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19 EAST HEATH ROAD

Drainage Strategy

August 2009

REVISIONS

Date	Revision	Status	Comment	Q/A
14-04-08	-	Draft	For comment	308-031 19.1 PO
01-05-08		Final	For Planning	308-091 19.1 PO
07-05-08	A	Final	For Planning	308-091 19.1 PO
09-05-08	B	Final	For Planning	308-091 19.1 PO
19-08-09	C	Final	For Planning	308-091 19.1 PO

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1 INTRODUCTION

1.1 Scope of works

RYB Konsult has been instructed to carry out a preliminary drainage strategy to accompany a planning application for residential redevelopment of land at 19 East Heath Road, London. The report considers issues relating to flood risk and Sustainable Urban Drainage Systems (SUDS).

1.2 Proposal Description

The proposal is for a private home in Hampstead. The design comprises a two storey dwelling including a lower ground floor with a swimming pool. A rainwater storage area has been proposed for the Proposed Development to be used for toilet flushing and garden irrigation. The site is currently overlain by impermeable surfaces such as tarmac and garage buildings.

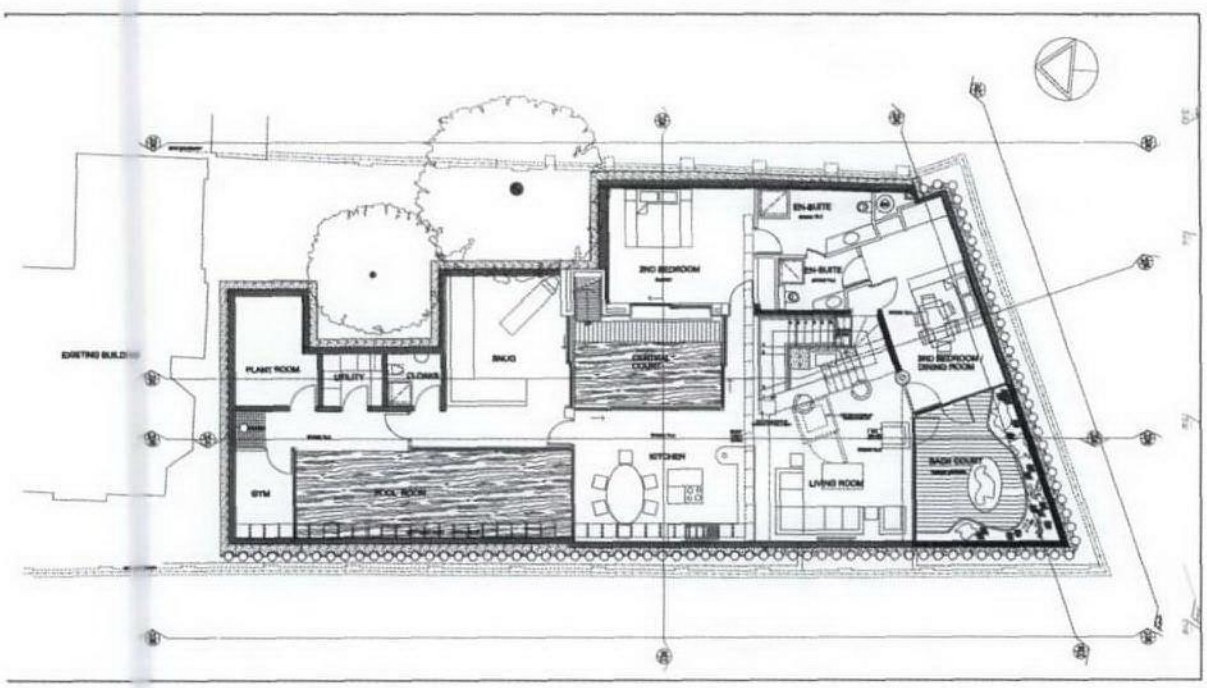


Figure 1.1 **Plan of Proposed Development – Lower ground level**

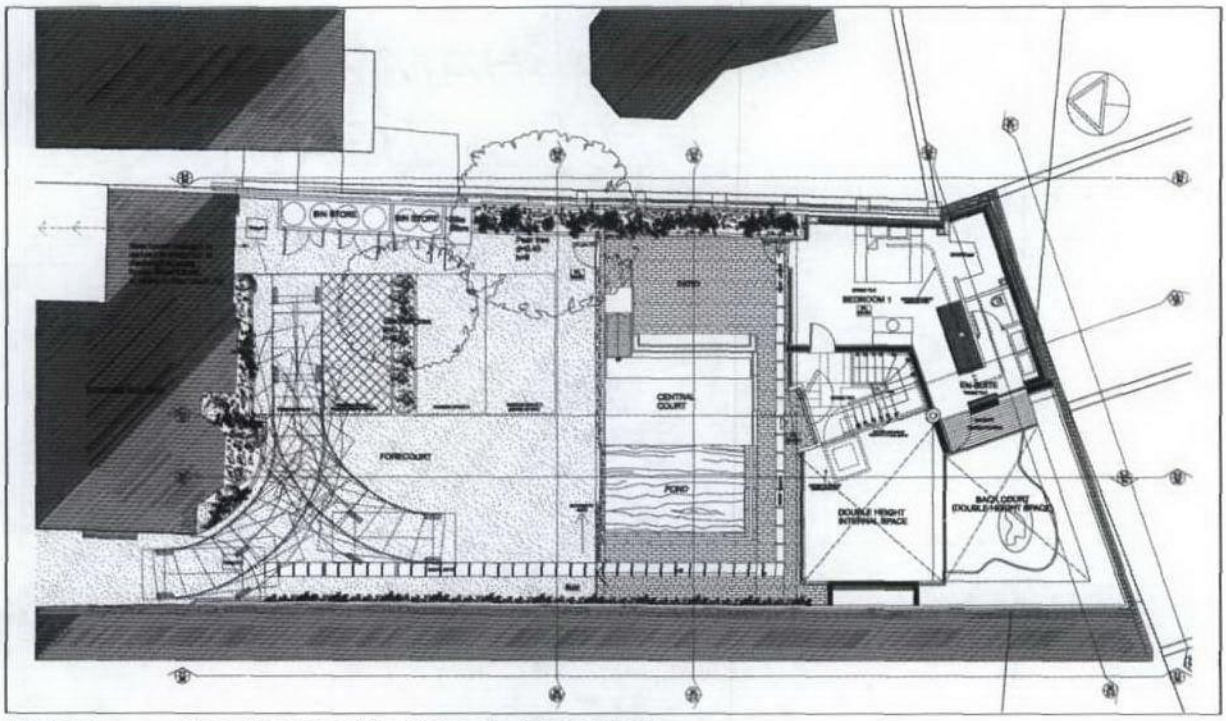


Figure 1.2 **Plan of Proposed Development – Ground level**

The Proposed Development is located in Hampstead, Camden. The location is displayed below.

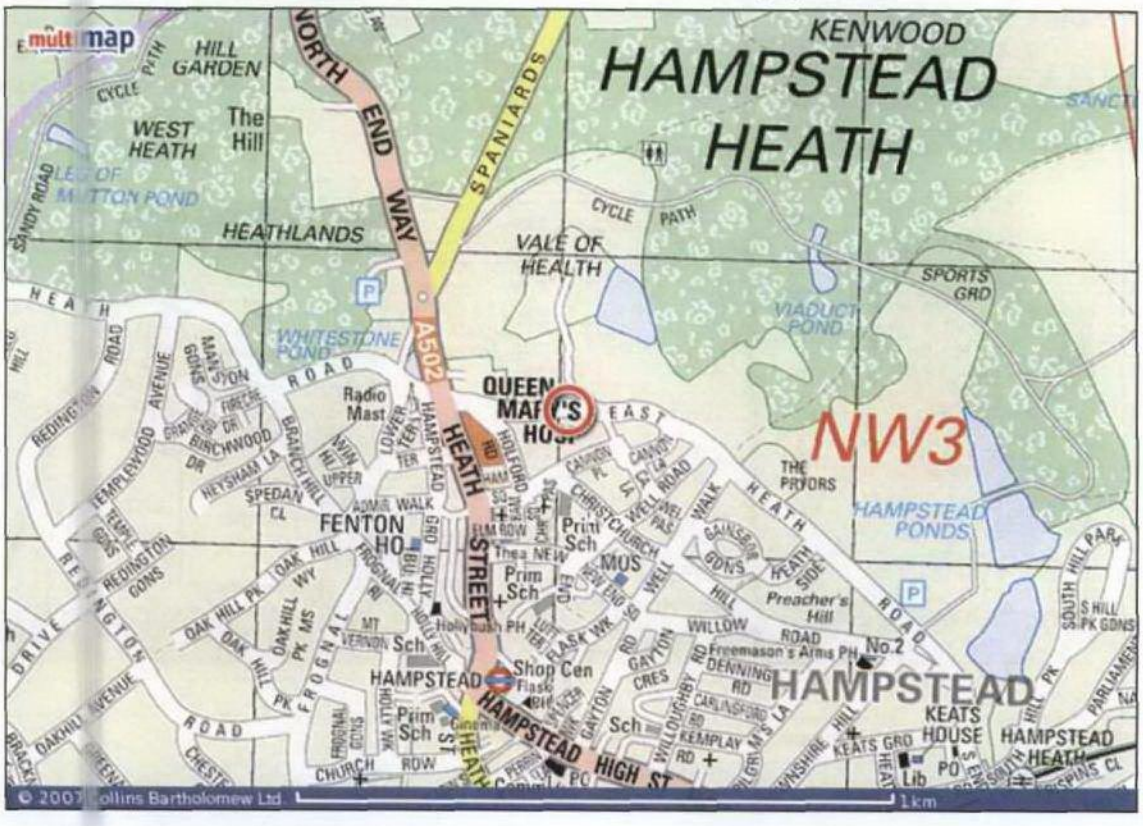


Figure 1.3 **Location of Proposed Development**

2 POLICY

2.1 Planning Policy Statement (PPS) 25: Development and Flood Risk

PPS 25 sets out Government policy on development and flood risk. It's aims are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe, without increasing flood risk elsewhere, and, where possible, reducing flood risk overall. PPS 25 also states that the surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same net effect.

2.2 Camden Unitary Development Plan (UDP), July 2006

Camden's UDP contains policy SD9 - Resources and energy (B – Water) which states the following regarding flood risk and drainage: *In considering proposals for development, the Council will need to be satisfied that adequate provision can be made for water supply and waste treatment. The Council will only grant planning permission for development that it considers is sited and designed in a manner that does not cause harm to the water environment, water quality or drainage systems and prevents or mitigates flooding. The Council will require developers to include measures to conserve water and where appropriate incorporate Sustainable Urban Drainage Systems.*

2.3 Code for Sustainable Homes

The Code for Sustainable Homes measures the sustainability of a new home against categories of sustainable design, rating the 'whole home' as a complete package. The Code uses a 1 to 6 star rating system to communicate the overall sustainability performance of a new home. The Code sets minimum standards for energy and water use at each level and, within England, replaces the EcoHomes scheme, developed by the Building Research Establishment (BRE).

Credit Sur 1 (Surface Water Run-off) is a mandatory credit which aims to reduce and delay water run-off from the hard surfaces of a housing development to public sewers and watercourses, thus reducing the risk of localised flooding, pollution and other environmental damage. The requirements are set out below.

Sur 1 : Surface Water Runoff (Code for Sustainable Homes, May 2009)

Mandatory Criteria

1) Peak Rate of Runoff

Ensure that the peak rate of runoff into watercourses is no greater for the developed site than it was for the pre-development site. This should comply with the Interim Code of Practice for Sustainable Drainage systems (SUDS) (CIRIA, 2004) or for at least the 1 year and 100 year return period events.

Calculation Criteria:

- For sites of **less than 200ha**, the calculation of Greenfield runoff rates should be in accordance with Flood estimation for small catchments (Marshall and Bayliss, 1994) and any subsequent updates.
- For sites of **200ha and more**, the calculation of Greenfield runoff rates should be in accordance with the Flood Estimation Handbook (Centre for Ecology and Hydrology, 1999) and any subsequent updates.
- An **allowance for climate change** should be made in accordance with current best practice (PPS25, 2006).

2) Volume of Runoff

Ensure that the **additional** predicted volume of rainwater discharge caused by the new development, for a 1 in 100 year event of 6 hour duration including an allowance for climate change (PPS25, 2006), is entirely reduced using:

• infiltration

AND / OR

• is made available for use in the dwelling as a replacement for potable water use in non-potable applications such as WC flushing or washing machine operation.

Any residual additional rainwater volume that cannot be prevented from being discharged (reasons must be provided with supporting evidence), for all events up to the 100-year return period, the peak discharge rate from the site should be reduced to (in order of priority):

A: the pre-development site's estimated mean annual flood flow rate (Qbar); or

B: 2l/s/ha; or

C: a minimum flow rate (litres per second), based on good practice guidelines to prevent easy blockage, by ensuring the outlet throttle is not too small; unless rainwater is being discharged to a public sewer or adopted surface water sewer, and there is a specific minimum requirement defined by the Sewerage Undertaker.

Note; reasons for discounting any of the options above must be provided with supporting evidence.

Additional credits

2 credits are available for using SUDS to improve water quality of the rainwater discharged or for protecting the quality of the receiving waters by:

1. Ensuring no discharge to the watercourse for rainfall depths up to 5mm.

Follow guidance in the Interim Code of Practice for Sustainable Drainage systems (SUDS), (CIRIA, 2004).

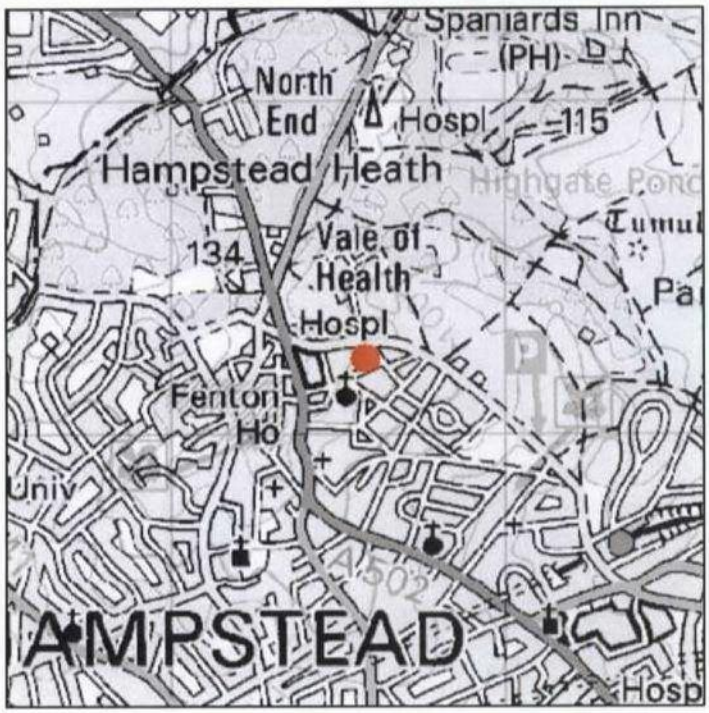
OR

2. Establish agreements for the ownership, long term operation and maintenance of all sustainable drainage systems used.

3 FLOOD RISK

3.1 Assessment of flood risk from rivers and the sea

The Flood Zone category for the site has been determined based upon Environment Agency Flood Mapping data. As can be seen in Figure 4.1, the Proposed Development lies within Flood Zone 1 i.e. less than a 1 in 1000 year chance of flooding from rivers and the sea. Reference to Table D3 in PPS 25 indicates that the development of dwelling houses (classified as 'More Vulnerable') and basement dwellings (classified as 'Highly Vulnerable') is appropriate in this low risk Flood Zone (see Figure 3.2).



	Proposed Development location
	Flood Zone 1 (Low Risk)
	Flood Zone 2 (Medium Risk)
	Flood Zone 3 (High Risk)
	Areas benefiting from flood defences

Figure 3.1 Environment Agency Flood Map

Flood Risk Vulnerability Classification	Essential Infrastructure	Water compatible	Highly Vulnerable	More vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	✓	×	Exception Test Required	✓
Zone 3b	Exception Test Required	✓	×	×	×

✓ Development is appropriate
× Development should not be permitted

Figure 3.2 Flood Risk Vulnerability and Flood Zone 'Compatibility' (PPS 25 Table D3)

4 LOCAL DRAINAGE ARRANGEMENTS

An asset location search has been requested from Thames Water to show the approximate lines of their waste water and clean water services. Figure 4.1 displays the sewer map of the Proposed Development's locality. The full document is appended.

The records indicate that surface water from the property drains via a private length of sewer to a combined public sewer system flowing from west to east along East Heath Road. A CCTV drainage survey was carried out in April 2006 to investigate the condition of the mainline and secondary foul drainage systems for site.

Figure 4.1 Thames Water Asset Location Search Results – Waste water services

5 DRAINAGE STRATEGY

5.1 Introduction

Surface water runoff arising from the site can sometimes be managed using Sustainable Urban Drainage Systems (SUDS), such as filter strips and swales, infiltration devices, permeable surfaces, ponds and basins. Due to space and drainage constraints at the site, these methods are not deemed appropriate for the Proposed Development. A below ground water holding tank with a controlled pumped output to the existing drainage system is therefore proposed.

Rainwater collected in the tank will be pumped up to lower ground, ground and roof levels to replenish the upper and lower pools and also supply grey water irrigation to all the courtyard planting beds and sedum roof.

5.2 Reference drawings

The following drawings were used as a basis to carry out the preliminary drainage analysis for 19 East Heath Road.

- 19 EHR Site map (Drwg 1493)
- 1027R 510 Grnd Flr Plan
- 1027R 511 Lower Grnd Flr Plan

5.3 Preliminary drainage calculations

The proposed holding tank has been sized to accommodate runoff generated by storm events up to and including the 1:100 year + 30% event.

Rainfall intensity rates taken from M560 (mm) storm indicate a peak flow rate of 42mm/hour. The Proposed Development does not increase the impermeable surface area of the site. The grassed area associated with the Proposed Development has been included in the impermeable surface calculation as its drainage is impeded by the basement below; however some attenuation will be achieved via plant uptake compared to the existing tarmac area.

To attenuate a 1-hour peak storm event it is calculated that an underground storage tank with storage capacity of 14.3m^3 would be required for the Proposed Development (assuming an impermeable surface area of 340 m^2). In addition to this capacity, further storage of 6.7 m^3 is proposed to supply the rainwater harvesting system (which could be located separately in the plant room). In total a tank of 21 m^3 is therefore required, with a residual supply of up to 6.7 m^3 stored in the tank to feed the rainwater system, and water levels above this discharging (via pumps) to the public sewer system at a controlled rate.

It is proposed that the storage tank would be located immediately below the pool in the courtyard (see Figure 5.1). Indicative dimensions are 3.5m x 3m x 2m (length x width x depth). The final holding tank's position and size should be determined at the detailed design stage.

Recycling of surface water at source will reduce pressure on the existing local drainage infrastructure and reduce flood risk to the locality. Drainage from impermeable surfaces would be better controlled compared to previous levels via installation of the holding tank.

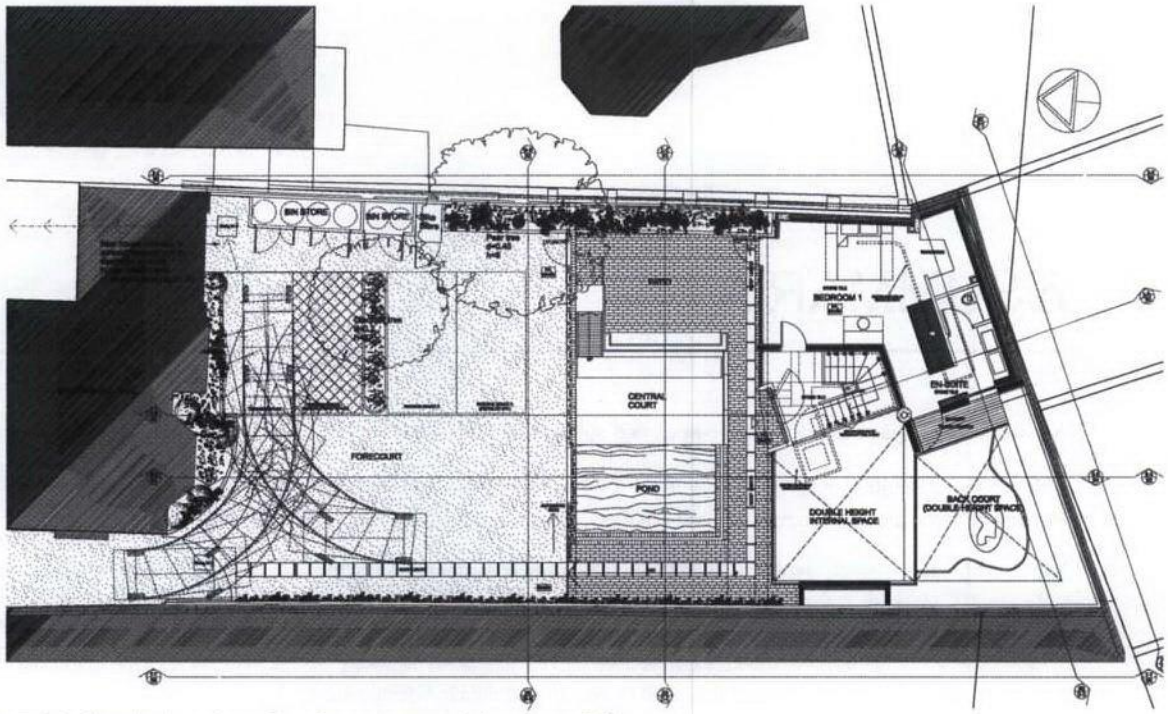


Figure 5.1 Indicative location of surface water tank (not to scale)

6 SUMMARY

A preliminary drainage strategy has been carried out by RYB Konsult for the Proposed Development at 19 East Heath Road.

Reference to Environment Agency Flood Maps indicates that the site is located in an area of low flood risk (Flood Zone 1). The Proposed Development is compatible with the Flood Zone classification in accordance with PPS 25 (Table D3).

The asset location search identifies a combined public sewer system flowing from west to east along East Heath Road.

A preliminary drainage calculation has indicated that a holding tank system with a capacity of $21m^3$ would be required for the Proposed Development to attenuate a 1-hour peak storm event, including additional capacity to feed the proposed rainwater harvesting system. Further calculations would be required at detailed design stage.

APPENDIX: ASSET LOCATION SEARCH

305060

7.3.

Commercial

Multisite Drainage & Water Search

Rob Banes
Rybka Battle
10 Lindsey Street
LONDON
EC1A 9HP

Search address MULTISITE SEARCH
19
East Heath Road
London
NW3 1AJ

Your reference 305060
Our reference CDWS/CDWS/4/2005_255157

Search date 16 November 2005

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

DX 151280 Slough 13

T 0118 923 6656
F 0118 923 6655/57
E searches@thameswater.co.uk
I www.twpropertyinsight.co.uk

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Commercial

Multisite Drainage & Water Search

All postal and DX enquiries should now be sent to:

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

DX 151280 Slough 13

Please note that our telephone number, fax number and website address remain the same (see below) and we are contactable between 9am and 5pm, Monday to Friday. Also, a redirection service is in operation for a limited period to ensure any post sent to our old address is responded to as normal.

Tel: 0118 923 6656
Fax: 0118 923 6655/57
www.twpropertinsight.co.uk

Search address **MULTISITE SEARCH, 19, East Heath Road, London, NW3 1AJ**

Any new owner or occupier will need to contact Thames Water on 0845 9200 888 in order to have the water and drainage services bills changed to their name.

From the **6th June 2005** Thames Water will be implementing price changes for the following products.

Products	New Price including VAT
Drainage & Water Search (CON29DW)	£42.77
Drainage & Water Search (CON29DW) – 4 hour response	£79.90
Commercial Drainage & Water Search	£94.00
Commercial Drainage & Water Search – 4 hour response	£188.00
Residential Multi Site Additional Parcel Fee*	£25.38
Commercial Multi Site Additional Parcel Fee*	£37.60
Home Zone™ Environmental Report	£34.78

*For further information on Multi Sites please contact us.

Please ensure that the correct amount is submitted with your search requests to avoid processing delays.

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Multisite Drainage & Water Search

Rights of Access

Is there a wayleave agreement, giving Thames Water (from here on known as "The company") the right of access to pass through private land in order to reach the company's assets?

No.

Is there an easement agreement, giving The Company the right of access to assets located in private land which prevent the landowner from restricting The Company's access?

No.

Manhole Cover & Invert Levels

Details of any manhole cover and invert levels applicable to this site are enclosed.

Trade Effluent Consents

Are there any trade effluent consents relating to this site/property for the disposal of chemically enhanced waste?

No.

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Building Over Regulations

Please clarify the circumstances in which an agreement to build over, or close to, a public sewer is required.

The following types of building work require our consent:

- Building within three metres of the outside of a public sewer, as measured at ground level;
- Building within the zone produce by marking a horizontal line through the centre of the sewer and marking two divergent lines at an angle of 45 degrees (from the horizontal line) from either side of the sewer to ground level.

There may already be a Building Over agreement or consent, relating to this site/property. Please refer to section 2.3 of this enquiry for details.

Further advice and application forms for building over, or close to, a public sewer can be obtained from Developer Services, Thames Water, 1 Kew Bridge Road, Brentford, Middlesex, TW8 0EE. Tel 0845 850 2777.

River Flooding

Is the site/property in an area known to be at risk of river flooding?

For details of river flooding and/or publicly maintained watercourses (whether over ground or cultivated), please contact The Environment Agency, Thames Region, Kings Meadow House, Kings Meadow Road, Reading, RG1 8DQ. Tel 0845 933 3111. Website www.environment-agency.gov.uk

Alternatively, we can provide you with a comprehensive report, which assesses the risk to the site of a number of environmental hazards, including river flooding, landfill sites and radioactive substances, at a very competitive price. For further information please call us on 0118 925 6652.

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