

SuDSmart Plus



Sustainable Drainage Assessment

Site Address

Land between 21 and 23 Mode Hill Lane
Whitefield
M45 8JF

Date

2023-06-08

Report Status

FINAL

Grid Reference

382134, 405987

Site Area

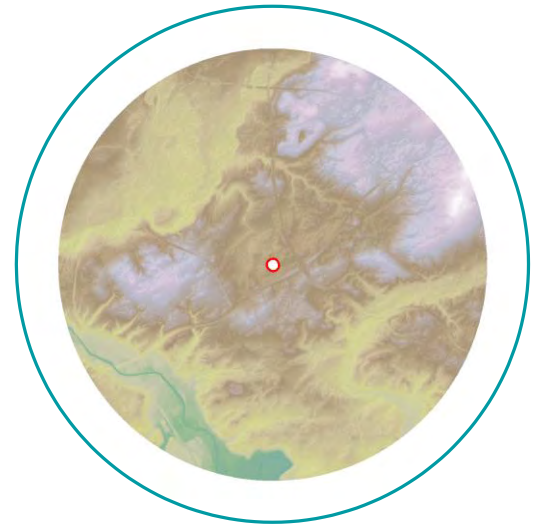
0.03 ha

Report Prepared for

Hanif Nadjafi
21A Mode Hill Lane

Report Reference

79400R1



Infiltrate to ground

The proposed Sustainable Drainage Scheme (SuDS) strategy is comprised of a rainwater harvesting butt, unlined permeable paving and a soakaway for surface water runoff.

Surface water will infiltrate to the ground subject to confirmation of the infiltration rate to BRE365 guidelines and the implementation of SuDS.

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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?	High
	What is the potential to discharge to surface water features?	Low
	What is the potential to discharge to sewers?	High
	What is the potential to discharge to highway drains?	Medium
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
	What is the groundwater flood risk at the Site?	Negligible
Pollution	Is the groundwater a protected resource?	No
	Is the surface water feature a protected resource?	N/A

Summary of existing and proposed development

The Site is currently undeveloped, an area of hardstanding is situated in the south and centre of the Site. Development proposals comprise the construction of a new residential dwelling with associated access and landscaping.

Summary of discharge routes

GeoSmart's SuDS Infiltration Potential (SD50) map indicates the Site has a High potential for infiltration, primarily due to the high permeability of the underlying geology (sandstone, sand and gravel). Infiltration to ground is therefore likely to be feasible.

Ordnance Survey (OS) mapping indicates that there are no surface water features within the vicinity of the Site, therefore discharge in this manner is not considered to be feasible.

A United Utilities asset location search included in Appendix C confirms the Site is located within 10m of the public surface water sewer network. Due to the short distance to nearby sewers discharging surface water runoff to the sewer is considered to be feasible.

According to Google Streetview, highway gullies are located within Mode Hill Lane, indicating the presence of the highway drainage network.

Runoff rate and attenuation requirements

Discharging via infiltration requires 9.5 m³ of attenuation to be provided to ensure there is no flooding as a result of the development in all storm events up to and including the 1 in 100 year including a 45% allowance for climate change. This volume has been calculated using Causeway Flow v.10.1 based on an assumed infiltration rate of 1×10^{-5} m/s taken from the table 25.1 of the CIRIA SuDS (C753) (2015) as the worst case scenario for sand and gravel soil type. This volume is subject to the results of infiltration testing and would ensure runoff is not increased above the greenfield scenario.

Discharging off-Site requires 5.82 m³ 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 45% allowance for climate change. This volume is subject to the discharge rate being restricted to 1 l/s (as close to the Greenfield 1 in 1 year rate as possible, without increasing the potential for blockages).

Proposed SuDS strategy

SuDS features comprised of a rainwater harvesting butt, unlined permeable paving and a soakaway are proposed to attenuate a minimum of 9.5 m³ of surface water runoff. The SuDS features would provide some water quality benefits (interception and filtration) prior to infiltrating to ground. Focused infiltration features should be sited at least 5m from building foundations and from adjacent highways.

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 45% allowance for climate change and will not cause flooding to the proposed development in accordance with DEFRA's 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 building, where payments for the works will form part of the property deeds and / or rental agreements.

Recommendations / Next steps

A site investigation is required to confirm the infiltration capacity of the ground in line with BRE 365 guidelines to confirm the infiltration rate and the groundwater level.

Where site investigation confirms the underlying ground conditions are not conducive to infiltration, the capacity of the public surface water sewer network should be confirmed with the utility provider and permission to connect gained where required.

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

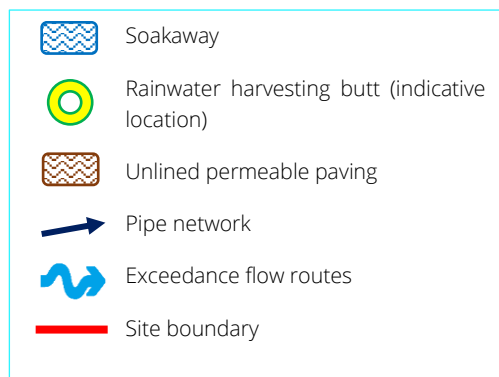
SuDS type	Source control (interception) and infiltration SuDS.
SuDS features	Rainwater harvesting butt, unlined permeable paving and soakaway.
Discharge location	Infiltration.
Discharge rate	$1 \times 10^{-5} \text{ m/s}^*$

*A worst-case rate for sand and gravel soils as indicated by Table 25.1 of the CIRIA SuDS Manual (CIRIA, 2015).

Table 2. Proposed SuDS sizing (dimensions) and attenuation volumes

Rainwater Harvesting	A rainwater harvesting butt should be established for the 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.
Soakaway	A soakaway measuring 2.5 m in width, 4 m in width and 1 m in depth, with a 95% void ratio is proposed to be located in the rear garden on Site. The soakaway would provide 9.5 m^3 attenuation.
Unlined Permeable Paving	A 35 m^2 area of unlined permeable paving is proposed for the driveway and southern paved areas on Site. This feature will maximise the permeable areas on Site and exclusively drain itself.
Total Attenuation Provided	9.5 m^3

Figure 1. Proposed SuDS scheme

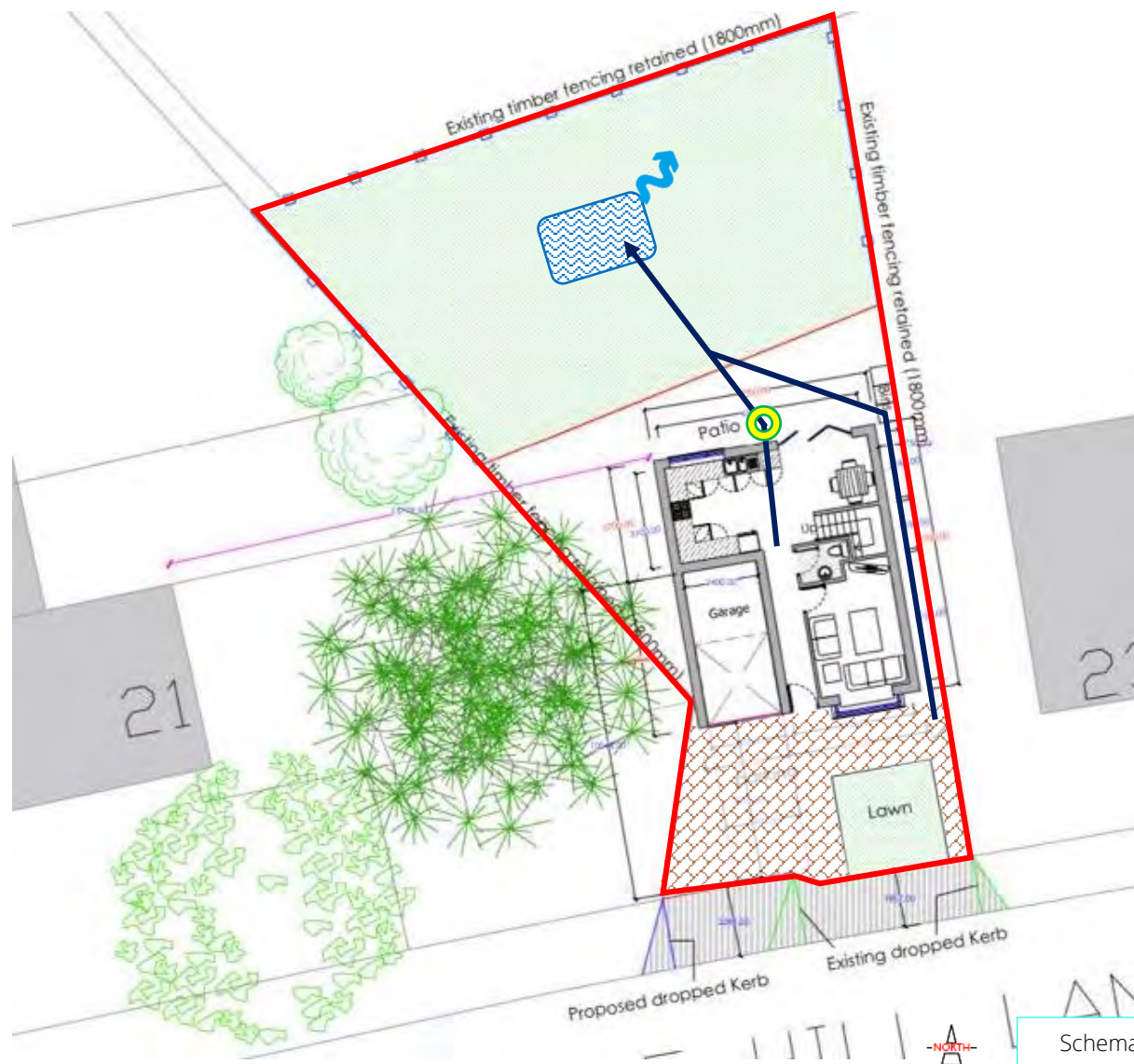


Surface water from the proposed dwelling should be conveyed into the rainwater harvesting butt and soakaway for infiltration to the ground.

Surface water from the rear patio should be conveyed directly into the soakaway for infiltration to ground.

An area of unlined permeable paving located in the south of the Site is proposed to exclusively drain itself.

Exceedance flows will be directed to non-essential, vegetated areas of the Site.



Schematic is not to scale

3 Site analysis

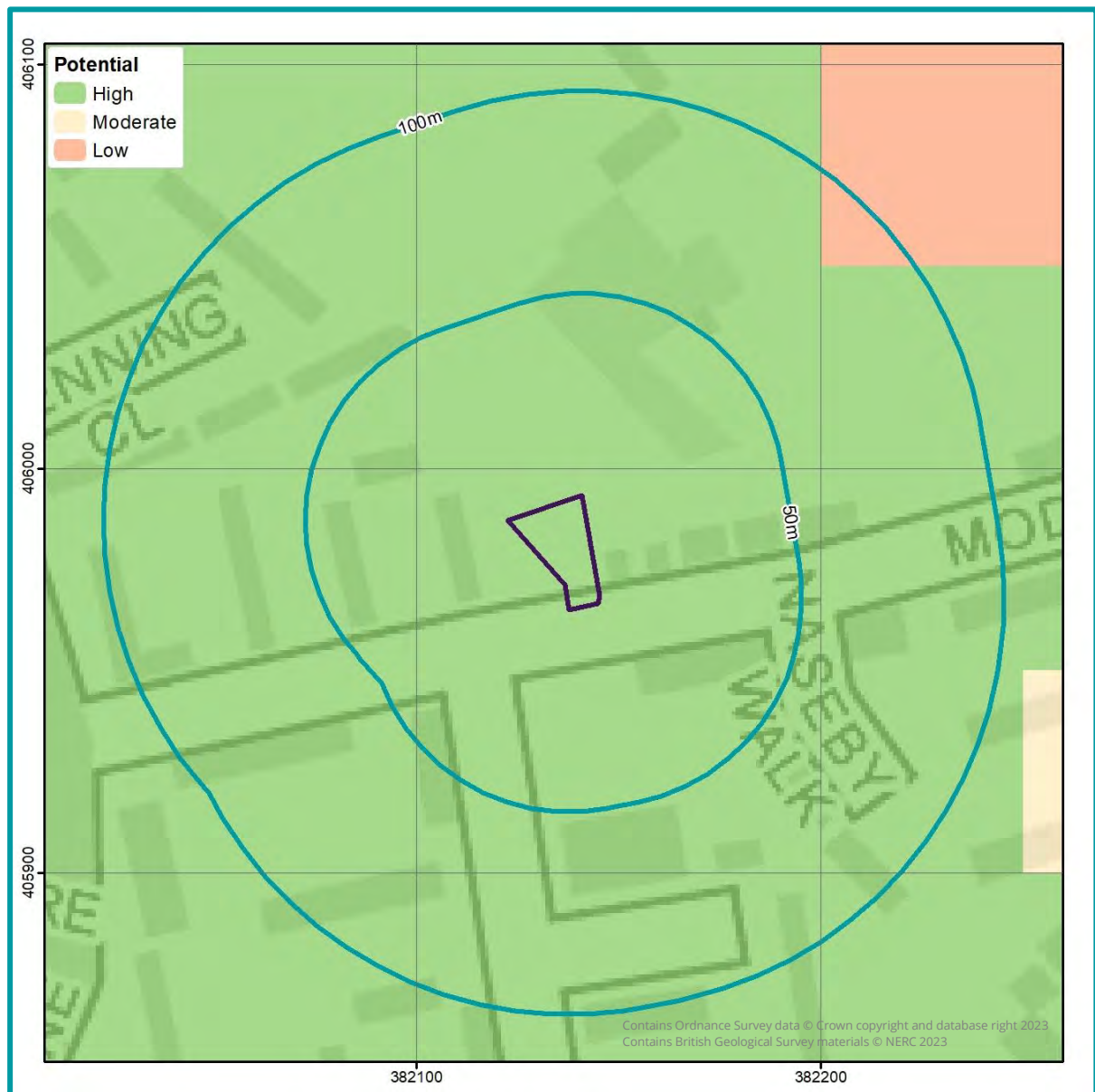


Site location

Figure 2. Aerial Imagery (Bluesky, 2023)



Figure 3. SuDS infiltration suitability (SD50) map (GeoSmart, 2023)



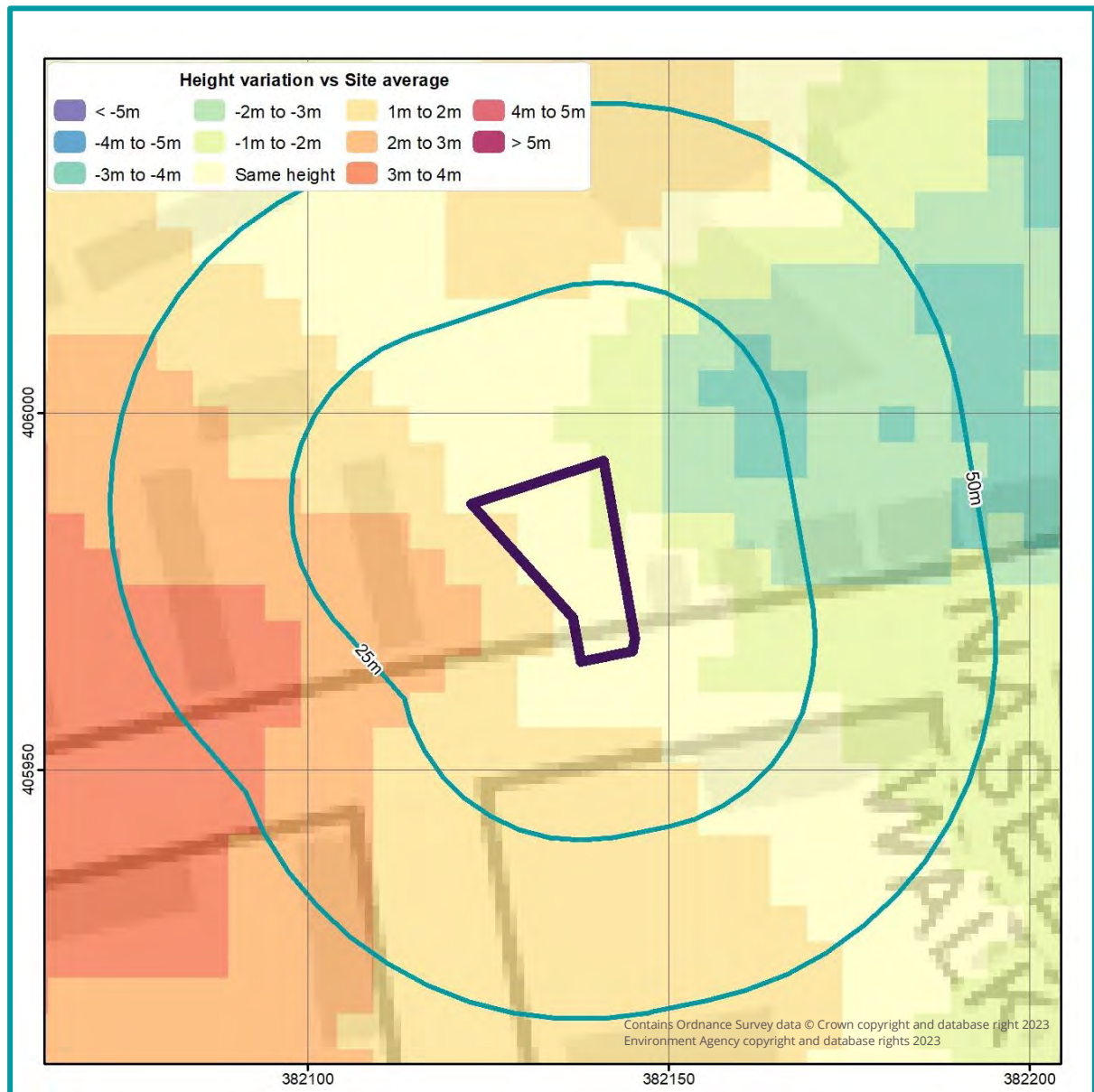
The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the potential for infiltration drainage at the Site and indicates where further assessment is recommended. The map combines information on the thickness and permeability of the underlying material and the depth to the high groundwater table.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

Groundwater levels are expected to be sufficiently deep at the Site. Although, a Site Investigation is recommended to confirm the infiltration capacity and the depth to

groundwater. Various options can be considered for infiltration SuDS and these include infiltration trenches, soakaways, swales and permeable pavements.

Figure 4. Site topography (GeoSmart, 2023)



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 mapping confirms the overall Site is on a gradual slope falling towards the north east.

Further analysis could be undertaken by visiting the Site or by collecting additional topographic survey to provide further confirmation of ground levels.

Figure 5. Source protection zone map (EA, 2023)



An assessment of the EA's groundwater Source Protection Zones (SPZs) has been undertaken within the vicinity of the Site and confirms the Site is not located within an SPZ.

Infiltration, if possible, is likely to be acceptable providing risk screening identifies suitable mitigation measures, if required, to prevent an impact on water quality from the proposed or historical land use and contaminated land.

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 6. Surface water features map (EA, 2023)

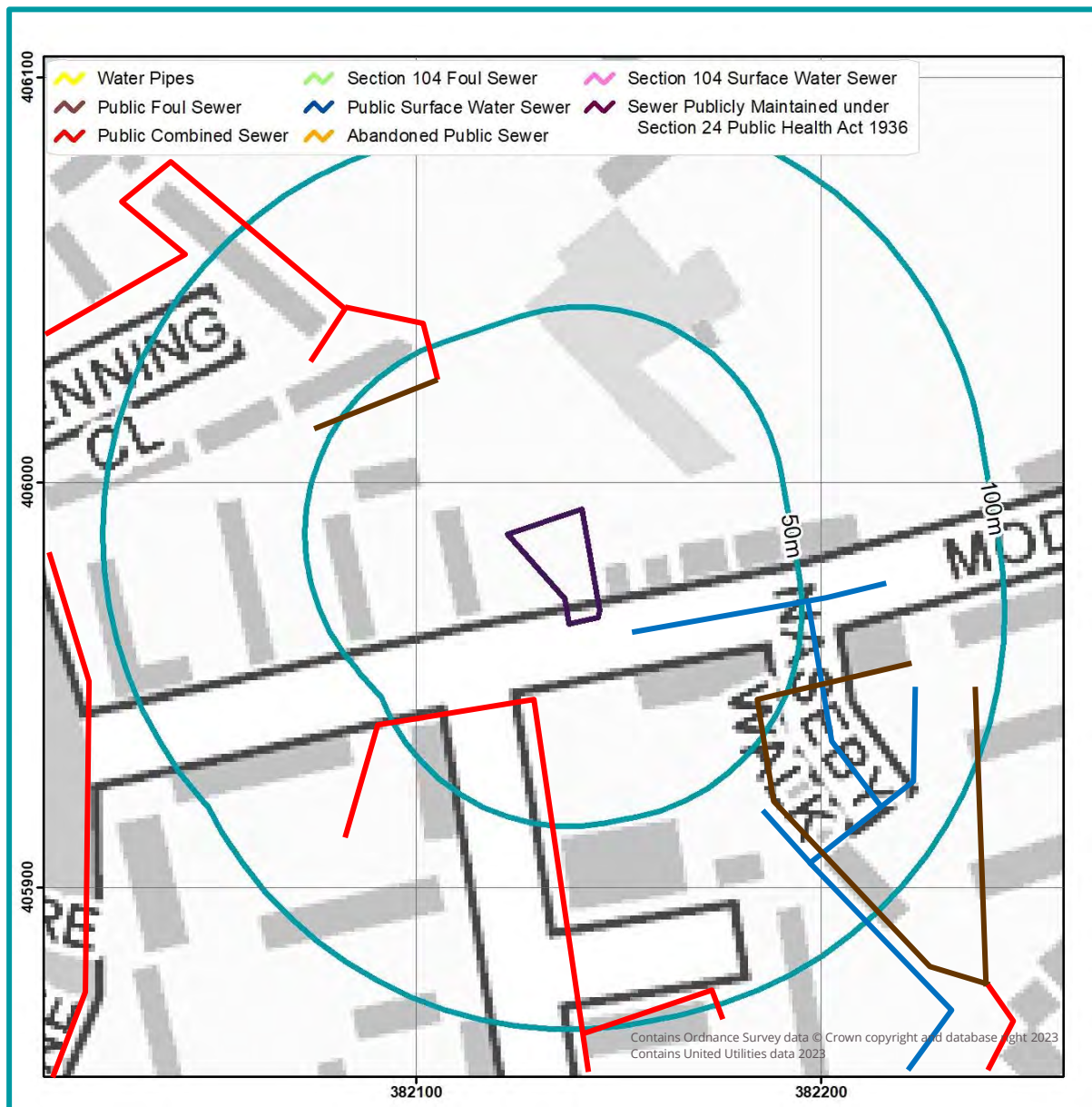


OS mapping indicates that there are no surface water features within 100m of the Site therefore discharge in this manner is not considered to be feasible.

According to the DEFRA'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 7. Sewer features map (OS & United Utilities, 2023)



GeoSmart has undertaken an assessment of the location of sewer features within the vicinity of the Site. According to the United Utilities asset location map, there is a public surface water sewer, located c. 10m south east of the Site. Due to the close proximity discharge to sewer is likely to be appropriate.

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 8. Risk of flooding from rivers & sea map (EA, 2023)



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.

Figure 10. Groundwater flood risk (GW5) map (GeoSmart, 2023)



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. An area at Moderate risk is located c. 20m east of the Site.

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 between 21 and 23 Mode Hill Lane', Whitefield, M45 8JF (the Site). The Site is located east of Whitefield in a setting residential use. The land slopes to the north east from 94.56 mAOD to 94.05 mAOD. Site plans and drawings are provided in Appendix A.

Development

The Site is currently undeveloped, an area of hardstanding is situated in the south and centre of the Site. Development proposals comprise the construction of a new residential dwelling with associated access and landscaping.

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 3. Site Geology

Geology present on-Site		Potentially permeable?
Superficial geology (Figure 11)	Glaciofluvial Ice Contact Deposits, Devensian (sand and gravel) (GFICD)	✓
Bedrock geology (Figure 12)	Chester Formation (sandstone) (CHES)	✓

The permeability of the underlying material at the Site shown within the BGS mapping is high, confirmation of the infiltration capacity is required.

The BGS website indicates that there are no nearby boreholes from which the underlying geology can be confirmed.

Infiltration SuDS are proposed directly into permeable superficial deposits.

The soil infiltration coefficient must be sufficient to accommodate the constraints on the dimensions of the soakaway and its emptying time.

Depth to groundwater

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

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

Relevant borehole/trial pit records were not available within the vicinity of the Site to confirm a likely depth to groundwater.

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.

Figure 11. Superficial Geology (BGS, 2023)

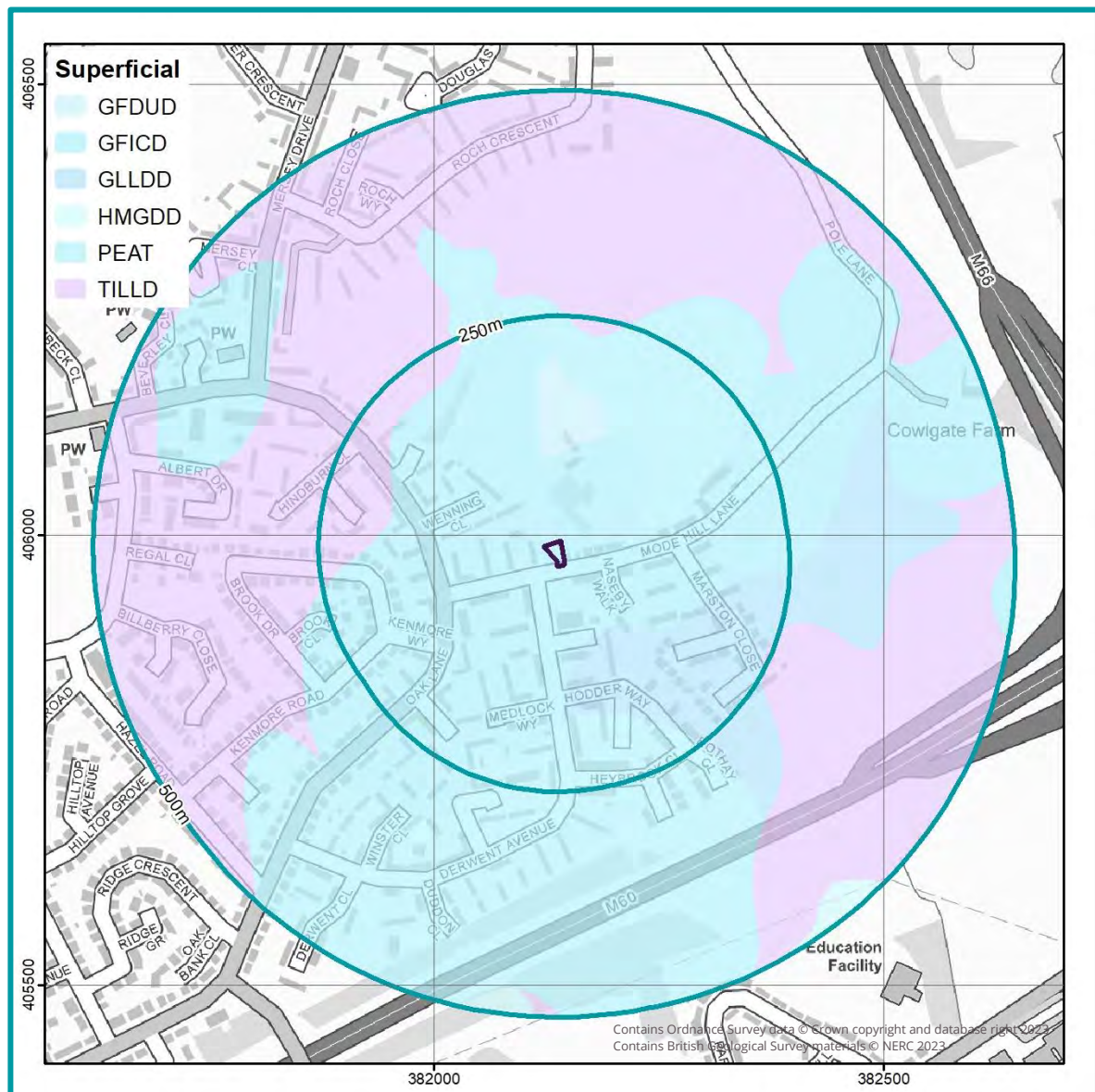
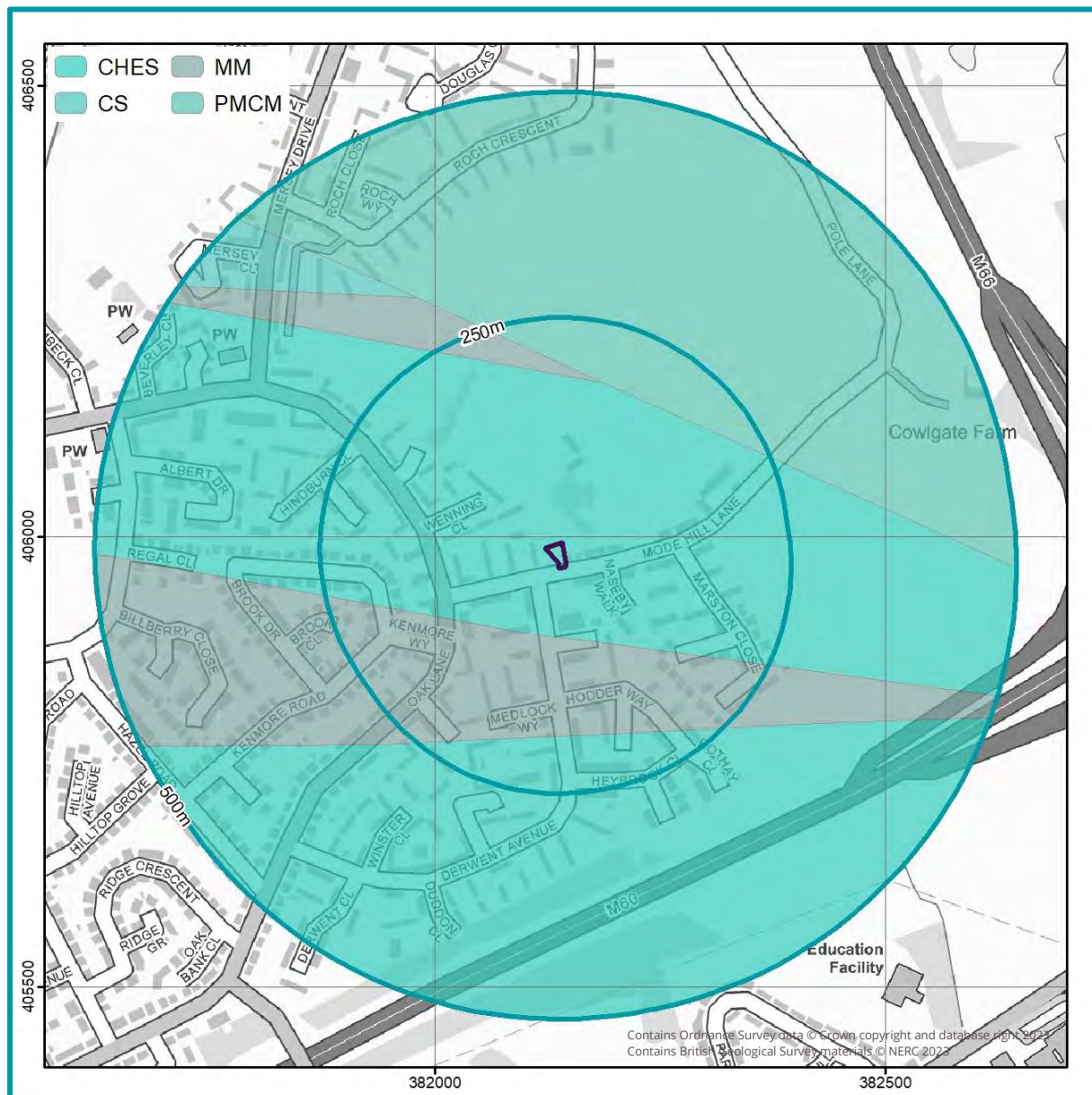


Figure 12. Bedrock Geology (BGS, 2023)



Ground conditions

Infiltration SuDS are proposed within permeable superficial deposits above sandstone bedrock therefore a detailed review of underlying ground conditions is recommended to ensure focused infiltration does not cause ground instability as a result of landslide or collapse associated with running sand.

Soakaways should be a minimum of 5m away from the foundations of a building and local guidance may recommend a greater distance. A detailed ground assessment is recommended: on steep slopes where infiltrating water would produce saturation and instability downslope; or within layered geology, where infiltrating water would produce springs down gradient.

Water quality

The Site does not lie within an SPZ. The infiltrated water quality should be of sufficient quality that it does not give rise to pollution of the underlying groundwater. Further consultation with the water company is unlikely to be required.

Infiltration systems should not be used where there is a risk of contaminating groundwater by infiltrating polluted runoff or where receiving groundwater is particularly sensitive.

The influence of surface runoff on water quality will depend on whether there is a source of contamination on-Site and the sensitivity of the receiving environment, either groundwater or surface water. The intervening pathway from source to receptor including mitigation and natural attenuation will determine the final impact.

The impact of contaminants on the groundwater will be reduced by travel and natural attenuation through the unsaturated soil zone. A greater depth of unsaturated zone and the presence of significant clay and organic material will provide greater protection for the underlying groundwater. Rapid flow through fractures will provide less protection than intergranular flow around soil and rock particles.

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 (2022)

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 ($\geq 3.3\%$ AEP) and 1 in 100 (< 3.3 to 1% AEP) year event.

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

Table 4. Peak rainfall intensity allowance within the Irwell Management Catchment

Irwell Management Catchment	3.3% annual exceedance rainfall event		1% annual exceedance rainfall event	
	Central allowance	Upper end allowance	Central allowance	Upper end allowance
2050s	25%	35%	25%	40%
2070s	30%	40%	30%	45%

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

Bury Local Plan Topic Paper 6: Flood Risk (Bury Council, October 2018)

Sustainable Urban Drainage Systems (SUDS)

Paragraph 165 of the NPPF states that “major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate”. Decisions on whether a sustainable drainage system would be inappropriate is a matter of judgement, based on guidance and advice from the Lead Local Flood Authority who will consider what type of sustainable drainage is reasonably practicable for a site.

SUDS are often viewed as taking up large areas of land within development sites. This is not necessarily the case, as there are a number of different SUDS components that can be used. The following hierarchical approach should be used when considering drainage options:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain, or other drainage system;
- To a combined sewer.

Planning applications proposing not to drain surface water in accordance with the above hierarchy and wishing to connect directly to the public sewerage system will require evidence as part of any submission to demonstrate why other options are not feasible. This will be reviewed by the Lead Local Flood Authority who will determine whether the proposals are acceptable.

SuDS have the opportunity to deliver multiple benefits in terms of high quality landscape design, opportunities for biodiversity and to improve water quality.

6 Storage, volume and peak flow rate



Suggested minimum and aspirational storage requirements for an infiltration or attenuation SuDS scheme for the development footprint are set out below, with more detail provided in subsequent sections. Storage volumes may be reduced (but not below the minimum level) if the design incorporates off-Site discharge.

Table 5. Storage requirements at the proposed development Site (Discharge runoff via infiltration)

Table 6. Attenuation scenario		Attenuation required (m ³)	Explanation
Discharge runoff via infiltration	1 in 100 year including 45% CC	9.50*	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year event including a 45% allowance for climate change**.

*Required attenuation has been calculated using Causeway Flow v.10.4 based on an assumed infiltration rate of 1×10^{-5} m/s (0.036 m/hr) taken from Table 25.1 of the CIRIA SuDS manual (2015) as the worst case scenario for sand and gravel soil type.

**Subject to confirmation through infiltration testing.

Table 7. 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 30 year	1.95	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 30 year (0.5 hour, Critical Storm Duration) event*. Flooding of the Site of 1.29 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 2.58 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	3.24	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year (0.5 hour, Critical Storm Duration) event*.	
	1 in 100 year including 45% CC	5.82	Attenuation required to ensure surface water runoff is attenuated in all storm events up to and including the 1 in 100 year (1 hour, Critical Storm Duration) event including a 45% allowance for climate change*.	

*See Appendix B for associated runoff and discharge calculations. Discharge rates all restricted as close as possible to greenfield rates in their respective events.

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 8. Change in impermeable area associated with the development

Total Site area	320 m ²
Impermeable area (and as a percentage of the total area of the proposed development footprint of 320 m ²)	
Pre-development	Post-development
170 m ² (53%)	150 m ² (47%)
Impermeable Land use: Hardstanding Permeable Land use: Vegetated areas	Impermeable land use: Proposed dwelling, patio and driveway* Permeable land use: Landscaped areas

*Please note, while these areas will be utilized for SuDS, for the calculations these areas will be classed as impermeable in order to assess the potential run-off volumes and rates for the Site post- development and the potential holding capability of the proposed SuDS features. 35m² area of driveway and paving is proposed to be comprised of unlined permeable paving to maximise the permeable areas on Site in the primary strategy.

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 9. 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	0.24	N/A	N/A	N/A
6 hour 1 in 1 year	0.20	0.27	0.26	-0.01
6 hour 1 in 10 year	0.33	0.43	0.41	-0.02
6 hour 1 in 30 year	0.40	0.57	0.54	-0.03
6 hour 1 in 100 year	0.50	0.76	0.72	-0.03
6 hour 1 in 100 year + 20% CC	N/A	N/A	0.87	0.11
6 hour 1 in 100 year + 45% CC	N/A	N/A	1.05	0.29

¹ Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the loH124 method.

Relevant national, regional and local planning policy has been consulted in Section 5 to determine restrictions on runoff from previously developed and greenfield sites. In some cases, greenfield rates may be requested, but in practice it is difficult to restrict discharge rates at any one control point to less than 1 l/s, without increasing the risk of any potential blockages occurring in the drainage network.

Total discharge volumes

The table overleaf 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'.

Table 10. 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	3.87	N/A	N/A	N/A
6 hour 1 in 1 year	3.67	5.86	5.60	-0.26
6 hour 1 in 10 year	5.91	9.20	8.82	-0.39
6 hour 1 in 30 year	7.70	12.31	11.77	-0.54
6 hour 1 in 100 year	10.24	16.38	15.65	-0.72
6 hour 1 in 100 year + 20% CC	N/A	N/A	18.78	2.41
6 hour 1 in 100 year + 45% CC	N/A	N/A	22.70	6.32

² Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the loH124 method.

Critical storm duration and volume requirements

Storage volumes for a range of return periods including the 1 in 30 year, 1 in 100 year and 1 in 100 year plus climate change (45%) 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 1 l/s.

Table 11. Critical Storm Duration and Attenuation volume requirements

Return Period	Runoff rate restriction (l/s)	Critical Storm Duration (hr)	Attenuation volume required (m ³)
1 in 30 year	1	0.5	1.95
1 in 100 year	1	0.5	3.24
1 in 100 year including a 45% climate change	1	1	5.82

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 permeable underlying sandstone, sand and gravel. Based on the groundwater flood risk mapping high groundwater levels are unlikely on Site (See Figure 10).

There are no known issues identified relating to Site contamination or the presence of a SPZ.

A site investigation comprising trial pits is recommended to confirm the depth to groundwater and allow infiltration tests to be undertaken to confirm the feasibility of an infiltration SuDS scheme.

Discharge to surface watercourse

OS mapping indicates that there are no surface water features within 100m of the Site therefore discharge in this manner is not considered to be feasible.

Discharge to sewer

Discharge to sewer is not likely to be the optimum sustainable drainage option for the new development area. However, a United Utilities asset location search confirms that a surface water sewer is located c. 10m south east of the Site, therefore discharge in this manner is likely to be feasible. If required, consultation with the local sewer undertaker should be undertaken. Discharge to sewer would only be accepted if it can be demonstrated that none of the above options are reasonably practical. Discharge would have to be controlled and on-Site attenuation would be required.

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 of very low (roof water) to low hazard. The Site does not lie within an SPZ and therefore additional treatment stages are not required.

Table 12. 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 13. 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.

Primary SuDS Strategy:

Ground conditions at the Site are conducive to infiltration, surface water runoff will be managed within SuDS features and infiltrated to ground.

Table 14. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and infiltration SuDS
SuDS features	Rainwater harvesting butt, unlined permeable paving and soakaway.
Discharge location	Infiltration.
Discharge rate	1×10^{-5} m/s*.

*A worst-case rate for sand and gravel soils as indicated by Table 25.1 of the CIRIA SuDS Manual (CIRIA, 2015).

Table 15. Proposed SuDS sizing (dimensions) and attenuation volumes

Rainwater Harvesting	A rainwater harvesting butt should be established for the 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.
Soakaway	A soakaway measuring 2.5 m in width, 4 m in width and 1 m in depth, with a 95% porosity is proposed to be located in the rear garden on Site. The soakaway would provide 9.5 m ³ attenuation.

Unlined Permeable Paving	A 35 m ² area of unlined permeable paving is proposed for the driveway and southern paved areas on Site. This feature will maximise the permeable areas on Site and exclusively drain itself.
Total Attenuation Provided	9.5 m ³

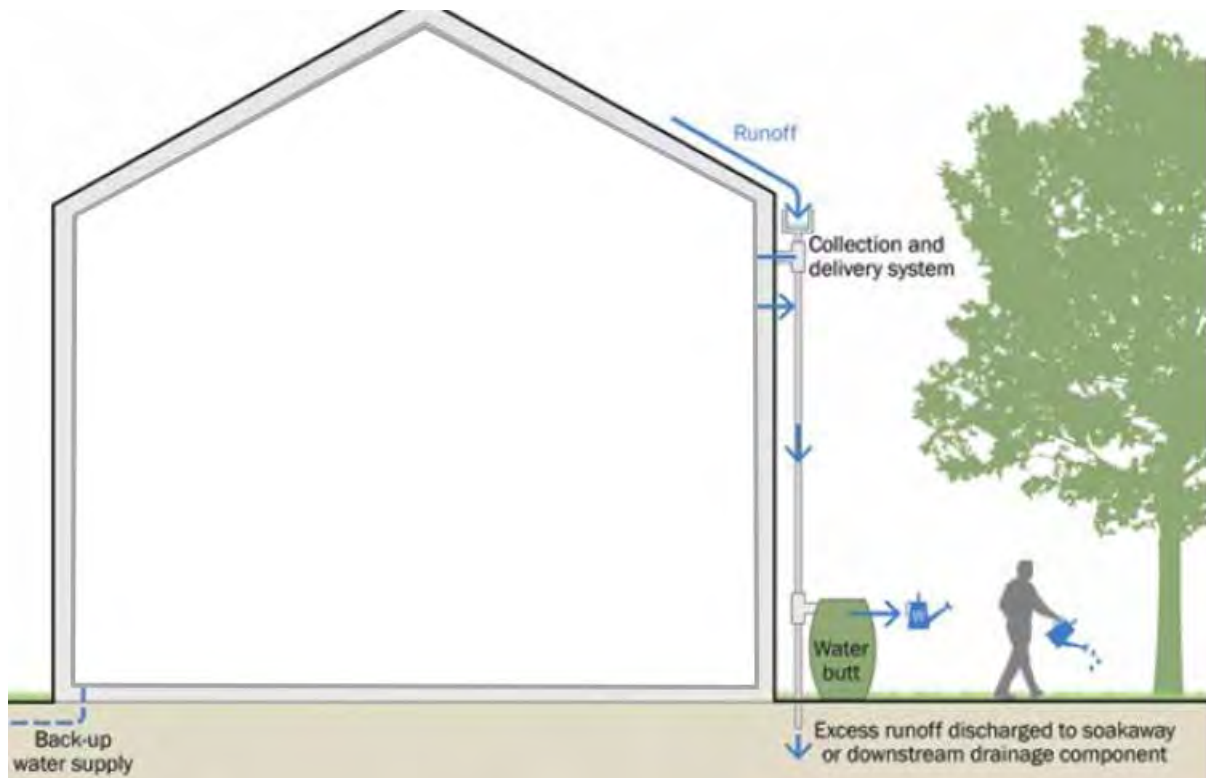
Rainwater harvesting

A rainwater harvesting butt is proposed on Site. The run-off from the proposed development roof should be led into rainwater harvesting butts via rainwater downpipes and guttering to catch run-off from the extension roof. Overflow from the butts should be discharged into the storage system provided by the soakaway.

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.

As there is an issue with the storage capability of Rainwater Harvesting tanks, this method should have a fixed attenuation volume and a controlled outlet to discharge into the proposed SuDS feature. An overflow system will be required for implementation on the Site due to exceedance events (where the pumps fail or there is a blockage within the system / or the number of residents and subsequent water usage is reduced).

Roof run-off is generally less polluted than run-off from road surfaces but can still generate pollutants such as sediments. Pollutants would be captured by the collection and filtration system and, by reducing the volume of run-off generated from the Site. Primary screening devices are used to prevent leaves and other debris from entering the butt and first flush devices can be designed to divert the first part of the rainfall away from the main storage tank and can pick up most of the dirt, debris and contaminants that collect on a residential roof.



Modified from Figure 11.3 of the CIRIA SuDS Manual (C753) (2015)

Soakaway

Soakaways should be used to store run-off and infiltrate collected water gradually into the ground. Proposed topographic data indicates roof water could be collected and conveyed by underground pipes to the features which are located at the Site. The base of the infiltration features should lie at an elevation at least 1 m above the highest winter groundwater levels, to ensure there is sufficient space for surface water to discharge. Soakaway excavation should be outside of the root zone of any protected trees and dimensions will depend on the depth to the sand layer where the soakaway is eventually situated.

Draining via soakaways means that property owners are less likely to pay for the utility company to drain surface water. In terms of future ownership and maintenance, where a soakaway drains a single property, the ownership and maintenance would be the property owner's responsibility.

Unlined Permeable paving

Unlined Permeable Paving is proposed for the driveway and southern paved areas on Site to intercept runoff. Suitable aggregate materials (angular gravels with suitable grading as per CIRIA, 2015) will improve water quality due to their filtration capacity and usually work to a 30% porosity. A geotextile layer will be required for paving underlain by aggregate material to intercept silt/particles. Permeable pavements are multi-layered surfacing systems. The surface layer is constructed out of permeable material allowing infiltration of water through gaps along its surface. A geomembrane isolates stored water from the surrounding soil, especially in contaminated areas and a geotextile layer prevents clogging and damage to the geo-cellular modules.

The geotextile layer works to intercept silt/particles flowing through the system via direct rainfall, or through vehicle use deposited onto the car park area and into the permeable paving. The majority of silt would be trapped within the top 30mm of the joining material between the paving blocks. Rainfall flowing into the permeable paving directly from the development roof/rainwater butts would not contain enough volumes of silt and or particles to cause blockage so will be fed directly into underlying porous substrate via rainwater pipes.

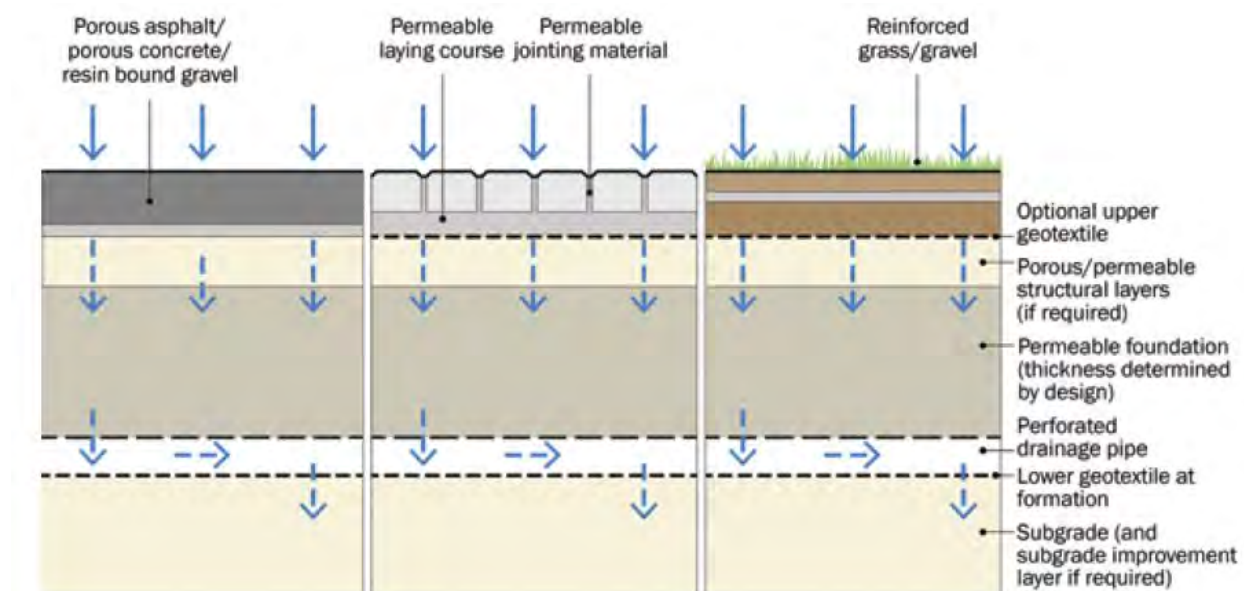


Figure 20.13 of the CIRIA SuDS Manual (C753) (2015)

Exceedance Flows

Exceedance flow routes are included within the proposed SuDS drainage layout. Where possible, exceedance flows should be directed away from buildings and into non-essential areas of the Site. The SuDS system recommended for the Site should provide enough storage that this method would only be utilised during a worst case scenario.

Secondary SuDS strategy:

Where infiltration to ground is not achievable at the Site, an attenuation volume of 5.82 m³ should be stored within lined SuDS features to accommodate the calculated 1 hour Critical Storm Duration for surface water discharge runoff, restricted to 1 l/s.

Table 16. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and attenuation SuDS.
SuDS features	Rainwater harvesting butt and permeable paving.
Discharge location	Public surface water sewer network.
Discharge rate	1 l/s.

Table 17. Proposed SuDS sizing (dimensions) and attenuation volumes

Rainwater Harvesting	A rainwater harvesting butts should be established for the 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.
Permeable paving	A 75 m ² area of permeable paving (underlain with a Type 3 aggregate material) within the proposed driveway and paved areas to a depth of 0.3 m, with a 30% porosity would result in c. 6.75 m ³ attenuation.
Total Attenuation Provided	6.75 m ³
Total Attenuation Required	5.82 m ³
Freeboard Storage Provided	0.93 m ³

Permeable paving

Permeable Paving is proposed for paved areas on Site to intercept runoff. Suitable aggregate materials (angular gravels with suitable grading as per CIRIA, 2015) will improve water quality due to their filtration capacity and usually work to a 30% porosity. A geotextile layer will be required for paving underlain by aggregate material to intercept silt/particles. Permeable pavements are multi-layered surfacing systems. The surface layer is constructed out of permeable material allowing infiltration of water through gaps along its surface. A geomembrane isolates stored water from the surrounding soil, especially in contaminated areas and a geotextile layer prevents clogging and damage to the geo-cellular modules.

The geotextile layer works to intercept silt/particles flowing through the system via direct rainfall, or through vehicle use deposited onto the car park area and into the permeable paving. The majority of silt would be trapped within the top 30mm of the joining material between the paving blocks. Rainfall flowing into the permeable paving directly from the development roof/rainwater butts would not contain enough volumes of silt and or particles to cause blockage so will be fed directly into underlying porous substrate via rainwater pipes.

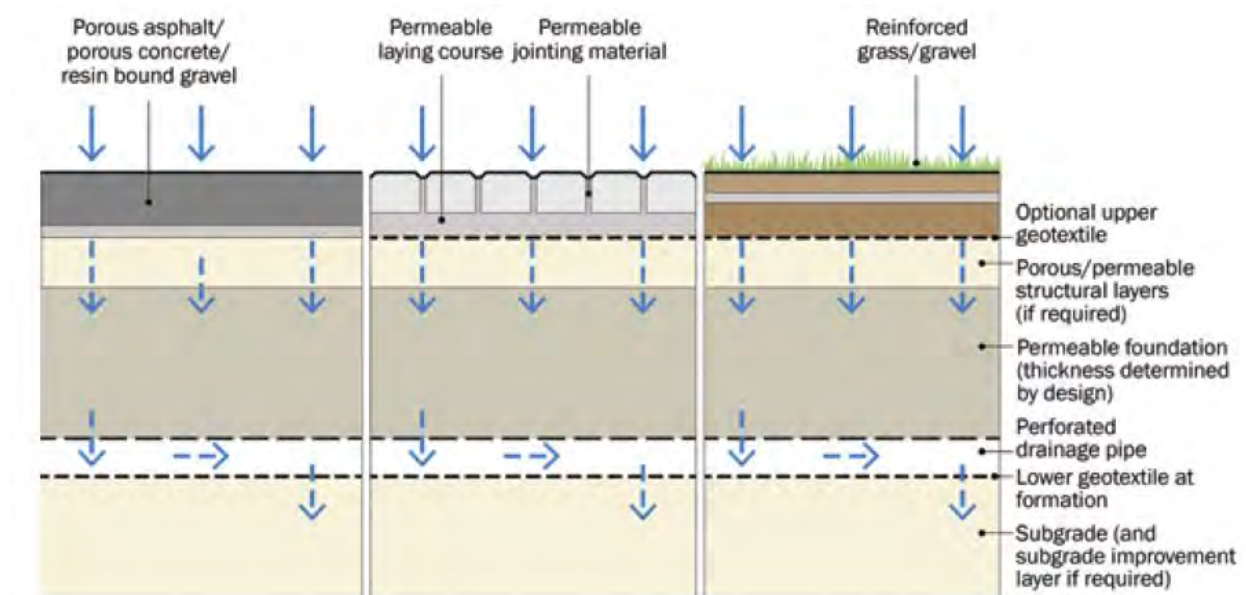


Figure 20.13 of the CIRIA SuDS Manual (C753) (2015)

Plastic geo-cellular systems could also be used, which can increase the void space and therefore storage but do not allow filtration unless they are combined with aggregate material and/or permeable geotextiles which could increase their storage potential by up to 20%. Geo-cellular modules also have the added advantage of reducing the amount of aggregate sub base required, thus keeping costs lower. Void systems, such as permavoids, have a void ratio of 95% (i.e. for every 1 m³ there is 0.95 m³ of space available for water storage), which has been factored into the storage capacity calculations.

Drainage protection devices

A non-return flap valve 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 are included within the proposed SuDS drainage layout. Where possible, exceedance flows should be directed away from buildings and into non-essential areas of the Site. The SuDS system recommended for the Site should provide enough storage that this method would only be utilized 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 18. SuDS operation and recommended maintenance requirements

Asset type	Maintenance schedule (and frequency)
Soakaways	Regular maintenance: - Remove sediment and debris from pretreatment and inspection chamber. Clean gutters, filters, downpipes. Trim roots prevent blockages (annually). - Reconstruct/ clean if performance deteriorates, replace clogged geotextile (as required) Monitoring: - Inspect inlets/outlets, silt traps – note rate of accumulation (monthly). - Check water levels and emptying time (annually).
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).
Hydro-Brake Flow Control	Low amounts of maintenance required as there are no moving parts within the Hydro-Brake® Flow Control. 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).

Asset type	Maintenance schedule (and frequency)
	- 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)

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 19. 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 20. 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 Further information



The following table includes a list of additional products by GeoSmart:

Additional GeoSmart Products			
	Additional assessment: FloodSmart Report		The FloodSmart Report range provides clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at a Site. Our consultants assess available data to determine the level of risk based on professional judgement and years of experience. Please contact info@geosmartinfo.co.uk for further information.
	Additional assessment: EnviroSmart Report		Provides a robust desk-based assessment of potential contaminated land issues, taking into account the regulatory perspective. Our EnviroSmart reports are designed to be the most cost effective solution for planning conditions. Each report is individually prepared by a highly experienced consultant conversant with Local Authority requirements. Ideal for pre-planning or for addressing planning conditions for small developments. Can also be used for land transactions. Please contact info@geosmartinfo.co.uk for further information.

14 References and glossary



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Ministry of Housing, Communities & Local Government. (2022). National Planning Policy Guidance (NPPG).

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 2023 BlueSky copyright and database rights 2023
Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2023 Ordnance Survey data © Crown copyright and database right 2023
Flood Risk (RoFRS/Pluvial/Surface Water Features/SPZ)	Environment Agency copyright and database rights 2023 Ordnance Survey data © Crown copyright and database right 2023
Flood Risk (Groundwater) and SuDS infiltration suitability (SD50)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2023) Contains British Geological Survey materials © NERC 2023 Ordnance Survey data © Crown copyright and database right 2023
Sewer Location	Contains Ordnance Survey data © Crown copyright and database right 2023 Contains United Utilities Search data 2023
Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2023 Environment Agency copyright and database rights 2023

15 Appendices



Appendix A



Site plans

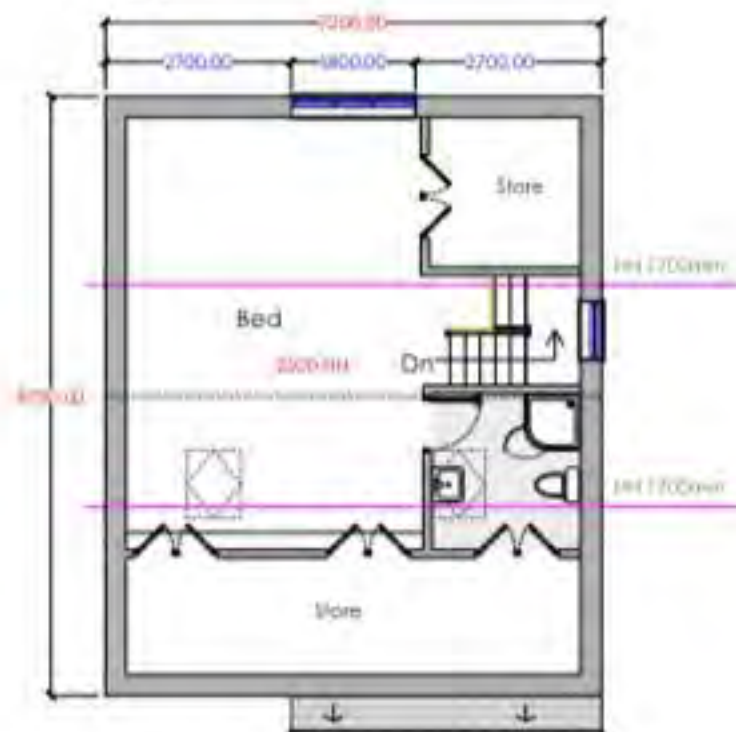
Land between 21 and 23 Mode Hill Lane-Site Plan.





Ground Floor Plan

Scale 1:50



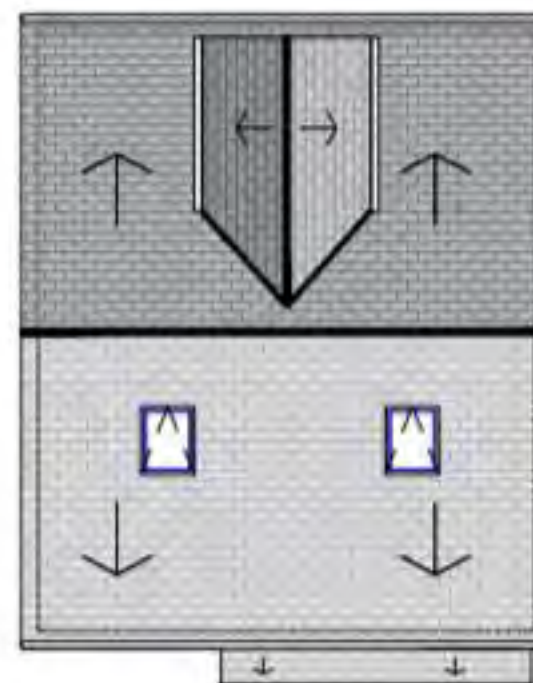
Loft Floor Plan

Scale 1:50



First Floor Plan

Scale 1:50



Roof Plan

Scale 1:50

KEY	
100	1000
200	2000
300	3000
400	4000
500	5000
600	6000
700	7000
800	8000
900	9000
1000	10000

Drawing No.	AT-A-Design
Scale	1:50
Date	12/12/2022
Drawn by	



Proposed Street Scene
Scale 1:100

GENERAL NOTES

1. The contractor must check the site and the approved drawings before commencing the works and must take any working measurements as necessary and any discrepancy must be reported to the client.
2. Work shall comply with any current relevant BS/codes of practices and confirm to the Building Regulations including the latest amendment. The contractor is responsible for setting out the works.

PROJECT ADDRESS

Land between 21 and
23 Mode Hill Lane
Whitfield
M45 8JF

PROJECT

Erection of Detached Dwelling

KEY

RWP Rain water pipe
Boundary

Drawing No
PP107(5)21
Rev D

Scale
1:100 @ A1

Date
07/03/2022

Drawn by
at

AT A. Design

Address:
12 Hastings Gardens
Stockport
SK5 8BF

T. 07830039347
E. ata_design@hotmail.com

Appendix B



Rainfall runoff calculations

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)
1	0.012	10.000	1.600

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	45	0	0

Node 1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.03600	Invert Level (m)	8.400	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.03600	Time to half empty (mins)	960	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	2.500	Number Required	1
Porosity	0.95	Pit Length (m)	4.000		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	328	8.584	0.184	0.3	1.7783	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
360 minute winter	1	Infiltration	0.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	1	870	8.842	0.442	0.3	4.2695	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
960 minute winter	1	Infiltration	0.1

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	1	690	8.984	0.584	0.5	5.6368	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
720 minute winter	1	Infiltration	0.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	1	456	9.303	0.903	0.9	8.7108	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
480 minute winter	1	Infiltration	0.1

Appendix C



United Utilities asset location plan

CON 29 drainage and water enquiry

This report has been produced on records held by United Utilities at the time the search results were compiled

Client:

Client ref: Proposed New Residential Unit

AT A. Design

**12
Hastings Gardens, ARCHITECTURE
Stockport, Greater Manchester
SK5 8BF**

Order number: UUPS-ORD-430023

Received date: 07/09/2022

Response date: 09/09/2022

The following records were searched in compiling this report:

The map of public sewers
The map of waterworks
Water and sewerage billing records
Adoption of public sewers records
Building over public sewer records
Adoption of public water mains records
Water supply clarification
All of these are held by United Utilities Water Limited.

Property address: Land between 21 and 23 Mode Hill Lane Whitefield M45 8JF, Land between 21 and 23 Mode Hill Lane Whitefield M45 8JF

Enquiries and Responses

The records were searched by Katy Lowry for United Utilities who does not have, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

This search report was prepared by Katy Lowry for United Utilities who does not have, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

Please note if you wish us to investigate and/or amend the results we can do this but we will need an instruction from the customer who originally ordered the search from us, we will not investigate based on the third party request.

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

What is included:

1. Summary of findings and key
2. Detailed findings of the CON29DW
3. Guidance for interpretation
4. Terms and conditions
5. Complaints policy

Additional useful numbers:

Moving Home, call 0345 026 7661 to change your billing details or set up new account.
Developer Services, call 0345 0726067 for a new connection or build over enquiries.

To help understand the implications of the drainage and water enquiries report a summary guide to the content of the full report is provided below.

✓ This response represents the typical situation for a property.

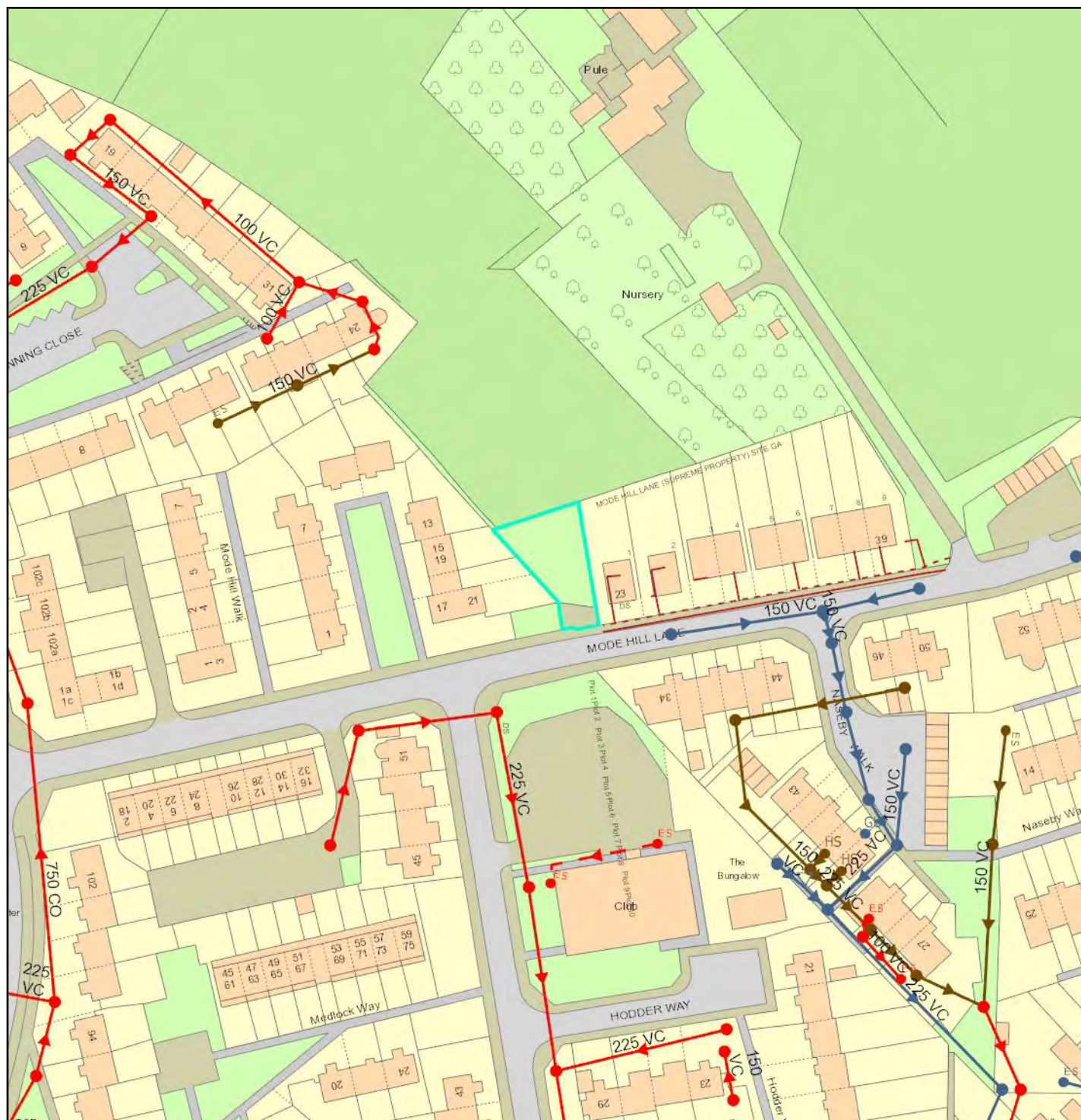
⚠ The attention of the purchaser is drawn to this response. The purchaser may wish to make further investigations into this situation.

✗ This response represents an uncommon situation for a property and the purchaser should carefully consider its implications.

Question	Report Schedule	Answer	
1.1	Where relevant, please include a copy of an extract from the public sewer map	Yes & location	✓
1.2	Where relevant, please include a copy of an extract from the map of waterworks.	Yes & location	✓
2.1	Does foul water from the property drain to a public sewer?	Plot of Land	⚠
2.2	Does surface water from the property drain to a public sewer?	Plot of Land	⚠
2.3	Is a surface water drainage charge payable?	No	✗
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	None	✓
2.4.1	Does the public sewer map indicate any pumping station or any other ancillary apparatus within the boundaries of the property?	None	✓
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	None	⚠
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?	None	✓
2.6.1	Are any foul sewers or lateral drains serving the development or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?	No	✓
2.6.2	Are any surface water pipes 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 a 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?	None	✓
2.8	Is the property, or part of the property, at risk of internal foul flooding due to overloaded public sewers?	No	✓
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	Yes	✓
3.1	Is the property connected to mains water supply?	Plot of land	⚠

Question	Report Schedule	Answer	
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 the building at risk of receiving low water pressure or flow?	No	✓
3.5	What is the clarification of the water supply for the property	Very soft	✓
3.6	Please include details of the location of any water meter serving the property.	No meter	✓
4.1s	Who is responsible for providing the sewerage services for the property?	United Utilities	✓
4.1w	Who is responsible for providing the water services for the property?	United Utilities	✓
4.2	Who bills the property for sewerage services?	Not billed	✗
4.3	Who bills the property for water services?	Not Billed	✗
4.4	What is the current basis for charging for sewerage and/or water services at the property?	Plot of Land	✗
4.5	Will the basis for charging for sewerage and water services at the property change as a consequence of a change of occupation?	Measured	✓

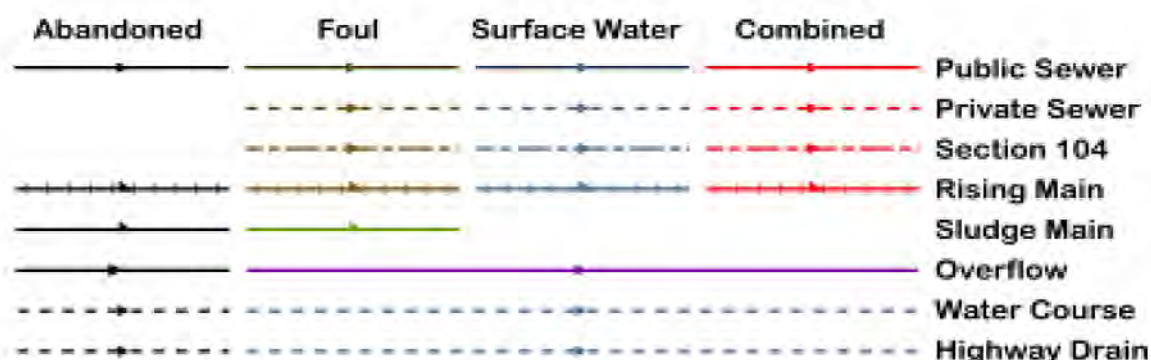
SEWER RECORD Land between 21 and 23 Mode Hill Lane Whitefield M45 8JF, Land between 21 and 23 Mode Hill Lane Whitefield M45 8JF



The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded. United Utilities Water PLC will not accept any liability for any damage caused by the actual positions being different from those shown.

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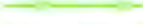
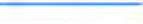
Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

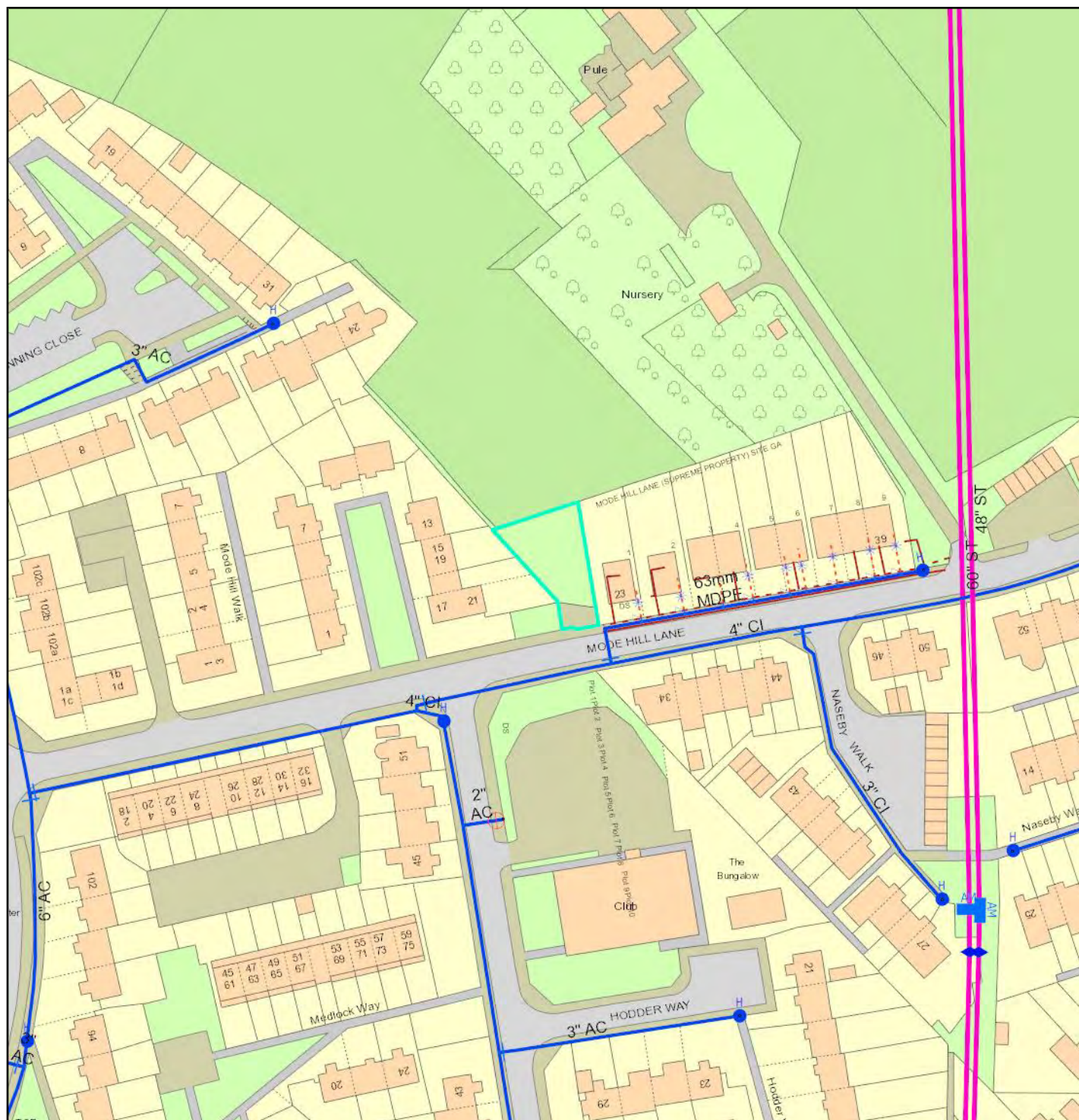
Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	

Clean Water Symbolology

Proposed	Abandoned	Live	
			Distribution Main
			Trunk Main
			Comms Pipe
			Private Pipe
			Concessionary Service
			Raw Water
			LDTM Raw Water
			LDTM Treated Water
			Air Valve
			AC Valve, open
			AC Valve, closed
			CC Valve, open
			CC Valve, closed
			Non Return Valve
			Pressure Management Valve
			OMS Valve
			Stop Tap
			Flow Meter
			Domestic Meter
			Commercial Meter
			Pump
			Hydrant
			Fire Hydrant
			Anode
			Chlorination Point
			De-chlorination Point
			Strainer Point
			Access Point
			Hatch Box
			IP Point
			Sampling Station
			Logger Box
			Bore Hole
			Inlet Point
			Bulk Supply Point
			End Cap
			Site Termination
			Change of Characteristic
			Condition Report
			<u>Property Types</u>
			Water Tower
			Valve House
			Booster Pumping Station
			Intake Pumping Station
			Water Treatment Works
			Supply Reservoir
			Service Reservoir
			Impounding Reservoir
			Pipe Bridge

Symbology for proposed assets is the same as above, but shown in green
Symbology for abandoned assets is the same as above, but shown in black

WATER RECORD Land between 21 and 23 Mode Hill Lane Whitefield M45 8JF, Land between 21 and 23 Mode Hill Lane Whitefield M45 8JF



The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded. United Utilities Water PLC will not accept any liability for any damage caused by the actual positions being different from those shown.

© United Utilities Water PLC 2017. The plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office, Crown copyright 100022432 and United Utilities Water PLC copyrights are reserved. Unauthorised reproduction will infringe these copyrights.

Question 1.1**Where relevant, please include a copy of an extract from the public sewer map****Answer****A copy of an extract from the public sewer map is included in which the location of the property is identified.****Guidance**

The Water Industry Act 1991 defines public sewers as those which (United Utilities) have responsibility for.

Other assets and rivers, water courses, ponds, culverts or highway drains may be shown for information purposes 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.

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 sewerage undertaker or its contractors needing to enter the property to carry out work.

Question 1.2**Where relevant, please include a copy of an extract from the map of waterworks.****Answer****A copy of an extract from the map of waterworks is included in which the location of the property is identified.****Guidance**

The "water mains" in this context are those which are vested in and maintainable by the water undertaker under statute.

Assets other than public water mains may be shown on the plan, for information only. Water undertakers are not responsible for private supply 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 an extract of the public water main record is enclosed, it 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.

Where there is no water main easily accessible from the property boundary (e.g. it is not laid in a street very close to the property) and the property receives a water supply from the Water Undertaker this indicates that there is likely to be a private water supply pipe connecting the customer's water supply pipe to the water main. The Water Undertaker is not responsible for the maintenance of the private pipe and will have no record of the location of the pipe. Customers must rely on their own investigations to confirm the pipe's location and who is responsible for the maintenance of this private pipe.

The presence of a public water main running 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 water undertaker or its contractors needing to enter the property to carry out work.

Question 2.1**Does foul water from the property drain to a public sewer?****Answer****This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer.****Guidance**

Sewerage undertakers are not responsible for any private drains or 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.

If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.

If an extract from the public sewer map is enclosed, this will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.2 Does surface water from the property drain to a public sewer?

Answer **This enquiry appears to relate to a plot of land or a recently built property. It is recommended that drainage proposals are checked with the developer. If the property was constructed after the 6th April 2015 the surface water drainage may be served by a sustainable drainage system.**

Guidance Sewerage undertakers are not responsible for any private drains or 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 undertakers' 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 sewerage undertaker.

If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse.

If an extract from the public sewer map is enclosed, this will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

Question 2.3 Is a surface water drainage charge payable?

Answer **Records confirm that a surface water drainage charge is not payable for the property.**

Guidance If the property was constructed after the 6th April 2015 the surface water drainage may be served by a sustainable drainage system. Where surface water from a property does not drain to the public sewerage system no surface water drainage charges are payable.

Where surface water charges are payable but 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 sewerage undertaker.

Drainage charges are subject to annual review and amounts may change. If the property was constructed after 6th April 2015 the surface water drainage may be served by a sustainable drainage system. Further information may be available from the developer or question 3.3 of the CON29 from the local authority from 4th July 2016.

Question 2.4 Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

Answer The public sewer map included indicates that there are no public sewers, disposal mains or lateral drains within the boundary of the property. However from the 1st October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map which may further prevent or restrict development of the property. If you are considering any future development at this property which may require build over consent, please complete the enquiry form by accessing the following link <https://www.unitedutilities.com/services/builders-developers/>

Guidance The approximate boundary of the property has been determined by reference to the Ordnance Survey record. A property of this type will normally be served by a shared sewer passing through the boundaries of several properties. It is therefore likely that a public sewer or lateral drain is present within the property boundary.

Please note that from 1st October 2011 the majority of private sewers and lateral drains connected to the public network as of 1st July 2011 transferred into public ownership and therefore it is possible there may be additional public assets which may not be shown on the public sewer plan.

The presence of public assets running within the boundary of the property may restrict further development. If there are any plans to develop the property further enquiries should be made to United Utilities Build Over department.

United Utilities Water has a legal 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.

Question 2.4.1 Does the public sewer map indicate any pumping station or any other ancillary apparatus within the boundaries of the property?

Answer The public sewer map included indicates that there is no public pumping station or other ancillary apparatus within the boundaries of the property. However, from the 1st October 2016 private pumping stations which serve more than one property will be transferred into public ownership but may not be recorded on the public sewer map until that time

Guidance From 1 October 2016 United Utilities will be responsible for private pumping stations (though we may take ownership of some stations before this date) that either:

* serve a single property, and are outside the property boundary or

* serves two or more properties

Only private pumping stations installed before 1st July 2011 will be transferred into our ownership. United Utilities will be responsible for all associated costs, maintenance, repairs and any necessary upgrade work.

Where the property is part of a very recent or ongoing development and the sewers/pumping station are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains, sewers and pumping stations for which they will hold maintenance and renewal liabilities.

Question 2.5 Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

Answer The public sewer map included indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the boundary of the property. However from the 1st October 2011 private sewers will be transferred into public ownership and may not be recorded on the public sewer map and it is our professional opinion that there will be a public sewer within 30.48 (100 feet) of a building within the boundary of the property.

Guidance From 1st October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.

The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the Local Authority requiring a property to be connected to the public sewer.

The measure is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.

Sewers 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.

Assets other than public sewers may be shown on the copy extract for information only.

Question 2.5.1

Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

Answer

The public sewer map included indicates that there is no public pumping station or other ancillary apparatus within 50 metres of any buildings within the property. However, from 1st October 2016 private pumping stations which serve more than one property will be transferred into public ownership but may not be recorded on the public sewer map until that time.

Guidance

From 1 October 2016 United Utilities will be responsible for private pumping stations (though we may take ownership of some stations before this date) that either:

- * serve a single property, and are outside the property boundary or

- * serves two or more properties.

Only private pumping stations installed before 1st July 2011 will be transferred into our ownership. United Utilities will be responsible for all associated costs, maintenance, repairs and any necessary upgrade work.

If you think there might be a private pumping station on your land or near your business property, please let us know by completing this questionnaire with as much information as possible, please visit our website <http://www.unitedutilities.com/ppstransfer.aspx>.

Where the property is part of a very recent or ongoing development and the sewers/pumping station are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains, sewers and pumping stations for which they will hold maintenance and renewal liabilities.

Question 2.6.1

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

Answer

Records confirm that foul sewers and/or lateral drains serving the development, of which the property forms part are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance

This enquiry is of interest to purchasers of new property who will want to know whether or not the property will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under section 104 of the water industry act 1991.

Question 2.6.2

Are any surface water pipes 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?

Answer **The surface water sewer(s) and/or surface water lateral drain(s) are not the subject of an adoption agreement and it is recommended that responsibility for maintenance of these is checked with the Developer as this may be due to a Sustainable Drainage Scheme (SUDS)**

Guidance This enquiry is of interest to purchasers of new property who will want to know whether or not the property will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under section 104 of the water industry act 1991.

Question 2.7 **Has a 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?**

Answer **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, 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.**

Guidance Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

From 1st October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have approved or been consulted about plans to erect a building or extension on the property over or in the vicinity of these.

Prior to 2003 United Utilities Water Limited had sewerage agency agreements with the local authorities, therefore details of any agreements/consents or rejections may not have been forwarded on to our offices before this date.

Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

Question 2.8 **Is the property, or part of the property, at risk of internal foul flooding due to overloaded public sewers?**

Answer **The building is not recorded as being at risk of internal flooding due to overloaded public sewers. From the 1st October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership it is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.**

Guidance A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter).

Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.

"Internal flooding" from public sewers is defined as flooding which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

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 sewerage undertaker'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.

Properties may be at risk of flooding but not included where flooding incidents have not been reported to the sewerage undertaker.

Public sewers are defined as those for which the sewerage undertaker 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 sewerage undertaker.

This report excludes flooding from private sewers and drains and the sewerage undertaker makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

Question 2.9 Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.

Answer The nearest Sewage Treatment Works is 1.48 miles (2.38 km), North West of the property. The name of the Sewage treatment works is Bury WwTW. The owner is United Utilities

Guidance The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated i.e. the property may not necessarily drain to this works.

The sewerage undertaker's records were inspected to determine the nearest sewage treatment works.

It should be noted therefore that there may be a private sewage treatment works closer than the one detailed above that has not been identified. As a responsible utility operator, United Utilities Water Limited seeks to manage the impact of odour from operational sewage works on the surrounding area.

This is done in accordance with the "Code of Practice on Odour Nuisance from Sewage Treatment Works" issued via the Department of Environment, Food and Rural Affairs (DEFRA).

This code recognises that odour from sewage treatment works can have a detrimental impact on the quality of the local environment for those living close to works.

However DEFRA also recognises that sewage treatment works provide important services to communities and are essential for maintaining standards in water quality and protecting aquatic based environments. For more information visit www.unitedutilities.com.

Question 3.1 Is the property connected to mains water supply?

Answer This enquiry relates to a plot of land or a recently built property. It is recommended that the water supply proposals are checked with the developer.

Guidance Water undertakers are not responsible for private supply 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.

Details of private supplies are not kept by the water undertaker. The situation should be 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?

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

Guidance The approximate boundary of the property has been determined by reference to the ordnance survey record or the map supplied.

The presence of a public water main 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 water undertaker 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?**

Answer **Records confirm 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 This enquiry is of interest to purchasers of new premises who will want to know whether or not the property will be linked to the mains water supply.

Question 3.4 **Is the building at risk of receiving low water pressure or flow?**

Answer **Records confirm that the building is not recorded by the water undertaker as being at risk of receiving low water pressure or flow.**

Guidance The boundary of the property has been determined by reference to the Ordnance Survey record. "Low water pressure" means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal. Water undertakers report properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level). Reference level: The reference level of service is a flow of 9l/min at a pressure of 10m head on the customer's side of the main stop tap (mst). The reference level applies to a single property. The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap. Where a common service pipe serves more than one property, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served. Surrogate for the reference level: Because of the difficulty in measuring pressure and flow at the mst, companies may measure against a surrogate reference level. Companies should use a surrogate of 15m head in the adjacent distribution main unless a different level can be shown to be suitable. In some circumstances companies may need to use a surrogate pressure greater than 15m to ensure that the reference level is supplied at the customer's side of the mst (for example in areas with small diameter or shared communication pipes).

There are a number of circumstances under which properties identified as receiving low pressure should be excluded from the reported figure. The aim of these exclusions is to exclude properties which receive a low pressure as a result of a one-off event and which, under normal circumstances (including normal peaks in demand), will not receive pressure or flow below the reference level. Companies must maintain verifiable, auditable records of all the exclusions that they apply in order to confirm the accuracy and validity of their information. Allowable exclusions includes Abnormal demand, Planned maintenance, One off incidents, Low pressure incidents of short duration and common supply.

Abnormal demand:

This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand, which are normally expected. Water undertakers exclude figures from properties which are affected by low pressure only on those days with the highest peak demands. During the yearly report water undertakers may exclude, for each property, up to five days of low pressure caused by peak demand.

Planned maintenance:

Water undertakers will not report low pressures caused by planned maintenance. It is not intended that water undertakers identify the number of properties affected in each instance. However, water undertakers must maintain sufficiently accurate records to verify that low-pressure incidents that are excluded because of planned maintenance, are actually caused by maintenance.

One-off incidents:

This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as pressure reducing valves or booster pumps); fire fighting and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration:

Properties affected by low pressures that only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded.

A company must maintain a minimum pressure in the communication pipe of seven metres static head (0.7 bar). If pressure falls below this on two occasions, each occasion lasting more than one hour, within a 28-day period, the company must automatically make a GSS payment to the customer. There are exceptions to the requirement to make a GSS payment if the pressure standard is not met. These are: a payment has already been made to the same customer in respect of the same financial year; it is impractical for the company to have identified the particular customer as being affected, and the customer has not made a claim within three months of the date of the latter occasion; industrial action by the company's employees makes it not feasible to maintain the pressure standard; the act or default of a person other than the company's representative make it not feasible to maintain the pressure standard; or the pressure falls below the minimum standard due to necessary works taking place or due to a drought.

It should be noted that low water pressure can occur from private water mains, private supply pipes (the pipework from the external stop cock to the property) or internal plumbing which are not the responsibility of the Water Undertaker. This report excludes low water pressure from private water mains, supply pipes and internal plumbing and the Water Undertaker makes no comment upon this matter. For reporting purposes buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

Question 3.5

What is the clarification of the water supply for the property

Answer

The water supplied to the property has an average water hardness of 31mg/l calcium carbonate, which is defined as very soft by United Utilities

Guidance

The hardness of water is due to the presence of calcium and magnesium minerals that are naturally present in the water. The usual signs of a hard water supply are scaling inside kettles, poor lathering of soaps and scum.

What is water hardness?

Hard water is formed when water passes through or over limestone or chalk areas and calcium and magnesium ions dissolve into the water. The hardness is made up of two parts: temporary (carbonate) and permanent (non-carbonate) hardness. When water is boiled, calcium carbonate scale can form, which can deposit on things like kettle elements. The scale will not stick to kettles that have a plastic polypropylene lining but will float on the surface. The permanent hardness that comprises calcium and magnesium sulphate does not go on to form scale when heated or boiled.

How is water hardness measured?

Hardness is usually expressed in terms of the equivalent quantity of calcium carbonate (CaCO_3) in milligrams per litre or parts per million. You may also see hardness expressed as degrees of hardness in Clark (English) degrees, French or German degrees. Inter-conversion between the different measurements can be made by using the appropriate conversion factors below. There are no standard levels as to what constitutes a hard or a soft water. Table 1 gives an indication of the equivalents of calcium and calcium carbonate and the relative degree of hardness.

Water quality standards

There are no regulatory standards for water hardness in drinking water.

Water hardness in the North West

The majority of raw water in the United Utilities region comes from upland surface water reservoirs. The water in the reservoirs has little chance of passing through rocks and to dissolve the minerals that make water hard. Therefore, the

majority of water in this region is soft or very soft. We supply water from a number of boreholes in the south of the region that are reasonably hard, but these tend to be blended with softer sources to meet demand. No water supply in the North West is artificially softened.

Can hard water be softened?

Yes, water can be softened artificially by the installation of a water softener or the use of 'jug type' filters. Medical experts recommend that a non-softened supply is maintained for drinking purposes because softened water may contain high levels of sodium. Softeners should be fitted after the drinking water tap and comply with the requirements of the Water Supply (Water Fittings) Regulations 1999. They should be maintained in accordance with manufacturers' instructions.

If you're interested in finding out more about the quality of your drinking water, please visit www.unitedutilities.com/waterquality and enter your postcode.

The Drinking Water Inspectorate is responsible for ensuring the quality of public water supplies. Visit their website at: www.dwi.defra.gov.uk.

Question 3.6

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

Answer

Records indicate that the property is not served by a water meter.

Guidance

Where the property is not served by a meter and the customer wishes to consider this method of charging they should contact:

United Utilities Water Limited, PO Box 246, Warrington, WA55 1EA, Tel: 0345 672 2888, Internet; <https://www.unitedutilities.com/services/all-about-water-meters/>.

Question 4.1s

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

Answer

United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Guidance

Not applicable

Question 4.1w

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

Answer

United Utilities Water Limited, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Guidance

For further information regarding the Water undertaker please see below contact details

Question 4.2

Who bills the property for sewerage services?

Answer

The property is not billed for sewerage services.

Guidance

Notification of the change of occupancy on completion of sale should be made to this address.

Question 4.3

Who bills the property for water services?

Answer

The property is not billed for water services.

Guidance

Notification of the change of occupancy on completion of sale should be made to this address.

Question 4.4**What is the current basis for charging for sewerage and/or water services at the property?****Answer****Records indicate that this enquiry relates to a plot of land or a recently built property.****Guidance**

Properties built before April 1990 are charged using the rateable value of the property.

Rateable values were set by the valuation office agency and are not the same as the council tax banding for the property. In 1990 the valuation office stopped setting rateable values and water companies are not allowed to change them or use the council tax banding as a basis for charging for water. Therefore all new properties built after 1990 are fitted with a water meter and bills are based on the amount of water used and recorded by the meter.

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

Occupiers of properties charged using the rateable value of the property can opt to have a meter fitted. If they do, they have 24 months to decide if they want to stay on metered charges or go back to being charged on rateable value.

If they decide to go back to charges based on rateable value, the meter is left in place and any new occupier is charged using the meter, the new occupier cannot revert to rateable value charges.

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 undertaker.

Details are available from the office of water services (OFWAT) web Site: www.ofwat.gov.uk.

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?****Answer****The basis for the charges will change and will be based on a metered supply****Guidance**

Properties built before April 1990 are charged using the rateable value of the property.

Rateable values were set by the valuation office and are not the same as the council tax banding for the property.

In 1990 the valuation office stopped setting rateable values and water companies are not allowed to change them or use the council tax banding as a basis for charging for water. Therefore all new properties built after 1990 are fitted with a water meter and bills are based on the amount of water used and recorded by the meter.

If the property does not have a rateable value and we have been unable to fit a meter at the property charges will be based on an assessed charge.

Assessed charges are usually based on the type of property, for example terraced, semi-detached or number of occupiers.

Assessed charges and the single occupier tariff will be reassessed on change of occupancy because there may have been changes to pipework configuration or metering technology since the property was last surveyed which may mean that we are now able to fit a meter. Contact United Utilities on 0345 672 2888 to understand your basis for charging.

Occupiers of properties charged using the rateable value of the property can opt to have a meter fitted. If they do, they have 24 months to decide if they want to stay on metered charges or go back to being charged on rateable value.

If they decide to go back to charges based on rateable value, the meter is left in place and any new occupier is charged using the meter, the new occupier cannot revert to rateable value charges.

The water undertaker may also install a meter at the premises where a buyer makes a change of use of the property or where the buyer uses water for:

- Watering a garden using an unattended device (e.g. sprinkler);

- Filling a pond or swimming pool (over 10,000 litres) automatically ;
- A bath of capacity over 230 litres (measured to centre-line of overflow);
- A shower of type specified in paragraph 4(c) of the table in regulation 5 of the water fittings
- A unit which incorporates reverse osmosis

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

Appendix 1- General interpretation

1. (1) In this Schedule-

"the 1991 Act" means the Water Industry Act 1991(a);

"the 2000 Regulations" means the Water Supply (Water Quality) Regulations 2000(b);

"the 2001 Regulations" means the Water Supply (Water Quality) Regulations 2001(c);

"adoption agreement" means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act (d);

"bond" means a surety granted by a developer who is a party to an adoption agreement;

"bond waiver" means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;

"calendar year" means the twelve months ending with 31st December;

"discharge pipe" means a pipe from 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 any buildings or yards appurtenant to buildings within the same curtilage;

"effluent" means any liquid, including particles of matter and other substances in suspension in the liquid;

"financial year" means the twelve months ending with 31st March;

"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 (e);

"licensed water supplier" means a company which is the holder for the time being of a water supply licence under Section 17A(1) of the 1991 Act(f);

"maintenance period" means the period so specified in an adoption agreement as a period of time-

- (a) from the date of issue of a certificate by a Sewerage Undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker's satisfaction; and
- (b) until the date that private sewer or lateral drain is vested in the Sewerage Undertaker;

"map of waterworks" means the map made available under Section 198(3) of the 1991 Act (g) 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(h), 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(i);
- (b) by virtue of a scheme under Schedule 2 to the 1991 Act (j);

(c) under Section 179 of the 1991 Act (k); or

(d) otherwise;

"public sewer map" means the map made available under Section 199(5) of the 1991 Act (l);

"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" 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; and

"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.

(2) In this Schedule, 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.

- (a) 1991 c. 56.
- (b) S.I. 2000/3184. These Regulations apply in relation to England.
- (c) S.I. 2001/3911. These Regulations apply in relation to Wales.
- (d) Section 51A was inserted by Section 92(2) of the Water Act 2003 (c. 37). Section 104(1) was amended by Section 96(4) of that Act.
- (e) Various amendments have been made to Sections 102 and 104 by Section 96 of the Water Act 2003.
- (f) Inserted by Section 56 of and Schedule 4 to the Water Act 2003.
- (g) Subsection (1A) was inserted by Section 92(5) of the Water Act 2003.
- (h) Section 106(1A) was inserted by Section 99 of the Water Act 2003.
- (i) 1989 c. 15.
- (j) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
- (k) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
- (l) Section 199 was amended by Section 97(1) and (8) of the Water Act 2003.

Appendix 2 - DRAINAGE AND WATER ENQUIRY (DOMESTIC) AGREEMENT

The Customer and the Client are asked to note the provisions of this Agreement, which govern the basis on which this drainage and water report is supplied.

Definitions

'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property (including, where relevant, their mortgage lender).

'Company' means United Utilities Water Limited who produce the Report; its registered office being at Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington WA5 3LP, company number 2366678.

'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.

'Order' means any request completed by the Customer requesting the Report.

'Property' means the address or location supplied by the Customer in the Order.

'Report' means the drainage and water report prepared by the Company in respect of the Property.

Agreement

1.1 The Company agrees to supply the Report to the Customer and the Client subject to this Agreement. The scope and limitations of the Report are described in clauses 2 and 3 of this Agreement. Where the Customer is acting as an agent for the Client the Customer shall be responsible for bringing this Agreement (including, without limitation, any limitations and exclusions contained in it) to the attention of the Client and ensuring their acceptance of it pursuant to clause 1.2.

1.2 The Customer and the Client agree that the placing of an Order for a Report and the subsequent provision of a copy of the Report to the Customer and/or the Client indicates their acceptance of this Agreement and the Company shall be entitled to rely on this notwithstanding the Customer's failure to comply with clause 1.1.

1.3 The Company's cancellation policy in relation to an Order shall form part of this Agreement and is detailed at <https://propertysearches.unitedutilities.com/cancellation/>

Report

2.1 Whilst the Company will use reasonable care and skill in producing the Report, it is provided to the Customer and the Client on the basis that they acknowledge and agree to the following:-

2.2 The information contained in the Report can change on a regular basis so the Company cannot be responsible to the Customer and/or the Client for any change in the information contained in the Report after the date on which the Report was produced.

2.3 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

2.4 The information contained in the Report is based upon the accuracy, completeness and legibility of the address, drawn boundaries and/or plans supplied by the Customer in the Order.

2.5 The Report provides information as to the indicative location and connection status of existing services and other information in relation to drainage and water enquiries and should not be used or relied on for any other purpose. The Report may contain opinions or general advice to the Customer and the Client. The Company, subject to clauses 3.4 and 3.7 and without prejudice to the other provisions of this Agreement, accepts no liability in relation to any such opinion or general advice unless and only to the extent that such liability arises as a direct result of the Company's negligence (if relevant).

2.6 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made at the Property and/or in the vicinity of the Company's apparatus and, subject to clause 3.7, the Company accepts no liability in relation to any such reliance.

2.7 In providing the Report the Company will comply with the Drainage & Water Searches Network (DWSN) Standards.

Liability

3.1 The Company shall not be liable to the Customer and/or the Client for any failure defect or non-performance of its obligations arising from any failure to provide or delay in providing the Report to the extent that such failure or delay is due to an event or circumstance beyond the reasonable control of the Company including but not limited to any delay, failure of or defect in any machine, processing system or transmission link or any failure or default of a supplier or sub-contractor of the Company or any provider of any third party information except to the extent that such failure or delay is caused by the negligence of the Company.

3.2 Where a Report is requested for an address falling within a geographical area where two different entities separately provide Water and Sewerage Services, then any liability imposed on the Company pursuant to this Agreement for information contained in the Report which has been provided by the other entity shall be subject to the provisions of this Agreement and shall, without prejudice to the other provisions of this Agreement (including without limitation clauses 3.3 to 3.7), not exceed the liability that would have been imposed on the other entity had it supplied that information directly to the Customer.

3.3 The Report is produced only for use in relation to individual domestic property transactions which require the provision of drainage and water information and cannot be used for non-residential properties, commercial development of residential properties or any property used solely for carrying on a trade or business. Subject to clauses 3.4 to 3.7, the Company's entire liability to the Client howsoever arising under or in connection with the Report and/or this Agreement and whether in contract, negligence or any other tort or for breach of statutory duty or otherwise shall not exceed £10,000,000 (ten million pounds). The Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to the Client for any indirect or consequential loss or damage whatsoever caused and howsoever arising under or in connection with the Report and/or this Agreement

3.4 The plans attached to the report are provided pursuant to the Company's statutory duty to make such plans available for inspection. Without prejudice to the preceding part of this clause, the 1991 Act and clauses 3.3 and 3.5 to 3.7, any disclaimer contained on such plans shall not entitle, or be used by, the Company to exclude liability for its negligence (if relevant) in relation to the information contained in those plans save that, for the avoidance of doubt, nothing in this clause 3.4 shall be interpreted as, or deemed to be, in any way an acknowledgement or acceptance by the Company that a common law duty of care exists between the Company, the Customer and/or the Client in relation to those plans (including, without limitation, the provision of such plans and the information contained within them) and/or any other information contained in the Report.

3.5 Subject to clause 3.7, the Company's entire liability to the Customer howsoever arising under or in connection with this Agreement and whether in contract, negligence or any other tort or for breach of statutory duty or otherwise shall not exceed £5,000 (five thousand pounds) and the Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to the Customer for any indirect or consequential loss or damage whatsoever caused and howsoever arising under or in connection with this Agreement .

3.6 The Customer and the Client shall ensure that the Report is not accessed by, made available to, used by and/or relied on (in whole or in part) in any way by any other third party, and, subject to clause 3.7, the Company shall not in any circumstances (whether for breach of contract, negligence or any other tort, under statute or statutory duty, restitution or otherwise at all) be liable to any third party for any loss (whether direct, indirect or consequential loss (all three of which terms include without limitation, pure economic loss, loss of profit, loss of business depletion of goodwill and like loss)) or damage whatsoever caused and howsoever arising under or in connection with this Agreement and/or the Report and/or any use of or reliance placed upon the Report.

3.7 Nothing in this Agreement shall exclude the Company's liability for death or personal injury arising from its negligence or for fraud or any other matter to the extent that such liability cannot be excluded or limited by law.

Copyright and Confidentiality

4.1 The Customer and the Client acknowledge that the Report is confidential and is intended for the personal use of the Client only and shall not be used (in whole or in part) for any commercial gain in any circumstances. The Customer and the Client shall ensure that the Report is not accessed by, made available to, used by and/or relied on (in whole or in part) in any way by any other third party. The copyright and any other intellectual property rights in the Report shall remain the property of the Company and its licensors. No intellectual or other property rights are transferred or licensed to the Customer or the Client except to the extent expressly provided herein.

4.2 The Customer or the Client is entitled to make copies of the Report but may only copy Ordnance Survey mapping or data contained in or attached to the Report, if they have an appropriate licence from the originating source of that mapping or data

4.3 The Customer and, the Client agree (in respect of both the original and any copies made) to respect and not to alter any part of the Report including but not limited to altering, removing or obscuring the trademark, logo, copyright notice or other property marking which appears on the Report.

4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.5 The enquiries contained in the Report are protected by copyright by the Law Society of 113 Chancery Lane, London, WC2A 1PL and must not be used for any purpose outside the context of the Report

4.6 The Customer and the Client agree to indemnify the Company against any losses, costs, claims and damage suffered by the Company as a result of any breach by either of them of the provisions of clauses 4.1 to 4.5 inclusive.

Payment

5.1 Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay the price of the Report specified by the Company, without any set off, deduction or counterclaim.

5.2 Payment must be received in advance unless an account has been set up with the Company. In these cases, payment terms will be as agreed with the Company, but in any event any invoice must be paid within 30 days of the date of its issue.

5.3 The Company reserves the right to increase fees on reasonable prior written notice at any time.

Data Protection

6.1 We will process any personal data you provide to us in accordance with applicable data protection laws and our Data Protection and Privacy Notice (<https://www.unitedutilities.com/privacy/>). In addition we will use your personal data to manage and administer the provision of the Report under this Agreement and to develop and improve the business and services we provide to our customers. We may also disclose it to other companies in the United Utilities group (being United Utilities Water Limited, its holding companies (and their subsidiary companies) and its subsidiary companies) and their sub-contractors in connection with those purposes, but it will not be processed for other purposes or disclosed to other third parties without your express permission or without lawful purpose under data protection law.

General

7.1 If any provision of this Agreement is or becomes invalid or unenforceable, it will be taken to be removed from the rest of this Agreement to the extent that it is invalid or unenforceable. No other provision of this Agreement shall be affected.

7.2 This Agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

7.3 Nothing in this Agreement and conditions shall in any way restrict the Company's or the Customer's or the Client's statutory or any other rights in relation to the provision of and/or access to the information contained in the Report.

7.4 This Agreement and conditions may be enforced by the Customer and the Client but not by any other third party.

7.5 Before you agree to this Agreement, please note that where you are the Customer it is your responsibility to ensure your client/customer is aware of them and that any objections are raised accordingly.

Property Searches complaints procedure

In the event of any queries relating to this Report please e-mail, write or phone our customer team quoting the United Utilities reference detailed on the Report, We will endeavor to resolve any telephone contact or complaint at the time of the call.

Whilst we always try to resolve all complaints straight away, if this is not possible and you are not happy with the course of action taken by us you can ask us to escalate the issues internally via the complaints process detailed below.

We will listen to your complaint and do our best to deal with it immediately.

If we fail to give you a written substantive response within 5 working days the Company will compensate the Customer or the Client (as applicable) the amount of the original fee paid to the Company for the Report, regardless of the outcome of your complaint.

If it is a complex issue requiring more time, we will still get back to you within 5 working days and notify you of progress and update you with the new timescales.

If we consider your complaint to be justified or we have made any errors that substantially change the outcome of the search we will:

- Refund your Report fee
- Provide you with a revised Report (if requested)
- Take the necessary action within our power to put things right which may (where appropriate) include, at our complete discretion, financial compensation or the relocation/removal/installation of our affected water or sewerage assets.
- Keep you informed of any action required

If your complaint has gone through our full internal complaints procedure and you are not satisfied with the response or you believe that we have failed to comply with our internal complaints procedure you may be able to refer your complaint for consideration under The Property Ombudsman Scheme (TPOs). You can obtain further information by visiting www.tpos.co.uk or email admin@tpos.co.uk

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.

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 up to £5,000 to you if the Ombudsman 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
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

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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/>