.21</i>   |
| <i>2</i>        | <i>JD</i>     | <i>TJW</i>        | <i>09.12.21</i>   |

## CONTENTS

|     |   |    |
|-----|---|----|
| 1   | Introduction.....   | 1  |
| 1.4 | Policy Context.....   | 1  |
| 1.5 | Vulnerability and the NPPF Sequential Test .....                    | 2  |
| 2   | Site Location .....   | 4  |
| 3   | Site Background.....  | 5  |
| 4   | Existing Drainage.....  | 6  |
| 4.2 | Surface Water Drainage.....   | 6  |
| 4.3 | Foul Drainage .....   | 7  |
| 5   | Proposed Development.....   | 8  |
| 6   | Proposed Site Drainage .....  | 9  |
| 6.1 | General.....  | 9  |
| 6.2 | Surface Water Drainage.....   | 9  |
| 6.3 | Foul Drainage .....   | 12 |
| 6.4 | Detailed Design and Approvals.....                                  | 12 |
| 6.5 | Maintenance of Drainage Features .....                              | 13 |
| 7   | Potential Sources of Flooding .....                                 | 15 |
| 7.2 | Flooding from Land (Surface Water) .....                            | 15 |
| 7.3 | Flooding from Groundwater .....                                     | 16 |
| 7.4 | Flooding from Sewers.....   | 17 |
| 7.5 | Flooding from Reservoirs, Canals and Other Artificial Sources ..... | 17 |
| 8.0 | Summary and Recommendations.....                                    | 18 |

## APPENDICES

- A Site Location Plan
- B Proposed Site Plan
- C Soilscales Map
- D Thames Water Sewer Records
- E Greenfield Runoff Rates Calculation Sheet
- F Indicative Drainage Strategy
- G Micro Drainage Output Files
- H SFRA Groundwater Flood Risk Map
- I Thames Water Sewer Flooding History Enquiry

## 1 Introduction

- 1.1 Stomor Ltd have been commissioned by Comer Homes Group to prepare a Flood Risk Assessment (FRA) associated with the proposed redevelopment of North London Business Park in Barnet, London. A Site Location Plan is provided in **Appendix A**.
- 1.2 The overall area of the site is approximately 16.37 hectares (ha) and currently comprises office buildings, car parking facilities, a Secondary School and numerous other small structures.
- 1.3 Development proposals comprise a mixed-use development of up to 2,500 residential dwellings, 7,148m<sup>2</sup> of non-residential floorspace, 20,250m<sup>2</sup> of open space and a 5 Form Entry Secondary School. A copy of the Proposed Site Plan is provided in **Appendix B**.
- 1.4 The site was subject to an Outline Planning Application (REF: 15/07932/OUT) for a mixed-use development of up to 1,350 residential dwellings, 1,162m<sup>2</sup> retail space, 1,010m<sup>2</sup> community space and a 1,050-pupil capacity school. The application was submitted in 2015 and was granted planning permission at appeal in February 2020.
- 1.5 An FRA was previously prepared by Awcock Ward Partnership (AWP) to support the 2015 planning application. No objections to the FRA or the accompanying drainage strategy were received from the statutory consultees.

### 1.6 Policy Context

- 1.6.1 The FRA has been prepared in accordance with the relevant national, regional and local planning policy as follows:
- The National Planning Policy Framework (NPPF) by the Ministry of Housing, Communities and Local Government, and accompanying National Planning Practice Guidance (NPPG).
  - Department for Environment, Food and Rural Affairs (DEFRA) and The Environment Agency (EA) published Guidance for Planning Applications: Assessing Flood Risk.
  - The EA Flood Risk Standing Advice (FRSA) version 3.1 (April 2012).
  - The EA's Approach to Groundwater Protection (March 2017).
  - The London Plan (March 2021).

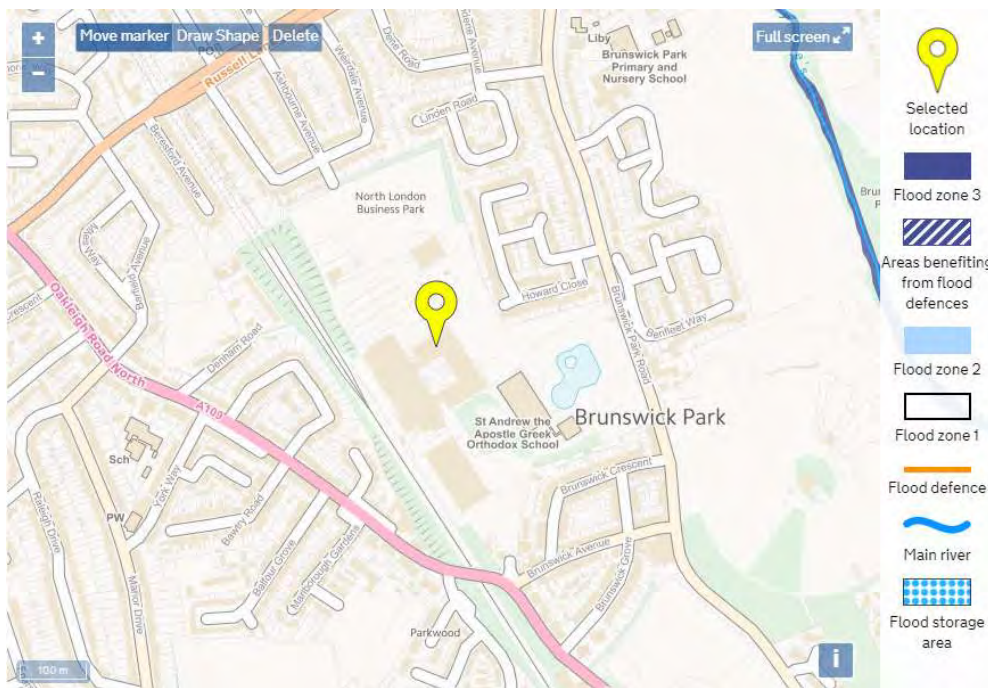
- London Borough of Barnet (LBB) Strategic Flood Risk Assessment (SFRA) (2018).
- LBB Local Flood Risk Management Strategy (October 2017).

1.6.2 Furthermore, the FRA follows the methodology prescribed in Construction Industry Research and Information Association (CIRIA) document C624: Development and Flood Risk (2004), Guidance for the Construction Industry.

1.7 Vulnerability and the NPPF Sequential Test

1.7.1 The NPPF follows a sequential risk based approach in determining the suitability of land for development in flood risk areas, with the intention of steering all new development to the lowest flood risk areas.

1.7.2 The indicative floodplain map obtained from the EA website is provided in **Figure 1.1**. This shows the site to be located within Flood Zone 1.



**Figure 1.1 - Environment Agency Indicative Floodplain Map**

1.7.3 The difference between Flood Zones 1, 2 and 3 are described in the table below:

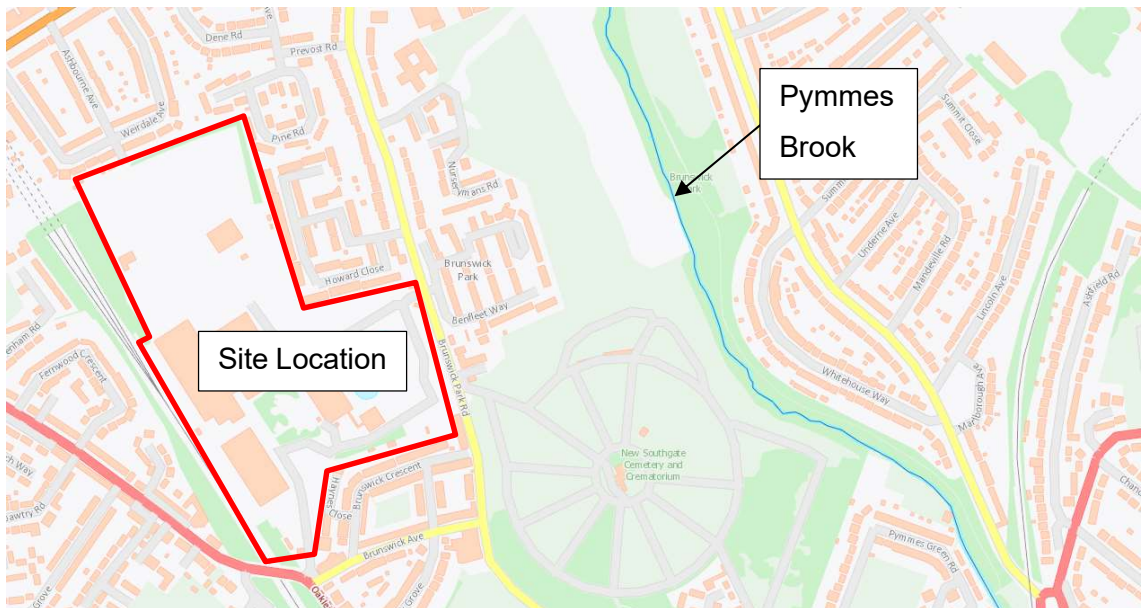
|                                     |  |
|-------------------------------------|--|
| <b>Zone 1</b><br>Low Probability    | Land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%)  |
| <b>Zone 2</b><br>Medium Probability | Land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.55% – 0.1%) in any year. |

|   |   |
|---|---|
| <b>Zone 3a</b><br>High Probability          | Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.  |
| <b>Zone 3b</b><br>The Functional Floodplain | Land where water has to flow or be stored in times of flood. (Land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood or at another probability to be agreed between the LPA and the EA including water conveyance routes). |

- 1.7.4 The Flood Risk and Coastal Change Category (ID 7) of the PPG and associated documents identifies that a Flood Risk Assessment is required for areas at risk of flooding, or for developments of more than 1ha within Flood Zone 1.
- 1.7.5 The Flood Risk and Coastal Change Category of the NPPG and associated documents identifies that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.
- 1.7.6 The current use of the site for commercial purposes would have an NPPF flood risk vulnerability classification of 'Less Vulnerable'. Where redevelopment comprises residential units and a new school, the flood risk vulnerability would increase from 'Less Vulnerable' to 'More Vulnerable'.
- 1.7.7 EA Technical Guidance identifies that 'Less Vulnerable' uses of land are appropriate within Flood Zones 1, 2 and 3a, whilst 'More Vulnerable' land uses are only appropriate within Flood Zones 1 and 2. Therefore, it is considered that the proposed development would be appropriate in this area.
- 1.7.8 The DEFRA and EA Guidance for Planning Applications identifies that an FRA will be required for developments more than 1 ha and in Flood Zone 1.
- 1.7.9 The Flood Risk and Coastal Change Category of the NPPG and associated documents identify that site-specific flood risk assessments should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

## 2 Site Location

- 2.1 The application site comprises approximately 16.37ha of previously developed land, to the west of New Southgate.
- 2.2 Access to the site is currently taken from the A109 Oakleigh Road South, to the south, and from Brunswick Park Road, to the east.
- 2.3 The development boundary is defined by an existing railway line to the west, Brunswick Park Road to the east and residential development to the north and south.
- 2.4 The site levels vary significantly, with steep slopes down to the south east and eastern boundaries. The highest point of the site is about 72.53m Above Ordnance Datum (AOD), at the north western corner, adjacent to the residential dwellings to the north.
- 2.5 The nearest watercourse to the site is Pymmes Brook, located approximately 450m to the east and is identified as an EA designated statutory Main River. A copy of the EA Main River Map is presented in **Figure 2.1**.



**Figure 2.1 - Environment Agency Main River Map**

- 2.6 The site is not located within any Groundwater Source Protection Zones. Therefore, there should be no restrictions on the area discharging via infiltration methods, subject to suitable infiltration rates and levels of water treatment.



### 3 Site Background

- 3.1 A level 1 Strategic Flood Risk Assessment (SFRA) for the area was prepared by Metis Consultants Ltd. in April 2018. The SFRA is used as a desk-based study to map all forms of flood risk to provide an evidence basis to locate new development primarily within low risk areas. The information allows the planning authority to identify the level of detail required for site-specific Flood Risk Assessments.
- 3.2 Inspection of the British Geological Survey (BGS) website identifies that the underlying ground conditions of the site comprise London Clay Formation. Local borehole data from the BGS website confirms the area to be underlain by London Clay.
- 3.3 Inspection of Cranfield University's Soilscales Map, obtained from the Land Information System (LandIS) website, identifies that the soil at the application site is base-rich, loamy and clayey with impeded drainage. A copy of the Soilscales map is provided in **Appendix C**.
- 3.4 For the purposes of this assessment, it is assumed that infiltration methods at the site will not be feasible. However, it is recommended that infiltration tests to BRE Digest 365 will need to be undertaken during the detailed design stages.

## 4 Existing Drainage

4.1 Investigations into the existing drainage of the site have been carried out using the above information in conjunction with the topographical survey and site inspection. In addition, existing Thames Water Utilities (TWU) drainage records have been obtained in order to identify the available public sewer networks in the vicinity of the site. A copy of the TWU records is provided in **Appendix D**.

### 4.2 Surface Water Drainage

4.2.1 Topographical survey information for the site identifies several existing gullies and inspection chambers located across the site. It is presumed that this infrastructure discharges to the public sewer network in the vicinity of the site.

4.2.2 TWU sewer records identify a 525mm diameter public surface water sewer which runs parallel to the western site boundary, before passing through the middle of the site from west to east. TWU records suggest this public sewer serves a culverted watercourse which crosses beneath the existing railway located to the west of the site.

4.2.3 An additional 375mm diameter public surface water sewer runs from west to east through the site. The head of this run appears to be located west of the existing school located on site. The two public sewers passing through the site converge at the eastern site boundary, before joining the public surface water sewer located on Brunswick Park Road

4.2.4 Inspection of the British Geological Survey (BGS) website identifies that the underlying geology of the site comprises London Clay Formation. This information indicates that the underlying soil conditions are unlikely to provide a suitable infiltration rate, although this would need to be confirmed by soil infiltration testing, in accordance with BRE Digest 365.

4.2.5 Considering an existing impermeable area of approximately 6.62ha, brownfield runoff rates for the site during various storm events have been calculated, based upon the Modified Rational Method, as follows:

| Storm Event    | Rainfall Intensity | Peak Runoff Rate |
|----------------|--------------------|------------------|
| 1 in 1 year    | 50mm/h             | 920l/s           |
| 1 in 30 years  | 126mm/h            | 2,319l/s         |
| 1 in 100 years | 152mm/h            | 2,797l/s         |

4.2.6 Greenfield runoff rates have been calculated based upon IH124 Method, using a total site area of 16.37ha to be positively drained. Geotechnical information indicates that the underlying soil conditions would reflect Winter Rain Acceptance Potential (WRAP) Soil Class 4. A copy of the calculation sheet is provided in **Appendix E**, which gives flow rates as follows:

| <b>Greenfield Runoff (l/s)</b> |      |       |
|--------------------------------|------|-------|
| Qbar                           | -    | 75.1  |
| 1 in 1 year                    | Q1   | 63.8  |
| 1 in 30 years                  | Q30  | 172.7 |
| 1 in 100 years                 | Q100 | 239.5 |

4.2.7 As previously stated, an FRA and associated drainage strategy were approved as part of the 2015 planning application, with permission received in February 2020. As part of this FRA, the following Greenfield Runoff Rates were identified and approved as discharge rates for the proposed development:

| <b>Greenfield Runoff (l/s)</b> |      |       |
|--------------------------------|------|-------|
| 1 in 2 year                    | Q2   | 63.3  |
| 1 in 30 years                  | Q30  | 152.9 |
| 1 in 100 years                 | Q100 | 222.7 |

4.2.8 With the introduction of additional SuDS features, it is proposed to provide betterment on these previously approved rates via a complex flow control for all return periods up to 1 in 100 years plus climate change allowance.

#### 4.3 Foul Drainage

4.3.1 TWU sewer records identify a 225mm public foul water sewer running from north to south along Brunswick Park Road, to the east of the site. The public foul sewer then appears to head east along Benfleet Way, although the sewer records identify the sewers on Benfleet Way as being subject to an adoption agreement.

4.3.2 TWU sewer records do not identify any public foul water manholes located within the application site.

## **5 Proposed Development**

- 5.1.1 Development proposals comprise a mixed-use development of up to 2,500 residential dwellings, 7,148m<sup>2</sup> of non-residential floorspace, 20,250m<sup>2</sup> of open space and a 5 Form Entry Secondary School.
- 5.1.2 Vehicular access to the site will be taken from Brunswick Park Road to the east and Oakleigh Road South to the south of the application site.
- 5.1.3 The proposed development would have a NPPF flood risk vulnerability classification of 'More Vulnerable', which NPPG guidance deems appropriate within Flood Zones 1, 2 and 3a.

## 6 Proposed Site Drainage

### 6.1 General

6.1.1 Environment Agency (EA) Flood Risk Assessment (FRA) Guidance Note 1 - Development within a Critical Drainage area or greater than 1 hectare (ha) in Flood Zone 1 (Dated April 2012) states that the applicant should submit, "*Proposals for surface water management that aims to not increase, and where practicable reduce the rate of runoff from the site as a result of the development*".

### 6.2 Surface Water Drainage

6.2.1 It is considered that surface water runoff from the site currently discharges into the public surface water sewers which pass through the site.

6.2.2 For the purposes of this assessment, it has been assumed that the proposed development of the site will result in the generation of approximately 6.62ha of impermeable area.

6.2.3 In accordance with EA Guidance, the order of consideration for the disposal of surface water runoff from a development should be as follows; infiltration methods, watercourses then public sewer network.

6.2.4 Inspection of the British Geological Survey (BGS) website identifies that the underlying geology of the site comprise London Clay Formation, which indicates it is unlikely there will be a suitable infiltration rate on site for the use of SuDS. Therefore, for the purpose of this assessment, it is assumed that infiltration methods will not be suitable for the discharge of surface water from the development.

6.2.5 The approved FRA previously prepared for the site identified the surrounding area as being subject to impeded drainage, and subsequently disregarded infiltration as a means of surface water discharge. Therefore, for the purposes of this assessment infiltration has not been deemed feasible.

6.2.6 It is therefore proposed that runoff will connect to the existing public sewer network passing through the site.

6.2.7 A drainage strategy for the site is provided in **Appendix F**. The strategy demonstrates a proposed layout of SuDS to provide sufficient source control and storage to avoid flooding within the site during all storms up to and including the 1 in 100 year storm event plus 40% allowance for climate change.

6.2.8 The proposed drainage strategy incorporates SuDS features which will need to have clear, enforceable maintenance regimes in place so that they provide effective flood protection and water treatment for the long term.

6.2.9 The CIRIA SuDS Manual C753 promotes the use of the Simple Index Approach as a methods of determining water quality risk management and is generally regarded as the accepted method within the industry.

6.2.10 Table 26.2 of The SuDS Manual C753 gives pollution hazard indices for different land use classifications:

| Land use   | Pollution hazard level | Total suspended solids (TSS) | Metals  | Hydro-carbons |
|--|------------------------|------------------------------|---|---------------|
| Residential Roofs  | Very Low               | 0.2                          | 0.2   | 0.05          |
| Other Roofs (typically commercial/ industrial roofs)   | Low                    | 0.3                          | 0.2 (unless there is potential for metals to leach from the roof) | 0.05          |
| Individual property driveways, residential car parks, low traffic roads (e.g cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g schools, offices) i.e <300 traffic movements/day | Low                    | 0.5                          | 0.4   | 0.4           |
| Commercial yard and delivery areas, non-residential car parking with frequent change (e.g hospitals, retail) all roads except low traffic roads and truck roads/ motorways   | Medium                 | 0.7                          | 0.6   | 0.7           |

6.2.11 Table 26.3 of The SuDS Manual provides typical treatments levels for discharge to surface waters. The proposed drainage strategy for the site incorporates permeable pavement, and a detention basin. An extract of the relevant sections of the table is reproduced below:

| Type of SuDS component             | Mitigation indices |        |              |
|------------------------------------|--------------------|--------|--------------|
|                                    | TSS                | Metals | Hydrocarbons |
| Bioretention System (Rain Gardens) | 0.8                | 0.8    | 0.8          |
| Detention Basin                    | 0.5                | 0.5    | 0.6          |

6.2.12 To deliver adequate treatment, the selected SuDS components should have a total mitigation indices that equals or is greater than the pollution hazard index. Where a single SuDS component is insufficient, additional components in a series would be required where:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_n)$$

6.2.13 Surface water runoff from residential roofs and low traffic roads will, as a minimum, pass through the detention basin. Therefore, as a minimum, the total SuDS mitigation would be as follows:

| SuDS components    | Mitigation indices |            |              |
|--------------------|--------------------|------------|--------------|
|                    | TSS                | Metals     | Hydrocarbons |
| 1) Detention Basin | 0.5                | 0.5        | 0.6          |
| <b>Total</b>       | <b>0.5</b>         | <b>0.5</b> | <b>0.6</b>   |

6.2.14 Surface water runoff from all other roads (greater than 300 traffic movements a day) will, as a minimum, pass through the proposed rain gardens and the detention basin. Therefore, as a minimum, the total SuDS mitigation would be as follows:

| SuDS components                       | Mitigation indices |             |              |
|---------------------------------------|--------------------|-------------|--------------|
|                                       | TSS                | Metals      | Hydrocarbons |
| 1) Bioretention System (Rain Gardens) | 0.8                | 0.8         | 0.8          |
| 2) Detention Basin                    | 0.25               | 0.25        | 0.3          |
| <b>Total</b>                          | <b>1.05</b>        | <b>1.05</b> | <b>1.1</b>   |

6.2.15 From the above tables the SuDS proposed on the development would provide an adequate level of water treatment for the potential pollution hazards generated by the land uses.

6.2.16 In order to provide a robust assessment, drainage proposals will retain the 1 in 100 year storm event within the site, without generating flood risk to proposed buildings within or adjacent to the development, while also making provision for climate change, relating to a 40% increase in rainfall intensity.

6.2.17 The proposed drainage strategy has been modelled using Micro Drainage. Copies of Micro Drainage output files for the development are provided in **Appendix G**, demonstrating that the proposed SuDS features provide sufficient storage to avoid flooding during the 1 in 100 year storm event plus 40% allowance for climate change.

6.2.18 During construction of the development, Opecprime Development Ltd will be responsible for managing and maintaining the surface water drainage features on site. Upon completion, the management and maintenance responsibilities will be transferred to Comer Property Management.

### 6.3 Foul Drainage

6.3.1 As previously stated, TWU sewer records do not identify any public foul water manholes located within the application site.

6.3.2 A proposed development of up to 2,500 residential units would be expected to generate a peak foul flow rate of approximately 115.7l/s, based upon 4000 litres/unit dwelling/day, in accordance with Water UK's Design and Construction Guidance.

6.3.3 A school with capacity for 1,050 students would be expected to generate a peak foul flow rate of approximately 3.39l/s, based upon 90 litres per head per day and an 8 hour school day. However, it is considered that the peak foul flow periods for the school and residential units would not occur at the same time due to the schools operational period being within the general working weekday periods of 09:00hrs to 17:00hrs.

6.3.4 A Pre-Planning Enquiry has been submitted to TWU to establish points of connection and to determine any requirement for associated upgrade works.

6.3.5 A drainage strategy for the discharge of foul water flows from the development has been prepared and is provided in **Appendix F**. These drawings show an illustrative drainage layout to demonstrate that the site can be drained based upon the proposed development. These drawings are a strategy only and must not be used for construction purposes.

### 6.4 Detailed Design and Approvals

6.4.1 The drainage strategy is subject to approval by the Lead Local Flood Authority, BBC and TWU.

6.4.2 During detailed design stage, surface and foul water discharge rates and connections will need to be approved by TWU.

6.4.3 Proposed drainage systems will need to be modelled in MicroDrainage to confirm required pipe sizes and storage volumes.



6.4.4 Overland flow routes have been shown on the drainage strategy through the development towards several wet ponds. Final external levels will be designed to prevent overland flow routes from entering buildings during extreme rainfall events.

#### 6.5 Maintenance of Drainage Features

6.5.1 The design process should consider the maintenance of the components including any corrective maintenance to repair defects or improve performance of SuDS. Inlets, outlets, control structures or other below ground features should be as shallow as reasonably possible to allow easy access for maintenance and to reduce safety risks, while ensuring that sufficient depth is maintained for structural stability.

6.5.2 A SuDS Management Plan will be provided at detailed design stage which will identify the following:

- The function of SuDS;
- How and why it works on the site;
- Impacts on amenity and wildlife, indicating how they can be enhanced;
- Health and safety issues;

6.5.3 Usually, SuDS components are on or near the surface and most can be managed using landscape maintenance techniques. Typical inspection and maintenance requirements for surface SuDS features are identified below:

| Activity                    | Indicative frequency               | Typical tasks  |
|-----------------------------|------------------------------------|--|
| Routine/regular maintenance | Monthly (for normal care of SuDS)  | <ul style="list-style-type: none"> <li>• litter picking</li> <li>• grass cutting (cuttings to compost, wildlife piles or removed from site) Height and frequency dependent upon amenity of grass area.</li> <li>• inspection of inlets, outlets and control structures.</li> </ul>   |
| Occasional maintenance      | Annually (dependent on the design) | <ul style="list-style-type: none"> <li>• silt control around components</li> <li>• vegetation management around components</li> <li>• suction sweeping of permeable paving in autumn after leaf fall</li> <li>• silt and debris removal from inlets, outlets, gratings, catchpits, control chambers, soakaways and cellular storage.</li> <li>• strim wet swale or pond edges in September to October or 3-year rotation for wildlife value</li> <li>• wetland vegetation to be cut to 30% height annually and to 100mm on a 3 year rotation</li> <li>• remove overhanging trees or growth within SuDS features</li> </ul> |

|                      |   |  |
|----------------------|---|--|
| Remedial maintenance | As required (tasks to repair problems due to damage or vandalism) | <ul style="list-style-type: none"> <li>• inlet/outlet repair</li> <li>• erosion repairs</li> <li>• reinstatement of edgings</li> <li>• reinstatement following pollution</li> <li>• removal of silt build up.</li> </ul> |
|----------------------|---|--|

- 6.5.4 For below-ground SuDS, such as permeable paving, the manufacturer or designer should provide maintenance advice. This should include routine and long-term actions that can be incorporated into the SuDS Management Plan.
- 6.5.5 Funding for the maintenance of SuDS features on the site should be resolved at the start of the development process to ensure that there is sufficient resources to maintain the systems in the long-term.
- 6.5.6 If the development is to be constructed in phases, the proposed surface water drainage system is established as soon as reasonably practicable. It will be necessary to ensure sufficient storage is provided for earlier phases of development to avoid flooding during the 1 in 100 year storm event plus 40% allowance for climate change.

## **7 Potential Sources of Flooding**

### **7.1 Flooding from Rivers or Sea**

7.1.1 The EA Indicative Floodplain Map, shown in **Figure 1.1**, identifies that the site lies wholly within Flood Zone 1; land considered to have a Very Low probability of flooding and defined as land having less than 1 in 1,000 annual probability of river or sea flooding.

7.1.2 The primary source of fluvial flooding from the site would be from Pymmes Brook, located approximately 450m east of the site.

7.1.3 The EA Indicative Floodplain Map identifies that fluvial flooding associated with Pymmes Brook would not affect any areas in the immediate vicinity of the site.

### **7.2 Flooding from Land (Surface Water)**

7.2.1 Flooding from land occurs when intense rainfall is unable to soak into the ground or enter drainage systems. Local topography and built form can have a strong influence on the direction and depth of flow.

7.2.2 The EA indicative surface water flood map identifies land to the east of the existing school building on site, and the railway line abutting the western site boundary, are considered to be at a high risk of surface water flooding. A small corridor of land which passes through the middle of the site from north to south, before heading east towards Brunswick Park Road, is considered to be at a low risk of surface water flooding. An extract from the EA website is provided in **Figure 7.1** below.



**Figure 7.1 – Environment Agency Indicative Surface Water Flood Map**

7.2.3 Overland flow paths will be taken into account in design of levels for the proposed development to direct overland flows away from buildings. Overland flow routes are shown on the Indicative Drainage Strategy which is provided in **Appendix F**.

7.2.4 On-site drainage systems will be designed to accommodate runoff volume from a 1 in 100 year plus 40% climate change rainfall event, so as to minimise overland flow routes during such storm events.

### 7.3 Flooding from Groundwater

7.3.1 Groundwater flooding occurs when water levels in the ground rise above surface elevations. Groundwater flooding events are most likely to occur in low lying areas underlain by permeable rocks (aquifers).

7.3.2 The SFRA identifies land within the eastern half of the site as being <25% susceptible to groundwater flooding. According to the SFRA maps, land to the north west of the site is considered to have no susceptibility to groundwater flooding. A copy of the Susceptibility

to Groundwater Flood Risk Map from the London Borough of Barnet SFRA is provided in **Appendix H**.

7.3.3 It is anticipated that groundwater flooding should not be an issue to the proposed development. However, overland flow routes will be taken into account in the design of levels for the proposed development and, should groundwater flooding occur on the site, flows will tend to run overland towards ponds situated at the low areas of the site.

#### 7.4 Flooding from Sewers

7.4.1 The SFRA identifies between 61-80No. sewer flooding incidents within the N11 1 postcode area. However, the exact location of these incidents has not been specified. A sewer flooding history enquiry was submitted to Thames Water who confirmed that they have no historic recorded flooding incidents for the area in the vicinity of the site. A copy of the TWU sewer flooding history enquiry response is provided in **Appendix I**.

7.4.2 The development layout will be designed with consideration of flood routing, to ensure that new buildings and occupants of the site will not be subject to detrimental impacts in the event of flooding from infrastructure failure within or upstream of the site.

#### 7.5 Flooding from Reservoirs, Canals and Other Artificial Sources

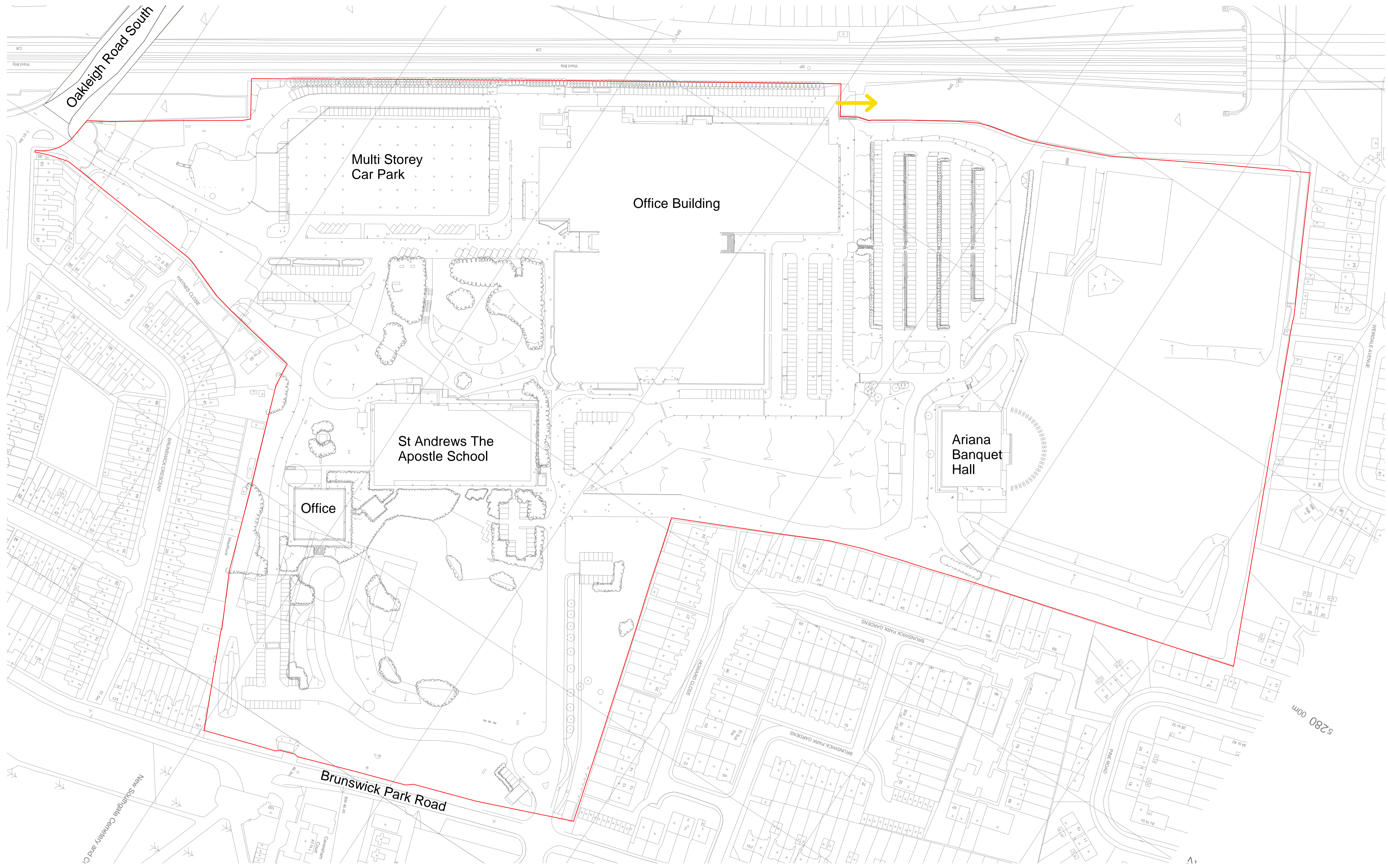
7.5.1 Inspection of the EA flood maps confirms that there are no records of flooding due to reservoirs, canals or other artificial sources in the vicinity of the site.

7.5.2 No other non-natural or artificial sources of flooding where water is retained above natural ground level, operational and redundant industrial processes including mining, quarrying and sand and gravel extraction, would appear to be located in the vicinity of the site which may cause increase floodwater depths or velocities.

## **8.0 Summary and Recommendations**

- 8.1 Stomor Ltd have been commissioned by Comer Homes Group to prepare a Flood Risk Assessment (FRA) associated with proposed redevelopment North London Business Park in Barnet, London.
- 8.2 The overall area of the site is approximately 16.37 hectares (ha) and comprises office buildings, car parking facilities, a Secondary School and numerous other small structures.
- 8.3 Development proposals comprise a mixed-use development of up to 2,500 residential dwellings, 7,148m<sup>2</sup> of non-residential floorspace, 20,250m<sup>2</sup> of open space and a 5 Form Entry Secondary School.
- 8.4 The nearest watercourse to the site is Pymmes Brook, located approximately 450m east of the site.
- 8.5 The proposed development would have an NPPF flood risk vulnerability classification of 'More Vulnerable'. The proposed development area of the site will be situated mostly within Flood Zone 1. NPPG identifies that 'More Vulnerable' uses of land are appropriate within this flood zone.
- 8.6 It is considered that the site would not be at risk of flooding from surface water, sewer, groundwater or artificial sources.
- 8.7 A potential surface water outfall from the development would appear to be feasible into the existing public surface water sewer passing through the site.
- 8.8 The proposed surface water drainage strategy demonstrates a system of SuDS and attenuation features to provide sufficient storage to avoid flooding within the site during the 1 in 100 year storm event + 40% allowance for climate change.
- 8.9 Overland flow paths will be taken into account in design of levels for the proposed development to direct overland flows away from buildings.





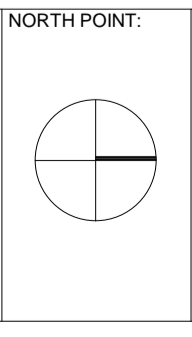
**General Notes**

- 1. Development Zones (within which development can occur) and public open spaces are identified on drawing number 211\_WS\_02\_01
- 2. Access and circulation routes are identified on Drawing number 211\_WS\_02\_02.
- 3. Landscape treatments are identified on drawing number 211\_WS\_02\_03
- 4. Allowable uses at ground floor frontages are identified on Drawing number 211\_WS\_02\_04
- 4. Allowable uses at ground floor frontages are identified on Drawing number 211\_WS\_02\_04
- 5. Proposed site ground levels, heights, allowable horizontal and vertical deviations are identified on Drawing number 211\_WS\_02\_05

**Legend**

Planning Application Boundary

| REV. | DATE: | DETAILS: | INITIALS: |
|------|-------|----------|-----------|
|      |       |          |           |
|      |       |          |           |
|      |       |          |           |
|      |       |          |           |
|      |       |          |           |



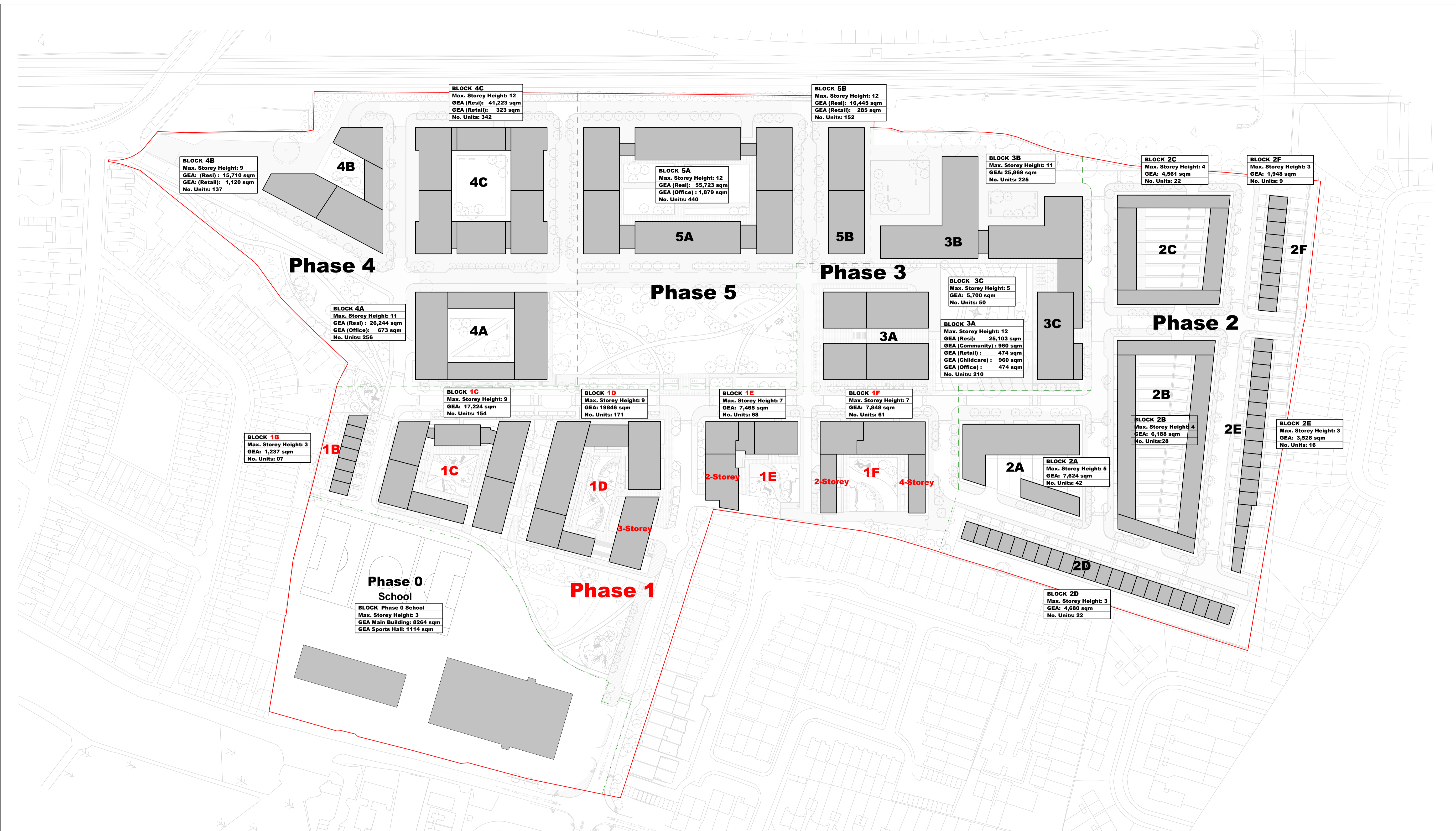
KEY PLAN:

|                         |   |  |                   |
|-------------------------|---|--|-------------------|
| <b>PLUSARCHITECTURE</b> |   | Chancery Lane, Dublin 8, Ireland. W: www.plusarchitecture.ie T: 353 (0) 1 521 3378 |                   |
| PROJECT:                | 211<br>North London Business Park           | PROJECT:   | 211<br>21/06/2021 |
| CLIENT:                 | The Comer Group                             | DRAWING NO.:   | 211_WS_02_00      |
| TITLE:                  | Existing Site Plan / Red Line Boundary Plan | DRAWN BY.:   | JG                |
| ISSUE TYPE:             | Planning                                    | CHECKED BY.:   | DT                |
|                         |   | SCALE AT A1.:  | 1:1000            |
|                         |   | SCALE AT A3.:  | 1:2000            |

Copyright of this drawing is vested in the Architect and it must not be copied or reproduced without consent. Figures dimensions only are to be taken from this drawing. All contractors must visit site and be responsible for setting and checking all dimensions before work. PLUS ARCHITECTURE are to be advised of any variation between drawings and site conditions. DO NOT SCALE OFF THIS DRAWING. ... or IN DOUBT ASK







**General Notes**

- Development Zones (within which development can occur) and public open spaces are identified on drawing number 211\_WS\_02\_01
- Access and circulation routes are identified on Drawing number 211\_WS\_02\_02.
- Landscape treatments are identified on drawing number 211\_WS\_02\_03
- Allowable uses at ground floor frontages are identified on Drawing number 211\_WS\_02\_04
- Allowable uses at ground floor frontages are identified on Drawing number 211\_WS\_02\_04
- Proposed site ground levels, heights, allowable horizontal and vertical deviations are identified on Drawing number 211\_WS\_02\_05

**Additional Notes**

- Refer to the Design Principles Document for further guidance on the Development Zone.
- Refer to the Design Principles Document for further guidance on the Public Open Space Zones, access routes typologies, and landscaping treatments of streets and spaces.
- Refer to the Design Principles Document for further guidance on the streets and circulation routes.

| NOTES: | REV. | DATE: | DETAILS: | INITIALS: |
|--------|------|-------|----------|-----------|
|        |      |       |          |           |
|        |      |       |          |           |
|        |      |       |          |           |
|        |      |       |          |           |
|        |      |       |          |           |

**Legend**

- Planning Application Boundary
- Public Open Space
- Detailed Application Zone Blocks
- Phase 1 Detailed Application Zone Reference
- 1A Detailed Application Zone Block Reference
- +57.00 Proposed Ground Floor Level
- Detailed Application Phasing boundaries

**North Point:**

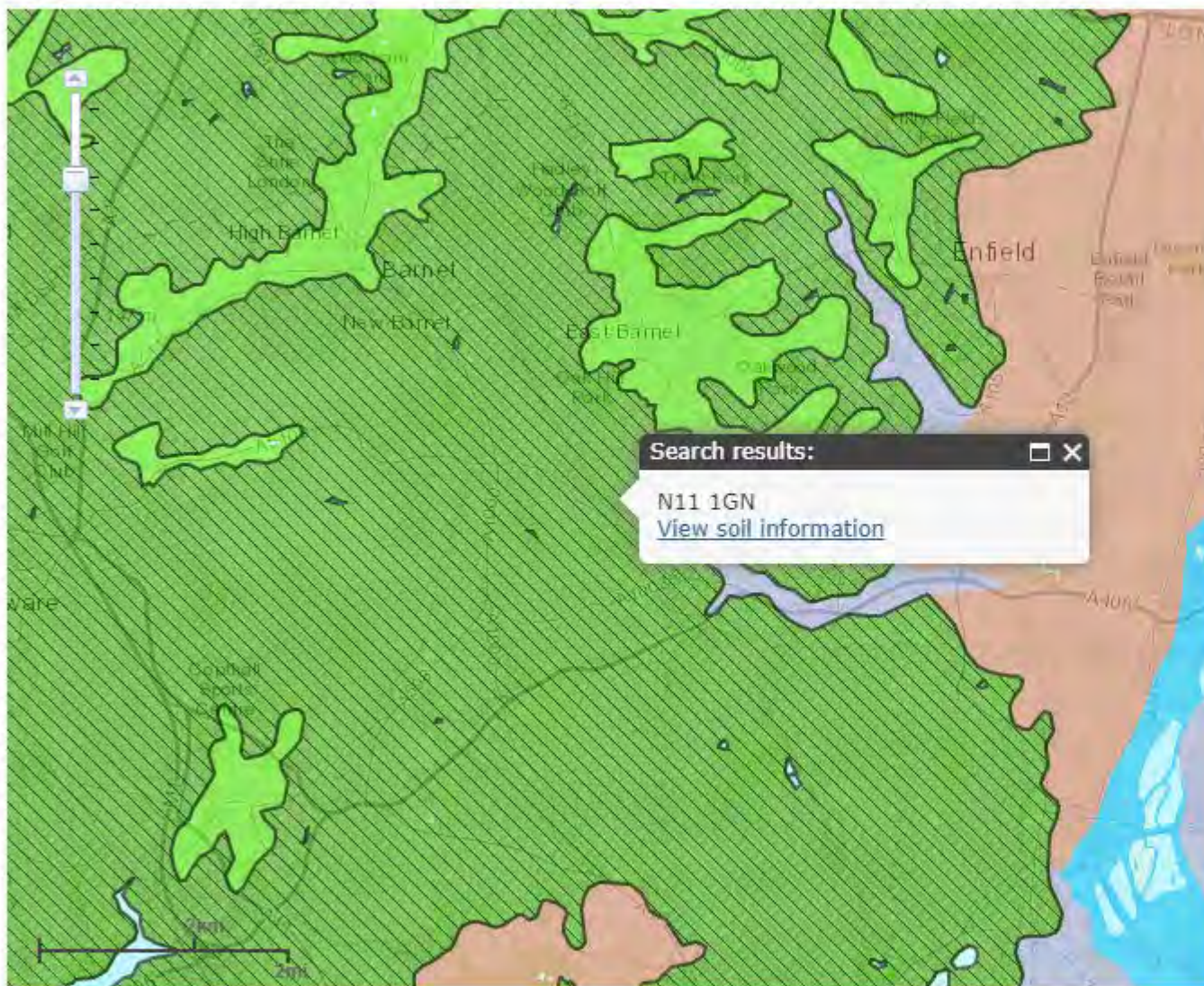
**Key Plan:**

**PLUSARCHITECTURE**  
Chancery Lane, Dublin 8, Ireland. W: www.plusarchitecture.ie T: 353 (0) 1 521 3378

|                                       |                           |                      |
|---------------------------------------|---------------------------|----------------------|
| PROJECT: North London Business Park   | PROJECT: 211              | DATE: 21/06/2021     |
| CLIENT: The Corner Group              | DRAWING NO.: 211_WS_02_01 | REVISION NO.:        |
| TITLE: Proposed Development Zone Plan | DRAWN BY.: JG             | SCALE AT A1.: 1:1000 |
| ISSUE TYPE: Planning                  | CHECKED BY.: DT           | SCALE AT A3.: 1:2000 |

Copyright of this drawing is vested in the architect and it must not be copied or reproduced without consent. Figures dimensions only are to be taken from this drawing. All contractors must use this and be responsible for setting and checking all dimensions against their work. PLUS Architecture are to be advised of any variation between drawings and/or quantities.





## Search results:

N11 1GN

[View soil information](#)

## Legend

## Search

## Soil information

**Soilscape 18:**

Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils

**Texture:**

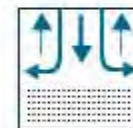
Loamy and clayey

**Coverage:**

England: 19.9%   Wales: 2.4%  
England & Wales: 17.5%

**Selected area:**483km<sup>2</sup>**Drainage:**

Impeded drainage

**Fertility:**

Moderate

**Habitats:**

Seasonally wet pastures and woodlands

**Landcover:**

Grassland and arable some woodland

**Carbon:**

Low

**Drains to:**

Adjust transparency



# Asset location search



## Property Searches

Stomor Ltd  
19

HITCHIN  
SG4 9SP

**Search address supplied** Building 1  
Oakleigh Road South  
North London Business Park  
London  
N11 1GN

**Your reference** ST-3013

**Our reference** ALS/ALS Standard/2021\_4405603

**Search date** 19 April 2021

### Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0800 009 4540

**Search address supplied:** Building 1, Oakleigh Road South, North London Business Park, London, N11 1GN

Dear Sir / Madam

**An Asset Location Search is recommended when undertaking a site development.** It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

## Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd  
Property Searches  
PO Box 3189  
Slough  
SL1 4WW

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)

## Waste Water Services

**Please provide a copy extract from the public sewer map.**

The following quartiles have been printed as they fall within Thames' sewerage area:

TQ2893SW  
TQ2893NW  
TQ2793SE  
TQ2793NE

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

## Clean Water Services

**Please provide a copy extract from the public water main map.**

Following examination of our statutory maps, Thames Water has been unable to find





any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

New Connections / Diversions  
Thames Water  
Network Services Business Centre  
Brentford  
Middlesex  
TW8 0EE

Tel: 0845 850 2777  
Fax: 0207 713 3858  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

|          |                |
|----------|----------------|
| TQ2893SW | Affinity Water |
| TQ2893NW | Affinity Water |
| TQ2793SE | Affinity Water |
| TQ2793NE | Affinity Water |

Affinity Water Ltd  
Tamblin Way  
Hatfield  
AL10 9EZ

Tel: 0345 3572401

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

## Payment for this Search

A charge will be added to your suppliers account.

## Further contacts:

### Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

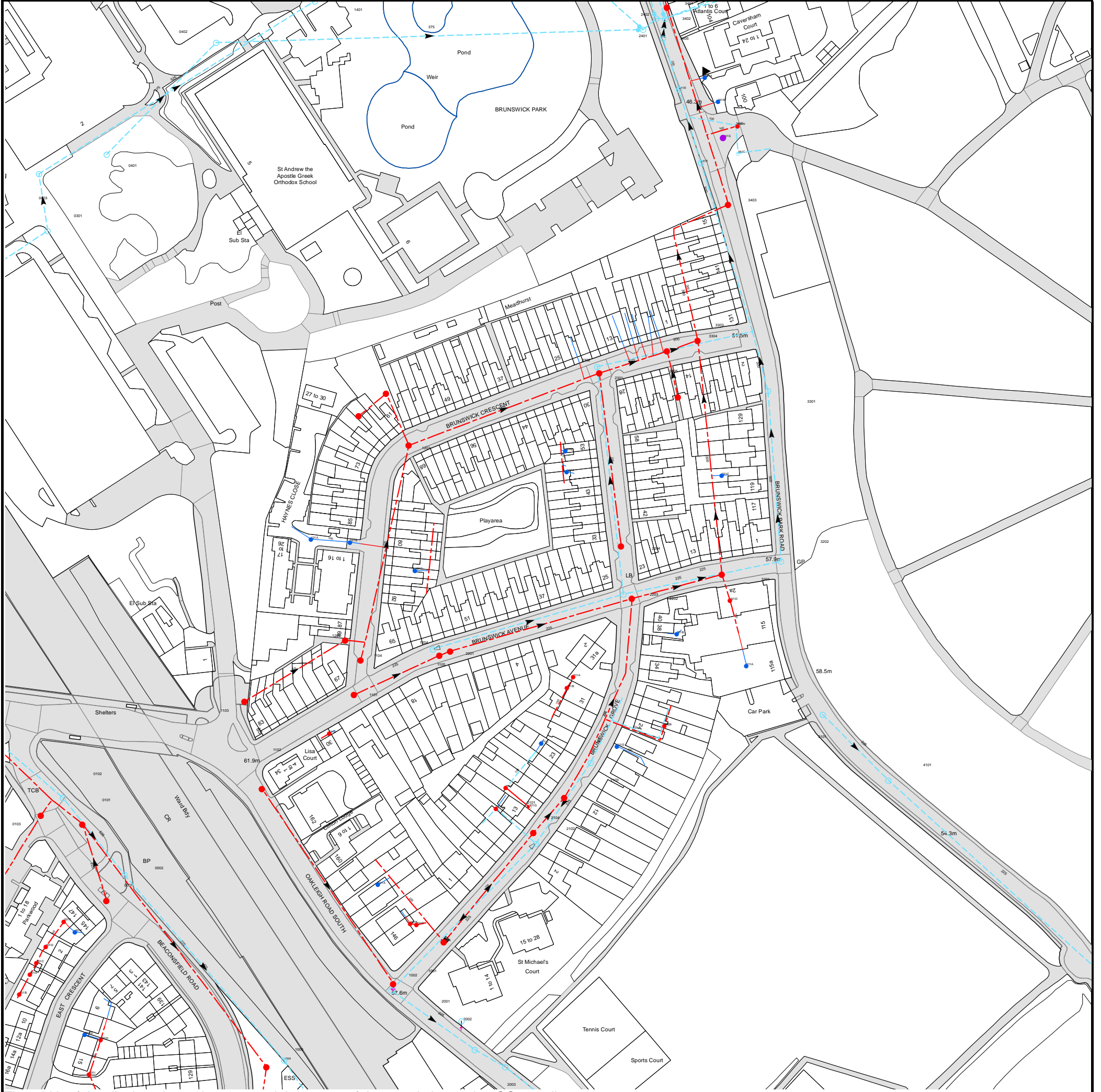
Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

### Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)



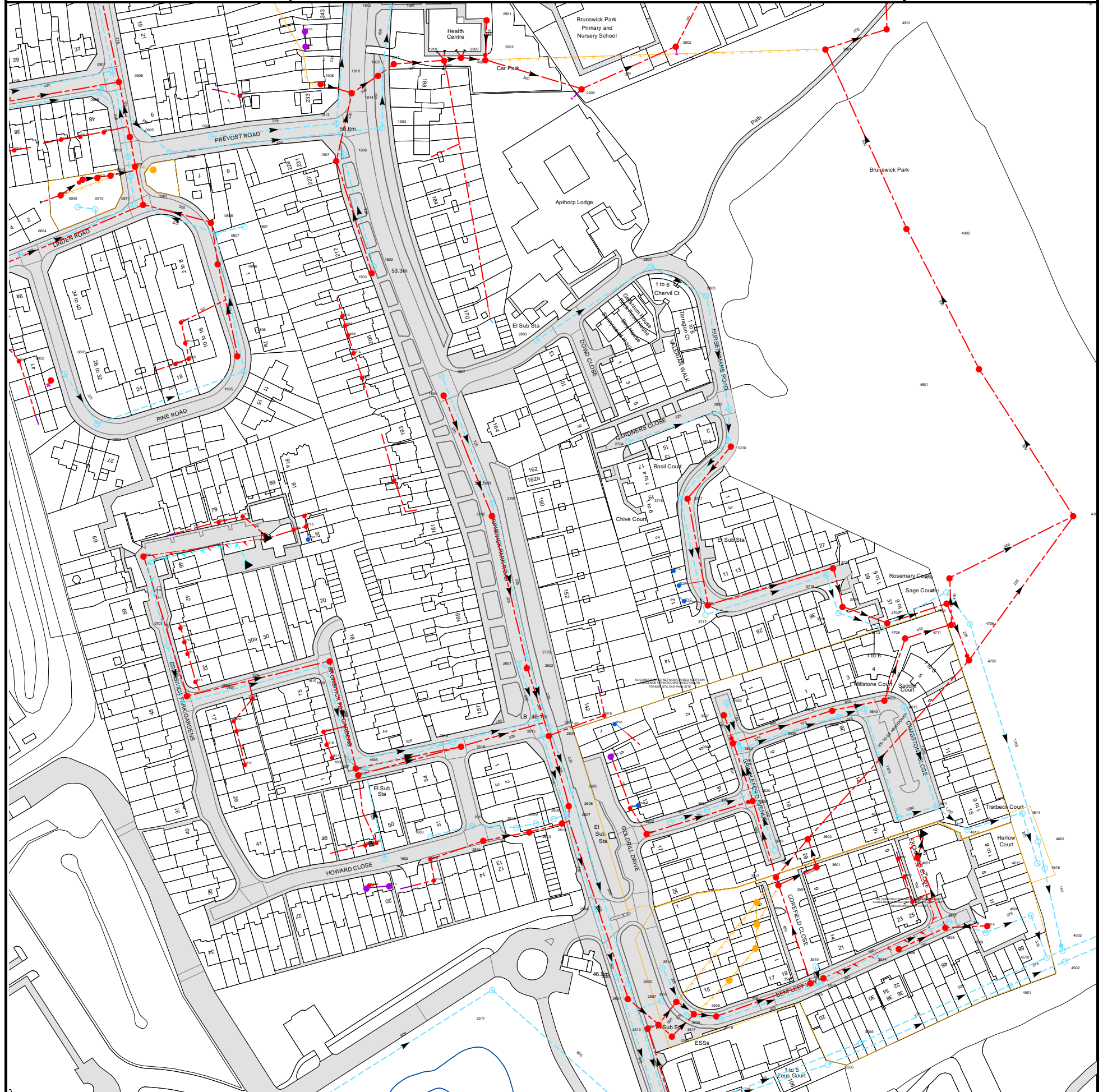
The width of the displayed area is 500m and the centre of the map is located at OS coordinates 528250,193250  
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 2402              | 45.92               | 41.04                |
| 3405              | 45.98               | 44.57                |
| 3402              | 45.99               | 40.98                |
| 3401              | 45.99               | 45.08                |
| 221B              | n/a                 | n/a                  |
| 1202              | 57.7                | 55.03                |
| 3305              | 54.22               | 51.9                 |
| 1301              | n/a                 | n/a                  |
| 3301              | 53.24               | 52.04                |
| 2301              | 55.02               | 52.99                |
| 2302              | 54.63               | 53.1                 |
| 3304              | 53.15               | 50.45                |
| 3303              | 52.4                | 49.68                |
| 3403              | 47.75               | 46.1                 |
| 341F              | n/a                 | n/a                  |
| 341C              | n/a                 | n/a                  |
| 341G              | n/a                 | n/a                  |
| 341H              | n/a                 | n/a                  |
| 341D              | n/a                 | n/a                  |
| 341B              | n/a                 | n/a                  |
| 341E              | n/a                 | n/a                  |
| 341A              | n/a                 | n/a                  |
| 1401              | 50.63               | 47.33                |
| 2401              | 49.38               | 41.38                |
| 4101              | 55.94               | 54.16                |
| 211D              | n/a                 | n/a                  |
| 311C              | n/a                 | n/a                  |
| 311B              | n/a                 | n/a                  |
| 3101              | 57.56               | 55.88                |
| 1104              | .01                 | n/a                  |
| 121C              | n/a                 | n/a                  |
| 1204              | .01                 | n/a                  |
| 1105              | 61.05               | 58.6                 |
| 2201              | 60.94               | n/a                  |
| 221A              | n/a                 | n/a                  |
| 211A              | n/a                 | n/a                  |
| 2204              | 59                  | n/a                  |
| 2203              | 59.86               | n/a                  |
| 2202              | 59.91               | 54.67                |
| 321B              | n/a                 | n/a                  |
| 321C              | n/a                 | n/a                  |
| 3201              | 58.88               | 54.08                |
| 321D              | n/a                 | n/a                  |
| 311A              | n/a                 | n/a                  |
| 3202              | 58.01               | 56.76                |
| 001I              | n/a                 | n/a                  |
| 1005              | .01                 | n/a                  |
| 1004              | .01                 | n/a                  |
| 2003              | 54.88               | 54.11                |
| 2002              | 55.66               | 54.31                |
| 001H              | n/a                 | n/a                  |
| 001G              | n/a                 | n/a                  |
| 2001              | .01                 | n/a                  |
| 1002              | 57.63               | n/a                  |
| 1001              | .01                 | n/a                  |
| 2004              | 58.16               | 56.18                |
| 001F              | n/a                 | n/a                  |
| 101C              | n/a                 | n/a                  |
| 101B              | n/a                 | n/a                  |
| 001E              | n/a                 | n/a                  |
| 0001              | .01                 | n/a                  |
| 101A              | n/a                 | n/a                  |
| 0002              | 61.18               | 59.43                |
| 2102              | 59.07               | 57.86                |
| 2101              | 59.26               | 55.9                 |
| 0101              | 61.88               | 57.31                |
| 211E              | n/a                 | n/a                  |
| 211G              | n/a                 | n/a                  |
| 2104              | 59.59               | 55.86                |
| 1102              | 61.37               | n/a                  |
| 211F              | n/a                 | n/a                  |
| 2103              | .01                 | n/a                  |
| 211C              | n/a                 | n/a                  |
| 1103              | .01                 | n/a                  |
| 1101              | 61.29               | 59.05                |
| 211B              | n/a                 | n/a                  |
| 001B              | n/a                 | n/a                  |
| 001A              | n/a                 | n/a                  |
| 001C              | n/a                 | n/a                  |
| 0103              | 62.56               | 58.07                |
| 001D              | n/a                 | n/a                  |
| 0102              | 62.34               | 61.07                |
| 111A              | n/a                 | n/a                  |
| 121A              | n/a                 | n/a                  |
| 1201              | 61                  | 59.71                |
| 121B              | n/a                 | n/a                  |
| 1302              | n/a                 | n/a                  |
| 0402              | .01                 | n/a                  |
| 0301              | 57.72               | 51.12                |
| 0403              | 57.44               | 51.02                |
| 0401              | .01                 | n/a                  |

| Manhole Reference   | Manhole Cover Level | Manhole Invert Level |
|---|---------------------|----------------------|
|   |                     |                      |
| <p>The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.</p> |                     |                      |



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 528250,193750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

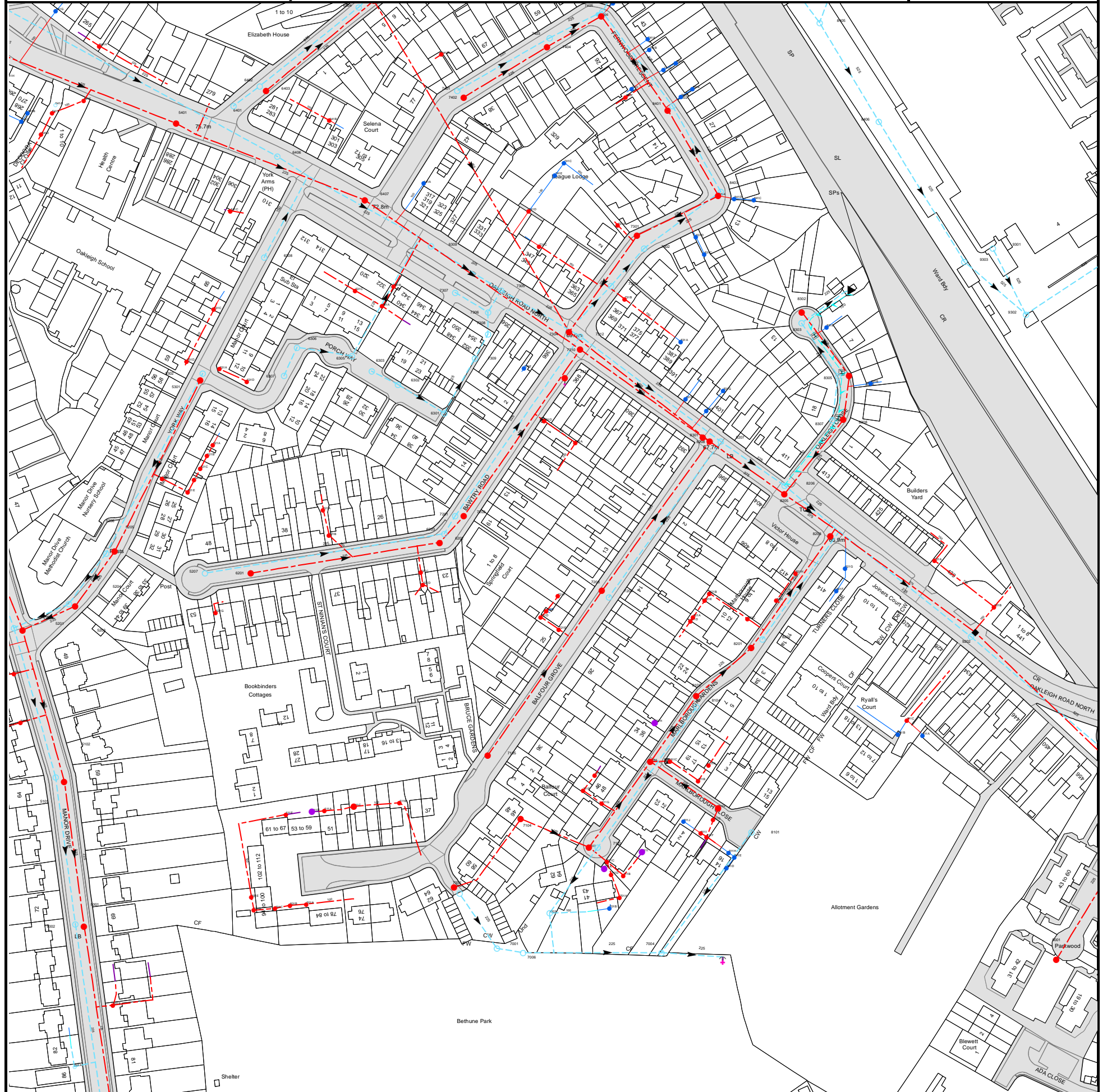
| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 4706              | 46.14               | 43.29                |
| 4509              | 41.3                | 39.55                |
| 451A              | n/a                 | n/a                  |
| 4501              | .01                 | n/a                  |
| 4614              | n/a                 | n/a                  |
| 4508              | 40.95               | 39.32                |
| 4615              | n/a                 | n/a                  |
| 4602              | 45.26               | 43.07                |
| 4616              | n/a                 | n/a                  |
| 4510              | 42.89               | 38.9                 |
| 4503              | 42.76               | 38.51                |
| 4502              | .01                 | n/a                  |
| 4701              | 43.1                | 41.5                 |
| 3723              | n/a                 | n/a                  |
| 3639              | n/a                 | n/a                  |
| 3719              | n/a                 | n/a                  |
| 3724              | n/a                 | n/a                  |
| 3506              | .01                 | n/a                  |
| 3640              | n/a                 | n/a                  |
| 3514              | 44.75               | 43                   |
| 3713              | n/a                 | n/a                  |
| 4603              | n/a                 | n/a                  |
| 4702              | n/a                 | n/a                  |
| 461A              | n/a                 | n/a                  |
| 4610              | n/a                 | n/a                  |
| 4506              | 44.37               | 42.42                |
| 4612              | n/a                 | n/a                  |
| 451C              | n/a                 | n/a                  |
| 4708              | n/a                 | n/a                  |
| 451B              | n/a                 | n/a                  |
| 4621              | 43.94               | 41.39                |
| 4611              | n/a                 | n/a                  |
| 4505              | 43.57               | 41.62                |
| 4703              | n/a                 | n/a                  |
| 4704              | 46.04               | 43.69                |
| 4507              | 43.72               | 41.97                |
| 4712              | n/a                 | n/a                  |
| 4711              | n/a                 | n/a                  |
| 4613              | n/a                 | n/a                  |
| 4705              | 45.97               | 42.12                |
| 4801              | .01                 | n/a                  |
| 4802              | .01                 | n/a                  |
| 3901              | .01                 | n/a                  |
| 4901              | .01                 | n/a                  |
| 2513              | 46.17               | 44.87                |
| 2507              | 46.27               | 45.47                |
| 2514              | 46.96               | 45.2                 |
| 3622              | n/a                 | n/a                  |
| 2505              | 46.74               | 44.22                |
| 3510              | 46.76               | 44.83                |
| 3517              | 46.6                | 44.84                |
| 3509              | 46.54               | 44.06                |
| 3621              | n/a                 | n/a                  |
| 3508              | 46.39               | 44                   |
| 3518              | 46.37               | 44.6                 |
| 3603              | n/a                 | n/a                  |
| 3620              | n/a                 | n/a                  |
| 3619              | n/a                 | n/a                  |
| 3513              | 46.32               | 43.23                |
| 3504              | 45.6                | 43.03                |
| 3602              | 45.54               | 43.09                |
| 3507              | 45.66               | 43.68                |
| 3519              | 45.58               | 43.95                |
| 3601              | 44.79               | 43.09                |
| 3516              | 45.59               | 43.73                |
| 3515              | 45.66               | 43.73                |
| 3505              | .01                 | n/a                  |
| 2602              | 49.49               | 46.91                |
| 2703              | 49.55               | 47.32                |
| 2615              | 48.85               | 47.11                |
| 2603              | 48.79               | 46.98                |
| 2604              | 48.8                | 46.6                 |
| 2605              | 48.47               | n/a                  |
| 261B              | n/a                 | n/a                  |
| 261C              | n/a                 | n/a                  |
| 261A              | n/a                 | n/a                  |
| 2704              | 48.79               | 47.94                |
| 371A              | n/a                 | n/a                  |
| 371B              | n/a                 | n/a                  |
| 3715              | n/a                 | n/a                  |
| 371C              | n/a                 | n/a                  |
| 3721              | n/a                 | n/a                  |
| 3717              | n/a                 | n/a                  |
| 3722              | n/a                 | n/a                  |
| 3607              | n/a                 | n/a                  |
| 3633              | n/a                 | n/a                  |
| 3714              | n/a                 | n/a                  |
| 3802              | 47.99               | 46.4                 |
| 3720              | n/a                 | n/a                  |
| 3606              | n/a                 | n/a                  |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 3632              | n/a                 | n/a                  |
| 3638              | n/a                 | n/a                  |
| 3718              | n/a                 | n/a                  |
| 3612              | n/a                 | n/a                  |
| 161E              | n/a                 | n/a                  |
| 151D              | n/a                 | n/a                  |
| 151B              | n/a                 | n/a                  |
| 1604              | 52.66               | 50.37                |
| 1602              | 52.04               | 51.03                |
| 151C              | n/a                 | n/a                  |
| 161D              | n/a                 | n/a                  |
| 1603              | 51.04               | 49.47                |
| 151A              | n/a                 | n/a                  |
| 2611              | 50.18               | 49.16                |
| 2614              | 50.3                | 48.37                |
| 2511              | .01                 | n/a                  |
| 2610              | 49.56               | 48.3                 |
| 2613              | 49.55               | 48.21                |
| 2609              | 49.55               | 48.1                 |
| 2608              | 49.23               | 47.7                 |
| 2612              | 49.26               | 47.98                |
| 2607              | 48.43               | 46.6                 |
| 2606              | 48.44               | 46.27                |
| 2504              | 47.75               | 45.63                |
| 2503              | 46.63               | 43.88                |
| 2502              | 46.6                | n/a                  |
| 2501              | 46.58               | 45.28                |
| 261D              | n/a                 | n/a                  |
| 261E              | n/a                 | n/a                  |
| 2620              | n/a                 | n/a                  |
| 251A              | n/a                 | n/a                  |
| 1914              | 50.2                | 47.42                |
| 2905              | 48.53               | 45.56                |
| 1908              | n/a                 | n/a                  |
| 1916              | 49.85               | 47.4                 |
| 1902              | 49.8                | 47.05                |
| 1917              | 50                  | 47.39                |
| 1918              | 49.67               | 46.98                |
| 2902              | 49.75               | 46.84                |
| 2903              | 49.8                | 47                   |
| 191C              | n/a                 | n/a                  |
| 1805              | 59.66               | 57.74                |
| 1806              | 59.34               | n/a                  |
| 181C              | n/a                 | n/a                  |
| 2803              | n/a                 | n/a                  |
| 181B              | n/a                 | n/a                  |
| 181E              | n/a                 | n/a                  |
| 181A              | n/a                 | n/a                  |
| 3803              | n/a                 | n/a                  |
| 1803              | 53.53               | 53.22                |
| 1802              | 53.4                | 52.11                |
| 2804              | n/a                 | n/a                  |
| 1801              | 56.57               | n/a                  |
| 1907              | 52.62               | n/a                  |
| 1906              | 51.53               | n/a                  |
| 1903              | 51.2                | 48.04                |
| 1913              | 50.83               | n/a                  |
| 191A              | n/a                 | n/a                  |
| 161G              | n/a                 | n/a                  |
| 161F              | n/a                 | n/a                  |
| 161I              | n/a                 | n/a                  |
| 171C              | n/a                 | n/a                  |
| 171D              | n/a                 | n/a                  |
| 171F              | n/a                 | n/a                  |
| 161C              | n/a                 | n/a                  |
| 1609              | 54.33               | 53.5                 |
| 161B              | n/a                 | n/a                  |
| 1610              | 54.28               | 53.18                |
| 161A              | n/a                 | n/a                  |
| 1608              | 53.56               | 52.64                |
| 1607              | 53.43               | 52.14                |
| 1605              | 52.89               | 49.52                |
| 181D              | n/a                 | n/a                  |
| 1606              | 53.39               | 50.49                |
| 171A              | n/a                 | n/a                  |
| 1807              | 52.48               | 50.74                |
| 1804              | 52.35               | 50.04                |
| 2619              | 50.9                | 49.49                |
| 2618              | 48.85               | 47.11                |
| 2702              | 51.3                | n/a                  |
| 2701              | 51.29               | n/a                  |
| 2601              | 49.53               | 47.45                |
| 161H              | n/a                 | n/a                  |
| 0601              | 59.59               | 57.76                |
| 0602              | 59.58               | 58.06                |
| 061A              | n/a                 | n/a                  |
| 071C              | n/a                 | n/a                  |
| 0701              | 59.6                | n/a                  |
| 071B              | n/a                 | n/a                  |
| 071A              | n/a                 | n/a                  |
| 071H              | n/a                 | n/a                  |
| 071G              | n/a                 | n/a                  |
| 171E              | n/a                 | n/a                  |



| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 071D              | n/a                 | n/a                  |
| 171G              | n/a                 | n/a                  |
| 0803              | 62.32               | 60.23                |
| 081B              | n/a                 | n/a                  |
| 081E              | n/a                 | n/a                  |
| 081C              | n/a                 | n/a                  |
| 081D              | n/a                 | n/a                  |
| 0806              | 57.86               | 56.05                |
| 0807              | 57.51               | n/a                  |
| 0808              | 57.45               | n/a                  |
| 0910              | 57.9                | 56.28                |
| 0903              | 55.78               | n/a                  |
| 0911              | 56.9                | 53.89                |
| 091G              | 56.13               | 55.09                |
| 0912              | 55.51               | 53.62                |
| 091H              | 56.13               | 54.77                |
| 0904              | 55.51               | n/a                  |
| 0913              | 55.09               | 53.47                |
| 0902              | 54.67               | 51.32                |
| 0905              | 55.05               | n/a                  |
| 0901              | 53.69               | 51.26                |
| 091D              | n/a                 | n/a                  |
| 0908              | 55.12               | 52.88                |
| 0906              | 54.46               | 52.89                |
| 0907              | 54.49               | 53.24                |
| 0909              | 57.94               | 56.84                |
| 091I              | 58.03               | 56.81                |
| 091F              | 57.65               | 56.28                |
| 091A              | n/a                 | n/a                  |
| 091B              | n/a                 | n/a                  |
| 091C              | n/a                 | n/a                  |
| 0802              | 62.47               | n/a                  |
| 081A              | n/a                 | n/a                  |
| 0804              | 59.59               | n/a                  |
| 0801              | 63.16               | n/a                  |
| 3902              | 46.87               | 44.48                |
| 191B              | n/a                 | n/a                  |
| 2901              | 49.06               | 48.24                |
| 1901              | 48.44               | 45.49                |
| 1912              | 48.84               | 46.98                |

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 527750,193250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 811H              | n/a                 | n/a                  |
| 811E              | n/a                 | n/a                  |
| 8101              | 64.74               | 63.58                |
| 911B              | n/a                 | n/a                  |
| 911C              | n/a                 | n/a                  |
| 911A              | n/a                 | n/a                  |
| 9001              | .01                 | -1.49                |
| 831H              | n/a                 | n/a                  |
| 821D              | n/a                 | n/a                  |
| 821A              | n/a                 | n/a                  |
| 8301              | 67.66               | 64.92                |
| 821E              | n/a                 | n/a                  |
| 831F              | n/a                 | n/a                  |
| 821B              | n/a                 | n/a                  |
| 8208              | 67.63               | 60.12                |
| 8207              | 67.52               | 66.35                |
| 831G              | n/a                 | n/a                  |
| 821C              | n/a                 | n/a                  |
| 8201              | .01                 | n/a                  |
| 8202              | 68.27               | 66.75                |
| 8206              | 67.18               | 65.93                |
| 8205              | 66.72               | n/a                  |
| 8203              | 66.93               | 59.75                |
| 8307              | .01                 | n/a                  |
| 821F              | n/a                 | n/a                  |
| 8308              | 64.32               | 60.16                |
| 821G              | n/a                 | n/a                  |
| 831B              | n/a                 | n/a                  |
| 921A              | n/a                 | n/a                  |
| 9202              | 65.8                | 64.27                |
| 921B              | n/a                 | n/a                  |
| 711I              | n/a                 | n/a                  |
| 7101              | 65.91               | 61.93                |
| 711H              | n/a                 | n/a                  |
| 7004              | .01                 | n/a                  |
| 811C              | n/a                 | n/a                  |
| 811J              | n/a                 | n/a                  |
| 8104              | .01                 | n/a                  |
| 8103              | .01                 | n/a                  |
| 811B              | n/a                 | n/a                  |
| 811I              | n/a                 | n/a                  |
| 811F              | n/a                 | n/a                  |
| 811A              | n/a                 | n/a                  |
| 811G              | n/a                 | n/a                  |
| 8102              | .01                 | n/a                  |
| 811D              | n/a                 | n/a                  |
| 7006              | .01                 | n/a                  |
| 7001              | .01                 | n/a                  |
| 7003              | .01                 | n/a                  |
| 701B              | n/a                 | n/a                  |
| 701A              | n/a                 | n/a                  |
| 7002              | .01                 | n/a                  |
| 701D              | n/a                 | n/a                  |
| 711B              | n/a                 | n/a                  |
| 711D              | n/a                 | n/a                  |
| 711A              | n/a                 | n/a                  |
| 711C              | n/a                 | n/a                  |
| 7103              | 64.28               | 62.36                |
| 7102              | 68.35               | 66.78                |
| 7104              | .01                 | n/a                  |
| 711G              | n/a                 | n/a                  |
| 711F              | n/a                 | n/a                  |
| 711E              | n/a                 | n/a                  |
| 7105              | .01                 | n/a                  |
| 721E              | n/a                 | n/a                  |
| 721D              | n/a                 | n/a                  |
| 721C              | n/a                 | n/a                  |
| 7204              | 70.93               | 68.01                |
| 721F              | n/a                 | n/a                  |
| 7203              | .01                 | n/a                  |
| 6202              | 73.11               | 70.82                |
| 6203              | 72.84               | 71.12                |
| 7201              | 72.84               | 70.91                |
| 7202              | .01                 | n/a                  |
| 531D              | n/a                 | n/a                  |
| 521E              | n/a                 | n/a                  |
| 521D              | n/a                 | n/a                  |
| 521C              | n/a                 | n/a                  |
| 5301              | .01                 | n/a                  |
| 5302              | .01                 | n/a                  |
| 521B              | n/a                 | n/a                  |
| 521A              | n/a                 | n/a                  |
| 531C              | n/a                 | n/a                  |
| 531A              | n/a                 | n/a                  |
| 631D              | n/a                 | n/a                  |
| 6307              | .01                 | n/a                  |
| 6306              | 75.41               | 73.96                |
| 6305              | 74.97               | 73.14                |
| 6303              | .01                 | n/a                  |
| 631A              | n/a                 | n/a                  |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 6302              | .01                 | n/a                  |
| 6301              | 73.65               | 72.18                |
| 7309              | .01                 | n/a                  |
| 7306              | 70.57               | 69.41                |
| 7308              | .01                 | n/a                  |
| 731E              | n/a                 | n/a                  |
| 731D              | n/a                 | n/a                  |
| 7311              | .01                 | n/a                  |
| 7304              | 69.08               | 60.88                |
| 721A              | n/a                 | n/a                  |
| 7310              | 88.93               | n/a                  |
| 7312              | 68.93               | n/a                  |
| 5002              | .01                 | n/a                  |
| 501B              | n/a                 | n/a                  |
| 601E              | n/a                 | n/a                  |
| 601D              | n/a                 | n/a                  |
| 601C              | n/a                 | n/a                  |
| 611E              | n/a                 | n/a                  |
| 601B              | n/a                 | n/a                  |
| 601A              | n/a                 | n/a                  |
| 611D              | n/a                 | n/a                  |
| 611A              | n/a                 | n/a                  |
| 611C              | n/a                 | n/a                  |
| 5101              | .01                 | n/a                  |
| 5102              | .01                 | n/a                  |
| 501A              | n/a                 | n/a                  |
| 5001              | .01                 | n/a                  |
| 511A              | n/a                 | n/a                  |
| 511B              | n/a                 | n/a                  |
| 511C              | n/a                 | n/a                  |
| 5202              | 76.31               | 73.98                |
| 5201              | 76.36               | 74.68                |
| 5204              | .01                 | n/a                  |
| 5203              | .01                 | n/a                  |
| 621D              | n/a                 | n/a                  |
| 5207              | 75.41               | 73.96                |
| 6201              | .01                 | n/a                  |
| 621C              | n/a                 | n/a                  |
| 5205              | .01                 | n/a                  |
| 5206              | .01                 | n/a                  |
| 621B              | n/a                 | n/a                  |
| 621A              | n/a                 | n/a                  |
| 741A              | n/a                 | n/a                  |
| 741B              | n/a                 | n/a                  |
| 8405              | 57.31               | 53.5                 |
| 8305              | 62.89               | 61.66                |
| 8306              | .01                 | n/a                  |
| 831A              | n/a                 | n/a                  |
| 831E              | n/a                 | n/a                  |
| 8303              | 62.57               | 61.27                |
| 9302              | 57.3                | 51.67                |
| 8302              | 62.41               | 60.49                |
| 9303              | 56.94               | 51.99                |
| 831C              | n/a                 | n/a                  |
| 9301              | 57.61               | 52.03                |
| 7302              | .01                 | n/a                  |
| 831D              | n/a                 | n/a                  |
| 7301              | .01                 | n/a                  |
| 841C              | n/a                 | n/a                  |
| 841D              | n/a                 | n/a                  |
| 8404              | 62.58               | 61.39                |
| 8403              | .01                 | n/a                  |
| 8406              | 57.03               | 52.93                |
| 8401              | .01                 | n/a                  |
| 8402              | .01                 | n/a                  |
| 841F              | n/a                 | n/a                  |
| 841E              | n/a                 | n/a                  |
| 741G              | n/a                 | n/a                  |
| 841G              | n/a                 | n/a                  |
| 7307              | .01                 | n/a                  |
| 7401              | .01                 | n/a                  |
| 7402              | .01                 | n/a                  |
| 7305              | 70.22               | n/a                  |
| 741D              | n/a                 | n/a                  |
| 731C              | n/a                 | n/a                  |
| 7404              | .01                 | n/a                  |
| 7403              | .01                 | n/a                  |
| 741E              | n/a                 | n/a                  |
| 741C              | n/a                 | n/a                  |
| 7406              | .01                 | n/a                  |
| 7405              | 63.59               | 60.85                |
| 7303              | .01                 | n/a                  |
| 741H              | n/a                 | n/a                  |
| 731A              | n/a                 | n/a                  |
| 731B              | n/a                 | n/a                  |
| 741F              | n/a                 | n/a                  |
| 5401              | .01                 | n/a                  |
| 641C              | n/a                 | n/a                  |
| 6401              | 75.37               | 73.84                |
| 6402              | 74.02               | 72.37                |
| 6308              | 75.77               | 74.8                 |
| 6403              | .01                 | n/a                  |
| 6406              | 75.18               | 73.02                |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 641B              | n/a                 | n/a                  |
| 631C              | n/a                 | n/a                  |
| 6404              | 68.48               | 66.91                |
| 6407              | .01                 | n/a                  |
| 6405              | 68.19               | 61.24                |
| 631B              | n/a                 | n/a                  |
| 641A              | n/a                 | n/a                  |
| 6309              | .01                 | n/a                  |
| 641D              | n/a                 | n/a                  |
| 541F              | n/a                 | n/a                  |
| 541H              | n/a                 | n/a                  |
| 541G              | n/a                 | n/a                  |
| 521F              | n/a                 | n/a                  |
| 541D              | n/a                 | n/a                  |
| 541C              | n/a                 | n/a                  |
| 541B              | n/a                 | n/a                  |
| 541A              | n/a                 | n/a                  |
| 521G              | n/a                 | n/a                  |
| 821I              | n/a                 | n/a                  |
| 821H              | n/a                 | n/a                  |
| 611B              | n/a                 | n/a                  |
| 541E              | n/a                 | n/a                  |
| 741I              | n/a                 | n/a                  |

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 527750,193750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 9905              | 59.5                | 57.12                |
| 9904              | 59.36               | 58.21                |
| 9906              | 58.91               | 57.42                |
| 9902              | 60.51               | 58.28                |
| 9903              | 60.26               | 58.48                |
| 8908              | 64.86               | 63.91                |
| 9901              | 61.81               | 59.64                |
| 9801              | .01                 | n/a                  |
| 981F              | n/a                 | n/a                  |
| 981G              | n/a                 | n/a                  |
| 881A              | n/a                 | n/a                  |
| 981A              | n/a                 | n/a                  |
| 9802              | 62.64               | 61.17                |
| 9803              | .01                 | n/a                  |
| 981E              | n/a                 | n/a                  |
| 981B              | n/a                 | n/a                  |
| 981C              | n/a                 | n/a                  |
| 981D              | n/a                 | n/a                  |
| 991A              | n/a                 | n/a                  |
| 7506              | .01                 | n/a                  |
| 7505              | n/a                 | n/a                  |
| 7507              | n/a                 | n/a                  |
| 8501              | n/a                 | n/a                  |
| 8806              | 72.66               | n/a                  |
| 8805              | 72.58               | 69.68                |
| 8502              | n/a                 | n/a                  |
| 8807              | n/a                 | n/a                  |
| 8809              | n/a                 | n/a                  |
| 8810              | n/a                 | n/a                  |
| 8503              | 57.72               | 53.87                |
| 8808              | n/a                 | n/a                  |
| 8801              | 68.04               | 66.11                |
| 8802              | 68                  | 65.75                |
| 7804              | n/a                 | n/a                  |
| 881B              | n/a                 | n/a                  |
| 8811              | n/a                 | n/a                  |
| 8812              | n/a                 | n/a                  |
| 8803              | 66.32               | 64.45                |
| 8804              | 66.26               | n/a                  |
| 7803              | n/a                 | n/a                  |
| 781J              | n/a                 | n/a                  |
| 781K              | n/a                 | n/a                  |
| 8902              | 66.34               | 63.96                |
| 8903              | 66.31               | 64.18                |
| 891A              | n/a                 | n/a                  |
| 8906              | 64.9                | 63.71                |
| 8905              | 65.13               | 63.82                |
| 8904              | 65.15               | 63.63                |
| 8901              | 68.09               | 66.8                 |
| 8907              | .01                 | n/a                  |
| 891B              | n/a                 | n/a                  |
| 7515              | 66.2                | 64.432               |
| 7510              | 66.267              | 64.72                |
| 7514              | 65.82               | 64.22                |
| 7511              | 65.5                | 62.6                 |
| 7501              | 65.8                | 62.22                |
| 7509              | 65.7                | 64.33                |
| 7508              | 65.82               | 64.38                |
| 7512              | 65.55               | 63.623               |
| 7513              | 65.648              | 63.87                |
| 7502              | n/a                 | n/a                  |
| 6704              | 76.33               | 74.83                |
| 6703              | 76.32               | 74.85                |
| 671H              | n/a                 | n/a                  |
| 671G              | n/a                 | n/a                  |
| 671F              | n/a                 | n/a                  |
| 771B              | n/a                 | n/a                  |
| 671C              | n/a                 | n/a                  |
| 7705              | 75.17               | 72.93                |
| 671B              | n/a                 | n/a                  |
| 671E              | n/a                 | n/a                  |
| 7706              | 75.12               | 72.59                |
| 7701              | 76.44               | n/a                  |
| 7702              | 76.46               | n/a                  |
| 771A              | n/a                 | n/a                  |
| 7704              | 75.65               | n/a                  |
| 7703              | 75.67               | n/a                  |
| 781O              | n/a                 | n/a                  |
| 781L              | n/a                 | n/a                  |
| 781N              | n/a                 | n/a                  |
| 781M              | n/a                 | n/a                  |
| 6801              | 77.5                | 75.63                |
| 7801              | 72.38               | n/a                  |
| 6802              | 77.56               | 75.97                |
| 7802              | 72.36               | n/a                  |
| 681B              | n/a                 | n/a                  |
| 781H              | n/a                 | n/a                  |
| 781A              | n/a                 | n/a                  |
| 681A              | n/a                 | n/a                  |
| 5503              | .01                 | n/a                  |

| Manhole Reference | Manhole Cover Level | Manhole Invert Level |
|-------------------|---------------------|----------------------|
| 6509              | .01                 | n/a                  |
| 6501              | 69.93               | 68.9                 |
| 6502              | 67.94               | 67.04                |
| 6503              | .01                 | n/a                  |
| 6504              | .01                 | n/a                  |
| 6505              | 65.9                | 63.73                |
| 6506              | 65.71               | 64.11                |
| 6508              | 65.84               | 63.85                |
| 6507              | 65.43               | n/a                  |
| 6510              | 65.28               | 64                   |
| 5702              | .01                 | n/a                  |
| 571C              | n/a                 | n/a                  |
| 571D              | n/a                 | n/a                  |
| 5704              | 81.76               | n/a                  |
| 571A              | n/a                 | n/a                  |
| 671D              | n/a                 | n/a                  |
| 671A              | n/a                 | n/a                  |
| 571B              | n/a                 | n/a                  |
| 6701              | 79.84               | 77.86                |
| 6702              | 79.89               | 78.2                 |
| 5801              | 81.78               | 79.91                |
| 581A              | n/a                 | n/a                  |
| 5802              | 81.81               | 80.31                |
| 5804              | n/a                 | n/a                  |
| 581B              | n/a                 | n/a                  |
| 581F              | n/a                 | n/a                  |
| 581E              | n/a                 | n/a                  |
| 5803              | 81.87               | 80.72                |
| 681C              | n/a                 | n/a                  |
| 581D              | n/a                 | n/a                  |
| 581H              | n/a                 | n/a                  |
| 581G              | n/a                 | n/a                  |
| 591A              | n/a                 | n/a                  |
| 6512              | 66.634              | 64.685               |
| 6511              | 66.756              | 65.34                |
| 551D              | n/a                 | n/a                  |
| 5501              | 76.19               | 73.49                |
| 551E              | n/a                 | n/a                  |
| 5601              | 78.18               | 76.33                |
| 6605              | n/a                 | 65.34                |
| 6601              | 67.58               | 66.25                |
| 5606              | 77.63               | 75.45                |
| 6602              | 67.675              | 65.187               |
| 561D              | n/a                 | n/a                  |
| 6603              | n/a                 | 65.3                 |
| 561F              | n/a                 | n/a                  |
| 5602              | 72.66               | 62.8                 |
| 5603              | 72.83               | n/a                  |
| 6604              | n/a                 | 65.348               |
| 5605              | 77.22               | 75.85                |
| 561E              | n/a                 | n/a                  |
| 561C              | n/a                 | n/a                  |
| 561B              | n/a                 | n/a                  |
| 561A              | n/a                 | n/a                  |
| 5604              | 76.72               | n/a                  |
| 571E              | n/a                 | n/a                  |
| 5701              | 78.82               | n/a                  |
| 551A              | n/a                 | n/a                  |
| 551B              | n/a                 | n/a                  |
| 5502              | 76.28               | 74.53                |
| 551C              | n/a                 | n/a                  |
| 571F              | n/a                 | n/a                  |
| 561G              | n/a                 | n/a                  |
| 6902              | 80.43               | n/a                  |
| 7901              | 72.89               | n/a                  |
| 7902              | 77.84               | n/a                  |
| 691A              | n/a                 | n/a                  |
| 6903              | 76.6                | n/a                  |
| 6904              | 76.51               | n/a                  |
| 691B              | n/a                 | n/a                  |
| 791A              | n/a                 | n/a                  |
| 791B              | n/a                 | n/a                  |
| 7904              | n/a                 | n/a                  |
| 7903              | n/a                 | n/a                  |
| 6901              | 80.48               | n/a                  |



















The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.





# ALS Sewer Map Key

## Public Sewer Types (Operated & Maintained by Thames Water)

-  **Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
-  **Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  **Trunk Surface Water**
-  **Trunk Foul**
-  **Storm Relief**
-  **Trunk Combined**
-  **Vent Pipe**
-  **Bio-solids (Sludge)**
-  **Proposed Thames Surface Water Sewer**
-  **Proposed Thames Water Foul Sewer**
-  **Gallery**
-  **Foul Rising Main**
-  **Surface Water Rising Main**
-  **Combined Rising Main**
-  **Sludge Rising Main**
-  **Proposed Thames Water Rising Main**
-  **Vacuum**

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or 'D' on a manhole level indicates that data is unavailable.

## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

-  Air Valve
-  Dam Chase
-  Fitting
-  Meter
-  Vent Column




## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

-  Control Valve
-  Drop Pipe
-  Ancillary
-  Weir






## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

-  Outfall
-  Undefined End
-  Inlet






## Other Symbols

Symbols used on maps which do not fall under other general categories.








-  /  Public/Private Pumping Station
-  Change of characteristic indicator (C.O.C.I.)
-  Invert Level
-  Summit

### Areas

Lines denoting areas of underground surveys, etc.

-  Agreement
-  Operational Site
-  Chamber
-  Tunnel
-  Conduit Bridge

## Other Sewer Types (Not Operated or Maintained by Thames Water)

-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  Culverted Watercourse
-  Proposed
-  Abandoned Sewer

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0800 009 4540.

## Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

### Ways to pay your bill

| Credit Card  | BACS Payment  | Telephone Banking   | Cheque  |
|--|---|---|---|
| <p>Call <b>0800 009 4540</b> quoting your invoice number starting CBA or ADS / OSS</p> | <p>Account number <b>90478703</b><br/>Sort code <b>60-00-01</b><br/>A remittance advice must be sent to:<br/><b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b><br/>or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a></p> | <p>By calling your bank and quoting:<br/>Account number <b>90478703</b><br/>Sort code <b>60-00-01</b> and your invoice number</p> | <p>Made payable to '<b>Thames Water Utilities Ltd</b>'<br/>Write your Thames Water account number on the back.<br/>Send to:<br/><b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b><br/>or by DX to <b>151280 Slough 13</b></p> |

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



Calculated by:

Site name:

Site location:

## Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used 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). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Runoff estimation approach

## Site characteristics

Total site area (ha):

## Methodology

$Q_{BAR}$  estimation method:

SPR estimation method:

## Soil characteristics

|              | Default | Edited |
|--------------|---------|--------|
| SOIL type:   | 4       | 4      |
| HOST class:  | N/A     | N/A    |
| SPR/SPRHOST: | 0.47    | 0.47   |

## Hydrological characteristics

|                                | Default | Edited |
|--------------------------------|---------|--------|
| SAAR (mm):                     | 670     | 670    |
| Hydrological region:           | 6       | 6      |
| Growth curve factor 1 year:    | 0.85    | 0.85   |
| Growth curve factor 30 years:  | 2.3     | 2.3    |
| Growth curve factor 100 years: | 3.19    | 3.19   |
| Growth curve factor 200 years: | 3.74    | 3.74   |

## Notes

### (1) Is $Q_{BAR} < 2.0$ l/s/ha?

When  $Q_{BAR}$  is  $< 2.0$  l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

### (2) Are flow rates $< 5.0$ l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

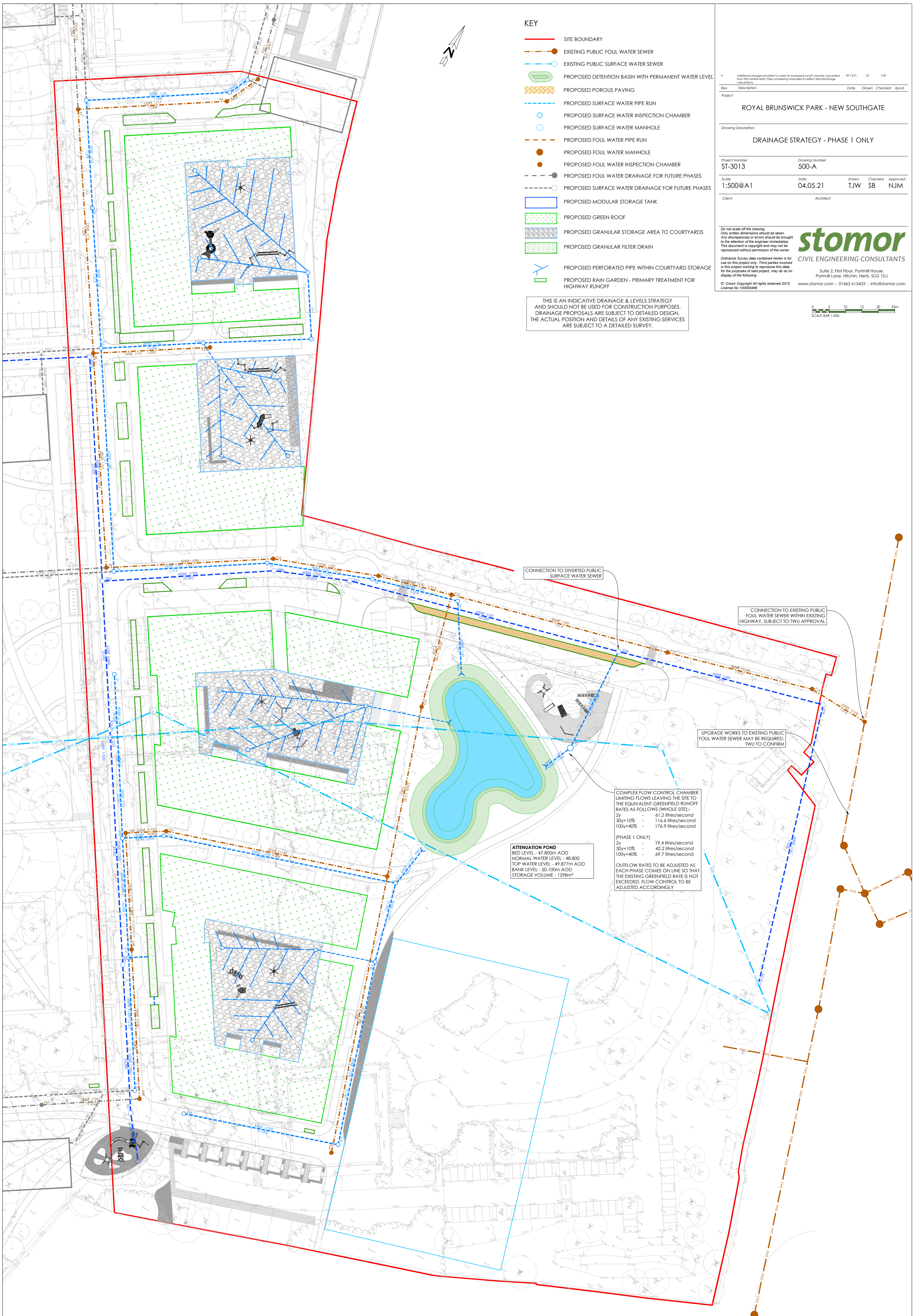
### (3) Is $SPR/SPRHOST \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

## Greenfield runoff rates

|                       | Default | Edited |
|-----------------------|---------|--------|
| $Q_{BAR}$ (l/s):      | 75.08   | 75.08  |
| 1 in 1 year (l/s):    | 63.82   | 63.82  |
| 1 in 30 years (l/s):  | 172.69  | 172.69 |
| 1 in 100 year (l/s):  | 239.52  | 239.52 |
| 1 in 200 years (l/s): | 280.81  | 280.81 |





**KEY**

- SITE BOUNDARY
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- PROPOSED DETENTION BASIN WITH PERMANENT WATER LEVEL
- PROPOSED POROUS PAVING
- PROPOSED SURFACE WATER PIPE RUN
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED FOUL WATER PIPE RUN
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER INSPECTION CHAMBER
- - - PROPOSED FOUL WATER DRAINAGE FOR FUTURE PHASES
- - - PROPOSED SURFACE WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED MODULAR STORAGE TANK
- PROPOSED GREEN ROOF
- PROPOSED GRANULAR STORAGE AREA TO COURTYARDS
- PROPOSED GRANULAR FILTER DRAIN
- PROPOSED PERFORATED PIPE WITHIN COURTYARD STORAGE
- PROPOSED RAIN GARDEN - PRIMARY TREATMENT FOR HIGHWAY RUNOFF

THIS IS AN INDICATIVE DRAINAGE & LEVELS STRATEGY AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN. THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES ARE SUBJECT TO A DETAILED SURVEY.

|  |                |          |         |          |        |
|--|----------------|----------|---------|----------|--------|
| Additional storage provided to cater for increased runoff volumes calculated from historical data. Run numbering generated to reflect mesochorage calculation. |                | 09/12/21 | JD      | 17W      |        |
| Rev  | Description    | Date     | Drawn   | Checked  | Appl'd |
| <b>ROYAL BRUNSWICK PARK - NEW SOUTHGATE</b>  |                |          |         |          |        |
| Drawing Description  |                |          |         |          |        |
| <b>DRAINAGE STRATEGY - PHASE 1 ONLY</b>  |                |          |         |          |        |
| Project Number   | Drawing Number |          |         |          |        |
| ST-3013  | 500-A          |          |         |          |        |
| Scale  | Date           | Drawn    | Checked | Approved |        |
| 1:500@A1   | 04.05.21       | TJW      | SB      | NJM      |        |
| Client   | Architect      |          |         |          |        |

Do not scale off the drawing. Only written dimensions should be taken. Any discrepancies or errors should be brought to the attention of the engineer immediately. This document is copyright and may not be reproduced without permission of the owner.

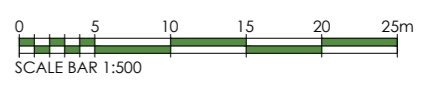
Ordnance Survey data contained herein is for use on this project only. Third parties involved in this project wishing to reproduce this data for the purposes of said project, may do so on display of the following:

© Crown Copyright All rights reserved 2015. Licence No 10005466.

**stomor**  
CIVIL ENGINEERING CONSULTANTS

Suite 2, First Floor, Portmill House,  
Portmill Lane, Hitchin, Herts, SG5 1DJ

www.stomor.com | 01462 615433 | info@stomor.com



CONNECTION TO DIVERTED PUBLIC SURFACE WATER SEWER

CONNECTION TO EXISTING PUBLIC FOUL WATER SEWER WITHIN EXISTING HIGHWAY. SUBJECT TO TWU APPROVAL

UPGRADE WORKS TO EXISTING PUBLIC FOUL WATER SEWER MAY BE REQUIRED. TWU TO CONFIRM

COMPLEX FLOW CONTROL CHAMBER  
LIMITING FLOWS LEAVING THE SITE TO THE EQUIVALENT GREENFIELD RUNOFF RATES AS FOLLOWS (WHOLE SITE):-

|          |                     |
|----------|---------------------|
| 2y       | 61.2 litres/second  |
| 30y+10%  | 116.6 litres/second |
| 100y+40% | 176.9 litres/second |

(PHASE 1 ONLY)

|          |                    |
|----------|--------------------|
| 2y       | 19.4 litres/second |
| 30y+10%  | 42.2 litres/second |
| 100y+40% | 67.7 litres/second |

OUTFLOW RATES TO BE ADJUSTED AS EACH PHASE COMES ON LINE SO THAT THE EXISTING GREENFIELD RATE IS NOT EXCEEDED. FLOW CONTROL TO BE ADJUSTED ACCORDINGLY

**ATTENUATION POND**  
BED LEVEL - 47.800m AOD  
NORMAL WATER LEVEL - 48.800  
TOP WATER LEVEL - 49.877m AOD  
BANK LEVEL - 50.100m AOD  
STORAGE VOLUME - 1298m³

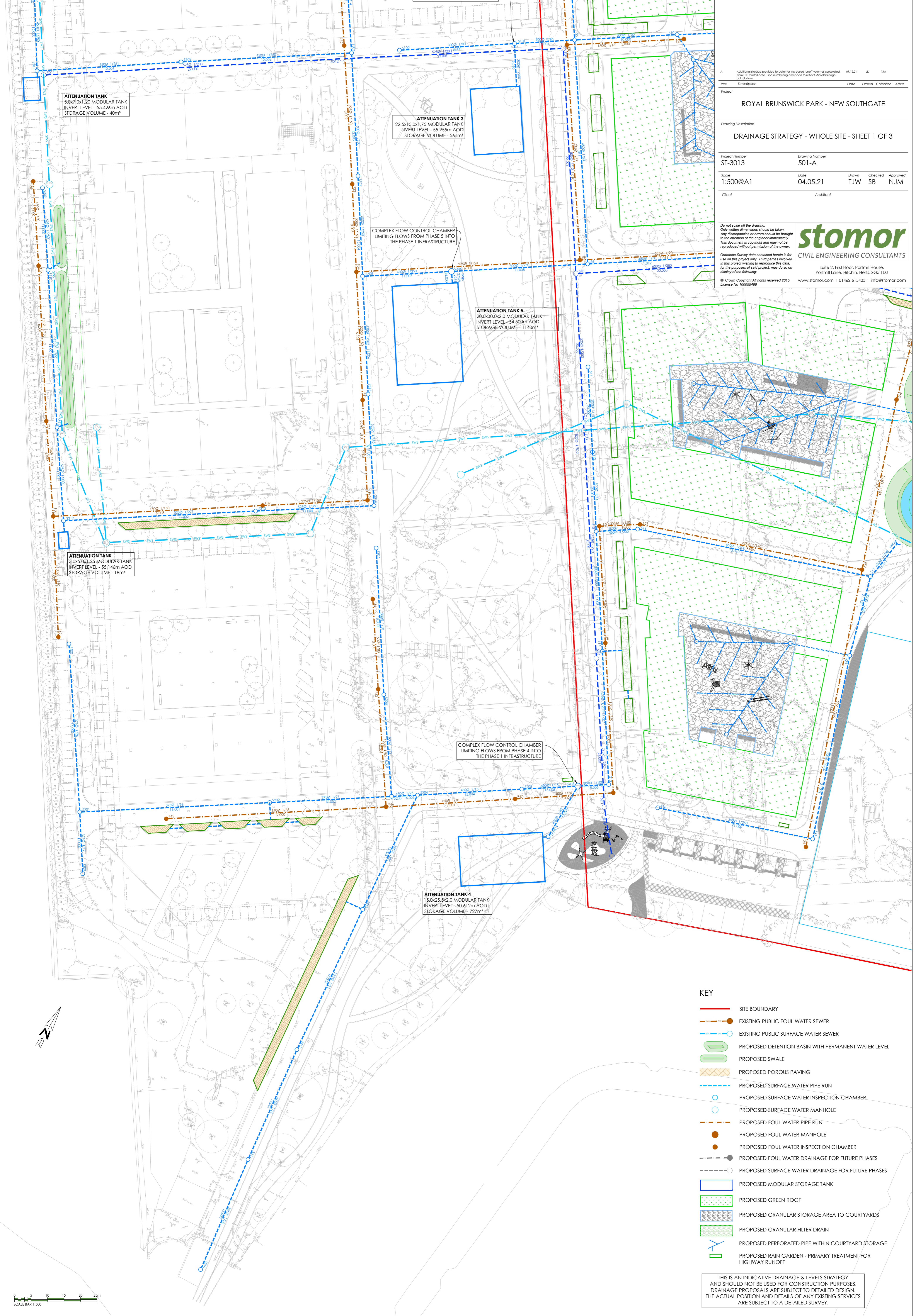
|  |             |                |         |          |        |
|--|-------------|----------------|---------|----------|--------|
| Additional storage provided to cover for increased runoff volumes calculated from first rainfall data. Pipe numbering amended to reflect re-arrangement. |             | 09.12.21       | JD      | 1/2W     |        |
| Rev  | Description | Date           | Drawn   | Checked  | Apvtd. |
| Project  |             |                |         |          |        |
| ROYAL BRUNSWICK PARK - NEW SOUTHGATE   |             |                |         |          |        |
| Drawing Description  |             |                |         |          |        |
| DRAINAGE STRATEGY - WHOLE SITE - SHEET 1 OF 3  |             |                |         |          |        |
| Project Number   |             | Drawing Number |         |          |        |
| ST-3013  |             | 501-A          |         |          |        |
| Scale  | Date        | Drawn          | Checked | Approved |        |
| 1:500@A1   | 04.05.21    | TJW            | SB      | NJM      |        |
| Client   |             | Architect      |         |          |        |

Do not scale off the drawing. Only written dimensions should be taken. Any discrepancies or errors should be brought to the attention of the engineer immediately. This document is copyright and may not be reproduced without permission of the owner.

Ordnance Survey data contained herein is for use on this project only. Third parties involved in this project wishing to reproduce this data for the purposes of said project, may do so on display of the following:

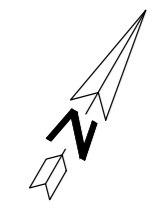
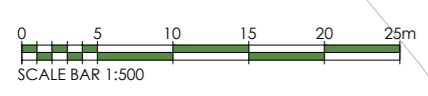
© Crown Copyright All rights reserved 2015  
License No 10005466

**stomor**  
CIVIL ENGINEERING CONSULTANTS  
Suite 2, First Floor, Portmill House,  
Portmill Lane, Hitchin, Herts, SG5 1DJ  
www.stomor.com | 01462 615433 | info@stomor.com



- KEY**
- SITE BOUNDARY
  - EXISTING PUBLIC FOUL WATER SEWER
  - EXISTING PUBLIC SURFACE WATER SEWER
  - PROPOSED DETENTION BASIN WITH PERMANENT WATER LEVEL
  - PROPOSED SWALE
  - PROPOSED POROUS PAVING
  - PROPOSED SURFACE WATER PIPE RUN
  - PROPOSED SURFACE WATER INSPECTION CHAMBER
  - PROPOSED SURFACE WATER MANHOLE
  - PROPOSED FOUL WATER PIPE RUN
  - PROPOSED FOUL WATER MANHOLE
  - PROPOSED FOUL WATER INSPECTION CHAMBER
  - PROPOSED FOUL WATER DRAINAGE FOR FUTURE PHASES
  - PROPOSED SURFACE WATER DRAINAGE FOR FUTURE PHASES
  - PROPOSED MODULAR STORAGE TANK
  - PROPOSED GREEN ROOF
  - PROPOSED GRANULAR STORAGE AREA TO COURTYARDS
  - PROPOSED GRANULAR FILTER DRAIN
  - PROPOSED PERFORATED PIPE WITHIN COURTYARD STORAGE
  - PROPOSED RAIN GARDEN - PRIMARY TREATMENT FOR HIGHWAY RUNOFF

THIS IS AN INDICATIVE DRAINAGE & LEVELS STRATEGY AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN. THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES ARE SUBJECT TO A DETAILED SURVEY.





|     |   |          |       |         |       |
|-----|---|----------|-------|---------|-------|
| Rev | Description   | Date     | Drawn | Checked | Apvtd |
| A   | Additional storage provided to cover for increased runoff volumes calculated from first rainfall data. Pipe numbering generated to reflect re-arrangement | 09.12.21 | JD    | TJW     |       |

Project: ROYAL BRUNSWICK PARK - NEW SOUTHGATE  
 Drawing Description: DRAINAGE STRATEGY - WHOLE SITE - SHEET 2 OF 3

|                |                |       |         |          |
|----------------|----------------|-------|---------|----------|
| Project Number | Drawing Number |       |         |          |
| ST-3013        | 502-A          |       |         |          |
| Scale          | Date           | Drawn | Checked | Approved |
| 1:500@A1       | 04.05.21       | TJW   | SB      | NJM      |
| Client         | Architect      |       |         |          |

Do not scale off the drawing. Only written dimensions should be taken. Any discrepancies or errors should be brought to the attention of the engineer immediately. This document is copyright and may not be reproduced without permission of the owner.

Ordnance Survey data contained herein is for use on this project only. Third parties involved in this project wishing to reproduce this data for the purposes of said project, may do so on display of the following:  
 © Crown Copyright All rights reserved 2015 License No 100054666

**stomor**  
 CIVIL ENGINEERING CONSULTANTS  
 Suite 2, First Floor, Portmill House,  
 Portmill Lane, Hitchin, Herts, SG5 1DJ  
 www.stomor.com | 01462 615433 | info@stomor.com

**KEY**

- SITE BOUNDARY
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- PROPOSED DETENTION BASIN WITH PERMANENT WATER LEVEL
- PROPOSED SWALE
- PROPOSED POROUS PAVING
- PROPOSED SURFACE WATER PIPE RUN
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED FOUL WATER PIPE RUN
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED SURFACE WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED MODULAR STORAGE TANK
- PROPOSED GREEN ROOF
- PROPOSED GRANULAR STORAGE AREA TO COURTYARDS
- PROPOSED GRANULAR FILTER DRAIN
- PROPOSED PERFORATED PIPE WITHIN COURTYARD STORAGE
- PROPOSED RAIN GARDEN - PRIMARY TREATMENT FOR HIGHWAY RUNOFF

THIS IS AN INDICATIVE DRAINAGE & LEVELS STRATEGY AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN. THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES ARE SUBJECT TO A DETAILED SURVEY.

**ATTENUATION TANK 7**  
 4.0x5.0x1.0 MODULAR TANK  
 INVERT LEVEL - 67.947m AOD  
 STORAGE VOLUME - 20m³

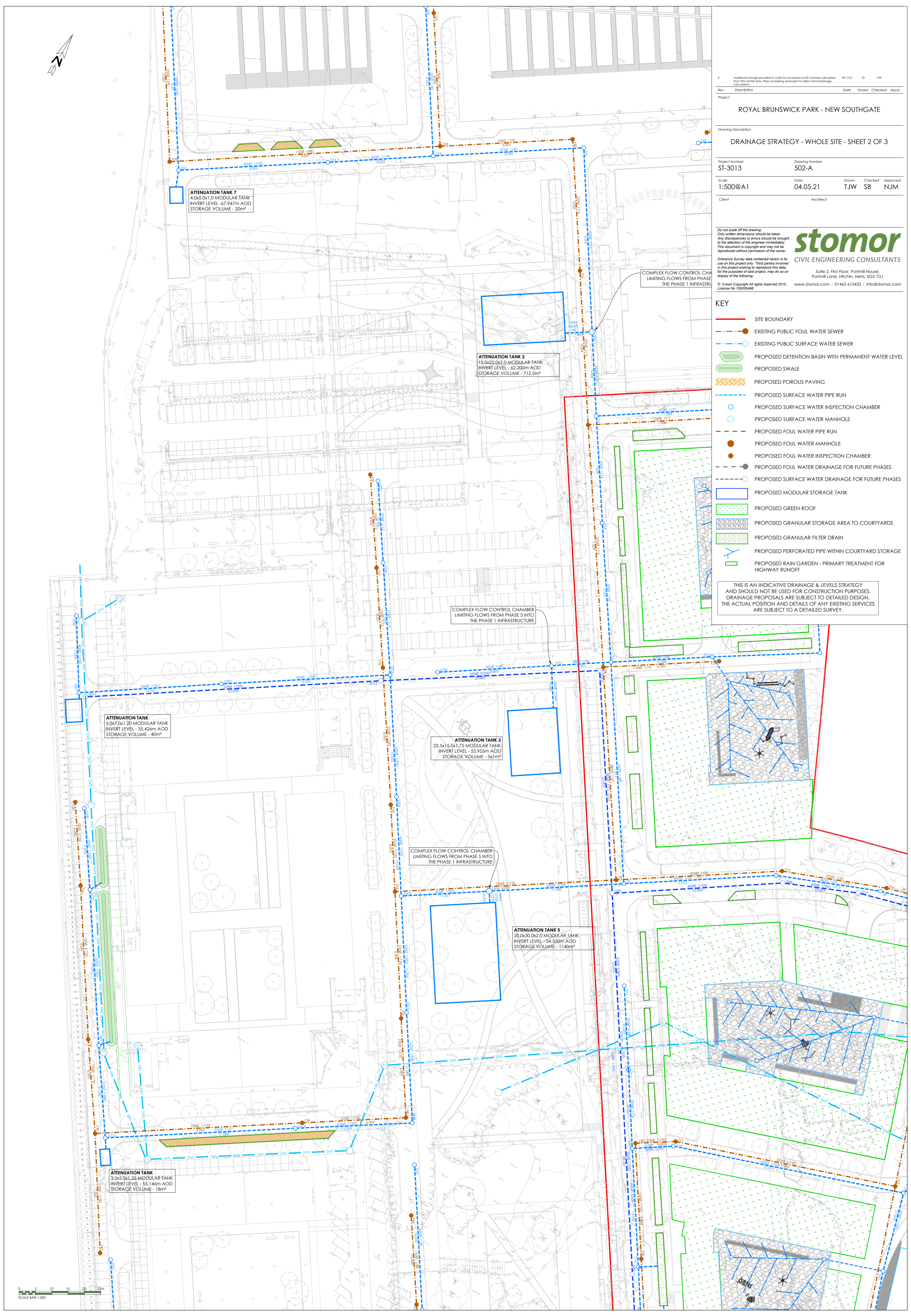
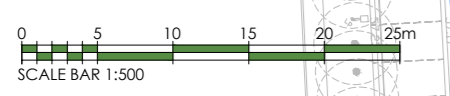
**ATTENUATION TANK 2**  
 15.0x25.0x2.0 MODULAR TANK  
 INVERT LEVEL - 62.200m AOD  
 STORAGE VOLUME - 712.5m³

**ATTENUATION TANK 3**  
 22.5x15.0x1.75 MODULAR TANK  
 INVERT LEVEL - 55.955m AOD  
 STORAGE VOLUME - 561m³

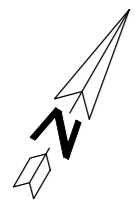
**ATTENUATION TANK 5**  
 20.0x30.0x2.0 MODULAR TANK  
 INVERT LEVEL - 54.500m AOD  
 STORAGE VOLUME - 1140m³

**ATTENUATION TANK**  
 5.0x7.0x1.20 MODULAR TANK  
 INVERT LEVEL - 55.426m AOD  
 STORAGE VOLUME - 40m³

**ATTENUATION TANK**  
 3.0x5.0x1.25 MODULAR TANK  
 INVERT LEVEL - 55.146m AOD  
 STORAGE VOLUME - 18m³







KEY

- SITE BOUNDARY
- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- PROPOSED DETENTION BASIN WITH PERMANENT WATER LEVEL
- PROPOSED SWALE
- PROPOSED POROUS PAVING
- PROPOSED SURFACE WATER PIPE RUN
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED SURFACE WATER MANHOLE
- PROPOSED FOUL WATER PIPE RUN
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED SURFACE WATER DRAINAGE FOR FUTURE PHASES
- PROPOSED MODULAR STORAGE TANK
- PROPOSED GREEN ROOF
- PROPOSED GRANULAR STORAGE AREA TO COURTYARDS
- PROPOSED GRANULAR FILTER DRAIN
- PROPOSED PERFORATED PIPE WITHIN COURTYARD STORAGE
- PROPOSED RAIN GARDEN - PRIMARY TREATMENT FOR HIGHWAY RUNOFF

THIS IS AN INDICATIVE DRAINAGE & LEVELS STRATEGY AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES. DRAINAGE PROPOSALS ARE SUBJECT TO DETAILED DESIGN. THE ACTUAL POSITION AND DETAILS OF ANY EXISTING SERVICES ARE SUBJECT TO A DETAILED SURVEY.

|  |             |                |           |            |          |
|--|-------------|----------------|-----------|------------|----------|
| Additional storage provided to cater for increased runoff volumes calculated from 100% rainfall data. Flow numbering generated to reflect mismanagement. |             | 09/12/21       | JD        | 17W        |          |
| Rev  | Description | Date           | Drawn     | Checked    | Approved |
| <b>ROYAL BRUNSWICK PARK - NEW SOUTHGATE</b>  |             |                |           |            |          |
| Drawing Description  |             |                |           |            |          |
| <b>DRAINAGE STRATEGY - WHOLE SITE - SHEET 3 OF 3</b>   |             |                |           |            |          |
| Project Number   |             | Drawing Number |           |            |          |
| ST-3013  |             | 503-A          |           |            |          |
| Scale  |             | Date           |           | Drawn      |          |
| 1:500@A1   |             | 04.05.21       |           | TJW SB NJM |          |
| Client   |             |                | Architect |            |          |

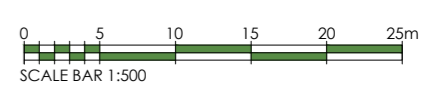
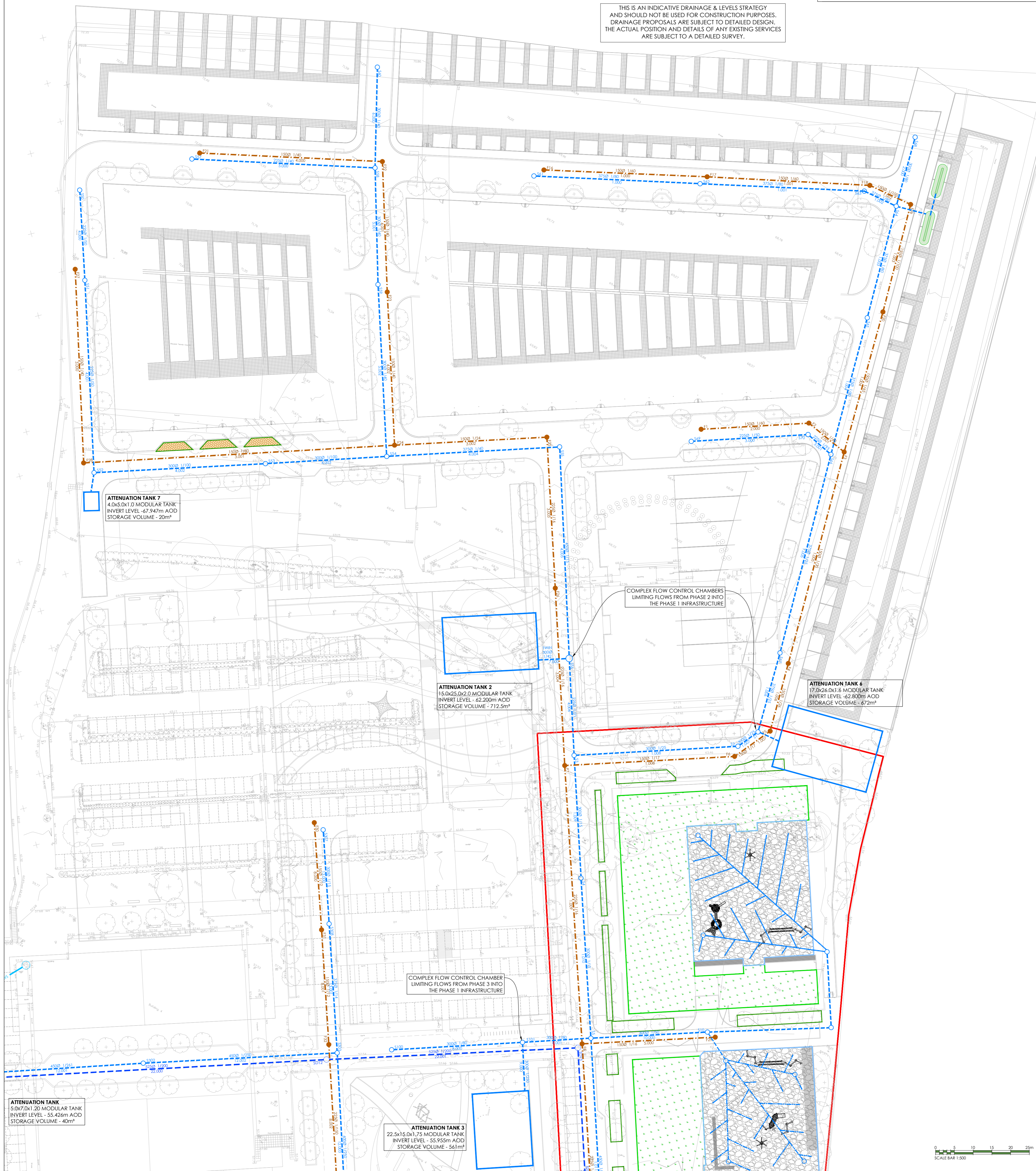
Do not scale off the drawing. Only written dimensions should be taken. Any discrepancies or errors should be brought to the attention of the engineer immediately. This document is copyright and may not be reproduced without permission of the owner.

Ordnance Survey data contained herein is for use on this project only. Third parties involved in this project wishing to reproduce this data for the purposes of said project, may do so on display of the following:


© Crown Copyright All rights reserved 2015. License No 10005466.



Suite 2, First Floor, Portmill House,  
Portmill Lane, Hitchin, Herts, SG5 1DJ  
www.stomor.com | 01462 615433 | info@stomor.com






|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 0  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Existing Network Details for Surface Network 1

\* - Indicates pipe has been modified outside of System 1

| 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 | 44.357        | 0.554       | 80.1           | 0.152          | 5.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 1.001   | 43.867        | 0.548       | 80.0           | 0.159          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 1.002   | 9.405         | 0.118       | 79.7           | 0.082          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| * 2.000 | 19.091        | 0.239       | 79.9           | 0.024          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 1.003   | 30.750        | 0.384       | 80.1           | 0.058          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 1.004   | 37.745        | 0.472       | 80.0           | 0.063          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 3.000   | 31.211        | 0.624       | 50.0           | 0.046          | 5.00           | 0.600     | o           | 225         | Pipe/Conduit |
| * 3.001 | 8.078         | 0.087       | 92.9           | 0.009          | 0.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 1.005   | 54.677        | 2.187       | 25.0           | 0.151          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 1.006   | 21.894        | 0.876       | 25.0           | 0.202          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 1.007   | 6.559         | 0.262       | 25.0           | 0.038          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 1.008   | 43.775        | 1.751       | 25.0           | 0.041          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 4.000   | 24.098        | 0.482       | 50.0           | 0.026          | 5.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 4.001   | 51.405        | 1.028       | 50.0           | 0.087          | 0.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 4.002   | 45.790        | 0.458       | 100.0          | 0.049          | 0.00           | 0.600     | o           | 300         | 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 | S61           | 70.003       | 67.868       | 1.760                | 69.257       | 67.314       | 1.568                |              | 1200          |
| 1.001   | S62           | 69.257       | 67.313       | 1.569                | 70.390       | 66.765       | 3.250                |              | 1200          |
| 1.002   | S63           | 70.390       | 66.765       | 3.250                | 68.521       | 66.647       | 1.499                |              | 1200          |
| * 2.000 | S68           | 68.755       | 66.961       | 1.494                | 68.521       | 66.722       | 1.499                |              | 1200          |
| 1.003   | S64           | 68.521       | 66.647       | 1.499                | 68.132       | 66.263       | 1.494                |              | 1200          |
| 1.004   | S65           | 68.132       | 66.263       | 1.494                | 67.661       | 65.791       | 1.495                |              | 1200          |
| 3.000   | S69           | 68.127       | 66.652       | 1.250                | 67.821       | 66.028       | 1.568                |              | 1200          |
| * 3.001 | S70           | 67.821       | 66.028       | 1.568                | 67.661       | 65.941       | 1.495                |              | 1200          |
| 1.005   | S66           | 67.661       | 65.791       | 1.495                | 66.029       | 63.604       | 2.050                |              | 1200          |
| 1.006   | S67           | 66.029       | 63.604       | 2.050                | 64.918       | 62.728       | 1.815                |              | 1200          |
| 1.007   | S1            | 64.918       | 62.728       | 1.890                | 64.537       | 62.466       | 1.771                | Hydro-Brake® | 1200          |
| 1.008   | S2            | 64.537       | 62.466       | 1.771                | 63.329       | 60.715       | 2.314                |              | 1200          |
| 4.000   | S50           | 71.802       | 69.532       | 2.045                | 71.045       | 69.050       | 1.770                |              | 1200          |
| 4.001   | S51           | 71.045       | 69.050       | 1.770                | 69.303       | 68.022       | 1.056                |              | 1200          |
| 4.002   | S52           | 69.303       | 67.947       | 1.056                | 69.266       | 67.489       | 1.477                |              | 1200          |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 1  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Existing Network Details for Surface Network 1

| 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 |
|-------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|
| 4.003 | 32.407        | 0.324       | 100.0          | 0.176          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 5.000 | 48.910        | 1.223       | 40.0           | 0.113          | 5.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 6.000 | 26.892        | 0.672       | 40.0           | 0.025          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 5.001 | 31.130        | 0.778       | 40.0           | 0.071          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 5.002 | 45.922        | 1.148       | 40.0           | 0.158          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 4.004 | 46.195        | 1.155       | 40.0           | 0.036          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 4.005 | 56.494        | 3.860       | 14.6           | 0.259          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 7.000 | 8.300         | 0.200       | 41.5           | 0.000          | 5.00           | 0.600     | oo          | 300         | Double Pipe  |
| 4.006 | 25.898        | 1.210       | 21.4           | 0.172          | 0.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 1.009 | 32.830        | 2.189       | 15.0           | 0.094          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 1.010 | 42.779        | 2.852       | 15.0           | 0.070          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 8.000 | 34.971        | 0.437       | 80.0           | 0.145          | 5.00           | 0.600     | o           | 300         | 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) |
|-------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|---------|---------------|
| 4.003 | S53           | 69.266       | 67.489       | 1.477                | 68.947       | 67.165       | 1.482                |         | 1200          |
| 5.000 | S57           | 72.225       | 70.389       | 1.611                | 71.539       | 69.166       | 2.148                |         | 1200          |
| 6.000 | S60           | 71.286       | 69.763       | 1.223                | 71.539       | 69.091       | 2.148                |         | 1200          |
| 5.001 | S58           | 71.539       | 69.091       | 2.148                | 71.198       | 68.313       | 2.585                |         | 1200          |
| 5.002 | S59           | 71.198       | 68.313       | 2.585                | 68.947       | 67.165       | 1.482                |         | 1200          |
| 4.004 | S54           | 68.947       | 67.090       | 1.482                | 68.487       | 65.935       | 2.177                |         | 1350          |
| 4.005 | S55           | 68.487       | 65.860       | 2.177                | 65.177       | 62.000       | 2.727                |         | 1350          |
| 7.000 | TANK 2        | 65.200       | 62.200       | 2.700                | 65.177       | 62.000       | 2.877                |         | 1200          |
| 4.006 | S56           | 65.177       | 62.000       | 2.952                | 63.329       | 60.790       | 2.314                | Complex | 1800          |
| 1.009 | S3            | 63.329       | 60.715       | 2.314                | 60.981       | 58.526       | 2.155                |         | 1200          |
| 1.010 | S4            | 60.981       | 58.526       | 2.155                | 58.345       | 55.674       | 2.371                |         | 1200          |
| 8.000 | S100          | 58.700       | 56.340       | 2.060                | 58.500       | 55.903       | 2.297                |         | 1200          |


|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 2  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Existing Network Details for Surface Network 1

| 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 |
|----------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|------|
| 9.000    | 12.982        | 0.052       | 250.0          | 0.000          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |      |
| 8.001    | 18.274        | 0.228       | 80.1           | 0.126          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |      |
| 10.000   | 31.127        | 0.623       | 50.0           | 0.319          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |      |
| 1.011    | 68.102        | 1.362       | 50.0           | 0.161          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |      |
| * 11.000 | 25.033        | 0.100       | 250.3          | 0.089          | 5.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 11.001 | 47.773        | 0.159       | 300.5          | 0.085          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 11.002 | 28.455        | 0.095       | 299.5          | 0.070          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 11.003 | 58.355        | 0.215       | 271.4          | 0.057          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 11.004 | 35.927        | 0.103       | 348.8          | 0.163          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 11.005 | 33.904        | 0.097       | 349.5          | 0.052          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 11.006 | 35.813        | 0.177       | 202.3          | 0.088          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |      |
| * 12.000 | 23.645        | 0.095       | 250.0          | 0.073          | 5.00           | 0.600     | o           | 450         | Pipe/Conduit |      |
| * 12.001 | 43.782        | 0.168       | 260.6          | 0.056          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |      |
| * 12.002 | 51.798        | 0.207       | 250.2          | 0.177          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |      |
| 13.000   | 25.137        | 1.676       | 15.0           | 0.465          | 5.00           | 0.600     | o           | 300         | 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) |
|----------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|--------------|---------------|
| 9.000    | TANK 3        | 58.500       | 55.955       | 2.245                | 58.500       | 55.903       | 2.297                |              | 1200          |
| 8.001    | S101          | 58.500       | 55.903       | 2.297                | 58.345       | 55.675       | 2.370                | Hydro-Brake® | 1800          |
| 10.000   | S10           | 58.612       | 56.297       | 2.015                | 58.345       | 55.674       | 2.371                |              | 1200          |
| 1.011    | S5            | 58.345       | 55.524       | 2.371                | 56.963       | 54.162       | 2.351                |              | 1350          |
| * 11.000 | S309          | 56.900       | 55.500       | 0.875                | 56.900       | 55.400       | 0.975                |              | 1350          |
| * 11.001 | S310          | 56.900       | 55.400       | 0.975                | 56.900       | 55.241       | 1.134                |              | 1800          |
| * 11.002 | S311          | 56.900       | 55.241       | 1.134                | 56.990       | 55.146       | 1.319                |              | 1350          |
| * 11.003 | S312          | 56.990       | 55.146       | 1.319                | 57.411       | 54.931       | 1.955                |              | 1350          |
| * 11.004 | S313          | 57.411       | 54.932       | 1.954                | 57.873       | 54.829       | 2.519                |              | 1350          |
| * 11.005 | S314          | 57.873       | 54.829       | 2.519                | 57.001       | 54.732       | 1.744                |              | 1350          |
| * 11.006 | S315          | 57.001       | 54.732       | 1.744                | 57.769       | 54.555       | 2.689                |              | 1350          |
| * 12.000 | S300          | 57.248       | 55.521       | 1.277                | 57.080       | 55.426       | 1.204                |              | 1200          |
| * 12.001 | S301          | 57.080       | 55.426       | 1.204                | 57.694       | 55.258       | 1.986                |              | 1200          |
| * 12.002 | S302          | 57.694       | 55.258       | 1.986                | 57.503       | 55.051       | 2.002                |              | 1350          |
| 13.000   | S307          | 62.267       | 59.027       | 2.940                | 60.000       | 57.351       | 2.349                |              | 1200          |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 3  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Existing Network Details for Surface Network 1

| 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 |
|----------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|
| * 13.001 | 34.505        | 2.451       | 14.1           | 0.111          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 12.003   | 37.429        | 0.150       | 249.5          | 0.000          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 12.004   | 30.468        | 0.122       | 249.7          | 0.239          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 11.007   | 27.000        | 0.077       | 350.6          | 0.000          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 14.000   | 3.551         | 0.014       | 253.6          | 0.000          | 5.00           | 0.600     | oo          | 375         | Double Pipe  |
| 11.008   | 41.354        | 0.165       | 250.0          | 0.000          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 1.012    | 46.740        | 0.935       | 50.0           | 0.140          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 1.013    | 32.402        | 1.620       | 20.0           | 0.233          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 1.014    | 26.817        | 1.341       | 20.0           | 0.217          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 1.015    | 34.992        | 1.166       | 30.0           | 0.000          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 1.016    | 28.661        | 0.100       | 286.6          | 0.000          | 0.00           | 0.600     | 1 \_ /      | 500         | 1:1 Ditch    |
| 15.000   | 36.353        | 1.454       | 25.0           | 0.039          | 5.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 15.001   | 36.536        | 1.461       | 25.0           | 0.042          | 0.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 15.002   | 46.990        | 1.880       | 25.0           | 0.050          | 0.00           | 0.600     | o           | 225         | Pipe/Conduit |
| 15.003   | 38.485        | 1.539       | 25.0           | 0.159          | 0.00           | 0.600     | o           | 225         | 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) |
|----------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|---------|---------------|
| * 13.001 | S308          | 60.000       | 57.352       | 2.273                | 57.503       | 54.901       | 2.227                |         | 1200          |
| 12.003   | S303          | 57.503       | 54.901       | 2.002                | 57.734       | 54.751       | 2.383                |         | 1350          |
| 12.004   | S304          | 57.734       | 54.752       | 2.382                | 57.769       | 54.630       | 2.539                |         | 1350          |
| 11.007   | S305          | 57.769       | 54.555       | 2.614                | 57.777       | 54.478       | 2.699                |         | 1350          |
| 14.000   | TANK 5        | 57.785       | 54.492       | 2.918                | 57.777       | 54.478       | 2.924                |         | 1200          |
| 11.008   | S306          | 57.777       | 54.478       | 2.999                | 56.963       | 54.312       | 2.351                | Complex | 1350          |
| 1.012    | S6            | 56.963       | 54.162       | 2.351                | 55.888       | 53.227       | 2.211                |         | 1350          |
| 1.013    | S7            | 55.888       | 53.227       | 2.211                | 53.744       | 51.607       | 1.687                |         | 1350          |
| 1.014    | S8            | 53.744       | 51.607       | 1.687                | 52.091       | 50.266       | 1.375                |         | 1350          |
| 1.015    | S9            | 52.091       | 50.266       | 1.374                | 50.000       | 49.100       | 0.450                |         | 1240 x 900    |
| 1.016    | HW1           | 50.000       | 49.100       | 0.600                | 50.000       | 49.000       | 0.700                |         | 900 x 900     |
| 15.000   | S210          | 62.450       | 60.351       | 1.874                | 61.184       | 58.897       | 2.062                |         | 1200          |
| 15.001   | S211          | 61.184       | 58.897       | 2.062                | 59.337       | 57.436       | 1.676                |         | 1200          |
| 15.002   | S212          | 59.337       | 57.436       | 1.676                | 57.477       | 55.556       | 1.696                |         | 1200          |
| 15.003   | S213          | 57.477       | 55.556       | 1.696                | 56.037       | 54.017       | 1.795                |         | 1200          |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 4  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Existing Network Details for Surface Network 1

| 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 |
|----------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|
| * 16.000 | 51.133        | 0.533       | 95.9           | 0.090          | 5.00           | 0.600     | o           | 375         | Pipe/Conduit |
| * 17.000 | 18.746        | 1.129       | 16.6           | 0.079          | 5.00           | 0.600     | o           | 375         | Pipe/Conduit |
| * 16.001 | 57.670        | 0.601       | 96.0           | 0.045          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| * 16.002 | 37.023        | 0.381       | 97.2           | 0.164          | 0.00           | 0.600     | o           | 375         | Pipe/Conduit |
| 18.000   | 44.560        | 0.891       | 50.0           | 0.189          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |
| * 18.001 | 30.979        | 0.982       | 31.5           | 0.170          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| * 16.003 | 7.884         | 0.313       | 25.2           | 0.000          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 15.004   | 31.683        | 2.437       | 13.0           | 0.054          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| * 15.005 | 17.041        | 1.160       | 14.7           | 0.044          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| * 19.000 | 17.832        | 0.418       | 42.7           | 0.000          | 5.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 15.006   | 9.354         | 0.094       | 99.5           | 0.164          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 15.007   | 40.473        | 0.202       | 200.4          | 0.091          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 15.008   | 36.443        | 0.182       | 200.2          | 0.146          | 0.00           | 0.600     | o           | 300         | 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) |
|----------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|---------|---------------|
| * 16.000 | S200          | 57.119       | 55.695       | 1.049                | 57.507       | 55.162       | 1.970                |         | 1350          |
| * 17.000 | S209          | 57.632       | 56.291       | 0.966                | 57.507       | 55.162       | 1.970                |         | 1350          |
| * 16.001 | S201          | 57.507       | 55.162       | 1.970                | 58.084       | 54.561       | 3.148                |         | 1350          |
| * 16.002 | S202          | 58.084       | 54.561       | 3.148                | 56.599       | 54.180       | 2.044                |         | 1350          |
| 18.000   | S207          | 57.372       | 56.128       | 0.944                | 57.513       | 55.237       | 1.976                |         | 900 x 750     |
| * 18.001 | S208          | 57.513       | 55.237       | 1.976                | 56.599       | 54.255       | 2.044                |         | 1200          |
| * 16.003 | S203          | 56.599       | 54.105       | 2.044                | 56.037       | 53.792       | 1.795                |         | 1350          |
| 15.004   | S204          | 56.037       | 53.792       | 1.795                | 53.772       | 51.355       | 1.967                |         | 1350          |
| * 15.005 | S205          | 53.772       | 51.354       | 1.968                | 52.549       | 50.194       | 1.905                |         | 1350          |
| * 19.000 | TANK 4        | 53.350       | 50.612       | 2.288                | 52.549       | 50.194       | 1.905                |         | 1200          |
| 15.006   | S206          | 52.549       | 50.344       | 1.905                | 52.007       | 50.250       | 1.457                | Complex | 1800          |
| 15.007   | S13           | 52.007       | 50.100       | 1.607                | 52.343       | 49.898       | 2.145                |         | 1200          |
| 15.008   | S14           | 52.343       | 49.898       | 2.145                | 52.692       | 49.716       | 2.676                |         | 1200          |


|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 5  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Existing Network Details for Surface Network 1

| 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 |
|---------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|
| 20.000  | 25.365        | 1.812       | 14.0           | 0.093          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 20.001  | 24.162        | 1.726       | 14.0           | 0.180          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 15.009  | 12.603        | 0.063       | 200.0          | 0.000          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 15.010  | 72.051        | 0.360       | 200.0          | 0.000          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 21.000  | 49.302        | 0.197       | 250.3          | 0.130          | 5.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 21.001  | 40.800        | 0.163       | 250.3          | 0.060          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 21.002  | 40.714        | 0.163       | 249.8          | 0.053          | 0.00           | 0.600     | o           | 300         | Pipe/Conduit |
| 15.011  | 21.104        | 0.053       | 398.2          | 0.109          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 15.012  | 35.015        | 0.089       | 393.4          | 0.074          | 0.00           | 0.600     | 1 \_ /      | 500         | 1:1 Ditch    |
| * 1.017 | 9.683         | 0.800       | 12.1           | 0.245          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| * 1.018 | 34.255        | 2.969       | 11.5           | 0.000          | 0.00           | 0.600     | o           | 450         | Pipe/Conduit |
| 22.000  | 90.710        | 0.454       | 200.0          | 0.000          | 5.00           | 0.600     | o           | 525         | Pipe/Conduit |
| 22.001  | 67.132        | 0.336       | 200.0          | 0.000          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |
| 22.002  | 68.459        | 5.860       | 11.7           | 0.000          | 0.00           | 0.600     | o           | 525         | 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) |
|---------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|---------|---------------|
| 20.000  | S11           | 55.455       | 53.253       | 1.902                | 53.769       | 51.441       | 2.028                |         | 1200          |
| 20.001  | S12           | 53.769       | 51.441       | 2.028                | 52.692       | 49.715       | 2.677                |         | 1200          |
| 15.009  | S15           | 52.692       | 49.565       | 2.676                | 52.300       | 49.502       | 2.348                |         | 1350          |
| 15.010  | S16           | 52.300       | 49.502       | 2.348                | 50.600       | 49.142       | 1.008                |         | 1350          |
| 21.000  | S18           | 51.725       | 49.815       | 1.610                | 51.102       | 49.618       | 1.184                |         | 1200          |
| 21.001  | S19           | 51.102       | 49.618       | 1.184                | 51.000       | 49.455       | 1.245                |         | 1200          |
| 21.002  | S20           | 51.000       | 49.455       | 1.245                | 50.600       | 49.292       | 1.008                |         | 1200          |
| 15.011  | S17           | 50.600       | 49.142       | 1.008                | 50.000       | 49.089       | 0.461                |         | 1240 x 900    |
| 15.012  | HW2           | 50.000       | 49.089       | 0.611                | 50.000       | 49.000       | 0.700                |         | 900 x 900     |
| * 1.017 | HW3           | 50.000       | 48.800       | 0.750                | 50.000       | 48.000       | 1.550                |         | 900 x 750     |
| * 1.018 | S21           | 50.000       | 48.000       | 1.550                | 49.986       | 45.031       | 4.505                | Complex | 1200          |
| 22.000  | SD11          | 57.027       | 53.629       | 2.873                | 57.510       | 53.176       | 3.810                |         | 1500          |
| 22.001  | SD12          | 57.510       | 53.176       | 3.810                | 58.383       | 52.840       | 5.018                |         | 1500          |
| 22.002  | SD13          | 58.383       | 52.840       | 5.018                | 56.983       | 46.980       | 9.478                |         | 1500          |



|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 6  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage Network 2020.1                            |                                |   |

Existing Network Details for Surface Network 1

| 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 |
|--------|---------------|-------------|----------------|----------------|----------------|-----------|-------------|-------------|--------------|
| 23.000 | 60.167        | 0.241       | 250.0          | 0.000          | 5.00           | 0.600     | o           | 525         | Pipe/Conduit |
| 23.001 | 69.422        | 0.278       | 250.0          | 0.000          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |
| 23.002 | 2.329         | 0.005       | 500.0          | 0.000          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |
| 23.003 | 45.268        | 0.129       | 350.0          | 0.000          | 0.00           | 0.600     | o           | 525         | Pipe/Conduit |
| 22.003 | 52.408        | 0.150       | 350.0          | 0.000          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 22.004 | 23.251        | 0.066       | 350.0          | 0.000          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 22.005 | 84.676        | 1.694       | 50.0           | 0.000          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 1.019  | 64.370        | 1.287       | 50.0           | 0.000          | 0.00           | 0.600     | o           | 600         | Pipe/Conduit |
| 1.020  | 87.290        | 2.144       | 40.7           | 0.000          | 0.00           | 0.600     | o           | 600         | 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) |
|--------|---------------|--------------|--------------|----------------------|--------------|--------------|----------------------|-------------|---------------|
| 23.000 | SD1           | 52.929       | 47.518       | 4.886                | 52.373       | 47.278       | 4.571                |             | 1500          |
| 23.001 | SD2           | 52.373       | 47.278       | 4.571                | 54.270       | 47.000       | 6.745                |             | 1500          |
| 23.002 | SD3           | 54.270       | 47.000       | 6.745                | 54.426       | 46.995       | 6.906                | 1240 x 975  |               |
| 23.003 | SD4           | 54.426       | 46.995       | 6.906                | 56.983       | 46.866       | 9.592                | 1240 x 975  |               |
| 22.003 | SD5           | 56.983       | 46.791       | 9.592                | 55.745       | 46.641       | 8.504                | 1240 x 1050 |               |
| 22.004 | SD6           | 55.745       | 46.641       | 8.504                | 54.163       | 46.575       | 6.988                | 1240 x 1050 |               |
| 22.005 | SD7           | 54.163       | 46.575       | 6.988                | 49.986       | 44.881       | 4.505                | 1240 x 1050 |               |
| 1.019  | SD8           | 49.986       | 44.881       | 4.505                | 48.228       | 43.594       | 4.034                |             | 1500          |
| 1.020  | SD9           | 48.228       | 43.594       | 4.034                | 48.464       | 41.450       | 6.414                |             | 1500          |

Manhole Schedules for Surface Network 1

| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | Pipe Out PN | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | Pipes In PN | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|-------------|---------------------------|------------------------|-------------|---------------------------|------------------------|---------------|
| S61     | 70.003    | 2.135        | Open Manhole  | 1200               | 1.000       | 67.868                    | 375                    |             |                           |                        |               |
| S62     | 69.257    | 1.944        | Open Manhole  | 1200               | 1.001       | 67.313                    | 375                    | 1.000       | 67.314                    | 375                    | 1             |
| S63     | 70.390    | 3.625        | Open Manhole  | 1200               | 1.002       | 66.765                    | 375                    | 1.001       | 66.765                    | 375                    |               |
| S68     | 68.755    | 1.794        | Open Manhole  | 1200               | 2.000       | 66.961                    | 300                    |             |                           |                        |               |
| S64     | 68.521    | 1.874        | Open Manhole  | 1200               | 1.003       | 66.647                    | 375                    | 1.002       | 66.647                    | 375                    |               |
|         |           |              |               |                    |             |                           |                        | 2.000       | 66.722                    | 300                    |               |
| S65     | 68.132    | 1.869        | Open Manhole  | 1200               | 1.004       | 66.263                    | 375                    | 1.003       | 66.263                    | 375                    |               |
| S69     | 68.127    | 1.475        | Open Manhole  | 1200               | 3.000       | 66.652                    | 225                    |             |                           |                        |               |
| S70     | 67.821    | 1.793        | Open Manhole  | 1200               | 3.001       | 66.028                    | 225                    | 3.000       | 66.028                    | 225                    |               |
| S66     | 67.661    | 1.870        | Open Manhole  | 1200               | 1.005       | 65.791                    | 375                    | 1.004       | 65.791                    | 375                    |               |
|         |           |              |               |                    |             |                           |                        | 3.001       | 65.941                    | 225                    |               |
| S67     | 66.029    | 2.425        | Open Manhole  | 1200               | 1.006       | 63.604                    | 375                    | 1.005       | 63.604                    | 375                    |               |
| S1      | 64.918    | 2.190        | Open Manhole  | 1200               | 1.007       | 62.728                    | 300                    | 1.006       | 62.728                    | 375                    |               |
| S2      | 64.537    | 2.071        | Open Manhole  | 1200               | 1.008       | 62.466                    | 300                    | 1.007       | 62.466                    | 300                    |               |
| S50     | 71.802    | 2.270        | Open Manhole  | 1200               | 4.000       | 69.532                    | 225                    |             |                           |                        |               |
| S51     | 71.045    | 1.995        | Open Manhole  | 1200               | 4.001       | 69.050                    | 225                    | 4.000       | 69.050                    | 225                    |               |
| S52     | 69.303    | 1.356        | Open Manhole  | 1200               | 4.002       | 67.947                    | 300                    | 4.001       | 68.022                    | 225                    |               |
| S53     | 69.266    | 1.777        | Open Manhole  | 1200               | 4.003       | 67.489                    | 300                    | 4.002       | 67.489                    | 300                    |               |
| S57     | 72.225    | 1.836        | Open Manhole  | 1200               | 5.000       | 70.389                    | 225                    |             |                           |                        |               |
| S60     | 71.286    | 1.523        | Open Manhole  | 1200               | 6.000       | 69.763                    | 300                    |             |                           |                        |               |
| S58     | 71.539    | 2.448        | Open Manhole  | 1200               | 5.001       | 69.091                    | 300                    | 5.000       | 69.166                    | 225                    |               |
|         |           |              |               |                    |             |                           |                        | 6.000       | 69.091                    | 300                    |               |
| S59     | 71.198    | 2.885        | Open Manhole  | 1200               | 5.002       | 68.313                    | 300                    | 5.001       | 68.313                    | 300                    |               |
| S54     | 68.947    | 1.857        | Open Manhole  | 1350               | 4.004       | 67.090                    | 375                    | 4.003       | 67.165                    | 300                    |               |
|         |           |              |               |                    |             |                           |                        | 5.002       | 67.165                    | 300                    |               |
| S55     | 68.487    | 2.627        | Open Manhole  | 1350               | 4.005       | 65.860                    | 450                    | 4.004       | 65.935                    | 375                    |               |
| TANK 2  | 65.200    | 3.000        | Open Manhole  | 1200               | 7.000       | 62.200                    | 300                    |             |                           |                        |               |
| S56     | 65.177    | 3.177        | Open Manhole  | 1800               | 4.006       | 62.000                    | 225                    | 4.005       | 62.000                    | 450                    |               |
|         |           |              |               |                    |             |                           |                        | 7.000       | 62.000                    | 300                    |               |
| S3      | 63.329    | 2.614        | Open Manhole  | 1200               | 1.009       | 60.715                    | 300                    | 1.008       | 60.715                    | 300                    |               |
|         |           |              |               |                    |             |                           |                        | 4.006       | 60.790                    | 225                    |               |
| S4      | 60.981    | 2.455        | Open Manhole  | 1200               | 1.010       | 58.526                    | 300                    | 1.009       | 58.526                    | 300                    |               |
| S100    | 58.700    | 2.360        | Open Manhole  | 1200               | 8.000       | 56.340                    | 300                    |             |                           |                        |               |
| TANK 3  | 58.500    | 2.545        | Open Manhole  | 1200               | 9.000       | 55.955                    | 300                    |             |                           |                        |               |
| S101    | 58.500    | 2.597        | Open Manhole  | 1800               | 8.001       | 55.903                    | 300                    | 8.000       | 55.903                    | 300                    |               |
|         |           |              |               |                    |             |                           |                        | 9.000       | 55.903                    | 300                    |               |
| S10     | 58.612    | 2.315        | Open Manhole  | 1200               | 10.000      | 56.297                    | 300                    |             |                           |                        |               |
| S5      | 58.345    | 2.821        | Open Manhole  | 1350               | 1.011       | 55.524                    | 450                    | 1.010       | 55.674                    | 300                    |               |

Manhole Schedules for Surface Network 1

| 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) | Diameter (mm) | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|--------|---------------------------|------------------------|--------|---------------------------|---------------|---------------|
|         |           |              |               |                    |        |                           |                        | 8.001  | 55.675                    | 300           |               |
|         |           |              |               |                    |        |                           |                        | 10.000 | 55.674                    | 300           |               |
| S309    | 56.900    | 1.400        | Open Manhole  | 1350               | 11.000 | 55.500                    | 525                    |        |                           |               |               |
| S310    | 56.900    | 1.500        | Open Manhole  | 1800               | 11.001 | 55.400                    | 525                    | 11.000 | 55.400                    | 525           |               |
| S311    | 56.900    | 1.659        | Open Manhole  | 1350               | 11.002 | 55.241                    | 525                    | 11.001 | 55.241                    | 525           |               |
| S312    | 56.990    | 1.844        | Open Manhole  | 1350               | 11.003 | 55.146                    | 525                    | 11.002 | 55.146                    | 525           |               |
| S313    | 57.411    | 2.480        | Open Manhole  | 1350               | 11.004 | 54.932                    | 525                    | 11.003 | 54.931                    | 525           |               |
| S314    | 57.873    | 3.044        | Open Manhole  | 1350               | 11.005 | 54.829                    | 525                    | 11.004 | 54.829                    | 525           |               |
| S315    | 57.001    | 2.269        | Open Manhole  | 1350               | 11.006 | 54.732                    | 525                    | 11.005 | 54.732                    | 525           |               |
| S300    | 57.248    | 1.727        | Open Manhole  | 1200               | 12.000 | 55.521                    | 450                    |        |                           |               |               |
| S301    | 57.080    | 1.654        | Open Manhole  | 1200               | 12.001 | 55.426                    | 450                    | 12.000 | 55.426                    | 450           |               |
| S302    | 57.694    | 2.436        | Open Manhole  | 1350               | 12.002 | 55.258                    | 450                    | 12.001 | 55.258                    | 450           |               |
| S307    | 62.267    | 3.240        | Open Manhole  | 1200               | 13.000 | 59.027                    | 300                    |        |                           |               |               |
| S308    | 60.000    | 2.649        | Open Manhole  | 1200               | 13.001 | 57.352                    | 375                    | 13.000 | 57.351                    | 300           |               |
| S303    | 57.503    | 2.602        | Open Manhole  | 1350               | 12.003 | 54.901                    | 600                    | 12.002 | 55.051                    | 450           |               |
|         |           |              |               |                    |        |                           |                        | 13.001 | 54.901                    | 375           |               |
| S304    | 57.734    | 2.983        | Open Manhole  | 1350               | 12.004 | 54.752                    | 600                    | 12.003 | 54.751                    | 600           |               |
| S305    | 57.769    | 3.214        | Open Manhole  | 1350               | 11.007 | 54.555                    | 600                    | 11.006 | 54.555                    | 525           |               |
|         |           |              |               |                    |        |                           |                        | 12.004 | 54.630                    | 600           |               |
| TANK 5  | 57.785    | 3.293        | Open Manhole  | 1200               | 14.000 | 54.492                    | 375                    |        |                           |               |               |
| S306    | 57.777    | 3.299        | Open Manhole  | 1350               | 11.008 | 54.478                    | 300                    | 11.007 | 54.478                    | 600           |               |
|         |           |              |               |                    |        |                           |                        | 14.000 | 54.478                    | 375           |               |
| S6      | 56.963    | 2.801        | Open Manhole  | 1350               | 1.012  | 54.162                    | 450                    | 1.011  | 54.162                    | 450           |               |
|         |           |              |               |                    |        |                           |                        | 11.008 | 54.312                    | 300           |               |
| S7      | 55.888    | 2.661        | Open Manhole  | 1350               | 1.013  | 53.227                    | 450                    | 1.012  | 53.227                    | 450           |               |
| S8      | 53.744    | 2.137        | Open Manhole  | 1350               | 1.014  | 51.607                    | 450                    | 1.013  | 51.607                    | 450           |               |
| S9      | 52.091    | 1.825        | Open Manhole  | 1240 x 900         | 1.015  | 50.266                    | 450                    | 1.014  | 50.266                    | 450           |               |
| HW1     | 50.000    | 0.900        | Open Manhole  | 900 x 900          | 1.016  | 49.100                    | 500                    | 1.015  | 49.100                    | 450           |               |
| S210    | 62.450    | 2.099        | Open Manhole  | 1200               | 15.000 | 60.351                    | 225                    |        |                           |               |               |
| S211    | 61.184    | 2.287        | Open Manhole  | 1200               | 15.001 | 58.897                    | 225                    | 15.000 | 58.897                    | 225           |               |
| S212    | 59.337    | 1.901        | Open Manhole  | 1200               | 15.002 | 57.436                    | 225                    | 15.001 | 57.436                    | 225           |               |
| S213    | 57.477    | 1.921        | Open Manhole  | 1200               | 15.003 | 55.556                    | 225                    | 15.002 | 55.556                    | 225           |               |
| S200    | 57.119    | 1.424        | Open Manhole  | 1350               | 16.000 | 55.695                    | 375                    |        |                           |               |               |
| S209    | 57.632    | 1.341        | Open Manhole  | 1350               | 17.000 | 56.291                    | 375                    |        |                           |               |               |
| S201    | 57.507    | 2.345        | Open Manhole  | 1350               | 16.001 | 55.162                    | 375                    | 16.000 | 55.162                    | 375           |               |
|         |           |              |               |                    |        |                           |                        | 17.000 | 55.162                    | 375           |               |
| S202    | 58.084    | 3.523        | Open Manhole  | 1350               | 16.002 | 54.561                    | 375                    | 16.001 | 54.561                    | 375           |               |
| S207    | 57.372    | 1.244        | Open Manhole  | 900 x 750          | 18.000 | 56.128                    | 300                    |        |                           |               |               |













|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 9  |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Manhole Schedules for Surface Network 1

| 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) | Diameter (mm) | Backd (mm) |
|---------|-----------|--------------|---------------|--------------------|--------|---------------------------|------------------------|--------|---------------------------|---------------|------------|
| S208    | 57.513    | 2.276        | Open Manhole  | 1200               | 18.001 | 55.237                    | 300                    | 18.000 | 55.237                    | 300           |            |
| S203    | 56.599    | 2.494        | Open Manhole  | 1350               | 16.003 | 54.105                    | 450                    | 16.002 | 54.180                    | 375           |            |
| S204    | 56.037    | 2.245        | Open Manhole  | 1350               | 15.004 | 53.792                    | 450                    | 18.001 | 54.255                    | 300           |            |
|         |           |              |               |                    |        |                           |                        | 15.003 | 54.017                    | 225           |            |
| S205    | 53.772    | 2.418        | Open Manhole  | 1350               | 15.005 | 51.354                    | 450                    | 16.003 | 53.792                    | 450           |            |
|         |           |              |               |                    |        |                           |                        | 15.004 | 51.355                    | 450           |            |
| TANK 4  | 53.350    | 2.738        | Open Manhole  | 1200               | 19.000 | 50.612                    | 450                    |        |                           |               |            |
| S206    | 52.549    | 2.355        | Open Manhole  | 1800               | 15.006 | 50.344                    | 300                    | 15.005 | 50.194                    | 450           |            |
|         |           |              |               |                    |        |                           |                        | 19.000 | 50.194                    | 450           |            |
| S13     | 52.007    | 1.907        | Open Manhole  | 1200               | 15.007 | 50.100                    | 300                    | 15.006 | 50.250                    | 300           |            |
| S14     | 52.343    | 2.445        | Open Manhole  | 1200               | 15.008 | 49.898                    | 300                    | 15.007 | 49.898                    | 300           |            |
| S11     | 55.455    | 2.202        | Open Manhole  | 1200               | 20.000 | 53.253                    | 300                    |        |                           |               |            |
| S12     | 53.769    | 2.328        | Open Manhole  | 1200               | 20.001 | 51.441                    | 300                    | 20.000 | 51.441                    | 300           |            |
| S15     | 52.692    | 3.126        | Open Manhole  | 1350               | 15.009 | 49.565                    | 450                    | 15.008 | 49.716                    | 300           |            |
|         |           |              |               |                    |        |                           |                        | 20.001 | 49.715                    | 300           |            |
| S16     | 52.300    | 2.798        | Open Manhole  | 1350               | 15.010 | 49.502                    | 450                    | 15.009 | 49.502                    | 450           |            |
| S18     | 51.725    | 1.910        | Open Manhole  | 1200               | 21.000 | 49.815                    | 300                    |        |                           |               |            |
| S19     | 51.102    | 1.484        | Open Manhole  | 1200               | 21.001 | 49.618                    | 300                    | 21.000 | 49.618                    | 300           |            |
| S20     | 51.000    | 1.545        | Open Manhole  | 1200               | 21.002 | 49.455                    | 300                    | 21.001 | 49.455                    | 300           |            |
| S17     | 50.600    | 1.458        | Open Manhole  | 1240 x 900         | 15.011 | 49.142                    | 450                    | 15.010 | 49.142                    | 450           |            |
|         |           |              |               |                    |        |                           |                        | 21.002 | 49.292                    | 300           |            |
| HW2     | 50.000    | 0.911        | Open Manhole  | 900 x 900          | 15.012 | 49.089                    | 500                    | 15.011 | 49.089                    | 450           |            |
| HW3     | 50.000    | 1.200        | Open Manhole  | 900 x 750          | 1.017  | 48.800                    | 450                    | 1.016  | 49.000                    | 500           |            |
|         |           |              |               |                    |        |                           |                        | 15.012 | 49.000                    | 500           |            |
| S21     | 50.000    | 2.000        | Open Manhole  | 1200               | 1.018  | 48.000                    | 450                    | 1.017  | 48.000                    | 450           |            |
| SD11    | 57.027    | 3.398        | Open Manhole  | 1500               | 22.000 | 53.629                    | 525                    |        |                           |               |            |
| SD12    | 57.510    | 4.335        | Open Manhole  | 1500               | 22.001 | 53.176                    | 525                    | 22.000 | 53.176                    | 525           |            |
| SD13    | 58.383    | 5.543        | Open Manhole  | 1500               | 22.002 | 52.840                    | 525                    | 22.001 | 52.840                    | 525           |            |
| SD1     | 52.929    | 5.411        | Open Manhole  | 1500               | 23.000 | 47.518                    | 525                    |        |                           |               |            |
| SD2     | 52.373    | 5.096        | Open Manhole  | 1500               | 23.001 | 47.278                    | 525                    | 23.000 | 47.278                    | 525           |            |
| SD3     | 54.270    | 7.270        | Open Manhole  | 1240 x 975         | 23.002 | 47.000                    | 525                    | 23.001 | 47.000                    | 525           |            |
| SD4     | 54.426    | 7.431        | Open Manhole  | 1240 x 975         | 23.003 | 46.995                    | 525                    | 23.002 | 46.995                    | 525           |            |
| SD5     | 56.983    | 10.192       | Open Manhole  | 1240 x 1050        | 22.003 | 46.791                    | 600                    | 22.002 | 46.980                    | 525           |            |
|         |           |              |               |                    |        |                           |                        | 23.003 | 46.866                    | 525           |            |
| SD6     | 55.745    | 9.104        | Open Manhole  | 1240 x 1050        | 22.004 | 46.641                    | 600                    | 22.003 | 46.641                    | 600           |            |
| SD7     | 54.163    | 7.588        | Open Manhole  | 1240 x 1050        | 22.005 | 46.575                    | 600                    | 22.004 | 46.575                    | 600           |            |
| SD8     | 49.986    | 5.105        | Open Manhole  | 1500               | 1.019  | 44.881                    | 600                    | 1.018  | 45.031                    | 450           |            |
|         |           |              |               |                    |        |                           |                        | 22.005 | 44.881                    | 600           |            |

Manhole Schedules for Surface Network 1
















| MH Name | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | Pipe Out |                  | Pipes In      |       |                  | Backdrop (mm) |
|---------|-----------|--------------|---------------|--------------------|----------|------------------|---------------|-------|------------------|---------------|
|         |           |              |               |                    | PN       | Invert Level (m) | Diameter (mm) | PN    | Invert Level (m) |               |
| SD9     | 48.228    | 4.634        | Open Manhole  | 1500               | 1.020    | 43.594           | 600           | 1.019 | 43.594           | 600           |
| SD10    | 48.464    | 7.014        | Open Manhole  | 1240 x 1050        |          | OUTFALL          |               | 1.020 | 41.450           | 600           |

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)  |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---|
| S61     | 527886.005          | 193751.953           | 527886.005               | 193751.953                | Required       |    |
| S62     | 527925.417          | 193772.304           | 527925.417               | 193772.304                | Required       |  |
| S63     | 527964.364          | 193792.490           | 527964.364               | 193792.490                | Required       |  |
| S68     | 527968.909          | 193811.716           | 527968.909               | 193811.716                | Required       |  |
| S64     | 527973.738          | 193793.246           | 527973.738               | 193793.246                | Required       |  |
| S65     | 527981.919          | 193763.605           | 527981.919               | 193763.605                | Required       |  |
| S69     | 527957.739          | 193711.584           | 527957.739               | 193711.584                | Required       |  |
| S70     | 527983.824          | 193728.722           | 527983.824               | 193728.722                | Required       |  |
| S66     | 527991.751          | 193727.162           | 527991.751               | 193727.162                | Required       |  |
| S67     | 528006.447          | 193674.497           | 528006.447               | 193674.497                | Required       |  |
| S1      | 528011.904          | 193653.295           | 528011.904               | 193653.295                | Required       |  |
| S2      | 528009.182          | 193647.327           | 528009.182               | 193647.327                | Required       |  |

Manhole Schedules for Surface Network 1

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)  |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---|
| S50     | 527782.943          | 193688.152           | 527782.943               | 193688.152                | Required       |    |
| S51     | 527796.151          | 193667.996           | 527796.151               | 193667.996                | Required       |    |
| S52     | 527823.924          | 193624.740           | 527823.924               | 193624.740                | Required       |    |
| S53     | 527862.328          | 193649.677           | 527862.328               | 193649.677                | Required       |    |
| S57     | 527804.716          | 193710.290           | 527804.716               | 193710.290                | Required       |  |
| S60     | 527835.319          | 193756.241           | 527835.319               | 193756.241                | Required       |  |
| S58     | 527848.218          | 193732.645           | 527848.218               | 193732.645                | Required       |  |
| S59     | 527864.451          | 193706.082           | 527864.451               | 193706.082                | Required       |  |
| S54     | 527889.383          | 193667.517           | 527889.383               | 193667.517                | Required       |  |
| S55     | 527928.074          | 193692.754           | 527928.074               | 193692.754                | Required       |  |
| TANK 2  | 527951.526          | 193640.622           | 527951.526               | 193640.622                | Required       |  |
| S56     | 527958.486          | 193645.144           | 527958.486               | 193645.144                | Required       |  |
| S3      | 527972.533          | 193623.387           | 527972.533               | 193623.387                | Required       |  |
| S4      | 527990.498          | 193595.909           | 527990.498               | 193595.909                | Required       |  |
| S100    | 527969.631          | 193530.999           | 527969.631               | 193530.999                | Required       |  |

Manhole Schedules for Surface Network 1

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)  |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---|
| TANK 3  | 528005.869          | 193539.239           | 528005.869               | 193539.239                | Required       |    |
| S101    | 527998.875          | 193550.176           | 527998.875               | 193550.176                | Required       |    |
| S10     | 528040.237          | 193577.186           | 528040.237               | 193577.186                | Required       |    |
| S5      | 528014.123          | 193560.246           | 528014.123               | 193560.246                | Required       |   |
| S309    | 527896.734          | 193440.741           | 527896.734               | 193440.741                | Required       |  |
| S310    | 527910.664          | 193419.942           | 527910.664               | 193419.942                | Required       |  |
| S311    | 527936.833          | 193379.974           | 527936.833               | 193379.974                | Required       |  |
| S312    | 527952.736          | 193356.378           | 527952.736               | 193356.378                | Required       |  |
| S313    | 528001.752          | 193388.044           | 528001.752               | 193388.044                | Required       |  |
| S314    | 528032.035          | 193407.375           | 528032.035               | 193407.375                | Required       |  |
| S315    | 528013.572          | 193435.811           | 528013.572               | 193435.811                | Required       |  |
| S300    | 527865.064          | 193490.706           | 527865.064               | 193490.706                | Required       |  |
| S301    | 527877.543          | 193470.622           | 527877.543               | 193470.622                | Required       |  |
| S302    | 527914.038          | 193494.808           | 527914.038               | 193494.808                | Required       |  |
| S307    | 527924.486          | 193572.727           | 527924.486               | 193572.727                | Required       |  |

32 Beehive Lane  
 Welwyn Garden City  
 Herts AL7 4BQ



Date 23/11/2021 18:19  
 File ST-3013-Drainage Strate...

Designed by info  
 Checked by


Micro Drainage

Network 2020.1
















Manhole Schedules for Surface Network 1

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|----------------|
| S308    | 527938.393          | 193551.788           | 527938.393               | 193551.788                | Required       |                |
| S303    | 527957.469          | 193523.036           | 527957.469               | 193523.036                | Required       |                |
| S304    | 527977.838          | 193491.635           | 527977.838               | 193491.635                | Required       |                |
| S305    | 527994.264          | 193465.974           | 527994.264               | 193465.974                | Required       |                |
| TANK 5  | 528018.863          | 193477.784           | 528018.863               | 193477.784                | Required       |                |
| S306    | 528016.877          | 193480.727           | 528016.877               | 193480.727                | Required       |                |
| S6      | 528051.510          | 193503.324           | 528051.510               | 193503.324                | Required       |                |
| S7      | 528090.655          | 193528.864           | 528090.655               | 193528.864                | Required       |                |
| S8      | 528120.823          | 193540.686           | 528120.823               | 193540.686                | Required       |                |
| S9      | 528146.671          | 193547.832           | 528146.671               | 193547.832                | Required       |                |
| HW1     | 528165.714          | 193518.476           | 528165.714               | 193518.476                | Required       |                |
| S210    | 528102.330          | 193180.250           | 528102.330               | 193180.250                | Required       |                |
| S211    | 528098.100          | 193216.356           | 528098.100               | 193216.356                | Required       |                |
| S212    | 528094.278          | 193252.691           | 528094.278               | 193252.691                | Required       |                |
| S213    | 528090.294          | 193299.512           | 528090.294               | 193299.512                | Required       |                |


















|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 14   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Manhole Schedules for Surface Network 1

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)  |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---|
| S200    | 527972.840          | 193324.814           | 527972.840               | 193324.814                | Required       |    |
| S209    | 528011.325          | 193266.489           | 528011.325               | 193266.489                | Required       |    |
| S201    | 528001.182          | 193282.254           | 528001.182               | 193282.254                | Required       |    |
| S202    | 528049.648          | 193313.509           | 528049.648               | 193313.509                | Required       |    |
| S207    | 528039.035          | 193396.581           | 528039.035               | 193396.581                | Required       |  |
| S208    | 528063.282          | 193359.195           | 528063.282               | 193359.195                | Required       |  |
| S203    | 528080.742          | 193333.606           | 528080.742               | 193333.606                | Required       |  |
| S204    | 528087.364          | 193337.886           | 528087.364               | 193337.886                | Required       |  |
| S205    | 528113.854          | 193355.266           | 528113.854               | 193355.266                | Required       |  |
| TANK 4  | 528128.028          | 193346.718           | 528128.028               | 193346.718                | Required       |  |
| S206    | 528128.145          | 193364.549           | 528128.145               | 193364.549                | Required       |  |
| S13     | 528135.989          | 193369.645           | 528135.989               | 193369.645                | Required       |  |
| S14     | 528114.136          | 193403.711           | 528114.136               | 193403.711                | Required       |  |
| S11     | 528067.592          | 193475.991           | 528067.592               | 193475.991                | Required       |  |
| S12     | 528081.239          | 193454.611           | 528081.239               | 193454.611                | Required       |  |

Manhole Schedules for Surface Network 1

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)  |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|---|
| S15     | 528094.316          | 193434.294           | 528094.316               | 193434.294                | Required       |    |
| S16     | 528104.867          | 193441.187           | 528104.867               | 193441.187                | Required       |    |
| S18     | 528152.404          | 193370.955           | 528152.404               | 193370.955                | Required       |    |
| S19     | 528199.129          | 193386.686           | 528199.129               | 193386.686                | Required       |    |
| S20     | 528186.158          | 193425.369           | 528186.158               | 193425.369                | Required       |  |
| S17     | 528173.220          | 193463.973           | 528173.220               | 193463.973                | Required       |  |
| HW2     | 528181.840          | 193483.236           | 528181.840               | 193483.236                | Required       |  |
| HW3     | 528194.265          | 193515.972           | 528194.265               | 193515.972                | Required       |  |
| S21     | 528198.256          | 193524.795           | 528198.256               | 193524.795                | Required       |  |
| SD11    | 527879.904          | 193470.510           | 527879.904               | 193470.510                | Required       |  |
| SD12    | 527955.878          | 193520.070           | 527955.878               | 193520.070                | Required       |  |
| SD13    | 528012.403          | 193556.286           | 528012.403               | 193556.286                | Required       |  |
| SD1     | 528146.490          | 193350.465           | 528146.490               | 193350.465                | Required       |  |
| SD2     | 528113.664          | 193400.889           | 528113.664               | 193400.889                | Required       |  |
| SD3     | 528075.789          | 193459.068           | 528075.789               | 193459.068                | Required       |  |

32 Beehive Lane  
 Welwyn Garden City  
 Herts AL7 4BQ




Date 23/11/2021 18:19  
 File ST-3013-Drainage Strate...

Designed by info  
 Checked by

Micro Drainage Network 2020.1

Manhole Schedules for Surface Network 1

| MH Name | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North) |
|---------|---------------------|----------------------|--------------------------|---------------------------|----------------|----------------|
| SD4     | 528074.493          | 193461.003           | 528074.493               | 193461.003                | Required       |                |
| SD5     | 528049.889          | 193499.002           | 528049.889               | 193499.002                | Required       |                |
| SD6     | 528093.614          | 193527.893           | 528093.614               | 193527.893                | Required       |                |
| SD7     | 528115.104          | 193536.767           | 528115.104               | 193536.767                | Required       |                |
| SD8     | 528196.804          | 193559.019           | 528196.804               | 193559.019                | Required       |                |
| SD9     | 528258.860          | 193576.120           | 528258.860               | 193576.120                | Required       |                |
| SD10    | 528284.267          | 193492.609           |                          |                           | No Entry       |                |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 17   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


PIPELINE SCHEDULES for Surface Network 1

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        | 375       | S61     | 70.003      | 67.868      | 1.760       | Open Manhole  | 1200               |
| 1.001 | o        | 375       | S62     | 69.257      | 67.313      | 1.569       | Open Manhole  | 1200               |
| 1.002 | o        | 375       | S63     | 70.390      | 66.765      | 3.250       | Open Manhole  | 1200               |
| 2.000 | o        | 300       | S68     | 68.755      | 66.961      | 1.494       | Open Manhole  | 1200               |
| 1.003 | o        | 375       | S64     | 68.521      | 66.647      | 1.499       | Open Manhole  | 1200               |
| 1.004 | o        | 375       | S65     | 68.132      | 66.263      | 1.494       | Open Manhole  | 1200               |
| 3.000 | o        | 225       | S69     | 68.127      | 66.652      | 1.250       | Open Manhole  | 1200               |
| 3.001 | o        | 225       | S70     | 67.821      | 66.028      | 1.568       | Open Manhole  | 1200               |
| 1.005 | o        | 375       | S66     | 67.661      | 65.791      | 1.495       | Open Manhole  | 1200               |
| 1.006 | o        | 375       | S67     | 66.029      | 63.604      | 2.050       | Open Manhole  | 1200               |
| 1.007 | o        | 300       | S1      | 64.918      | 62.728      | 1.890       | Open Manhole  | 1200               |
| 1.008 | o        | 300       | S2      | 64.537      | 62.466      | 1.771       | Open Manhole  | 1200               |
| 4.000 | o        | 225       | S50     | 71.802      | 69.532      | 2.045       | Open Manhole  | 1200               |
| 4.001 | o        | 225       | S51     | 71.045      | 69.050      | 1.770       | Open Manhole  | 1200               |
| 4.002 | o        | 300       | S52     | 69.303      | 67.947      | 1.056       | Open Manhole  | 1200               |
| 4.003 | o        | 300       | S53     | 69.266      | 67.489      | 1.477       | 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 | 44.357     | 80.1        | S62     | 69.257      | 67.314      | 1.568       | Open Manhole  | 1200               |
| 1.001 | 43.867     | 80.0        | S63     | 70.390      | 66.765      | 3.250       | Open Manhole  | 1200               |
| 1.002 | 9.405      | 79.7        | S64     | 68.521      | 66.647      | 1.499       | Open Manhole  | 1200               |
| 2.000 | 19.091     | 79.9        | S64     | 68.521      | 66.722      | 1.499       | Open Manhole  | 1200               |
| 1.003 | 30.750     | 80.1        | S65     | 68.132      | 66.263      | 1.494       | Open Manhole  | 1200               |
| 1.004 | 37.745     | 80.0        | S66     | 67.661      | 65.791      | 1.495       | Open Manhole  | 1200               |
| 3.000 | 31.211     | 50.0        | S70     | 67.821      | 66.028      | 1.568       | Open Manhole  | 1200               |
| 3.001 | 8.078      | 92.9        | S66     | 67.661      | 65.941      | 1.495       | Open Manhole  | 1200               |
| 1.005 | 54.677     | 25.0        | S67     | 66.029      | 63.604      | 2.050       | Open Manhole  | 1200               |
| 1.006 | 21.894     | 25.0        | S1      | 64.918      | 62.728      | 1.815       | Open Manhole  | 1200               |
| 1.007 | 6.559      | 25.0        | S2      | 64.537      | 62.466      | 1.771       | Open Manhole  | 1200               |
| 1.008 | 43.775     | 25.0        | S3      | 63.329      | 60.715      | 2.314       | Open Manhole  | 1200               |
| 4.000 | 24.098     | 50.0        | S51     | 71.045      | 69.050      | 1.770       | Open Manhole  | 1200               |
| 4.001 | 51.405     | 50.0        | S52     | 69.303      | 68.022      | 1.056       | Open Manhole  | 1200               |
| 4.002 | 45.790     | 100.0       | S53     | 69.266      | 67.489      | 1.477       | Open Manhole  | 1200               |
| 4.003 | 32.407     | 100.0       | S54     | 68.947      | 67.165      | 1.482       | Open Manhole  | 1350               |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 18   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


PIPELINE SCHEDULES for Surface Network 1

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) |
|-------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 5.000 | o        | 225       | S57     | 72.225      | 70.389      | 1.611       | Open Manhole  | 1200               |
| 6.000 | o        | 300       | S60     | 71.286      | 69.763      | 1.223       | Open Manhole  | 1200               |
| 5.001 | o        | 300       | S58     | 71.539      | 69.091      | 2.148       | Open Manhole  | 1200               |
| 5.002 | o        | 300       | S59     | 71.198      | 68.313      | 2.585       | Open Manhole  | 1200               |
| 4.004 | o        | 375       | S54     | 68.947      | 67.090      | 1.482       | Open Manhole  | 1350               |
| 4.005 | o        | 450       | S55     | 68.487      | 65.860      | 2.177       | Open Manhole  | 1350               |
| 7.000 | oo       | 300       | TANK 2  | 65.200      | 62.200      | 2.700       | Open Manhole  | 1200               |
| 4.006 | o        | 225       | S56     | 65.177      | 62.000      | 2.952       | Open Manhole  | 1800               |
| 1.009 | o        | 300       | S3      | 63.329      | 60.715      | 2.314       | Open Manhole  | 1200               |
| 1.010 | o        | 300       | S4      | 60.981      | 58.526      | 2.155       | Open Manhole  | 1200               |
| 8.000 | o        | 300       | S100    | 58.700      | 56.340      | 2.060       | Open Manhole  | 1200               |
| 9.000 | o        | 300       | TANK 3  | 58.500      | 55.955      | 2.245       | 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) |
|-------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 5.000 | 48.910     | 40.0        | S58     | 71.539      | 69.166      | 2.148       | Open Manhole  | 1200               |
| 6.000 | 26.892     | 40.0        | S58     | 71.539      | 69.091      | 2.148       | Open Manhole  | 1200               |
| 5.001 | 31.130     | 40.0        | S59     | 71.198      | 68.313      | 2.585       | Open Manhole  | 1200               |
| 5.002 | 45.922     | 40.0        | S54     | 68.947      | 67.165      | 1.482       | Open Manhole  | 1350               |
| 4.004 | 46.195     | 40.0        | S55     | 68.487      | 65.935      | 2.177       | Open Manhole  | 1350               |
| 4.005 | 56.494     | 14.6        | S56     | 65.177      | 62.000      | 2.727       | Open Manhole  | 1800               |
| 7.000 | 8.300      | 41.5        | S56     | 65.177      | 62.000      | 2.877       | Open Manhole  | 1800               |
| 4.006 | 25.898     | 21.4        | S3      | 63.329      | 60.790      | 2.314       | Open Manhole  | 1200               |
| 1.009 | 32.830     | 15.0        | S4      | 60.981      | 58.526      | 2.155       | Open Manhole  | 1200               |
| 1.010 | 42.779     | 15.0        | S5      | 58.345      | 55.674      | 2.371       | Open Manhole  | 1350               |
| 8.000 | 34.971     | 80.0        | S101    | 58.500      | 55.903      | 2.297       | Open Manhole  | 1800               |
| 9.000 | 12.982     | 250.0       | S101    | 58.500      | 55.903      | 2.297       | Open Manhole  | 1800               |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 19   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


PIPELINE SCHEDULES for Surface Network 1

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) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 8.001  | o        | 300       | S101    | 58.500      | 55.903      | 2.297       | Open Manhole  | 1800               |
| 10.000 | o        | 300       | S10     | 58.612      | 56.297      | 2.015       | Open Manhole  | 1200               |
| 1.011  | o        | 450       | S5      | 58.345      | 55.524      | 2.371       | Open Manhole  | 1350               |
| 11.000 | o        | 525       | S309    | 56.900      | 55.500      | 0.875       | Open Manhole  | 1350               |
| 11.001 | o        | 525       | S310    | 56.900      | 55.400      | 0.975       | Open Manhole  | 1800               |
| 11.002 | o        | 525       | S311    | 56.900      | 55.241      | 1.134       | Open Manhole  | 1350               |
| 11.003 | o        | 525       | S312    | 56.990      | 55.146      | 1.319       | Open Manhole  | 1350               |
| 11.004 | o        | 525       | S313    | 57.411      | 54.932      | 1.954       | Open Manhole  | 1350               |
| 11.005 | o        | 525       | S314    | 57.873      | 54.829      | 2.519       | Open Manhole  | 1350               |
| 11.006 | o        | 525       | S315    | 57.001      | 54.732      | 1.744       | Open Manhole  | 1350               |
| 12.000 | o        | 450       | S300    | 57.248      | 55.521      | 1.277       | Open Manhole  | 1200               |
| 12.001 | o        | 450       | S301    | 57.080      | 55.426      | 1.204       | Open Manhole  | 1200               |
| 12.002 | o        | 450       | S302    | 57.694      | 55.258      | 1.986       | Open Manhole  | 1350               |
| 13.000 | o        | 300       | S307    | 62.267      | 59.027      | 2.940       | Open Manhole  | 1200               |
| 13.001 | o        | 375       | S308    | 60.000      | 57.352      | 2.273       | 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) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 8.001  | 18.274     | 80.1        | S5      | 58.345      | 55.675      | 2.370       | Open Manhole  | 1350               |
| 10.000 | 31.127     | 50.0        | S5      | 58.345      | 55.674      | 2.371       | Open Manhole  | 1350               |
| 1.011  | 68.102     | 50.0        | S6      | 56.963      | 54.162      | 2.351       | Open Manhole  | 1350               |
| 11.000 | 25.033     | 250.3       | S310    | 56.900      | 55.400      | 0.975       | Open Manhole  | 1800               |
| 11.001 | 47.773     | 300.5       | S311    | 56.900      | 55.241      | 1.134       | Open Manhole  | 1350               |
| 11.002 | 28.455     | 299.5       | S312    | 56.990      | 55.146      | 1.319       | Open Manhole  | 1350               |
| 11.003 | 58.355     | 271.4       | S313    | 57.411      | 54.931      | 1.955       | Open Manhole  | 1350               |
| 11.004 | 35.927     | 348.8       | S314    | 57.873      | 54.829      | 2.519       | Open Manhole  | 1350               |
| 11.005 | 33.904     | 349.5       | S315    | 57.001      | 54.732      | 1.744       | Open Manhole  | 1350               |
| 11.006 | 35.813     | 202.3       | S305    | 57.769      | 54.555      | 2.689       | Open Manhole  | 1350               |
| 12.000 | 23.645     | 250.0       | S301    | 57.080      | 55.426      | 1.204       | Open Manhole  | 1200               |
| 12.001 | 43.782     | 260.6       | S302    | 57.694      | 55.258      | 1.986       | Open Manhole  | 1350               |
| 12.002 | 51.798     | 250.2       | S303    | 57.503      | 55.051      | 2.002       | Open Manhole  | 1350               |
| 13.000 | 25.137     | 15.0        | S308    | 60.000      | 57.351      | 2.349       | Open Manhole  | 1200               |
| 13.001 | 34.505     | 14.1        | S303    | 57.503      | 54.901      | 2.227       | Open Manhole  | 1350               |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 20   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


PIPELINE SCHEDULES for Surface Network 1

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) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 12.003 | o        | 600       | S303    | 57.503      | 54.901      | 2.002       | Open Manhole  | 1350               |
| 12.004 | o        | 600       | S304    | 57.734      | 54.752      | 2.382       | Open Manhole  | 1350               |
| 11.007 | o        | 600       | S305    | 57.769      | 54.555      | 2.614       | Open Manhole  | 1350               |
| 14.000 | oo       | 375       | TANK 5  | 57.785      | 54.492      | 2.918       | Open Manhole  | 1200               |
| 11.008 | o        | 300       | S306    | 57.777      | 54.478      | 2.999       | Open Manhole  | 1350               |
| 1.012  | o        | 450       | S6      | 56.963      | 54.162      | 2.351       | Open Manhole  | 1350               |
| 1.013  | o        | 450       | S7      | 55.888      | 53.227      | 2.211       | Open Manhole  | 1350               |
| 1.014  | o        | 450       | S8      | 53.744      | 51.607      | 1.687       | Open Manhole  | 1350               |
| 1.015  | o        | 450       | S9      | 52.091      | 50.266      | 1.374       | Open Manhole  | 1240 x 900         |
| 1.016  | 1 \_ /   | 500       | HW1     | 50.000      | 49.100      | 0.600       | Open Manhole  | 900 x 900          |
| 15.000 | o        | 225       | S210    | 62.450      | 60.351      | 1.874       | Open Manhole  | 1200               |
| 15.001 | o        | 225       | S211    | 61.184      | 58.897      | 2.062       | Open Manhole  | 1200               |
| 15.002 | o        | 225       | S212    | 59.337      | 57.436      | 1.676       | Open Manhole  | 1200               |
| 15.003 | o        | 225       | S213    | 57.477      | 55.556      | 1.696       | 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) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 12.003 | 37.429     | 249.5       | S304    | 57.734      | 54.751      | 2.383       | Open Manhole  | 1350               |
| 12.004 | 30.468     | 249.7       | S305    | 57.769      | 54.630      | 2.539       | Open Manhole  | 1350               |
| 11.007 | 27.000     | 350.6       | S306    | 57.777      | 54.478      | 2.699       | Open Manhole  | 1350               |
| 14.000 | 3.551      | 253.6       | S306    | 57.777      | 54.478      | 2.924       | Open Manhole  | 1350               |
| 11.008 | 41.354     | 250.0       | S6      | 56.963      | 54.312      | 2.351       | Open Manhole  | 1350               |
| 1.012  | 46.740     | 50.0        | S7      | 55.888      | 53.227      | 2.211       | Open Manhole  | 1350               |
| 1.013  | 32.402     | 20.0        | S8      | 53.744      | 51.607      | 1.687       | Open Manhole  | 1350               |
| 1.014  | 26.817     | 20.0        | S9      | 52.091      | 50.266      | 1.375       | Open Manhole  | 1240 x 900         |
| 1.015  | 34.992     | 30.0        | HW1     | 50.000      | 49.100      | 0.450       | Open Manhole  | 900 x 900          |
| 1.016  | 28.661     | 286.6       | HW3     | 50.000      | 49.000      | 0.700       | Open Manhole  | 900 x 750          |
| 15.000 | 36.353     | 25.0        | S211    | 61.184      | 58.897      | 2.062       | Open Manhole  | 1200               |
| 15.001 | 36.536     | 25.0        | S212    | 59.337      | 57.436      | 1.676       | Open Manhole  | 1200               |
| 15.002 | 46.990     | 25.0        | S213    | 57.477      | 55.556      | 1.696       | Open Manhole  | 1200               |
| 15.003 | 38.485     | 25.0        | S204    | 56.037      | 54.017      | 1.795       | Open Manhole  | 1350               |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 21   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

PIPELINE SCHEDULES for Surface Network 1


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) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 16.000 | o        | 375       | S200    | 57.119      | 55.695      | 1.049       | Open Manhole  | 1350               |
| 17.000 | o        | 375       | S209    | 57.632      | 56.291      | 0.966       | Open Manhole  | 1350               |
| 16.001 | o        | 375       | S201    | 57.507      | 55.162      | 1.970       | Open Manhole  | 1350               |
| 16.002 | o        | 375       | S202    | 58.084      | 54.561      | 3.148       | Open Manhole  | 1350               |
| 18.000 | o        | 300       | S207    | 57.372      | 56.128      | 0.944       | Open Manhole  | 900 x 750          |
| 18.001 | o        | 300       | S208    | 57.513      | 55.237      | 1.976       | Open Manhole  | 1200               |
| 16.003 | o        | 450       | S203    | 56.599      | 54.105      | 2.044       | Open Manhole  | 1350               |
| 15.004 | o        | 450       | S204    | 56.037      | 53.792      | 1.795       | Open Manhole  | 1350               |
| 15.005 | o        | 450       | S205    | 53.772      | 51.354      | 1.968       | Open Manhole  | 1350               |
| 19.000 | o        | 450       | TANK 4  | 53.350      | 50.612      | 2.288       | Open Manhole  | 1200               |
| 15.006 | o        | 300       | S206    | 52.549      | 50.344      | 1.905       | Open Manhole  | 1800               |
| 15.007 | o        | 300       | S13     | 52.007      | 50.100      | 1.607       | Open Manhole  | 1200               |
| 15.008 | o        | 300       | S14     | 52.343      | 49.898      | 2.145       | 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) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 16.000 | 51.133     | 95.9        | S201    | 57.507      | 55.162      | 1.970       | Open Manhole  | 1350               |
| 17.000 | 18.746     | 16.6        | S201    | 57.507      | 55.162      | 1.970       | Open Manhole  | 1350               |
| 16.001 | 57.670     | 96.0        | S202    | 58.084      | 54.561      | 3.148       | Open Manhole  | 1350               |
| 16.002 | 37.023     | 97.2        | S203    | 56.599      | 54.180      | 2.044       | Open Manhole  | 1350               |
| 18.000 | 44.560     | 50.0        | S208    | 57.513      | 55.237      | 1.976       | Open Manhole  | 1200               |
| 18.001 | 30.979     | 31.5        | S203    | 56.599      | 54.255      | 2.044       | Open Manhole  | 1350               |
| 16.003 | 7.884      | 25.2        | S204    | 56.037      | 53.792      | 1.795       | Open Manhole  | 1350               |
| 15.004 | 31.683     | 13.0        | S205    | 53.772      | 51.355      | 1.967       | Open Manhole  | 1350               |
| 15.005 | 17.041     | 14.7        | S206    | 52.549      | 50.194      | 1.905       | Open Manhole  | 1800               |
| 19.000 | 17.832     | 42.7        | S206    | 52.549      | 50.194      | 1.905       | Open Manhole  | 1800               |
| 15.006 | 9.354      | 99.5        | S13     | 52.007      | 50.250      | 1.457       | Open Manhole  | 1200               |
| 15.007 | 40.473     | 200.4       | S14     | 52.343      | 49.898      | 2.145       | Open Manhole  | 1200               |
| 15.008 | 36.443     | 200.2       | S15     | 52.692      | 49.716      | 2.676       | Open Manhole  | 1350               |



|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 22   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

PIPELINE SCHEDULES for Surface Network 1

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) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 20.000 | o        | 300       | S11     | 55.455      | 53.253      | 1.902       | Open Manhole  | 1200               |
| 20.001 | o        | 300       | S12     | 53.769      | 51.441      | 2.028       | Open Manhole  | 1200               |
| 15.009 | o        | 450       | S15     | 52.692      | 49.565      | 2.676       | Open Manhole  | 1350               |
| 15.010 | o        | 450       | S16     | 52.300      | 49.502      | 2.348       | Open Manhole  | 1350               |
| 21.000 | o        | 300       | S18     | 51.725      | 49.815      | 1.610       | Open Manhole  | 1200               |
| 21.001 | o        | 300       | S19     | 51.102      | 49.618      | 1.184       | Open Manhole  | 1200               |
| 21.002 | o        | 300       | S20     | 51.000      | 49.455      | 1.245       | Open Manhole  | 1200               |
| 15.011 | o        | 450       | S17     | 50.600      | 49.142      | 1.008       | Open Manhole  | 1240 x 900         |
| 15.012 | 1 \_ /   | 500       | HW2     | 50.000      | 49.089      | 0.611       | Open Manhole  | 900 x 900          |
| 1.017  | o        | 450       | HW3     | 50.000      | 48.800      | 0.750       | Open Manhole  | 900 x 750          |
| 1.018  | o        | 450       | S21     | 50.000      | 48.000      | 1.550       | Open Manhole  | 1200               |
| 22.000 | o        | 525       | SD11    | 57.027      | 53.629      | 2.873       | Open Manhole  | 1500               |
| 22.001 | o        | 525       | SD12    | 57.510      | 53.176      | 3.810       | Open Manhole  | 1500               |
| 22.002 | o        | 525       | SD13    | 58.383      | 52.840      | 5.018       | Open Manhole  | 1500               |
| 23.000 | o        | 525       | SD1     | 52.929      | 47.518      | 4.886       | Open Manhole  | 1500               |

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) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 20.000 | 25.365     | 14.0        | S12     | 53.769      | 51.441      | 2.028       | Open Manhole  | 1200               |
| 20.001 | 24.162     | 14.0        | S15     | 52.692      | 49.715      | 2.677       | Open Manhole  | 1350               |
| 15.009 | 12.603     | 200.0       | S16     | 52.300      | 49.502      | 2.348       | Open Manhole  | 1350               |
| 15.010 | 72.051     | 200.0       | S17     | 50.600      | 49.142      | 1.008       | Open Manhole  | 1240 x 900         |
| 21.000 | 49.302     | 250.3       | S19     | 51.102      | 49.618      | 1.184       | Open Manhole  | 1200               |
| 21.001 | 40.800     | 250.3       | S20     | 51.000      | 49.455      | 1.245       | Open Manhole  | 1200               |
| 21.002 | 40.714     | 249.8       | S17     | 50.600      | 49.292      | 1.008       | Open Manhole  | 1240 x 900         |
| 15.011 | 21.104     | 398.2       | HW2     | 50.000      | 49.089      | 0.461       | Open Manhole  | 900 x 900          |
| 15.012 | 35.015     | 393.4       | HW3     | 50.000      | 49.000      | 0.700       | Open Manhole  | 900 x 750          |
| 1.017  | 9.683      | 12.1        | S21     | 50.000      | 48.000      | 1.550       | Open Manhole  | 1200               |
| 1.018  | 34.255     | 11.5        | SD8     | 49.986      | 45.031      | 4.505       | Open Manhole  | 1500               |
| 22.000 | 90.710     | 200.0       | SD12    | 57.510      | 53.176      | 3.810       | Open Manhole  | 1500               |
| 22.001 | 67.132     | 200.0       | SD13    | 58.383      | 52.840      | 5.018       | Open Manhole  | 1500               |
| 22.002 | 68.459     | 11.7        | SD5     | 56.983      | 46.980      | 9.478       | Open Manhole  | 1240 x 1050        |
| 23.000 | 60.167     | 250.0       | SD2     | 52.373      | 47.278      | 4.571       | Open Manhole  | 1500               |

PIPELINE SCHEDULES for Surface Network 1

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) |
|--------|----------|-----------|---------|-------------|-------------|-------------|---------------|--------------------|
| 23.001 | o        | 525       | SD2     | 52.373      | 47.278      | 4.571       | Open Manhole  | 1500               |
| 23.002 | o        | 525       | SD3     | 54.270      | 47.000      | 6.745       | Open Manhole  | 1240 x 975         |
| 23.003 | o        | 525       | SD4     | 54.426      | 46.995      | 6.906       | Open Manhole  | 1240 x 975         |
| 22.003 | o        | 600       | SD5     | 56.983      | 46.791      | 9.592       | Open Manhole  | 1240 x 1050        |
| 22.004 | o        | 600       | SD6     | 55.745      | 46.641      | 8.504       | Open Manhole  | 1240 x 1050        |
| 22.005 | o        | 600       | SD7     | 54.163      | 46.575      | 6.988       | Open Manhole  | 1240 x 1050        |
| 1.019  | o        | 600       | SD8     | 49.986      | 44.881      | 4.505       | Open Manhole  | 1500               |
| 1.020  | o        | 600       | SD9     | 48.228      | 43.594      | 4.034       | Open Manhole  | 1500               |

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) |
|--------|------------|-------------|---------|-------------|-------------|-------------|---------------|--------------------|
| 23.001 | 69.422     | 250.0       | SD3     | 54.270      | 47.000      | 6.745       | Open Manhole  | 1240 x 975         |
| 23.002 | 2.329      | 500.0       | SD4     | 54.426      | 46.995      | 6.906       | Open Manhole  | 1240 x 975         |
| 23.003 | 45.268     | 350.0       | SD5     | 56.983      | 46.866      | 9.592       | Open Manhole  | 1240 x 1050        |
| 22.003 | 52.408     | 350.0       | SD6     | 55.745      | 46.641      | 8.504       | Open Manhole  | 1240 x 1050        |
| 22.004 | 23.251     | 350.0       | SD7     | 54.163      | 46.575      | 6.988       | Open Manhole  | 1240 x 1050        |
| 22.005 | 84.676     | 50.0        | SD8     | 49.986      | 44.881      | 4.505       | Open Manhole  | 1500               |
| 1.019  | 64.370     | 50.0        | SD9     | 48.228      | 43.594      | 4.034       | Open Manhole  | 1500               |
| 1.020  | 87.290     | 40.7        | SD10    | 48.464      | 41.450      | 6.414       | Open Manhole  | 1240 x 1050        |

Free Flowing Outfall Details for Surface Network 1

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
| 1.020               | SD10         | 48.464       | 41.450       | 0.000            | 1240     | 1050   |

Simulation Criteria for Surface Network 1

|                                 |       |  |       |
|---------------------------------|-------|--|-------|
| 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 Offline Controls                 | 0     |
| Number of Online Controls       | 6     | Number of Storage Structures               | 17    |


|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 24   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

Simulation Criteria for Surface Network 1

Number of Time/Area Diagrams 3 Number of Real Time Controls 0

Synthetic Rainfall Details

|                       |                                 |
|-----------------------|---------------------------------|
| Rainfall Model        | FEH                             |
| Return Period (years) | 100                             |
| FEH Rainfall Version  | 2013                            |
| Site Location         | GB 528030 193475 TQ 28030 93475 |
| Data Type             | Point                           |
| Summer Storms         | Yes                             |
| Winter Storms         | No                              |
| Cv (Summer)           | 0.750                           |
| Cv (Winter)           | 0.840                           |
| Storm Duration (mins) | 30                              |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 25   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S1, DS/PN: 1.007, Volume (m³): 4.8

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0184-2000-2000-2000 |
| Design Head (m)                   | 2.000                      |
| Design Flow (l/s)                 | 20.0                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 184                        |
| Invert Level (m)                  | 62.728                     |
| Minimum Outlet Pipe Diameter (mm) | 225                        |
| Suggested Manhole Diameter (mm)   | 1800                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 2.000    | 20.0       |
| Flush-Flo™                | 0.579    | 20.0       |
| Kick-Flo®                 | 1.234    | 15.9       |
| Mean Flow over Head Range | -        | 17.4       |


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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 6.4        | 1.200     | 16.5       | 3.000     | 24.2       | 7.000     | 36.4       |
| 0.200     | 16.6       | 1.400     | 16.9       | 3.500     | 26.1       | 7.500     | 37.7       |
| 0.300     | 18.6       | 1.600     | 18.0       | 4.000     | 27.8       | 8.000     | 38.9       |
| 0.400     | 19.5       | 1.800     | 19.0       | 4.500     | 29.5       | 8.500     | 40.0       |
| 0.500     | 19.9       | 2.000     | 20.0       | 5.000     | 31.0       | 9.000     | 41.1       |
| 0.600     | 20.0       | 2.200     | 20.9       | 5.500     | 32.4       | 9.500     | 42.2       |
| 0.800     | 19.6       | 2.400     | 21.8       | 6.000     | 33.8       |           |            |
| 1.000     | 18.7       | 2.600     | 22.6       | 6.500     | 35.2       |           |            |

Complex Manhole: S56, DS/PN: 4.006, Volume (m³): 17.8

Hydro-Brake® Optimum

|                   |                            |
|-------------------|----------------------------|
| Unit Reference    | MD-SHE-0131-1000-2000-1000 |
| Design Head (m)   | 2.000                      |
| Design Flow (l/s) | 10.0                       |
| Flush-Flo™        | Calculated                 |
| Objective         | Minimise upstream storage  |
| Application       | Surface                    |
| Sump Available    | Yes                        |
| Diameter (mm)     | 131                        |
| Invert Level (m)  | 62.000                     |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 26   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Hydro-Brake® Optimum

Minimum Outlet Pipe Diameter (mm) 150  
Suggested Manhole Diameter (mm) 1500

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 2.000    | 10.0       |
| Flush-Flo™                | 0.569    | 9.8        |
| Kick-Flo®                 | 1.167    | 7.8        |
| Mean Flow over Head Range | -        | 8.7        |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 4.7        | 1.200     | 7.9        | 3.000     | 12.1       | 7.000     | 18.1       |
| 0.200     | 8.3        | 1.400     | 8.5        | 3.500     | 13.0       | 7.500     | 18.7       |
| 0.300     | 9.2        | 1.600     | 9.0        | 4.000     | 13.9       | 8.000     | 19.3       |
| 0.400     | 9.6        | 1.800     | 9.5        | 4.500     | 14.7       | 8.500     | 19.9       |
| 0.500     | 9.8        | 2.000     | 10.0       | 5.000     | 15.4       | 9.000     | 20.5       |
| 0.600     | 9.8        | 2.200     | 10.5       | 5.500     | 16.2       | 9.500     | 21.0       |
| 0.800     | 9.6        | 2.400     | 10.9       | 6.000     | 16.8       |           |            |
| 1.000     | 9.0        | 2.600     | 11.3       | 6.500     | 17.5       |           |            |

Weir


Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 64.600

Hydro-Brake® Optimum Manhole: S101, DS/PN: 8.001, Volume (m³): 9.8

Unit Reference MD-SHE-0098-5000-1500-5000  
Design Head (m) 1.500  
Design Flow (l/s) 5.0  
    Flush-Flo™ Calculated  
Objective Minimise upstream storage  
Application Surface  
Sump Available Yes  
Diameter (mm) 98  
Invert Level (m) 55.903  
Minimum Outlet Pipe Diameter (mm) 150  
Suggested Manhole Diameter (mm) 1200

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.500    | 5.0        |
| Flush-Flo™                | 0.431    | 4.9        |
| Kick-Flo®                 | 0.878    | 3.9        |
| Mean Flow over Head Range | -        | 4.3        |

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 27   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Hydro-Brake® Optimum Manhole: S101, DS/PN: 8.001, Volume (m³): 9.8

Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 3.2        | 1.200     | 4.5        | 3.000     | 6.9        | 7.000     | 10.3       |
| 0.200     | 4.4        | 1.400     | 4.8        | 3.500     | 7.4        | 7.500     | 10.7       |
| 0.300     | 4.8        | 1.600     | 5.1        | 4.000     | 7.9        | 8.000     | 11.0       |
| 0.400     | 4.9        | 1.800     | 5.4        | 4.500     | 8.4        | 8.500     | 11.3       |
| 0.500     | 4.9        | 2.000     | 5.7        | 5.000     | 8.8        | 9.000     | 11.6       |
| 0.600     | 4.8        | 2.200     | 6.0        | 5.500     | 9.2        | 9.500     | 11.9       |
| 0.800     | 4.3        | 2.400     | 6.2        | 6.000     | 9.6        |           |            |
| 1.000     | 4.1        | 2.600     | 6.5        | 6.500     | 10.0       |           |            |

Complex Manhole: S306, DS/PN: 11.008, Volume (m³): 12.5


Hydro-Brake® Optimum

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0137-1090-2000-1090 |
| Design Head (m)                   | 2.000                      |
| Design Flow (l/s)                 | 10.9                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 137                        |
| Invert Level (m)                  | 54.478                     |
| Minimum Outlet Pipe Diameter (mm) | 150                        |
| Suggested Manhole Diameter (mm)   | 1500                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 2.000    | 10.9       |
| Flush-Flo™                | 0.593    | 10.9       |
| Kick-Flo®                 | 1.213    | 8.6        |
| Mean Flow over Head Range | -        | 9.6        |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 4.9        | 1.000     | 10.1       | 2.400     | 11.9       | 5.500     | 17.6       |
| 0.200     | 9.0        | 1.200     | 8.8        | 2.600     | 12.3       | 6.000     | 18.4       |
| 0.300     | 10.1       | 1.400     | 9.2        | 3.000     | 13.2       | 6.500     | 19.1       |
| 0.400     | 10.6       | 1.600     | 9.8        | 3.500     | 14.2       | 7.000     | 19.8       |
| 0.500     | 10.8       | 1.800     | 10.4       | 4.000     | 15.1       | 7.500     | 20.5       |
| 0.600     | 10.9       | 2.000     | 10.9       | 4.500     | 16.0       | 8.000     | 21.1       |
| 0.800     | 10.7       | 2.200     | 11.4       | 5.000     | 16.8       | 8.500     | 21.7       |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 28   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Hydro-Brake® Optimum

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 9.000     | 22.3       | 9.500     | 22.9       |           |            |           |            |

Hydro-Brake® Optimum

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0185-1700-1000-1700 |
| Design Head (m)                   | 1.000                      |
| Design Flow (l/s)                 | 17.0                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 185                        |
| Invert Level (m)                  | 55.078                     |
| Minimum Outlet Pipe Diameter (mm) | 225                        |
| Suggested Manhole Diameter (mm)   | 1500                       |

**Control Points                      Head (m)    Flow (l/s)**

|                           |       |      |
|---------------------------|-------|------|
| Design Point (Calculated) | 1.000 | 17.0 |
| Flush-Flo™                | 0.330 | 17.0 |
| Kick-Flo®                 | 0.711 | 14.4 |
| Mean Flow over Head Range | -     | 14.4 |


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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 6.5        | 1.200     | 18.5       | 3.000     | 28.7       | 7.000     | 43.2       |
| 0.200     | 16.3       | 1.400     | 19.9       | 3.500     | 30.9       | 7.500     | 44.7       |
| 0.300     | 16.9       | 1.600     | 21.2       | 4.000     | 33.0       | 8.000     | 46.1       |
| 0.400     | 16.9       | 1.800     | 22.5       | 4.500     | 34.9       | 8.500     | 47.5       |
| 0.500     | 16.5       | 2.000     | 23.6       | 5.000     | 36.7       | 9.000     | 48.8       |
| 0.600     | 16.0       | 2.200     | 24.7       | 5.500     | 38.4       | 9.500     | 50.1       |
| 0.800     | 15.3       | 2.400     | 25.8       | 6.000     | 40.1       |           |            |
| 1.000     | 17.0       | 2.600     | 26.8       | 6.500     | 41.7       |           |            |

Weir

Discharge Coef 0.544 Width (m) 1.500 Invert Level (m) 56.078

Complex Manhole: S206, DS/PN: 15.006, Volume (m³): 10.7

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 29   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Hydro-Brake® Optimum

Unit Reference MD-SHE-0140-1010-1400-1010  
 Design Head (m) 1.400  
 Design Flow (l/s) 10.1  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 140  
 Invert Level (m) 50.344  
 Minimum Outlet Pipe Diameter (mm) 225  
 Suggested Manhole Diameter (mm) 1200

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.400    | 10.1       |
| Flush-Flo™                | 0.412    | 10.1       |
| Kick-Flo®                 | 0.880    | 8.1        |
| Mean Flow over Head Range | -        | 8.8        |

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


| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 5.1        | 1.200     | 9.4        | 3.000     | 14.5       | 7.000     | 21.7       |
| 0.200     | 9.3        | 1.400     | 10.1       | 3.500     | 15.6       | 7.500     | 22.5       |
| 0.300     | 9.9        | 1.600     | 10.8       | 4.000     | 16.6       | 8.000     | 23.2       |
| 0.400     | 10.1       | 1.800     | 11.4       | 4.500     | 17.6       | 8.500     | 23.8       |
| 0.500     | 10.0       | 2.000     | 11.9       | 5.000     | 18.5       | 9.000     | 24.5       |
| 0.600     | 9.8        | 2.200     | 12.5       | 5.500     | 19.3       | 9.500     | 25.2       |
| 0.800     | 8.9        | 2.400     | 13.0       | 6.000     | 20.2       |           |            |
| 1.000     | 8.6        | 2.600     | 13.5       | 6.500     | 21.0       |           |            |

Hydro-Brake® Optimum

Unit Reference MD-SHE-0186-1600-0500-1600  
 Design Head (m) 0.500  
 Design Flow (l/s) 16.0  
 Flush-Flo™ Calculated  
 Objective Minimise upstream storage  
 Application Surface  
 Sump Available Yes  
 Diameter (mm) 186  
 Invert Level (m) 51.444  
 Minimum Outlet Pipe Diameter (mm) 225  
 Suggested Manhole Diameter (mm) 1200

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 0.500    | 16.0       |
| Flush-Flo™                | 0.266    | 16.0       |



|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 30   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Hydro-Brake® Optimum

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Kick-Flo®                 | 0.419    | 14.7       |
| Mean Flow over Head Range | -        | 12.2       |

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

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 6.5        | 1.200     | 24.3       | 3.000     | 37.7       | 7.000     | 56.8       |
| 0.200     | 15.7       | 1.400     | 26.1       | 3.500     | 40.6       | 7.500     | 58.8       |
| 0.300     | 15.9       | 1.600     | 27.9       | 4.000     | 43.3       | 8.000     | 60.8       |
| 0.400     | 15.1       | 1.800     | 29.5       | 4.500     | 45.9       | 8.500     | 62.6       |
| 0.500     | 16.0       | 2.000     | 31.0       | 5.000     | 48.3       | 9.000     | 64.5       |
| 0.600     | 17.4       | 2.200     | 32.5       | 5.500     | 50.2       | 9.500     | 66.3       |
| 0.800     | 20.0       | 2.400     | 33.9       | 6.000     | 52.5       |           |            |
| 1.000     | 22.2       | 2.600     | 35.2       | 6.500     | 54.7       |           |            |

Weir

Discharge Coef 0.544 Width (m) 1.800 Invert Level (m) 51.844


Complex Manhole: S21, DS/PN: 1.018, Volume (m³): 3.6

Hydro-Brake® Optimum

|                                   |                            |
|-----------------------------------|----------------------------|
| Unit Reference                    | MD-SHE-0315-6120-1500-6120 |
| Design Head (m)                   | 1.500                      |
| Design Flow (l/s)                 | 61.2                       |
| Flush-Flo™                        | Calculated                 |
| Objective                         | Minimise upstream storage  |
| Application                       | Surface                    |
| Sump Available                    | Yes                        |
| Diameter (mm)                     | 315                        |
| Invert Level (m)                  | 48.000                     |
| Minimum Outlet Pipe Diameter (mm) | 375                        |
| Suggested Manhole Diameter (mm)   | 2100                       |

| Control Points            | Head (m) | Flow (l/s) |
|---------------------------|----------|------------|
| Design Point (Calculated) | 1.500    | 61.2       |
| Flush-Flo™                | 0.529    | 61.2       |
| Kick-Flo®                 | 1.087    | 52.4       |
| Mean Flow over Head Range | -        | 51.3       |

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

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 31   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Hydro-Brake® Optimum


| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0.100     | 9.5        | 1.200     | 54.9       | 3.000     | 85.6       | 7.000     | 129.3      |
| 0.200     | 32.3       | 1.400     | 59.2       | 3.500     | 92.2       | 7.500     | 133.7      |
| 0.300     | 56.2       | 1.600     | 63.1       | 4.000     | 98.4       | 8.000     | 138.0      |
| 0.400     | 60.3       | 1.800     | 66.8       | 4.500     | 104.2      | 8.500     | 142.2      |
| 0.500     | 61.1       | 2.000     | 70.3       | 5.000     | 109.7      | 9.000     | 146.2      |
| 0.600     | 61.0       | 2.200     | 73.6       | 5.500     | 114.9      | 9.500     | 150.1      |
| 0.800     | 59.4       | 2.400     | 76.8       | 6.000     | 119.9      |           |            |
| 1.000     | 55.8       | 2.600     | 79.8       | 6.500     | 124.7      |           |            |

Orifice

Diameter (m) 0.215 Discharge Coefficient 0.600 Invert Level (m) 49.100

Orifice

Diameter (m) 0.162 Discharge Coefficient 0.600 Invert Level (m) 49.420

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 32   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Storage Structures for Surface Network 1

Swale Manhole: S64, DS/PN: 1.003

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

|                                      |         |                            |       |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Length (m)                 | 23.2  |
| Infiltration Coefficient Side (m/hr) | 0.00000 | Side Slope (1:X)           | 3.0   |
| Safety Factor                        | 2.0     | Slope (1:X)                | 80.0  |
| Porosity                             | 1.00    | Cap Volume Depth (m)       | 0.000 |
| Invert Level (m)                     | 66.647  | Cap Infiltration Depth (m) | 0.000 |
| Base Width (m)                       | 0.5     | Include Swale Volume       | Yes   |

Cellular Storage Manhole: S1, DS/PN: 1.007

|                                      |         |               |      |
|--------------------------------------|---------|---------------|------|
| Invert Level (m)                     | 62.728  | Safety Factor | 2.0  |
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity      | 0.95 |
| Infiltration Coefficient Side (m/hr) | 0.00000 |               |      |

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 494.0                  | 446.0                       | 1.610     | 0.0                    | 446.6                       |
| 1.600     | 494.0                  | 446.6                       |           |                        |                             |

Cellular Storage Manhole: S52, DS/PN: 4.002

|                                      |         |               |      |
|--------------------------------------|---------|---------------|------|
| Invert Level (m)                     | 67.947  | Safety Factor | 2.0  |
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity      | 0.95 |
| Infiltration Coefficient Side (m/hr) | 0.00000 |               |      |

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 20.0                   | 20.0                        | 1.001     | 0.0                    | 20.0                        |
| 1.000     | 20.0                   | 20.0                        |           |                        |                             |


Cellular Storage Manhole: TANK 2, DS/PN: 7.000

|                                      |         |               |      |
|--------------------------------------|---------|---------------|------|
| Invert Level (m)                     | 62.200  | Safety Factor | 2.0  |
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity      | 0.95 |
| Infiltration Coefficient Side (m/hr) | 0.00000 |               |      |

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 375.0                  | 375.0                       | 2.010     | 0.0                    | 535.0                       |
| 2.000     | 375.0                  | 535.0                       |           |                        |                             |

Cellular Storage Manhole: TANK 3, DS/PN: 9.000

|                                      |         |               |      |
|--------------------------------------|---------|---------------|------|
| Invert Level (m)                     | 55.955  | Safety Factor | 2.0  |
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity      | 0.95 |
| Infiltration Coefficient Side (m/hr) | 0.00000 |               |      |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 33   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

Cellular Storage Manhole: TANK 3, DS/PN: 9.000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 337.5                  | 337.5                       | 1.751     | 0.0                    | 337.5                       |
| 1.750     | 337.5                  | 337.5                       |           |                        |                             |

Complex Manhole: S10, DS/PN: 10.000

Tank or Pond

Invert Level (m) 56.297

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 155.0                  | 0.450     | 155.0                  |

Tank or Pond

Invert Level (m) 56.297

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 138.0                  | 0.450     | 138.0                  |

Swale Manhole: S310, DS/PN: 11.001


Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

|                                      |         |                            |       |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Length (m)                 | 22.5  |
| Infiltration Coefficient Side (m/hr) | 0.00000 | Side Slope (1:X)           | 3.0   |
| Safety Factor                        | 2.0     | Slope (1:X)                | 200.0 |
| Porosity                             | 1.00    | Cap Volume Depth (m)       | 0.000 |
| Invert Level (m)                     | 56.600  | Cap Infiltration Depth (m) | 0.000 |
| Base Width (m)                       | 1.0     | Include Swale Volume       | Yes   |

Swale Manhole: S311, DS/PN: 11.002

Warning:- Volume should always be included unless the upstream pipe is being used for storage and/or as a carrier

|                                      |         |                            |       |
|--------------------------------------|---------|----------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Length (m)                 | 64.5  |
| Infiltration Coefficient Side (m/hr) | 0.00000 | Side Slope (1:X)           | 3.0   |
| Safety Factor                        | 2.0     | Slope (1:X)                | 200.0 |
| Porosity                             | 1.00    | Cap Volume Depth (m)       | 0.000 |
| Invert Level (m)                     | 56.600  | Cap Infiltration Depth (m) | 0.000 |
| Base Width (m)                       | 1.0     | Include Swale Volume       | Yes   |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 34   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Cellular Storage Manhole: S312, DS/PN: 11.003

Invert Level (m) 55.146 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 15.0                   | 0.0                         | 1.310     | 0.0                    | 0.0                         |
| 1.300     | 15.0                   | 0.0                         |           |                        |                             |

Cellular Storage Manhole: S301, DS/PN: 12.001

Invert Level (m) 55.426 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 35.0                   | 0.0                         | 1.201     | 0.0                    | 0.0                         |
| 1.200     | 35.0                   | 0.0                         |           |                        |                             |

Cellular Storage Manhole: TANK 5, DS/PN: 14.000

Invert Level (m) 54.492 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.00000


| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 600.0                  | 600.0                       | 2.010     | 0.0                    | 800.0                       |
| 2.000     | 600.0                  | 800.0                       |           |                        |                             |

Porous Car Park Manhole: S213, DS/PN: 15.003

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 2.5  
 Membrane Percolation (mm/hr) 1000 Length (m) 69.2  
 Max Percolation (l/s) 48.1 Slope (1:X) 0.0  
 Safety Factor 2.0 Depression Storage (mm) 5  
 Porosity 0.30 Evaporation (mm/day) 3  
 Invert Level (m) 56.807 Cap Volume Depth (m) 0.450

Porous Car Park Manhole: S202, DS/PN: 16.002

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 2.5  
 Membrane Percolation (mm/hr) 1000 Length (m) 32.4  
 Max Percolation (l/s) 22.5 Slope (1:X) 96.0  
 Safety Factor 2.0 Depression Storage (mm) 5  
 Porosity 0.30 Evaporation (mm/day) 3  
 Invert Level (m) 54.561 Cap Volume Depth (m) 0.450

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 35   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

Cellular Storage Manhole: TANK 4, DS/PN: 19.000

Invert Level (m) 50.612 Safety Factor 2.0  
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95  
 Infiltration Coefficient Side (m/hr) 0.00000

| Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Inf. Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------------------------|-----------|------------------------|-----------------------------|
| 0.000     | 380.0                  | 0.0                         | 2.010     | 0.0                    | 0.0                         |
| 2.000     | 380.0                  | 0.0                         |           |                        |                             |

Filter Drain Manhole: S13, DS/PN: 15.007

Infiltration Coefficient Base (m/hr) 0.00000 Pipe Diameter (m) 0.225  
 Infiltration Coefficient Side (m/hr) 0.00000 Pipe Depth above Invert (m) 0.000  
 Safety Factor 2.0 Number of Pipes 1  
 Porosity 0.30 Slope (1:X) 0.0  
 Invert Level (m) 50.250 Cap Volume Depth (m) 0.000  
 Trench Width (m) 2.0 Cap Infiltration Depth (m) 1.000  
 Trench Length (m) 33.5

Tank or Pond Manhole: S19, DS/PN: 21.001

Invert Level (m) 49.618

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 150.0                  | 0.450     | 150.0                  |

Complex Manhole: HW3, DS/PN: 1.017

Tank or Pond

Invert Level (m) 48.750

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|-----------|------------------------|
| 0.000     | 737.0                  | 0.800     | 1256.0                 | 1.250     | 2865.0                 |
| 0.200     | 915.0                  | 0.810     | 2400.0                 |           |                        |

Tank or Pond

Invert Level (m) 48.750

| Depth (m) | Area (m <sup>2</sup> ) | Depth (m) | Area (m <sup>2</sup> ) |
|-----------|------------------------|-----------|------------------------|
| 0.000     | 172.0                  | 0.550     | 172.0                  |

Time Area Diagram for Green Roof at Pipe Number 8.000 (Surface Network 1)

Area (m<sup>3</sup>) 3307 Evaporation (mm/day) 3  
Depression Storage (mm) 5 Decay Coefficient 0.050

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| From:       | To:       | From:       | To:       | From:       | To:       | From:       | To:       |
| 0           | 4         | 32          | 36        | 64          | 68        | 96          | 100       |
| 4           | 8         | 36          | 40        | 68          | 72        | 100         | 104       |
| 8           | 12        | 40          | 44        | 72          | 76        | 104         | 108       |
| 12          | 16        | 44          | 48        | 76          | 80        | 108         | 112       |
| 16          | 20        | 48          | 52        | 80          | 84        | 112         | 116       |
| 20          | 24        | 52          | 56        | 84          | 88        | 116         | 120       |
| 24          | 28        | 56          | 60        | 88          | 92        |             |           |
| 28          | 32        | 60          | 64        | 92          | 96        |             |           |

Time Area Diagram for Green Roof at Pipe Number 9.000 (Surface Network 1)

Area (m<sup>3</sup>) 2497 Evaporation (mm/day) 3  
Depression Storage (mm) 5 Decay Coefficient 0.050

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| From:       | To:       | From:       | To:       | From:       | To:       | From:       | To:       |
| 0           | 4         | 32          | 36        | 64          | 68        | 96          | 100       |
| 4           | 8         | 36          | 40        | 68          | 72        | 100         | 104       |
| 8           | 12        | 40          | 44        | 72          | 76        | 104         | 108       |
| 12          | 16        | 44          | 48        | 76          | 80        | 108         | 112       |
| 16          | 20        | 48          | 52        | 80          | 84        | 112         | 116       |
| 20          | 24        | 52          | 56        | 84          | 88        | 116         | 120       |
| 24          | 28        | 56          | 60        | 88          | 92        |             |           |
| 28          | 32        | 60          | 64        | 92          | 96        |             |           |


Time Area Diagram for Green Roof at Pipe Number 23.000 (Surface Network 1)

Area (m<sup>3</sup>) 3817 Evaporation (mm/day) 3  
Depression Storage (mm) 5 Decay Coefficient 0.050

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| From:       | To:       | From:       | To:       | From:       | To:       | From:       | To:       |
| 0           | 4         | 32          | 36        | 64          | 68        | 96          | 100       |
| 4           | 8         | 36          | 40        | 68          | 72        | 100         | 104       |
| 8           | 12        | 40          | 44        | 72          | 76        | 104         | 108       |
| 12          | 16        | 44          | 48        | 76          | 80        | 108         | 112       |
| 16          | 20        | 48          | 52        | 80          | 84        | 112         | 116       |
| 20          | 24        | 52          | 56        | 84          | 88        | 116         | 120       |
| 24          | 28        | 56          | 60        | 88          | 92        |             |           |
| 28          | 32        | 60          | 64        | 92          | 96        |             |           |






|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 38   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN    | US/MH<br>Name | Water<br>Level<br>(m) | Surcharged<br>Depth<br>(m) | Flooded<br>Volume<br>(m <sup>3</sup> ) | Flow /<br>Overflow<br>Cap.<br>(l/s) | Half Drain<br>Time<br>(mins) | Pipe<br>Flow<br>(l/s) | Status | Level<br>Exceeded |
|-------|---------------|-----------------------|----------------------------|--|-------------------------------------|------------------------------|-----------------------|--------|-------------------|
|       |               |                       |                            |  |                                     |                              |                       |        |                   |
| 1.000 | S61           | 67.954                | -0.289                     | 0.000                                  | 0.12                                |                              | 23.8                  | OK     |                   |
| 1.001 | S62           | 67.433                | -0.255                     | 0.000                                  | 0.22                                |                              | 45.3                  | OK     |                   |
| 1.002 | S63           | 66.934                | -0.206                     | 0.000                                  | 0.42                                |                              | 56.3                  | OK     |                   |
| 2.000 | S68           | 66.998                | -0.263                     | 0.000                                  | 0.04                                |                              | 3.8                   | OK     |                   |
| 1.003 | S64           | 66.798                | -0.224                     | 0.000                                  | 0.34                                | 5                            | 67.1                  | OK     |                   |
| 1.004 | S65           | 66.422                | -0.216                     | 0.000                                  | 0.37                                |                              | 75.0                  | OK     |                   |
| 3.000 | S69           | 66.701                | -0.176                     | 0.000                                  | 0.11                                |                              | 7.3                   | OK     |                   |
| 3.001 | S70           | 66.097                | -0.156                     | 0.000                                  | 0.20                                |                              | 8.5                   | OK     |                   |
| 1.005 | S66           | 65.925                | -0.241                     | 0.000                                  | 0.27                                |                              | 101.7                 | OK     |                   |
| 1.006 | S67           | 63.764                | -0.215                     | 0.000                                  | 0.37                                |                              | 126.9                 | OK     |                   |
| 1.007 | S1            | 62.971                | -0.057                     | 0.000                                  | 0.14                                | 98                           | 17.7                  | OK     |                   |
| 1.008 | S2            | 62.526                | -0.240                     | 0.000                                  | 0.09                                |                              | 18.7                  | OK     |                   |
| 4.000 | S50           | 69.568                | -0.189                     | 0.000                                  | 0.06                                |                              | 4.1                   | OK     |                   |
| 4.001 | S51           | 69.122                | -0.153                     | 0.000                                  | 0.22                                |                              | 15.9                  | OK     |                   |
| 4.002 | S52           | 68.040                | -0.207                     | 0.000                                  | 0.21                                | 8                            | 21.6                  | OK     | 1                 |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 39   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH<br>Name | Storm      | Return<br>Period | Climate<br>Change | First (X)<br>Surcharge | First (Y)<br>Flood | First (Z)<br>Overflow | Overflow<br>Act. |
|--------|---------------|------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|
| 4.003  | S53           | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 5.000  | S57           | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 6.000  | S60           | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 5.001  | S58           | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 5.002  | S59           | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 4.004  | S54           | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 4.005  | S55           | 15 Winter  | 2                | +0%               | 100/15 Winter          |                    |                       |                  |
| 7.000  | TANK 2        | 240 Winter | 2                | +0%               | 2/120 Summer           |                    |                       |                  |
| 4.006  | S56           | 240 Winter | 2                | +0%               | 2/15 Summer            |                    |                       |                  |
| 1.009  | S3            | 120 Winter | 2                | +0%               |                        |                    |                       |                  |
| 1.010  | S4            | 15 Winter  | 2                | +0%               |                        |                    |                       |                  |
| 8.000  | S100          | 120 Summer | 2                | +0%               | 30/120 Winter          |                    |                       |                  |
| 9.000  | TANK 3        | 360 Winter | 2                | +0%               | 30/30 Summer           |                    |                       |                  |
| 8.001  | S101          | 120 Winter | 2                | +0%               | 2/120 Summer           |                    |                       |                  |
| 10.000 | S10           | 30 Winter  | 2                | +0%               |                        |                    |                       |                  |
| 1.011  | S5            | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 11.000 | S309          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 11.001 | S310          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 11.002 | S311          | 15 Winter  | 2                | +0%               | 30/15 Winter           |                    |                       |                  |
| 11.003 | S312          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 11.004 | S313          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 11.005 | S314          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 11.006 | S315          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 12.000 | S300          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 12.001 | S301          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 12.002 | S302          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 13.000 | S307          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 13.001 | S308          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 12.003 | S303          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 12.004 | S304          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 11.007 | S305          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 14.000 | TANK 5        | 360 Winter | 2                | +0%               | 2/180 Winter           |                    |                       |                  |
| 11.008 | S306          | 360 Winter | 2                | +0%               | 2/15 Summer            |                    |                       |                  |
| 1.012  | S6            | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 1.013  | S7            | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 1.014  | S8            | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 1.015  | S9            | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 1.016  | HW1           | 15 Winter  | 2                | +0%               | 100/360 Winter         | 100/180 Winter     |                       |                  |
| 15.000 | S210          | 15 Winter  | 2                | +0%               |                        |                    |                       |                  |
| 15.001 | S211          | 15 Winter  | 2                | +0%               | 100/15 Winter          |                    |                       |                  |
| 15.002 | S212          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 15.003 | S213          | 15 Winter  | 2                | +0%               | 30/15 Summer           |                    |                       |                  |
| 16.000 | S200          | 15 Winter  | 2                | +0%               | 100/15 Winter          |                    |                       |                  |
| 17.000 | S209          | 15 Winter  | 2                | +0%               |                        |                    |                       |                  |
| 16.001 | S201          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 16.002 | S202          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |
| 18.000 | S207          | 15 Winter  | 2                | +0%               | 100/15 Summer          | 100/15 Winter      |                       |                  |
| 18.001 | S208          | 15 Winter  | 2                | +0%               | 100/15 Summer          |                    |                       |                  |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 40   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1


| PN     | US/MH<br>Name | Water Level<br>(m) | Surcharged Depth<br>(m) | Flooded Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Half Drain<br>Time<br>(mins) | Pipe          | Status     |
|--------|---------------|--------------------|-------------------------|-------------------------------------|----------------|-------------------|------------------------------|---------------|------------|
|        |               |                    |                         |                                     |                |                   |                              | Flow<br>(l/s) |            |
| 4.003  | S53           | 67.627             | -0.162                  | 0.000                               | 0.43           |                   |                              | 43.4          | OK         |
| 5.000  | S57           | 70.462             | -0.152                  | 0.000                               | 0.22           |                   |                              | 17.7          | OK         |
| 6.000  | S60           | 69.795             | -0.268                  | 0.000                               | 0.03           |                   |                              | 4.0           | OK         |
| 5.001  | S58           | 69.182             | -0.209                  | 0.000                               | 0.19           |                   |                              | 31.3          | OK         |
| 5.002  | S59           | 68.430             | -0.183                  | 0.000                               | 0.32           |                   |                              | 52.7          | OK         |
| 4.004  | S54           | 67.241             | -0.224                  | 0.000                               | 0.34           |                   |                              | 98.9          | OK         |
| 4.005  | S55           | 65.985             | -0.325                  | 0.000                               | 0.17           |                   |                              | 132.4         | OK         |
| 7.000  | TANK 2        | 62.591             | 0.091                   | 0.000                               | 0.04           |                   | 169                          | 9.2           | SURCHARGED |
| 4.006  | S56           | 62.592             | 0.367                   | 0.000                               | 0.09           |                   |                              | 9.5           | SURCHARGED |
| 1.009  | S3            | 60.784             | -0.231                  | 0.000                               | 0.12           |                   |                              | 32.0          | OK         |
| 1.010  | S4            | 58.602             | -0.224                  | 0.000                               | 0.14           |                   |                              | 38.7          | OK         |
| 8.000  | S100          | 56.410             | -0.230                  | 0.000                               | 0.13           |                   |                              | 14.4          | OK         |
| 9.000  | TANK 3        | 56.192             | -0.063                  | 0.000                               | 0.08           |                   | 200                          | 4.4           | OK         |
| 8.001  | S101          | 56.258             | 0.055                   | 0.000                               | 0.05           |                   |                              | 4.8           | SURCHARGED |
| 10.000 | S10           | 56.363             | -0.234                  | 0.000                               | 0.11           |                   | 27                           | 15.7          | OK         |
| 1.011  | S5            | 55.649             | -0.325                  | 0.000                               | 0.17           |                   |                              | 72.2          | OK         |
| 11.000 | S309          | 55.584             | -0.441                  | 0.000                               | 0.06           |                   |                              | 13.9          | OK         |
| 11.001 | S310          | 55.512             | -0.413                  | 0.000                               | 0.10           |                   | 7                            | 24.7          | OK         |
| 11.002 | S311          | 55.374             | -0.392                  | 0.000                               | 0.14           |                   | 6                            | 33.2          | OK         |
| 11.003 | S312          | 55.280             | -0.391                  | 0.000                               | 0.14           |                   | 8                            | 38.2          | OK         |
| 11.004 | S313          | 55.126             | -0.331                  | 0.000                               | 0.24           |                   |                              | 53.0          | OK         |
| 11.005 | S314          | 55.055             | -0.299                  | 0.000                               | 0.26           |                   |                              | 56.4          | OK         |
| 11.006 | S315          | 55.005             | -0.252                  | 0.000                               | 0.22           |                   |                              | 64.1          | OK         |
| 12.000 | S300          | 55.598             | -0.373                  | 0.000                               | 0.07           |                   |                              | 11.4          | OK         |
| 12.001 | S301          | 55.515             | -0.361                  | 0.000                               | 0.09           |                   | 9                            | 15.3          | OK         |
| 12.002 | S302          | 55.391             | -0.317                  | 0.000                               | 0.19           |                   |                              | 35.1          | OK         |
| 13.000 | S307          | 59.137             | -0.190                  | 0.000                               | 0.29           |                   |                              | 74.1          | OK         |
| 13.001 | S308          | 57.461             | -0.266                  | 0.000                               | 0.18           |                   |                              | 88.4          | OK         |
| 12.003 | S303          | 55.139             | -0.362                  | 0.000                               | 0.32           |                   |                              | 116.6         | OK         |
| 12.004 | S304          | 55.026             | -0.326                  | 0.000                               | 0.42           |                   |                              | 146.4         | OK         |
| 11.007 | S305          | 54.955             | -0.200                  | 0.000                               | 0.61           |                   |                              | 177.3         | OK         |
| 14.000 | TANK 5        | 54.933             | 0.066                   | 0.000                               | 0.06           |                   | 288                          | 9.6           | SURCHARGED |
| 11.008 | S306          | 54.934             | 0.156                   | 0.000                               | 0.16           |                   |                              | 10.8          | SURCHARGED |
| 1.012  | S6            | 54.312             | -0.300                  | 0.000                               | 0.24           |                   |                              | 99.7          | OK         |
| 1.013  | S7            | 53.366             | -0.311                  | 0.000                               | 0.20           |                   |                              | 128.7         | OK         |
| 1.014  | S8            | 51.762             | -0.295                  | 0.000                               | 0.26           |                   |                              | 156.8         | OK         |
| 1.015  | S9            | 50.436             | -0.280                  | 0.000                               | 0.30           |                   |                              | 156.1         | OK         |
| 1.016  | HW1           | 49.301             | -0.699                  | 0.000                               | 0.08           |                   |                              | 157.1         | OK         |
| 15.000 | S210          | 60.388             | -0.188                  | 0.000                               | 0.06           |                   |                              | 6.2           | OK         |
| 15.001 | S211          | 58.949             | -0.173                  | 0.000                               | 0.12           |                   |                              | 11.8          | OK         |
| 15.002 | S212          | 57.502             | -0.159                  | 0.000                               | 0.19           |                   |                              | 18.5          | OK         |
| 15.003 | S213          | 55.656             | -0.125                  | 0.000                               | 0.40           |                   | 8                            | 39.9          | OK         |
| 16.000 | S200          | 55.763             | -0.307                  | 0.000                               | 0.07           |                   |                              | 14.1          | OK         |
| 17.000 | S209          | 56.334             | -0.332                  | 0.000                               | 0.03           |                   |                              | 12.6          | OK         |
| 16.001 | S201          | 55.267             | -0.270                  | 0.000                               | 0.17           |                   |                              | 32.4          | OK         |
| 16.002 | S202          | 54.700             | -0.236                  | 0.000                               | 0.29           |                   | 5                            | 53.1          | OK         |
| 18.000 | S207          | 56.220             | -0.208                  | 0.000                               | 0.20           |                   |                              | 29.6          | OK         |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 41   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1


| PN     | US/MH<br>Name | Water        | Surcharged   | Flooded                     | Half Drain Pipe      |                   |                | Status |                       |
|--------|---------------|--------------|--------------|-----------------------------|----------------------|-------------------|----------------|--------|-----------------------|
|        |               | Level<br>(m) | Depth<br>(m) | Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. (l/s) | Overflow<br>(l/s) | Time<br>(mins) |        | Pipe<br>Flow<br>(l/s) |
| 18.001 | S208          | 55.348       | -0.189       | 0.000                       | 0.29                 |                   |                | 52.5   | OK                    |

| PN     | US/MH<br>Name | Level<br>Exceeded |
|--------|---------------|-------------------|
| 4.003  | S53           |                   |
| 5.000  | S57           |                   |
| 6.000  | S60           |                   |
| 5.001  | S58           |                   |
| 5.002  | S59           |                   |
| 4.004  | S54           |                   |
| 4.005  | S55           |                   |
| 7.000  | TANK 2        |                   |
| 4.006  | S56           |                   |
| 1.009  | S3            |                   |
| 1.010  | S4            |                   |
| 8.000  | S100          |                   |
| 9.000  | TANK 3        |                   |
| 8.001  | S101          |                   |
| 10.000 | S10           |                   |
| 1.011  | S5            |                   |
| 11.000 | S309          |                   |
| 11.001 | S310          |                   |
| 11.002 | S311          |                   |
| 11.003 | S312          |                   |
| 11.004 | S313          |                   |
| 11.005 | S314          |                   |
| 11.006 | S315          |                   |
| 12.000 | S300          |                   |
| 12.001 | S301          |                   |
| 12.002 | S302          |                   |
| 13.000 | S307          |                   |
| 13.001 | S308          |                   |
| 12.003 | S303          |                   |
| 12.004 | S304          |                   |
| 11.007 | S305          |                   |
| 14.000 | TANK 5        |                   |
| 11.008 | S306          |                   |
| 1.012  | S6            |                   |
| 1.013  | S7            |                   |
| 1.014  | S8            |                   |
| 1.015  | S9            |                   |
| 1.016  | HW1           | 2                 |
| 15.000 | S210          |                   |
| 15.001 | S211          |                   |
| 15.002 | S212          |                   |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 42   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1


| PN     | US/MH Name | Level Exceeded |
|--------|------------|----------------|
| 15.003 | S213       |                |
| 16.000 | S200       |                |
| 17.000 | S209       |                |
| 16.001 | S201       |                |
| 16.002 | S202       |                |
| 18.000 | S207       | 1              |
| 18.001 | S208       |                |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 43   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 16.003 | S203       | 15 Winter  | 2             | +0%            | 100/15 Summer       |                 |                    |               |
| 15.004 | S204       | 15 Winter  | 2             | +0%            | 100/15 Summer       |                 |                    |               |
| 15.005 | S205       | 15 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 19.000 | TANK 4     | 240 Winter | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 15.006 | S206       | 15 Summer  | 2             | +0%            | 2/15 Summer         | 100/15 Winter   |                    |               |
| 15.007 | S13        | 15 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 15.008 | S14        | 15 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 20.000 | S11        | 15 Winter  | 2             | +0%            |                     |                 |                    |               |
| 20.001 | S12        | 15 Winter  | 2             | +0%            | 100/15 Summer       |                 |                    |               |
| 15.009 | S15        | 15 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 15.010 | S16        | 15 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 21.000 | S18        | 15 Winter  | 2             | +0%            | 100/15 Summer       |                 |                    |               |
| 21.001 | S19        | 30 Winter  | 2             | +0%            | 100/15 Summer       |                 |                    |               |
| 21.002 | S20        | 30 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 15.011 | S17        | 15 Winter  | 2             | +0%            | 30/15 Summer        |                 |                    |               |
| 15.012 | HW2        | 15 Winter  | 2             | +0%            | 100/240 Winter      | 100/180 Winter  |                    |               |
| 1.017  | HW3        | 360 Winter | 2             | +0%            | 30/30 Summer        | 100/360 Winter  |                    |               |
| 1.018  | S21        | 180 Winter | 2             | +0%            | 2/15 Winter         |                 |                    |               |
| 22.000 | SD11       | 15 Summer  | 2             | +0%            |                     |                 |                    |               |
| 22.001 | SD12       | 15 Summer  | 2             | +0%            |                     |                 |                    |               |
| 22.002 | SD13       | 15 Summer  | 2             | +0%            |                     |                 |                    |               |
| 23.000 | SD1        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 23.001 | SD2        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 23.002 | SD3        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 23.003 | SD4        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 22.003 | SD5        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 22.004 | SD6        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 22.005 | SD7        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 1.019  | SD8        | 120 Summer | 2             | +0%            |                     |                 |                    |               |
| 1.020  | SD9        | 120 Summer | 2             | +0%            |                     |                 |                    |               |

| PN     | US/MH Name | Water Surcharged Flooded |           |                          | Half Drain Pipe            |             | Status |                 |
|--------|------------|--------------------------|-----------|--------------------------|----------------------------|-------------|--------|-----------------|
|        |            | Level (m)                | Depth (m) | Volume (m <sup>3</sup> ) | Flow / Overflow Cap. (l/s) | Time (mins) |        | Pipe Flow (l/s) |
| 16.003 | S203       | 54.284                   | -0.271    | 0.000                    | 0.33                       |             | 105.4  | OK              |
| 15.004 | S204       | 53.926                   | -0.316    | 0.000                    | 0.20                       |             | 152.1  | OK              |
| 15.005 | S205       | 51.509                   | -0.295    | 0.000                    | 0.26                       |             | 157.4  | OK              |
| 19.000 | TANK 4     | 51.050                   | -0.012    | 0.000                    | 0.03                       | 175         | 9.8    | OK              |
| 15.006 | S206       | 51.187                   | 0.543     | 0.000                    | 0.13                       |             | 10.0   | SURCHARGED      |
| 15.007 | S13        | 50.209                   | -0.191    | 0.000                    | 0.28                       |             | 20.4   | OK              |
| 15.008 | S14        | 50.058                   | -0.140    | 0.000                    | 0.55                       |             | 39.5   | OK              |
| 20.000 | S11        | 53.299                   | -0.254    | 0.000                    | 0.06                       |             | 14.8   | OK              |
| 20.001 | S12        | 51.518                   | -0.223    | 0.000                    | 0.15                       |             | 39.0   | OK              |
| 15.009 | S15        | 49.782                   | -0.234    | 0.000                    | 0.47                       |             | 78.2   | OK              |
| 15.010 | S16        | 49.690                   | -0.263    | 0.000                    | 0.36                       |             | 76.3   | OK              |
| 21.000 | S18        | 49.931                   | -0.184    | 0.000                    | 0.31                       |             | 20.3   | OK              |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 44   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH<br>Name | Water Level<br>(m) | Surcharged Depth<br>(m) | Flooded Volume<br>(m <sup>3</sup> ) | Flow / Overflow<br>Cap. (l/s) | Half Drain Time<br>(mins) | Pipe Flow<br>(l/s) | Status     |
|--------|---------------|--------------------|-------------------------|-------------------------------------|-------------------------------|---------------------------|--------------------|------------|
|        |               |                    |                         |                                     |                               |                           |                    |            |
| 21.001 | S19           | 49.693             | -0.225                  | 0.000                               | 0.14                          |                           | 9.2                | OK         |
| 21.002 | S20           | 49.543             | -0.212                  | 0.000                               | 0.18                          |                           | 12.0               | OK         |
| 15.011 | S17           | 49.430             | -0.162                  | 0.000                               | 0.73                          |                           | 96.0               | OK         |
| 15.012 | HW2           | 49.258             | -0.742                  | 0.000                               | 0.06                          |                           | 103.2              | OK         |
| 1.017  | HW3           | 49.228             | -0.022                  | 0.000                               | 0.13                          | 252                       | 66.8               | OK         |
| 1.018  | S21           | 49.140             | 0.690                   | 0.000                               | 0.07                          |                           | 61.0               | SURCHARGED |
| 22.000 | SD11          | 53.629             | -0.525                  | 0.000                               | 0.00                          |                           | 0.0                | OK         |
| 22.001 | SD12          | 53.176             | -0.525                  | 0.000                               | 0.00                          |                           | 0.0                | OK         |
| 22.002 | SD13          | 52.840             | -0.525                  | 0.000                               | 0.00                          |                           | 0.0                | OK         |
| 23.000 | SD1           | 47.601             | -0.442                  | 0.000                               | 0.06                          |                           | 16.6               | OK         |
| 23.001 | SD2           | 47.360             | -0.443                  | 0.000                               | 0.06                          |                           | 16.5               | OK         |
| 23.002 | SD3           | 47.108             | -0.417                  | 0.000                               | 0.09                          |                           | 16.5               | OK         |
| 23.003 | SD4           | 47.088             | -0.433                  | 0.000                               | 0.07                          |                           | 16.5               | OK         |
| 22.003 | SD5           | 46.878             | -0.513                  | 0.000                               | 0.05                          |                           | 16.4               | OK         |
| 22.004 | SD6           | 46.733             | -0.508                  | 0.000                               | 0.06                          |                           | 16.3               | OK         |
| 22.005 | SD7           | 46.626             | -0.548                  | 0.000                               | 0.02                          |                           | 16.3               | OK         |
| 1.019  | SD8           | 44.996             | -0.485                  | 0.000                               | 0.08                          |                           | 71.8               | OK         |
| 1.020  | SD9           | 43.699             | -0.495                  | 0.000                               | 0.07                          |                           | 71.8               | OK         |

| PN     | US/MH<br>Name | Level<br>Exceeded |
|--------|---------------|-------------------|
| 16.003 | S203          |                   |
| 15.004 | S204          |                   |
| 15.005 | S205          |                   |
| 19.000 | TANK 4        |                   |
| 15.006 | S206          | 2                 |
| 15.007 | S13           |                   |
| 15.008 | S14           |                   |
| 20.000 | S11           |                   |
| 20.001 | S12           |                   |
| 15.009 | S15           |                   |
| 15.010 | S16           |                   |
| 21.000 | S18           |                   |
| 21.001 | S19           |                   |
| 21.002 | S20           |                   |
| 15.011 | S17           |                   |
| 15.012 | HW2           | 4                 |
| 1.017  | HW3           | 1                 |
| 1.018  | S21           |                   |
| 22.000 | SD11          |                   |
| 22.001 | SD12          |                   |
| 22.002 | SD13          |                   |
| 23.000 | SD1           |                   |
| 23.001 | SD2           |                   |
| 23.002 | SD3           |                   |

32 Beehive Lane  
Welwyn Garden City  
Herts AL7 4BQ



Date 23/11/2021 18:19  
File ST-3013-Drainage Strate...

Designed by info  
Checked by


Micro Drainage

Network 2020.1

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| <b>PN</b> | <b>US/MH<br/>Name</b> | <b>Level<br/>Exceeded</b> |
|-----------|-----------------------|---------------------------|
| 23.003    | SD4                   |                           |
| 22.003    | SD5                   |                           |
| 22.004    | SD6                   |                           |
| 22.005    | SD7                   |                           |
| 1.019     | SD8                   |                           |
| 1.020     | SD9                   |                           |



|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 46   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

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 17  
Number of Online Controls 6    Number of Time/Area Diagrams 3  
Number of Offline Controls 0    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH  
FEH Rainfall Version 2013  
Site Location GB 528030 193475 TQ 28030 93475  
Data Type Point  
Cv (Summer) 0.750  
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, 180, 240, 360, 480, 600,  
720, 960, 1440, 2160, 2880, 4320, 5760  
Return Period(s) (years) 2, 30, 100  
Climate Change (%) 0, 10, 40

| PN    | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surchage | First (Y) Flood      | First (Z) Overflow | Overflow Act. |
|-------|------------|------------|---------------|----------------|--------------------|----------------------|--------------------|---------------|
| 1.000 | S61        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 1.001 | S62        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 1.002 | S63        | 15 Winter  | 30            | +10%           | 30/15              | Summer               |                    |               |
| 2.000 | S68        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 1.003 | S64        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 1.004 | S65        | 15 Winter  | 30            | +10%           | 30/15              | Summer               |                    |               |
| 3.000 | S69        | 15 Winter  | 30            | +10%           | 100/15             | Winter               |                    |               |
| 3.001 | S70        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 1.005 | S66        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 1.006 | S67        | 15 Winter  | 30            | +10%           | 30/15              | Summer               |                    |               |
| 1.007 | S1         | 180 Winter | 30            | +10%           | 30/15              | Summer               |                    |               |
| 1.008 | S2         | 15 Winter  | 30            | +10%           |                    |                      |                    |               |
| 4.000 | S50        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 4.001 | S51        | 15 Winter  | 30            | +10%           | 100/15             | Summer               |                    |               |
| 4.002 | S52        | 15 Winter  | 30            | +10%           | 100/15             | Summer 100/15 Winter |                    |               |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1


| PN    | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status     |
|-------|------------|-----------------|----------------------|---------------------|----------------------------|------------------------|-----------------|------------|
| 1.000 | S61        | 68.019          | -0.224               | 0.000               | 0.33                       |                        | 67.9            | OK         |
| 1.001 | S62        | 67.549          | -0.139               | 0.000               | 0.69                       |                        | 141.8           | OK         |
| 1.002 | S63        | 67.227          | 0.087                | 0.000               | 1.34                       |                        | 180.8           | SURCHARGED |
| 2.000 | S68        | 67.034          | -0.227               | 0.000               | 0.10                       |                        | 10.9            | OK         |
| 1.003 | S64        | 67.004          | -0.018               | 0.000               | 0.95                       | 4                      | 189.0           | OK         |
| 1.004 | S65        | 66.659          | 0.021                | 0.000               | 1.03                       |                        | 209.5           | SURCHARGED |
| 3.000 | S69        | 66.737          | -0.140               | 0.000               | 0.30                       |                        | 20.8            | OK         |
| 3.001 | S70        | 66.156          | -0.097               | 0.000               | 0.60                       |                        | 24.8            | OK         |
| 1.005 | S66        | 66.047          | -0.119               | 0.000               | 0.79                       |                        | 294.3           | OK         |
| 1.006 | S67        | 64.243          | 0.264                | 0.000               | 1.13                       |                        | 386.3           | SURCHARGED |
| 1.007 | S1         | 63.426          | 0.398                | 0.000               | 0.16                       | 165                    | 20.0            | SURCHARGED |
| 1.008 | S2         | 62.548          | -0.218               | 0.000               | 0.16                       |                        | 33.5            | OK         |
| 4.000 | S50        | 69.595          | -0.162               | 0.000               | 0.17                       |                        | 11.8            | OK         |
| 4.001 | S51        | 69.199          | -0.076               | 0.000               | 0.76                       |                        | 53.4            | OK         |
| 4.002 | S52        | 68.211          | -0.036               | 0.000               | 0.67                       | 4                      | 69.5            | OK         |

| PN    | US/MH Name | Level Exceeded |
|-------|------------|----------------|
| 1.000 | S61        |                |
| 1.001 | S62        |                |
| 1.002 | S63        |                |
| 2.000 | S68        |                |
| 1.003 | S64        |                |
| 1.004 | S65        |                |
| 3.000 | S69        |                |
| 3.001 | S70        |                |
| 1.005 | S66        |                |
| 1.006 | S67        |                |
| 1.007 | S1         |                |
| 1.008 | S2         |                |
| 4.000 | S50        |                |
| 4.001 | S51        |                |
| 4.002 | S52        | 1              |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 48   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |


30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH<br>Name | Storm      | Return<br>Period | Climate<br>Change | First (X)<br>Surcharge | First (Y)<br>Flood | First (Z)<br>Overflow | Overflow<br>Act. |
|--------|---------------|------------|------------------|-------------------|------------------------|--------------------|-----------------------|------------------|
| 4.003  | S53           | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 5.000  | S57           | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 6.000  | S60           | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 5.001  | S58           | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 5.002  | S59           | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 4.004  | S54           | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 4.005  | S55           | 15 Winter  | 30               | +10%              | 100/15 Winter          |                    |                       |                  |
| 7.000  | TANK 2        | 360 Winter | 30               | +10%              | 2/120 Summer           |                    |                       |                  |
| 4.006  | S56           | 360 Winter | 30               | +10%              | 2/15 Summer            |                    |                       |                  |
| 1.009  | S3            | 15 Winter  | 30               | +10%              |                        |                    |                       |                  |
| 1.010  | S4            | 15 Winter  | 30               | +10%              |                        |                    |                       |                  |
| 8.000  | S100          | 480 Winter | 30               | +10%              | 30/120 Winter          |                    |                       |                  |
| 9.000  | TANK 3        | 480 Winter | 30               | +10%              | 30/30 Summer           |                    |                       |                  |
| 8.001  | S101          | 480 Winter | 30               | +10%              | 2/120 Summer           |                    |                       |                  |
| 10.000 | S10           | 30 Winter  | 30               | +10%              |                        |                    |                       |                  |
| 1.011  | S5            | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 11.000 | S309          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 11.001 | S310          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 11.002 | S311          | 15 Winter  | 30               | +10%              | 30/15 Winter           |                    |                       |                  |
| 11.003 | S312          | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 11.004 | S313          | 240 Winter | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 11.005 | S314          | 240 Winter | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 11.006 | S315          | 240 Winter | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 12.000 | S300          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 12.001 | S301          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 12.002 | S302          | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 13.000 | S307          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 13.001 | S308          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 12.003 | S303          | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 12.004 | S304          | 240 Winter | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 11.007 | S305          | 240 Winter | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 14.000 | TANK 5        | 360 Winter | 30               | +10%              | 2/180 Winter           |                    |                       |                  |
| 11.008 | S306          | 360 Winter | 30               | +10%              | 2/15 Summer            |                    |                       |                  |
| 1.012  | S6            | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 1.013  | S7            | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 1.014  | S8            | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 1.015  | S9            | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 1.016  | HW1           | 480 Winter | 30               | +10%              | 100/360 Winter         | 100/180 Winter     |                       |                  |
| 15.000 | S210          | 15 Winter  | 30               | +10%              |                        |                    |                       |                  |
| 15.001 | S211          | 15 Winter  | 30               | +10%              | 100/15 Winter          |                    |                       |                  |
| 15.002 | S212          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 15.003 | S213          | 15 Winter  | 30               | +10%              | 30/15 Summer           |                    |                       |                  |
| 16.000 | S200          | 15 Winter  | 30               | +10%              | 100/15 Winter          |                    |                       |                  |
| 17.000 | S209          | 15 Winter  | 30               | +10%              |                        |                    |                       |                  |
| 16.001 | S201          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 16.002 | S202          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |
| 18.000 | S207          | 15 Winter  | 30               | +10%              | 100/15 Summer          | 100/15 Winter      |                       |                  |
| 18.001 | S208          | 15 Winter  | 30               | +10%              | 100/15 Summer          |                    |                       |                  |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 49   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1


| PN     | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status     |
|--------|------------|-----------------|----------------------|----------------------------------|----------------------------|------------------------|-----------------|------------|
| 4.003  | S53        | 68.059          | 0.270                | 0.000                            | 1.29                       |                        | 131.4           | SURCHARGED |
| 5.000  | S57        | 70.523          | -0.091               | 0.000                            | 0.64                       |                        | 50.5            | OK         |
| 6.000  | S60        | 69.816          | -0.247               | 0.000                            | 0.07                       |                        | 11.4            | OK         |
| 5.001  | S58        | 69.260          | -0.131               | 0.000                            | 0.60                       |                        | 95.5            | OK         |
| 5.002  | S59        | 68.652          | 0.039                | 0.000                            | 1.00                       |                        | 165.1           | SURCHARGED |
| 4.004  | S54        | 67.542          | 0.077                | 0.000                            | 1.03                       |                        | 301.8           | SURCHARGED |
| 4.005  | S55        | 66.095          | -0.215               | 0.000                            | 0.53                       |                        | 414.3           | OK         |
| 7.000  | TANK 2     | 63.539          | 1.039                | 0.000                            | 0.04                       |                        | 8.6             | SURCHARGED |
| 4.006  | S56        | 63.539          | 1.314                | 0.000                            | 0.09                       |                        | 9.7             | SURCHARGED |
| 1.009  | S3         | 60.835          | -0.180               | 0.000                            | 0.32                       |                        | 85.2            | OK         |
| 1.010  | S4         | 58.667          | -0.159               | 0.000                            | 0.44                       |                        | 118.4           | OK         |
| 8.000  | S100       | 56.828          | 0.188                | 0.000                            | 0.14                       |                        | 16.4            | SURCHARGED |
| 9.000  | TANK 3     | 56.826          | 0.572                | 0.000                            | 0.08                       |                        | 4.4             | SURCHARGED |
| 8.001  | S101       | 56.825          | 0.622                | 0.000                            | 0.05                       |                        | 4.9             | SURCHARGED |
| 10.000 | S10        | 56.443          | -0.154               | 0.000                            | 0.48                       | 17                     | 68.7            | OK         |
| 1.011  | S5         | 55.768          | -0.206               | 0.000                            | 0.55                       |                        | 234.3           | OK         |
| 11.000 | S309       | 55.883          | -0.142               | 0.000                            | 0.16                       |                        | 39.7            | OK         |
| 11.001 | S310       | 55.853          | -0.072               | 0.000                            | 0.30                       | 8                      | 74.2            | OK         |
| 11.002 | S311       | 55.776          | 0.010                | 0.000                            | 0.38                       | 11                     | 87.6            | SURCHARGED |
| 11.003 | S312       | 55.726          | 0.055                | 0.000                            | 0.31                       | 11                     | 83.4            | SURCHARGED |
| 11.004 | S313       | 55.678          | 0.221                | 0.000                            | 0.16                       |                        | 35.3            | SURCHARGED |
| 11.005 | S314       | 55.663          | 0.309                | 0.000                            | 0.16                       |                        | 36.0            | SURCHARGED |
| 11.006 | S315       | 55.649          | 0.392                | 0.000                            | 0.14                       |                        | 39.7            | SURCHARGED |
| 12.000 | S300       | 55.818          | -0.153               | 0.000                            | 0.19                       |                        | 32.5            | OK         |
| 12.001 | S301       | 55.796          | -0.080               | 0.000                            | 0.44                       | 5                      | 78.2            | OK         |
| 12.002 | S302       | 55.765          | 0.057                | 0.000                            | 0.53                       |                        | 98.1            | SURCHARGED |
| 13.000 | S307       | 59.237          | -0.090               | 0.000                            | 0.82                       |                        | 211.8           | OK         |
| 13.001 | S308       | 57.552          | -0.175               | 0.000                            | 0.55                       |                        | 263.8           | OK         |
| 12.003 | S303       | 55.730          | 0.229                | 0.000                            | 0.83                       |                        | 305.3           | SURCHARGED |
| 12.004 | S304       | 55.663          | 0.311                | 0.000                            | 0.29                       |                        | 101.8           | SURCHARGED |
| 11.007 | S305       | 55.624          | 0.469                | 0.000                            | 0.45                       |                        | 131.1           | SURCHARGED |
| 14.000 | TANK 5     | 55.491          | 0.624                | 0.000                            | 0.14                       | 384                    | 23.6            | SURCHARGED |
| 11.008 | S306       | 55.549          | 0.772                | 0.000                            | 0.42                       |                        | 27.1            | SURCHARGED |
| 1.012  | S6         | 54.455          | -0.157               | 0.000                            | 0.74                       |                        | 306.8           | OK         |
| 1.013  | S7         | 53.496          | -0.181               | 0.000                            | 0.65                       |                        | 406.6           | OK         |
| 1.014  | S8         | 51.926          | -0.131               | 0.000                            | 0.82                       |                        | 501.6           | OK         |
| 1.015  | S9         | 50.656          | -0.060               | 0.000                            | 0.98                       |                        | 506.2           | OK         |
| 1.016  | HW1        | 49.669          | -0.331               | 0.000                            | 0.06                       |                        | 118.0           | OK         |
| 15.000 | S210       | 60.415          | -0.161               | 0.000                            | 0.18                       |                        | 17.8            | OK         |
| 15.001 | S211       | 58.994          | -0.128               | 0.000                            | 0.39                       |                        | 38.0            | OK         |
| 15.002 | S212       | 57.566          | -0.095               | 0.000                            | 0.62                       |                        | 62.0            | OK         |
| 15.003 | S213       | 56.644          | 0.863                | 0.000                            | 1.24                       | 3                      | 123.0           | SURCHARGED |
| 16.000 | S200       | 55.813          | -0.257               | 0.000                            | 0.21                       |                        | 40.1            | OK         |
| 17.000 | S209       | 56.366          | -0.300               | 0.000                            | 0.09                       |                        | 36.0            | OK         |
| 16.001 | S201       | 55.354          | -0.183               | 0.000                            | 0.50                       |                        | 96.0            | OK         |
| 16.002 | S202       | 54.846          | -0.090               | 0.000                            | 0.90                       | 4                      | 165.3           | OK         |
| 18.000 | S207       | 56.294          | -0.134               | 0.000                            | 0.57                       |                        | 84.6            | OK         |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 50   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH<br>Name | Water        | Surcharged   | Flooded                     | Half Drain Pipe      |                   |                | Status |
|--------|---------------|--------------|--------------|-----------------------------|----------------------|-------------------|----------------|--------|
|        |               | Level<br>(m) | Depth<br>(m) | Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. (l/s) | Overflow<br>(l/s) | Time<br>(mins) |        |
| 18.001 | S208          | 55.466       | -0.071       | 0.000                       | 0.92                 |                   | 166.1          | OK     |

| PN     | US/MH<br>Name | Level<br>Exceeded |
|--------|---------------|-------------------|
| 4.003  | S53           |                   |
| 5.000  | S57           |                   |
| 6.000  | S60           |                   |
| 5.001  | S58           |                   |
| 5.002  | S59           |                   |
| 4.004  | S54           |                   |
| 4.005  | S55           |                   |
| 7.000  | TANK 2        |                   |
| 4.006  | S56           |                   |
| 1.009  | S3            |                   |
| 1.010  | S4            |                   |
| 8.000  | S100          |                   |
| 9.000  | TANK 3        |                   |
| 8.001  | S101          |                   |
| 10.000 | S10           |                   |
| 1.011  | S5            |                   |
| 11.000 | S309          |                   |
| 11.001 | S310          |                   |
| 11.002 | S311          |                   |
| 11.003 | S312          |                   |
| 11.004 | S313          |                   |
| 11.005 | S314          |                   |
| 11.006 | S315          |                   |
| 12.000 | S300          |                   |
| 12.001 | S301          |                   |
| 12.002 | S302          |                   |
| 13.000 | S307          |                   |
| 13.001 | S308          |                   |
| 12.003 | S303          |                   |
| 12.004 | S304          |                   |
| 11.007 | S305          |                   |
| 14.000 | TANK 5        |                   |
| 11.008 | S306          |                   |
| 1.012  | S6            |                   |
| 1.013  | S7            |                   |
| 1.014  | S8            |                   |
| 1.015  | S9            |                   |
| 1.016  | HW1           | 2                 |
| 15.000 | S210          |                   |
| 15.001 | S211          |                   |
| 15.002 | S212          |                   |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 51   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH<br>Name | Level<br>Exceeded |
|--------|---------------|-------------------|
| 15.003 | S213          |                   |
| 16.000 | S200          |                   |
| 17.000 | S209          |                   |
| 16.001 | S201          |                   |
| 16.002 | S202          |                   |
| 18.000 | S207          | 1                 |
| 18.001 | S208          |                   |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 16.003 | S203       | 15 Winter  | 30            | +10%           | 100/15 Summer       |                 |                    |               |
| 15.004 | S204       | 15 Winter  | 30            | +10%           | 100/15 Summer       |                 |                    |               |
| 15.005 | S205       | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 19.000 | TANK 4     | 240 Winter | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 15.006 | S206       | 15 Winter  | 30            | +10%           | 2/15 Summer         | 100/15 Winter   |                    |               |
| 15.007 | S13        | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 15.008 | S14        | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 20.000 | S11        | 15 Winter  | 30            | +10%           |                     |                 |                    |               |
| 20.001 | S12        | 15 Winter  | 30            | +10%           | 100/15 Summer       |                 |                    |               |
| 15.009 | S15        | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 15.010 | S16        | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 21.000 | S18        | 15 Winter  | 30            | +10%           | 100/15 Summer       |                 |                    |               |
| 21.001 | S19        | 15 Winter  | 30            | +10%           | 100/15 Summer       |                 |                    |               |
| 21.002 | S20        | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 15.011 | S17        | 15 Winter  | 30            | +10%           | 30/15 Summer        |                 |                    |               |
| 15.012 | HW2        | 360 Winter | 30            | +10%           | 100/240 Winter      | 100/180 Winter  |                    |               |
| 1.017  | HW3        | 480 Winter | 30            | +10%           | 30/30 Summer        | 100/360 Winter  |                    |               |
| 1.018  | S21        | 180 Winter | 30            | +10%           | 2/15 Winter         |                 |                    |               |
| 22.000 | SD11       | 15 Summer  | 30            | +10%           |                     |                 |                    |               |
| 22.001 | SD12       | 15 Summer  | 30            | +10%           |                     |                 |                    |               |
| 22.002 | SD13       | 15 Summer  | 30            | +10%           |                     |                 |                    |               |
| 23.000 | SD1        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 23.001 | SD2        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 23.002 | SD3        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 23.003 | SD4        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 22.003 | SD5        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 22.004 | SD6        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 22.005 | SD7        | 30 Winter  | 30            | +10%           |                     |                 |                    |               |
| 1.019  | SD8        | 120 Winter | 30            | +10%           |                     |                 |                    |               |
| 1.020  | SD9        | 120 Winter | 30            | +10%           |                     |                 |                    |               |

| PN     | US/MH Name | Water Surcharged Flooded |           |                          | Half Drain Pipe            |             | Status |                 |
|--------|------------|--------------------------|-----------|--------------------------|----------------------------|-------------|--------|-----------------|
|        |            | Level (m)                | Depth (m) | Volume (m <sup>3</sup> ) | Flow / Overflow Cap. (l/s) | Time (mins) |        | Pipe Flow (l/s) |
| 16.003 | S203       | 54.553                   | -0.002    | 0.000                    | 1.00                       |             | 315.3  | OK              |
| 15.004 | S204       | 54.042                   | -0.200    | 0.000                    | 0.59                       |             | 460.7  | OK              |
| 15.005 | S205       | 52.621                   | 0.817     | 0.000                    | 0.79                       |             | 478.6  | SURCHARGED      |
| 19.000 | TANK 4     | 51.831                   | 0.769     | 0.000                    | 0.07                       |             | 25.3   | SURCHARGED      |
| 15.006 | S206       | 51.902                   | 1.258     | 0.000                    | 0.34                       |             | 26.0   | SURCHARGED      |
| 15.007 | S13        | 50.541                   | 0.141     | 0.000                    | 0.85                       | 6           | 61.6   | SURCHARGED      |
| 15.008 | S14        | 50.479                   | 0.281     | 0.000                    | 1.27                       |             | 91.9   | SURCHARGED      |
| 20.000 | S11        | 53.333                   | -0.220    | 0.000                    | 0.16                       |             | 42.4   | OK              |
| 20.001 | S12        | 51.589                   | -0.152    | 0.000                    | 0.49                       |             | 129.7  | OK              |
| 15.009 | S15        | 50.184                   | 0.168     | 0.000                    | 1.23                       |             | 206.9  | SURCHARGED      |
| 15.010 | S16        | 50.047                   | 0.095     | 0.000                    | 0.94                       |             | 199.7  | SURCHARGED      |
| 21.000 | S18        | 50.039                   | -0.076    | 0.000                    | 0.87                       |             | 57.2   | OK              |

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| PN     | US/MH<br>Name | Water Level<br>(m) | Surcharged Depth<br>(m) | Flooded Volume<br>(m <sup>3</sup> ) | Flow /<br>Cap. | Overflow<br>(l/s) | Half Drain<br>Time<br>(mins) | Pipe<br>Flow<br>(l/s) | Status     |
|--------|---------------|--------------------|-------------------------|-------------------------------------|----------------|-------------------|------------------------------|-----------------------|------------|
|        |               |                    |                         |                                     |                |                   |                              |                       |            |
| 21.001 | S19           | 49.813             | -0.105                  | 0.000                               | 0.63           |                   |                              | 40.9                  | OK         |
| 21.002 | S20           | 49.780             | 0.025                   | 0.000                               | 0.71           |                   |                              | 46.5                  | SURCHARGED |
| 15.011 | S17           | 49.727             | 0.135                   | 0.000                               | 1.94           |                   |                              | 254.7                 | SURCHARGED |
| 15.012 | HW2           | 49.656             | -0.344                  | 0.000                               | 0.04           |                   |                              | 72.0                  | OK         |
| 1.017  | HW3           | 49.629             | 0.379                   | 0.000                               | 0.20           |                   | 382                          | 100.2                 | SURCHARGED |
| 1.018  | S21           | 49.434             | 0.984                   | 0.000                               | 0.13           |                   |                              | 106.0                 | SURCHARGED |
| 22.000 | SD11          | 53.629             | -0.525                  | 0.000                               | 0.00           |                   |                              | 0.0                   | OK         |
| 22.001 | SD12          | 53.176             | -0.525                  | 0.000                               | 0.00           |                   |                              | 0.0                   | OK         |
| 22.002 | SD13          | 52.840             | -0.525                  | 0.000                               | 0.00           |                   |                              | 0.0                   | OK         |
| 23.000 | SD1           | 47.671             | -0.372                  | 0.000                               | 0.19           |                   |                              | 51.8                  | OK         |
| 23.001 | SD2           | 47.429             | -0.374                  | 0.000                               | 0.18           |                   |                              | 51.2                  | OK         |
| 23.002 | SD3           | 47.193             | -0.332                  | 0.000                               | 0.29           |                   |                              | 51.1                  | OK         |
| 23.003 | SD4           | 47.163             | -0.357                  | 0.000                               | 0.22           |                   |                              | 50.8                  | OK         |
| 22.003 | SD5           | 46.949             | -0.442                  | 0.000                               | 0.16           |                   |                              | 50.5                  | OK         |
| 22.004 | SD6           | 46.810             | -0.431                  | 0.000                               | 0.18           |                   |                              | 50.3                  | OK         |
| 22.005 | SD7           | 46.666             | -0.509                  | 0.000                               | 0.06           |                   |                              | 50.2                  | OK         |
| 1.019  | SD8           | 45.042             | -0.440                  | 0.000                               | 0.16           |                   |                              | 141.5                 | OK         |
| 1.020  | SD9           | 43.744             | -0.450                  | 0.000                               | 0.14           |                   |                              | 141.5                 | OK         |

**US/MH Level  
PN Name Exceeded**

|        |        |   |
|--------|--------|---|
| 16.003 | S203   |   |
| 15.004 | S204   |   |
| 15.005 | S205   |   |
| 19.000 | TANK 4 |   |
| 15.006 | S206   | 2 |
| 15.007 | S13    |   |
| 15.008 | S14    |   |
| 20.000 | S11    |   |
| 20.001 | S12    |   |
| 15.009 | S15    |   |
| 15.010 | S16    |   |
| 21.000 | S18    |   |
| 21.001 | S19    |   |
| 21.002 | S20    |   |
| 15.011 | S17    |   |
| 15.012 | HW2    | 4 |
| 1.017  | HW3    | 1 |
| 1.018  | S21    |   |
| 22.000 | SD11   |   |
| 22.001 | SD12   |   |
| 22.002 | SD13   |   |
| 23.000 | SD1    |   |
| 23.001 | SD2    |   |
| 23.002 | SD3    |   |



32 Beehive Lane  
Welwyn Garden City  
Herts AL7 4BQ



Date 23/11/2021 18:19  
File ST-3013-Drainage Strate...


Designed by info  
Checked by

Micro Drainage

Network 2020.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Surface Network 1

| <b>PN</b> | <b>US/MH<br/>Name</b> | <b>Level<br/>Exceeded</b> |
|-----------|-----------------------|---------------------------|
| 23.003    | SD4                   |                           |
| 22.003    | SD5                   |                           |
| 22.004    | SD6                   |                           |
| 22.005    | SD7                   |                           |
| 1.019     | SD8                   |                           |
| 1.020     | SD9                   |                           |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 55   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

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 | 17 |
| Number of Online Controls   | 6 | Number of Time/Area Diagrams | 3  |
| Number of Offline Controls  | 0 | Number of Real Time Controls | 0  |

Synthetic Rainfall Details


|                      |                                 |
|----------------------|---------------------------------|
| Rainfall Model       | FEH                             |
| FEH Rainfall Version | 2013                            |
| Site Location        | GB 528030 193475 TQ 28030 93475 |
| Data Type            | Point                           |
| Cv (Summer)          | 0.750                           |
| 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, 180, 240, 360, 480, 600,<br>720, 960, 1440, 2160, 2880, 4320, 5760 |
| Return Period(s) (years) | 2, 30, 100  |
| Climate Change (%)       | 0, 10, 40   |

WARNING: Half Drain Time has not been calculated as the structure is too full.

| 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 | S61        | 15 Winter  | 100           | +40%           | 100/15 Summer   |                 |                    |               | 68.565          |
| 1.001 | S62        | 15 Winter  | 100           | +40%           | 100/15 Summer   |                 |                    |               | 68.401          |
| 1.002 | S63        | 15 Winter  | 100           | +40%           | 30/15 Summer    |                 |                    |               | 67.816          |
| 2.000 | S68        | 15 Winter  | 100           | +40%           | 100/15 Summer   |                 |                    |               | 67.459          |
| 1.003 | S64        | 15 Winter  | 100           | +40%           | 100/15 Summer   |                 |                    |               | 67.448          |
| 1.004 | S65        | 15 Winter  | 100           | +40%           | 30/15 Summer    |                 |                    |               | 67.083          |
| 3.000 | S69        | 15 Winter  | 100           | +40%           | 100/15 Winter   |                 |                    |               | 66.896          |
| 3.001 | S70        | 15 Winter  | 100           | +40%           | 100/15 Summer   |                 |                    |               | 66.729          |
| 1.005 | S66        | 15 Winter  | 100           | +40%           | 100/15 Summer   |                 |                    |               | 66.666          |
| 1.006 | S67        | 15 Winter  | 100           | +40%           | 30/15 Summer    |                 |                    |               | 64.872          |
| 1.007 | S1         | 240 Winter | 100           | +40%           | 30/15 Summer    |                 |                    |               | 64.170          |
| 1.008 | S2         | 15 Winter  | 100           | +40%           |                 |                 |                    |               | 62.567          |


|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 56   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

| PN    | US/MH Name | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status     | Level Exceeded |
|-------|------------|----------------------|----------------------------------|----------------------------|------------------------|-----------------|------------|----------------|
| 1.000 | S61        | 0.322                | 0.000                            | 0.51                       |                        | 104.1           | SURCHARGED |                |
| 1.001 | S62        | 0.713                | 0.000                            | 1.02                       |                        | 209.5           | SURCHARGED |                |
| 1.002 | S63        | 0.676                | 0.000                            | 1.96                       |                        | 263.8           | SURCHARGED |                |
| 2.000 | S68        | 0.198                | 0.000                            | 0.14                       |                        | 15.5            | SURCHARGED |                |
| 1.003 | S64        | 0.426                | 0.000                            | 1.19                       | 6                      | 235.9           | SURCHARGED |                |
| 1.004 | S65        | 0.445                | 0.000                            | 1.23                       |                        | 249.4           | SURCHARGED |                |
| 3.000 | S69        | 0.019                | 0.000                            | 0.50                       |                        | 34.8            | SURCHARGED |                |
| 3.001 | S70        | 0.476                | 0.000                            | 1.08                       |                        | 45.1            | SURCHARGED |                |
| 1.005 | S66        | 0.500                | 0.000                            | 0.92                       |                        | 343.6           | SURCHARGED |                |
| 1.006 | S67        | 0.893                | 0.000                            | 1.42                       |                        | 483.5           | SURCHARGED |                |
| 1.007 | S1         | 1.142                | 0.000                            | 0.16                       |                        | 20.0            | SURCHARGED |                |
| 1.008 | S2         | -0.199               | 0.000                            | 0.24                       |                        | 51.0            | OK         |                |


100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

| PN     | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 4.000  | S50        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 4.001  | S51        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 4.002  | S52        | 15 Winter  | 100           | +40%           | 100/15 Summer       | 100/15 Winter   |                    |               |
| 4.003  | S53        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 5.000  | S57        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 6.000  | S60        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 5.001  | S58        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 5.002  | S59        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 4.004  | S54        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 4.005  | S55        | 15 Winter  | 100           | +40%           | 100/15 Winter       |                 |                    |               |
| 7.000  | TANK 2     | 240 Winter | 100           | +40%           | 2/120 Summer        |                 |                    |               |
| 4.006  | S56        | 240 Winter | 100           | +40%           | 2/15 Summer         |                 |                    |               |
| 1.009  | S3         | 15 Winter  | 100           | +40%           |                     |                 |                    |               |
| 1.010  | S4         | 15 Winter  | 100           | +40%           |                     |                 |                    |               |
| 8.000  | S100       | 600 Winter | 100           | +40%           | 30/120 Winter       |                 |                    |               |
| 9.000  | TANK 3     | 600 Winter | 100           | +40%           | 30/30 Summer        |                 |                    |               |
| 8.001  | S101       | 600 Winter | 100           | +40%           | 2/120 Summer        |                 |                    |               |
| 10.000 | S10        | 15 Winter  | 100           | +40%           |                     |                 |                    |               |
| 1.011  | S5         | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 11.000 | S309       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 11.001 | S310       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 11.002 | S311       | 15 Winter  | 100           | +40%           | 30/15 Winter        |                 |                    |               |
| 11.003 | S312       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 11.004 | S313       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 11.005 | S314       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 11.006 | S315       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 12.000 | S300       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 12.001 | S301       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 12.002 | S302       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 13.000 | S307       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 13.001 | S308       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 12.003 | S303       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 12.004 | S304       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 11.007 | S305       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 14.000 | TANK 5     | 360 Winter | 100           | +40%           | 2/180 Winter        |                 |                    |               |
| 11.008 | S306       | 360 Winter | 100           | +40%           | 2/15 Summer         |                 |                    |               |
| 1.012  | S6         | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 1.013  | S7         | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 1.014  | S8         | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 1.015  | S9         | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 1.016  | HW1        | 360 Winter | 100           | +40%           | 100/360 Winter      | 100/180 Winter  |                    |               |
| 15.000 | S210       | 15 Winter  | 100           | +40%           |                     |                 |                    |               |
| 15.001 | S211       | 15 Winter  | 100           | +40%           | 100/15 Winter       |                 |                    |               |
| 15.002 | S212       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 15.003 | S213       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 16.000 | S200       | 15 Winter  | 100           | +40%           | 100/15 Winter       |                 |                    |               |
| 17.000 | S209       | 15 Winter  | 100           | +40%           |                     |                 |                    |               |
| 16.001 | S201       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 58   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1


| PN     | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status     |
|--------|------------|-----------------|----------------------|---------------------|----------------------------|------------------------|-----------------|------------|
|        |            |                 |                      |                     |                            |                        |                 |            |
| 4.000  | S50        | 70.065          | 0.308                | 0.000               | 0.27                       |                        | 18.4            | SURCHARGED |
| 4.001  | S51        | 70.038          | 0.763                | 0.000               | 1.02                       |                        | 71.8            | SURCHARGED |
| 4.002  | S52        | 69.303          | 1.056                | 0.032               | 1.03                       |                        | 6 106.9         | FLOOD      |
| 4.003  | S53        | 69.042          | 1.253                | 0.000               | 1.50                       |                        | 152.5           | FLOOD RISK |
| 5.000  | S57        | 71.666          | 1.052                | 0.000               | 0.90                       |                        | 71.0            | SURCHARGED |
| 6.000  | S60        | 70.767          | 0.704                | 0.000               | 0.13                       |                        | 20.0            | SURCHARGED |
| 5.001  | S58        | 70.756          | 1.365                | 0.000               | 0.82                       |                        | 131.8           | SURCHARGED |
| 5.002  | S59        | 70.308          | 1.695                | 0.000               | 1.31                       |                        | 215.7           | SURCHARGED |
| 4.004  | S54        | 68.264          | 0.799                | 0.000               | 1.30                       |                        | 378.7           | SURCHARGED |
| 4.005  | S55        | 66.358          | 0.048                | 0.000               | 0.70                       |                        | 547.5           | SURCHARGED |
| 7.000  | TANK 2     | 64.763          | 2.263                | 0.000               | 0.05                       |                        | 10.3            | SURCHARGED |
| 4.006  | S56        | 64.762          | 2.537                | 0.000               | 1.04                       |                        | 108.4           | SURCHARGED |
| 1.009  | S3         | 60.871          | -0.144               | 0.000               | 0.53                       |                        | 138.7           | OK         |
| 1.010  | S4         | 58.718          | -0.108               | 0.000               | 0.73                       |                        | 195.9           | OK         |
| 8.000  | S100       | 58.090          | 1.450                | 0.000               | 0.21                       |                        | 23.9            | SURCHARGED |
| 9.000  | TANK 3     | 58.088          | 1.833                | 0.000               | 0.09                       |                        | 5.3             | SURCHARGED |
| 8.001  | S101       | 58.086          | 1.883                | 0.000               | 0.06                       |                        | 6.0             | SURCHARGED |
| 10.000 | S10        | 56.538          | -0.059               | 0.000               | 0.95                       |                        | 10 136.4        | OK         |
| 1.011  | S5         | 56.419          | 0.445                | 0.000               | 0.86                       |                        | 367.5           | SURCHARGED |
| 11.000 | S309       | 56.786          | 0.761                | 0.000               | 0.22                       |                        | 55.3            | FLOOD RISK |
| 11.001 | S310       | 56.746          | 0.821                | 0.000               | 0.35                       |                        | 8 86.4          | FLOOD RISK |
| 11.002 | S311       | 56.728          | 0.962                | 0.000               | 0.47                       |                        | 16 110.0        | FLOOD RISK |
| 11.003 | S312       | 56.697          | 1.026                | 0.000               | 0.47                       |                        | 16 124.6        | FLOOD RISK |
| 11.004 | S313       | 56.605          | 1.148                | 0.000               | 0.83                       |                        | 185.0           | SURCHARGED |
| 11.005 | S314       | 56.551          | 1.197                | 0.000               | 0.90                       |                        | 198.3           | SURCHARGED |
| 11.006 | S315       | 56.479          | 1.222                | 0.000               | 0.76                       |                        | 222.5           | SURCHARGED |
| 12.000 | S300       | 57.099          | 1.128                | 0.000               | 0.25                       |                        | 41.7            | FLOOD RISK |
| 12.001 | S301       | 57.037          | 1.161                | 0.000               | 0.39                       |                        | 11 69.2         | FLOOD RISK |
| 12.002 | S302       | 56.931          | 1.223                | 0.000               | 0.55                       |                        | 102.6           | SURCHARGED |
| 13.000 | S307       | 61.059          | 1.732                | 0.000               | 1.25                       |                        | 322.7           | SURCHARGED |
| 13.001 | S308       | 58.326          | 0.599                | 0.000               | 0.82                       |                        | 394.3           | SURCHARGED |
| 12.003 | S303       | 56.828          | 1.327                | 0.000               | 1.22                       |                        | 445.4           | SURCHARGED |
| 12.004 | S304       | 56.624          | 1.272                | 0.000               | 1.58                       |                        | 551.5           | SURCHARGED |
| 11.007 | S305       | 56.354          | 1.199                | 0.000               | 2.53                       |                        | 741.6           | SURCHARGED |
| 14.000 | TANK 5     | 56.160          | 1.293                | 0.000               | 0.14                       |                        | 469 23.6        | SURCHARGED |
| 11.008 | S306       | 56.161          | 1.383                | 0.000               | 1.37                       |                        | 89.2            | SURCHARGED |
| 1.012  | S6         | 55.528          | 0.916                | 0.000               | 1.04                       |                        | 431.6           | SURCHARGED |
| 1.013  | S7         | 54.588          | 0.911                | 0.000               | 0.88                       |                        | 556.3           | SURCHARGED |
| 1.014  | S8         | 53.290          | 1.233                | 0.000               | 1.11                       |                        | 680.3           | SURCHARGED |
| 1.015  | S9         | 51.589          | 0.873                | 0.000               | 1.31                       |                        | 680.2           | SURCHARGED |
| 1.016  | HW1        | 50.010          | 0.010                | 9.897               | 0.13                       |                        | 260.7           | FLOOD      |
| 15.000 | S210       | 60.436          | -0.140               | 0.000               | 0.30                       |                        | 30.1            | OK         |
| 15.001 | S211       | 59.132          | 0.010                | 0.000               | 0.63                       |                        | 62.2            | SURCHARGED |
| 15.002 | S212       | 58.647          | 0.986                | 0.000               | 0.92                       |                        | 91.7            | SURCHARGED |
| 15.003 | S213       | 57.161          | 1.380                | 0.000               | 1.33                       |                        | 4 132.0         | SURCHARGED |
| 16.000 | S200       | 56.150          | 0.080                | 0.000               | 0.36                       |                        | 67.5            | SURCHARGED |
| 17.000 | S209       | 56.387          | -0.279               | 0.000               | 0.15                       |                        | 60.9            | OK         |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 59   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1


| PN     | US/MH Name | Level (m) | Depth (m) | Water Surcharged |                   | Flooded           |                | Half Drain Time (mins) | Pipe Flow (l/s) | Status |
|--------|------------|-----------|-----------|------------------|-------------------|-------------------|----------------|------------------------|-----------------|--------|
|        |            |           |           | Volume (m³)      | Flow / Cap. (l/s) | Flow / Cap. (l/s) | Overflow (l/s) |                        |                 |        |
| 16.001 | S201       | 55.995    | 0.458     | 0.000            | 0.75              |                   |                | 143.7                  | SURCHARGED      |        |

| PN     | US/MH Name | Level Exceeded |
|--------|------------|----------------|
| 4.000  | S50        |                |
| 4.001  | S51        |                |
| 4.002  | S52        | 1              |
| 4.003  | S53        |                |
| 5.000  | S57        |                |
| 6.000  | S60        |                |
| 5.001  | S58        |                |
| 5.002  | S59        |                |
| 4.004  | S54        |                |
| 4.005  | S55        |                |
| 7.000  | TANK 2     |                |
| 4.006  | S56        |                |
| 1.009  | S3         |                |
| 1.010  | S4         |                |
| 8.000  | S100       |                |
| 9.000  | TANK 3     |                |
| 8.001  | S101       |                |
| 10.000 | S10        |                |
| 1.011  | S5         |                |
| 11.000 | S309       |                |
| 11.001 | S310       |                |
| 11.002 | S311       |                |
| 11.003 | S312       |                |
| 11.004 | S313       |                |
| 11.005 | S314       |                |
| 11.006 | S315       |                |
| 12.000 | S300       |                |
| 12.001 | S301       |                |
| 12.002 | S302       |                |
| 13.000 | S307       |                |
| 13.001 | S308       |                |
| 12.003 | S303       |                |
| 12.004 | S304       |                |
| 11.007 | S305       |                |
| 14.000 | TANK 5     |                |
| 11.008 | S306       |                |
| 1.012  | S6         |                |
| 1.013  | S7         |                |
| 1.014  | S8         |                |
| 1.015  | S9         |                |
| 1.016  | HW1        | 2              |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 60   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   | Network 2020.1                 |   |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

| PN     | US/MH Name | Level Exceeded |
|--------|------------|----------------|
| 15.000 | S210       |                |
| 15.001 | S211       |                |
| 15.002 | S212       |                |
| 15.003 | S213       |                |
| 16.000 | S200       |                |
| 17.000 | S209       |                |
| 16.001 | S201       |                |

|  |                                |   |
|--|--------------------------------|---|
| Stomor Ltd   |                                | Page 61   |
| 32 Beehive Lane<br>Welwyn Garden City<br>Herts AL7 4BQ   |                                |  |
| Date 23/11/2021 18:19<br>File ST-3013-Drainage Strate... | Designed by info<br>Checked by |   |
| Micro Drainage   |                                | Network 2020.1  |

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

| PN     | US/MH Name | Storm      | Return Period | Climate Change | First (X) Surcharge | First (Y) Flood | First (Z) Overflow | Overflow Act. |
|--------|------------|------------|---------------|----------------|---------------------|-----------------|--------------------|---------------|
| 16.002 | S202       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 18.000 | S207       | 15 Winter  | 100           | +40%           | 100/15 Summer       | 100/15 Winter   |                    |               |
| 18.001 | S208       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 16.003 | S203       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 15.004 | S204       | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 15.005 | S205       | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 19.000 | TANK 4     | 180 Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 15.006 | S206       | 30 Winter  | 100           | +40%           | 2/15 Summer         | 100/15 Winter   |                    |               |
| 15.007 | S13        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 15.008 | S14        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 20.000 | S11        | 15 Winter  | 100           | +40%           |                     |                 |                    |               |
| 20.001 | S12        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 15.009 | S15        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 15.010 | S16        | 15 Winter  | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 21.000 | S18        | 15 Winter  | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 21.001 | S19        | 360 Winter | 100           | +40%           | 100/15 Summer       |                 |                    |               |
| 21.002 | S20        | 360 Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 15.011 | S17        | 360 Winter | 100           | +40%           | 30/15 Summer        |                 |                    |               |
| 15.012 | HW2        | 360 Winter | 100           | +40%           | 100/240 Winter      | 100/180 Winter  |                    |               |
| 1.017  | HW3        | 360 Winter | 100           | +40%           | 30/30 Summer        | 100/360 Winter  |                    |               |
| 1.018  | S21        | 360 Winter | 100           | +40%           | 2/15 Winter         |                 |                    |               |
| 22.000 | SD11       | 15 Summer  | 100           | +40%           |                     |                 |                    |               |
| 22.001 | SD12       | 15 Summer  | 100           | +40%           |                     |                 |                    |               |
| 22.002 | SD13       | 15 Summer  | 100           | +40%           |                     |                 |                    |               |
| 23.000 | SD1        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 23.001 | SD2        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 23.002 | SD3        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 23.003 | SD4        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 22.003 | SD5        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 22.004 | SD6        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 22.005 | SD7        | 30 Winter  | 100           | +40%           |                     |                 |                    |               |
| 1.019  | SD8        | 120 Winter | 100           | +40%           |                     |                 |                    |               |
| 1.020  | SD9        | 120 Winter | 100           | +40%           |                     |                 |                    |               |

| PN     | US/MH Name | Water     |           | Flooded                  |                            | Half Drain  |            | Pipe  | Status     |
|--------|------------|-----------|-----------|--------------------------|----------------------------|-------------|------------|-------|------------|
|        |            | Level (m) | Depth (m) | Volume (m <sup>3</sup> ) | Flow / Overflow Cap. (l/s) | Time (mins) | Flow (l/s) |       |            |
| 16.002 | S202       | 55.764    | 0.828     | 0.000                    | 1.10                       |             | 5          | 201.7 | SURCHARGED |
| 18.000 | S207       | 57.372    | 0.944     | 0.222                    | 0.84                       |             |            | 123.2 | FLOOD      |
| 18.001 | S208       | 56.825    | 1.288     | 0.000                    | 1.26                       |             |            | 227.6 | SURCHARGED |
| 16.003 | S203       | 55.331    | 0.776     | 0.000                    | 1.29                       |             |            | 407.6 | SURCHARGED |
| 15.004 | S204       | 54.809    | 0.567     | 0.000                    | 0.71                       |             |            | 556.0 | SURCHARGED |
| 15.005 | S205       | 53.593    | 1.789     | 0.000                    | 0.95                       |             |            | 574.4 | FLOOD RISK |
| 19.000 | TANK 4     | 52.425    | 1.363     | 0.000                    | 0.13                       |             | 203        | 48.3  | SURCHARGED |
| 15.006 | S206       | 52.549    | 1.905     | 0.622                    | 0.91                       |             |            | 69.9  | FLOOD      |
| 15.007 | S13        | 51.404    | 1.004     | 0.000                    | 1.19                       |             | 7          | 86.5  | SURCHARGED |



100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

| PN     | US/MH Name | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Flow / Overflow Cap. (l/s) | Half Drain Time (mins) | Pipe Flow (l/s) | Status     |
|--------|------------|-----------------|----------------------|----------------------------------|----------------------------|------------------------|-----------------|------------|
|        |            |                 |                      |                                  |                            |                        |                 |            |
| 15.008 | S14        | 51.369          | 1.171                | 0.000                            | 1.66                       |                        | 120.1           | SURCHARGED |
| 20.000 | S11        | 53.359          | -0.194               | 0.000                            | 0.27                       |                        | 71.7            | OK         |
| 20.001 | S12        | 51.972          | 0.231                | 0.000                            | 0.78                       |                        | 206.1           | SURCHARGED |
| 15.009 | S15        | 50.934          | 0.918                | 0.000                            | 1.76                       |                        | 296.2           | SURCHARGED |
| 15.010 | S16        | 50.653          | 0.701                | 0.000                            | 1.38                       |                        | 292.8           | SURCHARGED |
| 21.000 | S18        | 50.365          | 0.250                | 0.000                            | 1.46                       |                        | 96.1            | SURCHARGED |
| 21.001 | S19        | 50.062          | 0.144                | 0.000                            | 0.31                       |                        | 20.2            | SURCHARGED |
| 21.002 | S20        | 50.052          | 0.297                | 0.000                            | 0.39                       |                        | 25.3            | SURCHARGED |
| 15.011 | S17        | 50.042          | 0.450                | 0.000                            | 1.13                       |                        | 149.0           | SURCHARGED |
| 15.012 | HW2        | 50.008          | 0.008                | 8.035                            | 0.08                       |                        | 156.9           | FLOOD      |
| 1.017  | HW3        | 50.006          | 0.756                | 19.019                           | 0.34                       |                        | 171.9           | FLOOD      |
| 1.018  | S21        | 49.807          | 1.357                | 0.000                            | 0.21                       |                        | 171.9           | FLOOD RISK |
| 22.000 | SD11       | 53.629          | -0.525               | 0.000                            | 0.00                       |                        | 0.0             | OK         |
| 22.001 | SD12       | 53.176          | -0.525               | 0.000                            | 0.00                       |                        | 0.0             | OK         |
| 22.002 | SD13       | 52.840          | -0.525               | 0.000                            | 0.00                       |                        | 0.0             | OK         |
| 23.000 | SD1        | 47.722          | -0.322               | 0.000                            | 0.32                       |                        | 88.3            | OK         |
| 23.001 | SD2        | 47.479          | -0.324               | 0.000                            | 0.31                       |                        | 87.8            | OK         |
| 23.002 | SD3        | 47.263          | -0.262               | 0.000                            | 0.50                       |                        | 87.5            | OK         |
| 23.003 | SD4        | 47.221          | -0.300               | 0.000                            | 0.38                       |                        | 87.3            | OK         |
| 22.003 | SD5        | 47.002          | -0.389               | 0.000                            | 0.27                       |                        | 86.9            | OK         |
| 22.004 | SD6        | 46.867          | -0.374               | 0.000                            | 0.30                       |                        | 86.6            | OK         |
| 22.005 | SD7        | 46.699          | -0.476               | 0.000                            | 0.10                       |                        | 86.6            | OK         |
| 1.019  | SD8        | 45.082          | -0.400               | 0.000                            | 0.24                       |                        | 214.7           | OK         |
| 1.020  | SD9        | 43.782          | -0.412               | 0.000                            | 0.22                       |                        | 214.7           | OK         |

| PN     | US/MH Name | Level Exceeded |
|--------|------------|----------------|
| 16.002 | S202       |                |
| 18.000 | S207       | 1              |
| 18.001 | S208       |                |
| 16.003 | S203       |                |
| 15.004 | S204       |                |
| 15.005 | S205       |                |
| 19.000 | TANK 4     |                |
| 15.006 | S206       | 2              |
| 15.007 | S13        |                |
| 15.008 | S14        |                |
| 20.000 | S11        |                |
| 20.001 | S12        |                |
| 15.009 | S15        |                |
| 15.010 | S16        |                |
| 21.000 | S18        |                |
| 21.001 | S19        |                |
| 21.002 | S20        |                |
| 15.011 | S17        |                |

32 Beehive Lane  
Welwyn Garden City  
Herts AL7 4BQ



Date 23/11/2021 18:19  
File ST-3013-Drainage Strate...

Designed by info  
Checked by

Micro Drainage Network 2020.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

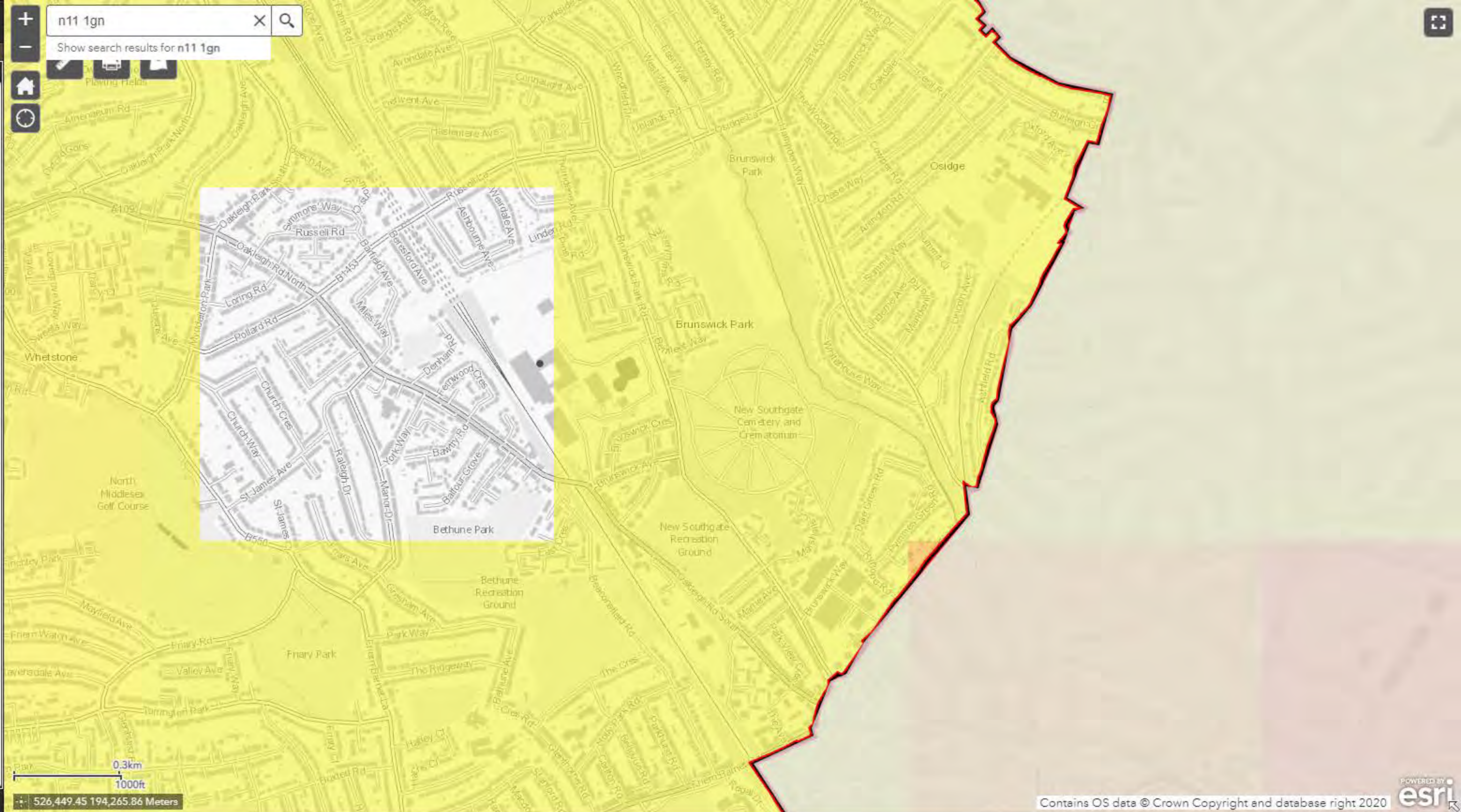
| PN     | US/MH Name | Level Exceeded |
|--------|------------|----------------|
| 15.012 | HW2        | 4              |
| 1.017  | HW3        | 1              |
| 1.018  | S21        |                |
| 22.000 | SD11       |                |
| 22.001 | SD12       |                |
| 22.002 | SD13       |                |
| 23.000 | SD1        |                |
| 23.001 | SD2        |                |
| 23.002 | SD3        |                |
| 23.003 | SD4        |                |
| 22.003 | SD5        |                |
| 22.004 | SD6        |                |
| 22.005 | SD7        |                |
| 1.019  | SD8        |                |
| 1.020  | SD9        |                |



Layer List

Layers

- Thames Water 2017 - Sewer Flooding Records (No. of Instances) ...
- EA 2017 - Susceptibility to Groundwater Flooding ...
  - < 25%
  - >= 25% <50%
  - >= 50% <75%
  - >= 75%
  - others
- GLA 2011 - Increased Potential for Elevated Groundwater ...
- EA 2015 - Historic Landfill Locations ...
- EA 2015 - Source Protection Zones ...
- EA 2010 - Risk of Flooding from Reservoirs ...





# Sewer Flooding

History Enquiry



Property Searches

Stomor Ltd

**Search address supplied**      Building 1  
Oakleigh Road South  
North London Business Park  
London  
N11 1GN

**Your reference**                      ST-3013

**Our reference**                        SFH/SFH Standard/2021\_4405606

**Received date**                        **19 April 2021**

**Search date**                            **19 April 2021**



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0800 009 4540

# Sewer Flooding

History Enquiry



Property Searches

**Search address supplied:** Building 1, Oakleigh Road South, North London  
Business Park, London, N11 1GN

**This search is recommended to check for any sewer flooding in a specific address or area**

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0800 009 4540

### History of Sewer Flooding

#### **Is the requested address or area at risk of flooding due to overloaded public sewers?**

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website [www.thameswater.co.uk](http://www.thameswater.co.uk)



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0800 009 4540