Land Adjoining No. 2 and No. 3 Townhouse Cottages
Townhouse Farm, Thakeham, West Sussex

Drainage Strategy

For

Fowlers Land and New Homes

Document Control Sheet

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This document has been issued and amended as follows:

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1.0 Introduction

1.1 This Drainage Strategy has been produced by Motion on behalf of their client, Fowlers Land and New Homes. It supports the proposed development of 2no. residential dwellings plus access and parking on Land Adjoining No. 2 and No. 3 Townhouse Cottages, Townhouse Farm, Thakeham, which is near the town of Storrington in West Sussex. A site location plan can be seen in Appendix A, and a layout of the proposed development can be seen in Appendix B.

1.2 The site is located within Flood Zone 1 and is not at risk of flooding from rivers. The Environment Agency's (EA's) Risk of Flooding from Surface Water (RoFSW) mapping shows that the site is also at Very Low risk of surface water flooding. This, in combination with the site area of less than one hectare means that a Flood Risk Assessment (FRA) is not required to support this application.

1.3 Although the development is minor in planning terms, it is a 'non-major' development in flood risk terms and, as such, a drainage strategy is also required to demonstrate how the development will manage and discharge surface water generated in all rainfall events up to and including the 1 in 100-year + 45% for climate change.

1.4 Therefore, this report will also define how the development will manage its surface water and foul sewage so that the development does not increase flood risk in the area or to neighbouring properties/land.

1.5 This FRA and drainage strategy follows the guidance set out in:

- West Sussex's Policy for the Management of Surface Water
- The National Planning Policy Framework (NPPF).
- The Planning Practice Guidance (PPG) to the National Planning Policy Framework.
- The CIRIA SuDS Manual 2015 (C753).
- The Environment Agency Rainfall Runoff Management for Developments.
- The National Standards for Sustainable Drainage Systems (July 2025)

1.6 This FRA and drainage strategy report pertains only to the drainage strategy for the development. It does not provide details of how the site will be drained during the construction phase. This report is also not a drainage verification report, which can only be produced post-construction.

1.7 Similarly, this report does not provide information on how the drainage infrastructure will be protected during the construction phase of the project. The provision of this information is the responsibility of the appointed contractor.

2.0 Site Description

Table 2.1 – Site Summary

Site Name	Land Adjoining No. 2 and No. 3 Townhouse Cottages
Location	Townhouse Farm , Duke's Hill, Thakeham, West Sussex, RH20 3EW
Grid Reference	TQ103175
Site Area	1,410m^2 (0.141 ha)
Development Type	Residential development of 2no. dwellings plus parking and access
Flood Zone	1 (Low Risk)
Surface Water Flood Risk	Very Low
Local Water Authority	Southern Water
Local Planning Authority	Horsham District Council (HDC)
Lead Local Flood Authority	West Sussex County Council (WSCC)

Site Location and Description

2.1 The proposed development site is currently occupied by garden space associated with No's 2 and 3 Townhouse Cottages, which are on the west side of Duke's Hill. The site location plan is in Appendix A.

2.2 The site is accessed from an unnamed road that runs behind Duke's Hill, which serves all of the Townhouse Cottages, as well as a commercial / light industrial estate that houses several small local businesses.

2.3 Much of the site is undeveloped and, therefore, 'greenfield'. However, the rearward (western) section of the site is currently surfaced with concrete hardstanding and serves as a double parking space for No. 2 and No. 3 Townhouse Cottages. Similarly, the existing access as defined within the red line boundary is surfaced with tarmacadam and is shared by all the Townhouse Cottages and the commercial / light industrial estate.

2.4 Photos of the existing site and its surrounds can be seen in Appendix C.

Topography

2.5 A topographic survey of the site has been carried out by HB Surveys Ltd and this can be seen in Appendix D.

2.6 The topographic survey shows an that levels are generally flat. In the part of the site to be developed, the highest levels are in the west of the site in the location of the existing concrete hardstanding. Levels here are circa 67.6 metres Above Ordnance Datum (mAOD) to 67.8 mAOD. Levels in the existing garden area to the east, between the parking and Duke's Hill, are between 66.7 mAOD and 67.5 mAOD, but this variation in topography is predominantly due to the features and landscaping within the garden.

Geology

2.7 The 1:50,000 British Geological Survey (BGS) online Geoindex Mapping identifies that the solid geology underlying the site is of the Fittleworth Member (sandstone and mudstone) and Hythe Formation, which is a sandstone. See Figures 2.1 and 2.2, below.

Figure 2.1 – BGS 1:50,000 Solid Geology Geoindex

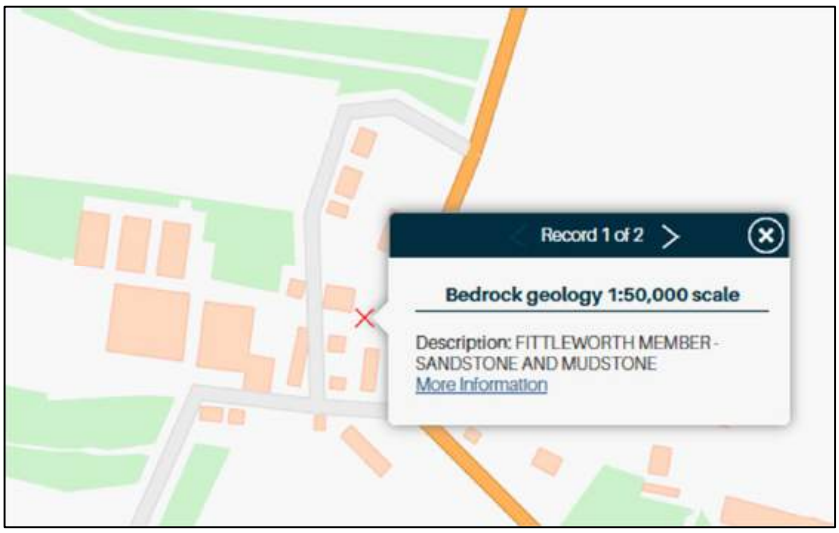
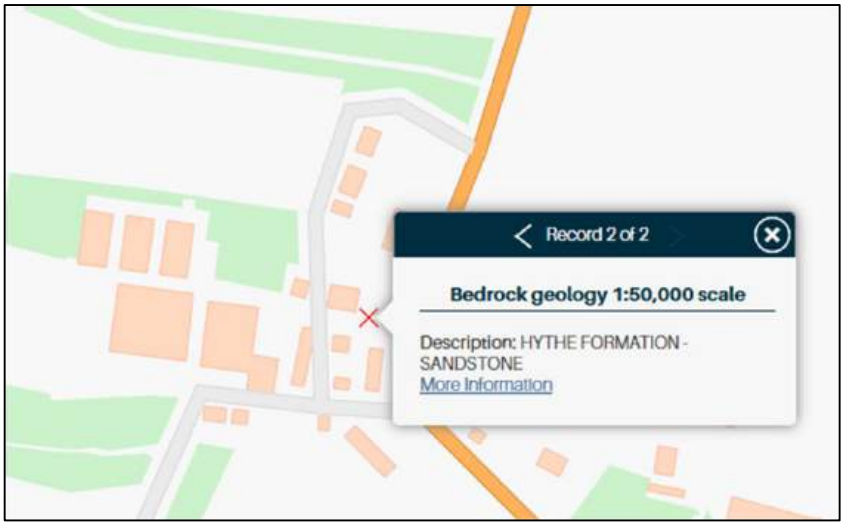


Figure 2.2 – BGS 1:50,000 Solid Geology Geoindex



2.8 No superficial geology is listed, thus this study has referred to local BGS boreholes as well as the outputs from ground investigations of immediately adjacent sites to understand the local soils, geology and the depths of strata in this location.

2.9 The nearest BGS borehole is TQ11NW58, which is 350 metres south of the site. The log of TQ11NW58 can be seen in Appendix E, and a summary of the strata encountered can be seen in Table 2.2, on the next page.

Table 2.2 – Geological strata as described in TW11NW58

Strata	Depth	Depth below surface
Topsoil	0.3m	0.3m
Brown and Orange Clay	17.0m	17.3m
Dark Blue Mudstone	3.0m	20.3m
Brown/Blue Mudstone and Sandstone	34.0m	54.3m
Grey Clay	5.7m	60.0m

2.10 BGS Borehole Log TQ11NW58 is a little distance from the site and topographically 18 metres lower than the proposed development site. Due to the variability in geology in this location, sources of geological information closer to the site have been obtained. This has been done through very recent planning applications on sites that either immediately neighbour or surround the proposed development site. These are discussed below.

DC/20/1711 and DISC/23/0063

2.11 Application DC/20/1711, which was for the demolition of existing commercial storage buildings and the erection of 2no. two-bed semi-detached dwellings surrounds the proposed development site. This application was permitted in December 2020. No surface water drainage strategy was submitted, so Condition 4 was imposed on the consent, and it required a drainage strategy detailing the proposed means of foul and surface water disposal to be submitted.

2.12 Condition 4 was discharged in application DISC/22/0063. Lanmor Consulting prepared an infiltration-based drainage strategy, which was based on geo-technical site information prepared by Geo-Environmental Services Ltd (GESL). GESL sank 5no. window sampler boreholes to a maximum depth of 4m below ground level (mBGL)

2.13 The ground conditions comprised a limited thickness of Topsoil and Made Ground overlying Hythe Formation. The Hythe Formation presented as slightly gravelly SAND, gravelly SAND, very sandy GRAVEL and slightly clayey sandy GRAVEL. The borehole logs associated with the 5no. window sampler boreholes can be viewed in Appendix F.

DC/25/0053

2.14 DC/25/0053 was submitted in 2025 for the erection of 5no. detached dwellings with associated access, car ports and landscaping. It is 100 metres southwest of the proposed development site. As part of the geotechnical investigations on the site in support of the drainage strategy, 2no. trial pits were dug by Albury SI to depths of 1.80mBGL and 2.00mBGL. These trial pits showed made ground (0.30m to 0.50m) over layers of sandy, very gravelly CLAY, gravelly silty SAND and silty SAND. The trial pit logs associated with DC/25/0053 can be seen in Appendix G.

Summary

2.15 The geological evidence from sites close to or immediately adjacent to the site show that the geology in this location and elevation is predominantly gravelly SAND, sandy GRAVEL, very gravelly CLAY and silty SAND.

2.16 These types of geology, especially the gravelly SAND and sandy GRAVEL have a high level of porosity, and this fact was borne out through the use of infiltration in the drainage strategies of the surrounding sites. This is discussed further, below.

Hydrogeology and Groundwater

Hydrogeology

2.17 Groundwater Source Protection Zones (SPZ's) are defined around groundwater abstraction sources such as wells, boreholes and springs that are used for public drinking water supply.

2.18 SPZ's show the risk of contamination to groundwater from any activities that might cause pollution in the area. The closer the activity to the source of abstraction, the greater the risk. The maps show three main zones; inner – Zone 1; outer – Zone 2 and; total catchment – Zone 3.

2.19 Certain geologies can contain fractures and pathways that allow groundwater to move more quickly than is defined above, so these should be used as a guideline and if it is suspected that there is potential for groundwater pollution even though a site is in a lower risk SPZ, professional advice should be sought from a geotechnical consultant.

2.20 Defra's Magic Map was reviewed to see where the site is in relation to the Groundwater SPZ's, and this shows that the site is within Groundwater SPZ3. This means it is within the total area around a source of potable water but is over 400 days travel time away. SPZ3 is not a protected water, thus special conditions are not required for discharge of surface water to ground.

2.21 Defra's Magic Map places the site as being on the boundary between areas where the bedrock is a Principal Aquifer and a Secondary A Aquifer. A Principal Aquifer stores and transmits large amounts of groundwater, providing strategic water supplies and supporting river flows. A 'Secondary A Aquifer' comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers. These classifications are commensurate with the site's location with SPZ3.

2.22 These classifications corroborate the site's location being in an area where the local geology has a high level of porosity. This being the case, then discharge of surface water to ground will be viable (noting that the site is within SPZ3, which is not a protected water and does not require additional tiers of pollution interception and mitigation over those prescribed in CIRIA C753 – The SuDS Manual).

Groundwater

2.23 It has been noted that infiltration-based drainage strategies have been used on the sites adjacent and immediately surrounding the site. A key factor in the successful specification of infiltration are groundwater levels, which must provide at least one metre of unsaturated ground below the base of any infiltration structures.

2.24 With this in mind, this study will revisit the geotechnical information prepared as part of the planning applications noted above to present the discussion of groundwater levels and monitoring.

DISC/23/0063

2.25 The geotechnical report prepared by Lanmor Consulting sank 5no. window sampler boreholes to a maximum depth of 4m below ground level (BGL). Standpipes were installed in 2no. of the boreholes for the monitoring of groundwater levels, and both boreholes were found to be dry upon the intrusive investigation and return visit. However, the return visit was conducted in August 2021, so may not represent the highest winter groundwater conditions.

DC/17/2107

2.26 In support of this application a Phase I Desk Study Geo-Environmental assessment was prepared by Land Science (report reference LS1927). They reviewed local BGS borehole information and the geological strata and stated the BGS borehole records identified no groundwater within 35.94mBGL and, based on the geology and topography of the local area, a relatively shallow groundwater table was not anticipated. Indeed, in their site walkover no features were identified on site that suggest shallow groundwater, such as boggy waterlogged soils or water loving plants, etc.

Summary

2.27 Groundwater monitoring has not been conducted for the current development proposals, but all intrusive investigations and local boreholes carried out to date have not encountered groundwater. Additionally, assessment by geotechnical experts have concluded that the local geology is not conducive to high groundwater levels.

2.28 However, it is acknowledged that groundwater monitoring should be required to support any infiltration-based drainage strategy. Because this report is being prepared in October 2025, which is at the start of the groundwater monitoring 'season', we propose that groundwater monitoring is imposed as a pre-commencement condition on any forthcoming planning consent, so that the application can proceed.

Infiltration Testing

2.29 Infiltration testing has not been carried out to date on the site, but site-based testing and evidence is available from the recent planning applications adjacent to and surrounding the site, which show that infiltration will be viable.

DC/20/1711 and DISC/23/0063

2.30 Application DC/20/1711, which was for the demolition of existing commercial storage buildings and the erection of 2no. two-bed semi-detached dwellings pertains to a site that surrounds the proposed development. This application was permitted in December 2020, and Condition 4 required a suitable drainage strategy detailing the proposed means of foul and surface water disposal to be submitted to and approved in writing by the Local Planning Authority.

2.31 To investigate soakage on site as part of the drainage strategy, falling head tests were undertaken by GESL within two of five window sampler boreholes (WS2 and WS3). Indicative infiltration rates of between 1 x 10^{-4} in WS3 and 4 x 10^{-6} were realised.

2.32 In the Drainage Strategy Technical note prepared by Lanmor Consulting as part of discharge of condition application DISC/23/0063, they stated it is likely that traditional soakaways would perform satisfactorily on site. Lanmor Consulting proposed to use a soakaway for disposal of surface water and "*a conservative infiltration rate of 1x10^{-5} m/*s" was used in the hydraulic design.

2.33 Lanmor Consulting then prepared an infiltration-based drainage design that used soakaways, within which they stated that on-site infiltration coefficients should be confirmed by soakage testing in accordance with BRE365 protocol. This testing was never carried out/submitted as part of the discharge of condition application.

2.34 Notwithstanding this, HDC discharged Condition 4 on 28th April 2023. This means that there is a recent precedent of the acceptance of a.) infiltration as a suitable surface water discharge method for surface water, b.) infiltration being accepted without the submission of BRE365 protocol soakage testing, and c.) groundwater monitoring not being required for an approval of an infiltration-based drainage strategy.

DC/17/2107 and DISC/20/0184

2.35 DC/17/2107 was for the erection of a single storey five-bedroom dwelling with associated landscaping and arboricultural works and is a site immediately to the north of Townhouse Farm/Townhouse Cottages. Condition 3 required a drainage strategy to be prepared and approved by the LPA, which was done as part of application DISC/20/0184.

2.36 The drainage strategy was prepared by Link Engineering, which referenced a Phase II geotechnical report prepared by Land Science (ref.: LS5006 - Upper Champions Barn). It is stated in Link Engineering's Drainage Strategy Technical Note that this geotechnical report accompanied their discharge of condition information, but this report does not appear to have been uploaded to the planning portal.

2.37 Nevertheless, Link Engineering's drainage design drawing (ref.: GHT-LE-GEN-XX-DR-CE-500-S4-A1-B) notes that a design infiltration rate of 4.92 x 10^{-6} was being used, as defined by the soakaway testing included in the Phase II geotechnical report prepared by Land Science. This means that we have evidence of what infiltration coefficients were encountered and that they were successful.

2.38 Condition 3 was discharged by HDC on 19th October 2020.

Summary

2.39 The previous local planning applications have proposed infiltration as a suitable method of surface water discharge and have submitted information in support of this approach. While the submitted information did not comply with BRE365 protocol and did not include groundwater monitoring, conditions relating to drainage were discharged.

2.40 The study will propose infiltration as a method of surface water discharge, and expects that the precedence of acceptance of such an approach will be sufficient to provide a conditional consent on such matters. It is proposed that a condition requiring the full outputs of BRE365 protocol infiltration testing be placed on a forthcoming planning consent, and this information can be submitted alongside the groundwater monitoring information also proposed for conditional consent.

2.41 For the purposes of design, an infiltration coefficient of 4.92 x 10^{-6} will be used, as it is the slowest of the infiltration rates used (and accepted/discharged by HDC) in recent drainage strategies.

Hydrology

2.42 There are no watercourses or open water features within or in proximity to the site. This lack of surface water features is evidence of porous soils that allow surface water to soak into the ground naturally.

Existing Drainage Regime

Surface Water Drainage

2.43 The existing site is predominantly garden space and, therefore, greenfield. This garden space does not currently have any formal surface water drainage and will drain naturally.

2.44 There is a small area of parking surfaced with concrete hardstanding, and this can be seen in the site photos in Appendix C. The concrete hardstanding covers an area of 35m^2 and the runoff from this area has been assessed using the Modified Rational Method with rainfall intensities for different return periods extracted from Table 1(a) of the Transport and Road Research Laboratory Report – Estimated Rainfall for Drainage Calculations in the United Kingdom (TRRL Report LR 595) by C. P. Young.

2.45 The Modified Rational Method Equation is:

$$Q_n = 2.78CiA$$

Where:

C = Runoff Coefficient (which is assumed to be '1' in this case to represent impermeable areas)

i_n = Rainfall intensity for a n return period (mm/hr) as prescribed by Table 1(a) of TRRL LR 595

A = Impermeable Area

Q_n = Runoff for n return period

The rainfall intensities for different return periods extracted from Table 1(a) of TRRL Report LR 595 are:

i_1 = 50.8 mm/hr

i_{30} = 113.02 mm/hr

i_{100} = 143.9 mm/hr

2.46 Using the above calculation and inputs, the brownfield runoff rates for the existing impermeable areas on site of 35m^2 are as follows in Table 2.3.

Table 2.3 – Brownfield Runoff Rate From Existing Impermeable Areas

Return Period	1 in 1	1 in 30	1 in 100
Discharge Rate (l/s)	0.49 l/s	1.10 l/s	1.40 l/s

These brownfield runoff rates are minimal, especially when viewed in the context of the significant areas of hardstanding that surround the site within the commercial areas. There does not appear to be any formal drainage associated with the existing area of concrete hardstanding, thus we expect that these small quantities of surface water currently runoff naturally to surrounding areas.

Public sewerage

2.47 The local public sewerage assets were reviewed on Southern Water's Asset Location Plans. These can be seen in Appendix H. They show that there are no public surface water gravity sewers locally, or in this area of Thakeham.

2.48 A public foul sewer is shown to commence in Duke's Hill immediately adjacent to the site at Node 3504. This 150mm pipe falls southeast on Duke's Hill with the prevailing gradient. Node 3504 has a cover level of 67.25 mAOD and an invert level of 65.44 mAOD. It is expected that a connection to this foul sewer will be possible for the site's foul wastewater, the quantity of which is calculated later in this report.

3.0 Surface Water Drainage Strategy

Sustainable Drainage Overview

3.1 Current planning policy and Environment Agency guidance requires developments to employ SuDS (Sustainable Drainage Systems) techniques wherever feasible. Careful design of SuDS features can ensure that a development's surface water drainage closely reflects the natural hydrology of the pre-developed site.

3.2 The key benefits of SuDS are as follows:

- Improving water quality over a conventional piped system by removing pollutants from diffuse pollutant sources (e.g., roads);
- Improving amenity through the provision of open green space;
- Improving biodiversity through increased areas for wildlife habitat; and
- Enabling a natural drainage regime that recharges groundwater (where possible).

3.3 SuDS provide a flexible approach to drainage, with a wide range of components from soakaways to large-scale basins or ponds. The individual techniques should be used where possible in a management train that mimics the natural pre-developed pattern of drainage.

Site Area and Greenfield Runoff Rate

3.4 The developed site's impermeable areas will be 0.030 hectares, inclusive of 10% urban creep. Urban creep is discussed later in this section of the drainage strategy.

3.5 The greenfield runoff rate has been determined for the site's overall impermeable areas that will contribute to the attenuated surface water load (for the lifetime of the development).

3.6 The greenfield runoff rates have been calculated using the QMED value, which is the index flood in the Flood Estimation Handbook (FEH). QMED has been calculated for rural and urban values in MicroDrainage using the catchment descriptors methodology, which includes the following input variables:

- Site Location
- SAAR – Standard Average Annual Rainfall 1961 – 1990 (mm)
- SPR Host - Standard percentage runoff derived from HOST soils data
- URBEXT - The extent of urban and suburban cover
- BFIHOST - Baseflow index derived from Hydrology of Soil Types (HOST) soils data
- FARL - Index of flood attenuation due to reservoirs and lakes

3.7 The QMED calculation sheet from MicroDrainage can be seen in Appendix I, but the outputs are summarised in Table 3.1, on the next page.

Table 3.1: QMED Rural/Urban Values

QMED Rural (l/s)	QMED Urban (l/s)
0.1	0.1

3.8 The calculated QMED Rural value for the proposed development's impermeable areas is 0.1 l/s. The QMED Rural Runoff value would be used to guide the finished development's target runoff rate if offsite discharge was proposed. However, for sites intending to use System A 'Total Infiltration' solutions, the QMED Rural discharge rate is of minor relevance to the drainage strategy.

Drainage Strategy Overview

3.9 The drainage strategy for the proposed development will use source control SuDS features, and complies with the new National Policy for SuDS by retaining the first 5mm of surface water on site (with no offsite discharge).

3.10 The following discussion of the drainage strategy should be read in conjunction with a review of the proposed drainage strategy layout in Appendix J.

3.11 It should be noted that the whole access from Duke's Hill is included in the red line boundary. This access is shared with the rest of the Townhouse Cottages and the commercial / light industrial estate and, because it is existing and already surfaced with tarmac, no alterations or engineering will be applied to this access. Therefore, the access and surface water arising from it will not form part of the drainage strategy.

3.12 Both properties will be fitted with water butts. These will reduce the reliance on potable water supplies during activities such as gardening and car washing. Water butts can also provide small amounts of storage for surface water and can often assist in achieving zero discharge for rainfall depths up to 5mm, which covers 50% of annual rainfall events (according to the EA's Rainfall Runoff Management for Developments report – SC030219). They do not, however, fully fulfil Standard 2 of the National Policy for SuDS, so further interception techniques have been employed (see below).

3.13 The 60m^2 parking area will be constructed from composite permeable paviours. The majority of the subbase of the permeable paviours will be constructed from 30% crushed stone. However, because more attenuation volume is needed in this part of the site, the attenuation capacity of the subbase of the permeable paviours will be augmented with 22.5m^2 of Polystorm Permavoid geocellular interlocking crates. The Polystorm Permavoid layer will be a minimum of 200mm deep. The total system attenuation volume provided by the composite permeable paviours will be 8.782m^3.

3.14 The composite permeable paviours will drain the area of the driveway as well the water from the roof areas of the neighbouring car ports. The relative areas of the car ports and the driveways complies with the General Requirements of the National Standards for SuDS, which states that "*where the infiltration capacity of the ground below the permeable surface is greater than 1 x 10^{-6} m/sec and unlined, up to 5 times the permeable surface area may be added as additional contributing area*."

3.15 As discussed in Section 2 of this report, infiltration has been proven as a suitable and viable form of surface water discharge. Of the studies that have taken place around the proposed development site, the most conservative applied infiltration rate was 4.92 x 10^{-6} m/sec, and it is this rate that has been applied to the base of the composite permeable paviours.

3.16 Roof water from the two dwellings will be commuted by a piped system in the gardens to individual soakaway systems. The northern property will be served by a geocellular soakaway tank within its back garden. However, because of arboricultural and RPZ constraints in the rear garden of the southern property, there is not room for a geocellular soakaway and to position it five metres from the foundations

of the property (in accordance with Building Regulations Part H). Therefore, the southern property will be served by a non-infiltration geocellular attenuation tank, which drains to a 'traditional' ring soakaway in the corner of the garden, which can maintain the five metre stand-off from the property and not incur into the RPZ's.

3.17 The details of the geocellular tanks and soakaways can be seen in the drainage strategy plan in Appendix J. While it is noted that the soakaways do not strictly accord with the requirements of the New National Standards for SuDS, it should be borne in mind that this small infill site has no public (or non-private) spaces in which to locate multifunctional SuDS features. The only shared space on site is the driveway, and this has already been used for other SuDS features and is not suitable for basins, swales, etc. Therefore, the drainage strategy must use a system that can be placed within private domestic gardens and cannot be altered or removed by the residents of the dwellings (such as rain gardens). Also, because each soakaway is within the garden of the property it serves, it does not create a maintenance issue or conflict, because those who need optimum function of the soakaways, and are responsible for them, have full access to them.

3.18 The total attenuation volume available on site is 22.187m^3, not including pipes or manholes. The attenuation available can attenuate the 1 in 100-year + 45% rainfall event without flooding. The hydraulic modelling of the proposed drainage strategy is discussed later in this report.

Design Criteria

3.19 The drainage strategy has been designed in accordance with the NPPF and current LLFA surface water modelling requirements.

3.20 This ensures that the current drainage strategy accords with local policy requirements (as well as those of the NPPF). In brief, this includes:

- Using FEH 2022 Annual Maximum Catchment data rather than FSR data.
- Using a runoff coefficient (CV) value of 1.0 in all hydraulic modelling in summer and winter storms.
- Reducing the MADD Factor (which assumes 10m^3 of pipe storage per hectare) to zero.
- Urban Creep at a rate of 10% has been considered and included in the parts of the site to which it applies (land within private ownership).
- The full suite of rainfall events has been used (up to the 5,760-minute storm, which is maximum allowable when using FEH data).
- The maximum rainfall intensity has been raised to 550mm/hr to ensure that the full hydrograph is included in the hydraulic calculations.
- A Factor of Safety of 1.5 has been applied due to the small area to be drained (0.030 ha) and because the system has a lot of freeboard within it, there would be no damage or inconvenience from flooding in this rural area.
- Infiltration is applied to the side only of the ring soakaway, which is a nod to the fact that these usually have either solid bases, or become silted up over time.

Urban Creep

3.21 An appropriate allowance should be made for urban creep throughout the lifetime of the development as per 'BS 8582:2013 Code of Practice for Surface Water Management for Developed Sites'.

3.22 The proposed private impermeable areas and how they should be uplifted is detailed in Table 3.2, below, and has been presented in terms of which pipes in the hydraulic model the uplift has been applied. Please note that pipe numbers without contributing impermeable areas are not included in the below table.

3.23 An urban creep increase of 10% has been added to all private impermeable areas, which includes the roofs areas.

Table 3.2: 10% Urban Creep Uplifts Applied to Hydraulic Model

Pipe Number	Total Impermeable Area (ha)	Private Impermeable Areas (ha)	10% Increase in Private Impermeable Areas (ha)	Post-Urban Creep Total Area Applied to Pipe (ha)
2.001	0.008	0.008	0.001	0.009
3.001	0.008	0.008	0.001	0.009

The Drainage Hierarchy

3.24 To deliver SuDS benefits and ensure that a development reduces overall flood risk, there is an established hierarchy of surface water drainage methods that should be considered. The most preferable and sustainable are at the top and the least preferable and least sustainable at the bottom.

3.25 The Planning Practice Guidance to the National Planning Policy Framework (NPPF) states that "*Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable*".

3.26 Standard 1 on the New National Standards for SuDS refines and reinforces this requirement and states that "*runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:*

1. *Priority 1: collected for non-potable use*
2. *Priority 2: infiltrated to ground*
3. *Priority 3: discharged to an above ground surface water body*
4. *Priority 4: discharged to a surface water sewer, or another piped surface water drainage system*
5. *Priority 5: discharged to a combined sewer"*

3.27 With regards to the proposed development on the Land Adjoining No. 2 and No. 3 Townhouse Cottages and its drainage strategy, the tiers of the drainage hierarchy that have been achieved are outlined in Table 3.3, on the next page. These are the highest available tiers, as demonstrated by the discussion of the geoenvironmental characteristics and constraints discussed in Section 2 of this report.

Table 3.3: Compliance with the Drainage Hierarchy

Tier	Discharge Method	Used?	Notes
1	Collected for non-potable use	ü	Water Butts are to be used on the downpipes of the dwellings.
2	Use infiltration techniques	ü	The local geology supports infiltration, and this has been used to discharge all surface water arising on site.
3	Discharged to an above ground surface water body	û	Open, above-ground water features are not available for the proposed development.
4	Discharged to a surface water sewer, or another piped surface water drainage system	û	There are no piped surface water systems available to the proposed development.
5	Discharged to a combined sewer	û	This tier of the drainage hierarchy will not be required.

Summary

3.28 The drainage strategy uses the 1st and 2nd tiers of the drainage hierarchy and uses the highest available and site-suitable SuDS features.

MicroDrainage Hydraulic Modelling

3.29 The drainage strategy outlined above has been designed in MicroDrainage's Network hydraulic modelling module. The results of the MicroDrainage hydraulic modelling for the proposed development can be seen in Appendix K.

3.30 The results of the hydraulic modelling show that the drainage strategy as outlined in this section can attenuate and discharge all surface water generated in storms up to and including the 1 in 100-year + 45% rainfall event, inclusive of urban creep, and without flooding.

4.0 Foul Water Drainage

4.1 The peak foul flow rate from the proposed development has been calculated based on Southern Water's foul sewerage modelling criteria. In summary, the calculation is based on the foul flow element, plus an allowance for misconnected surface water. While this is unlikely on a new, small site, it provides a precautionary approach.

4.2 Based on Southern Water's foul sewerage modelling criteria, the calculated design foul flow from the proposed development is 0.01 l/s.

4.3 The local public sewerage assets were reviewed on Southern Water's Asset Location Plans. These can be seen in Appendix H.

4.4 A public foul sewer is shown to commence in Duke's Hill immediately adjacent to the site at Node 3504. This 150mm pipe falls southeast on Duke's Hill with the prevailing gradient. Node 3504 has a cover level of 67.25 mAOD and an invert level of 65.44 mAOD and this can be reached by gravity from the development site.

4.5 The drainage strategy layout in Appendix J shows an indicative foul drainage layout and that a connection is viable to Node 3504 in Duke's Hill. A Section 106 application will be carried out in due course (as planning consent is needed prior to this process commencing).

4.6 All Water and Sewerage Companies (WaSC's) have a legal obligation under Section 94 of the Water Industry Act 1991 (the Act) to provide developers with the right to connect to a public sewer regardless of capacity issues. This, in conjunction with Section 91(1) of the Act effectively means that Southern Water cannot object and the LPA cannot refuse to grant planning permission on the grounds of insufficient capacity or that no improvement works are planned for an area. The case precedent for this is a Supreme Court decision in Barratt Homes vs Welsh Water, in which the court held that the developer has an absolute right to connect to the existing sewer, whether or not it overloads the system. It ruled that the specific wording of the legislation allows for this right to be exercised, at no cost to the developer, apart from the normal connection charges.

4.7 Where local sewerage infrastructure constraints are identified, network reinforcements are delivered by the WaSC through New Infrastructure Charges on developers. For non-strategic sites, the WaSC company have a maximum of 24 months to deliver sewerage improvements from the date of 'a firm commitment to the development', which is the date of outline or full planning consent.

5.0 Surface Water Runoff Quality

5.1 The NPPF states that development should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.

5.2 The CIRIA SuDS Manual provides guidance on the treatment of surface water runoff. With regards to the proposed development, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff from the dwellings or car ports is the removal of gross solids and sediments, which would be achieved using catchpits and silt traps upstream of the permeable surfacing and the geocellular soakaways.

5.3 With regards to the parking area, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from residential car parking and low traffic roads as 'low'. To mitigate a 'low' pollution hazard, the CIRIA SuDS Manual recommends using a simple index approach in line with Section 26.7.1. This is discussed, below.

5.4 Table 26.2 of the CIRIA SuDS Manual provides pollution hazard indices for different land use classifications. The land use classification that requires consideration for low traffic roads and parking areas is in Table 5.1 below.

Table 5.1: Excerpt from Table 26.2 of CIRIA SuDS Manual

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, homezones and general access roads) with less than 300 traffic movements per day.	Low	0.5	0.4	0.4

5.5 To deliver adequate pollution treatment and mitigation, the CIRIA SuDS Manual recommends using a SuDS component that has a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).

5.6 Table 26.4 of the CIRIA SuDS Manual provides indicative SuDS mitigation indices for each SuDS type when discharging to ground. Table 5.2, below, which is an excerpt from Table 26.4, shows the mitigation index for permeable paviours.

Table 5.2: Pollution Mitigation Indices for Permeable Pavements

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Permeable Pavements	0.7	0.6	0.7

5.7 The mitigation indices for permeable pavements exceed those of the highest pollution hazard index figures from Table 5.1, thus all pollution hazards will be mitigated on site prior to the site's discharge to ground via infiltration. Because the site is within groundwater SPZ3 and not within an area of protected waters, no further pollution mitigation measures are required.

6.0 Residual Risk and Infrastructure Maintenance

6.1 Whilst the drainage strategy for the development has been designed to attenuate surface water from the 1 in 100-year plus 45% rainfall event, plus an inclusion for urban creep, there could be a small residual risk of flooding due to blockage or failure or poor performance of on-site infrastructure. Therefore, appropriate and regular maintenance of the drainage infrastructure should be undertaken by the site management company or their agents.

6.2 To assist with this process, a Drainage Management and Maintenance Plan has been prepared, which sets out the principles for the long-term management and maintenance of the proposed surface water drainage system on the development. The Drainage Management and Maintenance Plan can be seen in Appendix L.

6.3 The purpose of this document is to ensure that those responsible for site maintenance have a robust inspection and maintenance plan going forwards. This will help ensure the optimum operation of the surface water drainage system and that it will be regularly maintained for the lifetime of the development. This will contribute to reducing the risk of surface water flooding both on- and off-site.

7.0 Exceedance Events

7.1 Exceedance events are those greater than the design rainfall event (i.e., greater than the 1 in 100-year rainfall event plus 45% for climate change).

7.2 Any rainfall events greater than the design rainfall event may cause flooding due to them 'exceeding' the capacity of the drainage system. In this situation it is imperative to check whether flooding would occur and, if so, whether it needs to be contained on site. Exceedance flows should not ingress into any properties on site and should not cause nuisance to any neighbouring sites or buildings.

7.3 Because the drainage system is not shown to flood in the MicroDrainage hydraulic model, it has 'freeboard' within it that would provide attenuation during exceedance events. This allows for the attenuation of some surface water in storms beyond the 1 in 100-year + 45% event.

7.4 Using the topography factors as a guide, a high-level plan of exceedance flows has been produced to show the pathway that exceedance flows would take across the site. This can be seen in Appendix M, and it is clear that the site's flat topography and undulating surface would not generate surface water flows or allow accumulation in any particular area. It is anticipated that the vast majority of exceedance flows would not leave the site but, if they do, there are no receptors that could suffer damage or inconvenience.

8.0 Summary and Conclusion

8.1 This Drainage Strategy has been produced by Motion on behalf of their client, Fowlers Land and New Homes. It supports the proposed development of 2no. residential dwellings plus access and parking on Land Adjoining No. 2 and No. 3 Townhouse Cottages, Thakeham.

8.2 The EA's Flood Map for Planning shows that the site is within Flood Zone 1, and the site is also at very low risk of surface water flooding.

8.3 The drainage strategy for the proposed development has been produced in line with the NPPF, LLFA and LPA policy, the drainage hierarchy and the New National Standards for SuDS. It has been informed through detailed site investigations on immediately adjacent sites and on principles accepted by the LPA through consented planning applications and discharged conditions.

8.4 The drainage strategy provides attenuation, source control and pollution mitigation. The development's surface water will discharge via infiltration through the attenuation structures on site. Composite permeable paviours and soakaways will be used. This small infill site has no public (or non-private) spaces in which to locate multifunctional SuDS features or place them in locations where they could be protected in perpetuity.

8.5 The drainage strategy has been hydraulically modelled in MicroDrainage's Network module and has shown that it can attenuate the 1 in 100-year + 45% rainfall event without flooding, with an inclusion for urban creep.

8.6 The drainage strategy as proposed can successfully mitigate the expected pollution hazards that will be generated on site and is in accordance with Chapter 26 of the CIRIA C753 SuDS Manual.

8.7 A drainage management and maintenance plan has been produced that shows how the proposed drainage system will be maintained in perpetuity.

8.8 Exceedance flows have been considered and an exceedance plan produced. Exceedance is expected to be of zero consequence to the site or neighbouring areas.

8.9 Foul waste from the site will connect to the existing foul sewer in Duke's Hill at Node 3504 with a design flow rate of 0.01 l/s.

8.10 In conclusion, this drainage strategy has shown that the proposed development is at a very low risk of flooding. The drainage strategy has shown that the development can manage its foul and surface water sustainably. Therefore, flood risk and surface water management should not form an impediment to the progress of this application, and any outstanding information (site-specific BRE365 soakage testing and groundwater monitoring) can be secured by condition.

Appendix A

Site Location Plan

Location Plan

Proposed Application Boundary

Job Title	Client's Name	Drawing Title
2 Townhouse, Thakeham	Fowlers Land and New Homes	Location Plan

Rev	Revision Details	Date
P02	Boundary revised to comment	15/10/24
P01	Boundary extended to highway	08/10/24

Job No	Drawing No	Rev
THK18	LOC01	P02

CAD Plot date: 15/10/2024 - 13:42:15 thk18-site.dwg

Appendix B

Proposed Development Layout

N

Scale 1:250

0m 1.25m 2.5m 6.25m 12.5m

ADJOINING PROPERTY

ADJOINING PROPERTIES

ADJOINING PROPERTY

COOLHAM ROAD

Existing C Grade tree to be removed

Existing shed structure removed

Existing pylon to be relocated

Replacement tree planting

Existing B Grade trees to be removed

Replacement tree planting

02
3B6PH
c.1324sqft

01
3B6PH
c.1324sqft

Carport

Carport

9043

9520

1500

8445

7619

Rev	Amendments	Date
P05	Plot numbering updated and Plot 01 flipped	19.10.25
P04	Dwelling position & roof plan updated	28.09.25
P03	Site boundary and carports moved	14.09.25
P02	Site boundary and housetypes revised	20.08.25
P01	First Issue	10.08.25

Document Status
Preliminary

Client Name
Fowlers Land and New Homes

Project Name
2 Townhouse, Thakeham

Scale	Project No.	Date Created
A3 - 1:250	THK18	AUG 25

Document Title
Proposed Site Plan

Document Reference	Revision
PL01	P05

1:100 @ A2

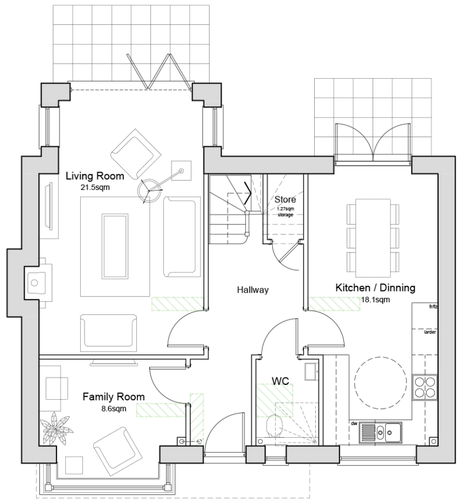
metres 2 4 6 8 10

Front Elevation
Plot 01
Plot 02 Handed

Side Elevation

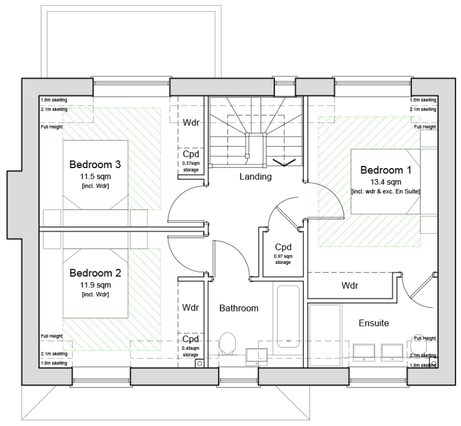
Rear Elevation

Side Elevation

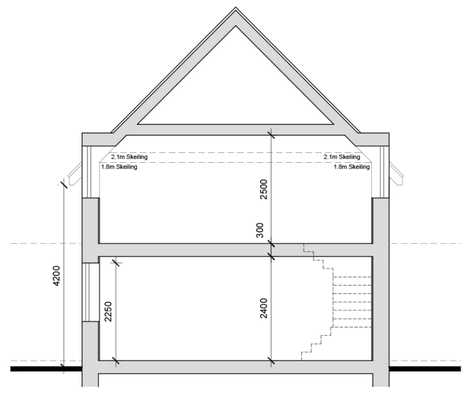


Ground Floor Plan

3-Bedroom 6-Person
Detached House
123.03 sqm / 1,324sqft



First Floor Plan



Typical Section

Materials Key

1 - Red Facing Brick
2 - Red Brick Quoining
3 - Tile Hanging
4 - Clay Roof Tile
5 - White Windows Frames
6 - Soldier Course Window Header
7 - Brick on End Window Cill
8 - Decorative Tile Hung Detail

Rev	Amendments	Date
P02	Patios Added	19.10.25
P01	First Issue	28.09.25

Document Status
Preliminary

Client Name
Fowlers Land and New Homes

Project Name
2 Townhouse, Thakeham

Scale	Project No.	Date Created
A2 - 1:100	THK18	SEPT 25

Document Title
Proposed Plans & Elevations

Document Reference	Revision
PL02	P02

Appendix C

Site Photos

Plate 1:

View of concrete hardstanding, garden and hedgerows looking east

Plate 2:

View of concrete hardstanding, garden and hedgerows looking northeast

Plate 3:

View of concrete hardstanding and tarmac access looking north.

Plate 4:

View of tarmac access and commercial units looking west.

Plate 5:

View of tarmac access units looking north.

Plate 6:

View of garden storage area looking northeast.

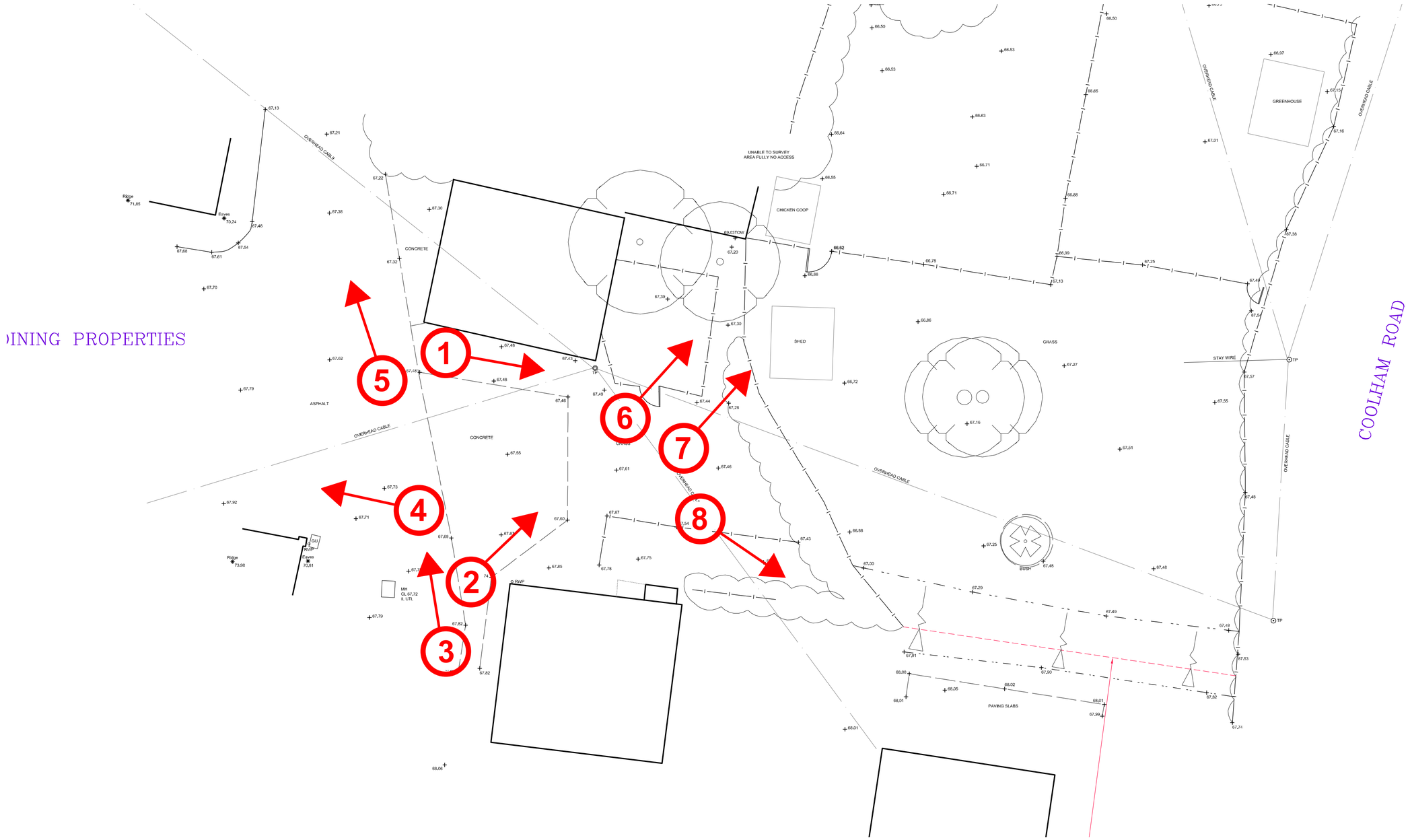
Plate 7:

View of garden and hedges area looking northeast.

Plate 8:

View of garden and hedges area looking southeast.

Site Photo Location and Orientation



Appendix D

Topographic Survey

Drawing Naming Convention:

Job No/Code/Dwg type/Location/Ref

Code: 02 = Existing

Dwg Type: B = Building, S = Section, E = Elevation, T = Topographical

Location: B = Basement, E = External, G = Ground, I = First, R = Roof, M = Mezzanine, C = Ceiling Plan, F = Front, S = Side, R = Rear, GA = General Layout, AA = Section A-A

Ref: Ref to individual dwg I.D. (e.g., Revision)

Standard Abbreviations (where applicable):

Building Survey		Land Survey	
AB	AIR BRICK	B	BOLLARD
ACU	AIR CONDITIONING UNIT	BB	BELISHA BEACON
AH	ACCESS HATCH	BT	B.T. COVER
AP	ACCESS PANEL	CAM	CAMERA
AV	AIR VALVE	CATV	CABLE TV COVER
BH	BEAM HT	CL	COVER LEVEL
BR	BOILER	ELEC	ELECTRIC COVER
BS	BOTTOM SOFFIT LEVEL	EP	ELECTRIC POST
CB	CUPBOARD	ER	EARTH ROD
CC	CEILING CHANGE	FH	FIRE HYDRANT
CH	CLEAR INTERNAL HT	FP	FLAG POLE
C-A	CILL TO APEX HT	FW	FOUL WATER
C-H	CILL TO HEAD HT	GU	GULLY
C-S	CILL TO SPRING HT	GV	GAS VALVE
DA	DOOR APEX HT	IC	INSPECTION COVER
DH	DOOR HEAD HT	IL	INVERT LEVEL
DR	DRAIN	LP	LAMP POST
EXF	EXTRACTOR FAN	MH	MANHOLE
FA	FIRE ALARM	MKR	MARKER POST
F-A	FLOOR TO APEX HT	P	POST
F-C	FLOOR TO CEL HT	PM	PARKING METER
F-H	FLOOR TO HEAD HT	PO	POLE
F-S	FLOOR TO SPRING HT	RO	RODDING EYE
GEA	GROSS EXTERNAL AREA	RS	ROAD SIGN
GIA	GROSS INTERNAL AREA	RTW	RETAINING WALL
GU	GULLY	RWP	RAIN WATER PIPE
HT	HEATER	SA	SITE AREA
HT	HOT WATER TANK	SI	SIGN
NIA	NET INTERNAL AREA	SL	SOFFIT LEVEL
NTS	NOT TO SCALE	SV	STOP VALVE
RAD	RADIATOR	SVP	SOIL VENT PIPE
RE	RECESS HEAD HEIGHT	SW	STORM WATER
RFV	RAISED FLOOR VOID	TOF	TOP OF FENCE
RL	ROOF LIGHT	TOW	TOP OF WALL
RSH	ROLLER SHUTTER	TS	TELEGRAPH POLE
SVP	SOIL VENT PIPE	UTL	UNABLE TO LIFT
SVP	SOIL VENT PIPE	VP	VENT PIPE
V	VENT	WM	WATER METER
WA	WARDROBE	WT	WATER TAP

Symbols (where applicable):

Direction of sloping ceiling

2.65 — FLOOR TO STRUCTURAL CEILING HT

2.65 — FLOOR TO SUSPENDED CEILING HT

10.00 — FLOOR LEVEL RELATIVE TO DATUM

Notes:

The Survey has been computed to ordnance survey 'Active Network'

All levels are in metres and relate to ordnance survey 'Active Network'.

All direction arrows indicate UP unless otherwise stated.

Drainage pipe sizes (where shown) have been gauged from the surface (for safety reasons) and should be regarded as approximate only.

Visible features in the vicinity of any boundaries, as shown on this survey, may not represent the extent of legally conveyed ownership.

Whilst every effort has been made to determine wall materials, no guarantee is given. Materials should be regarded as assumed unless verified by a qualified third party.

Tree spread and height are approximate. Species should be regarded as assumed unless verified by a qualified third party.

Rev	Date	By	Description

HB Surveys Ltd
Land & Measured Building Surveyors
Spring House, 60 Poplar Way, Midhurst, West Sussex GU29 9TA
t. 01730 816884 f. 01730 816884 info@hbsurveys.com

Client: FOWLERS LAND AND NEW HOMES

Project: TOWNHOUSE FARM
COOLHAM ROAD
THAKEHAM

Drawing Title: EXISTING
TOPOGRAPHICAL SURVEY

Date:	Scale:	Surveyor:	Drawn:	Checked:
MARCH 25	1:100@A0	KR	KR	HB

Job No:	Drawing No:	Sheet No:	Rev:
25011	25011-02-T-E	1 of 2	

Appendix E

BGS Borehole Log TQ11NW58

Borehole record form

NICHOLLS BOREHOLES & GROUND SOURCE

British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

Water Resources Act 1991 (as amended by the Water Act 2003)

A Site details

Borehole drilled for BELLWAY HOMES LTD

Location Monaghan Mushrooms, 74, Storrington Rd, RH20 3EQ

NGR (ten digits) TQ 10272 17266 Please attach site plan

Ground level (if known) 51m metres Above Ordnance Datum

Drilling company NICHOLLS BOREHOLES

Date drilling commenced 06/11/2023 (DD/MM/YYYY) Completed 20/11/2023 (DD/MM/YYYY)

B Construction details

Borehole datum (if not ground level) / metres (m). Please tick if this is above ☐ or below ☐ ground level.
(point from which all measurements of depth are taken, for example, flange, edge of chamber)

Borehole drilled diameter	300	mm from	0	to	60	m/depth
		mm from		to		m/depth
		mm from		to		m/depth
		mm from		to		m/depth

Casing material and type (for example, if plain steel, plastic slotted). Please record permanent casing details, not temporary casing.	Plain Plastic	diameter	200	mm from	0	to	9 m/depth
Casing material	Slotted Plastic	diameter	200	mm from	9	to	49 m/depth
Casing material	Plain Plastic	diameter	200	mm from	49	to	54 m/depth
Casing material		diameter		mm from		to	m/depth

Grouting details 119 bags of 2-4mm washed shingle / 14 bags of Mikolet

Water struck at 1. 21 m (depth below datum - mbd) 2. m (mbd)

3. m (mbd) 4. m (mbd)

C Test pumping summary (Please supply full details on form WR39)

Test pumping datum (if different from borehole datum) m. Please tick if this is above ☐ or below ☐ ground level.

Pump suction depth mbd

Water level (start of test) mbd

Water level (end of test) mbd

Type of test (for example, bailer, step, constant rate)

Pumping rate m^3/hour ☐ or litres/second ☐. Please tick as appropriate.

for days, hours, mins

Recovery to mbd in days, hours, mins
(from end of pumping)

Date(s) of measurements Pump started (DD/MM/YYYY)

Pump stopped (DD/MM/YYYY)

Please supply chemical analysis if available. If you have included this please tick this box ☐

WR38: Borehole record form

D Strata log

Geological classification (BGS only)	Description of strata	Thickness m	Depth (to base of strata) m
	* Top soil	.300mm	.300mm
	* Brown and orange clays	17	17.3
	* Dark blue mudstone	3	20.3
	* Brown/blue mudstones and Sandstone	34	54.3
	* Grey clay	5.7	60
	(continue on separate page if necessary)		
	Other comments (for example, gas encountered, saline water intercepted)		

E Completing this form

How long did it take you to fill in this form? _____

For Official use only

Date received (DD/MM/YYYY)	File	Consent number	BGS reference number
Accession number	Wellmaster number	SOBI number	NGR
LIC NO	Purpose		EA reference number
Copy number	Entered by		

The British Geological Survey will use the information you

Appendix F

Application DISC/23/0063 Borehole Logs

Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**		Borehole No. **WS1** Sheet 1 of 1
Project Name: Townhouse Farm, Thakeham	Project No. GE20186	Co-ords:	Hole Type WLS
Location: Thakeham		Level:	Scale 1:25
Client: Joe Fowler		Dates:	Logged By JG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES					Reworked TOPSOIL. Brown silty sandy gravelly CLAY. Gravel is partly composed of chalk. Charcoal fragments and rootlets throughout MADE GROUND
		0.30	ES		0.30			Light yellowish brown SAND. HYTHE FORMATION
		0.50	D		0.40			Orange brown with occasionally mottled light brown with occasional black discolouration clayey very gravelly SAND. Gravel is subangular to angular weakly cemented sandstone fragments. HYTHE FORMATION
		1.00	D					
		1.30	D		1.30			End of Borehole at 1.30m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**		Borehole No. **WS2** Sheet 1 of 1
Project Name: Townhouse Farm, Thakeham	Project No. GE20186	Co-ords:	Hole Type WLS
Location: Thakeham		Level:	Scale 1:25
Client: Joe Fowler		Dates:	Logged By JG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					Reworked TOPSOIL. Dark brown becoming brown silty sandy gravelly CLAY. Gravel is chalk and brick. Charoal and rootless throughout MADE GROUND
		0.50	D		0.65			
		0.90	ES					Grey mottled yellow brown silty clayey SAND with occasional gravel. Gravel is weakly cemented sandstone. HYTHE FORMATION
		1.00	D					
		1.50	D		1.60			
		2.00	D					Orange with light brown mottled silty clayey SAND. Gravel is weakly cemented sandstone. HYTHE FORMATION
		2.50	D		2.60			End of Borehole at 2.60m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**		Borehole No. **WS3** Sheet 1 of 1
Project Name: Townhouse Farm, Thakeham	Project No. GE20186	Co-ords:	Hole Type WLS
Location: Thakeham		Level:	Scale 1:25
Client: Joe Fowler		Dates:	Logged By JG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30			Reworked TOPSOIL: Dark brown silty sandy slightly gravelly CLAY. Gravel is chalk and concrete MADE GROUND
		0.50	D		0.40			Chalk FILL. MADE GROUND
		0.80	ES					Soft brown silty clayey gravelly SAND. Gravel is weakly cemented sandstone. HYTHE FORMATION
		1.00	D					
		1.50	D					
		2.00	D					
		2.50	D		2.50			Light grayish brown slightly gravelly SAND. Gravel is sandstone. HYTHE FORMATION
		3.00	D					
		3.50	D					
		4.00	D		3.70 4.00			Orangish brown slightly gravelly SAND. Gravel is sandstone. HYTHE FORMATION End of Borehole at 4.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**		Borehole No. **WS4** Sheet 1 of 1
Project Name: Townhouse Farm, Thakeham	Project No. GE20186	Co-ords:	Hole Type WLS
Location: Thakeham		Level:	Scale 1:25
Client: Joe Fowler		Dates:	Logged By JG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES					Possibly reworked dark brown silty sandy CLAY. Roots and rootlets throughout. TOPSOIL
					0.30			
		0.50	D					Yellowish brown mottled grey slightly gravelly SAND. Gravel is grey weakly cemented sandstone. Roots throughout. HYTHE FORMATION
		1.00	D					
		1.20	ES					
		1.50	D					
					1.90			
		2.00	D		2.05			Orangish brown gravelly SAND. Gravel is sandstone. Roots throughout HYTHE FORMATION
		2.50	D					Yellowish brown mottled light grey with red discolouration slightly clayey very sandy GRAVEL. Gravel is weakly cemented subangular sandstone. HYTHE FORMATION
					2.70			
		3.00	D					Light greyish brown slightly clayey sandy GRAVEL. Gravel is weakly cemented sandstone. HYTHE FORMATION
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net	**Borehole Log**		Borehole No. **WS5** Sheet 1 of 1
Project Name: Townhouse Farm, Thakeham	Project No. GE20186	Co-ords:	Hole Type WLS
Location: Thakeham		Level:	Scale 1:25
Client: Joe Fowler		Dates:	Logged By JG

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES					Reworked TOPSOIL: Brown silty sandy gravelly CLAY. Gravel is sub angular and partly composed of flint. Rare charcoal fragments. MADE GROUND
					0.40			
		0.50	D					Light yellow brown slightly gravelly SAND. Gravel is sandstone. HYTHE FORMATION
		0.60	ES					
					0.70			Orange brown SAND. HYTHE FORMATION
		1.00	D					
					1.10			Light yellow brown mottled orange brown with occassional black discolouration slightly gravelly SAND. Gravel is sandstone. HYTHE FORMATION
		1.50	D		1.50			End of Borehole at 1.50m

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

AGS

Appendix G

Application DC/25/0053 Trial Pit Logs

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH		**TRIAL PIT**	**SA1**
Contract	Storrington Road, Thakeham	**Report Ref**	23/12538/JAM
Client	Cygnature Homes Ltd	**Date**	30/01/2023
Site Address	South Hill, Storrington Road, Thakeham, West Sussex RH20 3EN	**Ground Level**	
Type of excavator	Machine	**Water level after completion, m**	0.70*

Water strikes, m		Pit Dimensions, m		Ease of excavation, m			
1	none	Length	1.9	Very easy	GL - 1.10	Difficult	1.30 - 1.70
2		Breadth	0.6	Moderate	1.10 - 1.30	Very hard	1.70 - 2.00

Remarks

BRE365 soakaway test performed in trial pit. Test failed due to the time to fall to 50% being greater than 24 hours

*From soakaway test

Samples or tests		Shear Strength kPa	Depth	Legend	Strata Description
Type	Depth, m				
D	0.10		0.30		MADE GROUND (dark brown slightly gravelly, clayey SAND with roots. Gravel consists of flint)
					Brown slightly gravelly, very sandy CLAY. Gravel consists of flint and sandstone fragments
D	1.00		1.10		Yellow gravelly, silty SAND. Gravel consists of sandstone fragments
D	1.90		2.00		END OF TRIAL PIT

Sample Code: *B - Large Disturbed* *D - Small Disturbed* *W - Water Sample* *R - Root Sample*

ALBURY S.I. LTD Miltons Yard, Petworth Road, Witley, Surrey GU8 5LH				TRIAL PIT	SA2
Contract	Storrington Road, Thakeham			**Report Ref**	23/12538/JAM
Client	Cygnature Homes Ltd			**Date**	30/01/2023
Site Address	South Hill, Storrington Road, Thakeham, West Sussex RH20 3EN			**Ground Level**	
Type of excavator	Machine		**Water level after completion, m**	1.04*	
Water strikes, m	**Pit Dimensions, m**		**Ease of excavation, m**		
1 none	Length	2.1	Very easy	GL - 0.45	Difficult
2	Breadth	0.65	Moderate	0.45 - 0.80	Very hard 0.80 - 1.80

Remarks

BRE365 soakaway test performed in trial pit. Test failed due to the time to fall to 50% being greater than 24 hours

*From soakaway test

Samples or tests		Shear Strength kPa	Depth	Legend	Strata Description
Type	**Depth, m**				
D	0.10				MADE GROUND (dark brown slightly gravelly, sandy CLAY with roots. Gravel consists of flint)
D	0.50		0.45		Yellow-brown silty SAND
			0.80		Grey silty SAND
D	1.50				
			1.80		END OF TRIAL PIT

Sample Code: *B - Large Disturbed* *D - Small Disturbed* *W - Water Sample* *R - Root Sample*

Appendix H

Southern Water Asset Location Plans

Date: 16/10/25

Scale: 1:1250

Map Centre: 510323,117615

Data updated: 21/09/25

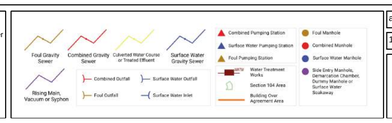
Our Ref: 1912440 - 1

Wastewater Plan A1
Powered by digiSal

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2025 Ordnance Survey AC0000808122 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



amaginnis@motion.co.uk

1ectha - Townhouse

from Southern Water

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
3501	F	63.22	61.82	
3502	F	65.60	63.93	
3503	F	66.89	65.25	
3504	F	67.25	65.44	
4301	F	52.38	50.89	
4302	F	55.83	54.52	
4303	F	57.34	56.03	
4401	F	60.20	58.57	
4402	F	62.42	60.90	
5401	F	65.63	64.12	
5402	F	65.51	63.89	
5403	F	64.95	63.30	
5404	F	63.34	61.80	
6301	F	62.59	0.00	
6401	F	63.84	62.24	
6402	F	65.25	63.53	
7301	F	58.46	0.00	
7302	F	61.65	0.00	
8302	F	55.83	0.00	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix I

QMED Greenfield Runoff Calculation

FEH Mean Annual Flood

Input

QMED Method	2008	URBEXT (1990)	0.0950
Site Location	GB 510050 116900 TQ 10050 16900	SPRHOST	19.080
Area (ha)	0.030	BFIHOST	0.815
SAAR (mm)	851	FARL	0.983

Results

QMED Rural (l/s) 0.1 QMED Urban (l/s) 0.1

Appendix J

Drainage Strategy Layout

north

Composite Permeable Paviours
Area: 60m²
Total System Depth: 580mm
Crushed Stone Subbase Depth: 250mm
Crushed Stone Subbase Porosity: 30%
Geocellular Crate Area: 22.5m²
Geocellular crate depth 200mm
Geocellular Crate Porosity: 95%
Total System Attenuation Volume: 8.782m³
Infiltration Coefficient: 4.92 x 10^{-6}

Geocellular
Tank Vent

Geocellular Soakaway 1
7m x 3m x 0.4m (L x W x D)
CL: 67.010
IL: 65.810
Top of Tank: 66.210
Cover to tank: 0.800m
Porosity: 95%
Volume: 7.987m³
Infiltration Coefficient: 4.92 x 10^{-6}

Geocellular
Tank Vent

Ring Soakaway
1.5m Ø
CL: 67.270
IL: 64.000
Stone filled - Porosity = 33%
Volume: 2.376m³
Infiltration Coefficient (sides only): 4.92 x 10^{-6}

Geocellular Attenuaiton Tank
4.0m x 2.0m x 0.4m (L x W x D)
CL: 67.270
IL: 66.200
Top of Tank: 66.600
Cover to tank: 0.670m
Porosity: 95%
Volume: 3.043m³
No infiltration (within 5m of foundations)

COOLHAM ROAD

Demarcation
Chamber

Foul connection
into Node 3504

Design Flow: 0.01 l/sec

Node 3504
CL: 67.25
IL: 65.44

0 4 8 12 16m
SCALE IN METRES
1:200

C:\Users\phillallen\Motion\StaffSite - 1ectha 2501051\Drawings\2501051-500-P03-Drainage Strategy.dwg

Notes

1. This Drainage Strategy Plan is for planning purposes and does not constitute detailed designs and should not be used for construction purposes
2. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
3. This drawing has been based upon survey supplied information and Motion cannot guarantee the accuracy of the data provided.
4. The drainage levels are based on existing levels, but also proposed levels where existing site features present unusual changes in gradient.
5. Any discrepancies should be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
6. This drawing should be read in conjunction with all other relevant engineering details, drawings and specification.
7. 350mm minimum cover is to be provided for private pipes laid in soft/paved areas, with 900mm minimum cover to be provided for private pipes laid beneath roads / driveways unless not practicable. Where unachievable, shallow pipe drains may require protection using concrete surround or paving slabs bridging the trench, subject to the NHBC Inspector's requirements.
8. Manholes situated within areas accessible to motor vehicles are to be fitted with suitable strength covers and frames.
9. All RWP locations are indicative.
10. Foul layout is indicative (SVP locations TBC)

Legend

- Site Boundary
- Composite Permeable Pavement (see drawing for details)
- Surface Water Gravity Pipe
- Surface Water Manhole
- Foul water gravity pipe
- Foul water manhole
- Polypipe Linflex Filter Pipe
- Southern Water Public Foul Sewer
- Geocellular Soakaway (see drawing for details)
- Catchpit Manhole / Silt Trap

Rev.	Description	Drn	Chk	App	Date
P03	Third Issue	PA	PA	PA	19/11/2025
P02	Second Issue	PA	PA	PA	06/11/2025
P01	First Issue	PA	PA	PA	31/10/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Fowlers Land and New Homes

Project:
Land Adjoining No. 2 and No. 3
Townhouse Cottages, Thakeham

Title:
Drainage Strategy Layout

Scale: 1:200 (@ A3)

Drawing: 2501051-0500

Revision: P03

Appendix K

MicroDrainage Network Hydraulic Model Results

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 510050 116900 TQ 10050 16900
Data Type	Catchment
Maximum Rainfall (mm/hr)	550
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm at outfall (pipe S1.001)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.012	4-8	0.000

Total Area Contributing (ha) = 0.012

Total Pipe Volume (m³) = 0.015

Time Area Diagram at outfall (pipe S2.002)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.009	4-8	0.000

Total Area Contributing (ha) = 0.009

Total Pipe Volume (m³) = 0.053

Time Area Diagram at outfall (pipe S3.001)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.009	4-8	0.000

Total Area Contributing (ha) = 0.009

Total Pipe Volume (m³) = 0.034

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	0.926	0.012	80.0	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
S1.001	1.025	0.013	80.0	0.012	0.00	0.0	0.600	o	100	Pipe/Conduit	
S2.000	4.320	0.024	182.7	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
S2.001	1.604	0.020	80.0	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	
S2.002	0.779	0.010	82.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S3.000	3.400	0.043	80.0	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
S3.001	0.879	0.011	79.9	0.009	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	106.69	15.02	66.832	0.000	0.0	0.0	0.0	0.86	6.8	0.0
S1.001	106.61	15.04	66.820	0.012	0.0	0.0	0.0	0.86	6.8	4.8
S2.000	106.28	15.13	66.497	0.000	0.0	0.0	0.0	0.57	4.4	0.0
S2.001	106.16	15.16	66.200	0.009	0.0	0.0	0.0	0.86	6.8	3.5
S2.002	106.10	15.17	64.000	0.009	0.0	0.0	0.0	0.85	6.7	3.5
S3.000	106.51	15.07	66.503	0.000	0.0	0.0	0.0	0.86	6.8	0.0
S3.001	106.44	15.08	65.810	0.009	0.0	0.0	0.0	0.86	6.8	3.5

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
1.001	User	-	100	0.006	0.006	0.006
	User	-	100	0.003	0.003	0.009
	User	-	100	0.003	0.003	0.012
	User	-	100	0.001	0.001	0.012
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.009	0.009	0.009
2.002	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.009	0.009	0.009
				Total	Total	Total
				0.030	0.030	0.030

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.001		67.400	66.807	0.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S2.002		67.270	63.991	0.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S3.001		67.010	65.799	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	1.000	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	0.000
Hot Start (mins)	0	Inlet Coeffiecient	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 Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 510050 116900 TQ 10050 16900
Data Type	Catchment
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	1.000
Cv (Winter)	0.840
Storm Duration (mins)	30

Online Controls for Storm

Pump Manhole: Composite Permeable Paviours, DS/PN: S1.001, Volume (m³): 0.2

Invert Level (m) 66.820

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	0.0000	1.800	0.0000	3.400	0.0000	5.000	0.0000
0.400	0.0000	2.000	0.0000	3.600	0.0000	5.200	0.0000
0.600	0.0000	2.200	0.0000	3.800	0.0000	5.400	0.0000
0.800	0.0000	2.400	0.0000	4.000	0.0000	5.600	0.0000
1.000	0.0000	2.600	0.0000	4.200	0.0000	5.800	0.0000
1.200	0.0000	2.800	0.0000	4.400	0.0000	6.000	0.0000
1.400	0.0000	3.000	0.0000	4.600	0.0000		
1.600	0.0000	3.200	0.0000	4.800	0.0000		

Pump Manhole: Ring Soakaway, DS/PN: S2.002, Volume (m³): 3.7

Invert Level (m) 64.000

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	0.0000	1.800	0.0000	3.400	0.0000	5.000	0.0000
0.400	0.0000	2.000	0.0000	3.600	0.0000	5.200	0.0000
0.600	0.0000	2.200	0.0000	3.800	0.0000	5.400	0.0000
0.800	0.0000	2.400	0.0000	4.000	0.0000	5.600	0.0000
1.000	0.0000	2.600	0.0000	4.200	0.0000	5.800	0.0000
1.200	0.0000	2.800	0.0000	4.400	0.0000	6.000	0.0000
1.400	0.0000	3.000	0.0000	4.600	0.0000		
1.600	0.0000	3.200	0.0000	4.800	0.0000		

Pump Manhole: Geocellular Soakaway 1, DS/PN: S3.001, Volume (m³): 0.4

Invert Level (m) 65.810

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	0.0000	1.800	0.0000	3.400	0.0000	5.000	0.0000
0.400	0.0000	2.000	0.0000	3.600	0.0000	5.200	0.0000
0.600	0.0000	2.200	0.0000	3.800	0.0000	5.400	0.0000
0.800	0.0000	2.400	0.0000	4.000	0.0000	5.600	0.0000
1.000	0.0000	2.600	0.0000	4.200	0.0000	5.800	0.0000
1.200	0.0000	2.800	0.0000	4.400	0.0000	6.000	0.0000
1.400	0.0000	3.000	0.0000	4.600	0.0000		
1.600	0.0000	3.200	0.0000	4.800	0.0000		

Storage Structures for Storm

Complex Manhole: Composite Permeable Paviours, DS/PN: S1.001

Cellular Storage

Invert Level (m)	66.820	Safety Factor	1.5
Infiltration Coefficient Base (m/hr)	0.01771	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.01771		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	22.5	22.5	0.201	0.0	26.3
0.200	22.5	26.3			

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.01771	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	16.7	Slope (1:X)	0.0
Safety Factor	1.5	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	66.820	Cap Volume Depth (m)	0.250

Cellular Storage Manhole: Geocellular Attenuation Tank, DS/PN: S2.001

Invert Level (m)	66.200	Safety Factor	1.5
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	8.0	8.0	0.401	0.0	12.8
0.400	8.0	12.8			

House Soakaway Manhole: Ring Soakaway, DS/PN: S2.002

Infiltration Coefficient Base (m/hr)	0.00000	Pit Width (m)	1.500
Infiltration Coefficient Side (m/hr)	0.01771	Number Required	1
Safety Factor	1.5	Cap Volume Depth (m)	3.200
Porosity	0.33	Cap Infiltration Depth (m)	3.200
Invert Level (m)	64.000		

Cellular Storage Manhole: Geocellular Soakaway 1, DS/PN: S3.001

Invert Level (m) 65.810 Safety Factor 1.5
Infiltration Coefficient Base (m/hr) 0.01771 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01771

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	21.0	21.0	0.401	0.0	29.0
0.400	21.0	29.0			

Volume Summary (Static)

Length Calculations based on Centre-Centre

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
S1.000	1	0.000	0.007	0.000	0.007
S1.001	Composite Permeable Paviours	0.164	0.008	8.782	8.954
S2.000	3	0.000	0.034	0.000	0.034
S2.001	Geocellular Attenuation Tank	0.303	0.013	3.043	3.358
S2.002	Ring Soakaway	3.698	0.006	2.376	6.080
S3.000	5	0.000	0.027	0.000	0.027
S3.001	Geocellular Soakaway 1	0.339	0.007	7.987	8.333
Total		4.504	0.102	22.187	26.793

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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 Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 3	Number of Storage Structures 4	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 510050 116900 TQ 10050 16900
Data Type	Catchment
Cv (Summer)	1.000
Cv (Winter)	1.000

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

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, 10, 30, 100
Climate Change (%)	0, 35, 40, 45

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)
S1.000	1	240 minute 2 year Summer I+0%	240	67.400	66.869
S1.001	Composite Permeable Paviours	240 minute 2 year Summer I+0%	240	67.400	66.869
S2.000	3	15 minute 2 year Summer I+0%	15	67.270	66.497
S2.001	Geocellular Attenuation Tank	30 minute 2 year Summer I+0%	30	67.270	66.240
S2.002	Ring Soakaway	2880 minute 2 year Summer I+0%	2880	67.270	65.557
S3.000	5	15 minute 2 year Summer I+0%	15	67.010	66.503
S3.001	Geocellular Soakaway 1	360 minute 2 year Summer I+0%	360	67.010	65.911

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infil. Vol (m³)	Half Drain Time (mins)
S1.000	1	-0.063	0.000	0.00			
S1.001	Composite Permeable Paviours	-0.051	0.000	0.00		3.359	136
S2.000	3	-0.100	0.000	0.00			
S2.001	Geocellular Attenuation Tank	-0.060	0.000	0.34		0.000	13
S2.002	Ring Soakaway	1.457	0.000	0.00		4.631	1680
S3.000	5	-0.100	0.000	0.00			
S3.001	Geocellular Soakaway 1	0.001	0.000	0.00		3.008	306

PN	US/MH Name	Pipe Flow (l/s)	Status
S1.000	1	0.0	OK*
S1.001	Composite Permeable Paviours	0.0	OK
S2.000	3	0.0	OK*
S2.001	Geocellular Attenuation Tank	1.3	OK
S2.002	Ring Soakaway	0.0	SURCHARGED
S3.000	5	0.0	OK*
S3.001	Geocellular Soakaway 1	0.0	SURCHARGED

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 510050 116900 TQ 10050 16900
Data Type	Catchment
Cv (Summer)	1.000
Cv (Winter)	1.000

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

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, 10, 30, 100
Climate Change (%)	0, 35, 40, 45

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)
S1.000	1	240 minute 10 year Winter I+35%	240	67.400	66.932
S1.001	Composite Permeable Paviours	240 minute 10 year Summer I+35%	240	67.400	66.939
S2.000	3	15 minute 10 year Summer I+35%	15	67.270	66.497
S2.001	Geocellular Attenuation Tank	720 minute 10 year Winter I+35%	720	67.270	66.368
S2.002	Ring Soakaway	720 minute 10 year Winter I+35%	720	67.270	66.368
S3.000	5	15 minute 10 year Summer I+35%	15	67.010	66.503
S3.001	Geocellular Soakaway 1	360 minute 10 year Winter I+35%	360	67.010	66.042

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infil. Vol (m³)	Half Drain Time (mins)
S1.000	1	0.000	0.000	0.00			
S1.001	Composite Permeable Paviours	0.019	0.000	0.00		7.173	196
S2.000	3	-0.100	0.000	0.00			
S2.001	Geocellular Attenuation Tank	0.068	0.000	0.10		0.000	336
S2.002	Ring Soakaway	2.268	0.000	0.00		5.486	1632
S3.000	5	-0.100	0.000	0.00			
S3.001	Geocellular Soakaway 1	0.132	0.000	0.00		5.991	504

PN	US/MH Name	Pipe Flow (l/s)	Status
S1.000	1	0.0	SURCHARGED*
S1.001	Composite Permeable Paviours	0.0	SURCHARGED
S2.000	3	0.0	OK*
S2.001	Geocellular Attenuation Tank	0.4	SURCHARGED
S2.002	Ring Soakaway	0.0	SURCHARGED
S3.000	5	0.0	OK*
S3.001	Geocellular Soakaway 1	0.0	SURCHARGED

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 3 Number of Storage Structures 4 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 510050 116900 TQ 10050 16900
Data Type	Catchment
Cv (Summer)	1.000
Cv (Winter)	1.000

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

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, 10, 30, 100
Climate Change (%)	0, 35, 40, 45

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)
S1.000	1	720 minute 30 year Winter I+40%	720	67.400	66.932
S1.001	Composite Permeable Paviours	240 minute 30 year Summer I+40%	240	67.400	66.985
S2.000	3	720 minute 30 year Winter I+40%	720	67.270	66.545
S2.001	Geocellular Attenuation Tank	720 minute 30 year Winter I+40%	720	67.270	66.545
S2.002	Ring Soakaway	720 minute 30 year Winter I+40%	720	67.270	66.545
S3.000	5	15 minute 30 year Summer I+40%	15	67.010	66.503
S3.001	Geocellular Soakaway 1	360 minute 30 year Winter I+40%	360	67.010	66.122

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infil. Vol (m³)	Half Drain Time (mins)
S1.000	1	0.000	0.000	0.00			
S1.001	Composite Permeable Paviours	0.065	0.000	0.00		9.407	244
S2.000	3	-0.052	0.000	0.00			
S2.001	Geocellular Attenuation Tank	0.245	0.000	0.13		0.000	636
S2.002	Ring Soakaway	2.445	0.000	0.00		6.744	2136
S3.000	5	-0.100	0.000	0.00			
S3.001	Geocellular Soakaway 1	0.212	0.000	0.00		7.735	642

PN	US/MH Name	Pipe Flow (l/s)	Status
S1.000	1	0.0	SURCHARGED*
S1.001	Composite Permeable Paviours	0.0	SURCHARGED
S2.000	3	0.0	OK*
S2.001	Geocellular Attenuation Tank	0.5	SURCHARGED
S2.002	Ring Soakaway	0.0	SURCHARGED
S3.000	5	0.0	OK*
S3.001	Geocellular Soakaway 1	0.0	SURCHARGED

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Inlet Coeffiecient	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 Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 3	Number of Storage Structures 4	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 510050 116900 TQ 10050 16900
Data Type	Catchment
Cv (Summer)	1.000
Cv (Winter)	1.000

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

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, 10, 30, 100
Climate Change (%)	0, 35, 40, 45

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)
S1.000	1	2160 minute 100 year Summer I+45%	2160	67.400	66.932
S1.001	Composite Permeable Paviours	240 minute 100 year Winter I+45%	240	67.400	67.108
S2.000	3	5760 minute 100 year Summer I+45%	5760	67.270	66.597
S2.001	Geocellular Attenuation Tank	960 minute 100 year Winter I+45%	960	67.270	67.120
S2.002	Ring Soakaway	960 minute 100 year Winter I+45%	960	67.270	67.120
S3.000	5	480 minute 100 year Winter I+45%	480	67.010	66.603
S3.001	Geocellular Soakaway 1	480 minute 100 year Winter I+45%	480	67.010	66.636

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infil. Vol (m³)	Half Drain Time (mins)
S1.000	1	0.000	0.000	0.00			
S1.001	Composite Permeable Paviours	0.188	0.000	0.00		12.083	288
S2.000	3	0.000	0.000	0.00			
S2.001	Geocellular Attenuation Tank	0.820	0.000	0.11		0.000	1200
S2.002	Ring Soakaway	3.020	0.000	0.00		8.094	
S3.000	5	0.000	0.000	0.01			
S3.001	Geocellular Soakaway 1	0.726	0.000	0.00		10.435	824

PN	US/MH Name	Pipe Flow (l/s)	Status
S1.000	1	0.0	SURCHARGED*
S1.001	Composite Permeable Paviours	0.0	FLOOD RISK
S2.000	3	0.0	SURCHARGED*
S2.001	Geocellular Attenuation Tank	0.4	FLOOD RISK
S2.002	Ring Soakaway	0.0	FLOOD RISK
S3.000	5	0.1	SURCHARGED*
S3.001	Geocellular Soakaway 1	0.0	SURCHARGED

Appendix L

Drainage Management and Maintenance Plan

Land Adjoining No. 2 and No. 3 Townhouse Cottages, Thakeham

Drainage Management & Maintenance Plan

For

Fowlers Land and New Homes

motion

Document Control Sheet

Land Adjoining No. 2 and No. 3 Townhouse Cottages, Thakeham

Fowlers Land and New Homes

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
6th November 2025	FINAL	Phil Allen MCIWEM C.WEM	Neil Jaques

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2.0 Maintenance Categories 2
3.0 The Surface Water Drainage System 3
4.0 General Maintenance Principles 4
5.0 Inspection and Maintenance Frequency of Components 6

1.0 Introduction

1.1 This document sets out the suggested principles for the long-term management and maintenance of the surface water drainage system on the proposed residential development at Land Adjoining No. 2 and No. 3 Townhouse Cottages, Thakeham, West Sussex.

1.2 The purpose of this document is to ensure that there is a robust inspection and maintenance plan in place for the lifetime of the development. This ensures the optimum operation of the surface water drainage system and that it will be maintained in perpetuity. This will contribute to reducing the risk of surface water flooding both on- and off-site.

1.3 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be undertaken and made available, if requested.

1.4 This document has been produced by Motion on behalf of their client, Fowlers Land and New Homes. This document describes the typical management and maintenance tasks that are known at the design stage (maintenance frequencies and typical tasks, for example). These have been drawn from industry guidance such as CIRIA C753 - The SuDS Manual – and manufacturer's own guidance.

1.5 Maintenance is considered as a construction activity under the CDM Regulations 2015. Under the CDM Regulations, it is a requirement that a competent person be appointed to carry out a required role. CDM defines a competent person as an individual with sufficient knowledge of the specific tasks to be undertaken, as well as sufficient experience and ability to carry out their duties in relation to the task in a way that secures health and safety on site.

1.6 In recognition of the requirements of the CDM Regulations 2015, this drainage management and maintenance plan expects that the maintenance work will be carried out by a competent person who must have prior knowledge of the drainage components and SuDS systems on site.

1.7 There are limitations on what this document can prescribe at the planning stage. At this stage this document cannot name the specific individuals who will carry out the maintenance and what equipment will be used. Related to this, this document is unable to provide method statements for exactly how maintenance practices will be carried out. These can only be determined at the time of the maintenance being carried out because it is driven by the exact maintenance need. Therefore, this is to be the responsibility of the individuals carrying out the work. We urge those who are carrying out the maintenance to record this information and make it available to the Local Planning Authority (LPA), if required to do so. This drainage management and maintenance plan needs to be a living document that is owned and maintained and it should be adhered to for the lifetime of the development.

2.0 Maintenance Categories

2.1 There are three categories of maintenance activities referred to in this report. These are:

Inspection and Monitoring

- Inspection and monitoring tasks should be carried out frequently, nominally once a month, and should include a visual inspection of all components including all inlets and outlets.

Regular Maintenance (Monthly)

- Regular maintenance consists of basic tasks done on a frequent and predictable schedule, including vegetation management and litter removal.

Seasonal Maintenance (Quarterly)

- Seasonal maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (leaf litter and sediment removal is an example).

Remedial Maintenance

- Remedial maintenance comprises of intermittent tasks that may be required to rectify faults associated with the system that have been identified through visual inspections. The likelihood of faults can be minimised by correct installation, regular inspection and timely maintenance. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events and, as such, timings are difficult to predict.

3.0 The Surface Water Drainage System

3.1 The proposed surface water drainage system is made up of a number of components/structures. These include:

- Manholes
- Composite Permeable paving
- Geocellular Soakaways
- Catchpit manholes/silt traps
- Pipes
- Water butts (although these will be in private ownership)

3.2 All components should be installed in accordance with the manufacturer's instructions and to the levels/arrangement as defined on the designer's drawings. Not doing so will invalidate any warranty provided by the manufacturer.

3.3 All maintenance and cleaning must be carried out in accordance with manufacturer's recommendations and by competent and suitably qualified staff, as defined in the CDM regulations 2015.

3.4 This document should be read in conjunction with the design drawings of the drainage system, so that the location and type of each feature can be recognised and understood.

3.5 Manufacturer's instructions are to be added to this document once specific products have been selected and installed as part of the detailed design. This document will subsequently form the basis for a drainage maintenance regime.

4.0 General Maintenance Principles

4.1 All surface water drainage systems, whether piped gravity systems, Sustainable Drainage Systems (SuDS), or flow control devices and pumps, require regular maintenance to keep them working at optimum efficiency and capacity. The maintenance of the surface water drainage system proposed for the development at Land Adjoining No. 2 and No. 3 Townhouse Cottages, Thakeham should be carried out alongside other regular maintenance tasks on site.

4.2 Timely and adequate maintenance will increase the lifespan of all the drainage components. Inadequate maintenance will do the reverse. Therefore, the projected lifespan and anticipated replacement date of each drainage component cannot be forecast at the time of this document being produced.

4.3 Construction activities can create and discharge significant quantities of sediment that will quickly clog the surface water drainage system. Therefore, construction-stage sediment removal is required immediately post-construction. The construction site manager should assess this and carry out cleaning as necessary.

4.4 Catchpit manholes/silt traps will be specified upstream of the permeable paved area and the geocellular soakaways. They will remove gross solids and the majority of silts. It is important that any debris build-up in the catchpit manholes/silt traps is removed at regular intervals. This will reduce the risk of the permeable paved areas becoming silted up. It will maintain the design capacity and function of this part of the drainage system.

4.5 Cleaning should also take place after large storms when there have been increased surface water flows and visible entrainment and deposition of debris.

4.6 An increased frequency of inspection and maintenance should be programmed into the autumn and winter months in acknowledgement that:

- Leaf fall from deciduous trees in autumn will result in an increased amount of leaf litter and an elevated blockage risk of drainage infrastructure.
- Increased rainfall during winter months will result in greater quantities of water moving through the drainage system and a greater input of silt and other debris.

4.7 Table 4.1, below, gives an overview of required maintenance tasks and the frequency with which they need to be undertaken. Section 5 – Inspection and Maintenance Frequency of Components – will assign typical maintenance frequencies and tasks to the specific components used within the surface water drainage system proposed for the development at Land Adjoining No. 2 and No. 3 Townhouse Cottages.

Table 4.1: Typical maintenance tasks and frequencies

Activity	Indicative Frequency	Typical Tasks
Inspection and Monitoring	Monthly	„ Inspection of all inlets, outlets and control structures
Regular Maintenance	Monthly, for the lifetime of the development	„ Litter picking and debris removal „ Weed removal and invasive plant control
Seasonal Maintenance	Quarterly, for the lifetime of the development	„ Vegetation management around components „ Sweeping of pavement areas to remove surface silt „ Silt removal from system, including catchpits, cellular storage structures and control structures
Remedial maintenance	As required as a result of inspections, for the lifetime of the development.	„ Inlet/outlet repairs „ Erosion repairs „ Reinstatement of edgings „ Reinstatement following pollution incidents „ Removal of silt build-up and leaf litter after storms „ Repair of vandalism „ Replacement of any blocked filter membranes/materials

5.0 Inspection and Maintenance Frequency of Components

5.1 Table 5.1 below lists each of the components used within the site's surface water drainage system. It suggests an indicative maintenance frequency for each component and ascribes typical maintenance tasks to them.

5.2 This list is not exhaustive, nor is it prescriptive. As mentioned in Section 3, additional, unscheduled maintenance may be required following adverse weather conditions or after autumn leaf falls. Additional maintenance tasks may be required to adequately clean and maintain individual components.

5.3 The list of components should be cross-referenced with the designer's drawings so that the location of each component can be identified.

5.4 If there is any uncertainty regarding the correct and safe methods of cleaning, or what equipment should be used, the manufacturer should be consulted.

Table 5.1: Maintenance Frequency and Task for Drainage Components

Activity	Indicative Frequency	Anticipated Tasks
Pipes	As required	„ Identify any pipes that may not be operating properly and employ a competent, qualified contractor to inspect using CCTV. „ If the pipe is blocked with silt or debris, the pipe should be jetted clean from an upstream access point. All silt and debris should be captured and removed at a downstream access point. „ Inspect once clean. „ If any other defects are encountered (cracks, displaced joints, root ingress), appropriate solutions should be discussed with a competent and qualified contractor. These services are usually provided by the same companies that offer CCTV surveys and pipe jetting services.
Manholes	Annually and as required, for the lifetime of the development.	„ Inspect/identify any damage or areas that are not operating correctly „ Remove silt, litter, leaves and other detritus. „ Inspect once clean.
Catchpit Manholes/Silt Traps	Annually and as required, for the lifetime of the development.	„ Inspect/identify any damage or areas that are not operating correctly „ Remove silt, litter, leaves and other detritus. „ Inspect once clean.
Water Butts (not the responsibility of the adopting site management agency, but individual homeowners)	Annually in Autumn to Winter	„ Remove falling leaves and seeds from guttering or those that have found their way into the water butt. „ Water may stagnate slightly. If so, use a water butt cleaning disc into the tank. „ In autumn and winter, drain water off every 10 days (or less) to make sure that water butts don't overflow and that water is kept moving. This will stop larvae and flies from using the water butt.

		„ Use safe products such as vinegar to clean the outside of the tank and the inside of the lid and be careful not to contaminate water with chemicals. „ At least once a year, completely empty the water butt and scrub it out with warm soapy water and then rinse thoroughly. This is best done at a time when the water butt is already nearly empty (end of summer) or when it can readily refill (winter).
Geocellular Soakaways	Annually	„ Contact manufacturer for instruction on approved and safe inspection and maintenance practices. „ Inspect/identify any areas that are not operating correctly. „ Remove debris from catchment surface. „ Remove sediment from pre-treatment structures. „ Check for silt build-up and flush and remove as required (in accordance with manufacturer's instructions). „ Inspect once clean. „ See Table 21.3 of CIRIA C753 for more information. „ Most geocellular units have a 60-year creep limited life expectancy, so they should be planned for replacement by 2075 (approx.).
Composite Permeable paving	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations.	„ Agitate surface by means of mechanical sweeping or vacuuming to ensure no vegetation or moss is allowed to establish and grow in the joints. „ Mechanical sweeping of paviours and refilling of joints with the correct aggregate need only be carried out at intervals of 5 years or so „ Remove weeds from the surface through the application of glyphosate-based weed killers „ Stabilise and mow contributing and adjacent areas. „ Inspect once clean. „ See Table 20.15 of CIRIA C753 for more information. „ Permeable paving has a nominal 25-year lifespan, if correctly and regularly maintained. „ When subjected to low level oil drips permeable paviours can continue to biodegrade hydrocarbons indefinitely. „ Major oil spills have the potential to contaminate the surface and the underlying crushed stone. In the event of a major oil spill, the area of block paviours and crushed stone that is affected should be removed, cleaned and reinstalled.

5.5 Upon completion of maintenance activities, a record should be kept of the work carried out. This should be retained, and an annual maintenance report should be compiled, which should include the following:

- Observations resulting from inspections
- Maintenance and operation activities undertaken during the year
- Recommendations for inspections and maintenance programmes for the following year

5.6 On the next page is a table with suggested information should be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this should be a living document and regularly updated, as required and should be kept for the lifetime of the development.

5.7 The Local Planning Authority (Horsham District Council) may request to check and sign off any maintenance activities. Therefore, it is the recommendation that the LPA is contacted prior to any scheduled routine maintenance. The table mentioned above and on the next page, as well as the annual maintenance report, should be offered to the LPA for their records and approval.

Date	Component requiring maintenance	Issues prompting maintenance	Scheduled maintenance (Y/N)	Maintenance carried out	Additional works required (Y/N). If yes, please detail	Next scheduled date of inspection and maintenance

Appendix M

Exceedance Plan

north

Composite Permeable Paviours
Area: 60m²
Total System Depth: 580mm
Crushed Stone Subbase Depth: 250mm
Crushed Stone Subbase Porosity: 30%
Geocellular Crate Area: 22.5m²
Geocellular crate depth 200mm
Geocellular Crate Porosity: 95%
Total System Attenuation Volume: 8.782m³
Infiltration Coefficient: 4.92 x 10⁻⁶

Geocellular
Tank Vent

Geocellular Soakaway 1
7m x 3m x 0.4m (L x W x D)
CL: 67.010
IL: 65.810
Top of Tank: 66.210
Cover to tank: 0.800m
Porosity: 95%
Volume: 7.987m³
Infiltration Coefficient: 4.92 x 10⁻⁶

Geocellular
Tank Vent

Ring Soakaway
1.5m Ø
CL: 67.270
IL: 64.000
Stone filled - Porosity = 33%
Volume: 2.376m³
Infiltration Coefficient (sides only): 4.92 x 10⁻⁶

Geocellular Attenuaiton Tank
4.0m x 2.0m x 0.4m (L x W x D)
CL: 67.270
IL: 66.200
Top of Tank: 66.600
Cover to tank: 0.670m
Porosity: 95%
Volume: 3.043m³
No infiltration (within 5m of foundations)

COOLHAM ROAD

Demarcation
Chamber

Foul connection
into Node 3504

Design Flow: 0.01 l/sec

Node 3504
CL: 67.25
IL: 65.44

0 4 8 12 16m
SCALE IN METRES
1:200

C:\Users\philallen\Motion\StaffSite - 1ectha 2501051\Drawings\2501051-500-P03-Drainage Strategy.dwg

Notes

1. This Drainage Strategy Plan is for planning purposes and does not constitute detailed designs and should not be used for construction purposes
2. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
3. This drawing has been based upon survey supplied information and Motion cannot guarantee the accuracy of the data provided.
4. The drainage levels are based on existing levels, but also proposed levels where existing site features present unusual changes in gradient.
5. Any discrepancies should be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
6. This drawing should be read in conjunction with all other relevant engineering details, drawings and specification.
7. 350mm minimum cover is to be provided for private pipes laid in soft/paved areas, with 900mm minimum cover to be provided for private pipes laid beneath roads / driveways unless not practicable. Where unachievable, shallow pipe drains may require protection using concrete surround or paving slabs bridging the trench, subject to the NHBC Inspector's requirements.
8. Manholes situated within areas accessible to motor vehicles are to be fitted with suitable strength covers and frames.
9. All RWP locations are indicative.
10. Foul layout is indicative (SVP locations TBC)

Legend

- Site Boundary
- Composite Permeable Pavement (see drawing for details)
- Surface Water Gravity Pipe
- Surface Water Manhole
- Foul water gravity pipe
- Foul water manhole
- Polypipe Linflex Filter Pipe
- Southern Water Public Foul Sewer
- Geocellular Soakaway (see drawing for details)
- Catchpit Manhole / Silt Trap

Rev.	Description	Drn	Chk	App	Date
P03	Third Issue	PA	PA	PA	19/11/2025
P02	Second Issue	PA	PA	PA	06/11/2025
P01	First Issue	PA	PA	PA	31/10/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Fowlers Land and New Homes

Project:
Land Adjoining No. 2 and No. 3
Townhouse Cottages, Thakeham

Title:
Drainage Strategy Layout

Scale: 1:200 (@ A3)

Drawing: 2501051-0500

Revision: P03