GeoSmart Information

SuDSmart Plus

Sustainable Drainage Assessment

Site Address

Land north of Chiswell Green Lane
Chiswell Green
St Albans

Grid Reference

E 512832 N 204703

Report Prepared for

McPartland Planning
10 Orient Close
St Albans
Hertfordshire
AL1 1AJ

Date

2022-07-05

Report Status

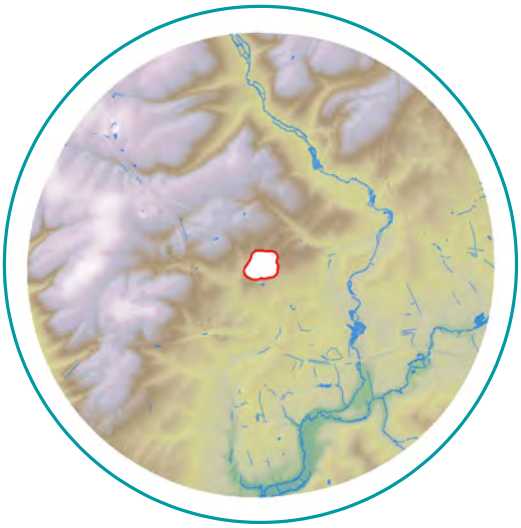
FINAL

Site Area

14.2 ha

Report Reference

75188.01.01R1



Discharge to sewer

SuDS features comprised of permeable surfacing, rain gardens, swales and infiltration/attenuation basins are proposed to attenuate a minimum of 1,978 m^3 of surface water runoff. The SuDS features would provide some water quality benefits (interception and filtration) prior to infiltrating to ground. Infiltration features should be sited at least 10 m from building foundations and 5 m from adjacent highways.

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1 Executive summary

This report assesses the feasibility of a range of Sustainable Drainage Scheme (SuDS) options in support of the Site development process. A SuDS strategy is proposed to ensure surface water runoff can be managed effectively over the lifetime of the development.

SuDS suitability

Risk	Issue	Result
Discharge Location	What is the infiltration potential at the Site?	Low[1]
	What is the potential to discharge to surface water features?	Low
	What is the potential to discharge to sewers?	Medium[2]
Flooding	What is the river (fluvial) flood risk at the Site?	Very Low
	What is the surface water (pluvial) flood risk at the Site?	Very Low[3]
	What is the groundwater flood risk at the Site?	Negligible
Pollution	Is the groundwater a protected resource?	Yes
	Is the surface water feature a protected resource?	N/A

[1]whilst initial mapping indicates a High potential for infiltration on the basis of the Site investigation undertaken by Structural Soils Ltd. (2022) this has been reduced to Low.

[2]A public surface water sewer is approximately 150 m to the east of the Site along Chiswell Green Lane.

[3]A High to Low risk is present in the north western corner of the Site, however, SuDS features are proposed outside the area mapped at risk.

Summary of existing and proposed development

The Site is currently used in an agricultural capacity for crop growth (micro-salad), cattle grazing and paddocks, and hay production, and has previously been used in a commercial capacity as a recreational sports ground for polo. A gravel track is on-Site to the south of the Site and four buildings are present, the largest being used for hay storage (drained via French drains and soakaway), a smaller shed used to grow micro salad, and two wooden stables used for hay storage. The Site has been confirmed to be 99 % greenfield in a report by Structural Soils in June 2021 (Appendix A).

Development proposals are for the erection of 327 residential dwellings comprising of:

- 180 three-bed dwellings;
- 115 two-bed dwellings; and

- 32 one-bed dwellings.

Associated access road, garden and amenity, and parking are also proposed, with primary vehicular access to the Site from the south along Chiswell Green Lane. Pedestrian and cycling access are also proposed to the east along The Croft.

Summary of discharge routes

GeoSmart's SuDS Infiltration Potential (SD50) map indicates the Site has a High potential for infiltration, primarily due to the anticipated high permeability of the underlying geology (sand and gravel). Despite the initial mapping, infiltration testing has been undertaken at the Site (Appendix D) confirming infiltration is not deemed feasible and therefore is not proposed.

Ordnance Survey (OS) mapping indicates a surface water feature is not located within 100 m of the Site.

The regulated drainage and water search included in Appendix C confirms the Site is located within 150 m of the public sewer network. According to a Utilities Assessment undertaken at the Site by MEC (2021) Thames Water have been contacted confirming an aggregable discharge rate of 10 l/s (Appendix E).

Runoff rate and attenuation requirements

Discharging off-Site requires 5,045.43 m^3 of attenuation to be provided to ensure there is no flooding within the development in all storm events up to and including the 1 in 100 year including a 40 % allowance for climate change. This volume is subject to the discharge rate being restricted to 10 l/s, as agreed with Thames Water.

Proposed SuDS strategy

SuDS features comprised of permeable surfacing, rain gardens, swales and attenuation/infiltration basins are proposed to attenuate a minimum of 1,978 m^3 of surface water runoff.

The proposed SuDS strategy would ensure surface water runoff is stored on-Site in SuDS features for the 1 in 100 year event including a 40 % allowance for climate change and will not cause flooding to the proposed development in accordance with DEFRAs non-statutory technical standards (DEFRA, 2015).

SuDS & drainage network maintenance

The management and maintenance of the SuDS features, in line with the details and schedules outlined in Section 10 of this report, will be undertaken by contractors appointed by the owners and occupiers of the new residential buildings, where payments for the works will form part of the property deeds and / or rental agreements.

2 Proposed SuDS strategy

The most suitable SuDS options are outlined below and a SuDS strategy schematic is shown overleaf. Supporting information is provided in subsequent sections.

Table 1. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting, lined permeable surfacing, planted rain gardens, swales and a detention basin/wetland features.
Discharge location	Public surface water sewer.
Discharge rate	10 l/s (as agreed with Thames Water).
Total Attenuation Provided	2,015.2 m^3
Total Attenuation Required	1,978.0 m^3
Freeboard Storage Provided	37.2 m^3

2. Proposed SuDS scheme layout

- Rainwater harvesting butt
- Rain Garden
- Swale
- Basin
- Roof drainage network
- Road drainage network
- Exceedance flow routes
- Outflow
- Hydro brake

An assumed area of 23.04 m^2 of permeable paving has been included for each of the dwellings for the driveways. To avoid the schematic being too congested these areas have been omitted. The final configuration of these features will be determined at the detailed design phase.

Roof drainage is proposed to be drained via infiltration through individual plot rain gardens and rainwater harvesting butts before being conveyed to the permeable paving via surface water network to detention basins prior to being discharged off-site.

Road drainage is proposed to be drained via road gullies in a separate network to swales/detention basins, to provide filtration of potential pollutants.

The Site is to be drained via 3 sub-catchments, to the north, to the south and to the east. To allow for gravity drainage, 3 separate connections are proposed as agreed with Thames Water.

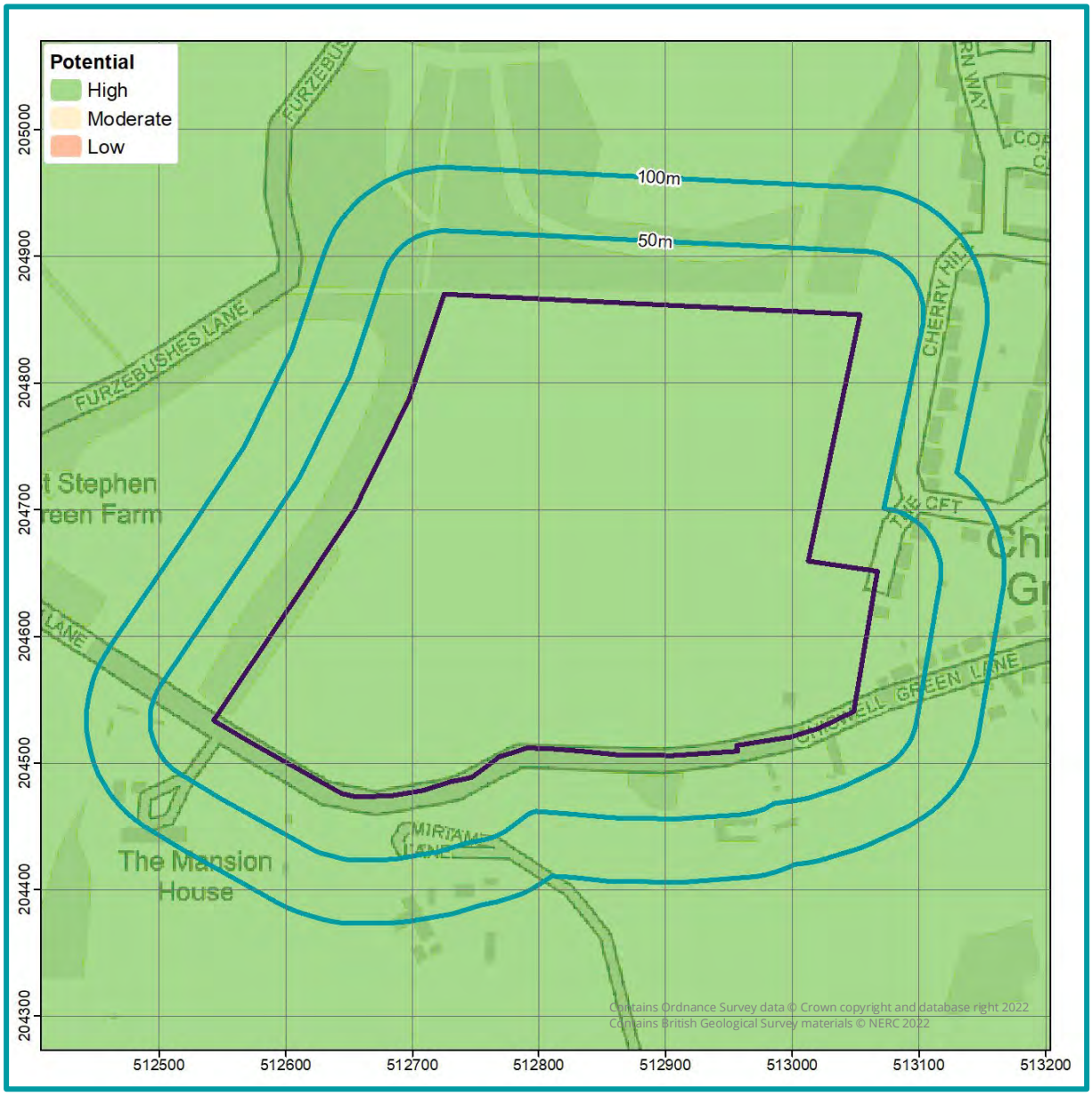
Schematic is not to scale

3 Site analysis

Site location

Figure 1. Aerial Imagery (Bluesky, 2022)

Figure 2. SuDS infiltration suitability (SD50) map (GeoSmart, 2022)



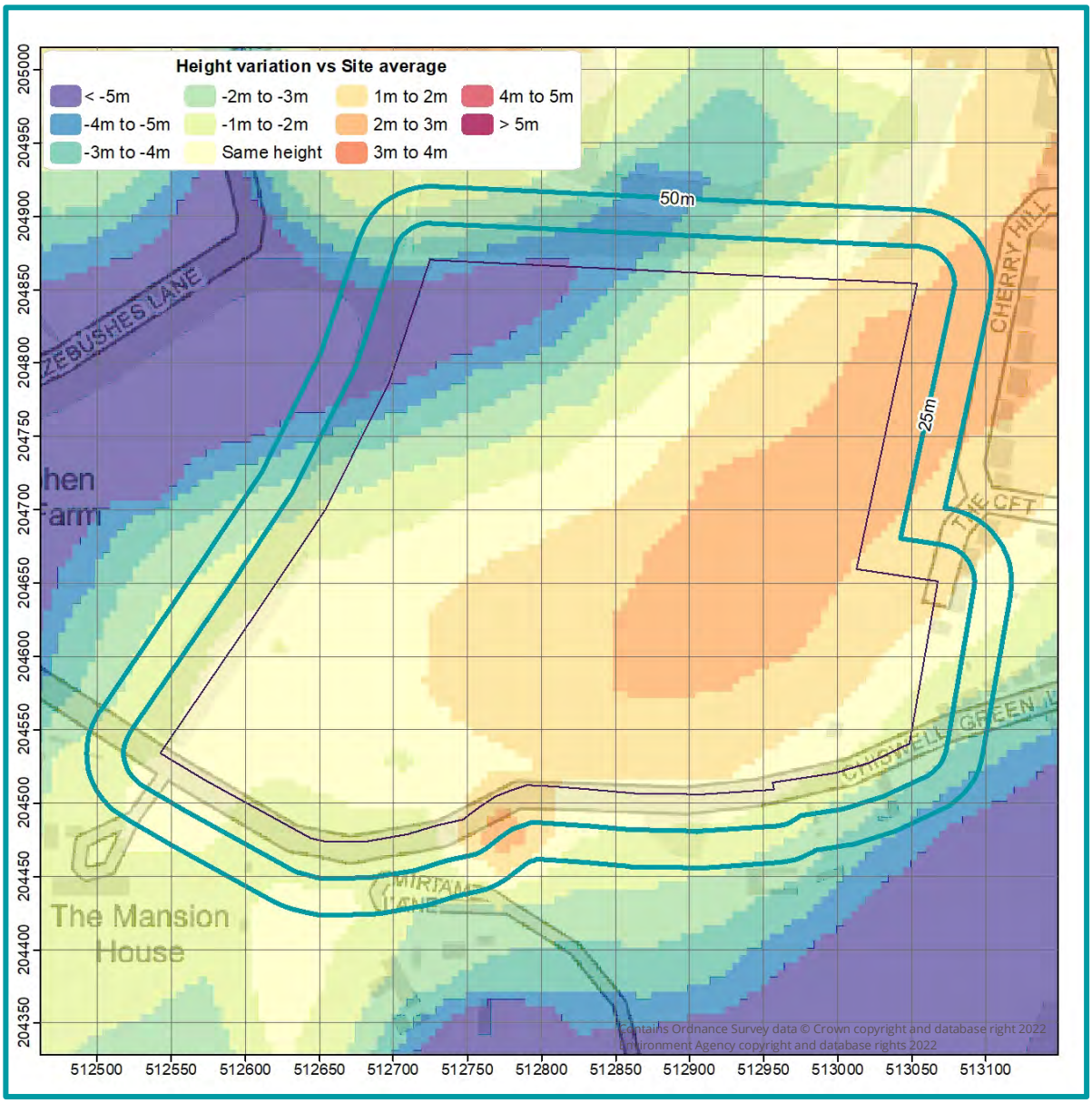
The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the potential for infiltration drainage at the Site and indicates where further assessment is recommended. The map combines information on the thickness and permeability of the underlying material and the depth to the high groundwater table. It supports conceptual Site drainage design and the planning of further Site investigation.

There is a High potential for infiltration SuDS across the Site. It is likely that the underlying geology at the Site has high permeability and an infiltration SuDS scheme has the potential to be possible at the Site.

Whilst the ground potential has been initially mapped as being potentially conducive to infiltration features, Site investigation has been carried out by Structural Soils Ltd. (2022) (ref: 563403/AC) comprising of five trial pits across the Site identifying is not feasible. At four of

the trial pits the tests failed to drain any significant volume of water with an infiltration rate being too low to calculate with the remaining producing a borderline result, unlikely to achieve the required 24 hour drain down requirements. The full report is included within Appendix D.

Figure 3. Site topography (GeoSmart, 2022)

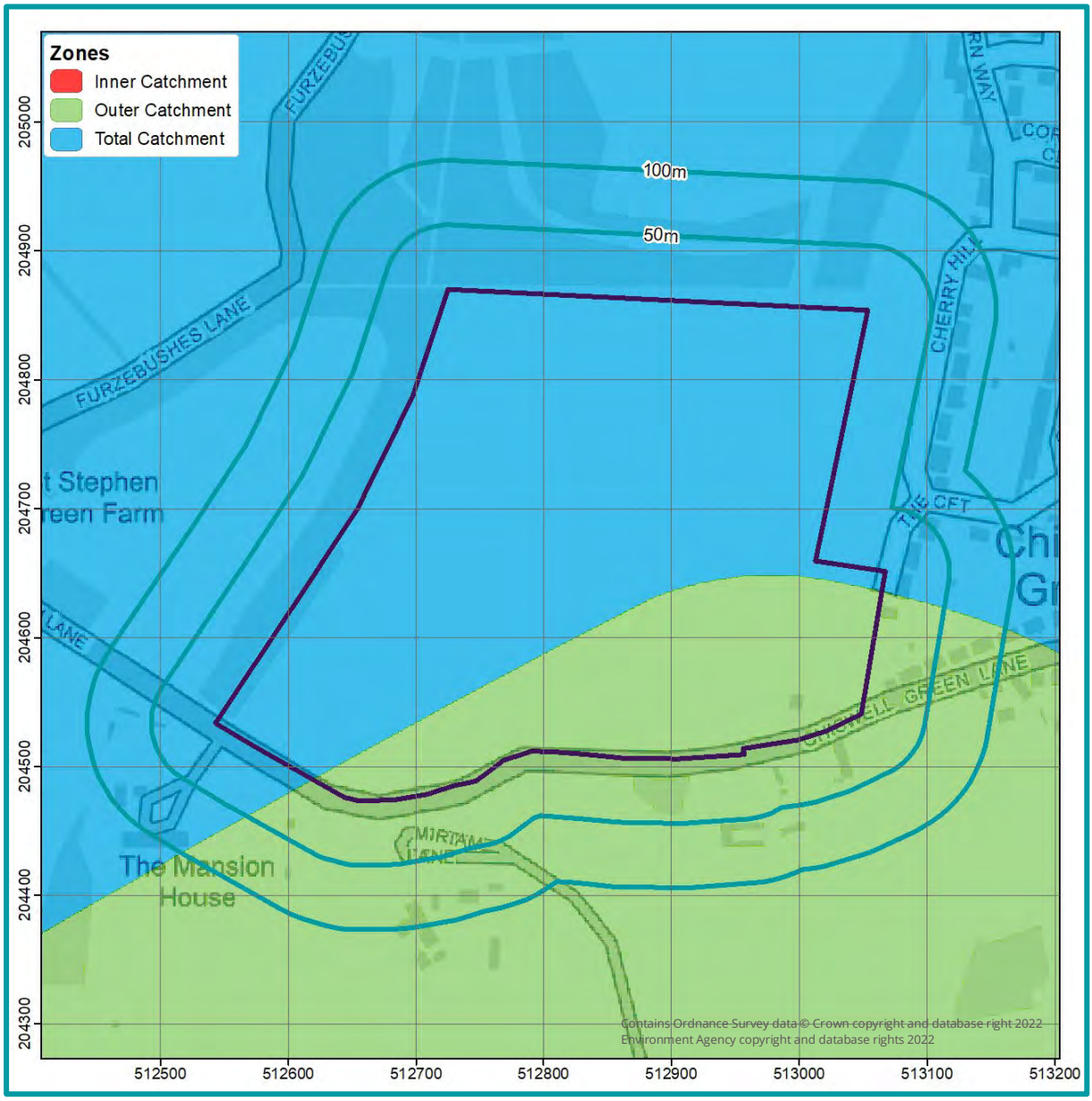


An assessment of the topography at the Site has been undertaken using LiDAR DTM5 elevation data to identify the general slope and any localised depressions. The mapping shows a comparison between average ground levels on the Site with ground levels in the surrounding area.

The general ground levels on the Site are between 97.67 and 105.36 mAOD with the Site falling towards the north west, west, and south from a central high point. This is based upon a Site specific topographic survey undertaken by Tower Surveys in June 2021 (Appendix D).

Due to the topographical nature of the Site, the development has been divided into 3 sub catchments to allow for gravity drainage. These are detailed further in the report.

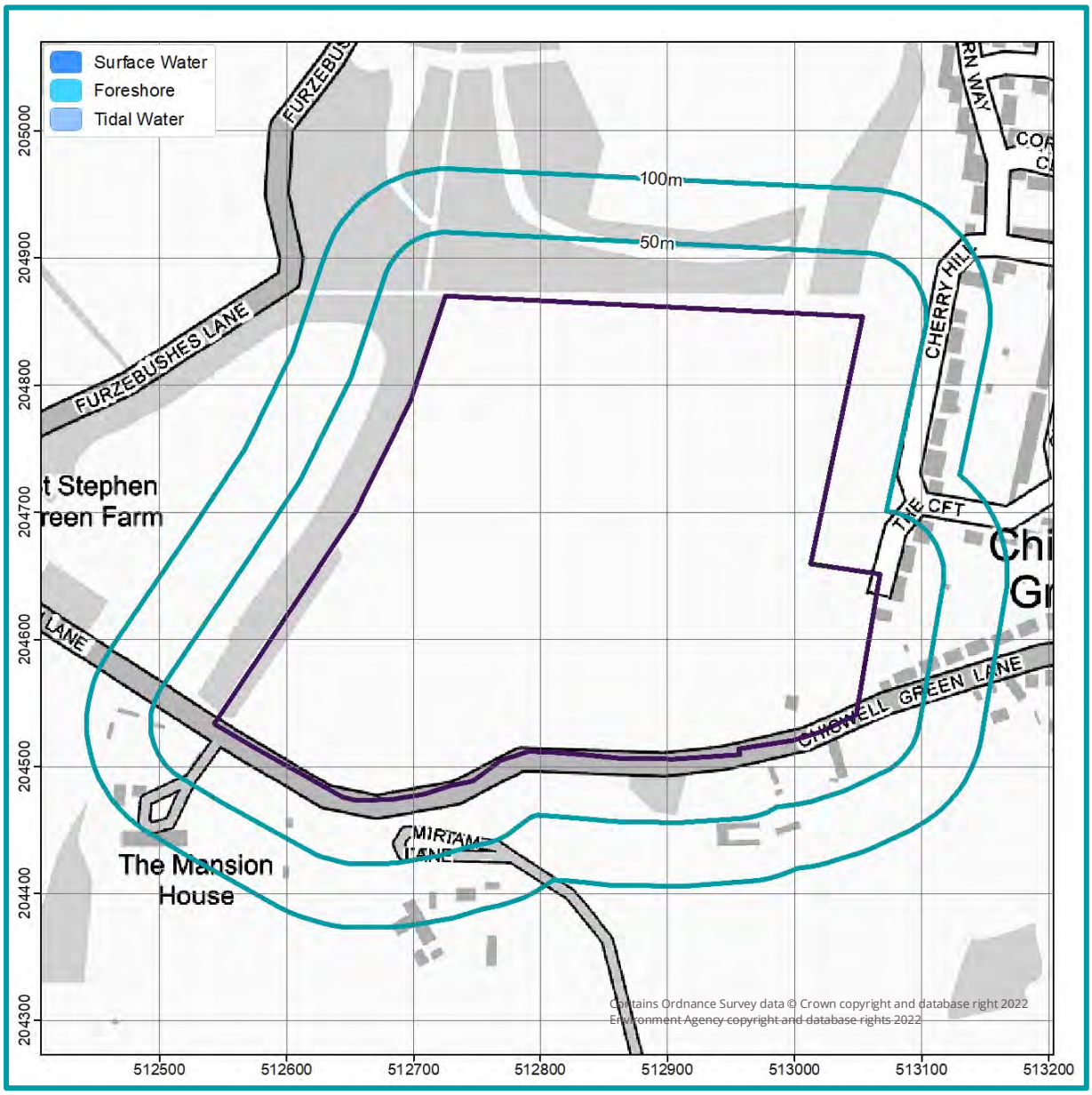
Figure 4. Source protection zone map (EA, 2022)



An assessment of the EA's groundwater Source Protection Zones (SPZs) has been undertaken within the vicinity of the Site and confirms the Site lies within a total groundwater Source Protection Zone (SPZ III) and an outer groundwater Source Protection Zone (SPZ II).

If further analysis is required, this would involve a review of Site specific contaminated land data. If hazards are identified, it is recommended that the Local Authority and the Environment Agency are contacted to confirm the susceptibility of any SPZs within the wider area.

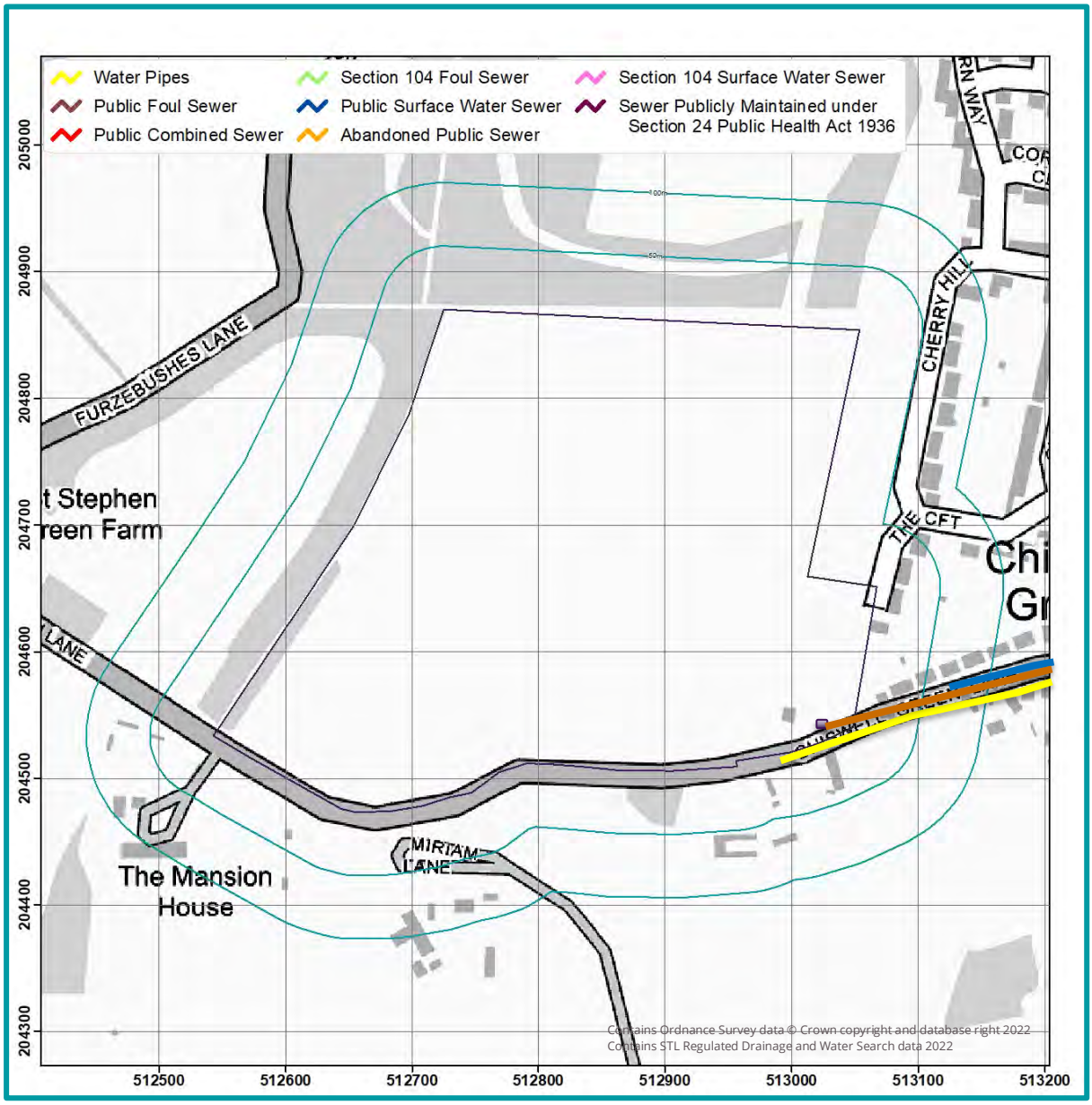
Figure 5. Surface water features map (EA, 2022)



OS mapping indicates there are no surface water features located within 100 m of the Site. According to the EA's Magic Map, the Site is not within 250m of a SSSI or SPA.

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency (EA) to confirm the presence, location and condition of any additional unmapped surface water features.

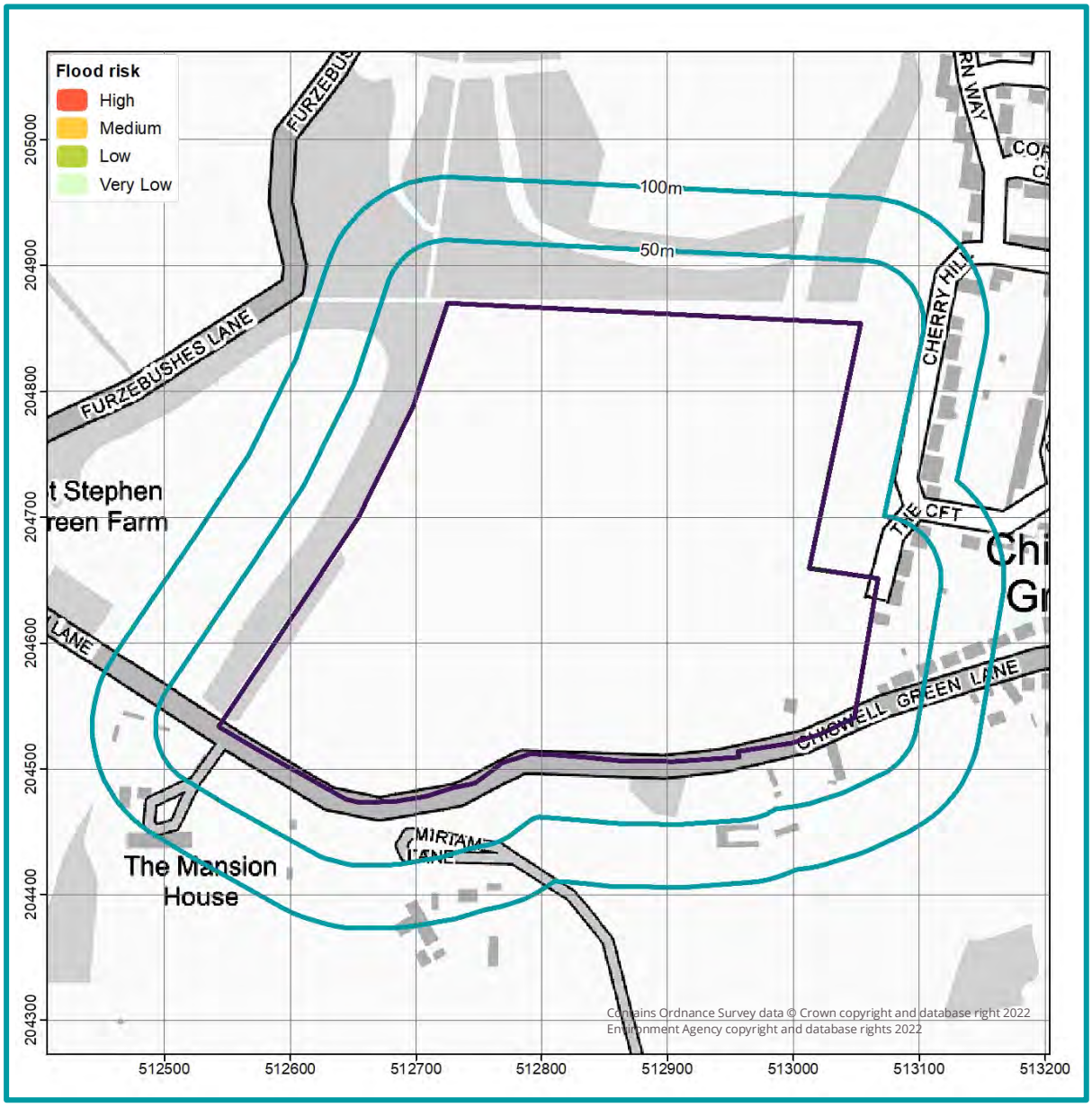
Figure 6. Sewer features map (OS & STL, 2022)



GeoSmart has undertaken an assessment of the location of sewer features within the vicinity of the Site. There is a public surface water sewer, located 150 m to the east along Chiswell Green Lane.

Further analysis of the connections and condition of the public surface water drainage system should be undertaken by carrying out a CCTV survey or by contacting the drainage provider or the Local Council to confirm the presence, location and condition of the sewer. Consultation with the drainage provider would also be required to determine that sufficient capacity is available to accept the proposed discharge, and to gain permission to connect if required.

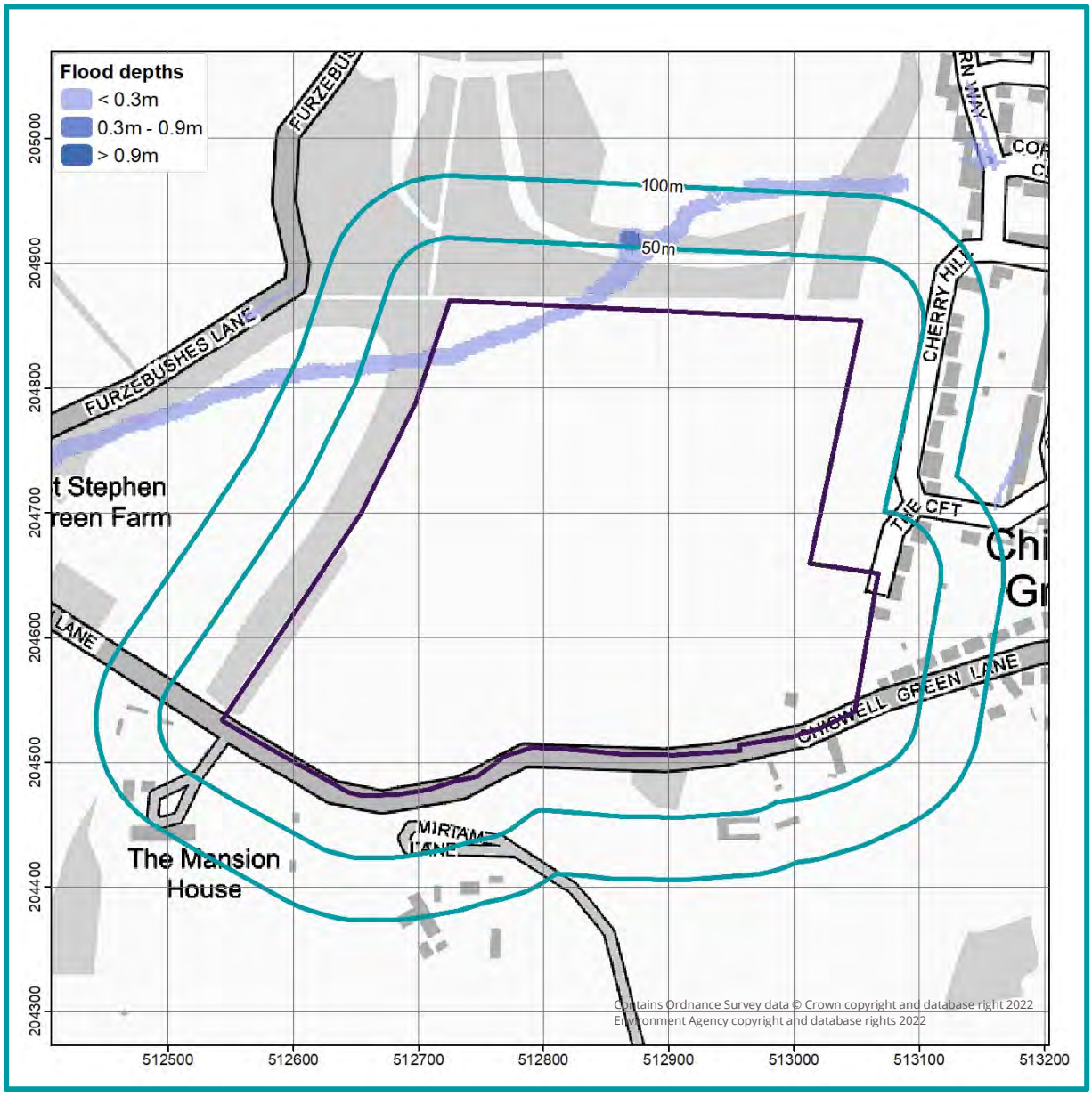
Figure 7. Risk of flooding from rivers & sea map (EA, 2022)



According to the EA's Risk of Flooding from Rivers and the Sea (RoFRS) map, the Site has a Very Low risk of flooding from fluvial or coastal flooding, with less than 0.1 % annual probability of flooding, therefore the SuDS design is unlikely to be affected.

A separate Flood Risk Assessment has been undertaken (ref: 75188), where the potential risks to the development are discussed further.

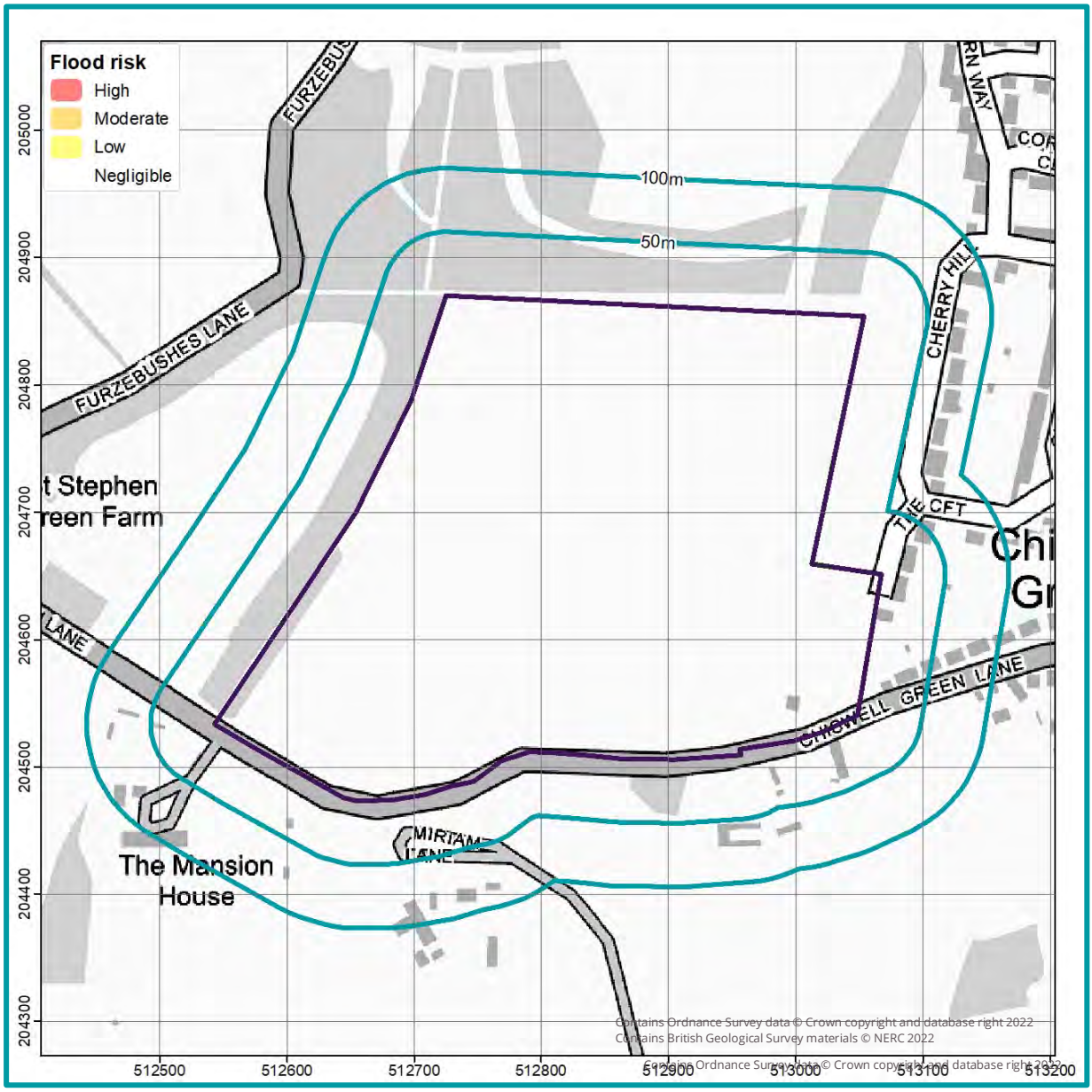
Figure 8. Risk of surface water flooding map (EA, 2022)



GeoSmart have undertaken an assessment of the risk of flooding from surface water (pluvial) sources within the vicinity of the Site using the EA's Risk of Flooding from Surface Water (RoFSW) mapping. The EA's mapping confirms the Site is considered to be at Very Low to High risk of surface water flooding, although areas affected are constrained to the north western corner. The above map shows the extent and depth of flooding during a 1 % annual probability (1 in 100 year) event, this confirms there are areas where flooding could occur in a 1 in 100 year event. Flooding in these areas may constrain certain types of SuDS features being used.

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency to confirm the pluvial flood risk, flood depths and velocities where applicable.

Figure 9. Groundwater flood risk (GW5) map (GeoSmart, 2022)



GeoSmart have undertaken an assessment of the risk of flooding from groundwater within the vicinity of the Site. GeoSmart's Groundwater Flood Risk Screening (GW5) map confirms the Site has a Negligible risk of groundwater flooding during a 1 % annual probability (1 in 100 year) event.

4 Site context

Site information

The purpose of this report is to assess the potential for disposing of surface water through a Sustainable Drainage System (SuDS) for the site of Land north of Chiswell Green Lane, Chiswell Green, St Albans (the Site). The Site is located in a setting of agricultural and residential use. The general ground levels on the Site are between 97.67 and 105.36 mAOD with the Site falling towards the north west, west, and south from a central high point.

Development

The Site is currently used in an agricultural capacity for crop growth (micro-salad), cattle grazing and paddocks, and hay production, and has previously been used in a commercial capacity as a recreational sports ground for polo. A gravel track is on-Site to the south of the Site and four buildings are present, the largest being used for hay storage (drained via French drains and soakaway), a smaller shed used to grow micro salad, and two wooden stables used for hay storage. The Site has been confirmed to be 99 % greenfield in a report by Structural Soils in June 2021 (Appendix A).

Development proposals are for the erection of 327 residential dwellings comprising of:

- 180 three-bed dwellings;
- 115 two-bed dwellings; and
- 32 one-bed dwellings.

Associated access road, garden and amenity, and parking are also proposed, with primary vehicular access to the Site from the south along Chiswell Green Lane. Pedestrian and cycling access are also proposed to the east along The Croft.

Site plans are included within Appendix A.

Geology, permeability and thickness

British Geological Survey (BGS) national superficial and bedrock geology mapping confirms the geological formations underlying the Site and each formation may have a range of permeability.

Table 2. Site Geology

Geology present on-Site		Potentially permeable?
Superficial geology (Figure 10)	Kesgrave Catchment Subgroup (KGCA) (sand and gravel) covering 80 % of the Site	✓
Bedrock geology (Figure 11)	Lewes Nodular Chalk Formation And Seaford Chalk Formation (undifferentiated) (LESE) (chalk)	✓

Site investigation has been undertaken at the Site by Structural Soils Ltd. (2022) comprising of two boreholes at the Site.

Borehole 1 confirms the underlying deposits at the Site comprise of grass over friable slightly gravelly sandy silt to a depth of 0.30 m below ground level (bgl), overlying sand to a depth of 1.00 m bgl, overlying clay to a depth of 2.50 m bgl, where the borehole was terminated. Groundwater was not encountered throughout the borehole log.

Borehole 2 confirms the underlying deposits at the Site comprise of grass over friable slightly gravelly sandy silt to a depth of 0.30 m bgl, overlying sand to a depth of 1.00 m bgl, overlying clay to a depth of 2.00 m bgl, overlying sand to a depth of 2.50 m bgl, where the borehole was terminated. Groundwater was not encountered throughout the borehole log.

A review of the BGS borehole database (BGS, 2022) indicates the nearest and most relevant borehole (ref: TL10SW22) is 20 m to the south of the Site boundary at an elevation of 103 mAOD and indicates glacial sand and gravel to 8.0 m below ground level (bgl) underlain by upper chalk to 8.02 bgl where the borehole was terminated. Groundwater was not encountered.

Depth to groundwater

The SuDS system should be designed to operate in periods of extreme groundwater levels.

According to borehole data and GeoSmart's Groundwater Flood Risk (GW5) map, shallow groundwater is unlikely to be an issue at the Site.

The base of the infiltration system needs to be 1 m above the expected seasonal high-water table. Passage through unsaturated soil is important for improving the quality of infiltrating water before it reaches the water table.

Ground conditions

Infiltration SuDS features are not proposed at the Site, therefore a detailed investigation into the ground conditions is not required.

Figure 10. Superficial Geology (BGS, 2022)

Figure 11. Bedrock Geology (BGS, 2022)

Water quality

Whilst the Site lies within an SPZ as infiltration features are not proposed further assessment of historical land uses is not considered necessary.

5 National & local policy context

National Guidance

CIRIA SuDS Manual (C753) (2015)

A development should utilise sustainable drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1. Use infiltration techniques, such as porous surfaces in non-clay areas,
2. attenuate rainwater in ponds or open water features for gradual release,
3. attenuate rainwater by storing in tanks or sealed water features for gradual release,
4. discharge rainwater direct to a watercourse,
5. discharge rainwater to a surface water sewer / drain,
6. discharge rainwater to the combined sewer.

Defra - Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems (2015)

Peak Flow control

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.

Volume control

Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event. The runoff volume must be discharged at a rate that does not adversely affect flood risk.

The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the Site for a 1 in 30 year rainfall event.

Ministry of Housing, Communities & Local Government – National Planning Practice Guidance: Flood risk assessments: climate change allowances (2014)

The Peak rainfall intensity allowances section provides advice on the increased rainfall effects on river levels and land and urban drainage systems. As of May 2022, the applicable climate change allowance is defined by specific Management Catchment for the 1 in 30 (≥ 3.3% AEP) and 1 in 100 (< 3.3 to 1% AEP) year event.

As the Site is located within the Colne Management Catchment the following climate change allowances are applicable.

Table 3. Colne Management Catchment peak rainfall allowances

Colne Management Catchment	3.3% Annual exceedance rainfall event		1% Annual exceedance rainfall event	
	2050s	2070s	2050s	2070s
Central	20%	25%	20%	25%
Upper end	35%	35%	40%	40%

The drainage system should be designed to make sure there is no increase in the rate of runoff discharged from the Site for the upper end allowance.

Where on-Site flooding for the upper end allowance presents a significant flood hazard (for example, depths and velocities of surface water runoff cause a significant danger to people), you will need to take further mitigation measures to protect people and property (for example, raising finished floor levels). As a minimum, there should be no significant flood hazard to people from on-Site flooding for the central allowance.

Local Policy

JBA Consulting - South West Hertfordshire Level 1 Strategic Flood Risk Assessment (2018)

"*11.2.3 Runoff rates and storage volumes Hertfordshire guidance on designing runoff rates and storage volumes is in keeping with, or an improvement on, best practice (Defra Non-Statutory Technical Standards for Sustainable Drainage), with the following requirements for developments on greenfield and previously developed sites:*

- *The peak runoff rate and volume from the development for the 1 in 1-year and the 1 in 100-year events must not exceed the peak greenfield runoff rate for the same event. • Flooding must not occur on any part of the site for a 1 in 30-year rainfall event.*

- *Flooding must not occur during a 1 in 100-year plus climate change rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development.*
- *Rainfall in excess of a 1 in 100-year plus climate change rainfall event must be managed via exceedance routes that minimise the risks to people and property."*

"An allowance in calculations must also be made for 'urban creep', the impact of permeable surfaces in a development (e.g. front gardens), gradually becoming paved over to form impermeable extensions (such as patios or driveways). The urban creep allowance referenced within the latest Hertfordshire SuDS Design Guidance should be applied."

"*11.2.4 Discharge location*

The destination of surface water that is not collected for use on site should be prioritised, with water re-use preferred, followed by infiltration, then discharge to surface waters, such as a watercourse or lake. New connections to existing surface waters or combined sewers are the least preferred options, and should only be considered where other discharge routes are proven to be infeasible. Discharge to a foul sewer is not a viable option, as it is a major contributor to sewer flooding."

"Where infiltration SuDS are proposed for anything other than clean roof drainage in a SPZ1, a hydrogeological risk assessment should be undertaken, to ensure that the system does not pose an unacceptable risk to the source of supply."

Hertfordshire County Council - LLFA Summary Guidance for developers

"Technical Requirements We require that the drainage assessment/ FRA demonstrates the following as a minimum;

1. Runoff rates

Peak discharge rates from site will not increase as a result of the proposed development, up to a 1 in 100 chance in any year including an allowance for climate change storm event. We expect all applicants to achieve greenfield runoff rates for greenfield development sites and to aim to provide greenfield run-off rates for all brownfield sites to reduce the impact of the development on the surface water drainage infrastructure

2. Storage volumes

Storage volumes for all events up to a 1 in 100 chance in any year including an allowance for climate change storm event will be provided on site utilising above ground storage where practicable. The site will not flood from surface water up to a 1 in 100 year chance in any year including an allowance for climate change event, OR surface water flooding will be safely contained on site up to this event, ensuring that surface water runoff will not increase flood risk to the development or third parties. There should be no flooding within the site for up to and including the 1 in 30 year rainfall event.

3. Sustainable drainage techniques

Sustainable Drainage Systems (SuDS) such as green roofs, ponds, swales and permeable pavements will be used.

SuDS are an approach to managing surface water run-off which seeks to mimic natural drainage systems and retain water on or near the site as opposed to traditional drainage approaches which involve piping water off site as quickly as possible. SuDS offer significant advantages over conventional piped drainage systems in reducing flood risk by attenuating the rate and quantity of surface water run-off from a site, promoting groundwater recharge and biodiversity benefits, as well as improving water quality and amenity value.

The SuDS hierarchy should be followed as you design the site. The methods at the top of the hierarchy are preferred because they are beneficial in terms of sustainability, water quality and biodiversity. The hierarchy should be used in descending order, with any obstacles to the use of SuDS methods clearly justified. If the 'lack' of space is given as a reason for not implementing SuDS we will require evidence that an alternative layout and consideration of other SuDS techniques has been considered. If the 'cost' is given as a reason for not implementing s SuDS system evidence should be provided to the LPA."

"6. Infiltration rates

Infiltration rates should be worked out in accordance with BRE Digest 365. If it is not feasible to access the site to carry out soakage tests before planning approval is granted, a desktop study could be undertaken looking at the underlying geology of the area however experience has shown that these should not be used for site specific analysis. We will therefore require you to assume a worst-case infiltration rate for that site and provide a feasible alternative drainage scheme which gives priority to above ground SuDS techniques."

6 Storage, volume and peak flow rate

Table 4. Storage requirements at the proposed development Site (Discharge runoff to surface water sewer)

Attenuation scenario		Attenuation required (m^3)	Explanation	
Discharge runoff to / surface water sewer	1 in 1 year	1063.02	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 1 year (8 hour, Critical Storm Duration) event*.	
	1 in 30 year	2,545.63	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 30 year (12 hour, Critical Storm Duration) event*. Flooding of the Site of 907.53 m^3 should be contained within permeable landscaped areas within the Site to ensure no flooding of internal areas during the 1 in 100 year storm event.	A further 1,592.27 m^3 should be managed within overland flow routes to ensure there is no increase in flood risk in all events up to the 1 in 100 year including 40 % allowance for climate change.
	1 in 100 year	3,453.16	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year (12 hour, Critical Storm Duration) event*.	
	1 in 100 year including 40 % CC	5,045.43	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year (20 hour, Critical Storm Duration) event including a 40 % allowance for climate change*.	

*See Appendix B for associated runoff and discharge calculations.

Surface water runoff

An increase in impermeable area on-Site will result in greater rainfall runoff. Reduction in runoff will help mitigate flood risk both on and off-Site. Further information on the surface water runoff calculations is provided in Section 12 'Background Information'.

Guidance

The Non-Statutory Technical Guidance for SuDS (Defra, March 2015) states:

"Where reasonably practicable, for Greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the Greenfield runoff volume for the same event. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the Greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event."

Table 5. Change in impermeable area associated with the development

Total Site area	142,500 m^2
Impermeable area (and as a percentage of the total area of the proposed development footprint of 142,500 m^2)	
Pre-development	Post-development
810 m^2 (1 %)	44,500 m^2 (31 %)*
Impermeable Land use: Building cover and hardstanding Permeable Land use: Greenfield	New **impermeable** land use: 20,700 m^2 Roads and Pavements 23,800 m^2 Building Cover New **permeable** land use: 27,500 m^2 of Permeable Driveways and Patios 33,000 m^2 of Gardens 37,500 m^2 of Open Amenity Space

*A 10 % allowance for Urban Creep has been included within calculations and so an impermeable area of 48,950 m^2 has been used.

Guidance

"The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event' and 'flooding does not occur during a 1 in 100 year rainfall event in any part

of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development"

(Defra, March 2015, non-statutory guidance).

Peak discharge rates

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate. Further information on the calculation and control of peak discharge rates is provided in Section 12 'Background Information'.

Table 6. Peak discharge rates associated with the development

Rainfall event	Greenfield runoff rates (l/s)	Existing runoff rates[1] (l/s)	Potential runoff rates without attenuation (l/s)	Potential minus existing (l/s)
QBAR	25.10	N/A	N/A	N/A
6 hour 1 in 1 year	21.34	51.60	91.74	40.14
6 hour 1 in 10 year	40.67	86.13	150.54	64.41
6 hour 1 in 30 year	56.23	109.40	194.50	85.10
6 hour 1 in 100 year	80.08	142.99	254.22	111.23
6 hour 1 in 100 year + 20% CC	N/A	N/A	305.06	162.08
6 hour 1 in 100 year + 40% CC	N/A	N/A	355.91	212.92

[1] Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the IoH124 method.

Total discharge volumes

The table below presents discharge volumes for a range of storm events used to assess the impact of the proposed development and calculate the required storage volumes. Further information on the calculation of total discharge volumes is provided in Section 11 'Methodology and Limitations'. Total discharge volumes associated with the development.

Table 7. Total discharge volumes associated with the development

Rainfall event	Greenfield runoff volume (m^3)	Existing runoff volume[2] (m^3)	Potential runoff volume without attenuation (m^3)	Potential minus existing (m^3)
QBAR	1175.63	N/A	N/A	N/A
6 hour 1 in 1 year	1099.96	1114.55	1981.60	867.05
6 hour 1 in 10 year	1836.97	1860.38	3251.57	1391.20
6 hour 1 in 30 year	2332.01	2362.94	4201.17	1838.23
6 hour 1 in 100 year	3048.08	3088.50	5491.17	2402.67
6 hour 1 in 100 year + 20% CC	N/A	N/A	6589.40	3500.90
6 hour 1 in 100 year + 40% CC	N/A	N/A	7687.64	4599.14

[2] Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the IoH124 method.

Critical storm duration and volume requirements

Storage volumes for a range of return periods including the 1 in 1 year, 1 in 30 year, 1 in 100 year and 1 in 100 year plus climate change (40 %) events have been calculated to assess the impact of the proposed development. The required storage volumes for attenuation features have been calculated for the critical storm durations, limited to a maximum discharge rate of 10 l/s, as agreed with Thames Water.

Table 8. Critical Storm Duration and Attenuation volume requirements

Return Period	Runoff rate restriction (l/s)	Critical Storm Duration (hr)	Attenuation volume required (m^3)
1 n 1 year	10	8	1,063.02
1 in 30 year		12	2,545.63
1 in 100 year		12	3,453.16
1 in 100 year including a 40 % climate change		20	5,045.43

Catchments

Due to the agreed three connections to the Thames Water sewer, three separate networks are proposed, ground re-profiling may be required in sections of the Site to ensure this is achievable via gravity drainage. The areas of the catchment have been calculated as a percentage of the whole Site, and the runoff volume required for the total Site has been worked out in accordance with these percentages and attributed to each catchment. Volumes have been calculated for the 1 in 100 year event plus a 40 % allowance for climate change with a 10 % allowance for urban creep.

Table 9. Sub-catchment areas a percentages

Sub-catchment	Area (m^2)	Percentage of whole Site (%)	Attenuation required for discharge off-Site (m^3)
1	74,325	51	2,573.15
2	34,880	24	1,210.90
3	37,015	25	1,261.38
		Total	5,045.43

Figure 12. Sub-Catchments Proposed

7 Runoff destination

Options for the destination for the runoff generated on-Site have been assessed in line with the prioritisation set out in the Building Regulations Part H document (HM Government, published in 2010 and updated in 2015) and Defra's Non-statutory Technical Standards for SuDS (2015).

Flow attenuation using infiltration SuDS (discharge to ground) is generally the preferred option. If discharge to ground is not available, runoff discharge to surface water is the other preferred method. Only if these two options are impractical should discharge to the sewer network be considered.

Discharge to ground

The Site has High potential for infiltration, with anticipated permeable underlying sand and gravel.

Whilst the ground potential has been initially mapped as being potentially conducive to infiltration features, Site investigation has been carried out by Structural Soils Ltd. (2022) (ref: 563403/AC) comprising of five trial pits across the Site identifying is not feasible. At four of the trial pits the tests failed to drain any significant volume of water with an infiltration rate being too low to calculate with the remaining producing a borderline result, unlikely to achieve the required 24 hour drain down requirements. The full report is included within Appendix D.

Discharge to surface watercourse

No mapped surface water features are within 500 m of the Site.

Discharge to sewer

According to the regulated water and drainage search (Appendix C) there is a surface water sewer within Chiswell Green Lane that runs in proximity to the Site. Discharge to sewer is likely to be feasible and the most appropriate method of discharge. The local sewer company (Thames Water) has been contacted as part of the Utilities Assessment (Appendix E) confirming three agreeable points of connection at a total discharge rate of 10 l/s.

8 Water quality

A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution. This can be effectively managed by an appropriate "train" or sequence of SuDS components that are connected in series. The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be adequately treated with SuDS.

The minimum number of treatment stages will depend on the sensitivity of the receiving water body and the potential hazard associated with the proposed development SuDS Manual (CIRIA, 2015). The proposed development is a combination of very low (roof water) to low hazard (runoff from car parking and road). The Site does lie within an SPZ and therefore additional treatment stages may be required.

Table 10. Level of hazard

Hazard	Source of hazard
Very Low	Residential roof drainage
Low	Residential, amenity uses including low usage car parking spaces and roads, other roof drainage.
Medium	Commercial, industrial uses including car parking spaces and roads (excluding low usage roads, trunk roads and motorways).
High	Areas used for handling and storage of chemicals and fuels, handling of storage and waste (incl. scrap-yards).

The recommended minimum number treatment stages suggested for the different runoff waters identified for the proposed development is highlighted in the table below.

Table 11. Minimum number of treatment stages for runoff

		Sensitivity of the receiving water body		
		Low	Medium	High
Hazard	Low	1	1	1
	Med	2	2	2
	High	3	3	3

9 Proposed SuDS strategy

Sustainable drainage systems

DEFRA's non-statutory requirements for SuDS require the below ground drainage systems to have the capacity to accommodate at least the 1 in 30 year event and to manage the 1 in 100 year event without flooding of on-site buildings and substations. All runoff should be managed on-Site though for the 1 in 100 year event, accounting for the maximum impacts of climate change to ensure flood risk is not increased to third-parties.

It is assumed that drainage from areas outside the development footprint will continue to use existing drainage arrangements.

A surface water drainage strategy (summarised in Section 2 of this report) includes the following SuDS features to intercept, attenuate and treat surface water runoff.

SuDS Strategy:

Infiltration to ground is not achievable at the Site, and water features were not identified or available, therefore surface water runoff will be managed within SuDS features and discharged to the public sewer network.

Table 12. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting, lined permeable surfacing, planted rain gardens, swales and a detention basin/wetland features.
Discharge location	Public surface water sewer.
Discharge rate	10 l/s (as agreed with Thames Water).
Total Attenuation Provided	5,096.39 m^3
Total Attenuation Required	5,045.43 m^3
Freeboard Storage Provided	50.96 m^3

Table 13. Proposed SuDS sizing (dimensions) and attenuation volumes – **Catchment 1**

Rainwater Harvesting	Rainwater harvesting butts should be established for each proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by Rainwater Harvesting has not been considered within the Preliminary SuDS schematic.
Lined permeable paving	An area of 23.04 m^2 of permeable paving is assumed for each house based on the average parking space of 2.4 m x 4.8 m with an average of two spaces per dwelling. This equates to a total area of approximately 3,041.28 m^2 of permeable paving; to a depth of 0.4 m and underlain with type-3 aggregate material (30% porosity) equates to c. 364.95 m^3.
Lined Rain Gardens	Planted rain gardens should be sited in garden areas to provide storage of runoff from development roofs and provide amenity and biodiversity benefit to each plot. A 2 m^2 lined rain garden with a 0.25 depth of soil and a 0.2 m depth of porous aggregate (30 % porosity) including 0.1 m storage above the topsoil would attenuate 0.32 m^3 each. This would combine for a total of 42.24 m^3 of attenuation.
Lined Swale	Two lined swales along the western boundary for a total length of 180 m (two lengths of 80m) (1:3 slope) with a width of 3.5 m, basal width of 0.5 m and a depth of 0.5 m would attenuate 180 m^3 of runoff prior to conveyance to the infiltration basin. The swale is proposed to collect runoff from the proposed access road to allow for capture and filtration of any potential pollutants.
Detention Basin	A lined detention basin located within the Site with a volume of approximately 2,000 m^3 (2000 m^2 to an assumed depth of 1.0 m) will be used to attenuate and filtrate runoff. This will avoid potential pollutants being discharged off-site and will also provide a biodiversity/ amenity feature for the Site.
Total Attenuation Provided	2,587.19 m^3
Total Attenuation Required	2,573.15 m^3
Freeboard Storage Provided	14.04 m^3

Table 14. Proposed SuDS sizing (dimensions) and attenuation volumes – **Catchment 2**

Rainwater Harvesting	Rainwater harvesting butts should be established for each proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by Rainwater Harvesting has not been considered within the Preliminary SuDS schematic.
Lined permeable paving	An area of 23.04 m^2 of permeable paving is assumed for each house based on the average parking space of 2.4 m x 4.8 m with an average of two spaces per dwelling. This equates to a total area of approximately 1,520.64 m^2 of permeable paving; to a depth of 0.4 m and underlain with type-3 aggregate material (30% porosity) equates to c. 182.48 m^3.
Lined Rain Gardens	Planted rain gardens should be sited in garden areas to provide storage of runoff from development roofs and provide amenity and biodiversity benefit to each plot. A 2 m^2 lined rain garden with a 0.25 depth of soil and a 0.2 m depth of porous aggregate (30 % porosity) including 0.1 m storage above the topsoil would attenuate 0.32 m^3 each. This would combine for a total of 21.12 m^3 of attenuation.
Detention Basin	A lined detention basin located within the Site with a volume of approximately 1,010 m^3 (1,010 m^2 to an assumed depth of 1.0 m) will be used to attenuate and filtrate runoff. This will avoid potential pollutants being discharged off-site and will also provide a biodiversity/ amenity feature for the Site.
Total Attenuation Provided	1,213.60 m^3
Total Attenuation Required	1,210.90 m^3
Freeboard Storage Provided	2.70 m^3

Table 15. Proposed SuDS sizing (dimensions) and attenuation volumes – **Catchment 3**

Rainwater Harvesting	Rainwater harvesting butts should be established for each proposed development. In terms of attenuation storage within this SuDS scheme, the volume of run-off which could be attenuated by Rainwater Harvesting has not been considered within the Preliminary SuDS schematic.
Lined permeable paving	An area of 23.04 m^2 of permeable paving is assumed for each house based on the average parking space of 2.4 m x 4.8 m with an average of two spaces per dwelling. This equates to a total area of approximately 714.24 m^2 of permeable paving; to a depth of 0.4 m and underlain with type-3 aggregate material (30% porosity) equates to c. 85.71 m^3.
Lined Rain Gardens	Planted rain gardens should be sited in garden areas to provide storage of runoff from development roofs and provide amenity and biodiversity benefit to each plot. A 2 m^2 lined rain garden with a 0.25 depth of soil and a 0.2 m depth of porous aggregate (30 % porosity) including 0.1 m storage above the topsoil would attenuate 0.32 m^3 each. This would combine for a total of 9.92 m^3 of attenuation.
Detention Basin	A lined detention basin located within the Site with a volume of approximately 1,200 m^3 (1,200 m^2 to an assumed depth of 1.0 m) will be used to attenuate and filtrate runoff. This will avoid potential pollutants being discharged off-site and will also provide a biodiversity/ amenity feature for the Site.
Total Attenuation Provided	1,295.63 m^3
Total Attenuation Required	1,261.38 m^3
Freeboard Storage Provided	34.25 m^3

Rainwater harvesting

A rainwater harvesting butt should be established for each proposed development. The run-off from the proposed development roof should be led into rainwater harvesting butts via rainwater downpipes and guttering. Overflow from the butts should be discharged into the storage system provided by the rain gardens.

Due to the relatively insignificant amounts of attenuation provided by rainwater harvesting tanks in this instance and the requirement to retain water for non-potable uses such garden maintenance, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the report.

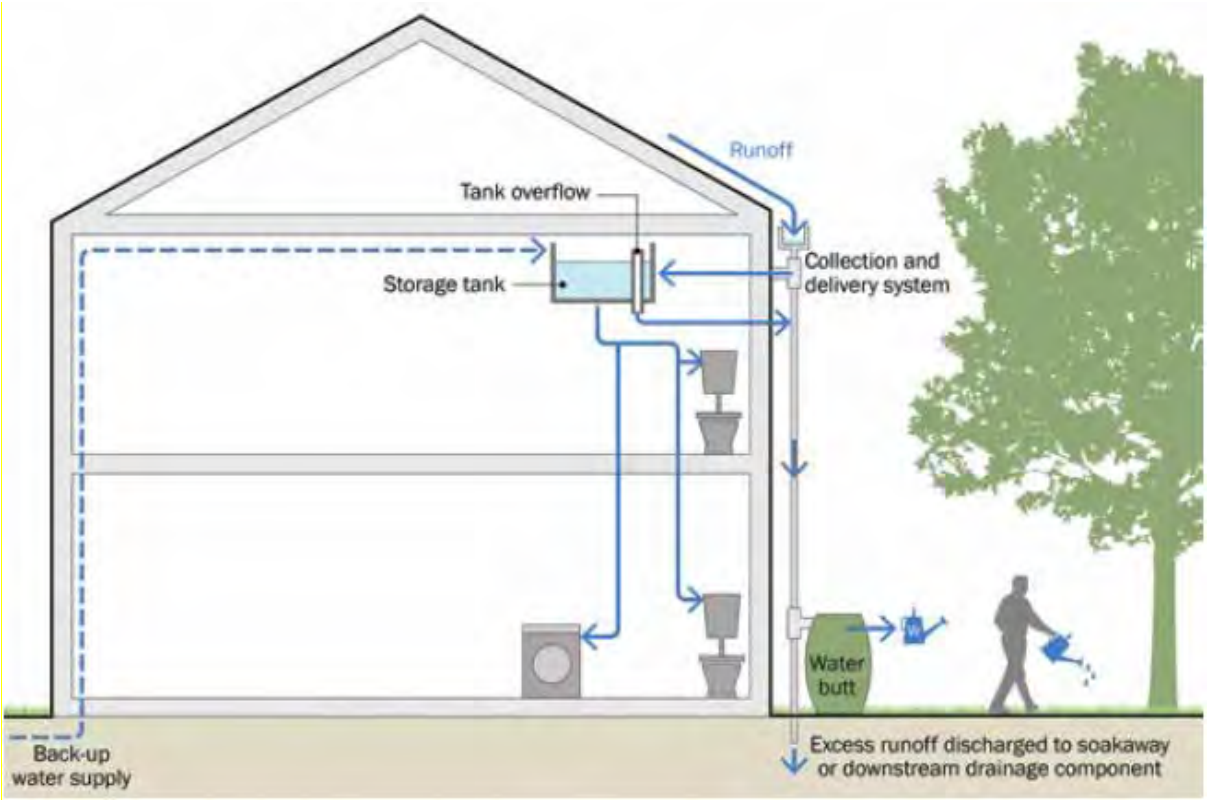


Figure 20.13 of the CIRIA SuDS Manual (C753) (2015)

Lined Rain Gardens

Rain gardens (bio-retention areas) will be used to collect and store surface water prior to being conveyed to the infiltration basin. The bio-retention area should provide an area to store and treat rainwater where water is either collected and returned to the conveyance system.

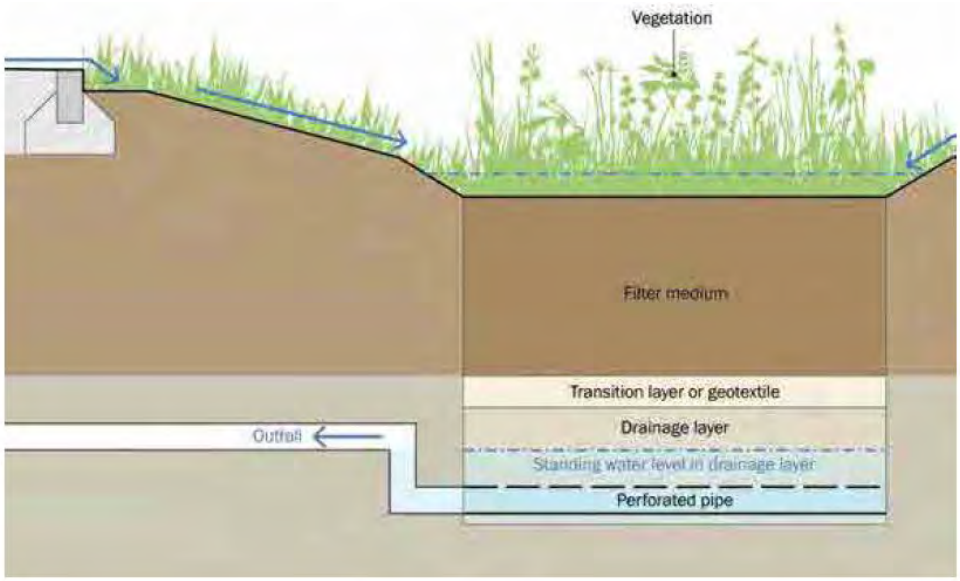


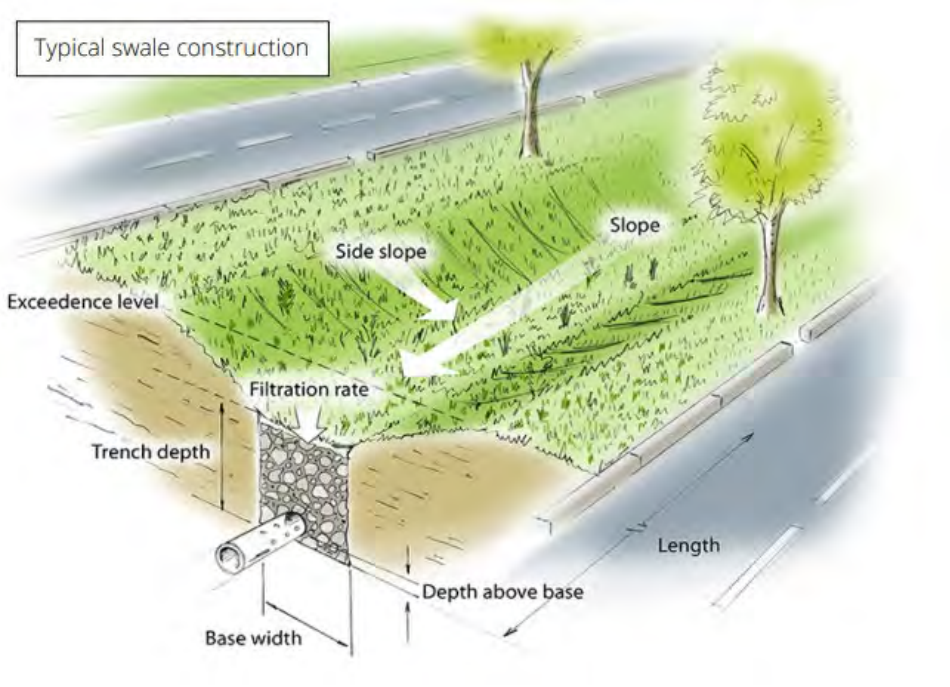
Figure 18.18 of the CIRIA SuDS Manual (C753) (2015)

This feature will reduce surface run-off by intercepting the first 5 mm of rain to reduce the volume of water running off-site.

The main functions of the elements of the system comprises the inlet, which allows water to evenly distribute water into the filter system. The vegetation will influence the performance of the system through direct uptake of pollutants and by facilitating physical and chemical processed in the soil that removes nutrients. The filter medium is normally sand based which also works to filter out pollutants but also controls the rate at which water filter through the system. This medium is usually 750 - 1000 mm thick through can be reduced for smaller catchments (minimum depth – 400 mm). The transition layer is required to prevent washing of fines from the filter medium into the drainage layer and must be at least 100 mm deep. The drainage layer is used to collect water from the filter medium to allow for access into the perforated pipes.

Swales

Swales are flat bottomed, shallow open channels used to attenuate surface water which work to decrease flow velocity by ponding run-off temporarily. Longitudinal slopes should be between 0.5-6% with a maximum side slope of 1 in 3 (33%) with a depth of 0.4m-0.6m but can be slightly deeper if required. Lined swales are appropriate for areas where infiltration to ground is not possible and/or recommended.



The seasonal high groundwater level should be below the base level of the swale. The treatment process within SuDS features is linked to velocity and retention time of run-off. Swales can offer primary and secondary treatment stages and can work to reduce sediment loads. As swales retain their vegetative state, the feature is able to remove coarse sediments through groundcover while the underlying soil can help to remove finer particles. The risk of swale erosion can be reduced with the implementation of inlets and flow spreaders (CIRIA, 2015).

The swale may also require a series of check dams to increase its capacity downslope, this should be a consideration of detailed design.

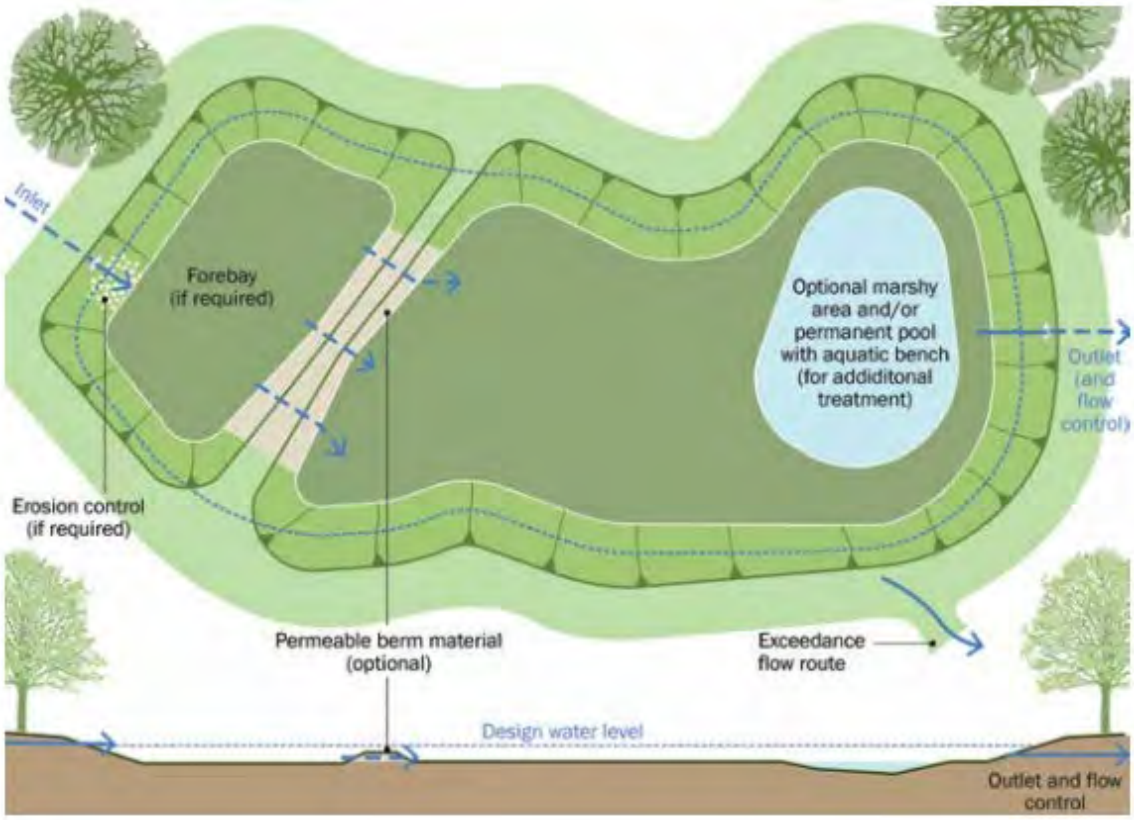
Detention basin

A detention basin is proposed to provide attenuation storage and treatment of surface water runoff from the development. A flow control system at the outfall controls the rates of discharge for a range of water levels, causing the basin to fill during storm events. The volume of the pool influences the effectiveness of the feature in settling out particulate pollutants, with larger volumes providing longer periods of time for sedimentation to occur, and greater opportunities for biodegradation and biological uptake mechanisms.

The soil below a basin should be sufficiently impermeable to maintain the water levels within the permanent basin at the required level. In permeable strata, a liner (or other impermeable material such as puddled clay) will be required to prevent the basin drying out. Evaluation of soils investigations and permeability tests.

Vegetated basins can deliver some interception because there tends to be no runoff from them for the majority of small rainfall events. The water soaks into the basin topsoil layer and is removed by evapotranspiration and even very small amounts of infiltration (where this is permitted). The extent of the volumetric reduction in the runoff to surface waters will depend

on the infiltration rate of the surrounding soil, the catchment area, the area and depth of the system, the type of vegetation and the climate.



Figures 22.2 Plan and elevation of a vegetated detention basin of the CIRIA SuDS Manual (C753) (2015).

Planting

The following information has been taken from the RSPB and Wildlife and Wetlands Trust document Maximising the potential for people and wildlife: A guide for local authorities and developers (2012):

All planting should be native to the areas. Water Non-native species (such as Fern and Floating Pennywort) should not be used in wetlands areas, but may be considered for formally planted areas such as the rain gardens (subject to approval) where they are not invasive or liable to spread.

Wildflower mixes should be used in preference within the retention basin area so promote a nectar source for insects. Cultivated turf should be laid to consolidate the edges.

The following information has been taken from the SuDS Manual Update Paper RP992/16 SuDS Construction Specification Clauses:

"*Planting is to be carried out between April and September. Seeding and turfing is to be undertaken in spring or autumn in suitable weather conditions. The contractor shall obtain the approval of the client to undertake planting, seeding or turfing.*

Plant stock should be sourced from approved nurseries that only grow native species of local provenance to avoid the introduction of alien species.

Topsoil is not to be placed within 300mm of the permanent water level in the wetland. Wetland plants are to be directly planted into the subsoil.

Fertilisers and pesticides are not to be used."

Examples of plants that may be suitable for planting within the basin and swale are: Water Iris; Great Pond, Lesser and Common Sedge; Branched Bur-Reed; and Lesser Reed Mace. These should be planted at a density of 5 per 1 m^2.

Adoptable highways:

The highway running through the Site has been included within the runoff calculations (not considered to be adoptable for the purposes of this report). However if this access is proposed for adoption by the Local Council or the utility company, the drainage and storage requirements should be kept separately to the drainage from the residential areas in accordance with HA40 and discharged to attenuation basins or swales within amenity areas of the Site.

Consideration of flow control measures must be included in the design of piped network and also applies to any French drains or attenuation basins. Pipes draining the adoptable highway should provide the following cover below ground levels to the soffit of the pipe.

- 1.2 m (in the carriageway).
- 0.9 m (in footways, footpaths, service strips or verges).

Flow control devices and systems

Hydrobrake Flow control systems can be used to reduce the runoff rate from the Site. These are usually a device used for controlling water flow into a connecting feature, such as a sewer, to a specific attenuation performance. The design consists of an intake, a volute and an outlet and the configuration is critical to ensure discharge control. For drainage areas which are less than 3 ha, outlet throttle diameters would have to be small (<150mm diameter) to achieve outflow rates which could result in blockage. For most SuDS features, a flow control device will comprise a fixed orifice or a throttle such as a short pipe.

A Vortex Control is usually a self-activating vortex flow device which directs water into a volute to form a vortex. For the Site, rainwater down pipes from the development roof should drain directly into the attenuation feature to reduce infill from potential flood water.

Drainage protection devices

A non-return flap value is recommended for outflow pipes to reduce the risk of backflow from the channel/sewer during a large scale rainfall event.

Exceedance Flows

Exceedance flow routes, where possible, should be directed away from buildings and into non-essential areas of the Site such as gardens and landscaped areas. The SuDS system

recommended for the Site should provide enough storage that this method would only be utilised during a worst case scenario.

10 SuDS maintenance

Regular maintenance is essential to ensure effective operation of the SuDS features over the intended lifespan of the proposed development. The SuDS Manual (C753) (CIRIA, 2015) provides a maintenance schedule for SuDS with details of the necessary required actions as shown in the Table below.

Table 16. SuDS operation and recommended maintenance requirements

Asset type	Maintenance schedule (and frequency)
Detention basin	Regular maintenance: • Remove litter and debris from basin (monthly). • Trimming any roots and surrounding grass blockages (as required). Monitoring: • Inspect inlets, outlets and overflows for blockages,(monthly or after a heavy storm). • Inspect inlets and outlets for silt accumulation (half yearly). • Inspect infiltration surfaces for compaction and ponding (monthly).
Permeable pavements	Regular maintenance: • Brushing and vacuuming (three times per year). • Trimming any roots and surrounding grass and weeds that may be causing blockages (annually or as required). Monitoring: • Initial inspection (monthly). • Inspect for poor performance and inspection chambers (annually).
Swales	Regular maintenance: • Remove litter and debris from basin (annually). • Trimming any roots and surrounding grass that may be causing blockages (annually or as required). Monitoring: • Inspect inlets, outlets and overflows for blockages (monthly). • Remove and replace mulching (annually). • Inspect and trim nearby trees
Hydro-Brake Flow Control	Low amounts of maintenance required as there are no moving parts within the Hydro-Brake® Flow Control.

Asset type	Maintenance schedule (and frequency)
	• Initial monthly inspection at the manhole once the construction phase is over. If blockages occur they normally do so at the intake. Hydro-Brake® Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur. Inspection should be undertaken annually or when a storm event occurs.
Underground drainage pipe network	Regular maintenance: • Remove sediment and debris from pre-treatment devices and floor of inspection tube or chamber (annually). • Cleaning of gutters and any filters on downpipes (annually). • Trimming any roots that may be causing blockages (annually or as required). Monitoring: • Inspect silt traps and note rate of sediment accumulation (monthly in the first year and then annually).
Rainwater Harvesting	Regular maintenance: • Inspection of tank for debris and sediment build up (annually and following poor performance). • Inspection of inlets, outlets, overflow areas, pumps and filters (annually and following poor performance). • Cleaning of tank, inlets, outlets, gutters, roof drain filters and withdrawal devices (annually or as required). Remedial actions: • Repair or overflow erosion damage or damage to tank and associated components (as required)
Rain garden	Regular maintenance: • Remove litter and debris from basin (monthly). • Trimming any roots and surrounding grass blockages (as required). Monitoring: • Inspect inlets, outlets and overflows for blockages,(monthly or after a heavy storm). • Inspect inlets and outlets for silt accumulation (half yearly). • Inspect infiltration surfaces for compaction and ponding (monthly).

Client checklist

A drainage strategy has been recommended as suitable on the basis of the information provided. Prior to installation of the Site drainage system it is recommended that the client carries out the following checks to confirm the development proposals. GeoSmart would be able to support with any updates required to the drainage scheme, please contact us and we would be happy to provide you with a proposal to undertake the work.

Table 17. Potential SuDS limitations

Conditions in Non-Statutory Technical Standards (Defra, 2015), limitations to infiltration SuDS	Do these conditions arise at the Site?
Is the surface runoff greater than the rate at which water can infiltrate into the ground?	
Is there an unacceptable risk of ground instability?	
Is there an unacceptable risk of mobilising contaminants?	
Is there an unacceptable risk of pollution to groundwater?	
Is there an unacceptable risk of groundwater flooding?	
Is the infiltration system going to create a high risk of groundwater leakage to the combined sewer?	

Table 18. SuDS design considerations

Confirm that potential flooding on-Site in excess of the design storm event and exceedance flow routes have been considered.	
Review options for the control of discharge rates (e.g. hydrobrake).	
Confirm the owners/adopters of the drainage system. Consider management options for multiple owners.	
Is there an unacceptable risk of pollution to groundwater?	
Review access and way leave requirements.	
Review maintenance requirements.	

Health and safety considerations for SuDS

GeoSmart reports may include outline strategies or designs to support with development plans. Any drawings or advice provided do not comprise any form of detailed design. Implementation of any conceptual scheme options may constitute 'Construction Work' as defined by CDM Regulations (2015).

The CDM Regulations place specific Health and Safety duties on those commissioning, planning and undertaking construction works. If you are uncertain what this means you should seek the advice of your architect, builder or other competent professional.

GeoSmart does not provide health and safety advisory services but we are required to advise you of your general responsibilities under CDM (visit http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/ for more information).

Please remember that detailed design work should be undertaken by a competent professional who might be your engineer, architect, builder or another competent party.

11 Methodology and limitations of study

This report assesses the feasibility of infiltration SuDS and alternative drainage strategies in support of the Site development process. From April 6th 2015 SuDS are regulated by Local Planning Authorities and will be required under law for major developments in all cases unless demonstrated to be inappropriate. What is considered appropriate in terms of costs and benefits by the Planning Authority will vary depending on local planning policy, and Site setting. The Lead Local Flood Authority will require information as a statutory consultee on major planning applications with surface water drainage implications. The National Planning Policy Framework requires that new developments in areas at risk of flooding should give priority to the use of SuDS and demonstrate that the proposed development does not increase flood risk downstream to third parties.

How was the suitability of SuDS estimated for the Site?

There are a range of SuDS options available to provide effective surface water management that intercept and store excess runoff. When considering these options, the destination of the runoff should be assessed using the order of preference outlined in the Building Regulations Part H document (HM Government, 2010) and Defra's National Standards for SuDS (2015):

1. Discharge to the ground;
2. Discharge to a surface water body;
3. Discharge to a surface water sewer;
4. Discharge to a local highway drain; and
5. Discharge to a combined sewer.

Data sets relating to each of the potential discharge options have been analysed to assess the feasibility of each option according to the hierarchy set out above. Hydrogeological characteristics for the Site are assessed in conjunction with the occurrence of SPZ's to assess infiltration suitability. The Site has been screened to determine whether flood risk from groundwater, surface water, fluvial or coastal sources may constrain SuDS. The distance to surface water bodies and sewers has been reviewed gauge whether these provide alternative options.

GeoSmart SuDS Infiltration Suitability Map (SD50)

The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the suitability for infiltration drainage in different parts of the Site and indicates where further assessment is recommended. In producing the SuDS Infiltration Suitability Map (SD50), GeoSmart used data from the British Geological Survey on groundwater levels, geology and permeability to screen

for areas where infiltration SuDS may be suitable. The map classifies areas into 3 categories of High, Medium and Low suitability for infiltration SuDS. This can then be used in conjunction with additional data on Site constraints to give recommendations for SuDS design and further investigation.

The primary constraint on infiltration potential is the minimum permeability of the underlying material and in some cases the range in permeability may be considerable, ranging down to low. The map classifies these areas as moderate infiltration suitability requiring further investigation. In cases where the thickness of the receiving permeable horizon is less than 1.5 meters then additional Site investigation is recommended. If the Site is at risk of groundwater flooding for up to the 1% annual occurrence the map classifies these areas as moderate infiltration suitability requiring further investigation.

The GeoSmart SuDS Infiltration Suitability Map (SD50) is a national screening tool for infiltration SuDS techniques but a Site specific assessment should be used before final detailed design is undertaken. Further information on the GeoSmart SuDS Infiltration Suitability Map (SD50) is available at geosmartinfo.co.uk

How is the suitability to discharge to sewers and watercourses calculated?

The suitability to discharge to discharge to sewers and watercourses has been calculated using the distance from the Site to both. For example, where the Site is within 50m of a surface water body. Discharge to surface water is potentially appropriate subject to land access arrangements and a feasibility assessment. Where the Site is within 50m of a sewer, discharge to sewer is potentially appropriate subject to land access arrangements and a feasibility assessment. The utility company should be contacted to agree connection feasibility and sewer capacity.

Further information relating to sewers available in the area can be found in Appendix C.

What is a Source Protection Zone?

The Environment Agency have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which is occasionally applied. The zones are used to set up pollution prevention measures in areas which are at a higher risk. The shape and size of a zone depends on the condition of the ground, how the groundwater is removed, and other environmental factors. Inner zone (Zone 1) is defined as the 50 day travel time from any point below the water table to the source (minimum radius of 50 metres). Outer zone (Zone 2) is defined by a 400 day travel time. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source.

How was surface water runoff estimated from the Site?

In accordance with The SuDS Manual (C753) (CIRIA, 2015), the Greenfield runoff from the Site has been calculated using the IoH124 method and is assumed representative of the runoff generated on the undeveloped surfaces that are affected by the proposed development. The method used for calculating the runoff complies with the NPPF (MHCLG, 2021). For the impermeable surfaces, it has been assumed that 100% runoff will occur (calculations provided in Appendix B). Rainfall data is derived from the Flood Estimation Handbook (FEH), developed by NERC (2009). Only areas affected by the proposed development are considered in the flow and volume calculations. Permeable areas that remain unchanged are not included in the calculations as it is assumed these will not be actively drained and attenuated.

What is the peak discharge rate?

An estimation of peak runoff flow rate and volume is required to calculate infiltration, storage and discharge requirements. The peak discharge rate is the maximum flow rate at which surface water runoff leaves the Site during a particular storm event, without considering the impact of any mitigation such as storage, infiltration or flow control. Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. If all drainage is to infiltration there will be no discharge off-Site. Discharging all flow from Site at the existing 1 in 100 event would increase flood risk during smaller events. Flow restriction is generally required to limit the final discharge from Site during all events as a basic minimum to the green field QBAR rate. A more complex flow restriction which varies the final discharge rate from the Site depending on the storm event will reduce the volume of storage required on-Site. Drainage to infiltration SuDS is subtracted from the total discharge off-Site to achieve a beneficial net affect.

What is the total discharge volume?

The total discharge volume is calculated on the basis of the surface water runoff that has the potential to leave the Site as a result of the assumed 6 hour duration design storm event. The runoff is related to the underlying soil conditions, impermeable cover, rainfall intensity and duration of the storm event. The total volume generated by the current Site is compared to the potential total volume from the developed Site (not taking into consideration any mitigation). The difference provides the minimum total volume that will need to be stored and infiltrated on-Site or released at a controlled rate. Guidance indicates that the total discharge volume should never exceed the runoff volume from the development Site prior to redevelopment for that event and should be as close as is reasonably practicable to the Greenfield runoff volume.

12 Background SuDS information

SuDS control surface water runoff close to where it falls. SuDS are designed to replicate, as closely as possible, the natural drainage from the Site before development to ensure that the flood risk downstream does not increase as a result of the Site being developed, and that the Site will have satisfactory drainage under current and likely future climatic conditions. SuDS provide opportunities to reduce the causes and impacts of flooding; remove pollutants from urban runoff at source; and combine water management with green space with benefits for amenity, recreation and wildlife. Government planning policy and planning decisions now include a presumption in favour of SuDS being used for all development Sites, unless they can be shown to be inappropriate.

For general information on SuDS see our website: http://geosmartinfo.co.uk/

Infiltration SuDS

Government policy for England is to introduce sustainable drainage systems (SuDS) via conditions in planning approvals. Guidance indicates that capturing rainfall runoff on-Site and infiltrating it into the ground (infiltration SuDS) is the preferred method for managing surface water without increasing flood risk downstream.

The greatest benefit to general flood risk is if all runoff is infiltrated on-Site, however, this may not be feasible due to physical and economic constraints in which case infiltration may be considered as a part of an integrated drainage solution. The final design capacity for an infiltration SuDS system depends on the Site constraints and the requirements of the individual Planning Authority and the Lead Local Flood Authority.

The capacity of the ground to receive infiltration depends on the nature, thickness and permeability of the underlying material and the depth to the high groundwater table. The final proportion of the Site drained by infiltration will depend on topography, outfall levels and a suitable drainage gradient. It is important to note that, even if the whole Site cannot be drained by infiltration, the use of partial infiltration is encouraged, with the remainder of runoff discharged via other SuDS systems.

Types of infiltration SuDS

Infiltration components include infiltration trenches, soakaways, swales and infiltration basins without outlets, rain gardens and permeable pavements. These are used to capture surface water runoff and allow it to infiltrate (soak) and filter through to the subsoil layer, before returning it to the water table below.

An infiltration trench is usually filled with permeable granular material and is designed to promote infiltration of surface water to the ground. An infiltration basin is a dry basin or depression designed to promote infiltration of surface water runoff into the ground. Soakaways are the most common type of infiltration device in the UK where drainage is often connected to over-sized square or rectangular, rubble-filled voids sited beneath lawns.

According to the guidance in Building Research Establishment (BRE) Digest 365 (2016) a soakaway must be able to discharge 50% of the runoff generated during a 1 in 10 year storm event within 24 hours in readiness for subsequent storm flow. This is the basic threshold criteria for a soakaway design and the internal surface area of the proposed soakaway design options should be calculated on this basis by taking into account the soil infiltration rate for the Site.

Developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components, allowing for any machinery access required.

SuDS maintenance and adoption

Regular maintenance is essential to ensure effective operation of the soakaway(s) over the intended lifespan of the proposed development. A maintenance schedule for SuDs is required. Sewerage undertakers or Local Authorities may adopt SuDS and will require maintenance issues to be dealt with in accordance with their Management Plan. If the SuDS will not be adopted other provision is required with associated financial implications. Maintenance is a long-term obligation requiring the upkeep of all elements of the SuDS, including mechanical components (e.g. pumps), as well as inspections, regular maintenance and repair.

Additional background SuDS information can be found on our website: http://geosmartinfo.co.uk/

13 References and glossary

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GeoSmart Information

Glossary

General terms

Attenuation	Reduction of peak flow and increased duration of a flow event.
Combined sewer	A sewer designed to carry foul sewage and surface water in the same pipe.
Detention basin	A vegetated depression, normally is dry except after storm events, constructed to store water temporarily to attenuate flows. May allow infiltration of water to the ground.
Evapotranspiration	The process by which the Earth's surface or soil loses moisture by evaporation of water and by uptake and then transpiration from plants.
FEH	Flood Estimation Handbook, produced by Centre for Ecology and Hydrology, Wallingford (formerly the Institute of Hydrology).
Filter drain or trench	A linear drain consisting of a trench filled with a permeable material, often with a perforated pipe in the base of the trench to assist drainage, to store and conduct water, but may also be designed to permit infiltration.
First flush	The initial runoff from a site or catchment following the start of a rainfall event. As runoff travels over a catchment it will collect or dissolve pollutants, and the "first flush" portion of the flow may be the most contaminated as a result. This is especially the case for intense storms and in small or more uniform catchments. In larger or more complex catchments pollution.
Flood plain	Land adjacent to a watercourse that would be subject to repeated flooding under natural conditions (see Environment Agency's Policy and practice for the protection of flood plains for a fuller definition).
Greenfield runoff	This is the surface water runoff regime from a site before development, or the existing site conditions for brownfield redevelopment sites.
Impermeable surface	An artificial non-porous surface that generates a surface water runoff after rainfall.
Permeability	A measure of the ease with which a fluid can flow through a porous medium. It depends on the physical properties of the medium, for example grain size, porosity and pore shape.

Runoff	Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable, is saturated or if rainfall is particularly intense.
Sewerage undertaker	This is a collective term relating to the statutory undertaking of water companies that are responsible for sewerage and sewage disposal including surface water from roofs and yards of premises.
Soakaway	A subsurface structure into which surface water is conveyed to allow infiltration into the ground.
Treatment	Improving the quality of water by physical, chemical and/or biological means.

The terms included in this glossary have been taken from CIRIA (2015) guidance.

Data Sources

Aerial Photography	Contains Ordnance Survey data © Crown copyright and database right 2022 BlueSky copyright and database rights 2022
Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2022 Ordnance Survey data © Crown copyright and database right 2022
Flood Risk (RoFRS/Pluvial/Surface Water Features/SPZ)	Environment Agency copyright and database rights 2022 Ordnance Survey data © Crown copyright and database right 2022
Flood Risk (Groundwater) and SuDS infiltration suitability (SD50)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2022) Contains British Geological Survey materials © NERC 2022 Ordnance Survey data © Crown copyright and database right 2022
Sewer Location	Contains Ordnance Survey data © Crown copyright and database right 2022 Contains STL Regulated Drainage and Water Search data 2022
Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2022 Environment Agency copyright and database rights 2022

14 Appendices

GeoSmart Information

Appendix A

Site plans (layout and topography)

- 6-unit apartment block
  - 6 x 2-bed 61sqm flat
- 6-unit apartment block
  - 3 x 1-bed 50sqm flat
  - 3 x 2-bed 61sqm flat
- 1-bed dwelling - 56sqm
- 2-bed dwelling - 96sqm
- 3-bed dwelling - 114sqm

Total units: **327 units**

Unit mix:
180 x 3-bed - 55%
115 x 2-bed - 35%
32 x 1 -bed - 10%

Approximate area analysis:

Site area - 142,000sqm / 14.2ha
Open space - 3,500sqm / 0.35ha
Memorial park - 15,000sqm / 1.5ha
Green buffer zone - 19,000sqm / 1.9ha

Overall percentage of green space - 26%

N

SK_22.06.2021_01 - Indicative Site Layout - 1:2500@A3

0 25 50 100 250m

GeoSmart Information

Appendix B

Rainfall runoff calculations

Greenfield Site Run-Off Calculations usng the IoH124 method

Greenfield peak run-off rate (QBAR):

Parameters	Input	Units	Comments
Area	50	ha	mimimum 50ha
SAAR	680	mm	FEH CD ROM (NERC, 2009)
SPR	0.30	N/A	Soil run-off coefficient
Region	6	N/A	Region on Hydrological area map

QBAR

$$Q_{BAR(rural)} = 1.08AREA^{0.89}SAAR^{1.17}SPR^{2.17}$$

Where:

$Q_{BAR(rural)}$	is the mean annual flood (a return period of 2.3 years) in l/s
AREA	is the area of the catchment in km² (minimum of 0.5km²)
SAAR	is the standard average rainfall for the period 1941 to 1970 in mm
SPR	is the soil run-off coefficient

$Q_{BAR(rural)}$ can be factored by the UK Flood Studies Report regional growth curves to produce peak flood flows for any return period.

$Q_{BAR(rural)}$	=	88.08	l/s for 50ha site
Divided by 50 to scale down	=	1.76	l/s/ha
Actual Area of the entire Site	=	14.25	ha

Return Periods (Growth curves obtained from DEFRA report)

Return Period		Growth Factor	l/s/ha	Peak site run-off rate (l/s)
1	**$Q_{BAR(rural)}$ x**	**0.85**	**1.50**	**21.338**
2	$Q_{BAR(rural)}$ x	0.88	1.55	22.09
5	$Q_{BAR(rural)}$ x	1.28	2.25	32.13
10	$Q_{BAR(rural)}$ x	1.62	2.85	40.67
25	$Q_{BAR(rural)}$ x	2.14	3.77	53.72
30	**$Q_{BAR(rural)}$ x**	**2.24**	**3.95**	**56.233**
50	$Q_{BAR(rural)}$ x	2.62	4.62	65.77
100	**$Q_{BAR(rural)}$ x**	**3.19**	**5.62**	**80.08**
200	$Q_{BAR(rural)}$ x	3.86	6.80	96.90

Greenfield total run-off volume:

= actual area of the entire site x SPR x 6 hour rainfall depth

Return Period	6 hour rainfall (mm) from FEH CD-ROM	Area (ha)	SPR	Total run-off (m^3)
2.3 (QBAR)	27.5	14.25	0.30	1175.6
1	25.73	14.25	0.30	1100.0
10	42.97	14.25	0.30	1837.0
30	54.55	14.25	0.30	2332.0
100	71.3	14.25	0.30	3048.1

Developed site run-off calculation sheet

1 in 1 year

Proposed impermeable area	4.895	ha
CC Factor	40%	
Total volume for surfaces during 6 hour event	1259.48	m³
Total volume for 6 hour event inc CC	1763.28	m³
Total volume for 6 hour event exc CC	1,259.48	m³

Duration	Rainfall 1 yr event	Run-off rate 1 yr event	Run-off rate 1 yr +cc event	Outflow at 10 l/s	inflow from rain	Diff (storage required)
hours	mm	m³	m³			
0.25	7.63	373.49	522.88	9.00	373.49	364.49
0.5	9.74	476.77	667.48	18.00	476.77	458.77
0.75	11.03	539.92	755.89	27.00	539.92	512.92
1	11.98	586.42	820.99	36.00	586.42	550.42
2	17.40	851.73	1,192.42	72.00	851.73	779.73
3	20.67	1,011.80	1,416.52	108.00	1,011.80	903.80
4	22.90	1,120.96	1,569.34	144.00	1,120.96	976.96
5	24.49	1,198.79	1,678.30	180.00	1,198.79	1,018.79
6	25.73	1,259.48	1,763.28	216.00	1,259.48	1,043.48
8	27.60	1,351.02	1,891.43	288.00	1,351.02	1,063.02
10	28.99	1,419.06	1,986.68	360.00	1,419.06	1,059.06
12	30.10	1,473.40	2,062.75	432.00	1,473.40	1,041.40
16	31.81	1,557.10	2,179.94	576.00	1,557.10	981.10
20	33.18	1,624.16	2,273.83	720.00	1,624.16	904.16
24	34.39	1,683.39	2,356.75	864.00	1,683.39	819.39
28	35.51	1,738.21	2,433.50	1,008.00	1,738.21	730.21
32	36.56	1,789.61	2,505.46	1,152.00	1,789.61	637.61
36	37.56	1,838.56	2,573.99	1,296.00	1,838.56	542.56
40	38.52	1,885.55	2,639.78	1,440.00	1,885.55	445.55
44	39.45	1,931.08	2,703.51	1,584.00	1,931.08	347.08
48	40.35	1,975.13	2,765.19	1,728.00	1,975.13	247.13

1 in 30 year

Proposed impermeable area	4.895	ha
CC Factor	40%	
Total volume for surfaces during 6 hour event	2670.22	m³
Total volume for 6 hour event inc CC	3738.31	m³
Total volume for 6 hour event exc CC	2,670.22	m³

Duration	Rainfall 30 yr event	Run-off volume 30 yr event	Run-off volume 30 yr +cc event	Outflow at 10 l/s	inflow from rain	Diff (storage required)
hours	mm	m³	m³			
0.25	20.71	1,013.75	1,419.26	9.00	1013.75	1004.75
0.5	26.76	1,309.90	1,833.86	18.00	1309.90	1291.90
0.75	30.43	1,489.55	2,085.37	27.00	1489.55	1462.55
1	33.07	1,618.78	2,266.29	36.00	1618.78	1582.78
2	41.81	2,046.60	2,865.24	72.00	2046.60	1974.60
3	46.81	2,291.35	3,207.89	108.00	2291.35	2183.35
4	50.19	2,456.80	3,439.52	144.00	2456.80	2312.80
5	52.65	2,577.22	3,608.10	180.00	2577.22	2397.22
6	54.55	2,670.22	3,738.31	216.00	2670.22	2454.22
8	57.27	2,803.37	3,924.71	288.00	2803.37	2515.37
10	59.26	2,900.78	4,061.09	360.00	2900.78	2540.78
12	60.83	2,977.63	4,168.68	432.00	2977.63	2,545.63
16	63.27	3,097.07	4,335.89	576.00	3097.07	2521.07
20	65.16	3,189.58	4,465.41	720.00	3189.58	2469.58
24	66.75	3,267.41	4,574.38	864.00	3267.41	2403.41
28	68.17	3,336.92	4,671.69	1008.00	3336.92	2328.92
32	69.49	3,401.54	4,762.15	1152.00	3401.54	2249.54
36	70.73	3,462.23	4,847.13	1296.00	3462.23	2166.23
40	71.91	3,519.99	4,927.99	1440.00	3519.99	2079.99
44	73.04	3,575.31	5,005.43	1584.00	3575.31	1991.31
48	74.15	3,629.64	5,081.50	1728.00	3629.64	1901.64

1 in 100 year

Proposed impermeable area	4.895	ha
CC Factor	40%	
Total volume for surfaces during 6 hour event	3490.14	m³
Total volume for 6 hour event inc CC	4886.19	m³
Total volume for 6 hour event exc CC	3,490.14	m³

Duration	Rainfall n-off volu 00 yr ever	n-off volume 00 yr ever) yr +cc event	Outflow at 10 l/s	inflow from rain	100yr Sce Diff (storage required)	CC Scenari Diff (storage required)
hours	mm	m³	m³				
0.25	26.76	1,309.90	1,833.86	9.00	1833.86	1300.90	1824.86
0.5	34.88	1,707.38	2,390.33	18.00	2390.33	1689.38	2372.33
0.75	39.85	1,950.66	2,730.92	27.00	2730.92	1923.66	2703.92
1	43.39	2,123.94	2,973.52	36.00	2973.52	2087.94	2937.52
2	54.38	2,661.90	3,726.66	72.00	3726.66	2589.90	3654.66
3	60.98	2,984.97	4,178.96	108.00	4178.96	2876.97	4070.96
4	65.50	3,206.23	4,488.72	144.00	4488.72	3062.23	4344.72
5	68.78	3,366.78	4,713.49	180.00	4713.49	3186.78	4533.49
6	71.30	3,490.14	4,886.19	216.00	4886.19	3274.14	4670.19
8	74.91	3,666.84	5,133.58	288.00	5133.58	3378.84	4845.58
10	77.44	3,790.69	5,306.96	360.00	5306.96	3430.69	4946.96
12	79.37	3,885.16	5,439.23	432.00	5439.23	3,453.16	5007.23
16	82.14	4,020.75	5,629.05	576.00	5629.05	3444.75	5053.05
20	84.13	4,118.16	5,765.43	720.00	5765.43	3398.16	5,045.43
24	85.73	4,196.48	5,875.08	864.00	5875.08	3332.48	5011.08
28	87.08	4,262.57	5,967.59	1008.00	5967.59	3254.57	4959.59
32	88.30	4,322.29	6,051.20	1152.00	6051.20	3170.29	4899.20
36	89.44	4,378.09	6,129.32	1296.00	6129.32	3082.09	4833.32
40	90.51	4,430.46	6,202.65	1440.00	6202.65	2990.46	4762.65
44	91.54	4,480.88	6,273.24	1584.00	6273.24	2896.88	4689.24
48	92.52	4,528.85	6,340.40	1728.00	6340.40	2800.85	4612.40

GeoSmart Information

Appendix C

Regulated Drainage and Water Search

Regulated Drainage & Water Search

Search Details

Prepared for: GeoSmart
Matter: 75188.01
Client address: Suite 9-11 Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU

Property:
35 Chiswell Green Lane, St. Albans, AL2 3AJ

Water Company:
Thames Water Utilities Ltd
Thames Water Plc, PO Box 286, Swindon, SN38 2RA

Date Returned:
22/07/2021

Property type:
Residential

InfoTrack Limited, Level 11, 91 Waterloo Road, London, SE1 8RT
T: 0207 186 8090 **E:** helpdesk@infotrack.co.uk

Summary for Conveyancers

This summary identifies matters revealed which you may wish to highlight to your client or investigate further. It is intended as a snapshot of the information contained in the search, should in no way be considered legal advice, and should be taken in context with the full search information and with your client's planned use and enjoyment of the property.

Maps

1.1	Where relevant, please include a copy of an extract from the public sewer map	Map Provided
1.2	Where relevant, please include a copy of an extract from the map of waterworks	Map Provided

Drainage

2.1	Does foul water from the property drain to the public sewer?	Yes
2.2	Does surface water from the property drain to the public sewer?	Yes
2.3	Is a surface water drainage charge payable?	Refer to Vendor
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	No
2.4.1	Does the public sewer map indicate any public sewage pumping station within the boundaries of the property?	No
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	Yes
2.5.1	Does the public sewer map indicate any public pumping station within 50 metres (164.04 feet) of any buildings within the property?	Insured
2.6	Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
2.7	Has any Sewerage Undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	No
2.8	Is any building which is, or forms part of the property, at risk of internal flooding due to overloaded public sewers?	Insured
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works	Insured

Water

3.1	Is the property connected to mains water supply?	Yes
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	No
3.3	Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
3.4	Is this property at risk of receiving low water pressure or flow?	Insured
3.5	What is the classification of the water supply for the property?	See report
3.6	Please include details of the location of any water meter serving the property	See report

Charging

4.1.1	Who is responsible for providing the sewerage services for the property?	Thames Water
4.1.2	Who is responsible for providing the water services for the property?	Veolia Central
4.2	Who bills the property for sewerage services?	Thames Water
4.3	Who bills the property for water services?	Veolia Central
4.4	What is the current basis for charging for sewerage and/or water services at the property?	See report
4.5	Will the basis for charging for sewerage and water services at the property change as a consequence of a change of occupation?	Insured

Question 1.1

Where relevant, please include a copy of an extract from the public sewer map

A copy of an extract from the public sewer map is included in which the location of the property is identified

Guidance Notes:

Pipes that are shown on the public sewer map as sewers, disposal mains or lateral drains are defined as those for which a Sewerage Undertaker holds statutory responsibility under the Water Industry Act 1991. A Sewerage Undertaker is not generally responsible for rivers, water courses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only. Sewers or lateral drains indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended that these details are checked with the developer, if any. Please note that following the private sewer transfer on 1 October 2011 there may be additional public assets other than those shown on the public sewer map.

Question 1.2

Where relevant, please include a copy of an extract from the map of waterworks

A copy of an extract from the map of waterworks is included in which the location of the property is identified

Guidance Notes:

Pipes that are shown on the map of waterworks as water mains, resource mains or discharge pipes are defined as those for which a Water Undertaker holds statutory responsibility under the Water Industry Act 1991. Water Undertakers are not responsible for private water mains or private service pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal. The extract of the map of waterworks shows water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Public Sewer & Water Map

- Public Combined Sewer
- Public Foul Sewer
- Public Surface Water Sewer
- Abandoned Public Sewer
- Water Pipes
- Sewer Publicly Maintained under Section 24 Public Health Act 1936
- Section 104 Surface Water Sewer
- Section 104 Foul Sewer
- Decommissioned Water
- Public Sewage Pumping Station

This map is provided by InfoTrack Ltd and must be used in conjunction with the search results attached. Please note, the boundary may have been adjusted from the plan provided so that it reflects the National Polygon dataset provided by the Land Registry. This dataset covers all registered titles (freehold and leasehold) in England and Wales and shows the indicative shape and position of each boundary. The information shown on the map is based on data obtained from various sources but the position of any water company apparatus must should be regarded as approximate. Service pipes, private sewers and drains are generally not shown. This map should not be used for detailed design of any proposed works and users of this map are strongly advised to commission their own survey of the area before carrying out any works to establish the actual position of all apparatus.

Question 2.1

Does foul water from the property drain to the public sewer?

Records indicate that foul water from the property does drain to a public sewer.

Guidance Notes:

The above answer is inferred from the proximity of a public sewer as indicated on the enclosed map. If the inference is wrong, the attached Information Accuracy Indemnity covers an adverse entry.
For confirmation, please refer to billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains drainage. Sewerage Undertakers are not responsible for private drains and private sewers that connect the property to the public sewerage system, and do not hold details of these. The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility with other users if the property is served by a private sewer which also serves other properties if not connected to the public sewerage system. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal. An extract from the public sewer map is enclosed. This will show known public sewers and lateral drains in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or private sewers connecting the property to the public sewerage system. If foul water does not drain to the public sewerage system the property may have private facilities in the form of a septic tank, cesspit or other type of treatment plant.

Question 2.2

Does surface water from the property drain to the public sewer?

Records indicate that surface water from the property does drain to a public sewer.

Guidance Notes:

The above answer is inferred from the proximity of a public sewer as indicated on the enclosed map. If the inference is wrong, the attached Information Accuracy Indemnity covers an adverse entry.
For confirmation, please refer to billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains drainage. Sewerage Undertakers are not responsible for private drains and private sewers that connect the property to the public sewerage system, and do not hold details of these. The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility with other users if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal. In some cases, Sewerage Undertaker records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Water Company. An extract from the public sewer map is enclosed. This will show known public sewers and lateral drains in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or private sewers connecting the property to the public sewerage system. If surface water does not drain to a public sewer the property may have private facilities in the form of a soakaway or private connection to a watercourse. Please note, the property may drain to a Sustainable Urban Drainage System (SuDs), please refer to the Local Authority Search for further information.

Question 2.3

Is a surface water drainage charge payable?

Please refer to vendor or pre-contract documents and/or your own survey of the property

Guidance Notes:

Where surface water charges are payable but upon inspection the property owner believes that surface water does not drain to the public sewerage system, an application can be made to the Water Company to end surface water charges.

Question 2.4

Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

The public sewer map indicates that there are no public sewers, disposal mains or lateral drains within the boundaries of the property. Please note, it has not always been a requirement for such public sewers, disposal mains or lateral drains to be recorded on the public sewer map. It is therefore possible for unidentified sewers, disposal mains or lateral drains to exist within the boundaries of the property. However on 1 October 2011 private sewers were transferred into public ownership. There may therefore be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may prevent or restrict development of the property.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the plan provided. The presence of a public sewer, disposal main or lateral drain running within the boundary of the property may restrict further development. The Sewerage Undertaker has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Company or its contractors needing to enter the property to carry out work. Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are considered to be not an 'as constructed' record. It is recommended these details are checked with the developer.

Question 2.4.1

Does the public sewer map indicate any public sewage pumping station within the boundaries of the property?

The public sewer map included indicates that there is no public sewage pumping station within the boundaries of the property.

Guidance Notes:

The presence of a public sewage pumping station running within the boundary of the property may restrict further development. The company has a statutory right of access to carry out work on its assets subject to notice. Please note that private pumping stations built prior to 1 July 2011 which serve more than one property and pump to the existing public sewer are eligible for transfer into public ownership as of 1 October 2016. Pumping stations installed after 1 July 2011 remain the responsibility of the homeowner unless they are the subject of an adoption agreement. Please note that the Water Company may not have been made aware of all the pumping stations which meet the adoption obligation criteria and therefore there may be pumping stations not recorded on the public sewer map.

Question 2.5

Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

The public sewer map indicates that there is a public sewer within 30.48 metres (100 feet) of a building within the property. On 1 October 2011 private sewers were transferred into public ownership, there may therefore be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are within 30.48 metres (100 feet) of a building within the property.

Guidance Notes:

Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer. The presence of a public sewer within 30.48 metres (100 feet) of any buildings within the property can result in the Local Authority requiring a property to be connected to the public sewer. The measure is estimated using the map provided and the water company records, between the building(s) within the boundary of the property and the nearest public sewer.

Question 2.5.1

Does the public sewer map indicate any public pumping station within 50 metres (164.04 feet) of any buildings within the property?

Not answered - This information is not available, if an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

The presence of a public sewage pumping station running within the boundary of the property may restrict further development. The company has a statutory right of access to carry out work on its assets subject to notice. Please note that private pumping stations built prior to 1 July 2011 which serve more than one property and pump to the existing public sewer are eligible for transfer into public ownership as of 1 October 2016. Pumping stations installed after 1 July 2011 will remain the responsibility of the homeowner unless they are the subject of an adoption agreement. Please note that the Water Company may not have been made aware of all the pumping stations which meet the adoption obligation criteria and therefore there may be pumping stations not recorded on the public sewer map.

Question 2.6

Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

Records indicate that sewers serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance Notes:

On 1 October 2011 all foul Section 104 sewers laid before 1 July 2011 were transferred into public ownership, excluding those that discharge to a privately owned sewage treatment or collection facility. All surface Section 104 sewers that do not discharge to a public watercourse were also transferred. Water Companies' mapping records are currently being reviewed and updated and may not yet reflect this change, therefore there may be additional public sewers, disposal mains or lateral drains which are not yet recorded on the public sewer map or public sewers that still show as Section 104 sewers.

Question 2.7

Has any Sewerage Undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

There are no records in relation to any approval or consultation about plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However please note the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. The attached Information Accuracy Indemnity covers adverse entries at the date of this report where data is not available.

Guidance Notes:

Buildings or extensions erected over a public sewer, disposal main or lateral drain in contravention of building controls or which conflict with the provisions of the Water Industry Act 1991 may have to be removed or altered. On 1 October 2011 the majority of private sewers, disposal mains and lateral drains, connected to the public network as of 1 July 2011, transferred to public ownership. Therefore there may be formerly private sewers and lateral drains that have been built over, however the sewerage undertaker may not have approved or been consulted about any plans to erect a building or extension on the property or in the vicinity of these. Please also refer to vendor or pre-contract documents and/or your own survey of the property.

Question 2.8

Is any building which is, or forms part of the property, at risk of internal flooding due to overloaded public sewers?

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

A sewer is 'overloaded' when the flow from a storm is unable to pass through it due to a permanent problem (eg. flat gradient, small diameter). Flooding as a result of temporary problems such as blockage, siltation, collapses and equipment or operational failures are excluded. 'Internal flooding' from public sewers is defined as flooding which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes. 'At Risk' properties are those that the Water Company is required to include in the Regulatory Register that is reported annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure. Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk register. Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company. Public sewers are defined as those for which the company holds statutory responsibility under the Water Industry Act 1991. It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company and therefore would be excluded from the report.

Question 2.9

Please state the distance from the property to the nearest boundary of the nearest sewage treatment works

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.

Question 3.1

Is the property connected to mains water supply?

Records indicate that the property is connected to the mains water supply.

Guidance Notes:

The above answer is inferred from the proximity of a public water main as indicated on the enclosed map. If the inference is wrong, the attached Information Accuracy Indemnity covers an adverse entry.
For confirmation, please refer to billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains water, and information regarding whether a water meter is installed. Details of private supplies are not kept by the Water Undertaker. We recommend the situation is checked with the current owner of the property.

Question 3.2

Are there any water mains, resource mains or discharge pipes within the boundaries of the property?

The map of waterworks does not indicate any water mains, resource mains or discharge pipes within the boundaries of the property.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the plan provided. The presence of public water main, resource main or discharge pipe within the boundary of the property may restrict further development within it. Water Undertakers have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the Company or its contractors needing to enter the property to carry out work.

Question 3.3

Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

Records indicate that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance Notes:

Where the property is part of a very recent or ongoing development and the water mains and service pipes are not the subject of an adoption application, buyers should consult with the developer to confirm that the Water Undertaker will be asked to provide a water supply to the development or to ascertain the extent of any private water supply system for which they will hold maintenance and renewal liabilities.

Question 3.4

Is this property at risk of receiving low water pressure or flow?

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

'Low water pressure' means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal.

Question 3.5

What is the classification of the water supply for the property?

To check the average water hardness of water supplied to the property please visit https://www.affinitywater.co.uk/check-hardness.aspx

Guidance Notes:

The hardness of water depends on the amount of calcium in it - the more it contains the harder the water is. There is no UK or European standard set for the hardness of drinking water. More information on water hardness can be found on the Drinking Water Inspectorates' website: http://www.dwi.gov.uk
If the property is in a hard water area, you may wish to refer to the vendor or pre-contract documents and/or your own survey of the property to establish if a water softener has been installed.

Question 3.6

Please include details of the location of any water meter serving the property

Please refer to vendor or pre-contract documents and / or your own survey of the property. For further information regarding the water meter serving this property please contact:

Affinity Water (Veolia Central)
Tamblin Way
Hatfield
AL10 9EZ
Tel: 0845 782 3333
www.affinitywater.co.uk/index.aspx

Question 4.1.1

Who is responsible for providing the sewerage services for the property?

Please refer to vendor or pre-contract documents and / or your own survey of the property. The Sewerage Undertakers for the area are:

Thames Water Utilities Limited
Clearwater Court
Reading
RG1 8DB
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.1.2

Who is responsible for providing the water services for the property?

Please refer to vendor or pre-contract documents and / or your own survey of the property. The Water Undertakers for the area are:

Affinity Water (Veolia Central)
Tamblin Way
Hatfield
AL10 9EZ
Tel: 0845 782 3333
www.affinitywater.co.uk/index.aspx

Question 4.2

Who bills the property for sewerage services?

Thames Water Utilities Limited
Clearwater Court
Reading
RG1 8DB
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.3

Who bills the property for water services?

Affinity Water (Veolia Central)
Tamblin Way
Hatfield
AL10 9EZ
Tel: 0845 782 3333
www.affinitywater.co.uk/index.aspx

Question 4.4

What is the current basis for charging for sewerage and/or water services at the property?

Water and sewerage companies' full charges are set out in their charges schemes which are available from the company free of charge upon request.

Guidance Notes:

The Water Industry Act 1991 Section 150, The Water Resale Order 2001 provides protection for people who buy their water or sewerage services from a person or company instead of directly from a water or sewerage company.

The average household bill is, by definition, an average across all customers. Readings taken from a water meter are used to calculate metered sewerage charges, the volume charge for sewerage services is usually based on a percentage of total water supplied. To view the above information in full please visit the Office of Water Services (OFWAT) Website: http://www.ofwat.gov.uk Water and Sewerage Companies full charges are set out in their charges schemes which are available from the Company free of charge upon request.

Question 4.5

Will the basis for charging for sewerage and water services at the property change as a consequence of a change of occupation?

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

The Company may install a meter at the premises where a buyer makes a change of use of the property or where the occupier uses water for watering the garden, other than by hand (this includes the use of sprinklers) or automatically replenishing a pond or swimming pool with a capacity greater than 10,000 litres.

Glossary

‘the 1991 Act’ means the Water Industry Act 1991[61]

‘the 2000 Regulations’ means the Water Supply (Water Quality) Regulations 2000[62]

‘adoption agreement’ means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act[64]

‘discharge pipe’ means a pipe which discharges are made or are to be made under Section 165(1) of the 1991 Act

‘disposal main’ means (subject to section 219(2) of the 1991 Act) any outfall pipe or other pipe which - (a) is a pipe for the conveyance of effluent to or from any sewage disposal works, whether of a Sewerage Undertaker or of any other person; and (b) is not a public sewer

‘drain’ means (subject to Section 219(2) of the 1991 Act) a drain used for the drainage of one building or of any buildings or yards appurtenant to buildings within the same curtilage

‘lateral drain’ means - (a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or (b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under Section 102 of the 1991 Act or in an agreement made under Section 104 of that Act[65]

‘map of waterworks’ means the map made available under Section 198(3) of the 1991 Act[67] in relation to the information specified in subsection (1A)

‘private sewer’ means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a Sewerage Undertaker

‘public sewer’ means, subject to Section 106(1A) of the 1991 Act[68], a sewer for the time being vested in a Sewerage Undertaker in its capacity as such, whether vested in that Undertaker - (a) by virtue of a scheme under Schedule 2 to the Water Act 1989[69]; (b) by virtue of a scheme under Schedule 2 to the 1991 Act[70]; (c) under Section 179 of the 1991 Act[71]; or (d) otherwise; ‘public sewer map’ means the map made available under Section 199(5) of the 1991 Act[72]

‘resource main’ means (subject to Section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of - (a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or (b) giving or taking a supply of water in bulk

‘sewerage services’ includes the collection and disposal of foul and surface water and any other services which are required to be provided by a Sewerage Undertaker for the purpose of carrying out its functions

‘Sewerage Undertaker’ means the company appointed to be the Sewerage Undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated

‘surface water’ includes water from roofs and other impermeable surfaces within the curtilage of the property

‘water main’ means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the Water Undertaker, which is used or to be used by a Water Undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the Undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers

‘water meter’ means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises

‘water supplier’ means the company supplying water in the water supply zone, whether a Water Undertaker or licensed water supplier

‘water supply zone’ in relation to a calendar year, means the names and areas designated by a Water Undertaker within its area of supply that are to be its water supply zones for that year

‘Water Undertaker’ means the company appointed to be the Water Undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated. In this Report, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

Information for Buyers

This section is a guide to the content of the regulated drainage and water search result. It should be read in association with the main report. This information should not be considered as legal advice and you should check with your conveyancer if you have any concerns about the search results.

Map of Public Sewers/Waterworks

What is a Map of Public Sewers or Map of Waterworks?	Water companies maintain maps of sewers and water pipes for which they are responsible. Most but not all sewer and water pipes within an individual property boundary are the property owner's responsibility.

Sewer & Water Maintenance

Are all Sewer & Water Pipes publicly maintained?	Sewer & Water Pipes can be either publicly or privately maintained. If they are publicly maintained, the local Sewerage or Water undertaker is responsible for repairs and maintenance. As from 1 October 2011 most lateral drains (see glossary) are now owned and maintained by the sewerage undertaker. Sewerage Undertakers are not responsible for any private drains and private sewers that connect the property to the public sewerage system, and do not hold details of these. The property owner will normally have sole responsibility for private drains and water pipes serving the property.

Sewers

What is a Foul Water Sewer?	Foul sewers/drains take foul sewage (waste from toilets, bathrooms and kitchens etc) away from your property.
What is a Surface Water Sewer?	Surface water sewers/drains take surface water (rainwater) away from your property (includes water from roofs and other impermeable surfaces within the curtilage of the property). In some cases, Sewerage Undertaker records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Water Company.
What is a Combined Sewer?	Combined sewers carry both foul sewage and surface water away from your property.

Adoption Agreement

What does it mean if a sewer is subject to a Section 104 adoption agreement?	With new developments, the developer will typically lay new sewers which are 'subject to adoption'. Purchasers of new homes will want to know whether or not the property will eventually be connected to a public sewer. The adoption of private sewers and drains by the Sewerage Undertaker is subject to the developer complying with the terms of the adoption agreement made under the provisions of Section 104 of the Water Industry Act 1991. For newly built properties, where the property is part of a very recent or on-going development and the sewers are not the subject of an adoption application, buyers should consult with the developers to ascertain the extent of private drains & sewers for which they will hold maintenance & renewal liabilities.
Why do I need to know if there is a public foul sewer within 30.48 metres (100 feet) of any buildings within the property?	If foul water from the property does not drain to a public sewer, the presence of a public foul sewer within 30.48 metres (100 feet) of any buildings within the property can result in the local authority requiring the property to be connected to a public sewer if the existing arrangements are unsatisfactory.

Water Pipes

What are Water Pipes?	Water pipes (water mains, resource mains or discharge pipes) supply clean water to a property. The pipework can be either publicly or privately maintained. Water Undertakers are not responsible for private water mains or private service pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal. If the property is not connected to mains water supply we recommend the situation is checked with the current owner of the property. Details of private supplies are not kept by the Water Undertaker.
What does it mean if there are public water pipes or public sewers within the boundary of the property?	The presence of public water pipes or public sewers within the boundary of the property may restrict further development. The Water and/or Sewerage Undertaker also has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Water Company or Sewer Undertaker or its contractors needing to enter the property to carry out work. The approximate boundary of the property has been determined by reference to the plan provided.

Information

What is meant by the Private Sewer Transfer?	On 1 October 2011, the responsibility for many private sewers and lateral drains, which drain to a public sewer and may be located both within and beyond the property boundary, transferred to the water and sewerage companies. The water and sewerage companies are currently undertaking an exercise to map these new public sewers and lateral drains. In the meantime however there may be additional public assets not shown on the public sewer map enclosed herein. For further information visit:

http://www.ofwat.gov.uk/households/supply-and-standards/supply-pipes/

The following diagram illustrate an example of the impact of the new drainage arrangements:

Sustainable Urban Drainage System (SuDS)

What are Sustainable Urban Drainage Systems (SuDS)?	Sustainable Urban Drainage System (SuDs) are designed to drain surface water from a property or site in a natural more sustainable way, than through conventional networks of pipes and sewers, to local watercourses. SuDS slow down surface water run-off and reduce the risk of flooding, particularly during heavy rain. They also improve water quality and reduce the risk of pollution that can happen when foul sewers are overwhelmed by surface water, leading to dirty water being released into rivers.

Unanswered Questions

Why are certain questions not answered within this report?	This report is compiled using publicly available information (as defined by the Water Industry Act 1991). Where data is not publicly available, we provide an insurance policy (see attached). Where we infer certain answers (Q2.1, 2.2 and 3.1) we refer you to alternative sources of information, including billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains drainage, if a septic tank is installed, and information regarding whether a water meter is installed. If both our inference and the form TA6, the Property Details Questionnaire or billing information are incorrect, then our insurance policy would apply.

stewart title

REGULATED DRAINAGE AND WATER SEARCH INFORMATION ACCURACY POLICY INSURANCE PRODUCT INFORMATION DOCUMENT

Company: Stewart Title Limited

Stewart Title Limited is a title insurance company authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. Registered in England and Wales No 270166. Registered office address: 11 Haymarket, London SW1V 4BP

Complete pre-contractual and contractual information on this policy is provided in other documents

WHAT IS THIS TYPE OF INSURANCE?

Regulated Drainage and Water Search Information Accuracy Policy

WHAT IS INSURED?

- ✓ The defect as described in the Defects section of the Policy Schedule and which arises from your use and ownership of the property as described in the Policy Schedule.
- ✓ In the event of a Regulated Drainage and Water Search provided by the Organisation containing an Adverse Entry which materially affects the market value of the Property then we will, subject to your compliance with the terms and conditions of this policy, pay under this policy for those losses and costs which are set out in the Cover section of the Policy Schedule.

WHAT IS NOT INSURED?

- × Any amount higher than the Limit of Indemnity under the Policy Schedule.
- × All matters set out under the Exclusions section of the Policy Schedule.
- × Any claim made either by you and/or a third party against you which is not set out in the Cover section of the Policy Schedule.

ARE THERE ANY RESTRICTIONS ON COVER?

- ! In deciding to accept this policy in exchange for the premium and in setting the terms and premium, we have relied on the information given by you (or anyone acting on your behalf). You must ensure that, when answering any questions asked by us, any information provided is accurate and complete.
- ! If you deliberately or recklessly provide us with false or misleading information, we may treat this policy as if it never existed and decline all claims. If you provide us with false or misleading information carelessly, we may:
    - o treat this Policy as if it had never existed, and refuse to pay all claims and return the premium paid. However, we may only do so if we would not otherwise have provided you with insurance cover at all;
    - o amend the terms of this policy, and apply the amended terms as if they were already in place, if a Claim has been adversely affected by your carelessness;
    - o reduce the amount we will pay on a Claim in the proportion the premium you paid bears to the premium we would have charged for this policy; or
    - o take a similar proportionate action.
- ! We, or anyone acting on our behalf, will write to you if we intend to treat this policy as if it had never existed, or amend the terms of this policy.
- ! If you become aware that the information given to us is inaccurate, you must inform us as soon as practicable.

WHERE AM I COVERED?

This policy covers you for the UK property specified in the Policy Schedule.

WHAT ARE MY OBLIGATIONS?

- You, or anyone acting on your behalf, must not:
  - disclose the existence of this policy to any third party other than prospective purchasers, lenders, lessees and their legal advisers without our prior written consent
  - take or fail to take action which results in a Claim as this may prejudice your position and void this policy
  - take any steps to settle a Claim without our prior written consent.
- On becoming aware of any potential or actual Claim, you will:
  - provide written notice and details to us at our registered office address immediately of all known facts including all communications, correspondence and all court documents.
  - not admit any liability whatsoever or take steps to compromise or settle the Claim, without our written consent.
  - provide all information and assistance that we and/or any party professional or otherwise acting on our behalf requires at your own expense doing everything reasonably practicable with our prior written consent to minimise any loss.
- You will not make any
  - admission, promise of payment or indemnity
  - application to a court, Upper Tribunal (Land Chamber) or the Land Registry without our written consent

WHEN AND HOW DO I PAY?

You do not make any payments to us directly. Your professional advisors who arranged and recommended the cover to you will tell you how and when to pay.

WHEN DOES THE COVER START AND END?

Your cover will begin on the Policy Date which is set out in the Policy Schedule. The dates of cover are specified on the Policy Schedule.

HOW DO I CANCEL THE CONTRACT?

This policy can be cancelled by contacting us within 14 days of the Policy Date, provided all interested parties (such as lenders holding a mortgage or charge on the Property) consent to cancellation. If you wish to cancel this policy, please write (quoting your policy number) to 'The Underwriting Manager' at our registered address or email to STLEnquiry@stewart.com.

We may at our discretion charge you for the time that you have been on cover including Insurance Premium Tax.

Any refund of premium will be made to the party who paid the premium.

BASIS OF COVER

The Insured has paid or agreed to pay the Premium for this indemnity cover.

The Insured agrees to comply with the terms and conditions of the policy. Failure by the Insured to comply can lead to invalidation of the policy in whole or in part or reduce the amount of any Claim subsequently made.

Signed for and on behalf of Stewart Title Limited

Steven Lessack
CEO, Stewart Title Limited

Authorised Signatory

stewart title

POLICY SCHEDULE

POLICY NUMBER 155853	PROPERTY Each property which is noted on the bordereau
POLICY DATE As referred to on the bordereau per Property	LIMIT OF INDEMNITY See Additional Policy Clause(s) section below
POLICY TERM In Perpetuity from the Policy Date	PREMIUM See Additional Policy Clause(s) section below

THE INSURED

The party purchasing the Property at the Policy Date and any bank, building society or other similar lending institution holding a mortgage or charge on the Property('the Lender') whether as a result of the purchase or as the result of the owner of the Property remortgaging it to the Lender

THE INSURER

STEWART TITLE LIMITED - (Company Reg 2770166), 11 Haymarket, London SW1Y 4BP

THE DEFECT

The Insured has been provided with a Regulated Drainage and Water Search ('the Search') by the Organisation which may contain an Adverse Entry which materially affects the market value of the Property.

INSURED USE

Continued use of the Property for residential or commercial uses as in existence at the Policy Date

EXCLUSION(S)

Any Claim arising from or relating to:

(i) any matter revealed in any other searches made available to the Insured or anyone acting on the Insured's behalf prior to the Policy Date

(ii) any matter otherwise known to the Insured or anyone acting on the Insured's behalf prior to the Policy Date

(iii) consequential loss

(iv) environmental or contamination matters (including but not limited to the Environmental Protection Act 1990

(v) any matter where the Insured or their legal advisors have not followed or acted upon the guidance notes provided in the Search

ADDITIONAL POLICY CLAUSE(S)

Definitions:-

Adverse Entry - Any matter or matters which would have been disclosed in the Search and which were in existence on or before the Policy Date which adversely affect the market value of the Property but which were not disclosed in the Search due to:-

(i) the absence in the Search of answers to questions 2.5.1,2.7,2.8,2.9,3.3,3.4 and 4.5 and/or

(ii) incorrect information being given to the Organisation by the statutory authority or authorities responsible for maintaining the registers forming the subject matter of the Search and/or

(iii) incorrect information being given by the Organisation to the Insured in respect of Questions 2.1,2.2,2.4.1 and 3.1.where the Organisation has interpreted data obtained from the statutory authority or authorities responsible for maintaining the registers but that interpretation is incorrect due to the negligence of, or an error by, the Organisation.

Organisation - STL Group PLC

Regulated Search - A search requested by or on behalf of the Insured in the course of a purchase or remortgage transaction relating to the Property in response to which the Organisation in accordance with the Council of Property Search Organisations' search code has undertaken enquiries and provided a report upon which the Insured relies.

LIMIT OF INDEMNITY	PREMIUM
(Up to £ per Property)	(£ inclusive of I.P.T)
£ 2,000,000.00	£ 0.75

MEMORANDUM OF ENDORSEMENT For Seller Cover

Definitions

The definitions referred to below shall be read as being in addition to those given or where repeated for the purpose of the cover provided to the seller under this Policy as an alternative to those in the Policy

Seller: the Seller of the Property who has requested and paid for the Regulated Search in order to enable the sale of the Property to the Buyer

Buyer: The person(s), corporate or incorporate body, named as Buyer in the exchanged contract for the purchase of the

Property on whose behalf a Regulated Search has been undertaken or who relies upon a Regulated Search carried out on behalf of the seller of the Property by the Organisation and who has subsequently purchased the Property following receipt of the Regulated Search.

Completion Date: the date upon which the sale of the Property to the Buyer completed

Offer Price: the lower of (i) the price agreed between the Seller and the Buyer for the sale of the Property prior to the Completion Date (ii) the highest valuation of the Property obtained by the Seller from an estate agent prior to marketing the property with the estate agent.

Sale Price: the price actually paid by the Buyer to the Seller for the Property on the Completion Date as detailed in the exchanged contract.

Seller Cover

The cover under this Policy will be extended to provide the following additional cover::-

The Seller shall have cover starting on the Completion Date for the matters referred to in sub paragraph (ii) under the definition of Adverse Entry in this policy by revealing an Adverse Entry which should not have been revealed ('the Error') and which is the sole and direct cause of the Buyer renegotiating the Offer Price of the Property to the Sale Price and as a result of which renegotiation the Seller has suffered loss.

Exclusions

The Company shall be not liable to indemnify the Seller for any Error :

(i) not disclosed in the Search

(ii) in respect of any matter of which the Seller or his legal representative had Knowledge as at the date that contracts are exchanged with the Buyer for the purchase of the Property.

(iii) Any Adverse Entry which arises after the Effective Date

(iv) The cover for the Seller shall not apply where the transaction is a remortgage or the Property is used for commercial purposes

Conditions

All conditions referred to in the Policy shall apply

GENERAL PROVISIONS

a. Any act or omission by the Insured, or anyone acting on the Insured's behalf, which in whole or in part induces a Claim under the policy may prejudice the Insured's position and could invalidate the policy in whole or in part or reduce the amount of any Claim.
b. The Insurers liability under this policy will not exceed the Limit of Indemnity (as increased by the Inflation Provision if applicable).
c. This policy shall be governed by and construed in accordance with the law of England and Wales and is subject to the jurisdiction of the courts of England and Wales.
d. The policy and any endorsement issued in respect of it are one contract and shall be read together.
e. The insured will not be entitled to abandon the Property to the Insurer.
f. Your information may be used for the purposes of insurance administration by the Insurer, its associated companies, by reinsurers and your intermediary. It may be disclosed to regulatory bodies for the purposes of monitoring and/or enforcing the Insurer's compliance with any regulatory rules/codes.
g. Your information may also be used for offering renewal, research and statistical purposes and crime prevention. It may be transferred to any country, including countries outside the European Economic Area for any of these purposes and for systems administration. Where this happens, we will ensure that anyone to whom we pass your information agrees to treat your information with the same level of protection as if we were dealing with it.
h. If you give us information about another person, in doing so you confirm that they have given you permission to provide it to us to be able to process their personal data (including any sensitive personal data) and also that you have told them who we are and what we will use their data for, as set out in this notice.
i. In the case of personal data, with limited exceptions, and on payment of the appropriate fee, you have the right to access and if necessary rectify information held about you.
j. The Insurer and the Organisation agree that this version of this Policy will be effective for all Properties entered on a bordereau on or after 1 December 2018.

NON INVALIDATION

The interest in this policy of any Insured will not be invalidated by a breach of the policy terms or conditions by any other party, unless

a. Such party acted on the Insured's behalf or with the Insured's knowledge and consent
b. Where the Insured is a successor in title, they had knowledge of a breach of the policy terms or conditions or of previous non-disclosure or misrepresentation to the Insurer.

IMPORTANT CONDITIONS

In respect of each Property:-

a. In deciding to accept this policy in exchange for the Premium and in setting the terms and premium, the Insurer has relied on the assumptions made being correct and any information given by the Insured (or anyone acting on the Insured's behalf). The Insured must ensure that, when answering any questions asked by the Insurer, any information provided is accurate and complete and the Insurer is informed of any assumptions which cannot be met.
b. If the Insured deliberately or recklessly provides the Insurer with false or misleading information, the Insurer may treat this policy as if it never existed and decline all claims.
c. If the Insured provides the Insurer with false or misleading information carelessly, the Insurer may:
    a. treat this policy as if it had never existed, and refuse to pay all claims and return the premium paid. However, the Insurer may only do so if it would not otherwise have provided the Insured with insurance cover at all;
    b. amend the terms of this insurance, and apply the amended terms as if they were already in place, if a claim has been adversely affected by the Insured's carelessness;
    c. reduce the amount the Insurer will pay on a claim in the proportion the premium the Insured has paid bears to the premium the Insurer would have charged for the policy; or
    d. take a similar proportionate action.
    The Insurer, or anyone acting on the Insurer's behalf, will write to the Insured if the Insurer intends to treat this policy as if it had never existed, or amend the terms of the policy.
d. If the Insured becomes aware that the information given to the Insurer is inaccurate, the Insured must inform the Insurer as soon as practicable.
e. The Insured (or anyone acting on the Insured's behalf) shall not at any time disclose the existence of this policy to any third party other than bona fide prospective purchasers, their lenders, lessees and respective legal advisers without the Insurers written consent
f. The Insured shall not discuss the Defect with any party without the Insurer's written consent, who, it is reasonable to believe can as a result of the discussion make a Claim.
g. A bordereau is provided to the Insurer by the Policyholder in Excel format setting out the address of the Property, the Limit of Indemnity (being the purchase price of the Property) and the Policy Date (being the date of exchange of contracts for the purchase of the Property by the Insured) and that the bordereau is sent to the Insurer at the Insurer's Address within 14 days of the month end following the Policy Date and payment for all properties listed on the bordereau paid either by cheque payable to Stewart Title Limited or by BACS to HSBC Bank Plc, 60 Queen Victoria Street, London EC4N 4TR Account Name: Stewart Title Premium Collection Account, Sort Code 40-05-30, Account Number: 94573269 Reference: «PolicyNumber»

In respect of Conditions e, f and g above where the Insured fails to comply with these conditions the Insurer's liability under this policy may be limited to the extent the Insurer is compromised by any breach of these conditions

COMPLAINTS PROCEDURE

Any complaint should be raised in the first instance with our General Counsel by

- Writing to the General Counsel at the Insurer's Address
- Telephoning 0207 010 7820

Details of our complaints handling procedure are available by contacting our General Counsel.

If we are unable to resolve your complaint to your satisfaction, you may have the right to refer your complaint to the Financial Ombudsman Service at Exchange Tower, London E14 9SR. The Financial Ombudsman Service website is http://www.financial-ombudsman.org.uk/.

The existence, and your use of, this complaints process is without prejudice to your other rights under this policy and your rights in law.

RIGHT TO CANCEL POLICY

This Policy can be cancelled by contacting us within 14 days of the policy date, provided all interested parties (such as lenders holding a mortgage or charge on the Property) consent to cancellation. If you wish to cancel this policy, please write (quoting your policy number) to 'The Underwriting Manager' at the Insurer's Address.

We may at our discretion charge you for the time that you have been on cover including Insurance Premium Tax.

Any refund of premium will be made to the party who paid the premium.

CLAIMS CONDITIONS

On becoming aware of any potential or actual Claim, the Insured will:

a. provide written notice and details to the Insurer at the Insurer's Address immediately of all known facts including all communications, correspondence and all court documents.
b. not admit any liability whatsoever or take steps to compromise or settle the Claim, without the written consent of the Insurer.
c. provide all information and assistance that the Insurer and/or any party professional or otherwise acting on the Insurer's behalf require at the Insured's own expense doing everything reasonably practicable with the Insurer's prior written consent to minimise any loss.

The Insured will not make any

a. admission, promise of payment or indemnity
b. application to a court, Upper Tribunal (Land Chamber) or the Land Registry without the written consent of the Insurer

DEALING WITH THE CLAIM

a. In dealing with the Claim the Insurer will at its discretion and cost be entitled to (whether or not the Insurer is liable under this policy):-
    i. take or defend proceedings in any court or tribunal in the name of the Insured in any proceedings including the right to abandon or submit to judgment
    ii. exercise, in the name of the Insured, any rights or remedies available to the Insured in any proceedings including the right to abandon or submit to judgment
    iii. compromise, settle or compound the Claim and deal in such manner as it thinks fit
    iv. pay at any time to the Insured the amount of the Limit of Indemnity (as increased by the Inflation Provision if applicable) or any lesser amount for which the Claim can be settled and then relinquish control of and have no further involvement with the Claim.
b. The Insurer shall be under no obligation to pay the proceeds of any Claim paid under this Policy to any party other than the Insured and that the proceeds of any Claim shall be incapable of assignment.
c. If, at the time of the Claim, there is other insurance (whether incepted by the Insured or any other party) under which the Insured may be entitled to make a Claim, either wholly or partly in respect of the same interest or risk covered by this policy, the Insurer will not be liable to pay or contribute more than their rateable proportion of the Claim.
d. If the Insured shall make any Claim knowing the same to be false or fraudulent, as regards amount or otherwise, this policy shall become void and the Claim shall be forfeited.
e. The Insurer will be entitled to all rights and defences it may have in respect of a Claim notified by any Insured against any successor to that Insured.
f. Where the Insurer and the Insured cannot agree to the amount to be paid under this policy the matter shall be referred to an arbitrator to be appointed by the parties (or in default of agreement, in accordance with the law in force at the time). The making of an award by the arbitrator shall be a condition precedent to any right of action against the Insurer. The Insured will afford to the Insurer every reasonable assistance in this respect.
g. If the Insurer agrees or is obliged to make any payment to or on behalf of an Insured because of the risk insured by this policy the Insurer will immediately be subrogated to any rights which the Insured may have in relation to that risk.

THE FINANCIAL SERVICES COMPENSATION SCHEME (FSCS)

We are covered by the FSCS. You may be entitled to compensation from the scheme if we cannot meet our obligations. This will depend on the type of business and the circumstances of the Claim.

Further information about the compensation scheme arrangements is available from the FSCS who can be contacted at Financial Services Compensation Scheme, 10th Floor, Beaufort House, 15 St Botolph Street, EC3A 7QU. The FSCS website may be viewed at www.fscs.org.uk.

Important Consumer Protection Information

This search has been produced by InfoTrack Ltd, Level 11, 91 Waterloo Road, London, SE1 8RT (Tel: 0207 186 8090, Email: helpdesk@infotrack.co.uk or visit www.infotrack.co.uk) which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the UK
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services. By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that all search services comply with the law, registration rules and standards
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details:
The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire
SP1 2BP

Tel: 01722 333306 / Fax: 01722 332296
Web: www.tpos.co.uk / Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

Please ask your search provider if you would like a copy of the Search Code.

Internal Complaints Procedure

InfoTrack Ltd has a formal internal complaints procedure for handling complaints speedily and fairly. If you wish to make a complaint, we will:

1. acknowledge your complaint within 5 working days of receipt
2. normally deal with it fully and provide a final response, in writing, within 20 working days of receipt
3. keep you informed by letter, telephone or email, as you prefer, if we need more time
4. provide a final response, in writing, at the latest within 40 working days of receipt
5. liaise, at your request, with anyone acting formally on your behalf

Complaints should be sent to: InfoTrack Ltd, Level 11, 91 Waterloo Road, London, SE1 8RT (Tel: 0207 186 8090, Email: helpdesk@infotrack.co.uk, www.infotrack.co.uk)

If you are not satisfied with our final response, or if we exceed the above timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs) - Tel: 01722 333306 / Email : admin@tpos.co.uk. We will co-operate with TPOs during an investigation and comply with any decision the Ombudsman makes.

Revised 29 January 2019

Terms and Conditions

1. Definitions

In these Terms the following words shall have the following meanings:

1.1 "Beta Service(s)" means a Service: (i) which we inform you is a Beta Service during the Order process; and (ii) where the technology required to provide such Service is still within its testing and development phase, and access to which is provided by InfoTrack to You on a strictly "at own risk" basis.

1.2 "Client" means the seller, buyer, potential buyer or lender in respect of the Property who is the intended recipient of the Report.

1.3 "Code" means the Search Code of Practice for Search Compilers and Retailers as updated from time to time.

1.4 "Company" means a company registered at Companies House in respect of which InfoTrack has been instructed to provide a Service.

1.5 "Consumer" means any person acting for purposes other than their trade, business or profession.

1.6 "Intellectual Property Rights" means copyright, patent, design right (registered or unregistered), service or trade mark (registered or unregistered), database right, or other data right, moral right or know how or any other intellectual property right.

1.7 "Data Protection Legislation" means the Data Protection Act 2018, The General Data Protection Regulation (EU) 2016/679, the Regulation of Investigatory Powers Act 2000, the Telecommunications (Lawful Business Practice) (Interception of Communications) Regulations 2000 (SI 2000/2699), the Electronic Communications Data Protection Directive (2002/58/EC), the Privacy and Electronic Communications (EC Directive) Regulations 2003 (SI 2426/2003) and all applicable Regulations relating to the processing of personal data and privacy (and any successor legislation, including without limitation, the General Data Protection Regulation), including where applicable the guidance and codes of practice issued by the Information Commissioner or any other supervisory authority and the equivalent of any of the foregoing in any relevant jurisdiction.

1.8 "Literature" means InfoTrack's brochures, price lists and advertisements in any type of media, including the content of the Website.

1.9 "Order" means the request for Services by You.

1.10 "Privacy Policy" means our Privacy Policy located on our Website and relevant Privacy Notices as applicable to the Services.

1.11 "Property" means an address or location for which InfoTrack provides a Service.

1.12 "Reasonable Inspection" means a due and careful review and examination being undertaken by a competent professional.

1.13 "Report" means the report prepared by InfoTrack in respect of the Property or the Order.

1.14 "Service(s)" means the supply of services by InfoTrack to You including but not limited to a Report, property searches, reports and photographs, company searches, trade marks and domain name searches and other services from time to time and includes our instructions to a Supplier, on your behalf and the dissemination of the information subsequently provided by the Suppliers.

1.15 "Supplier" means any organisation or third party who provides data or information of any form to InfoTrack for the purposes of providing the Services.

1.16 "Terms" means these terms and conditions of business.

1.17 "VAT" means value added tax under the Value Added Tax Act 1994 and any similar replacement or additional tax.

1.18 "Website" means our website located at www.infotrack.co.uk.

1.19 "We", "Us", "Our" and "InfoTrack" are references to InfoTrack Limited a company incorporated in England and Wales with registered number 09474590 and whose registered office is situated at 10 John Street, London, WC1N 2EB. VAT number GB214140659.

1.20 "You" and "Your" are references to the individual, company, partnership or organisation who accesses the Website or places an Order.

2. Agreement

2.1 The agreement between You and InfoTrack shall come into existence when InfoTrack accepts your completed Order by either sending you written confirmation or providing you with the relevant Services ("Agreement"). Please read and check your Order before it is submitted so that any errors can be identified and corrected.

2.2 These Terms may be varied from time to time. The Terms in force at the time of the Agreement, in conjunction with any relevant Supplier terms and conditions (where InfoTrack is placing orders for searches as Your agent), shall govern the Agreement to the exclusion of all other terms and conditions. You should print a copy of these Terms for future reference.

2.3 By submitting an Order, you shall be deemed to have accepted these Terms and Our Privacy Policy and Terms and Conditions and You agree to be bound by these Terms and that Our Privacy Policy is in effect when You place any Order.

2.4 These Terms together with the Literature, Privacy Policy and Order comprise the whole agreement relating to the supply of the Services to You by InfoTrack.

2.5 If You are not a Consumer You acknowledge that You have not relied upon any representations save insofar as the same have been expressly incorporated in these Terms and You agree that you shall have no remedy in respect of any misrepresentation (other than fraudulent misrepresentation) which has not become a term of these Terms.

2.6 If You are a Consumer then, while We accept responsibility for statements and representations made by Our duly authorised agents, please ensure You ask for any variations from these Terms to be confirmed in writing.

3. Services

3.1 InfoTrack shall use reasonable care and skill in providing the Services to You and shall use only established and trusted suppliers where obtaining information or data from third parties in accordance with the Code.

3.2 We reserve the right to make any changes to the Services described in our Literature to conform with any applicable statutory requirements or any non-material changes which we reasonably deem appropriate in our sole discretion.

3.3 Our Services are provided solely for Your use, or the use of Your Clients on whose behalf You have commissioned the Services, and shall not be used or relied upon by any other party, without Our written consent.

3.4 You hereby agree that We will start performing the Services as soon as possible, following the formation of the Agreement, which is likely to be before the end of the seven working day period set out in clause 5.2.2.

4. Price and Payment

4.1 The price payable for the Services shall be in pounds sterling inclusive of VAT as set out in the Literature or Order, as applicable.

4.2 Payment is due in full from You within 30 days of the date of Our invoice (or as otherwise contracted).

4.3 InfoTrack reserves the right to amend its prices from time to time and the Services will be charged at the price applicable at the date on which an Order is submitted.

4.4 If You fail to pay Our invoice on or before the due date, InfoTrack may charge You interest on the late payment at the prevailing statutory rate pursuant to the Late Payment of Commercial Debts (Interest) Act 1998 until the outstanding payment is made in full.

4.5 InfoTrack reserves the right to retain payment for Services where a search result is cancelled or the search result is NIL. Each refund is assessed based on its own merits, at Our discretion and is conditional upon the relevant Supplier refunding the applicable charges.

5. Cancellation of Services

5.1 If you are a Consumer, you have a legal right to cancel the Agreement under the Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013, during the period set out in Term 5.3.

5.2 This cancellation right does not apply:

5.2.1 in the case of goods made to Your specifications, where these are personalised goods or by reason of their nature cannot be returned; or

5.2.2 where We have started work on the Services with Your agreement (given in Term 3.4).

5.3 As a Consumer Your right to cancel the Agreement starts on the date the Agreement is formed. You have fourteen working days to cancel the Agreement. If you cancel the Agreement within this period, and the exceptions set out in Term 2 do not apply, then You will receive a full refund of any price paid by You. The refund will be processed as soon as possible, and in any case within 30 days of the day on which you gave us notice of cancellation. You will not be liable for any further payment to us in respect of the Agreement.

5.4 To cancel the Agreement You must contact Us in writing at our registered office address by sending an email to helpdesk@infotrack.co.uk.

5.5 Following cancellation of the Agreement (save for cancellation in accordance with Term 5.3) You will remain liable for any costs, expenses and disbursements incurred by Us prior to receiving written notice of cancellation. Such costs, expenses and disbursements shall be invoiced and payable in accordance with Term 4.2.

6. Termination

6.1 InfoTrack may suspend or terminate any agreement with You without any liability to You with immediate effect if at any time:

6.1.1 You fail to make any payment due in accordance with Term 4;

6.1.2 If You repeatedly breach or commit or cause to be committed a material breach of these Terms; or

6.1.3 You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so.

6.2 If an Agreement is terminated under this Term 6 and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us having regard to the value of Services already provided to You.

7. Events Beyond Our Control

7.1 We reserve the right without notice or liability to You, to defer the date of performance (by a period equivalent to the period during which the Services could not be performed) or to cancel the provision of the Services or reduce the volume of the Services ordered by You if we are prevented from or delayed in the carrying on of Our business due to circumstances beyond Our reasonable control provided that, if the event in question continues for a continuous period in excess of 60 days, You shall be entitled to give notice in writing to us to terminate the Order.

8. Warranties and Limitation of Liability

8.1 Subject to Term 10, Term 11 and Term 12 (as applicable) We provide warranties and accept liability only to the extent stated in this Term 8.

8.2 We do not exclude or restrict our liability for death or personal injury caused by our own negligence or any other liability the exclusion of which is expressly prohibited by law.

8.3 Unless otherwise indicated on the front page of the Report, We confirm that any individuals within Our business who conducted any searches has not knowingly had any personal or business relationship with any individual involved in the sale of or dealings with the Property.

8.4 In providing the Services You acknowledge and accept that:-

8.4.1 InfoTrack's only obligation is to exercise reasonable care and skill in providing the Services in accordance with the Code.

8.4.2 The Services do not include any information relating to the value or worth of the Property or the Company.

8.4.3 InfoTrack cannot warrant or guarantee that the Website or any website linked to or from the Website will be uninterrupted or error free or free of viruses or other harmful components and furthermore InfoTrack cannot warrant the performance of any linked internet service not operated by InfoTrack. Accordingly InfoTrack shall not be liable for any damage or loss whatsoever caused: by any virus, including damage to Your computer equipment, software, data or other property resulting from Your access to, use of or browsing of the Website; or as a result of downloading any material, data, text, images, video or audio from the Website; or by the contents of or Your access to, any website linked to the Website; or for inaccuracies or typographical errors of information or on the Website.

8.4.4 InfoTrack shall use reasonable endeavours to provide the Services within the timescale set out in the Literature.

8.4.5 Any services other than our Services, which are advertised in the Literature are for information only, and We are not responsible for any such services which You may use as a result of our recommendation or otherwise. Any such third party services may be subject to the terms and conditions of the relevant third party service provider.

8.5 In connection with the Report You undertake to make a reasonable inspection of any results set out therein to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify Us in writing of such defect as soon as possible after its discovery.

8.6 Any claim relating to data or information obtained from a Supplier shall in the first instance be made against the Supplier (with such assistance from InfoTrack as may reasonably be required) and only if such a claim cannot be made against the Supplier will You make a claim against InfoTrack.

9. Supplier's Obligations

This Term 9 only applies if you are a Supplier

For the purposes of this Term 9, the terms "controller", "processor", "processing", "data subject", "personal data", "personal data breach" and "appropriate technical and organisational measures" shall have the meanings given under the Data Protection Act 2018 and the General Data Protection Regulation and any related Data Protection Legislation.

In this Term 9 "Applicable Laws" means (for so long as and to the extent that they apply to InfoTrack) the law of the European Union, the law of any member state of the European Union and/or Domestic UK Law; and "Domestic UK Law" means the UK Data Protection Legislation and any other law that applies in the UK.

9.1 The parties acknowledge that for the purposes of the Data Protection Legislation, the Supplier is the controller and InfoTrack is the processor. Our Privacy Policy sets out the scope, nature and purpose of processing by Us, the duration of the processing and the types of personal data and categories of data subject.

9.2 The Supplier warrants that all personal data that it provides to InfoTrack has been lawfully obtained and that the receipt, possession or use of that personal data in accordance with these Terms will not place InfoTrack in breach of any applicable Data Protection Legislation or infringe any third party rights.

9.3 The Supplier shall ensure it obtains informed consent from data subjects in respect of the processing of any personal data that is personal to them (or otherwise have another valid lawful basis for processing (or transferring) their personal data), in accordance with all applicable Data Protection Legislation and regulations from time to time and (without limitation) the following specific obligations:

9.3.1 the Supplier shall ensure that all data subjects to which any personal data relates have (if so applicable) given their express, valid, informed and freely given consent and, to the transfer of their personal data by the Supplier to InfoTrack and to the processing of their personal data by InfoTrack in respect of the Services or otherwise have another valid lawful basis for processing (or transferring) their personal data);

9.3.2 the Supplier shall ensure that all data subjects to which any personal data relates are provided with a copy of Our Privacy Policy and any relevant Privacy Notices in accordance with all applicable Data Protection Legislation;

9.3.3 the Supplier shall maintain such documentation as is required under the Data Protection Legislation in respect of its obligations as controller of personal data;

9.3.4 the Supplier shall ensure that a data protection officer is designated at all times for the duration of the Agreement; and

9.3.5 the Supplier shall implement appropriate technical and organisational measures to ensure an appropriate level of security to protect any personal data.

9.4 The Supplier shall fully indemnify InfoTrack against all losses arising from or incurred by it as a result of the loss, destruction or unauthorised disclosure of or unauthorised access to or use of personal data as a result of the Supplier's failure to comply with the provisions of paragraphs 9.2 and 9.3. of these Terms or the Data Protection Legislation.

9.5 InfoTrack shall, in relation to any personal data processed in connection with the performance by InfoTrack of its obligations under the Agreement:

9.5.1 process that personal data only for the purposes of performing its obligations under the Agreement and in accordance with the written instructions given by the Supplier from time to time;

9.5.2 ensure that it has in place appropriate technical and organisational measures to protect against unauthorised or unlawful processing of personal data and against accidental loss or destruction of, or damage to, such personal data;

9.5.3 ensure that all personnel who have access to and/or process personal data are obliged to keep the personal data confidential;

9.5.4 not transfer any personal data outside of the European Economic Area unless it complies with its obligations under the Data Protection Legislation by providing an adequate level of protection to any personal data transferred;

9.5.5 assist the Supplier (at the Supplier's cost) in responding to any request from a data subject and in ensuring compliance with its obligations under the Data Protection Legislation with respect to security, breach notifications, impact assessments and consultations with supervisory authorities or regulators;

9.5.6 notify the Supplier without undue delay on becoming aware of a personal data breach;

9.5.7 maintain complete and accurate records to demonstrate its compliance with this paragraph 9.5;

9.5.8 at the written direction of the Supplier, delete or return personal data and copies thereof to the Supplier as soon as reasonably practicable on termination of the Agreement except for copies that InfoTrack may retain for audit or archiving purposes or unless otherwise required by Applicable Laws to store the personal data; and

9.5.9 subject to paragraph 9.6, not appoint any new third party processors of personal data without providing the Supplier with an opportunity to object to the appointment of each subcontractor.

9.6 The Supplier consents to InfoTrack appointing the third party processors as set out in Our Privacy Policy as third-party processors of personal data under the Agreement. The Supplier shall ensure that it obtains informed consent from data subjects in respect of the processing of any personal data that is personal to them in accordance with paragraph 9.3, as may be required by such third-party processors.

10. Our Liability if you are a Business

This Term only applies if you are not contracting as a Consumer and is subject to Term 12 below

10.1 We only supply the Reports for use by You and Your Clients, and You agree not to use the Reports for any re-sale purposes unless You have obtained Our prior written consent.

10.2 Nothing in these Terms limits or excludes Our liability for:

10.2.1 Death or personal injury caused by Our negligence;
10.2.2 Fraud or fraudulent misrepresentation;
10.2.3 Breach of the terms implied by section 12 of the Sale of Goods Act 1979 (title and quiet possession); or
10.2.4 Defective products under the Consumer Protection Act 1987.

10.3 Subject to Term 10.2, We will under no circumstances whatever be liable to You, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, arising under or in connection with the Agreement for:

10.3.1 Any loss of profits, sales, business or revenue;
10.3.2 Loss or corruption of data, information or software;
10.3.3 Loss of business opportunity;
10.3.4 Loss of anticipated savings;
10.3.5 Loss of goodwill; or
10.3.6 Any indirect or consequential loss.

10.4 Subject to Term 10. 2 and Term 10.3, Our total liability to You in respect of all other losses arising under or in connection with the Contract, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, shall in no circumstances exceed £10 million.

11. Our liability if you are a Consumer

This Term 11 only applies if you are a Consumer.

11.1 If We fail to comply with these Terms, We are responsible for loss or damage You suffer that is a foreseeable result of Our breach of these Terms or Our negligence, but We are not responsible for any loss or damage that is not foreseeable. Loss or damage is foreseeable if they were an obvious consequence of Our breach or if they were contemplated by You and us at the time We entered into the Agreement. Where data is transferred outside of the European Economic Area (subject to our Privacy Policy) then our liability shall be governed by the terms of the provision of services where an agreement approved by the European Commission is utilised.

11.2 We only supply the Reports for private use. You agree not to use the Reports for any commercial, business or re-sale purposes, and We have no liability to You for any loss of profit, loss of business, business interruption, or loss of business opportunity.

11.3 We do not in any way exclude or limit Our liability for:

11.3.1 Death or personal injury caused by Our negligence;
11.3.2 Fraud and fraudulent misrepresentation;
11.3.3 Any breach of the terms implied by section 12 of the Sale of Goods Act 1979 (title and quiet possession);
11.3.4 Any breach of the terms implied by sections 13 to 15 of the Sale of Goods Act 1979 (description, satisfactory quality, fitness for purpose and samples); and
11.3.5 Defective products under the Consumer Protection Act 1987.

11.4 We have obtained insurance cover in respect of Our own liability for individual claims not exceeding £10 million per claim. Our liability is therefore limited to £10 million in respect of any single claim, event, or series of related claims or events and You are responsible for making your own arrangements for the insurance of any excess loss.

12. Beta Services

12.1 If You place an Order for Beta Services You acknowledge and accept that: (i) the Beta Services are still within their development and testing phase; and (ii) that accordingly there is a risk that there may be errors or defects in the Beta Services (and any Reports or other outcomes derived from them).

12.2 Subject to Term 12.3 below:

12.2.1 We will under no circumstances whatsoever be liable to You (or any other party) for any loss or damage caused as a result of any defects, failures, errors or omissions contained within the Beta Services (and any Reports or other outcomes derived from them);
12.2.2 Without prejudice to the generality of Your obligations under Term 8.5, You must carry out a Reasonable Inspection of the Beta Services (and any Reports or other outcomes derived from them); and
12.2.3 You must satisfy Yourself that the content of the Beta Services (and any Reports or other outcomes derived from them) is correct and accurate.

12.3 Nothing in this Term 12 limits or excludes Our liability for:

12.3.1 Death or personal injury caused by Our negligence;
12.3.2 Fraud and fraudulent misrepresentation;
12.3.3 Any breach of the terms implied by section 12 of the Sale of Goods Act 1979 (title and quiet possession);
12.3.4 Any breach of the terms implied by sections 13 to 15 of the Sale of Goods Act 1979 (description, satisfactory quality, fitness for purpose and samples); and
12.3.5 Defective products under the Consumer Protection Act 1987.

13. Intellectual Property Rights

13.1 You acknowledge that all Intellectual Property Rights in the Services are and shall remain owned by either InfoTrack or our Suppliers and nothing in these Terms purports to transfer, assign or grant any rights to You in respect of the Intellectual Property Rights save solely to the extent set out at Term 13.5 below.

13.2 You agree that You will procure that Your clients on whose behalf You have commissioned the Services will not, except as permitted herein or by separate agreement with InfoTrack change, amend, remove, alter or modify the Service or any trademark or proprietary marking in the Service.

13.3 You agree to indemnify Us and keep us indemnified from and hold us on demand, harmless from and against all costs, claims, demands, actions, proceedings, liabilities, expenses, damages or losses (including without limitation, consequential losses and loss of profit, and all interest and penalties and legal and other professional costs and expenses) arising out of or in connection with a breach of this Term 13.

13.4 You agree to indemnify Us against all liabilities, costs, expenses, damages and losses (including but not limited to any direct, indirect or consequential losses and all interest, penalties and legal costs (calculated on a full indemnity basis) and all other professional costs and expenses) arising out of or in connection with any claim for actual or alleged infringement of a third party's Intellectual Property Rights as a result of You including an Ordnance Survey plan within the Order.

13.5 To the extent that some part of the Services purchased by You requires or permits You to use any of Our Intellectual Property Rights in Our software or otherwise, We hereby grant to You a licence to use such Intellectual Property Rights solely to the extent required for the purpose of receiving, accessing and using the Services ("Licence") on the following terms:

13.5.1 The Licence is non-exclusive, royalty free and shall not be sub-licensed, assigned or otherwise transferred by You;

13.5.2 The Licence will continue only for so long as it is reasonably required in order for You to receive, access and use the Services; and

13.5.3 We have the right to terminate the Licence at any time at our sole discretion.

14. Insurance

14.1 Our insurers are QBE Insurance (Europe) Ltd whose address is Plantation Place, 30 Fenchurch Street, London, EC3M 3BD. The level of cover provided by them for our Professional Indemnity Insurance is £10 million.

14.2 Our Professional Indemnity Insurance includes cover for errors and omissions in local authority and water company data and records used to compile our search reports. Should we cease to trade for any reason, prior to that event, we shall execute run-off insurance cover under our Professional Indemnity Insurance for our past search products and services.

14.3 Should we cease to trade for any reason, prior to that event, we shall execute run-off insurance cover under our Professional Indemnity Insurance for our past search products and services.

15. Complaints

15.1 Full details of Our Complaints Procedure are set out on Our Website. We will deal with any complaints made by You in accordance with the Complaints Procedure.

15.2 As per Our Complaints Procedure, should you not be satisfied with our final response or we have exceeded the response timescales pursuant to Our Complaints Procedure, you may refer your complaint to The Property Ombudsman Scheme. The Property Ombudsman Scheme's website is www.tpos.co.uk and email address is admin@tpos.co.uk We will co-operate fully with The Property Ombudsman Scheme during an investigation and comply with his final decision.

15.3 We will co-operate fully with The Property Ombudsman Scheme during an investigation and comply with his final decision. Terms and Conditions

16. General

16.1 You shall not be entitled to assign the Agreement or any part of it without Our prior written consent.

16.2 We may assign the Agreement or any part of it to any person, firm or company provided that such assignment shall not materially affect Your rights under the Agreement.

16.3 The parties to these Terms do not intend that any term of Our Agreement shall be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person that is not a party to these Terms or a permitted assignee.

16.4 Failure or delay by Us in enforcing or partially enforcing any provision of the Agreement will not be construed as a waiver of any of Our rights under the Agreement.

16.5 Any waiver by Us of any breach of, or any default under, any provision of the Agreement by You will not be deemed a waiver of any subsequent breach or default and will in no way affect the other terms of the Agreement.

16.6 If any provision or part of a provision is held to be invalid or unenforceable by any court or other body of competent jurisdiction, that provision or part of that provision shall be deemed severable and the other provisions or the remainder of the relevant provision will continue in full force and effect.

16.7 Unless otherwise stated in these Terms, all notices from You to InfoTrack or vice versa must be in writing and sent to InfoTrack's registered office address as stipulated in Term 1.19 (or as updated from time to time) or Your address as stipulated in the Order.

16.8 In providing the Services and Reports We will comply with the Search Code.

16.9 Any personal data which you provide to us will be held in accordance with the Data Protection Act 2018 and other applicable Data Protection Legislation and regulations from time to time (including, without limitation, the General Data Protection Regulation when it is brought into force) and only used in accordance with Our Privacy Policy (details of which are set out on Our Website) and any relevant Privacy Notices. Whilst non-contractual you agree and acknowledge that the terms of the Privacy Policy and any relevant Privacy Notices are in force during the term of this agreement and may be subject to change or variation from time to time.

16.10 The Agreement shall be governed by and construed in accordance with English law and shall be subject to the non-exclusive jurisdiction of the Courts of England and Wales. However, if You are a resident of Northern Ireland you may also bring proceedings in Northern Ireland, and if you are a resident of Scotland you may also bring proceedings in Scotland.

Revised January 2021

GeoSmart Information

Appendix D

Infiltration Testing

Your Ref: --

Our Ref: 563403/AC

Date: 27 June 2022

STRUCTURAL SOILS LTD

SITE INVESTIGATION
SOIL, ROCK & MATERIAL TESTING
GEOTECHNICAL CONSULTANCY
CONTAMINATED LAND ASSESSMENT

Mc Partland Planning Limited
10 Orient Close
St Albans
Hertfordshire
AL1 1AJ

For the attention of Brian Parker

Dear Brian,

SOAKAWAY TESTING
NORTH CHISWELL GREEN, ST ALBANS

Introduction
We write to report on the findings of the soakaway testing carried out by Structural Soils Limited at the above site on the instructions of McPartland Planning Ltd.

The site is located on the north side of Chiswell Green Lane. It is a large field, divided into paddocks used as grazing for horses (see attached plan). The British National Grid Reference of the approximate centre of the site is 512840,204690. Published geological mapping shows the bedrock beneath the site to be chalk (the Lewes Nodular Chalk Formation or Seaford Chalk Formation). Over most of the site this is overlain by River Terrace Deposits (mainly sand and gravel) of Pleistocene age (The Kesgrave Catchment Subgroup) with chalk shown to outcrop in the northwest corner (around TP1).

Soakaway testing was carried out at 5 locations on 20 and 21 June 2022. The locations are shown on the attached plan. The results sheets are appended, and the results summarised below:

TABLE 1 : SUMMARY OF SOAKAWAY TEST RESULTS

Geology	Typical Soil Description	Test Location	Depth of Pit at time of test, m bgl	Soil Infiltration Rate m/s
Kesgrave Subgroup	Variable clayey sand & gravelly clays	TP1	2.50	No fall in water level
Kesgrave Subgroup	"" ""	TP2	2.40	1.36×10^{-6}
Kesgrave Subgroup	"" ""	TP4	2.30	No fall in water level
Kesgrave Subgroup	"" ""	TP5	2.40	No fall in water level
Kesgrave Subgroup	"" ""	TP6	2.40	No fall in water level

Discussion
No groundwater was encountered when excavating the trial pits. The geological map shows no superficial deposits over the chalk bedrock in the north-west corner of the site, which was investigated in TP1. However, TP1 in fact found superficial deposits

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ask@soils.co.uk
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HEAD OFFICE:
Bristol
BRANCH OFFICES:
Castleford
Glasgow
Hemel Hempstead
Tonbridge
Wigan

Registered No. 828694 England
Registered Office: Spring Lodge, 172 Chester Road, Helsby WA6 0AR

down to at least 2.5 m depth, where the soakaway test was carried out. Chalk was not reached in any trial pit. Engineer's logs for TP1 and TP5 are appended.

In 4 of the 5 tested locations was there was no fall in water level over 4 hours, at which time the tests were aborted. In the fifth location (TP2) two fills were possible, and recorded very similar infiltration rates of 1.20 x 10^{-6} and 1.36 x 10^{-6} m/s. It seems unlikely that conventional soakaways would be practical at this site.

We are aware of a development in a similar situation where very shallow large soakaways / permeable paving were used to drain road surface run off, and borehole soakaways used to drain roof run off (nominally cleaner than road run off). The shallower soils (at less than 1.0 m depth) at Chiswell Green are generally sandier than those below so might be more permeable. It might also be possible to use borehole soakaways discharging into the underlying chalk. This would require the approval of the Environment Agency and would depend on proximity of any groundwater abstractions. The practicality and cost would depend on the depth to the chalk, and groundwater level within the chalk, which are not known although groundwater is likely to be deep (>30 m).

Closing Remarks
All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, and field tests performed during the investigation. There may be conditions at the site that have not been taken into account, such as unpredictable soil strata, and water conditions between or below exploratory holes.

This report was prepared by SSL for the sole and exclusive use of McPartland Planning Limited in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded. No liability will be accepted after a period of 6 years from the date of the report.

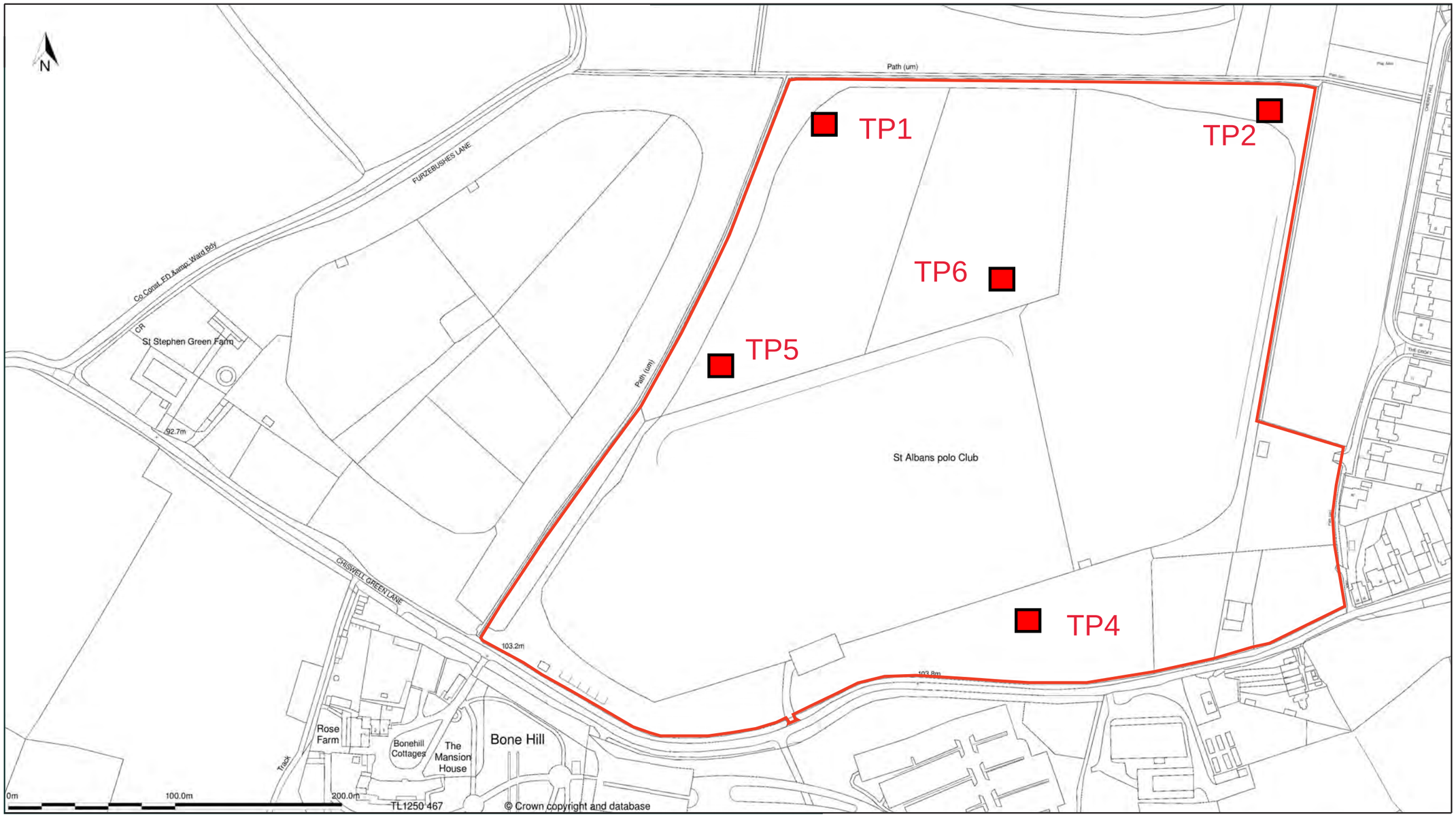
This concludes our work on this project. If you have any queries please do not hesitate to contact us.

Yours sincerely,
STRUCTURAL SOILS LIMITED

Alan Cattell
BSc PhD FGS CGeol

Refs:
1. BRE Digest 365 (2016) Soakaway Design

Encs:
1. Soakaway Location Plan
2. Soakaway Results Sheets
3. Legend and Trial Pit Logs for TP1 and TP5



Land north of Chiswell Green Lane and east of The Croft, Chiswell Green

Client: Virginia Properties		Project: SADC Call For Sites, 2021		McPartland Planning Limited 10 Orient Close, St Albans, Herts AL1 1AJ E. brian.mpp@outlook.com
Scale: 1:2500 (A3 original)		Drawing: Location Plan		
Ref: VP/CFS/lp	Revision:	Date: 23.04.21	By: B Parker	

FULL SCALE SOAKAWAY TEST

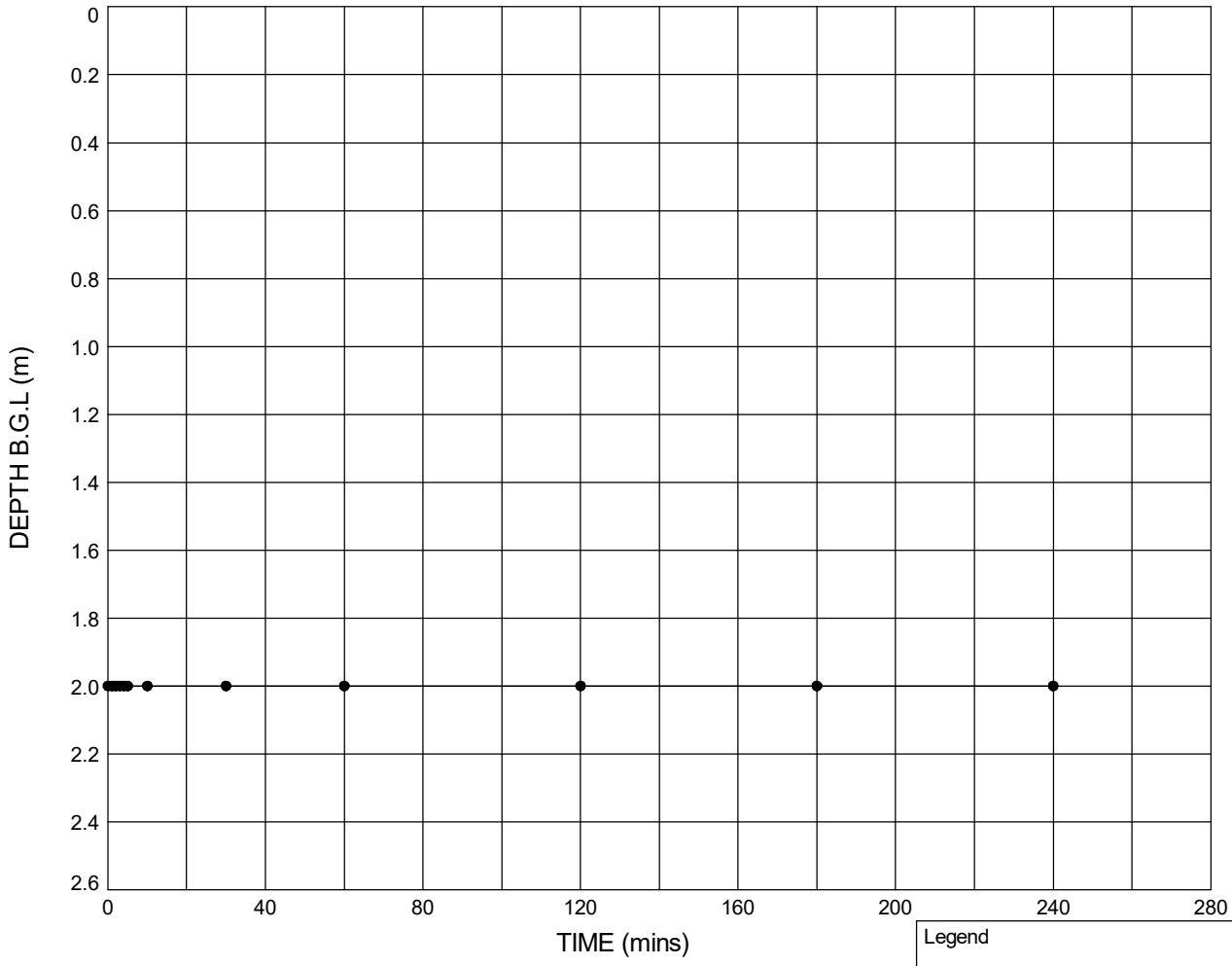
Non-standard test

Soakaway Test - Position ID : **TP1**

Ground Level: **---**

Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



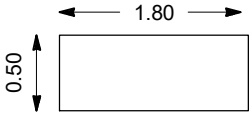
Pit start depth:	=	**2.50**	m
Pit final depth:	=	**2.40**	m
Effective depth, De	=	**0.40**	m
Effective storage volume, V_{p75-25}	=	**0.1800**	m^3
Surface area, a_{s50}	=	**1.8200**	m^2
Time, t_{p75-25}	=	**N/A**	secs
Infiltration rate, f	=	**N/A**	m/s

Notes: Test 1 - Unable to calculate infiltration rate due to insufficient drop in water level.

Legend

● Test 1 (21.06.22)

Plan (Not to scale)



No Bearing Taken

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date
KFlinacher	**23/06/22**		**23/06/22**

Contract: **North Chiswell Green Lane**

Contract Ref: **563403**

FULL SCALE SOAKAWAY TEST

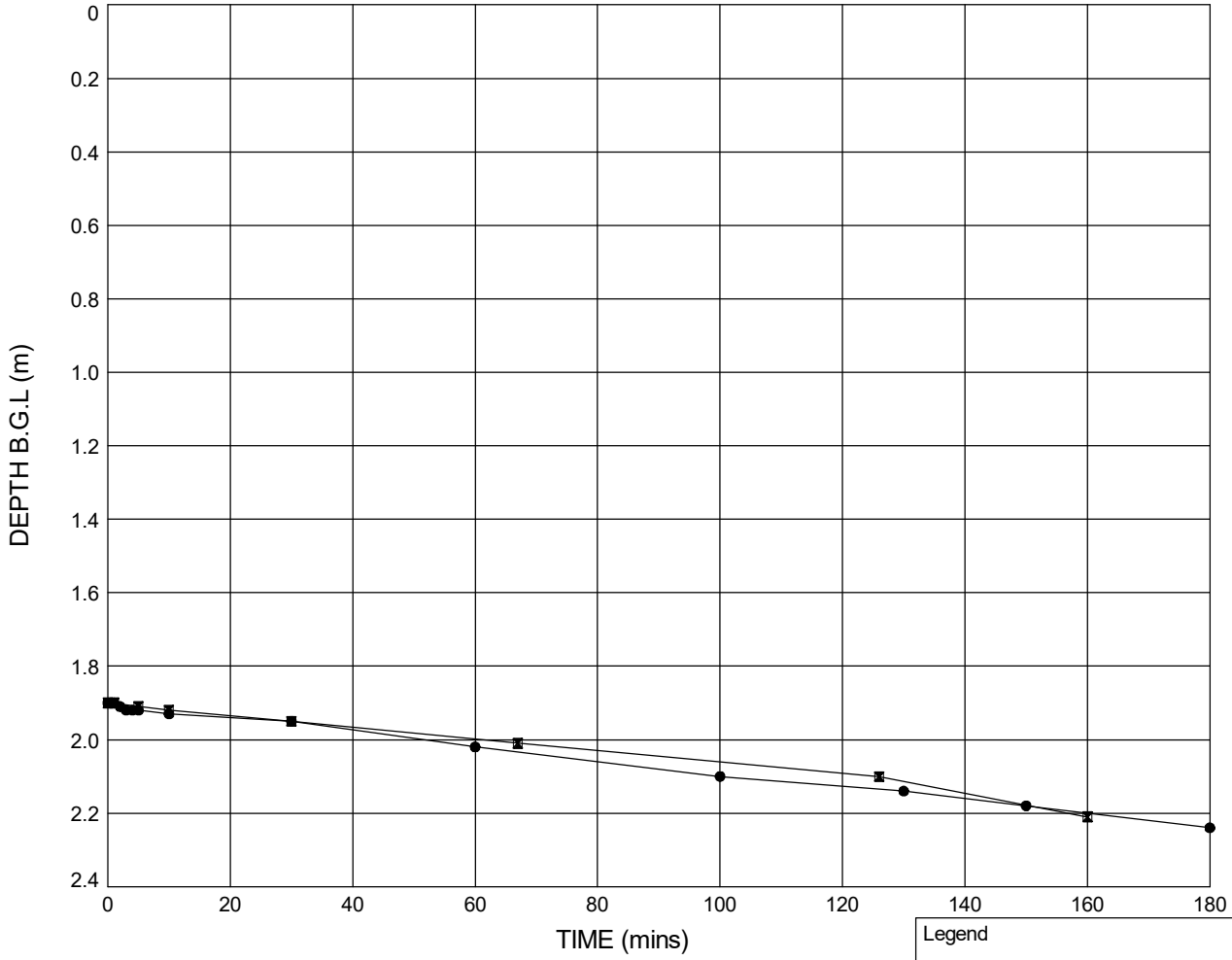
Non-standard test

Soakaway Test - Position ID : **TP2**

Ground Level: **---**

Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



		Test 1	Test 2	
Pit start depth:	=	**2.40**	*2.30*	m
Pit final depth:	=	**2.30**	*2.29*	m
Effective depth, De	=	**0.40**	*0.39*	m
Effective storage volume, V_{p75-25}	=	**0.1080**	*0.1053*	m^3
Surface area, a_{s50}	=	**1.3800**	*1.3590*	m^2
Time, t_{p75-25}	=	**6514**	*5717*	secs
Infiltration rate, f	=	**$1.20x10^{-5}$**	*$1.36x10^{-5}$*	m/s

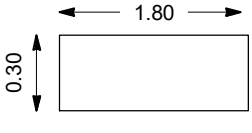
Please note test data was extrapolated to obtain tp75-tp25.

Legend

● Test 1 (21.06.22)

⊠ Test 2 (21.06.22)

Plan (Not to scale)



No Bearing Taken

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18 Frogmore Road
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Hertfordshire
HP3 9RT

Compiled By	Date	Checked By	Date
	23/06/22		**23/06/22**

Contract: **North Chiswell Green Lane**

Contract Ref: **563403**

FULL SCALE SOAKAWAY TEST

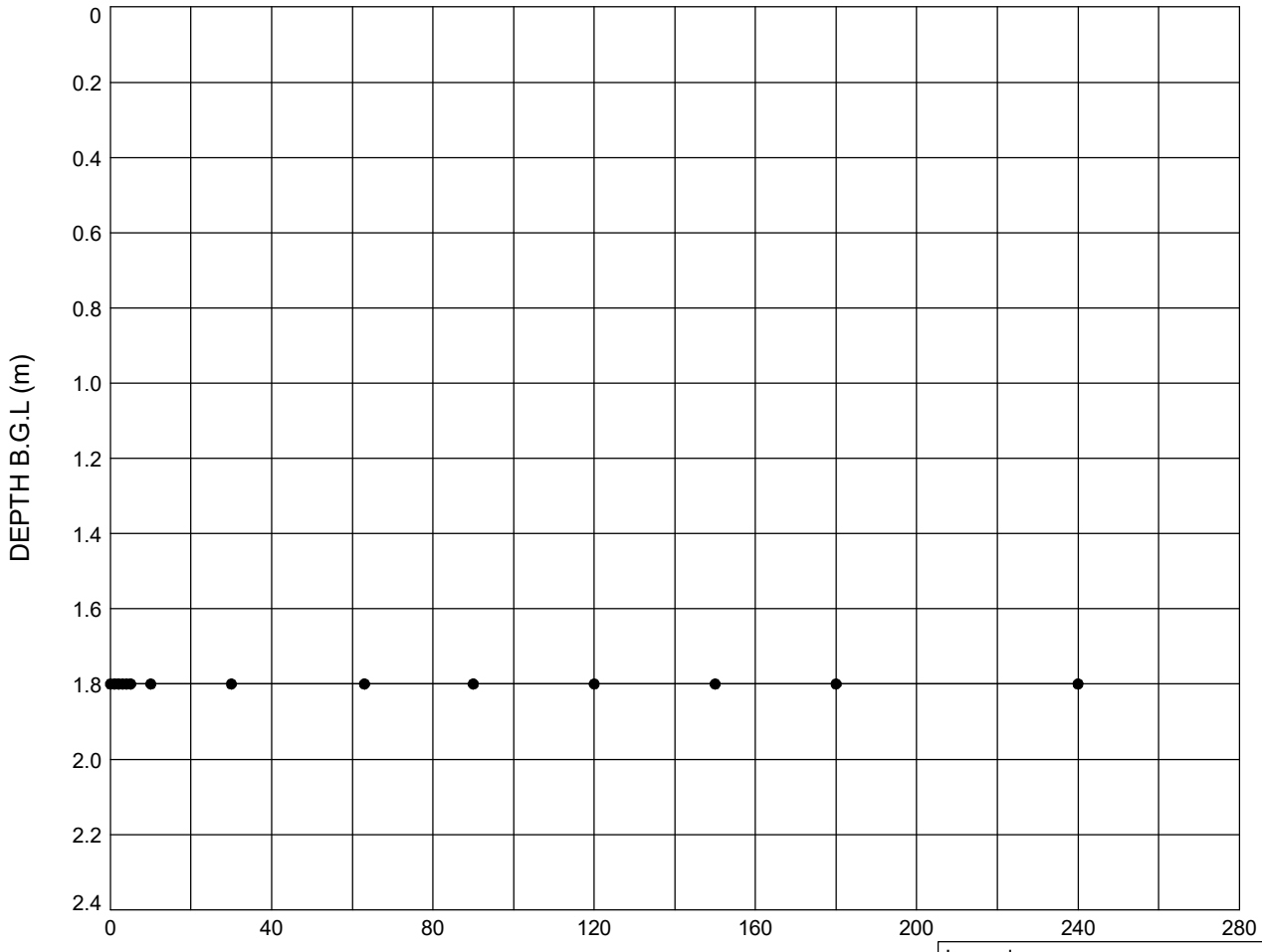
Non-standard test

Soakaway Test - Position ID : **TP4**

Ground Level: **---**

Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



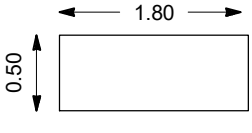
Pit start depth:	=	**2.30**	m
Pit final depth:	=	**2.30**	m
Effective depth, De	=	**0.50**	m
Effective storage volume, V_{p75-25}	=	**0.2250**	m^3
Surface area, a_{s50}	=	**2.0500**	m^2
Time, t_{p75-25}	=	**N/A**	secs
Infiltration rate, f	=	**N/A**	m/s

Notes: Test 1 - Unable to calculate infiltration rate due to insufficient drop in water level.

Legend

● Test 1 (21.06.22)

Plan (Not to scale)



No Bearing Taken

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KFlwracher	**23/06/22**		**23/06/22**

Contract: **North Chiswell Green Lane**

Contract Ref: **563403**

FULL SCALE SOAKAWAY TEST

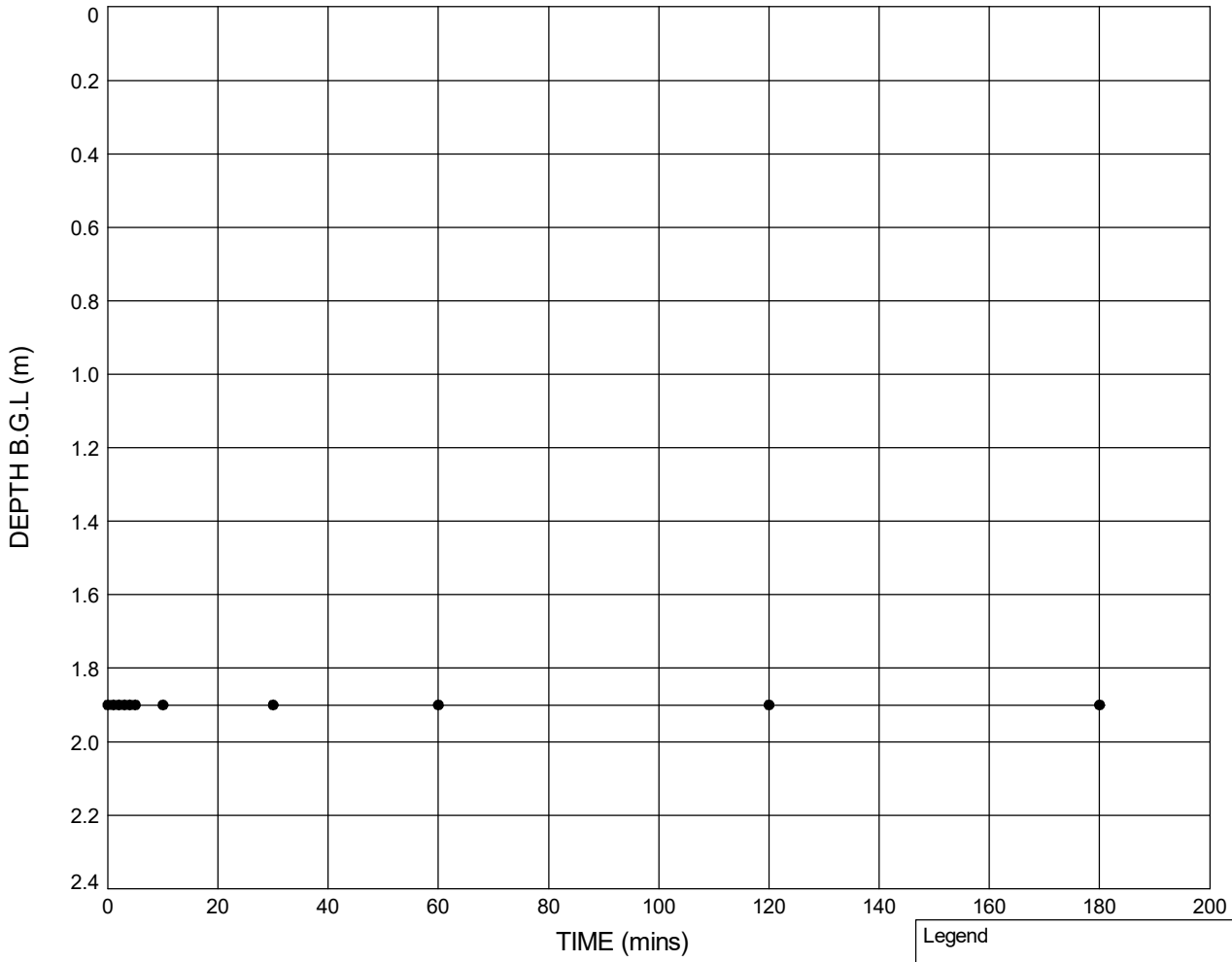
Non-standard test

Soakaway Test - Position ID : **TP5**

Ground Level: **---**

Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



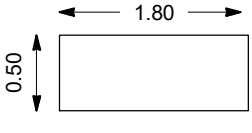
Pit start depth:	=	**2.40**	m
Pit final depth:	=	**2.30**	m
Effective depth, De	=	**0.40**	m
Effective storage volume, V_{p75-25}	=	**0.1800**	m^3
Surface area, a_{s50}	=	**1.8200**	m^2
Time, t_{p75-25}	=	**N/A**	secs
Infiltration rate, f	=	**N/A**	m/s

Notes: Test 1 - Unable to calculate infiltration rate due to insufficient drop in water level.

Legend

● Test 1 (20.06.22)

Plan (Not to scale)



No Bearing Taken

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Compiled By	Date	Checked By	Date
KFlinacher	**23/06/22**		**23/06/22**

Contract: **North Chiswell Green Lane**

Contract Ref: **563403**

FULL SCALE SOAKAWAY TEST

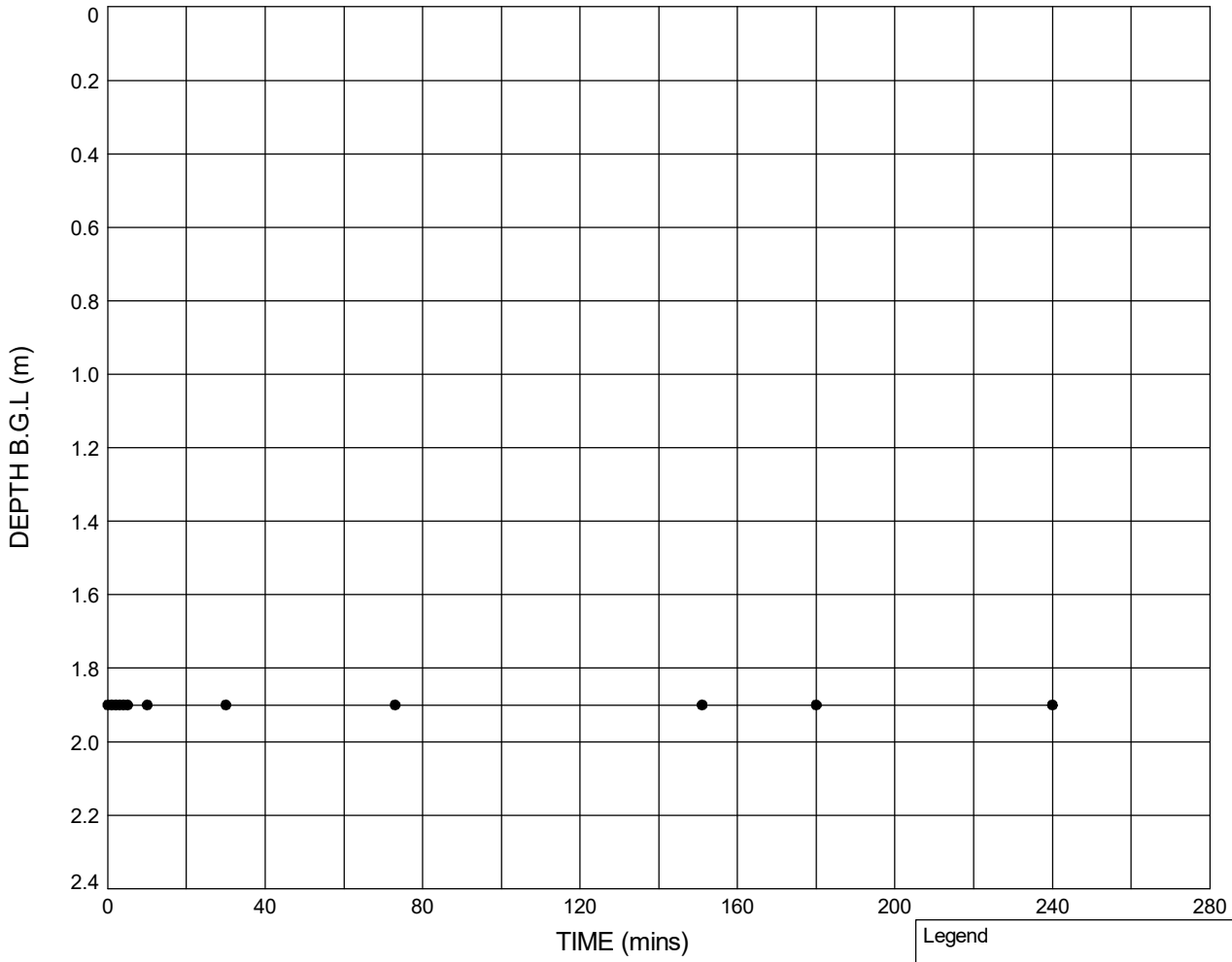
Non-standard test

Soakaway Test - Position ID : **TP6**

Ground Level: **---**

Co-ordinates: **---**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



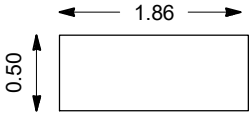
Pit start depth:	=	**2.40**	m
Pit final depth:	=	**2.35**	m
Effective depth, De	=	**0.45**	m
Effective storage volume, V_{p75-25}	=	**0.2093**	m^3
Surface area, a_{s50}	=	**1.9920**	m^2
Time, t_{p75-25}	=	**N/A**	secs
Infiltration rate, f	=	**N/A**	m/s

Notes: Test 1 - Unable to calculate infiltration rate due to insufficient drop in water level.

Legend

● Test 1 (21.06.22)

Plan (Not to scale)



No Bearing Taken

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Hertfordshire
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Compiled By	Date	Checked By	Date
KFlwracher	**23/06/22**		**23/06/22**

Contract: **North Chiswell Green Lane**

Contract Ref: **563403**

KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF ABBREVIATIONS

SAMPLING

Sample type codes:
B = Bulk disturbed sample.

IN-SITU TESTING

V = Field Vane Test. Peak value (c_u) & Residual value (c_r), given as shear strength in kPa.

ADDITIONAL NOTES

1. All soil and rock descriptions and legends in general accordance with BS EN ISO 14688-1:2018, 14688-2:2018, 14689:2018, and BS5930:2015+A1:2020.
2. Material types divided by a broken line (- - -) indicates an unclear boundary.
3. Fracture spacings (If) quoted in the Description of Strata for specific strata or specific fracture sets are also quoted in mm, e.g. (25/80/230) referring to (Min/Avg/Max).
4. The data on any sheet within the report showing the AGS icon is available in the AGS format.

Structural Soils Ltd, Branch Office - Hemel Hempstead: 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 416660, Fax: 01442 437550, Web: www.soils.co.uk, Email:hemel@soils.co.uk.

KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF GRAPHIC SYMBOLS

MATERIAL GRAPHIC LEGENDS

Gravelly clayey SAND

Sandy gravelly silty CLAY

Sandy gravelly SILT

Gravelly silty SAND

INSTRUMENTATION SYMBOLS

Backfill

STRUCTURAL SOILS

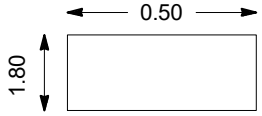
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
North Chiswell Green Lane	**McPartland Planning Limited**	**TP1**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
563403	**20.06.22**	**---**	**---**	**1** of **1**
	End: **20.06.22**			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.30	1	B				Grass over friable brown slightly gravelly sandy SILT with frequent roots and rootlets. Sand is fine to coarse gravel is subangular to rounded fine to coarse of quartzite.	(0.30)	
							0.30	
0.50-0.80	2	B				Orangish brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to rounded fine to coarse of quartzite	(0.70)	
							1.00	
1.20-1.50	3	B				Firm orangish brown and reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse gravel is angular to subrounded fine to coarse of quartzite and chert.		
1.20		V	c_u=60/56/56					
1.20		V	c_r=10/10/12				(0.80)	
1.50		V	c_u=40/36/50					
1.50		V	c_r=10/14/14					
							1.80	
2.00-2.30	4	B				Light orangish brown slightly gravelly sandy CLAY. Sand is fine to coarse gravel is angular to subangular fine to medium of chert.	(0.70)	
							2.50	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Soakaway test undertaken at 2.50m depth

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**ATidswell**	

STRUCTURAL SOILS

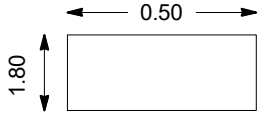
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
North Chiswell Green Lane	**McPartland Planning Limited**	**TP5**

Contract Ref:	Start:	Ground Level:	Co-ordinates:	Sheet:
563403	End: **20.06.22**	**---**	**---**	**1** of **1**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10-0.30	1	B				Grass over friable brown slightly gravelly sandy SILT with frequent roots and rootlets. Sand is fine to coarse gravel is subangular to rounded fine to coarse of quartzite.	(0.30) 0.30	
0.50-0.80	2	B				Orangish brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to rounded fine to coarse of quartzite	(0.70) 1.00	
1.30-1.50	3	B				Stiff to firm orangish brown and reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse gravel is angular to subrounded fine to coarse of chert.	(1.00) 2.00	
1.50		V	c_u=60/80/62					
1.50		V	c_r=10/10/12					
2.10-2.30	4	B				Orangish brown gravelly clayey fine to coarse SAND with a medium cobble content. Sand is fine to coarse gravel is angular to subangular fine to coarse of chert. Cobbles are angular to subrounded of chert.	(0.50) 2.50	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Soakaway test undertaken at 2.50m depth

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**JCB-3CX**	**ATidswell**	

GeoSmart Information

Appendix E

Utilities Assessment






PROPOSED RESIDENTIAL DEVELOPMENT, LAND AT CHISWELL GREEN LANE, CHISWELL GREEN, ST ALBANS

UTILITIES ASSESSMENT

SEPTEMBER 2021

REPORT REF: 26728-07-UR-01

Consulting Development Engineers

PROPOSED RESIDENTIAL DEVELOPMENT, CHISWELL GREEN LANE, CHISWELL GREEN, ST ALBANS

UTILITIES ASSESSMENT

SEPTEMBER 2021

REPORT REF: 26728-07-UR-01

CLIENT: McPartland Planning Limited

ENGINEER: Mewies Engineering Consultants Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

Tel: 01530 264753
E-mail: group@m-ec.co.uk

Report Prepared By:

.....
Claire Hosford
Utilities Technician

Report Approved By:

.....
Alexander Bennett BEng(Hons) MCIHT MTPS
Director

CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Mewies Engineering Consultants Ltd (M-EC) has been commissioned by McPartland Planning Limited to undertake a Utilities Assessment for a proposed development at Chiswell Green Lane, Chiswell Green, St Albans. A site location plan is provided in **Appendix A** and a sketch masterplan contained within **Appendix B.**

1.2 The development proposals comprise of up to 330 residential dwellings.

1.3 The purpose of this report is to establish how the proposed development will be serviced with key utility supplies, whether diversion or protection of existing apparatus may be required and estimated costs for service connection and diversion works, where available.

1.4 Consultation has been undertaken with key Statutory Undertakers to establish:

- Available capacity within existing infrastructure;
- Required capacity improvement works to accommodate the development;
- Required diversions of infrastructure to accommodate the proposed development;
- Any required easements;
- Service connection locations; and
- Service connection costs.

1.5 Consultation has been undertaken with the following Statutory Undertakers:

- Thames Water (sewerage provider for Chiswell Green);
- Affinity Water (clean water);
- Cadent (gas);
- UK Power Networks (electricity);
- Openreach & Virgin Media (telecommunications);
- HVSS (gas and electricity connections).

1.6 Consultation responses received from Statutory Undertakers are included within **Appendices C-G**. A services constraints plan has been produced from the apparatus plans, and is provided in **Appendix H.**

1.7 Following this introductory Section of the report, **Section 2.0** details the existing utilities infrastructure in the vicinity of the site, **Section 3.0** details proposed future supply to the site and **Section 4.0** provides details on requisite diversions and easements. A summary of information is provided within **Section 5.0.**

1.8 M-EC has completed this report for the benefit of the organisation referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from M-EC.

1.9 M-EC accepts no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned.

- The issue of this document to any third party with whom approval for use has not been agreed.

2.0 EXISTING SERVICES

2.1 Formal requests have been made to relevant utility companies for a copy of their existing asset plans for the proposed development area. The following table summarises the Statutory Undertakers that have been approached, their response and likely requirements for diversion or extra protection measures of any existing apparatus. Further information on the diversion and extra protection of the affected apparatus can be found in **Section 4.0** of this report.

Service	Statutory Undertaker	Response Received	Area Affected	Diversion / Protection Required
Electricity	UK Power Networks	Yes	Yes – Underground LV cables within the site boundary crossing the proposed entrance and within Chiswell Green Lane.	Yes – refer to **Section 4.0**
Electricity	Utility Assets	Yes	No	No
Gas	Cadent	Yes	Yes – Low pressure gas mains within the eastern footway of The Croft and within the northern verge of Chiswell Green Lane c35m east of the proposed development site.	No
Gas	Engie	Yes	No	No
Potable Water	Affinity Water	Yes	Yes – Clean water mains within Chiswell Green Lane and within the eastern footway of The Croft.	Yes – refer to **Section 4.0**
Foul and Surface Water	Thames Water	Yes	Yes– Foul sewers within land south of Chiswell Green Lane and east of The Croft. Surface water sewer within The Croft.	No
Electricity/Gas	GTC	Yes	No	No
Telecoms	Openreach	Yes	Yes –Overhead cables within Chiswell Green Lane and within the site boundary at the southwest corner. Overhead and underground cables within The Croft.	Yes – refer to **Section 4.0**
Telecoms	Virgin Media	Yes	Yes – underground cables within the eastern footway of The Croft and within the northern verge of Chiswell Green Lane east of the proposed development site.	No
Telecoms	Lumen	Yes	No	No
Telecoms	Sky	Yes	No	No
Telecoms	Vodafone	Yes	No	No
Telecoms	Colt	Yes	No	No
Telecoms	Verizon	Yes	No	No
Telecoms	Mobile Broadband Network	Yes	No	No
Telecoms	Sota	Yes	No	No
Telecoms	City Fibre	Yes	No	No
Street Lighting	Herts County Council	Yes	No	No

3.0 SERVICES SUPPLY

Foul Water

3.1 Thames Water (TW) have confirmed that in order to assess the impact of the new development on the existing sewer network and resources, a network capacity investigation will be necessary. The investigation determines whether any additional reinforcement or enhancement is required to provide sufficient capacity for foul flows from the proposed development.

3.2 The cost for the sewer modelling is entirely funded by TW and they will commence this work on receipt of authorisation from the landowner and confirmation of outline or full planning consent. Typical timescales for a development of this size would be 8 months to complete the modelling work, 6 months for the design work and 6 months to complete construction. A copy of the developer enquiry can be found in **Appendix C**.

3.3 The waste infrastructure charge for this development will be £365.00 per plot based on TW's published 2021/22 charging arrangements. The total waste infrastructure charge for this development is therefore calculated as £120,450.00.

Clean Water

3.4 Affinity Water (AW) have confirmed that there is sufficient capacity to supply the proposed development with clean water, therefore, reinforcement works are not required. Three points of connection will be required to supply the development: one within The Croft and two within Chiswell Green Lane adjacent to the southeast and southwest extents of the development.

3.5 AW have provide a budget new water main connection cost of £204,244.00 and a service connections cost of £157,057.00. It is to be noted that allowance is included for barrier pipe so costs may be reduced if a ground investigation report confirms there is no contamination present. It has been assumed that all onsite excavation will be carried out by the developer.

3.6 Based on AW's current charging arrangements the clean water infrastructure charge for this site will be £249.00 per plot and the income offset will be -£387.26 per plot. The total clean water infrastructure charge is therefore calculated at -£45,625.80 for the proposed development. The AW clean water enquiry can be found attached within **Appendix C**.

Gas

3.7 Cadent have confirmed that there is sufficient capacity in the local low pressure gas network to supply the development site and therefore reinforcement is not required. Connections are to be made to the 4" CI low pressure gas main located within Chiswell Green Lane which is approximately 35m to the east of the site boundary. A developer enquiry response and a connection plan showing the connection point can be found within **Appendix D**.

Electricity

3.8 UK Power Networks (UKPN) have provided a budget estimate of £840,000.00 to connect the proposed development to their existing HV (11kV) network. UKPN have advised that the point of supply will be from the HV (11kV) underground cable approximately 400m east of the proposed development in Chiswell Green Lane. UKPN will lay a new HV network from this point of connection to 2 new ground mounted substations within the proposed development. From the substations, UKPN will lay the necessary LV cables to serve the entire development. A budget quotation developer enquiry response can be found within **Appendix E.**

3.9 The typical plot of land required for a UKPN GRP substation enclosure is 5 x 6m and 24/7 vehicle and pedestrian access will be required. A minimum of 10m clearance should be maintained between the substation and nearest residential dwelling in order to mitigate the risk of noise disturbance.

Telecommunications

3.10 Openreach will deploy FTTP, free of charge, into all new housing developments of 20 or more homes. Openreach's FTTP infrastructure is open to all communication service providers to encourage greater adoption and customers can benefit from the faster speeds of up to 1Gbps. Openreach will supply all of the materials such as ducts and joint boxes required to build and install the network free of charge, however, it is the responsibility of the developer or their appointed contractor to install the on-site ducts and joint boxes to Openreach's specification. An asset map showing Openreach infrastructure within the area of the proposed development site is included in **Appendix F**.

Dual Fuel

3.11 HVSS is an independent connections provider who has supplied a budget cost of £298,750.00 to supply both gas and electricity connections to the proposed development. The HVSS quote allows for a high voltage electricity connection and a medium pressure gas connection which are not assumed to be local to the site. Their budget quote includes allowance for a gas governor located at the site boundary and an electricity substation onsite. A copy of their budget quote included in **Appendix G.**

4.0 DIVERSIONS AND PROTECTION OF APPARATUS

Clean Water

4.1 The AW clean water records show a 6'' CI/SI main within the verge and carriageway of Chiswell Green Lane. Records indicate that the main is within carriageway in the vicinity of the proposed site access. Although a diversion is not anticipated, extra care should be taken when working in this area. The approximate route is shown on the utilities constraints plan (drawing number 26728_00_010_01) within **Appendix H** of this report.

Electricity

4.2 UKPN asset plans show a low voltage cable installed within Chiswell Green Lane which enters the boundary of the proposed development in the vicinity of the proposed site access. This appears to supply an existing building within the development site which is proposed for demolition. Disconnection will be required in order to facilitate construction of the new development. Extra care is required when working in this area and all cables should be treated as live until proven dead. The approximate routing of the low voltage cable is shown on the utilities constraints plan within **Appendix H** of this report.

Telecommunications

4.3 Openreach apparatus plans show existing overhead cables within Chiswell Green Lane and an existing support pole within the proposed site entrance. Diversion will be required to facilitate construction of the new site access. Openreach have carried out an initial review and have advised that a budget diversion quote can be provided on receipt of detailed layout plans and payment of an application / survey fee of £7,132.50. Openreach correspondence can be found within **Appendix F**.

4.4 Plans also show overhead cables within the site boundary at the southwest corner and in The Croft. No diversions are anticipated but extra care should be taken when working in these areas. The approximate location of the Openreach apparatus is shown on the utilities constraints plan within **Appendix H**.

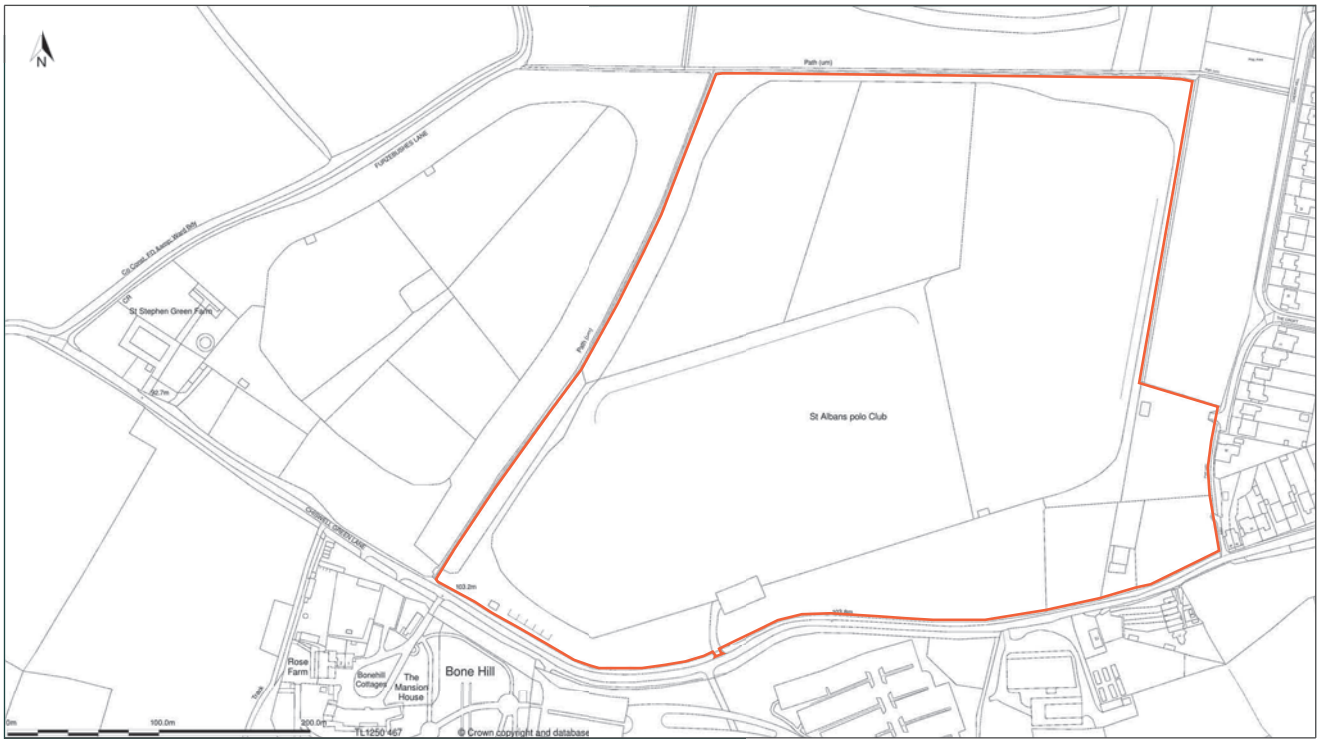
5.0 SUMMARY

5.1 This report has been produced to support a proposed residential development at Chiswell Green Lane, Chiswell Green, St Albans. A summary of all findings to date is provided in the below table.

Service and/or Provider	Capacity Available?	Point of connection	Budget Costs Provided?	Are Diversions/ Extra Protection Measures Required?	Additional Comments
Foul Drainage (Thames Water)	TBC – sewer modelling required	TBC on completion of sewer modelling.	Developer to construct and offer for adoption. Infrastructure Charge £120,450.00	No	TW have advised typical timescales of 8 months to complete the modelling work, 6 months for the design work and 6 months to complete construction.
Clean Water (Affinity Water)	Yes	3" CI clean water main in The Croft and 2 connections to 6'' CI clean water main in Chiswell Green Lane.	New Mains Connections £204,244.00 New Service Connections £157,057.00 Infrastructure Charge -£45,625.80	Caution required in the vicinity of the existing water main within Chiswell Green Lane.	New connection costs include an allowance for barrier pipe so may be reduced if a ground investigation report confirms no contamination.
Gas (Cadent)	Yes	4" CI low pressure gas main in Chiswell Green Lane c35m east of the site boundary.	Capacity check only.	No	N/A
Electricity (UK Power Networks)	Yes	Underground HV (11kV) cable c400m east of the proposed development in Chiswell Green Lane.	New Connections £840,000.00	Disconnection of the existing LV cable within the site boundary will be required to facilitate the proposed development.	Two substations will be required onsite to serve the development.

Service and/or Provider	Capacity Available?	Point of connection	Budget Costs Provided?	Are Diversions/ Extra Protection Measures Required?	Additional Comments
Telecoms (Openreach)	N/A	Openreach apparatus within Chiswell Green Lane.	New Connections £0.00 Diversion Survey £7,132.50	Diversion of existing overhead apparatus in Chiswell Green Lane will be required to facilitate construction of the proposed access.	Openreach will deploy FTTP, free of charge, into all new housing developments of 20 or more homes. No proposals therefore have been sought.
Dual Fuel (HVSS)	Assumed	HV electricity connection and MP gas connection which are not assumed to be local to the site.	New Connections £298,750.00	N/A	The HVSS budget quote includes allowance for a gas governor located at the site boundary and an electricity substation onsite.

APPENDIX A



Land north of Chiswell Green Lane and east of The Croft, Chiswell Green

Client: Virginia Properties		Project: SADC Call For Sites, 2021		McPARTLAND PLANNING McPartland Planning Limited 10 Orient Close, St Albans, Herts AL1 1AJ E. brian.mpp@outlook.com
Scale: 1:2500 (A3 original)		Drawing: Location Plan		
Ref: VP/CFS/lp	Revision:	Date: 23.04.21	By: B Parker	

APPENDIX B

6-unit apartment block
- 6 x 2-bed 61sqm flat

6-unit apartment block
- 3 x 1-bed 50sqm flat
- 3 x 2-bed 61sqm flat

1-bed dwelling - 56sqm

2-bed dwelling - 96sqm

3-bed dwelling - 114sqm

Total units: **327 units**

Unit mix: 180 x 3-bed - 55%
115 x 2-bed - 35%
32 x 1 -bed - 10%

Approximate area analysis:

Site area - 142,000sqm / 14.2ha
Open space - 3,500sqm / 0.35ha
Memorial park - 15,000sqm / 1.5ha
Green buffer zone - 19,000sqm / 1.9ha

Overall percentage of green space - 26%

N

SK_22.06.2021_01 - Indicative Site Layout - 1:2500@A3

0 25 50 100 250m

APPENDIX C

Asset location search

Property Searches

M-EC
The Old Chapel The Old Chapel

HUGGLESCOTE
LE67 2GB

Search address supplied Land at Chiswell Green Lane
Chiswell Green Lane
St Albans
AL2 3AJ

Your reference 26728

Our reference ALS/ALS Standard/2021_4479600

Search date 2 August 2021

Knowledge of features below the surface is essential for every development

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

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

Contact us to find out more.

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

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Land at Chiswell Green Lane, Chiswell Green Lane, St Albans, AL2 3AJ

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

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

TL1304NW

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

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

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

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

The following quartiles have not been printed as they contain no assets:

TL1204SE
TL1204NE

For your guidance:

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

Clean Water Services

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

Asset location search

Property Searches

Following examination of our statutory maps, Thames Water has been unable to find any plans of water mains within this area. If you require a connection to the public water supply system, please write to:

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

Tel: 0845 850 2777
Fax: 0207 713 3858
Email: developer.services@thameswater.co.uk

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

TL1204SE	Affinity Water
TL1204NE	Affinity Water
TL1304NW	Affinity Water

Affinity Water Ltd
Tamblin Way
Hatfield
AL10 9EZ

Tel: 0345 3572401

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Asset location search

Property Searches

Further contacts:

Waste Water queries

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

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

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

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

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

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

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2021_4479600

TL1304NW

The width of the displayed area is 500m and the centre of the map is located at OS coordinates 513250,204750

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

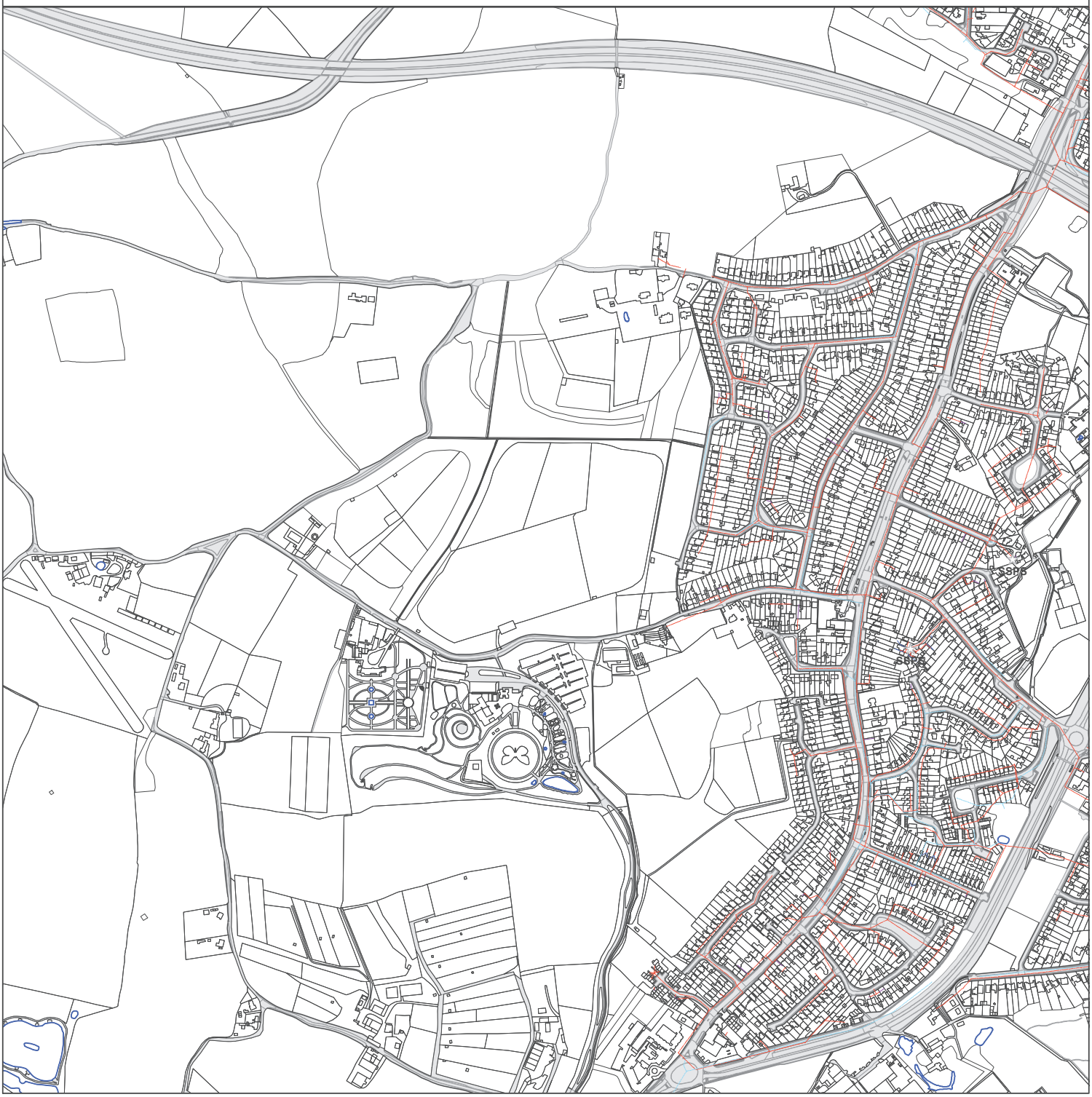
NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2705	104.07	103.12
2706	104.13	102.88
2709	n/a	n/a
2808	104.44	103.82
2806	104.84	103.99
2805	104.86	104.14
2804	105.1	104.38
1851	105.24	103.48
1601	104.13	102.32
1702	104.06	102.25
1701	104.32	102.49
1850	105.03	104.2
1703	104.82	103.23
1806	105.33	104.17
1700	104.53	103.53
1804	104.58	103.75
1803	104.72	103.88
1802	n/a	n/a
1801	105.04	104.14
1800	104.84	104.17
1805	105.24	104.3
1750	103.01	101.88
2803	105.29	104.54
2807	105.45	104.65
2750	103.27	101.98
2700	103.27	101.96
2703	104.37	103.2
2701	102.93	101.61
2851	104.48	103.03
2802	104.44	102.99
271B	n/a	n/a
2702	102.53	101.28
2751	102.5	101.27
2850	105.53	103.73
2801	105.49	103.74
2603	102.16	101.11
2800	105.89	104.55
271A	n/a	n/a
3600	101.49	99.34
371B	n/a	n/a
3704	103.62	102.02
3702	102.7	101.13
3701	103.34	101.61
371A	n/a	n/a
361D	n/a	n/a
3700	103.74	101.9
381C	n/a	n/a
3802	104.04	102.28
3801	103.96	102.36
3803	103.97	102.45
381D	n/a	n/a
381B	n/a	n/a
381A	n/a	n/a
3800	104.37	102.75
4600	100.82	98.37
4702	103.4	101.75
4650	n/a	n/a
4705	n/a	n/a
4804	103.38	101.91
4802	103.32	n/a
4703	103.59	101.52
461A	n/a	n/a
4803	103.45	102.25
4801	103.33	102.33
4701	102.31	100.23
461B	n/a	n/a
4700	102.96	100.89
4850	n/a	101.13
471C	n/a	n/a
471B	n/a	n/a
471A	n/a	n/a
4800	103.29	101.61
0500	101.73	99.91
0600	n/a	n/a
1504	101.73	100.48
1600	103.64	102.59
1604	103.88	102.43
1505	101.72	100.27
1506	101.71	100.16
1500	100.91	98.66
1507	101.64	99.94
1502	101.38	99.71
161A	n/a	n/a
151A	n/a	n/a
1501	100.98	97.98
1602	103.44	101.93
1550	100.71	99.41
1650	103.46	101.96
1605	103.08	102.45
1603	102.93	102.33
1606	102.8	102.2

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1551	100.49	98.99
2600	102.85	102
2601	n/a	n/a
2604	102.71	101.89
2500	99.78	97.03
2502	98.77	97.87
2508	98.71	97.83
2602	102.4	101.83
2550	99.72	98.27
2503	98.33	97.38
2506	98.15	97.25
2504	97.56	96.66
2501	98.09	96.39
2505	95.11	93.72
251A	n/a	n/a
2551	97.98	96.44
2552	98.35	96.75
3551	97.91	96.47
3650	101.52	99.72
361A	n/a	n/a
3500	98.95	95.99
3502	99.24	97.59
3604	99.75	98
3603	100.56	98.66
3602	101.4	99.6
3601	101.7	99.9
3605	n/a	n/a
361C	n/a	n/a
361B	n/a	n/a
3550	n/a	97.73
3552	95.28	93.61
3501	96.47	94.22
4550	97.69	95.22
4501	98.57	95.57
451B	n/a	n/a
451A	n/a	n/a
451H	n/a	93.63
4500	98.46	96.73
451I	n/a	93.89
451D	n/a	93.45
451G	n/a	93.8
451C	n/a	93.45
451F	n/a	93.98
1901	104.57	102.69
1951	104.91	103.73
1904	104.96	102.63
1903	104.65	102.75
2902	105.81	104.73
3901	106.12	104.82
2905	106.11	104.79
291B	n/a	n/a
1955	105.26	104.27
2904	106.27	105.02
191I	n/a	n/a
1954	105.4	104.22
291C	n/a	n/a
291A	n/a	n/a
191A	n/a	n/a
2903	106.29	105.29
1900	105.24	103.66
191B	n/a	n/a
191C	n/a	n/a
191E	n/a	n/a
191G	n/a	n/a
191F	n/a	n/a
1953	105.08	103.99
191H	n/a	n/a
191D	n/a	n/a
1952	104.87	103.74
2900	105.84	104.5
2901	105.58	104.27
2950	105.92	104.71
3904	105.93	104.96
1902	105.02	102.57
3900	106.05	104.95
1956	105.19	104.09
4901	104.26	103.33
4900	105.03	103.38
461C	n/a	n/a
461D	n/a	n/a
461E	n/a	n/a

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4479600



0 45 90 180 270 360
Meters

Scale:	1:7158
Width:	2000m
Printed By:	G1KANAGA
Print Date:	02/08/2021
Map Centre:	512818,204665
Grid Reference:	TL1204NE

Comments:

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

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

Terms and Conditions

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

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

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

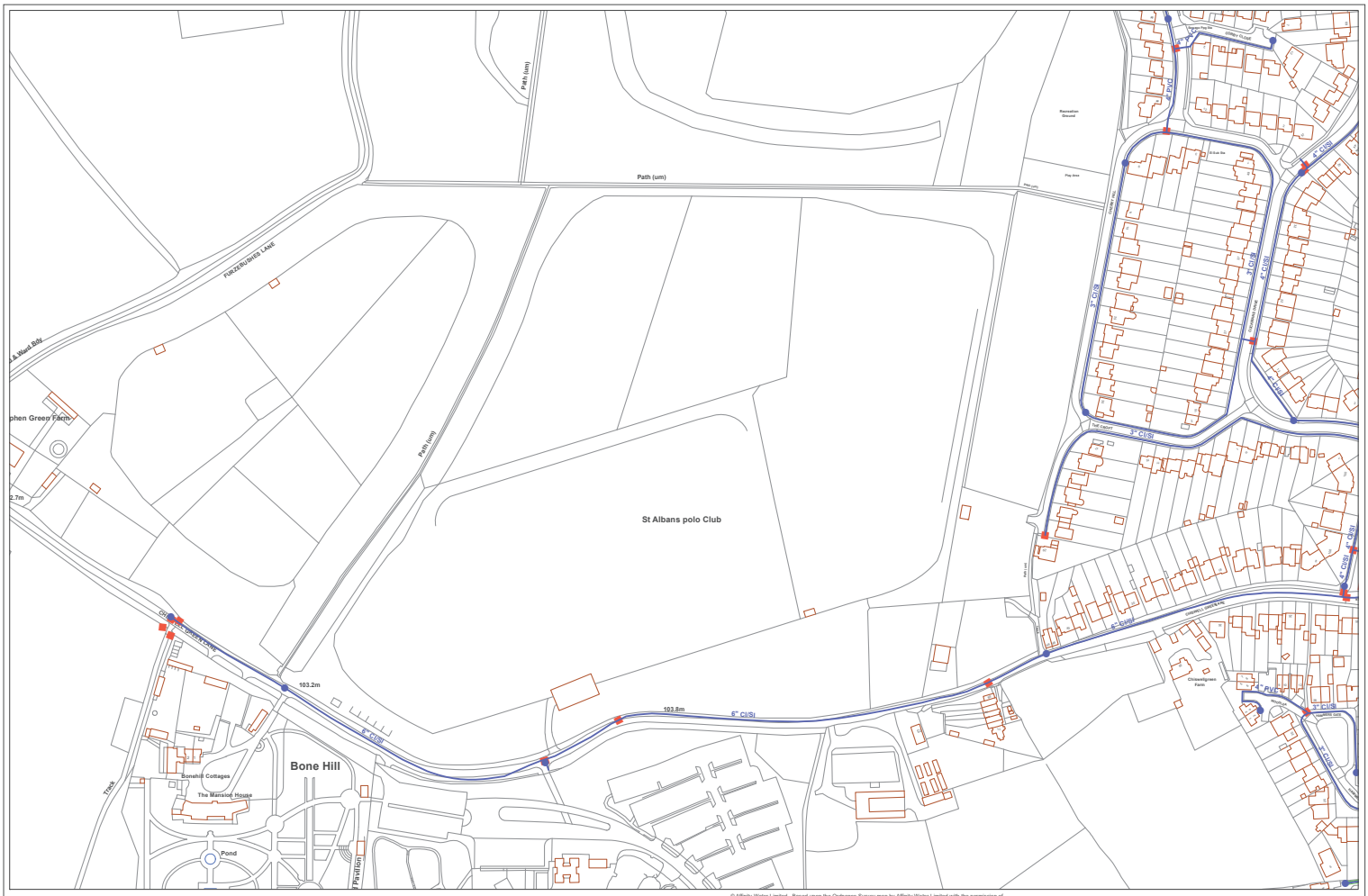
We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

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

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

Ways to pay your bill

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



AffinityWater

26728 - Chiswell Green Lane

26/07/2021

1:1,650

N

This map was created by the Affinity Water Geographical Analysis Team, Tamblin Way, Hatfield, AL10 9EZ
Page Size = A2

Mrs Claire Hosford
Mewies Engineering Consultants Ltd
The Old Chapel
Station Road
Hugglescote
LE67 2GB

Wastewater pre-planning
Our ref DS6086485

12 August 2021

Pre-planning enquiry: Capacity concerns

Site address: Chiswell Green Lane, Chiswell Green, St Albans, AL2 3AJ

Dear Mrs Hosford,

Thank you for providing information on your development for the proposed 327no. residential units on previously Greenfield site. We have based our assessment on the information you provided to us and have copied below for clarity:-

Proposed foul water flows to discharge via gravity into MH 1702 or MH 1500. Proposed surface water flows to discharge via gravity into 300mm SW sewer in Chiswell Green Ln. Flows restricted to 19l/s discharging a total impermeable area of 10Ha.

Foul Water

We've assessed your foul water proposals and concluded from our initial review, that our sewerage network does not have sufficient capacity to meet your requirements. At this stage we're unable to meet the needs of your full development at this time.

In order to ensure we make the appropriate upgrades – or 'off-site reinforcement' – to serve the remainder of your development, we'll need to carry out modelling work, design a solution and build the necessary improvements. Typical timescales for a development of your size are:

Modelling: 8 months
Design: 6 months
Construction: 6 months
Total: 20 months

If the time you're likely to take from planning and construction through to first occupancy is longer than this, we'll be able to carry out the necessary upgrades in time for your development. If it's shorter, please contact me on the number below to discuss the timing of our activities.

What do you need to tell us before we start modelling?

We're responsible for funding any modelling and reinforcement work. We need, though, to spend our customers' money wisely, so we'll only carry out modelling once we're confident that your development will proceed.

In order to have this confidence, we'll need to know that you **own the land and have either outline or full planning permission**. Please email this information to us as soon as you have it.

If the modelling shows we need to carry out reinforcement work, then before we start construction, we'll need you to supply us with notification that you've confirmed your 'nominated competent person' (NCP) submission to the Health and Safety Executive.

Surface Water

Thames Water Planning team would expect the surface water drainage hierarchy to be applied to demonstrate that discharge to the public sewer is the most appropriate discharge route. Once this has been demonstrated we will accept your proposals to discharge surface water runoff restricted at **10.0 litres/second** into the surface water network.

Please note

You must keep us informed of any changes to your design – for example, an increase in the number or density of homes or changes to the drainage strategy whereby a pumping station is being proposed. Such changes could mean there is no longer sufficient capacity.

If you have any further questions, please do not hesitate to contact me.

Yours sincerely

Rahim Khan
Thames Water – Adoptions Engineer
rahim.khan@thameswater.co.uk

Developer Services
Tamblin Way
Hatfield
Hertfordshire
AL10 9EZ

Telephone: 0345 357 2428

16/08/2021

DS0045008 – Chiswell Green Lane

Dear Claire Hosford,

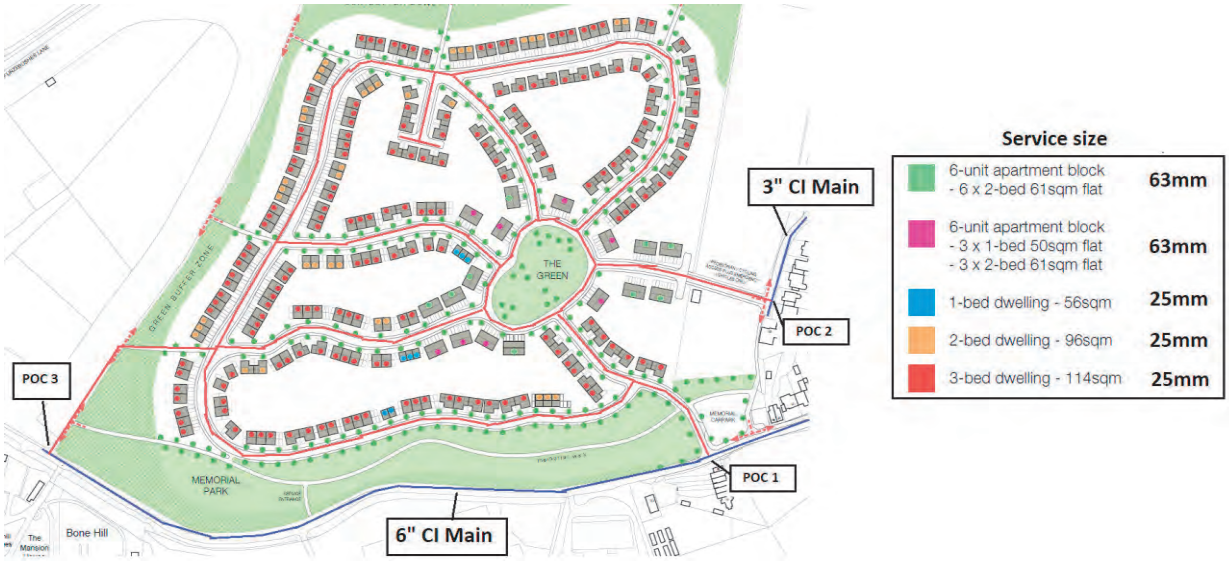
Re: Pre-development report for Chiswell Green Lane, St Albans, Hertfordshire, AL2 3AJ

Further to your recent request, I am pleased to enclose a pre-development report for a new water supply to your development. **Please be advised that this is an indicative budget that has been produced based upon the information you have provided at this stage**. Where information has not been provided or is vague, assumptions have been made.

Estimated Scope of Work

New development of 330 new properties. An estimated 1200m of 125mm PE main and 1300m of 90mm PE main is required, with 3 points of connection

Please see the diagram attached illustrating the proposed point of connection to your site.



Budget Estimate

All costs below are outlined in our *'New Connections Charging Arrangements 2021/22'* document, published **here** on our website. Please refer to this document for information regarding these costs.

New Water Mains and associated apparatus

Description	Qty	Charges 2021-22 (£)
8.2 Mains Application Fees		
Application Fee for Mains 100+ Properties (per application)	1	**£660.00** (£550.00 + VAT)
8.3 Mains Design Fees		
Design Fee 101+ properties (per scheme/ phase)	1	**£1,440.00** (£1,200.00 + VAT)
8.4 Mains Administration Fees		
Mains Administration Fee 100+ Properties (per application)	1	**£1,200.00**
Estimated for installation of New Water Mains and associated Apparatus		
Offsite – Install an estimated 10m of 90mm PE main *(excavation and reinstatement to be competed by Affinity Water)*	10m	**£2,700.00**
Offsite – Install an estimated 50m of 125mm PE main *(excavation and reinstatement to be completed by Affinity Water)*	50m	**£14,000.00**
Onsite – Install an estimated 1,290m of 90mm PE main ***(excavation and reinstatement to be completed by the sites contractors)***	1,290m	**£76,110.00**
Onsite – Install an estimated 1,050m of 125mm PE main ***(excavation and reinstatement to be completed by the sites contractors)***	1,150m	**£71,300.00**
Fire Hydrant or Washout (inline 50-190mm pipe)	12	**£10,560.00**
Fire Hydrant or Washout (end type 50-190mm pipe)	2	**£1,460.00**
Under pressure/Branch Connection (50-190mm diameter parent main)	3	**£5,292.00**
11.1 Traffic Management Costs		
To be determined during detailed design. Separate traffic management is required for the x3 separate points of connection At this time, it is estimated that 2-way lights are required for 5 days at 2 separate locations (POC1 and POC 3)	5 days x2	***£20,244.00*** *(£16,870.00 + VAT)*
Sub Total (£) Inc VAT		**£204,244.00**

New Service Connections

Description	Qty	Charges 2021-22 (£)
9.2 New Connections Application Fees		
Application Fee (per connection)	1	**£144.00** (£120.00 + VAT)
Application Fee (each subsequent property)	329	**£15,792.00** (£13,160 + VAT)
9.3 New Connections Administration Fees		
Administration Fee (per property)	330	**£26,400.00**
Estimate for installation of New Service Connections		
Install 3m of 25mm PE service pipe for 228 plots	228	**£90,972.00**
Install 3m of 63mm PE service for 17 blocks with 6 port manifolds	17	**£23,749.00**
11.1 Traffic Management Costs		
To be determined during detailed design *All services are onsite, so no traffic management fee apply*	0	*£0.00*
Sub Total (£) Inc VAT		**£157,057.00**

***Budget Estimate Total (Inc VAT)**	**£362,023.00**

***Please be advised that the above values have been provided as an indicative budget and are subject to confirmation during an subsequent connections and mains application.**

Assumptions Register

- All distances are estimated and will be confirmed upon full application & detailed design.
- All onsite works have been priced on the basis that all Excavation and reinstatement will be completed by you. Should you wish Affinity Water to complete this work, please let us know.
- Traffic Management Costs – traffic management costs have been included in the above costs. **These are estimated costs** and will be confirmed during detailed design. *For information purposes a list of these costs can be found in section 11 of our 'New Connections Charging Arrangements 2021/22' document*
- Services – services have been built up using a cost for parent main connection and 5m of service pipe. Actual quantities will be provided during detailed design/ cost.
- "No Excavation" is assumed for all accessories - the costs are based upon you completing all the onsite excavation and backfill. Should you wish Affinity Water to complete this work, please let us know.

Other important information

Appointing a Self-Lay Provider

One option you may wish to consider is to appoint a WIRS accredited Self-Lay Provider (SLP) to complete some of the works described above, which is known as Self-Lay. You can find more information on this option on our website, here. You may prefer to use a Self-Lay Provider for a number of reasons, such as:

- SLPs may be able to provide a multi-utility option;
- SLPs may offer a more cost-effective solution when constructing your project;
- SLPs may provide greater flexibility in meeting your construction programmes.

If you'd like to explore this option, and would like to find a WIRS accredited self-lay provider, you can do so at the Lloyd's Register website at the following address: https://www.lr.org/en/utilities/water-industry-registration-scheme-wirs-wirsae/search/.

Infrastructure Charges

The purpose of an infrastructure charge is to enable a charge to be levied to reflect broadly the expected additional load placed on our network by the connection of premises not previously connected to it. The infrastructure charge per domestic property for the 2021-22 charging year is £249.00*. Where a site is redeveloped or a building is converted, and still has a metered supply a credit will be given for each of these properties. These will be calculated based upon the number of properties and size of the incoming, metered supply. Infrastructure charges will be charged upon request for the plot, and not

** Where a property is considered to have an abnormally large load, the relevant multiplier calculation will be used. More details of this can be found in section of 16.5 our 'New Connection charging arrangements 2021/22' document.*

NB. Infrastructure charges are also applicable for wastewater services. If you are developing within the Anglian Water area, we will collect this on their behalf however if you are within the Thames Water or Southern Water area, they will collect this from you directly.

Income Offset

An income offset payment under our charging arrangements for all new connections where an infrastructure charge is applicable. The income offset is against the infrastructure charge not the mains requisition cost following the policy change in Ofwat's Charging Rules. We will apply an income offset for each new connection for a supply of water to the premises connected to a water main where an infrastructure charge is applicable. This is £387.26 per property for the 2021-22 charging year.

For more information on the value of these payments, when they are due and who they are paid to please refer to section 16.7 of our *'New Connection charging arrangements 2021/22'* document.

Water Efficient Development Credits

(1) Building Regulations include the requirement for all new dwellings to achieve a water efficiency standard of 125 litres of water per person per day.

(2) Building Regulations part G include an optional requirement of 110 litres of water per person per day for new residential development, which should be implemented through local policy where there is clear evidence needed.

(3) We operate in areas of serious water stress and support the inclusion of a water efficiency standard of 110 litres per person per day being included in planning policies.

(4) To help promote the achievement of this objective, we will apply a discount to the infrastructure charge for new homes where there is evidence of water efficiency design to a standard of 110 litres (or less) per person per day. The discount will be £80 per infrastructure charge.

Traffic Management

Where additional costs are payable as a result of traffic management and highway authority charges, we will provide upfront fixed charges which will be highlighted as a separate item in your cost advice. A *list of these costs can be found in section 11 of our 'New Connections Charging Arrangements 2021/22' document*

Other Costs

VAT – will be charged at the applicable rate, however, please note that application and design fees attract the standard rate (20%).

Next steps

Once you are happy to proceed, you will need to proceed with the application by logging onto the portal and progressing this application to a “Connections and Mains” application. To support this application, we will need some additional information from you*. This includes.

- a CAD site plan that shows your site boundary, road layout, plot information and has some OS background on so our designers can plot the exact location on our system.
- load information (per plot) for the development,
- Soil report *(as mentioned above, if this is not provided, we will default to the use of a barrier pipe system)*. *This has been completed already, PE mains and services*
- Plumbing Schematic Drawing (*only applicable for bulk services – see description above)*

*If you intend to submit a design for us to review, you will need to provide this to us, along with all other development information.

Due to the nature of some of the information provided within (ie charges applicable in the 2021-22 charging year) it may not be valid after April 2022. If you would like it updated at anytime after this date, please let us know.

If you need any further advice, please do not hesitate to contact us.

Yours sincerely

Adam Lainson
For, and on behalf of Developer Services
Affinity Water Ltd

www.affinitywater.co.uk/developing

APPENDIX D

Plant Protection
Cadent
Block 1; Floor 1
Brick Kiln Street
Hinckley
LE10 0NA
E-mail: plantprotection@cadentgas.com
Telephone: +44 (0)800 688588

National Gas Emergency Number:
0800 111 999*

National Grid Electricity Emergency Number:
0800 40 40 90*
* Available 24 hours, 7 days/week.
Calls may be recorded and monitored.

www.cadentgas.com

Claire Hosford
Mewies Engineering Consultants
The Old Chapel
Station Road
Hugglescote
Leicestershire
Leicester
Leicestershire

Date: 02/08/2021
Our Ref: EA_GE4A_3SWX_857297
Your Ref: 26728
RE: Proposed Works, Chiswell Green Lane

Thank you for your enquiry which was received on 02/08/2021.
Please note this response and any attached map(s) are valid for 28 days.

An assessment has been carried out with respect to Cadent Gas Limited, National Grid Electricity Transmission plc's and National Grid Gas Transmission plc's apparatus. Please note it does not cover the items listed in the section "Your Responsibilities and Obligations", including gas service pipes and related apparatus.
For details of Network areas please see the Cadent website (http://cadentgas.com/Digging-safely/Dial-before-you-dig) or the enclosed documentation.

As your works are at a "proposed" stage, any maps and guidance provided are for information purposes only. This is not approval to commence work. You must submit a "Scheduled Works" enquiry at the earliest opportunity and failure to do this may lead to disruption to your plans and works. Plant Protection will endeavour to provide an initial assessment within 14 days of receipt of a Scheduled Works enquiry and dependent on the outcome of this, further consultation may be required.

In any event, for safety and legal reasons, works must not be carried out until a Scheduled Works enquiry has been completed and final response received.

Your Responsibilities and Obligations

The "Assessment" Section below outlines the detailed requirements that must be followed when planning or undertaking your scheduled activities at this location.

It is your responsibility to ensure that the information you have submitted is accurate and that all relevant documents including links are provided to all persons (either direct labour or contractors) working for you near Cadent and/or National Grid's apparatus, e.g. as contained within the Construction (Design and Management) Regulations.

This assessment solely relates to Cadent Gas Limited, National Grid Electricity Transmission plc (NGET) and National Grid Gas Transmission plc (NGGT) and apparatus. This assessment does **NOT** include:

- Cadent and/or National Grid's legal interest (easements or wayleaves) in the land which restricts activity in proximity to Cadent and/or National Grid's assets in private land. You must obtain details of any such restrictions from the landowner in the first instance and if in doubt contact Plant Protection.
- Gas service pipes and related apparatus
- Recently installed apparatus
- Apparatus owned by other organisations, e.g. other gas distribution operators, local electricity companies, other utilities, etc.

It is **YOUR** responsibility to take into account whether the items listed above may be present and if they could be affected by your proposed activities. Further "Essential Guidance" in respect of these items can be found on either the National Grid or Cadent website.

This communication does not constitute any formal agreement or consent for any proposed development work; either generally or with regard to Cadent and/or National Grid's easements or wayleaves nor any planning or building regulations applications.

Cadent Gas Limited, NGGT and NGET or their agents, servants or contractors do not accept any liability for any losses arising under or in connection with this information. This limit on liability applies to all and any claims in contract, tort (including negligence), misrepresentation (excluding fraudulent misrepresentation), breach of statutory duty or otherwise. This limit on liability does not exclude or restrict liability where prohibited by the law nor does it supersede the express terms of any related agreements.

If you require further assistance please contact the Plant Protection team via e-mail (click here) or via the contact details at the top of this response.

Yours faithfully

Plant Protection Team

ASSESSMENT

Affected Apparatus
The apparatus that has been identified as being in the vicinity of your proposed works is:

- Low or Medium pressure (below 2 bar) gas pipes and associated equipment. (As a result it is highly likely that there are gas services and associated apparatus in the vicinity)

Requirements

BEFORE carrying out any work you must:

- Carefully read these requirements including the attached guidance documents and maps showing the location of apparatus.
- Contact the landowner and ensure any proposed works in private land do not infringe Cadent and/or National Grid's legal rights (i.e. easements or wayleaves). If the works are in the road or footpath the relevant local authority should be contacted.
- Ensure that all persons, including direct labour and contractors, working for you on or near Cadent and/or National Grid's apparatus follow the requirements of the HSE Guidance Notes HSG47 - 'Avoiding Danger from Underground Services' and GS6 – 'Avoidance of danger from overhead electric power lines'. This guidance can be downloaded free of charge at http://www.hse.gov.uk
- In line with the above guidance, verify and establish the actual position of mains, pipes, cables, services and other apparatus on site before any activities are undertaken.

GUIDANCE

Excavating Safely - Avoiding injury when working near gas pipes:
http://www.nationalgrid.com/NR/rdonlyres/2D2EEA97-B213-459C-9A26-18361C6E0B0D/25249/Digsafe_leaflet3e2finalamends061207.pdf

Standard Guidance

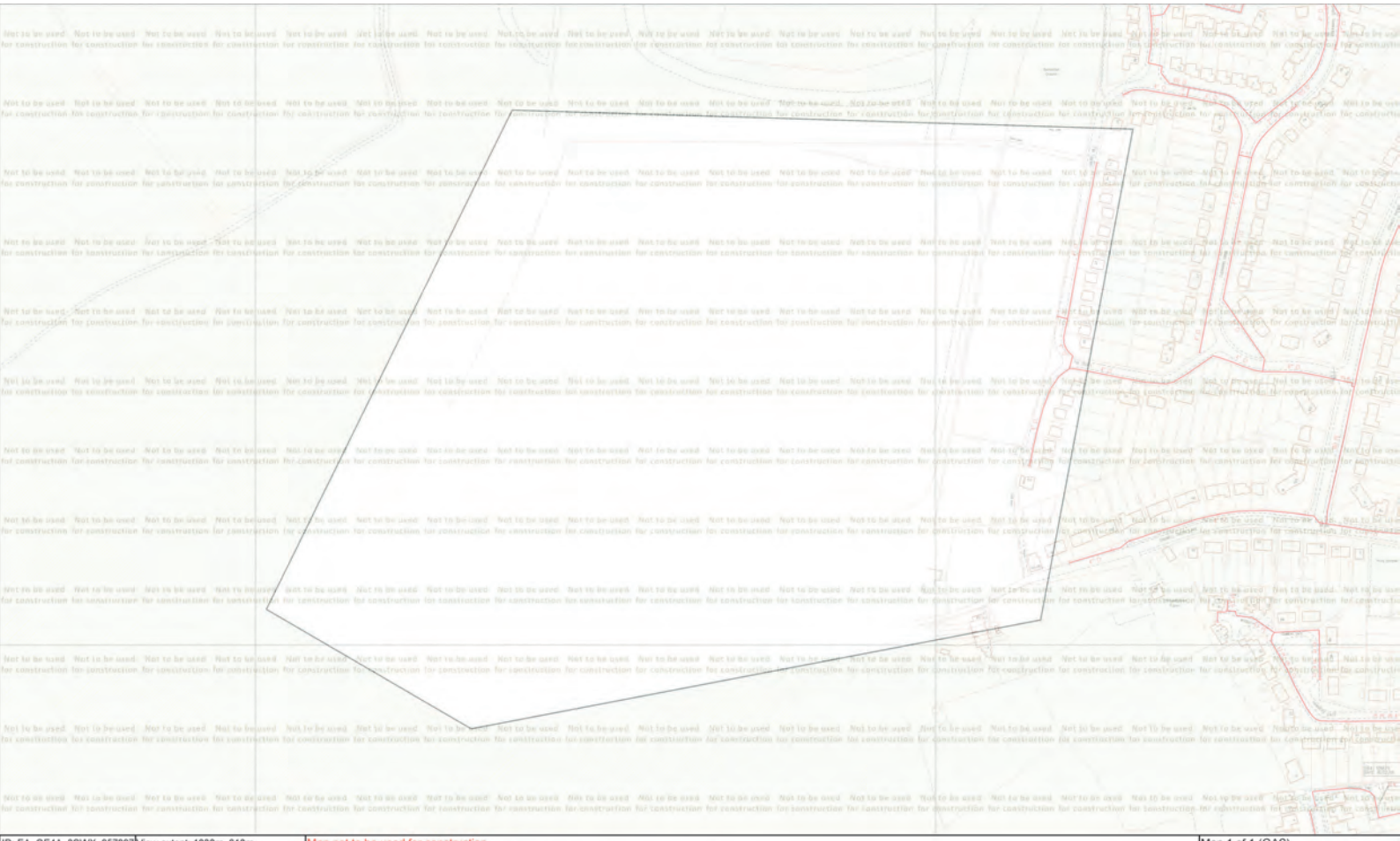
Essential Guidance document:
http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=8589934982

General Guidance document:
http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=35103

Excavating Safely in the vicinity of gas pipes guidance (Credit card):
http://www.nationalgrid.com/NR/rdonlyres/A3D37677-6641-476C-9DDA-E89949052829/44257/ExcavatingSafelyCreditCard.pdf

Excavating Safely in the vicinity of electricity cables guidance (Credit card):
http://www.nationalgrid.com/NR/rdonlyres/35DDEC6D-D754-4BA5-AF3C-D607D05A25C2/44858/ExcavatingSafelyCreditCardelectricitycables.pdf

Copies of all the Guidance Documents can also be downloaded from the National Grid and Cadent websites.



ID: EA_GE4A_3SWX_857297	View extent: 1030m, 610m	Map not to be used for construction	Map 1 of 1 (GAS)
USER: c.hosford	LP MAINS MP MAINS IP MAINS LHP MAINS NHP MAINS	This plan shows those pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc., are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.	MAPS Plot Server Version 1.11.0
DATE: 02/08/2021			Cadent Your Gas Network
DATA DATE: 01/08/2021			Requested by: Mewies Engineering Consultants
REF: 26728	0m 50m Approximate scale 1:2500 on A3 Colour Landscape		This plan is reproduced from or based on the OS map by Cadent Gas Limited, with the sanction of the controller of HM Stationery Office. Crown Copyright Reserved. Ordnance Survey Licence number 100024886
MAP REF: TL1204 CENTRE: 512827, 204666			

Some examples of Plant Items: Valve, Depth of Cover, Syphon, Diameter Change, Material Change, Out of Standard Service

ENQUIRY SUMMARY

Received Date
02/08/2021

Your Reference
26728

Location
Centre Point: 512826, 204666
X Extent: 638
Y Extent: 455
Postcode: AL2 3AJ
Location Description: Chiswell Green Lane

Map Options
Paper Size: A3
Orientation: LANDSCAPE
Requested Scale: 2500
Actual Scale: 1:2500 (GAS)
Real World Extents: 1030m x 610m (GAS)

Recipients
claire.hosford@m-ec.co.uk

Enquirer Details
Organisation Name: Mewies Engineering Consultants
Contact Name: Claire Hosford
Email Address: claire.hosford@m-ec.co.uk
Telephone: 01530264753
Address: The Old Chapel, Station Road, Hugglescote, Leicestershire, Leicester, Leicestershire, LE67 2GB

Description of Works
desktop survey for proposed new housing development

Enquiry Type
Proposed Works

Activity Type
Development Project

Work Types
Work Type: Plans Only

Network Enquiry No : 180013568
Your Reference : 26728

Cadent Gas Limited

National Gas Emergency Service - 0800 111 999* (24hrs)
***calls will be recorded and may be monitored**

Date : 2nd August 2021
Contact : Performance and Support
Direct Tel : 0845 3666758
Email : networkdesign@cadentgas.com

www.cadentgas.com

Stephanie Gray
M-EC Consulting Development Engineers
Station Road
The Old Chapel
Hugglescote
LE67 2GB

Dear Stephanie,

Re: Land Enquiry for Proposed Development Site at NEW SUPPLY, CHISWELL GREEN LANE, CHISWELL GREEN, ST. ALBANS, AL2 3AJ.

Thank you for your enquiry which we received on 26th July 2021. I enclose details of Cadent Gas plant in the vicinity of your proposed supply.

The nearest main with sufficient capacity is 35 metres from the site boundary and it is a Low Pressure main.

This Developer Enquiry response is a reflection of the network at the time delivered and is not a guarantee of gas flow or capacity due to the changing dynamics of the gas distribution network.
If you wish to secure capacity and connect to the network please submit quotation Connections Request via the official connections route allowing for further analysis to verify the capability of the network again.

Plans attached: Yes

A copy of the Cadent Connections Charging Statement referenced in this letter can be found on Cadent's website:

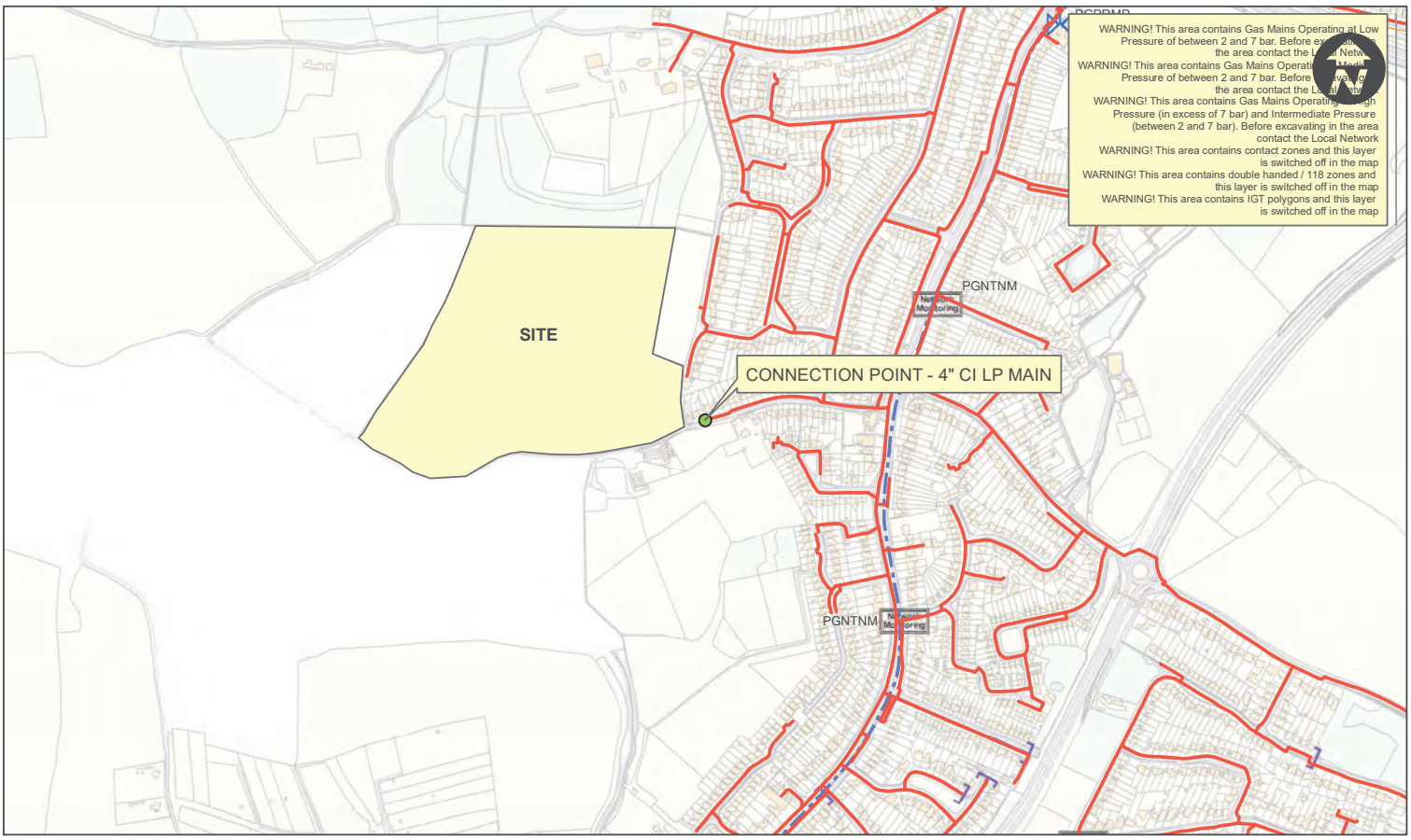
http://cadentgas.com/Get-connected

If you require a printed version please contact us on the details provided above.

I trust this meets with your requirements at this stage. If you have any queries please do not hesitate to contact Performance and Support on the above number.

Yours sincerely,

Laura Cheshire



SCALE: 1:500 @ A4

USER ID:James.Mason

DATE: 30-Jul-2021 08:30:47

INTERNAL USE ONLY

OS Ref 513098, 204560

CENTRE: <Centre>

Some examples of Plant Items:

Valve, Syphon, Depth of Cover, Change of Dia, Change of Material

L/P GAS MAIN
M/P GAS MAIN
I/P GAS MAIN
H/P GAS MAIN
N/H/P GAS MAIN
PROPOSED PIPE - LP
PROPOSED PIPE - MP
PROPOSED PIPE - IP
ABANDON - LP
ABANDON - MP
Out Of Standard Service

SCHEME: <NG GDFO Scheme Name>

DESIGN: <NG GDFO Design Number>

REVISION: <NG GDFO Revision>

This plan shows those pipes owned by Cadent in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area.Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plans given without warranty, the accuracy thereof cannot be iguranteed. Service pipes, valves, syphons, stub connections,etc., are not shown but their presence should be anticipated.No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any error oromission. Safe digging practices, inaccordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and any other apparatus on site before any mechanical plant is used. It is your responsability to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

180013568

Cadent

APPENDIX E

Disclaimer

This report has been prepared by GeoSmart in its professional capacity as soil, groundwater, flood risk and drainage specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by GeoSmart solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to GeoSmart at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, GeoSmart may, by prior written agreement, agree to such release, provided that it is acknowledged that GeoSmart accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. GeoSmart accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against GeoSmart except as expressly agreed with GeoSmart in writing.

For full T&Cs see http://geosmartinfo.co.uk/terms-conditions

Further information

Information on confidence levels and ways to improve this report can be provided for any location on written request to info@geosmart.co.uk or via our website. Updates to our model are ongoing and additional information is being collated from several sources to improve the database and allow increased confidence in the findings. Further information on groundwater levels and flooding are being incorporated in the model to enable improved accuracy to be achieved in future versions of the map. Please contact us if you would like to join our User Group and help with feedback on infiltration SuDS and mapping suggestion.

Important consumer protection information

This search has been produced by GeoSmart Information Limited, Suite 9-11, 1st Floor, Old Bank Buildings, Bellstone, Shrewsbury, SY1 1HU.

Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

GeoSmart Information Limited is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom.
- sets out minimum standards which firms compiling and selling search reports have to meet.
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals.
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.
- By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports.
- act with integrity and carry out work with due skill, care and diligence.
- at all times maintain adequate and appropriate insurance to protect consumers.
- conduct business in an honest, fair and professional manner.
- handle complaints speedily and fairly.
- ensure that products and services comply with industry registration rules and standards and relevant laws.
- monitor their compliance with the Code.

GeoSmart Information

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs contact details:

The Property Ombudsman scheme

Milford House

43-55 Milford Street

Salisbury

Wiltshire SP1 2BP

Tel: 01722 333306

Fax: 01722 332296

Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

Please ask your search provider if you would like a copy of the search code

Complaints procedure

GeoSmart Information Limited is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly. If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision. Complaints should be sent to:

Martin Lucass

Commercial Director

GeoSmart Information Limited

Suite 9-11, 1st Floor,

Old Bank Buildings,

Bellstone, Shrewsbury, SY1 1HU

Tel: 01743 298 100

MartinLucass@geosmartinfo.co.uk

15 Terms and conditions, CDM regulations and data limitations

Terms and conditions can be found on our website:

http://geosmartinfo.co.uk/terms-conditions/

CDM regulations can be found on our website:

http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/

Data use and limitations can be found on our website:

http://geosmartinfo.co.uk/data-limitations/