SUDS REPORT FOR 98 CONISBORO AVENUE, CAVERSHAM, READING, RG4 7JF

DOCUMENT NUMBER.: C3757-R1-REV-A

PREPARED BY

Nimbus
ENGINEERING CONSULTANTS

Contents

1. INTRODUCTION 3
   1.1 Appointment 3
   1.2 Objectives 3
   1.3 Limitations 4
2. GEOLOGY OF THE AREA 5
3. SUSTAINABLE URBAN DRAINAGE SYSTEMS 7
4. PROPOSED SOLUTION 11
5. TIMESCALE AND MAINTENANCE OF WORKS 12
6. CONCLUSIONS 17

APPENDICES

APPENDIX A – DRAWINGS

APPENDIX B – BRE365 INFILTRATION TEST REPORT

APPENDIX C – AVIRON GEOTECHNICAL REPORT & SOAKAGE RESULTS

APPENDIX D – SURFACE WATER RUN OFF CALCULATIONS

APPENDIX E – WATER AUTHORITY ASSET PLANS

1. INTRODUCTION

1.1 Appointment

Nimbus Engineering have been appointed to provide an outline solution on the management of Surface Water run-off and to ensure that there is no risk of flooding caused by the proposed development of a chalet bungalow. Pre and post development plans can be seen within Appendix A of this report.

1.2 Objectives

This report will provide information on a suitable Sustainable Urban Drainage System (SuDS) in order to reduce the surface water run off leaving the site and show that the proposed development will not increase Flood Risk at the site or elsewhere.

1.3 Limitations

The general limitations of this report are:

- A number of data and information sources have been used to prepare this report. Whilst Nimbus Engineering believes them to be trustworthy, Nimbus Engineering is unable to guarantee the accuracy of data and information that has been provided by others;

- This report has been prepared using the best data and information that was available at the time of writing. There is the potential for further information or data to become available, leading to changes in the conclusions drawn by this report, for which Nimbus Engineering cannot be held responsible.

2. GEOLOGY OF THE AREA

According to the British Geological Survey, the superficial deposits at the site is of the Black Park Gravel Member, consisting of Sand and Gravel, as shown in Figure 1, below. The bedrock in the area part of the Seaford Chalk Formation, as shown in Figure 2, below.

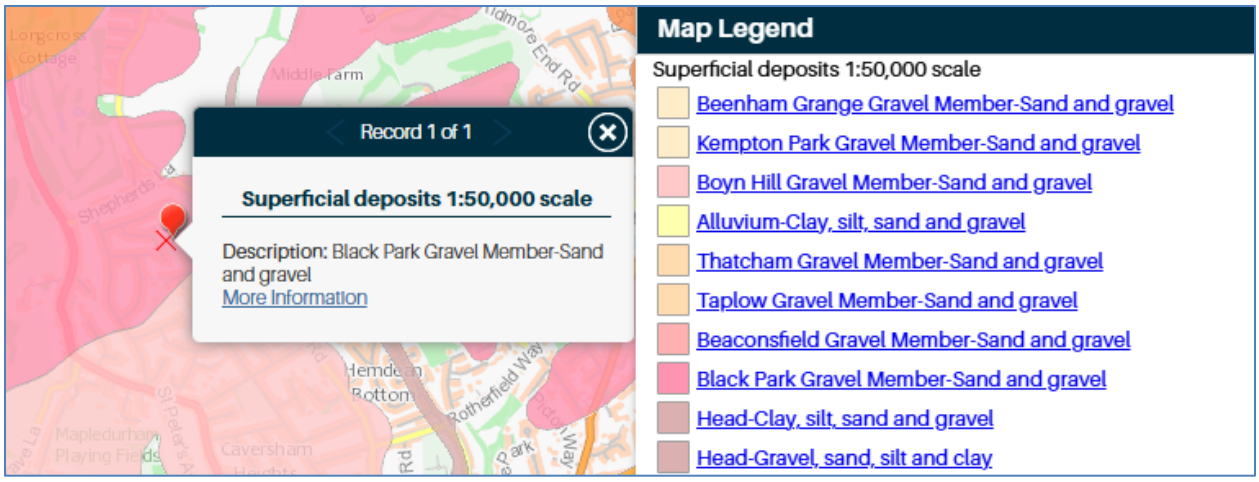


Figure 1- Superficial Deposits at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2026]. Base mapping is provided by ESRI)).

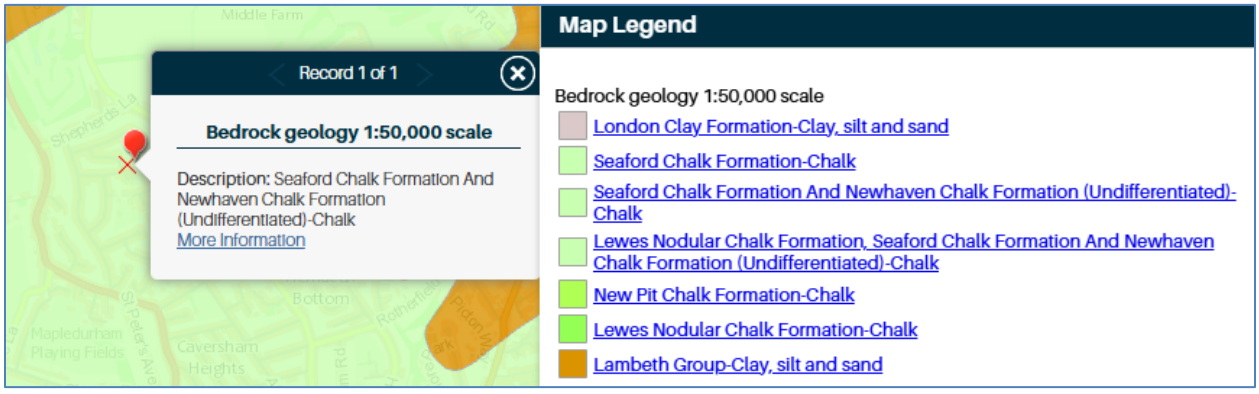


Figure 2 – Bedrock at the site. (Source: British Geological Society Website (Contains British Geological Survey materials © URKI [2026]. Base mapping is provided by ESRI)).

As the underlying geology consists of chalk, a BRE365 infiltration test was carried out at the site, which can be seen in its entirety within Appendix B, which shows that infiltration in a shallow soakaway would not be feasible at the site. Therefore, the client has undertaken a Cable Percussive Borehole and Soil Soakage Testing, showing that deeper infiltration strategies would be feasible. The results of this can also be found in Appendix C of this report.

3. SUSTAINABLE URBAN DRAINAGE SYSTEMS

The total site area for this proposed development equates to 1000m^2, the existing site is mostly greenfield with only 39m^2 of existing impermeable area. Following the proposed development, the impermeable areas at the site will have increased to 322m^2, consisting of the proposed roof extents and any additional hardstanding areas.

Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Reducing the rate of surface water discharge from urban sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.

- Reduction in groundwater levels and dry weather flows in watercourses.

- Reduce amenity and adversely affect biodiversity due to the surface water run-off containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures designed to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the natural landscape of an area which as well as slowing down the rate of runoff provides a number of environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality. As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through fine soils and the roots of specially selected plants. Pollutants washed off the hard landscaping by rainfall will be safely removed before the water reaches the natural receiving water course.

- A sympathetic approach to the environmental setting by providing opportunities to create habitats for flora and fauna in urban watercourses and open spaces.

- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	

Preferably a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders, such as developers, architects, landscape architects and engineers to work in order to determine a feasible solution.

4. PROPOSED SOLUTION

In order to ensure that the SuDS management train is followed, two wall mounted rainwater harvesting tank will be provided.

Additionally, all new hardstanding areas will be formed of porous surfacing, such as permeable paving and gravel surfacing on the terrace and access roads.

Although the BRE365 infiltration test showed that shallow infiltration strategies would be unfeasible, the falling head permeability tests provided in Appendix B, show that infiltration via a deep bore soakaway is possible at this site. Therefore, the proposed solution will include a below ground, crate-style attenuation tank, collecting the runoff from the proposed development, before discharging at a restricted rate to a deep bore soakaway, ensuring that no surface water runoff will leave this site.

We can confirm that there is enough available space at the site for this attenuation and the deep borehole soakaway, as can be seen in the plans provided within Appendix A. All surface water runoff calculations showing the pre and post development runoff rates, prior to the proposed SuDS Strategy, can be seen within Appendix B. During the subsequent design stages of the development, hydraulic modelling will be completed to determine the net storage volume required to be able to ensure no flooding occurs for a 1 in 100 year +45% climate change event.

5. TIMESCALE AND MAINTENANCE OF WORKS

All drainage works will be completed prior to first occupation and there will be no adoption of any of the drainage works within the site, the homeowner will be responsible in overseeing the long-term maintenance of all the SuDS system.

- Gullies should be cleaned every 3 months in order to ensure that there are no blockages.

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months.

- Any flow control device should be checked every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.

- The catchpit chamber and flow control to the attenuation tank should be checked and cleaned every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.

Maintenance schedule	Required action	Typical Frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table 1: Operation and maintenance requirement for RWH systems.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface	Once a year, after autumn leaf fall, or reduced frequency as required, based on sire-specific observations of clogging or manufacturers recommendations - pay particular attention to areas where water run onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an application rather than spraying	As required- once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, had been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 2: Operation and maintenance requirements for pervious pavements.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that re not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 3: Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect from surface and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then 6 monthly intervals
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Orifice plates within plastic chambers or vortex controls to be jetted from the surface after heavy rainfall events to remove any debris or silt	As required
	Empty catchpits upstream of SuDS features to ensure no debris is passed downstream	3 months or as required
Remedial actions*	In the event of a blockage, a vortex flow control can be removed from the chamber via the lifting cabled located at the access, this will be cleaned at surface level and reinstalled into its original location	As required
	In the event of a blockage, the orifice plate should be jetted from surface, and if blockage is not cleared the orifice plate can be removed by removing fixing bolts. These fixing bolts should be checked and replaced if needed.	As required
Monitoring	Following installation it is important that any extraneous materials i.e. building materials: granular backfill, in-situ pour concrete etc are removed from the unit and the new flow control chamber is fully jetted down	Upon installation
	Inspect/check chamber channel for any debris or silt build-up. Upstream chambers should be checked at the same time as these monitoring works to ensure network is operating at full capacity.	Annually

Table 4: Operation and maintenance requirements for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no access to chambers or removal of parts to be undertaken by homeowners

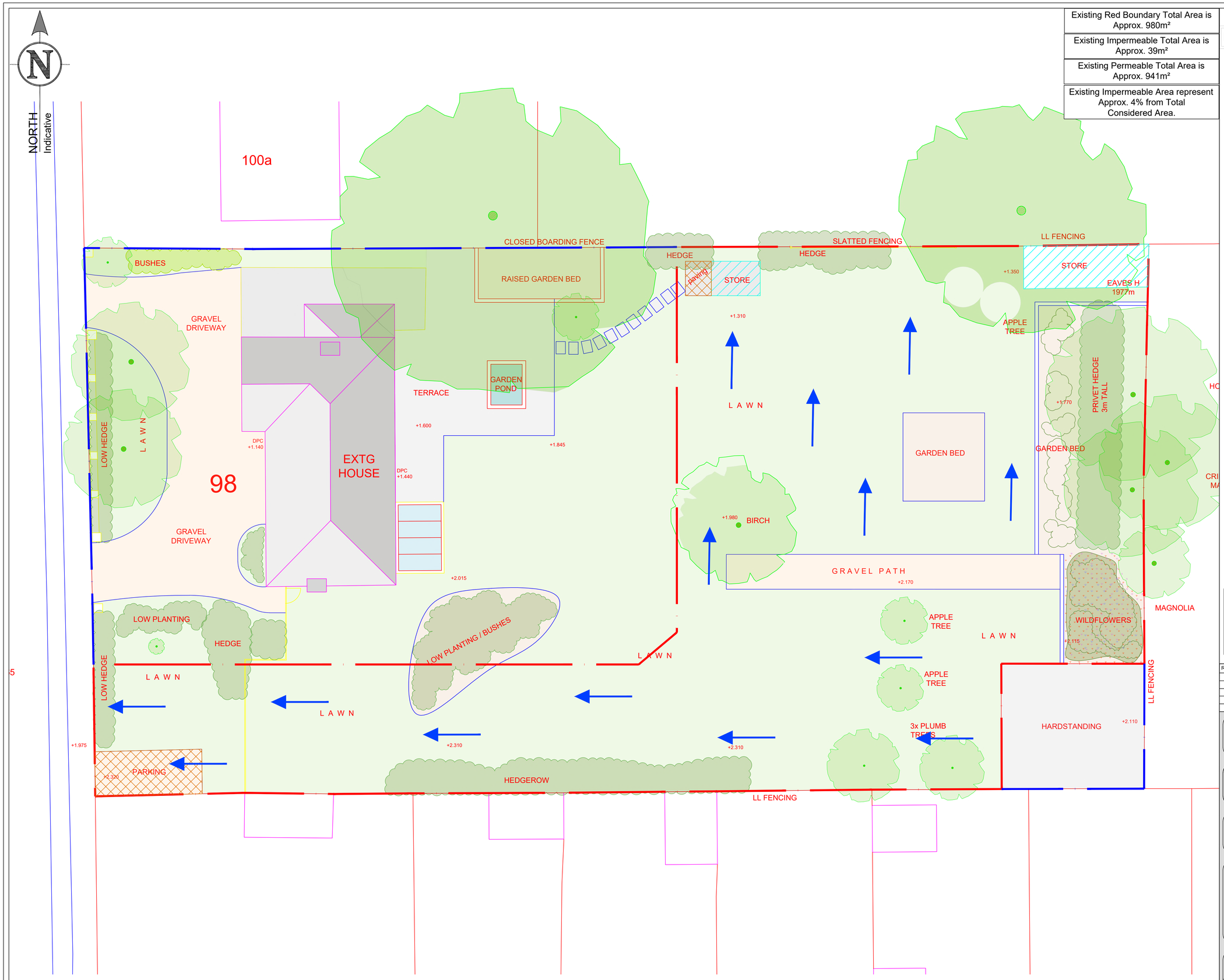
If upstream network of flow control chamber is regularly maintained, little maintenance is required within the chamber as there are no moving parts

6. CONCLUSIONS

The purpose of this report and associated drawings, is to satisfy the local planning authority that the surface water runoff from the proposed development is dealt with through Sustainable Urban Drainage Systems.

A suitable Sustainable Urban Drainage systems solution has been proposed, which follows the SuDS hierarchy. All components of the SuDS management train have been considered and utilised and this proposed development will ensure that no surface water runoff will be leaving the site and therefore reduce flood risk at the site and elsewhere.

APPENDIX A – DRAWINGS



Existing Red Boundary Total Area is Approx. 980m²
Existing Impermeable Total Area is Approx. 39m²
Existing Permeable Total Area is Approx. 941m²
Existing Impermeable Area represent Approx. 4% from Total Considered Area.

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Existing Roof Area
- Existing Hardstanding Area
- Proposed Site Boundary
- Additional Site Ownership
- Exceedance Route Arrow

NOT FOR CONSTRUCTION

IMPORTANT

DRAWING MUST BE PRINTED IN COLOUR.
NO DEVIATION MAY BE MADE FROM THE CONTENTS OF THIS DRAWING WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
THIS DRAWING IS TO BE REMOVED FROM CURRENCY IMMEDIATELY AFTER A REVISED EDITION HAS BEEN ISSUED.
ALL RIGHTS DESCRIBED IN CHAPTER IV OF THE COPYRIGHT DESIGN ACTS 1988 HAVE BEEN GENERALLY ASSERTED.

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	08-04-26	L.B	For Information.	S.L	S.L

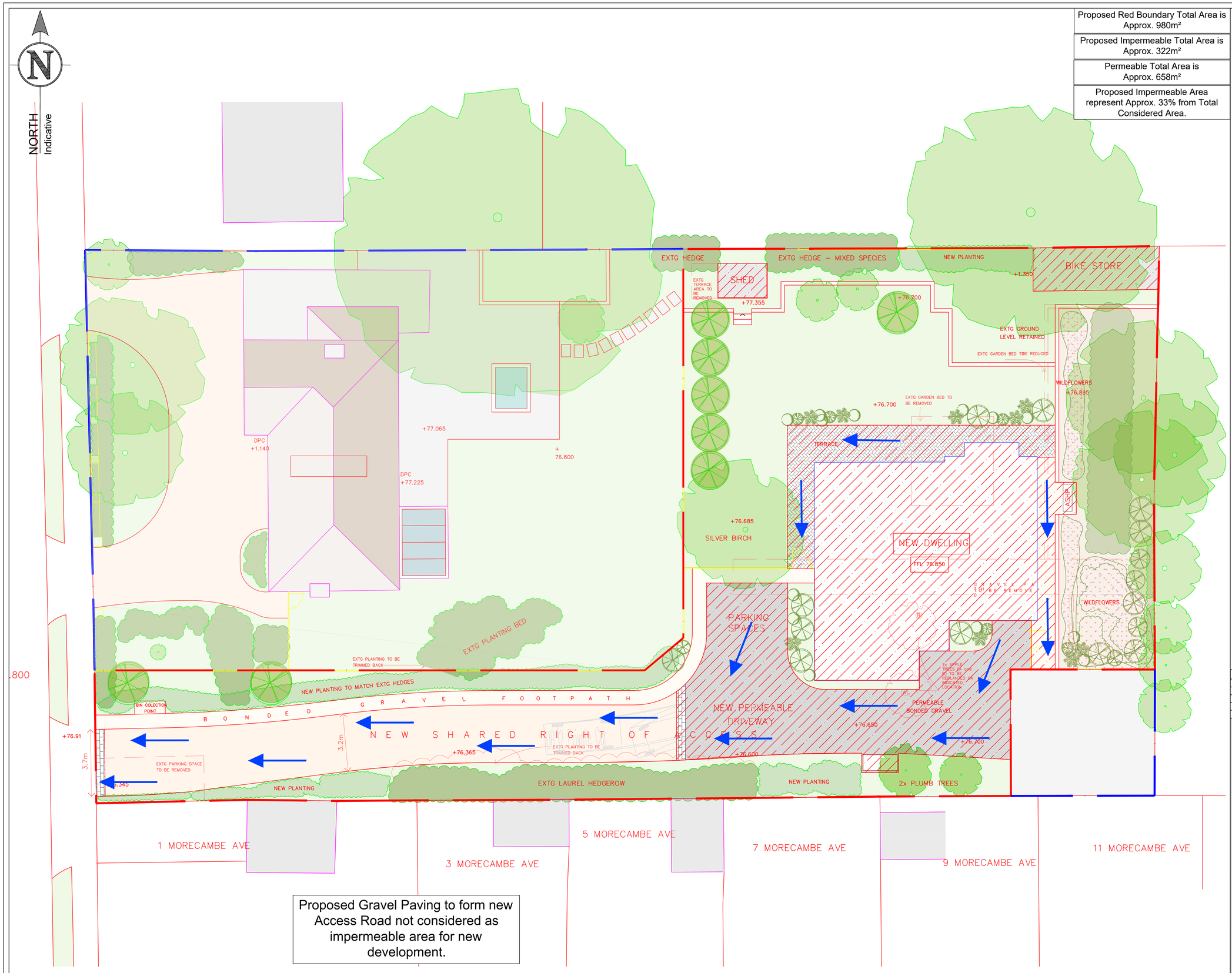
98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Pre Development Impermeable Areas Exeedence Route Plan

STL Architecture

Nimbus ENGINEERING CONSULTANTS

S.L	08-04-26	S.L	08-04-26
L.B	1:100	C3757-01	A
08-04-26	A1		



Proposed Gravel Paving to form new Access Road not considered as impermeable area for new development.

Proposed Red Boundary Total Area is Approx. 980m²
Proposed Impermeable Total Area is Approx. 322m²
Permeable Total Area is Approx. 658m²
Proposed Impermeable Area represent Approx. 33% from Total Considered Area.

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Roof & Hardstanding Areas
- Proposed Site Boundary
- Additional Site Ownership
- Exceedance Route Arrow

NOT FOR CONSTRUCTION

IMPORTANT

DRAWING MUST BE PRINTED IN COLOUR.
NO DEVIATION MAY BE MADE FROM THE CONTENTS OF THIS DRAWING WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
THIS DRAWING IS TO BE REMOVED FROM CURRENCY IMMEDIATELY AFTER A REVISED EDITION HAS BEEN ISSUED.
ALL RIGHTS DESCRIBED IN CHAPTER IV OF THE COPYRIGHT DESIGN ACTS 1988 HAVE BEEN GENERALLY ASSERTED.

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	08-04-26	L.B	For Information.	S.L	S.L

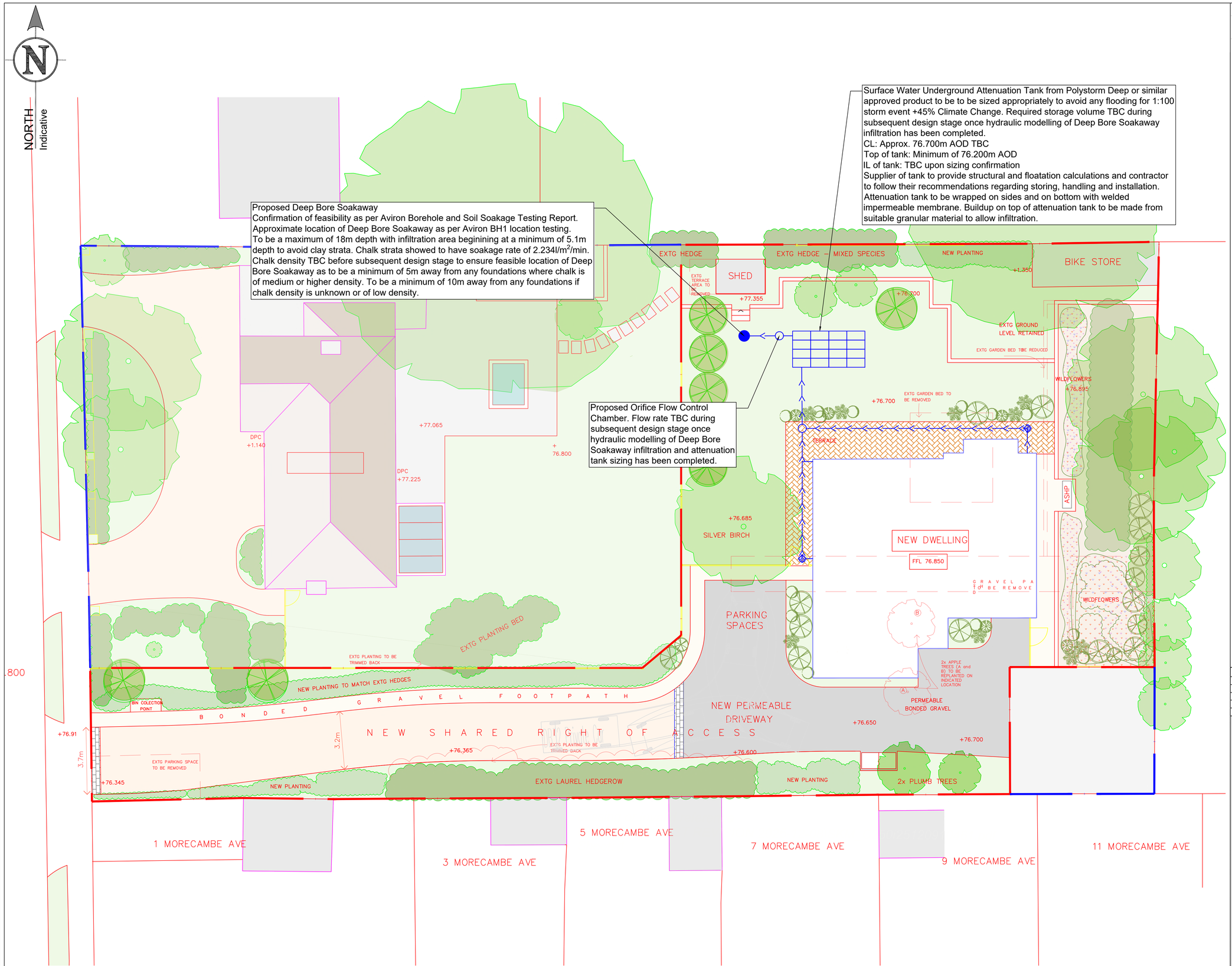
98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Post Development Impermeable Areas Exeedence Route Plan

STL Architecture

Nimbus ENGINEERING CONSULTANTS

S.L	08-04-26	S.L	08-04-26
L.B	1:100	C3757-02	A
08-04-26	A1		



DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Permeable Paving
- Proposed Site Boundary
- SW Inspection / Catchpit Chambers
- Surface Water UPVC Pipes
- Proposed Deep Bore Soakaway
- Proposed Attenuation Tank

NOT FOR CONSTRUCTION

IMPORTANT

DRAWING MUST BE PRINTED IN COLOUR.
NO DEVIATION MAY BE MADE FROM THE CONTENTS OF THIS DRAWING WITHOUT PRIOR PERMISSION FROM THE ENGINEER.
THIS DRAWING IS TO BE REMOVED FROM CURRENCY IMMEDIATELY AFTER A REVISED EDITION HAS BEEN ISSUED.
ALL RIGHTS DESCRIBED IN CHAPTER IV OF THE COPYRIGHT DESIGN ACTS 1988 HAVE BEEN GENERALLY ASSERTED.

REV	DATE	DRAWN	DESCRIPTION	CHECK	APPR.
A	13-04-26	M.HAM	For Information.	S.L	S.L

98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Outline SuDS Layout & Location Plan

STL Architecture

Nimbus ENGINEERING CONSULTANTS

S.L	13-04-26	S.L	13-04-26
M.HAM	1:100	C3757-03	A
13-04-26	A1		

APPENDIX B – BRE365 INFILTRATION TEST REPORT

BRE365 PERCOLATION TEST REPORT

FOR

98 CONISBORO AVENUE, CAVERSHAM,

READING, RG4 7JF

DOCUMENT NUMBER: C3122-R2-REV-A

Prepared by:

Nimbus
ENGINEERING CONSULTANTS

Contents

1. INTRODUCTION 1
2. TRIAL PIT 1 2
   2.1 TEST ONE 3
   2.2 TEST TWO 3
   2.3 TEST THREE 3
   2.4 INFILTRATION RESULTS 3
3. CONCLUSION 5

APPENDICES

APPENDIX A – BRE365 PERCOLATION TEST RESULTS

1. INTRODUCTION

Nimbus Engineering Consultants Limited have been instructed to carry out a BRE365 Infiltration test, as requested by the Local Planning Authority for 98 Conisboro Avenue, Caversham, Reading, RG4 7JF.

The BRE365 Infiltration test was carried out on the 28th of October in a suitable location.

The test was carried out to the BRE365 Digest, in order to calculate the infiltration rate for the proposed site, to treat and deal with the surface water runoff produced by the proposed construction of a chalet bungalow.

2. TRIAL PIT 1

A test pit of dimensions, 500mm by 500mm by 1000mm deep was excavated in a suitable location.

The excavated ground was described as:

- Approximately 300mm of lawn sub soil (0 – 0.3m deep)
- Approximately 700mm of orange clay (0.3 – 1.0m deep)

2.1 TEST ONE

Water was added to the pit at a consistent rate and the following was measured:

- Water drained from the 100% full level to the 75% level in approximately 38 minutes.

The test was cancelled as the water level failed to drop below 35 % after 423 minutes.

2.2 TEST TWO

N/A

2.3 TEST THREE

N/A

2.4 INFILTRATION RESULTS

The infiltration rate was not calculated as the water did not drop below 35% after 423 minutes, therefore infiltration is deemed not feasible at this site.

Figure 1 – Trial Pit

3. CONCLUSION

A trial pit was excavated at dimensions of 0.5 metres x 0.5 metres x 1.0 metres.

The test sheet can be found in Appendix A, these results show that infiltration in a soakaway is not feasible onsite. The infiltration rate was not calculated as the water level did not drop below 35% after 423 minutes, therefore infiltration is deemed not feasible at this site.

APPENDIX A – BRE365 PERCOLATION TEST RESULTS

CHECK SHEET

1. Please specify the size of the soakaway that you are proposing to use:

   Width (m) **Length (m)** **Depth (m)**

2. Please specify the area that is to be drained to the soakaway

3. Please specify the size of the trial pit:

   Width (m) 0.5 Length (m) 0.5 Depth (m) 1

4. Please specify the proposed invert level of the drain:

5. Below is a table for you to input the data (times) gathered from the Soil Infiltration Rate tests:

Test Number	**75%**	**25%**	**25% - 75%**
1	38	Na	Na
2	Na	Na	Na
3	Na	Na	Na

*To be filled in when info arrives.

Key:

75%: The time taken in minutes for the water level to fall to 75% full.

25%: The time taken in minutes for the water level to fall to 25% full.

25% - 75%: The 25% time minus the 75% time. (This will give the time for the water level to fall from 75% full to 25% full).

Test was cancelled after 423 minutes as water level didn't drop below 35%.

Name: Adam Luckett

Signature

Date: 28.10.23

APPENDIX C – AVIRON GEOTECHNICAL REPORT & SOAKAGE RESULTS

REPORT ON CABLE PERCUSSIVE BOREHOLE AND SOIL SOAKAGE TESTING

Client	Mr and Mrs R Smith
Works	Drilling of 1no. Cable Percussive Borehole and Soil Soakage Testing
Site	98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Project	Version	Date
23-277.01	1 (final)	5 December 2023

1.0 INTRODUCTION

At the instruction of Mr and Mrs R Smith (the Client) Aviron Associates Limited (Aviron) was appointed to undertake ground investigation works to enable surface water drainage design and construction using a deep borehole soakaway.

It is understood that the Client previously completed shallow infiltration testing. The Client indicated that the soil infiltration tests resulted in insufficient infiltration to enable the construction and discharge of surface water using shallow soakaways. On the basis of insufficient infiltration at shallow depth, a deep borehole soakaway was proposed.

Table 1: The Site	
Site Location	The site is located towards the northern end of Conisboro Avenue and on the eastern side of the avenue in an elevated position within Caversham Heights. The site is located at approximately 77 metres (m) Above Ordnance Datum (AOD) by Newlyn. Enclosed within **Appendix I** is **Figure 1** which is presented as a Site Location Plan.
Current Land Use	The site is currently a detached family home with gravel drive to the front and large landscaped gardens to the rear. Enclosed within **Appendix I** is **Figure 2** which provides an Existing Site Layout Plan.
Surrounding Land Use	The site is surrounded by residential property to all compass directions, with Conisboro Avenue forming the western site boundary.
Proposed Land Use	It is proposed to construct a new home in the rear garden to the east of the existing home. Enclosed within **Appendix I** is **Figure 3** which provides a Proposed Development (and Borehole Location) Plan.

This report has been prepared to enable:

- Completion of a cable percussive borehole to evaluate ground conditions to enable the design and construction of a new borehole soakaway for surface water drainage.
- The installation of a borehole soakaway and soakage testing in general accordance with The Soakage Design Guide, Kent County Council, July 2000.

2.0 DESK BASED RESEARCH

The British Geological Survey (BGS) website has been consulted, and the listed geology is reported within table 1.

Table 2: Anticipated Geology	
Superficial Geology	**Black Park Gravel Member** *Typically, clayey Gravel.*
Solid Geology	**Seaford Chalk Formation and Newhaven Chalk Formation** *Typically, Chalk with flints.*
Aquifer Status	Principal (Chalk) aquifer. See note below, groundwater anticipated circa 40m below ground level (bgl)

A local borehole log has been accessed and viewed using the BGS website and is enclosed within **Appendix II**.

The borehole was drilled in a Grass Verge on Kidmore Road approximately 100m north-east of the site in 1937 by Allsebrook & Co. to a depth of >10.2m below ground level (bgl). The BGS ID is 427875 and BGS Reference is SU77NW66. A summary of ground conditions encountered within the BGS borehole is presented in table 3.

Table 3: Summary of Local 'BGS' BH Log			
Unit	**Description**	**From (bgl)**	**To (bgl)**
Made Ground	Made up ground	GL	0.9m
Black Park Gravel Member	Dirty Gravel	0.9m	1.7m
	Fairly large Gravel	1.7m	2.9m
	Small Gravel	2.9m	6.4m
	Clay loam	6.4m	7.6m
	Clay loam with small stones	7.6m	10.2m
Chalk Formations	Chalk	10.2m	Not specified
Groundwater	Groundwater was not encountered within the borehole.		
GL = Ground Level			

The site is located at approximately 77m AOD and the above BGS borehole was drilled at approximately 80m AOD at a northerly and uphill (upgradient) position to the site. The River Thames is located approximately 2 kilometres (km) to the south of the site at a level of 38.3m AOD on Bridge Street. The river level is below the level of Bridge Street and is expected to be in continuity with groundwater in the surrounding area, which is expected to flow towards the river. Taking this into account, groundwater is therefore not expected to be encountered beneath the subject site until a depth of circa 40m bgl.

3.0 BOREHOLE DRILLING

Aviron was appointed to drill and install one cable percussive borehole (DBSA1) to a depth of 20m bgl. It was proposed to drill the borehole at 200mm diameter and install the borehole with 140mm diameter liner pipe to construct a soakaway into the underlying Chalk.

Prior to drilling, the working area was cleared for underground services using a Cable Avoidance Tool (CAT) at the exploratory hole location illustrated in **Figures 3** which enclosed as **Appendix I**, which was positioned on-site by the Client.

The borehole was completed on 30 November 2023 and 1 December 2023 using a cut-down cable and percussion drilling rig at 200mm diameter to enable installation of 140mm (external diameter) soakaway installation liner pipe.

Table 4 provides the drilling and casing depths of the borehole.

Table 4: Drilling Summary				
Borehole	**Drilling diameter**	**Casing Depth**	**Open-hole Depth**	**Notes**
BH1	200mm	GL-8m	8-18m	Drilling ceased at 18m bgl on encountering a very dense band of Flint Gravel which began to jam the drilling tooling.

				At a depth of 18m bgl the underlying Chalk has been penetrated by 12.5m.

Detailed strata descriptions are presented on the **borehole log** which are presented in **Appendix II**.

Ground conditions are consistent with the British Geological Survey (BGS) records, with sub-cropping competent structured Chalk strata at 5.1m bgl in DBSA1, as summarised in Table 5.

Table 5: Summary of BH1 Ground Conditions			
Unit	**Description**	**From (bgl)**	**To (bgl)**
Topsoil	Dark brown, silty, slightly gravelly humic CLAY	GL	0.25m
Black Park Gravel Member	Soft, light brown, slightly gravelly CLAY. Gravel is fine to medium and sub-rounded flint	0.25m	1.3m
	Soft to firm, light brown, silty CLAY	1.3m	3.6m
	Soft to firm, light brown, very sandy CLAY	3.6m	4.4m
	Firm, brown CLAY	4.4m	5.1m
Chalk Formations	Cream, white structured CHALK with abundant fine to coarse, sub-angular flint Gravel and Cobbles.	5.1m	18m
Groundwater	Groundwater was not encountered to 18m		
GL = Ground Level			

4.0 BOREHOLE SOAKAWAY INSTALLATION

Critical to the installation of borehole soakaways is ensuring a sufficient width of annulus between the wall of the borehole and installation pipework to allow an effective pea shingle packing and bentonite seal. Completing the borehole at 200mm and installing at 140mm provides a 30mm annulus such that 10mm pea shingle can be effectively introduced. This ensures the borehole does not collapse on to the liner pipe.

Prior to installation of liner pipe 20mm shingle was poured into the base of the borehole to provide a vertical pathway for migration of water and a footing to place the liner pipe on. The borehole is installed with the perforated pipework with pea shingle packing below plain pipework with wetted bentonite granules to ground level to provide a surface seal. Generally, the perforated pipe is targeted to the competent and permeable Chalk strata and the plain pipe with a seal targeted to negligibly permeable Clay strata.

Installation details are provided on the borehole log which is enclosed within **Appendix II** and summarised in table 6.

Table 6: Installation Summary				
Borehole	**20mm gravel**	**Perorated Pipe and 10mm annulus**	**Plain Pipe and bentonite seal**	**Notes**
BH1	18-16.13m	16.13m-6m	6m-GL	Plain pipe installed to 6m to seal off CLAY and silty, fine inclusions.

Following installation, no groundwater was encountered within the borehole.

5.0 SOIL SOAKAGE TESTS – BH1

On 4 December 2023 BH1 was filled with 1,000 litres of drinking water standard water pumped from a road going water tanker to enable infiltration testing by means of falling head testing. The subsequent fall in water level was recorded against time over the period specified within the **results** which are presented in **Appendix III**.

Soakage testing was completed in accordance with The Soakage Design Guide, Kent County Council, July 2000.

The soil soakage rates, in litres per metre squared per minute ($l/m^2/min$) are summarised within table 6.0 below.

On each occasion 1,000 litres of water was pumped into the borehole taking 2 min 30 seconds (pumped at 6.6 l/s) to do so and generally raising a head of water to between 6.87m bgl and 8.5m bgl; taking account circa 10 seconds to withdraw the pumping hose from the borehole and send the dip-metre down the hole to take a T=0 water level measurement.

Table 7 provides soakage rates.

Table 6.0: Soil Soakage Rates – BH1				
Location (Test no.)	**Testing depths (m bgl)**	**Strata Tested**	**Soil Soakage Rate ($l/m^2/min$)**	**Comments**
BH1 (T1)	6.0-16.13	CHALK	2.239	
BH1 (T2)	6.0-16.13	CHALK	2.234	
BH1 (T3)	6.0-16.13	CHALK	2.234	

6.0 CONTROL OF DRAINAGE

CIRIA C574 indicates that 'soakaways should be sited well away from foundations for structures or roads', as shown below:

- In areas where dissolution features are known to be prevalent, soakaways should be avoided if at all possible but, if unavoidable, should be sited at least 20m away from any foundations.
- **Where the chalk is of low density, or its density is not known, soakaways should be sited at least 10m away from any foundations, provided areas of dissolution can be avoided.**
- Where the chalk is of medium density (or higher), the closest part of the soakaway should be at least 5m away from any foundations.

7.0 CONCLUSIONS

Our report should be passed to the appointed drainage consultant to enable drainage design in accordance with their requirements.

Project designers should also be presented with any previous ground investigation reports to enable an improved understanding of ground conditions.

We trust that you find the above to be satisfactory, however should you require any further information please do not hesitate to contact the undersigned.

Prepared by	Approved by
Orlando Blackwell BEng (Hons) MSc (Eng) **Principal Engineer**	**James Burkitt** BEng (Hons) CEnv MRICS **Managing Director**

APPENDIX I

Figure 1 – Site Location Plan

Figure 2 – Existing Site Layout Plan

Figure 3 – Proposed Development and Borehole Location Plan

Legend

Site Boundary

Notes

Drawing prepared by STL

Figure 1

Drawing Title

Site Location Plan

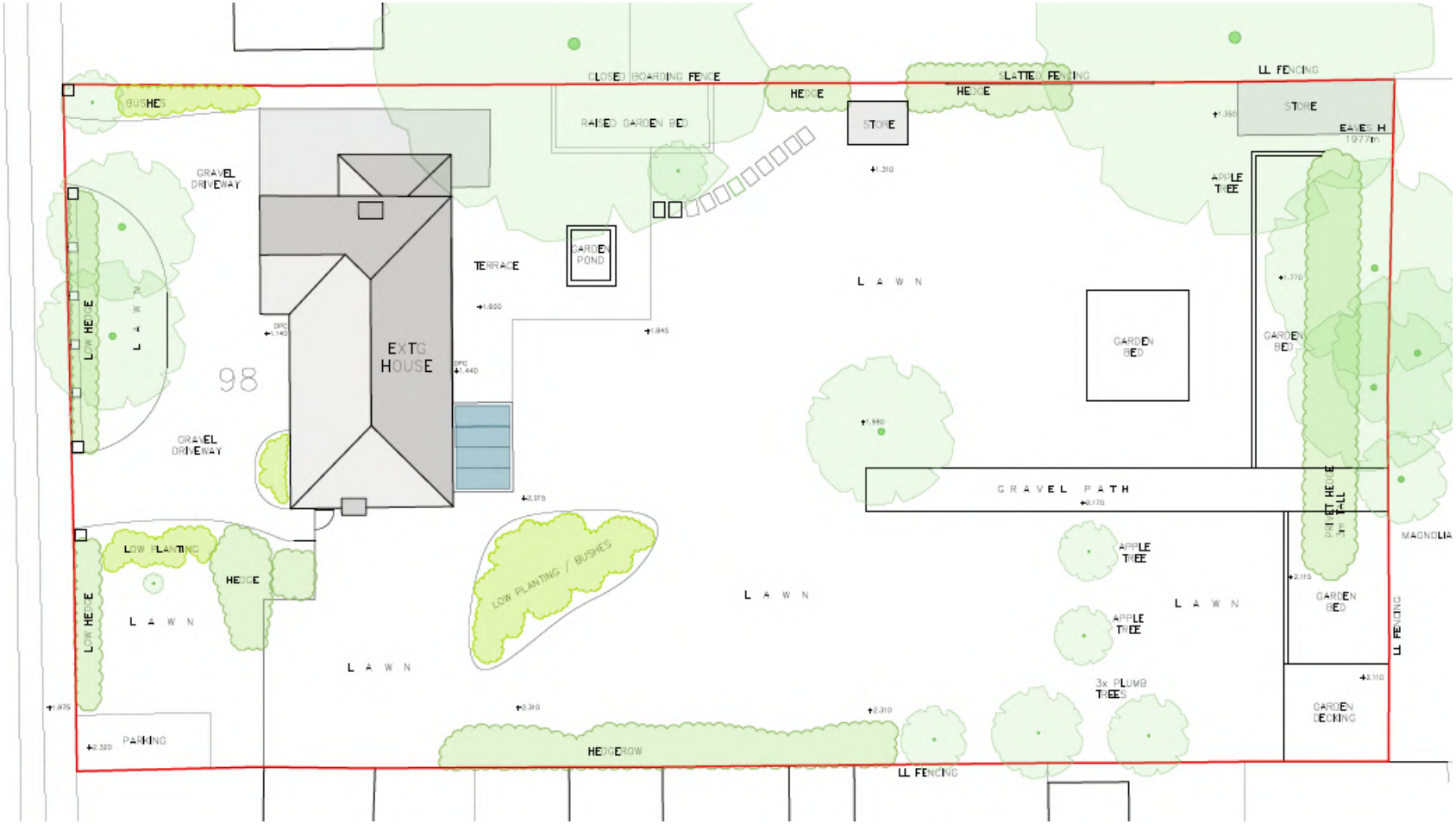
Project Number	23-277.01

Project Title

98 Conisboro Ave, Caversham, RG4 9BE

Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk



Legend

Site Boundary

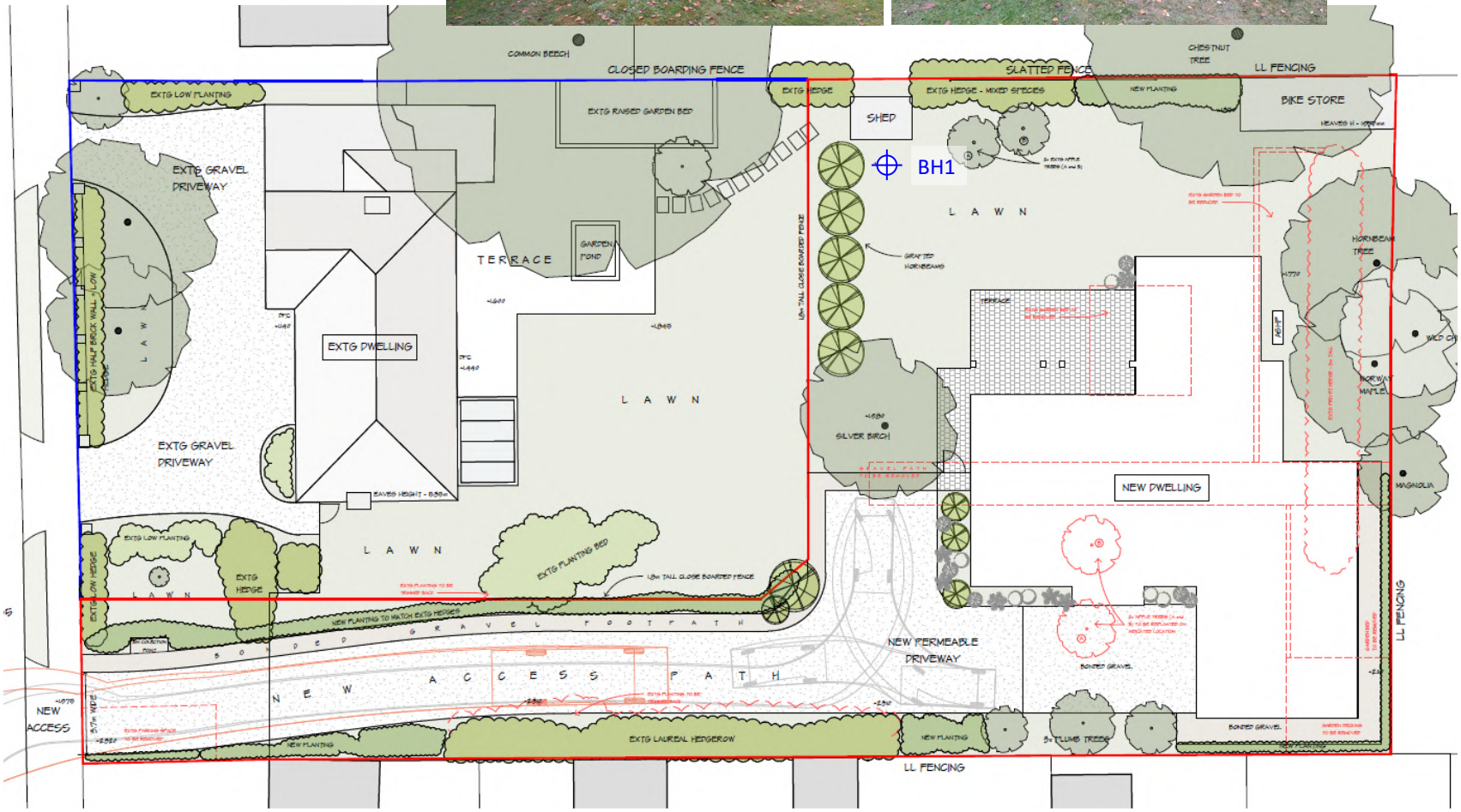
Notes

Drawing prepared by STL

Figure 2

Drawing Title	Existing Site Layout Plan
Project Number	23-277.01
Project Title	98 Conisboro Ave, Caversham, RG4 9BE
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk



Legend

Site Boundary

Borehole Location

Notes

Drawing prepared by STL

Figure 3

Drawing Title	Proposed Development and Borehole Location Plan
Project Number	23-277.01
Project Title	98 Conisboro Ave, Caversham, RG4 9BE
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk

APPENDIX II
BGS and BH1 Borehole Logs

British Geological Survey

BGS ID: 427875 : BGS Reference: SU77NW66
British National Grid (27700) : 470280,176600

Trial [illegible] SU77NW/66

RECORD OF WELL (SHAFT OR BORE)

7028.7660.

268

1" N.S. 265/359
1" O.S.
Grid Ref.

At

Town or Village Caversham County Berks Six-inch quarter sheet 295 E/W

Exact site Grass verge by Kidmore Road, Corner of Chicago Road

in parish of

Level of ground surface above sea-level (O.D.) 263.73 ft. If well starts below ground surface, state how [illegible] ft.

Shaft ft., diameter ft. Bore ft. Diameter of bore: at top ins.; at bottom ins.

Details of permanent lining tubes (internal diameters preferred)

Water struck at depths of (feet)

Rest-level of water below/above top of well feet. Suction at feet. Yield on hours'/days' test gallons per (with pump of capacity g.p.h.); depressing water level to feet below top. Time of recovery hrs. Amount normally pumped daily g.p.h. for hours.

Quality (attach copy of analysis if available)

Sunk by Allsebrook & Co. for Reading Corporation Date of well 1937

Information from

(For Survey use only) GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).	THICKNESS Feet.	THICKNESS Inches.	DEPTH Feet.	DEPTH Inches.
	Made up ground	3	-	3	-
	Dirty Gravel	2	6	5	6
	Fairly large Gravel	4	-	9	6
	Small Gravel	11	6	21	-
	Clay loam	4	-	25	-
	Clay loam with small stones	8	6	33	6
	Chalk				

GEOLOGICAL SURVEY AND MUSEUM.
SOUTH KENSINGTON.
LONDON. S.W.7.

For Survey use only

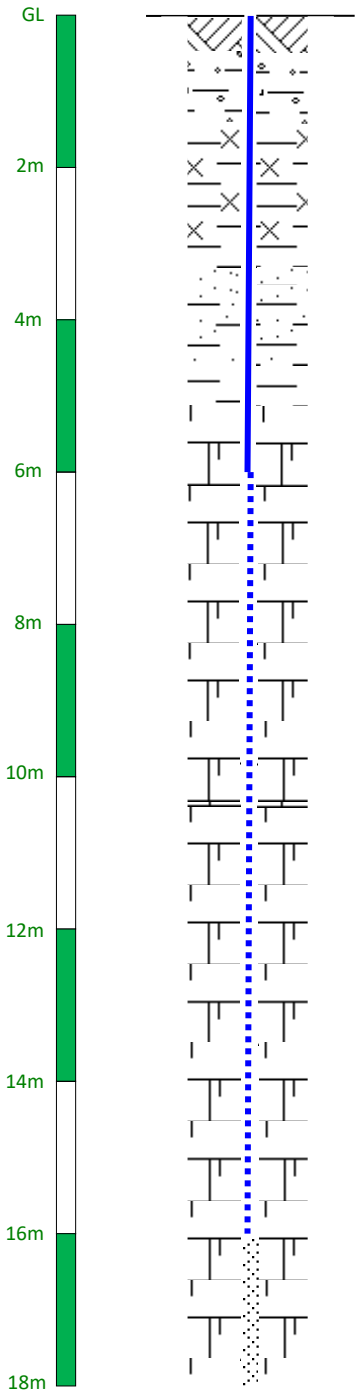
Date received	G.S.M. Office File No.	Site marked on 1" map (use symbol)

(7208) Wt.26064/3349 5,000 12/58
A.&E.W.Ltd. Gp.486

Contact BGS: ngdc@bgs.ac.uk

Aviron Associates Limited
Badgemore House, Gravel Hill, Henley on Thames, RG9 4NR
Tel: 01491 413 722 - 07787 771 686
Email: james@aviron.co.uk

Deep Bore Soakaway Log and Detail



TOPSOIL: Grass underlain by dark brown, silty, slightly gravely humic CLAY. GL-0.25m

BPG: Soft, light brown, slightly gravelly CLAY. Gravel is fine to medium and sub-rounded flint. 0.25-1.3m

BPG: Soft to firm, light brown, silty CLAY. 1.3-3.6m

BPG: Soft to firm, light brown, very sandy CLAY. 3.6-4.4m

BPG: Firm, brown CLAY. 4.4-5.1m

SNC: Cream, white structured CHALK with abundant fine to coarse, sub-angular flint Gravel and Cobbles. 5.1-18m

- flint band at 12-12.5m

- flint Band at 17-18m.

Key

140mm diameter unperforated installation pipe.

140mm diameter perforated installation pipe.

20mm shingle (bed)

BPG = Black Park Gravel Member
SNC = Seaford and Newhaven Chalk Formations

Project Title	98 Conisboro Ave, Caversham, RG4 7JF
Project Number	23-277.01
Client	Mr and Mrs r Smith
Drilled By	Cable Percussion
Scale	NTS (refer to dimensions in m)
Exploratory Hole	BH1
Elevation (m AOD)	NT
Coordinates	NT - completed in rear garden
Logged by	DN
Completed	30 Nov 2023 - 1 Dec 2023

APPENDIX III
Infiltration Test Results and Soakage Rates

Falling Head Soakage Test

23-277.01: 98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Based on The Soakage Design Guide (July 2000) - Kent County Council

Borehole DBSA1 **Test No.1**

04/12/2023

Readings Recorded By: dn

BH Casing Dimensions: **0.07m(r) x 16.13m(d)**

Casing Exposed Length (l): **6.13 m**

Diameter of casing (d): **0.14 m**

Time (mins)	Depth BGL (m)	Head of Water (m)
0	6.870	9.26
0.5	8.420	7.71
1	9.320	6.81
2	10.480	5.65
3	11.260	4.87
4	11.720	4.41
5	11.890	4.24
6	12.480	3.65
7	12.860	3.27
8	12.940	3.19
9	13.050	3.08
10	13.160	2.97
11	13.310	2.82
12	13.400	2.73
13	13.580	2.55
14	13.630	2.50
15	13.720	2.41
20	14.100	2.03
25	14.380	1.75
30	14.510	1.62
40	14.890	1.24
50	15.100	1.03

Construct line tangent to Head vs Time graph at a particular value of head under consideration and measure axes intercepts

Hp	2.8
th	67

Flow rate Q Asborbed water in time

$$= \frac{\pi d^2 * H_p * 1000}{4\, t_h}$$

= 0.643 l/min

Exposed area $\pi \times d \times l$

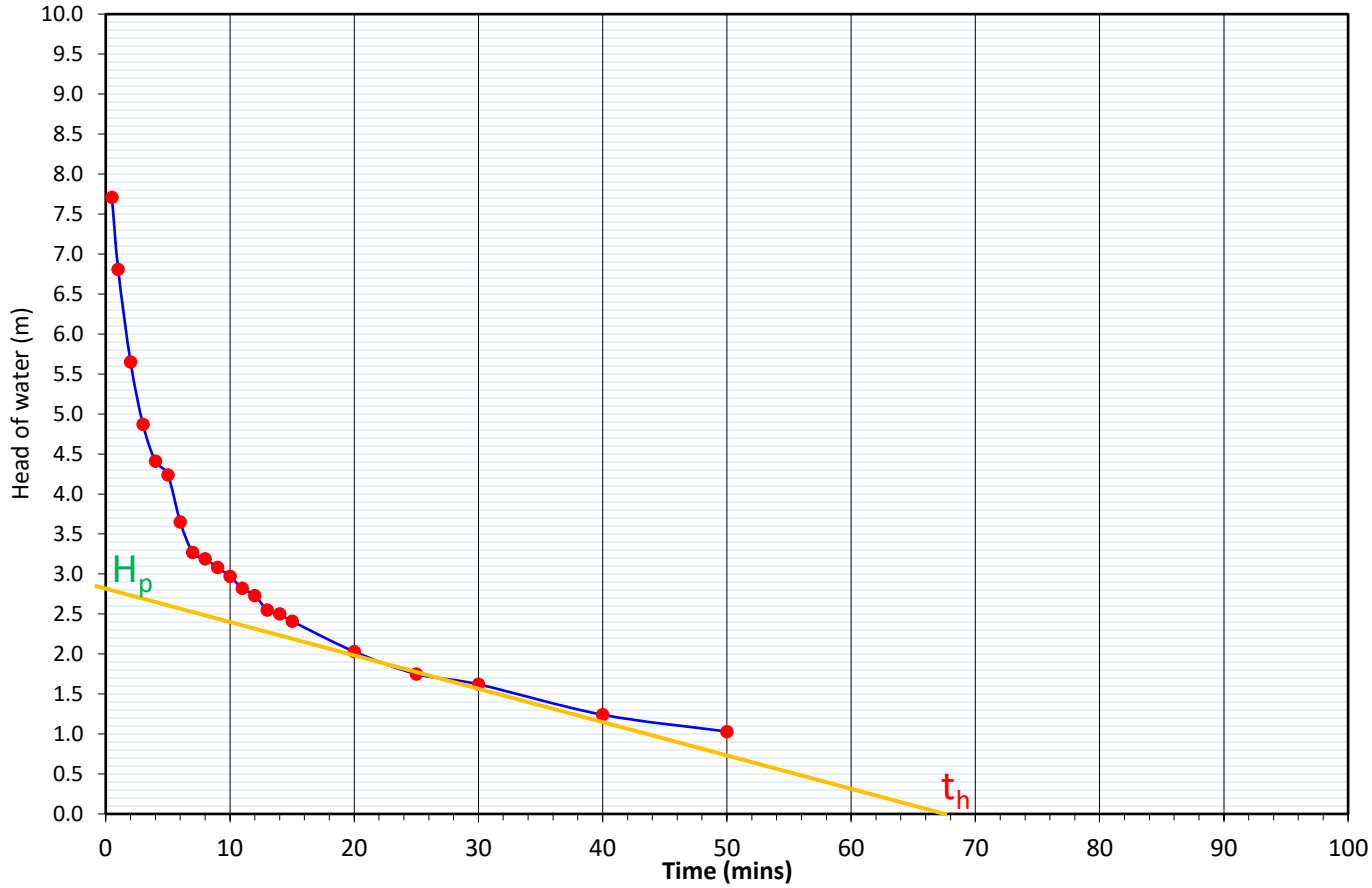
Area of cylinder. Base ignored due to debris accumulating at base

= 2.696 m^2

Soakage rate Flow Rate / Area

= 0.239 $l/m^2/min$

Head of Water vs. Time



Falling Head Soakage Test

23-277.01: 98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Based on The Soakage Design Guide (July 2000) - Kent County Council

Borehole DBSA1 **Test No.2**

04/12/2023

Readings Recorded By: dn

BH Casing Dimensions: **0.07m(r) x 16.13m(d)**

Casing Exposed Length (l): **6.13 m**

Diameter of casing (d): **0.14 m**

Time (mins)	Depth BGL (m)	Head of Water (m)
0	8.500	7.63
1	10.220	5.91
2	10.930	5.20
3	11.510	4.62
4	11.820	4.31
5	12.260	3.87
6	12.510	3.62
7	12.770	3.36
8	12.980	3.15
9	13.180	2.95
10	13.300	2.83
15	13.780	2.35
20	14.250	1.88
25	14.430	1.70
30	14.640	1.49
40	14.860	1.27
50	15.070	1.06
60	15.240	0.89
70	15.420	0.71

Construct line tangent to Head vs Time graph at a particular value of head under consideration and measure axes intercepts

Hp	2.7
th	66

Flow rate Q Asborbed water in time

$$= \frac{\pi d^2 * H_p * 1000}{4\, t_h}$$

= 0.630 l/min

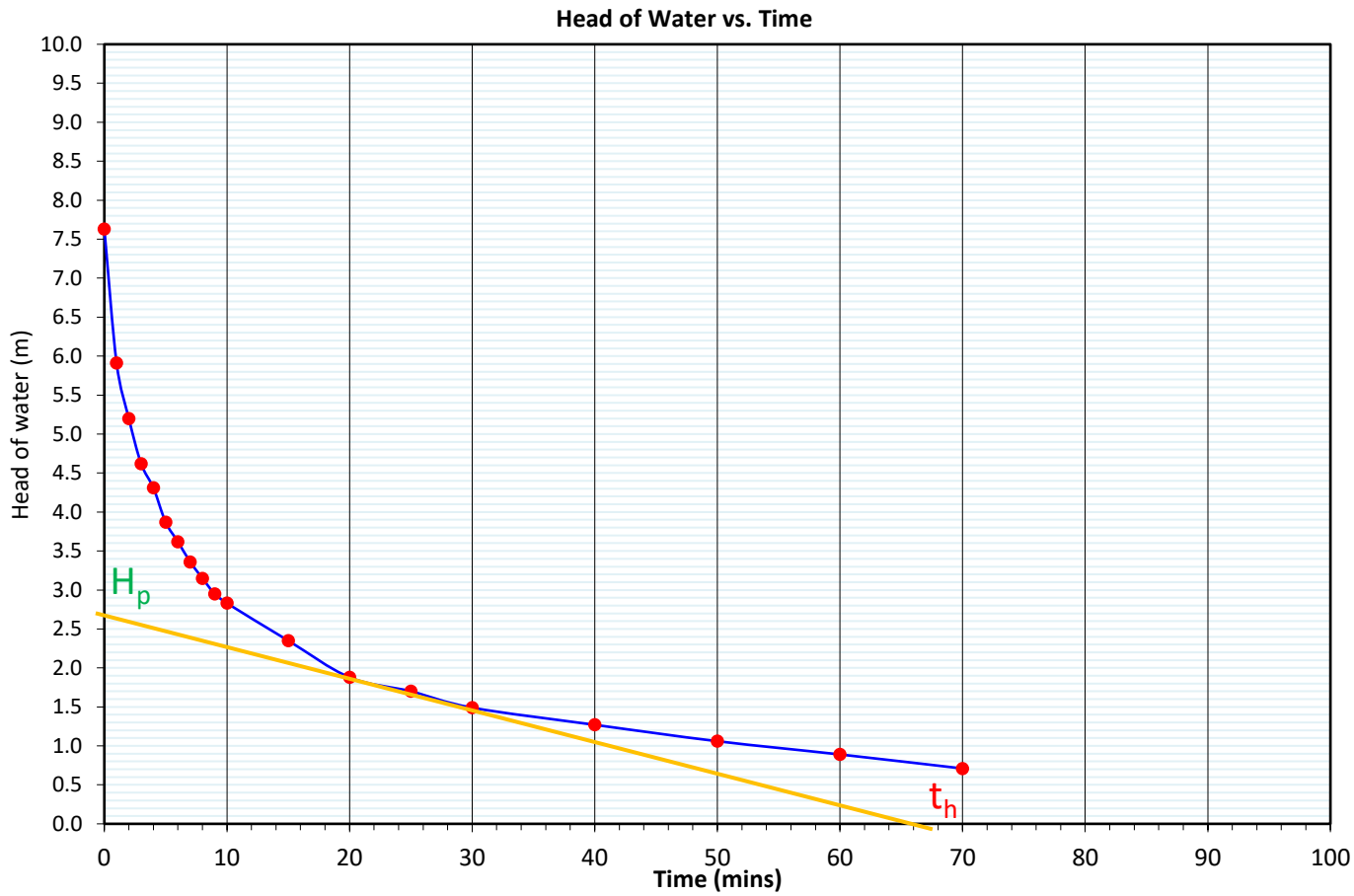
Exposed area $\pi \times d \times l$

Area of cylinder. Base ignored due to debris accumulating at base

= 2.696 m^2

Soakage rate Flow Rate / Area

= 0.234 $l/m^2/min$



Falling Head Soakage Test

23-277.01: 98 Conisboro Avenue, Caversham, Reading, RG4 7JF

Based on The Soakage Design Guide (July 2000) - Kent County Council

Borehole DBSA1 **Test No.3**

04/12/2023

Readings Recorded By: dn

BH Casing Dimensions: **0.07m(r) x 16.13m(d)**

Casing Exposed Length (l): **6.13 m**

Diameter of casing (d): **0.14 m**

Time (mins)	Depth BGL (m)	Head of Water (m)
0	7.820	8.31
1	9.490	6.64
2	10.240	5.89
3	10.810	5.32
4	11.260	4.87
5	11.630	4.50
6	11.920	4.21
7	12.180	3.95
8	12.360	3.77
9	12.490	3.64
10	12.620	3.51
15	13.010	3.12
20	13.420	2.71
25	13.680	2.45
30	13.950	2.18
40	14.260	1.87
50	14.480	1.65
60	14.660	1.47
70	14.800	1.33
80	15.040	1.09

Construct line tangent to Head vs Time graph at a particular value of head under consideration and measure axes intercepts

Hp	3.4
th	83

Flow rate Q Asborbed water in time

$$= \frac{\pi d^2 * H_p * 1000}{4\, t_h}$$

= 0.631 l/min

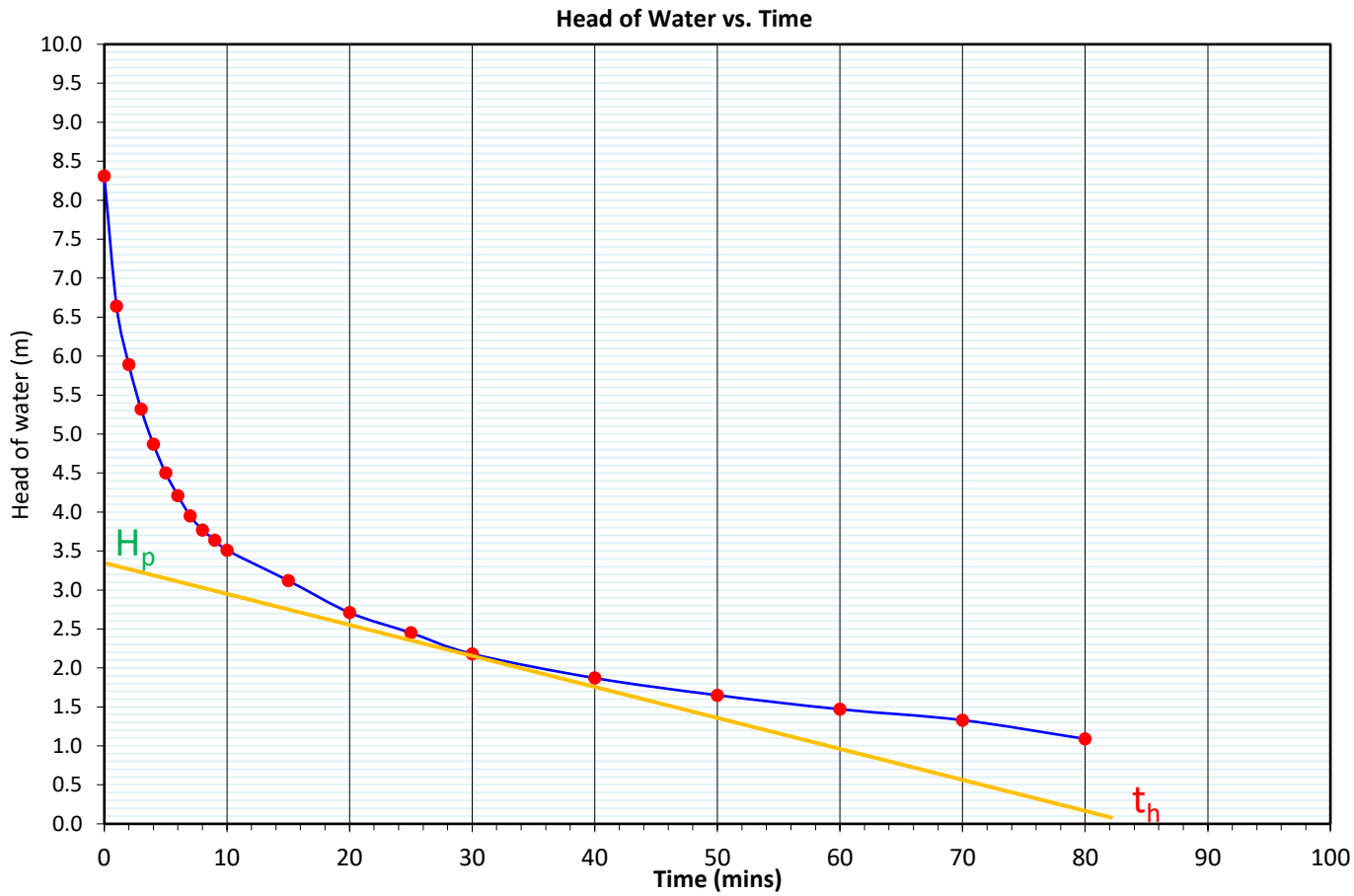
Exposed area $\pi \times d \times l$

Area of cylinder. Base ignored due to debris accumulating at base

= 2.696 m^2

Soakage rate Flow Rate / Area

= 0.234 $l/m^2/min$



APPENDIX D – SURFACE WATER RUN OFF CALCULATIONS

Nimbus Engineering Consultants Ltd www.nimbusengineering.co.uk	Kemp House, 152 City Road, London, EC1V 2NX Mob:0772 339 3155 email: info@nimbusengineering.co.uk	Job No. C3757 Sheet no. 1 Date 13/04/26	
MasterDrain HY 10.01	Project 98 Conisboro Avenue, Caversham, Reading, RG4 7JF	By M.HAM	Checked / Reviewed
	Title Pre & Post Development SW Runoff Calcs Prior to SuDS		

Data:-

Hydrology (FSR):-

Location = READING		WRAP	= 2
Long reference	= 472172	Grid reference	= SU7272
M5-60 (mm)	= 18	SAAR (mm/yr)	= 650
r	= 0.40	Soil	=0.30
Hyd. area	= 7	Hyd. zone	= 5
Hydrograph	= Winter	Area = England & Wales	

Site values used in design:-

Total site area	= 0.0980 ha	Climate change factor	= 45%
Pre-dev area drained	= 0.0039 ha	Post-dev area drained	= 0.0332 ha
Imperm runoff factor	= 100%	Perm runoff factor	= 20%

Pre-development

Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Pre-dev flow to drain	= 0.00 l/s

Post-development

Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Post-dev flow to drain	= 0.00 l/s

Calculations:-

Revised Post-dev Imperm. area = 0.033 ha
Equiv. Post-dev Imperm. area = 0.033 ha
Equiv. Post-dev Perm. area = 0.013 ha
Total Pre-dev equiv. area ha = 0.023 ha
Total Post-dev equiv. area ha = 0.046 ha
100 yr 6 hour mean intensity = 9.53mm/hr

Results:-

Pre-dev peakflow runoff (l/s) (m^3/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	4.4	2.8	1.8	1.1	0.7	0.5	0.4	0.4	4.4	N/A	4.4	1
30	10.7	7.0	4.4	2.6	1.6	1.2	0.9	0.8	10.7	N/A	10.7	30
100	13.9	9.1	5.7	3.5	2.1	1.5	1.2	1.0	13.9	N/A	13.9	100

Post-dev peakflow runoff (l/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	9.0	5.8	3.7	2.3	1.4	1.0	0.9	0.7	9.0	45	13.1	1
30	21.8	14.2	8.9	5.4	3.2	2.3	1.9	1.6	21.8	45	31.6	30
100	28.2	18.5	11.6	7.1	4.2	3.1	2.4	2.0	28.2	45	40.9	100

100 year 6 hour (x Climate Change Factor) storm gives:-

Pre-dev runoff volume m^3 = 13.0m^3
Post-dev rainfall volume = 38.3m^3
Post-dev volume m^3 (excess above SUDS) = 38.3m^3
100 yr 6 hour mean intensity = 9.53mm/hr
Pre-dev volume to drain at 0 l/s = 0.0 m^3
Post-dev volume to drain at 0 l/s = 0.0 m^3
Post-dev storage volume = 38.3m^3
Post-dev 5mm imperm volume = 1.7 m^3
Post-dev 5mm perm volume = 3.2 m^3

$Q_{BAR(rural)}$ = 0.164 l/s or 1.671 l/s/ha or 0.000 cumecs - from IoH 124.

The rainfall rates are calculated using the location specific values above in accordance with the Wallingford procedure.

Data summary.

Use the data below for the SUR1 form

Site areas:-

Total site area =	0.0980 ha ;980.0 m²	[3A]
Pre-development impermeable area =	0.0039 ha	[3B]
Pre-development permeable area =	0.0941 ha	
Post-development impermeable area =	0.0332 ha	[3C]
Post-development permeable area =	0.0648 ha	

Peak runoff:-

Pre-development 1 year storm (15min) =	4.4 l/s	[6A]
Pre-development 100 year storm (15min) =	13.9 l/s	[6C]
Post-development 1 year storm (15min) =	9.0 l/s	[6B]
Post-development 100 year storm (15min)=	28.18 l/s	[6D]

Greenfield runoff:-

$Q_{BAR(rural)}$ = 0.164 l/s or 1.671 l/s/ha or 0.000 cumecs - from IoH 124.

Climate change factor:-

CCF = 45%

Volumes:-

Pre-development 100 yr/6hr storm [12A]= 18.8m³
Post-development 100 yr/6hr storm (add. volume with no SUDS) [12B]= 38.3m³
Post-development 100 yr/6hr storm (add. volume with SUDS) = 38.3m³
Post-development add. predicted volume (No SUDS) [12C] = 19.4m³

You may also require

Data relating to the infiltration test calculations (if applicable)
Evidence to show runoff reduction (if applicable)
Information on calculation methods (if applicable see next sheet)

Note

Numbers in square brackets relate to the
Nov. 2010 v1.1 / issued 11/02/10 copy of SUR1

Definitions and methods

Hydrology

The hydrological constants are derived from the Wallingford maps. They are used to calculate location specific rainfall figures.

Site values and factors

Areas of the site should be entered in hectares (10000 m²). If the Pre-development site is a green field, this box is blank.
Climate Change Factor is initially set at 20% - this may be changed as required.
Greenfield runoff is calculated using the method described in IoH 124.
Runoff factors

The impermeable runoff factor is initially set at 98%
The permeable runoff factor is initially set at 20%

Note: the CCF and the runoff factors may be changed by the user to suit the development
The areas draining to soakaways and other SUDS are entered in the appropriate box (in hectares)

Calculations

The post-development area is reduced by subtracting the areas that drain to soakaways or other SUDS, to give a revised figure.
All areas are then multiplied by the appropriate runoff factor to give an equivalent area with 100% runoff.
These are then summated.
This gives a total pre-development equivalent area, and a similar figure for the post-development area.
The 'Post-dev volume to drain (no SUDS)' gives the total runoff to drain if no SUDS were used.

Results

The pre- and post-development areas are subjected to 1,30 and 100 year return period storms with a duration of 15 to 600 minutes.
The Revised Post-dev Imperm. area is the area (in ha) that is not going to SUDS x impervious runoff factor.
The runoff rates are calculated for the chosen hydrograph (Summer or Winter) as l/s. Figures in red indicate m³/s
The peak value is measured, multiplied by the CCF and the total maximum rate is shown.
The pre- and post-development volumes for a 100 year / 6 hour storm are calculated from the area under the hydrograph curve.
Post-dev volume (i.e. excess above SUDS) is that volume produced by the drained area that does not go to SUDS.
Qbar(rural) is calculated in accordance with the procedure laid down in IoH 124

APPENDIX E – WATER AUTHORITY ASSET PLANS

Asset location search

Property Searches

Nimbus Engineering Consultants LTD
Michealson Square
Office 8Livingston
LIVINGSTON
EH54 7DP

Search address supplied 98
Conisboro Avenue
Caversham
Reading
RG4 7JF

Your reference C3122

Our reference ALS/ALS Standard/2023_4901531

Search date 24 October 2023

Notification of Price Changes

From 1st April 2023 Thames water Property Searches will be increasing the prices of its CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches. Historically costs would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%.

Customers will be emailed with the new prices by January 1st 2023.

Any orders received with a higher payment prior to the 1st April 2023 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk

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

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

0800 009 4540

Asset location search

Property Searches

Search address supplied: 98, Conisboro Avenue, Caversham, Reading, RG4 7JF

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

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

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

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

Clean Water Services

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

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

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

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

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

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

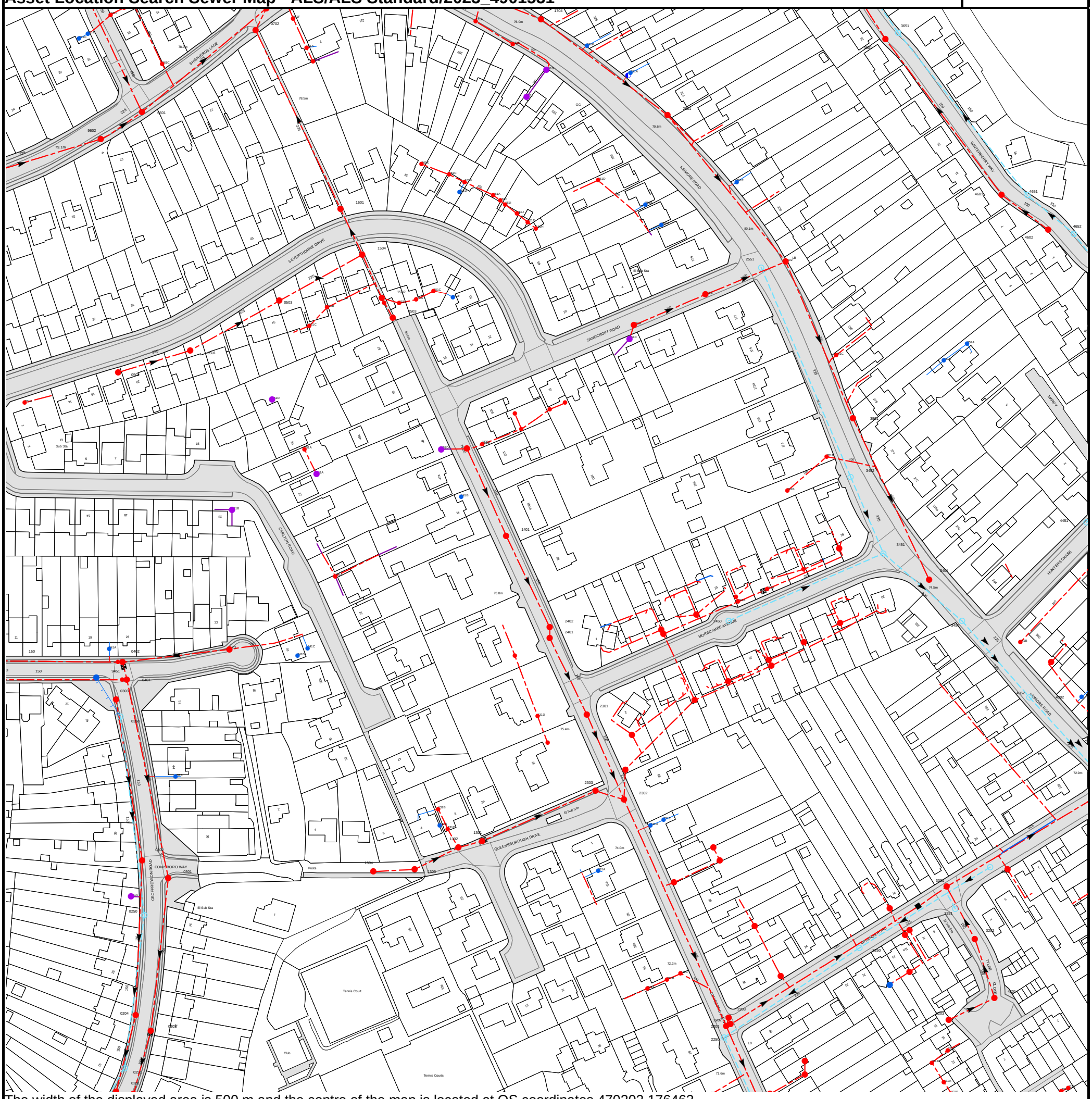
Clean Water queries

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

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

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

Asset Location Search Sewer Map - ALS/ALS Standard/2023_4901531



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 470202,176463

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

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
071J	n/a	n/a
071K	n/a	n/a
0701	77.66	76.02
071F	n/a	n/a
1601	78.57	77.09
161K	n/a	n/a
161C	n/a	n/a
161D	n/a	n/a
161B	n/a	n/a
171A	n/a	n/a
161A	n/a	n/a
161F	n/a	n/a
161I	n/a	n/a
161M	n/a	n/a
161J	n/a	n/a
161L	n/a	n/a
161E	n/a	n/a
161H	n/a	n/a
1704	76.37	71.66
261G	n/a	n/a
261F	n/a	n/a
261D	n/a	n/a
261A	n/a	n/a
261B	n/a	n/a
261C	n/a	n/a
2601	79.74	71.37
261E	n/a	n/a
3601	70.25	67.95
3651	70.1	68.6
4601	74.81	72.51
4651	75.17	73.32
4602	76.91	74.73
1504	78.63	77.27
1502	79.37	77.52
1503	80.53	78.92
151B	n/a	n/a
151A	n/a	n/a
151C	n/a	n/a
151D	n/a	n/a
151F	n/a	n/a
141B	n/a	n/a
1501	79.45	78.4
151E	n/a	n/a
15YZ	n/a	n/a
15ZQ	n/a	n/a
25ZT	n/a	n/a
25ZV	n/a	n/a
251C	n/a	n/a
251A	n/a	n/a
251B	n/a	n/a
041B	n/a	n/a
041A	n/a	n/a
051A	n/a	n/a
951A	n/a	n/a
051D	n/a	n/a
0502	n/a	n/a
0501	79.3	78.19
051C	n/a	n/a
051B	n/a	n/a
0503	n/a	n/a
9602	79.18	77.21
0601	78.99	77.07
061C	n/a	n/a
061B	n/a	n/a
061A	n/a	n/a
961C	n/a	n/a
961D	n/a	n/a
0702	77.59	76.3
3455	n/a	n/a
44ZT	n/a	n/a
3458	n/a	n/a
441B	n/a	n/a
3457	n/a	n/a
3456	n/a	n/a
3450	74.39	72.71
241A	n/a	n/a
2453	n/a	n/a
341A	n/a	n/a
3401	74.76	70.58
3453	n/a	n/a
441A	n/a	n/a
3451	75.4	73.48
3454	n/a	n/a
4451	75.74	73.94
341B	n/a	n/a
3452	76.6	74.73
351D	n/a	n/a
3501	77.86	70.89
351B	n/a	n/a
351C	n/a	n/a
351A	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2551	n/a	n/a
3502	80.05	71.06
4652	77.51	75.76
031B	n/a	n/a
0403	80.16	78.75
041D	n/a	n/a
041C	n/a	n/a
141A	n/a	n/a
131B	n/a	n/a
131A	n/a	n/a
131C	n/a	n/a
1302	75.74	74.53
1301	75.58	74.34
1401	77.93	76.6
14ZT	n/a	n/a
131D	n/a	n/a
23YW	n/a	n/a
2402	76.45	75.28
2401	76.5	75.21
2301	75.58	74.32
2303	75.29	73.93
2302	74.77	73.52
2304	n/a	n/a
2306	n/a	n/a
231D	n/a	n/a
2451	n/a	n/a
2452	n/a	n/a
231C	n/a	n/a
2305	n/a	n/a
2454	n/a	n/a
2455	n/a	n/a
2450	75.32	73.87
3250	72.1	70.33
3202	72	70.63
32XV	n/a	n/a
32XX	n/a	n/a
22ZV	n/a	n/a
3251	72.22	71.21
32YQ	n/a	n/a
3301	72.3	70.33
43WV	n/a	n/a
4351	72.41	70.9
43WY	n/a	n/a
4352	73.52	72
2202	71.71	n/a
32ZQ	n/a	n/a
32ZP	n/a	n/a
32ZR	n/a	n/a
32ZY	n/a	n/a
32YW	n/a	n/a
32YT	n/a	n/a
321B	n/a	n/a
321A	n/a	n/a
321C	n/a	n/a
3203	n/a	n/a
321E	n/a	n/a
4201	71.82	70.82
421B	n/a	n/a
421E	n/a	n/a
221B	n/a	n/a
23YV	n/a	n/a
221C	n/a	n/a
23ZS	n/a	n/a
23ZR	n/a	n/a
2250	71.69	70.08
2201	71.72	69.02
2203	71.71	n/a
031A	n/a	n/a
0202	76.5	74.41
0204	76.91	75.51
0302	78.65	77.15
0250	77.83	76.61
0203	76.89	74.62
0301	78.4	76.44
1304	76.5	75.07
1303	76.11	74.89
231A	n/a	n/a
221A	n/a	n/a
9451	81.45	80.72
941A	n/a	n/a
0303	81.11	79.69
0350	80.95	79.97
0402	81.31	77.98
0401	81.08	77.8
0201	76.22	74.87
0251	76.4	75.3

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

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

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

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

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

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

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

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

Operational Controls

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

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

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

- Inlet
- Outfall
- Undefined End

Other Symbols

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

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

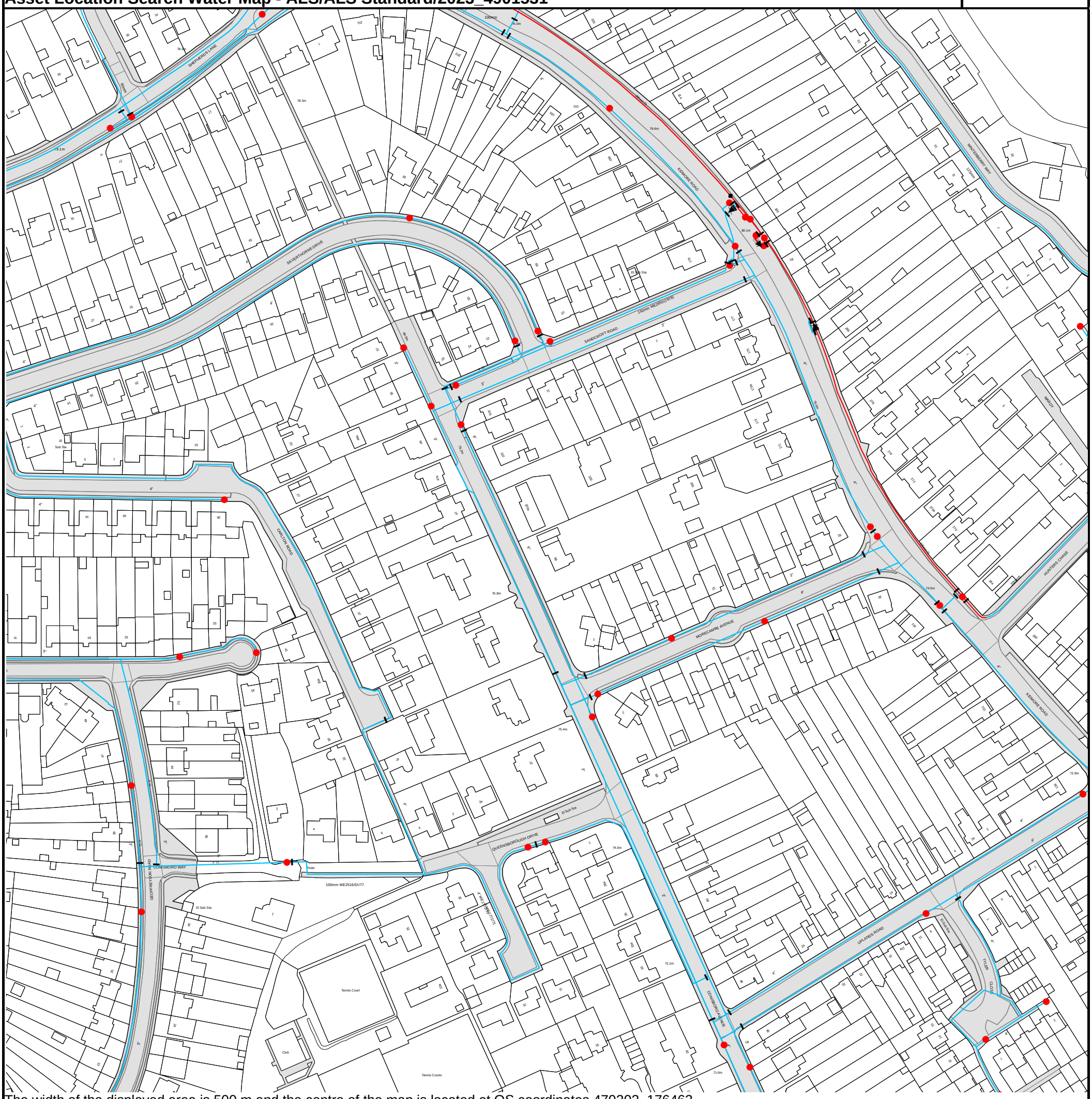
Ducts or Crossings

- Casement — Ducts may contain high voltage cables. Please check with Thames Water.
- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2023_4901531



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 470202, 176463.

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

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Casement: Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Payment Terms and Conditions

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

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment within 14 days of the date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service or will be held to be invalid.
4. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. A charge may be made at the discretion of the company for increased administration costs.

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

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

If you are unhappy with our service, you can speak to your original goods or customer service provider. If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0300 034 2222 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**
Please Call **0800 009 4540** quoting your invoice number starting CBA or ADS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number

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