Source Protection Zone map created 5 May 2015 [Ref:HNL046851 BC]

Environment Agency

Scale 1:25,000

N W E S

Flood Map for Planning (Rivers and Sea)

Source Protection Zones

- **Zone I - Inner Protection Zone**
- **Zone II - Outer Protection Zone**
- **Zone III - Total Catchment**
- **Zone of Special Interest**

Flood Map for Planning (Rivers and Sea)

(assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

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Ramirez-Romero, Lorena

From:	HNL Enquiries <HNLenquiries@environment-agency.gov.uk>
Sent:	26 June 2015 11:58
To:	Ramirez-Romero, Lorena
Subject:	HNL/047441/JH -- RE: Follow on enquiry RE: HNL046851 BC - 150423/cb03 Kidderpore North - Product 4
Attachments:	Standard Notice.pdf; Lost river map.pdf

Dear Lorena

Thank you for your email for lost rivers information.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please find attached a lost rivers map. The subterranean or underground rivers of London are tributaries of the River Thames and River Lee that were built over during the development of London. These rivers now flow through underground culverts.

Thames Water owns these rivers and we suggest you contact them for further information.

I have attached our Standard Notice which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

If you require any further assistance please contact me.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:
http://feedback1.environmentagency.uk.com/s3/HNLCustomer

Kind regards

James Hammett

Customers and Engagement Officer
Environment Agency, Hertfordshire and North London
Tel: 01707 632468 | Email: HNLenquiries@environment-agency.gov.uk

Our website has moved. Find us at http://www.gov.uk/environment-agency

We are now **Hertfordshire and North London Area**
Our new email address for requests for information is HNLenquiries@environment-agency.gov.uk.
But don't worry, any emails you send to our old address will still reach us.

Environment Agency

From: Ramirez-Romero, Lorena [mailto:lorena.ramirez@wspgroup.com]
Sent: 01 June 2015 15:36
To: HNL Enquiries
Subject: Follow on enquiry RE: HNL046851 BC - 150423/cb03 Kidderpore North - Product 4

Dear Becki,

Thank you for sending the product 4. I am also looking at the flood risk associated to lost rivers in the area. I am aware that the River Kilburn was running very close to the site. Is there any information you can provide in relation to this?

Thanks and best regards,

Lorena Ramirez
Graduate Hydrologist
Tel: +44 (0)117 930 2055

Website: www.wspgroup.co.uk

From: HNL Enquiries [mailto:HNLenquiries@environment-agency.gov.uk]
Sent: 12 May 2015 15:48
To: Ramirez-Romero, Lorena
Subject: HNL046851 BC - 150423/cb03 Kidderpore North - Product 4

Dear Lorena Ramirez

Enquiry regarding Kidderpore North, Kidderpore Avenue, Hampstead, London, NW3 7ST

Thank you for your enquiry. Please find attached our response.

I have attached our standard notice which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive: http://feedback1.environmentagency.uk.com/s3/HNLCustomer

If I can be of any further help, please contact me.

Yours sincerely

Becki Clark
Customers & Engagement Officer
Direct dial 01707 632302
Direct fax 01707 632610
Direct email HNLenquiries@environment-agency.gov.uk

From: Enquiries, Unit
Sent: 23 April 2015 09:17
To: lorena.ramirez@wspgroup.com
Subject: FW: 150423/cb03 Kidderpore North - Product 4

Dear Lorena,

I have passed your enquiry to our customer team for the relevant area and they will be in touch with you shortly.

The Freedom of Information Act and Environmental Information Regulations state that a public authority must respond to requests for information within 20 working days, but we aim to respond to all enquiries as quickly as we can.

You can find more information about our service commitment by clicking on the link below:

https://www.gov.uk/government/publications/environment-agency-customer-service-commitment

Should you wish to contact the customer team directly, please use the contact details below. Please quote your Enquiry Reference 150423/cb03 in any correspondence with us regarding this matter.

Customers and Engagement
Environment Planning & Engagement
Environment Agency
Hertfordshire and North London Area
Apollo Court
2 Bishops Square Business Park
St Albans Road West
HATFIELD
AL10 9EX

Tel: 03708 506506

Warm regards

Chris C Brown

Customer Service Advisor
National Customer Contact Centre - Part of National Operations Services

Tel: 03708 506 506
Web Site: www.gov.uk/environment-agency
Click an icon to keep in touch with us:-

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Our National Customer Contact Centre relies on customer feedback, so we really value your thoughts on how we are doing. We will always make changes where we can to improve our service. This will only take three minutes to complete:

Click here: http://feedback1.environmentagency.uk.com/s3/NCCCsurvey

From: Ramirez-Romero, Lorena [mailto:lorena.ramirez@wspgroup.com]
Sent: 22 April 2015 11:56
To: Enquiries, Unit
Cc: Bansal, Gurdeep
Subject: 150423/cb03 Kidderpore North - Product 4

Dear Sir/Madam

Kidderpore North, Kidderpore Avenue, Hampstead
Flood Risk Consultation

We are producing a Flood Risk Assessment (FRA) including an outline surface water drainage strategy to support the detailed planning application for the residential re-development of the site above. The site is approximately 1.2 ha in size and is located on the north side of Kidderpore Avenue in
Hampstead in the London Borough of Camden. Please find attached a location plan indicating the site for clarity.

The site is currently owned by King's College London and accommodates student housing across 9 buildings, along with Kidderpore and the College Chapel. The proposal to redevelop the site for residential uses includes the demolition of three existing buildings and the retention of six buildings (three listed buildings and three adjacent non-listed buildings). In addition, the Chapel will be converted to a residential facility and a basement for parking will be excavated in the central building of Old House.

In order to understand the potential sources of flooding and the level of flood risk at the site we require a Product 4 for the above site. We have some specific queries below and would be grateful for your attention to them.

River and tidal flooding

1. The site is shown within Flood Zone 1 on the Environment Agency online Flood Maps. Could you please confirm this is correct? Please confirm also whether the nature of flooding would be fluvial or tidal (if applicable).
2. Please provide us with details of any known historical flooding at the site. Any known information on the mechanism of flooding (including any studies undertaken) for the area would also be appreciated.

Other sources of flooding

3. Are there any watercourses/ditches that are within the area that may pose a flood risk to the site?
4. Are there any issues related to surface water flooding (including past flooding linked to drainage systems) within the area? We shall, of course, be contacting London Borough of Camden Council/ Thames Water Company for their records.
5. Could you please (if available) supply a pluvial flooding map; or any information available from a SWMP, PFRA or similar that may indicate potential flooding issues.
6. We would be interested in any information in your possession on groundwater (e.g. groundwater level) and the potential for groundwater flooding within the area. This includes if the site is located within a source protection zone and whether infiltration would be an appropriate means of disposing of surface water.
7. Are there any water quality issues/requirements for the watercourses on site or downstream that we need to take into account?

We would welcome your comments on any additional issues or concerns you may have involving this site.

We would appreciate an early response, therefore if you require any further information regarding the site to assist with our queries, please do not hesitate to contact me on 0117 930 2055 or Lorena.ramirez@WSPgroup.com.

Best regards

Lorena Ramirez
Graduate Hydrologist

Kings Orchard, 1 Queen St, Bristol, BS2 0HQ
Tel: +44(0)117 930 2055

www.wspgroup.co.uk
www.pbworld.com

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Appendix E

CONSULTATION WITH THAMES WATER

Asset Location Search

WSP Buildings Ltd
Central Purchase Ledger Colston 33
33Colston Avenue
BRISTOL
BS1 4UA

Search address supplied Kidderpore North
Kidderpore Avenue
Hampstead

Your reference N/A

Our reference ALS/ALS Standard/2015_3029209

Search date 29 April 2015

You are now able to order your Asset Location Search requests online by visiting
www.thameswater-propertysearches.co.uk

searchcode

Asset Location Search

Search address supplied: Kidderpore North, Kidderpore Avenue, Hampstead,

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 0845 070 9148, or use the address below:

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

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

Asset Location Search

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.

Asset Location Search

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: 0845 850 2777
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: 0845 850 2777
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2015_3029209

The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 525387,185842

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2503	79.14	75.01
2602	80.34	n/a
2606	80.34	n/a
26CJ	n/a	n/a
3604	n/a	n/a
26CI	n/a	n/a
3601	80.54	75.79
26CH	n/a	n/a
26CG	n/a	n/a
3603	n/a	n/a
1602	80.52	77.66
2603	81.67	76.7
1601	n/a	n/a
3602	83.88	82.09
2701	83.08	76.14
4701	84.53	81.17
17AH	n/a	n/a
17AG	n/a	n/a
17AI	n/a	n/a
17AF	n/a	n/a
171A	n/a	n/a
5001	102.82	97.96
5801	89.6	85.83
5902	98.97	95.43
5601	79.9	76.07
5701	n/a	n/a
591B	n/a	n/a
591A	n/a	n/a
5810	90.28	83.69
591C	n/a	n/a
57BG	n/a	n/a
581A	n/a	n/a
581B	n/a	n/a
57BF	n/a	n/a
57BE	n/a	n/a
581C	n/a	n/a
6601	84.61	76.78
4703	87.94	85.04
3701	93.89	90.71
18CI	n/a	n/a
481B	n/a	n/a
481A	n/a	n/a
1801	n/a	n/a
1802	85.86	77.59
3802	97.58	93.12
191A	n/a	n/a
49AE	0	0
2901	89.17	n/a
5901	95.47	89.09
1901	87.13	78.33
491A	n/a	n/a
4902	100.08	95.55
301A	98.72	97.78
3002	96.05	91.51
401A	100.57	99.6
2002	90.06	82.41
2003	91.21	83.02
1001	88.54	82.76
40AG	n/a	n/a
40AF	n/a	n/a
40AE	n/a	n/a
4001	103.98	100.27
2004	90.99	83.32
40BF	n/a	n/a

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.

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

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

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

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

2) All measurements on the plans are metric.

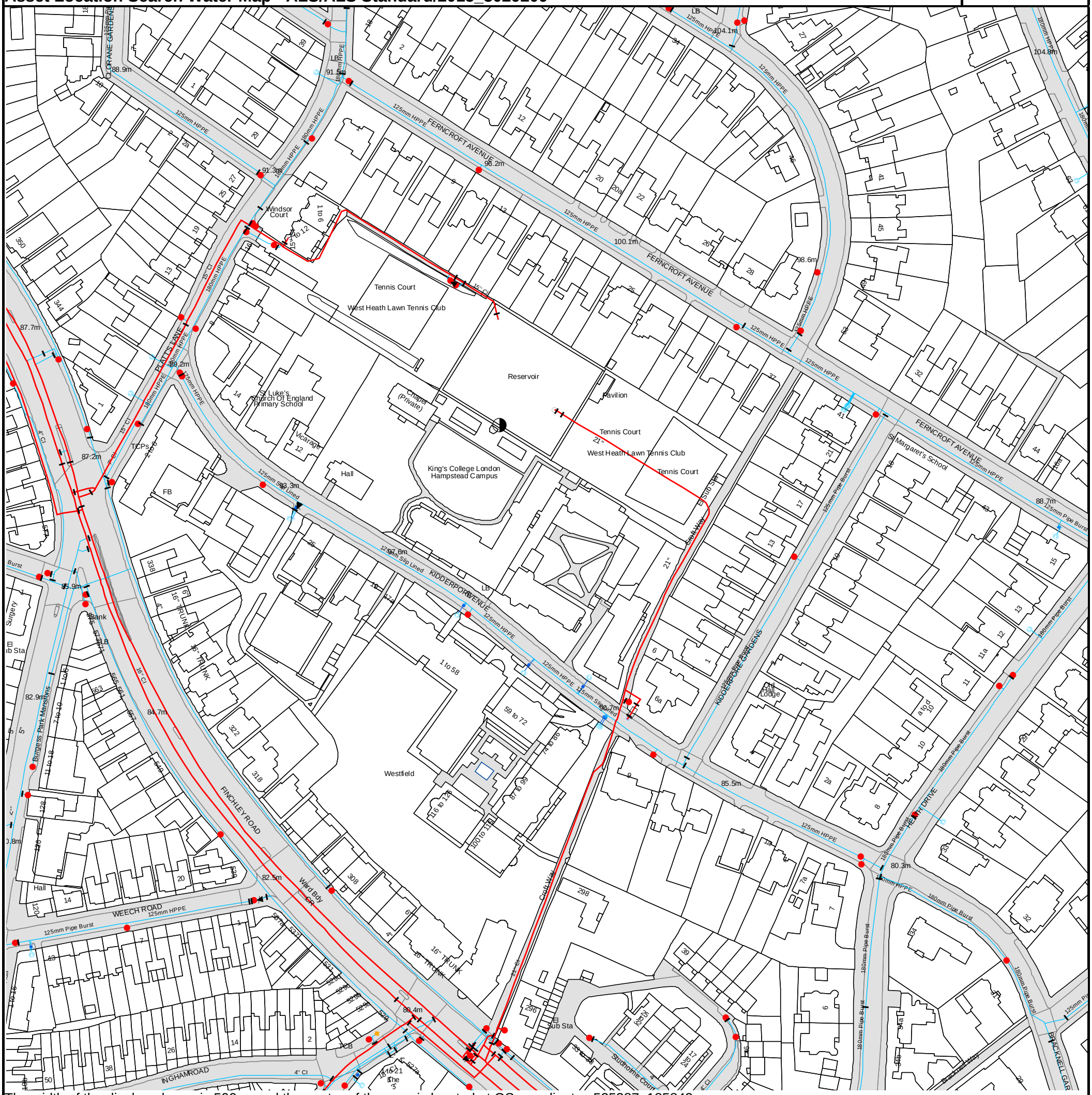
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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

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

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2015_3029209



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 525387, 185842.

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.

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ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

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

16"

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.

3" SUPPLY

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

3" FIRE

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

3" METERED

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.

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

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')

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.

Terms and Conditions

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

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

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

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

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

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

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0845 070 9148** 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	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

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

Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise 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 compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

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

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

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

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Sewer Flooding
History Enquiry

WSP Buildings Ltd

Colston Avenue

Search address supplied Kidderpore North
Kidderpore Avenue
Hampstead

Your reference N/A

Our reference SFH/SFH Standard/2015_3029210

Received date **29 April 2015**

Search date **30 April 2015**

Thames Water Utilities Ltd

Property Searches
PO Box 3189
Slough SL1 4WW

DX 151280 Slough 13

T 0118 925 1504
E searches@thameswater.co.uk
I www.thameswater-propertysearches.co.uk

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

Sewer Flooding

History Enquiry

Search address supplied: Kidderpore North,Kidderpore Avenue,Hampstead

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

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No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Sewer Flooding

History Enquiry

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your 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.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

Thames Water Utilities Ltd

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PO Box 3189
Slough SL1 4WW

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T 0118 925 1504
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Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading RG1 8DB

Ramirez-Romero, Lorena

From: David Cash <david.cash@thameswater.co.uk>
Sent: 05 June 2015 08:18
To: Bansal, Gurdeep
Cc: Ramirez-Romero, Lorena
Subject: RE: Kidderpore Resevoir

Gurdeep

Answers in red below

Regards

Dave

From: Bansal, Gurdeep [mailto:Gurdeep.Bansal@wspgroup.com]
Sent: 04 June 2015 09:42
To: David Cash
Cc: Ramirez-Romero, Lorena
Subject: RE: Kidderpore Resevoir

Good Morning David

Apologies for the chase, I would appreciate it if you would be able to provide comments/details back by tomorrow if possible?

Thanks

Gurdeep Bansal
Senior Engineer

WSP | PARSONS BRINCKERHOFF

WSP House, 70 Chancery Lane, London, WC2A 1AF
Tel: +44 (0)20 7314 5193

From: Ramirez-Romero, Lorena
Sent: 02 June 2015 14:20
To: David.cash@thameswater.co.uk
Cc: Bansal, Gurdeep
Subject: FW: Kidderpore Resevoir
Importance: High

Dear David,

Further to our phone conversation please find below the email sent on the 20th May 2015 by my colleague Gurdeep.

If you require any further information regarding the site, please do not hesitate to contact me on 0117 930 2055 or Lorena.ramirez@WSPgroup.com.

Thanks and best regards,

Lorena Ramirez
Graduate Hydrologist
Tel: +44 (0)117 930 2055

Website: www.wspgroup.co.uk

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From: Bansal, Gurdeep
Sent: 20 May 2015 11:40
To: developer.services@thameswater.co.uk
Cc: Ramirez-Romero, Lorena
Subject: Kidderpore Resevoir
Importance: High

Dear Sirs

We are looking at the redevelopment of a site along Kidderpore Avenue, London. See attached site location plan.

We are aware of the Kidderpore Reservoir located on the northern boundary of the site and that recent upgrade works have been undertaken to improve to reservoir walls/roof and safety which was expected to finish in January 2015. Can you confirm the following information:

- Has the upgrade works now been completed as intended, if so can you confirm exactly what was carried out to improve the reservoir. All work complete. New roof was constructed on the reservoir.
- Has any historical flooding occurred previously from the reservoir. We have been provided with a historical flooding report already by Thames Water (attached) but this makes no reference to reservoir flooding and therefore we would appreciate confirmation. No flooding from this reservoir
- Can you confirm how the system works to ensure no flooding of adjacent properties does not occur from the reservoir itself, i.e. emergency overflow, fully sealed system? Sealed concrete tank. Inspected every week. Fully integrated overflow protection system which trips pumps once high level alarm in reservoir is activated. Tested every 6 months.

I would appreciate a response as soon as possible.

Kind Regards

Gurdeep Bansal
Senior Engineer

WSP | PARSONS BRINCKERHOFF

WSP House, 70 Chancery Lane, London, WC2A 1AF
Tel: +44 (0)20 7314 5193

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For more information please visit http://www.symanteccloud.com

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We provide the essential service that's at the heart of daily life.

Ramirez-Romero, Lorena

From: DEVELOPER.SERVICES@THAMESWATER.CO.UK
Sent: 15 June 2015 10:45
To: Ramirez-Romero, Lorena
Subject: IRef:1012922375 RE: RE: Kidderpore Resevoir

Dear Lorena,

Thank you for your email.

Unfortunately, we have no further information on this, other than the information provided in our asset location plan.

If you have any further queries, please do not hesitate in calling us on 0800 009 3921.

Best regards

Shaun Picart

Thames Water - Development Engineer

0800 009 3921

Original Text

From: lorena.ramirez@wspgroup.com
To: developer.services@thameswater.co.uk
CC:
Sent: 08.06.15 11:09:45
Subject: RE: Kidderpore Resevoir

Dear Sirs,

In addition to the queries below for the site at Kidderpore Avenue, we are also looking at the risk associated with lost rivers in the area. We are aware that the River Kilburn run historically at approximately 140m to the west of the site. The SFRA indicates that this river was culverted in the 19th century and incorporated into the Thames Water sewer network as the Ranelagh Sewer.
Is there any information you can provide in relation to this? Please find attached a location map and the asset location search we requested for this site.

We would appreciate an early response, therefore if you require any further information regarding the site to assist with our queries, please do not hesitate to contact me on 0117 930 2055 or Lorena.ramirez@WSPgroup.com.

Kind Regards,

Lorena

Lorena Ramirez
Graduate Hydrologist
Tel: +44 (0)117 930 2055

Website: www.wspgroup.co.uk

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From: Ramirez-Romero, Lorena
Sent: 02 June 2015 10:08
To: developer.services@thameswater.co.uk
Cc: Bansal, Gurdeep
Subject: FW: Kidderpore Resevoir
Importance: High

Dear Adeel,

Further to our phone conversation please find below the email sent on the 20th May 2015 by my colleague Gurdeep.

Thanks and best regards,

Lorena Ramirez
Graduate Hydrologist
Tel: +44 (0)117 930 2055

Website: www.wspgroup.co.uk

We are WSP. United by our difference.

From: Bansal, Gurdeep
Sent: 20 May 2015 11:40
To: developer.services@thameswater.co.uk
Cc: Ramirez-Romero, Lorena
Subject: Kidderpore Resevoir
Importance: High

Dear Sirs

We are looking at the redevelopment of a site along Kidderpore Avenue, London. See attached site location plan.

We are aware of the Kidderpore Reservoir located on the northern boundary of the site and that recent upgrade works have been undertaken to improve to reservoir walls/roof and safety which was expected to finish in January 2015. Can you confirm the following information:

- Has the upgrade works now been completed as intended, if so can you confirm exactly what was carried out to improve the reservoir.
- Has any historical flooding occurred previously from the reservoir. We have been provided with a historical flooding report already by Thames Water (attached) but this makes no reference to reservoir flooding and therefore we would appreciate confirmation.
- Can you confirm how the system works to ensure no flooding of adjacent properties does not occur from the reservoir itself, i.e. emergency overflow, fully sealed system?

I would appreciate a response as soon as possible.

Kind Regards

Gurdeep Bansal
Senior Engineer

WSP House, 70 Chancery Lane, London, WC2A 1AF
Tel: +44 (0)20 7314 5193

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Appendix F

CONSULTATION WITH LONDON BOROUGH OF CAMDEN

Ramirez-Romero, Lorena

From: Farthing, Amy <Amy.Farthing@camden.gov.uk>
Sent: 02 June 2015 16:03
To: Ramirez-Romero, Lorena
Subject: RE: Kidderpore North - Flood risk consultation

Hi Lorena,

The river Kilburn has been fully culverted into sewer system.

There may be potential for increased ground water flow in areas near to previous rivers (developments within 100m of 'lost rivers' in Camden are required to produce a basement impact assessment where a basement is proposed due to the potential for increased groundwater flows), however Camden does not hold any further specific information on this.

Thanks

Amy Farthing
Sustainability Officer

Telephone: 020 7974 7611

From: Ramirez-Romero, Lorena [mailto:lorena.ramirez@wspgroup.com]
Sent: 01 June 2015 15:23
To: Farthing, Amy; Garner, Harold
Subject: RE: Kidderpore North - Flood risk consultation

Hi Harold and Amy,

Thank you for the information below.

I am also looking at the flood risk associated to lost rivers in the area. I can see from the map attached that the River Kilburn was running very close to the site. Is there any information you can provide in relation to this?

Thanks

Lorena Ramirez
Graduate Hydrologist
Tel: +44 (0)117 930 2055

Website: www.wspgroup.co.uk

From: Farthing, Amy [mailto:Amy.Farthing@camden.gov.uk]
Sent: 23 April 2015 09:58
To: Garner, Harold; Ramirez-Romero, Lorena
Subject: RE: Kidderpore North - Flood risk consultation

Hi Lorena,

Further to Harold's email, please see our planning webpage relating to Sustainable drainage policy requirements.

http://www.camden.gov.uk/ccm/content/environment/planning-and-built-environment/two/planning-applications/making-an-application/supporting-documentation/sustainable-urban-drainage-systems.en

Best wishes

Amy Farthing
Sustainability Officer

Telephone: 020 7974 7611

From: Garner, Harold
Sent: 23 April 2015 09:55
To: Lorena.ramirez@WSPgroup.com
Cc: Farthing, Amy
Subject: FW: Kidderpore North - Flood risk consultation

Hi Lorena

The majority of the information you're requesting is available on our website.

www.camden.gov.uk/flooding for the Flood Risk Management Strategy

http://www.camden.gov.uk/ccm/content/environment/planning-and-built-environment/two/planning-policy/local-development-framework/core-strategy/evidence-and-supporting-documents.en for the 2014 SFRA

Both documents are underpinned by the Preliminary Flood Risk Assessment and Surface Water Management Plan.

Regarding your question about watercourses, we are not necessarily responsible for watercourses or ditches on the site. It is more likely that these are the responsibility of the landowner. We are however responsible for providing any Ordinary Watercourse Consents should you wish to alter them.

I note there is a reservoir adjacent to the site. Reference to any flood risk associated with this should also be considered.

I'd also draw your attention to our planning policies relating to flood risk and basements – also available on the website Camden Planning Guidance 3 and 4 are the key documents
http://www.camden.gov.uk/ccm/content/environment/planning-and-built-environment/two/planning-policy/supplementary-planning-documents/camden-planning-guidance/

If you have any further questions please contact Amy Farthing in copy.

Regards

Harold

Harold Garner
Sustainability manager (technical projects)
Culture and Customers
Culture and Environment
London Borough of Camden

Telephone: 0207 974 2701
Web: camden.gov.uk

5PS
5 Pancras Square
London N1C 4AG

From: Ramirez-Romero, Lorena [mailto:lorena.ramirez@wspgroup.com]
Sent: 22 April 2015 13:09
To: GreenCamden
Cc: Bansal, Gurdeep
Subject: Kidderpore North - Flood risk consultation

Hello,

Could you please pass the email below to the flood risk manager of the area.

Dear Sir/Madam

Kidderpore North, Kidderpore Avenue, Hampstead
Flood Risk Consultation

We are producing a Flood Risk Assessment (FRA) including an outline surface water drainage strategy to support the detailed planning application for the residential re-development of the site above. The site is approximately 1.2 ha in size and is located on the north side of Kidderpore Avenue in Hampstead in the London Borough of Camden. Please find attached a location plan indicating the site for clarity.

The site is currently owned by King's College London and accommodates student housing across 9 buildings, along with Kidderpore and the College Chapel. The proposal to redevelop the site for residential uses includes the demolition of three existing buildings and the retention of six buildings (three listed buildings and three adjacent non-listed buildings). In addition, the Chapel will be converted to a residential facility and a basement for parking will be excavated in the central building of Old House.

We are investigating the potential flood risk issues at the site and are consulting in conjunction with the Environment Agency and Thames Water. We would be most obliged if you could answer the following queries:

1. In your role as lead local flood authority (LLFA) for the area could you please provide details of any known land drainage and surface water issues within the area.
2. In relation to the above, could you also please confirm that you are the sole party responsible for minor watercourses and ditches within the area; and if not what other authorities there are within the area.
3. Could you please provide details on the history of flooding within the area if available, including any flooding from highway systems.
4. Please also indicate whether an up to date Strategic Flood Risk Assessment (SFRA) covers the area.
5. Please also let us know if a Surface Water Management Plan and a Water Cycle Study are available to inform our study.
6. Is there a Preliminary Flood Risk Assessment (PFRA) that informs of Flood Risk within the area?
7. Please let us know if you have any local policies on flood risk and drainage which we should be aware of and should inform our studies.

We would welcome your comments on any issues or concerns you may have involving this site.

We would appreciate an early response, therefore if you require any further information regarding the site to assist with our queries, please do not hesitate to contact me on 0117 930 2055 or Lorena.ramirez@WSPgroup.com.

Best Regards

Lorena Ramirez
Graduate Hydrologist

Kings Orchard, 1 Queen St, Bristol, BS2 0HQ
Tel: +44(0)117 930 2055

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Appendix G

PROPOSED DRAINAGE STRATEGY

Tully De Ath consultants

Feasibility Research

EIA, Flood Risk & Transport Assessments

Urban Planning and Design

Integrated Transport Solutions

Infrastructure Development

Structural Design

Eco and MMC Focused

Drainage Strategy Statement
Kidderpore Avenue. Hampstead, NW3
For
Mount Anvil

11316

Engineering at its Best

Report For

Mount Anvil

Scheme No: 11316

Drainage Strategy Statement for Kidderpore Avenue, Hampstead NW3

Main Contributors

Simon Kaemena

June 2015

Issued By

Simon Kaemena

Approved By

Dr Paul Tittle

Tully De'Ath Consultants, Sheridan House, Forest Row, East Sussex, RH18 5EA
Tel: 01342 828000 Fax: 01342 828001 Email: info@tullydeath.com Web: **www.tullydeath.com**

Contents

Drainage Strategy Statement

1.0 Introduction

Tully De'Ath have been appointed by Mount Anvil to produce a Drainage Strategy Statement for the proposed residential development proposed for the Kings College London Campus (North) site situated on the northern side of Kidderpore Avenue, Hampstead NW3 7ST. This will accompany a planning application that is shortly to be made with respect to this development.

The purpose of this report is to demonstrate to the local planning authority that the proposed development will have adequate drainage and will not increase the likelihood of flooding elsewhere.

The report includes the London Borough of Camden's Surface Water Drainage Pro-Forma completed with respect to this project. This can be found in Appendix E.

The site is in a Flood Zone 1 (very low risk). However it is greater than a hectare in size. Therefore a detailed flood risk assessment is also required at planning stage. This is being produced by WSP consultants. We understand that this Drainage Strategy Report is to be incorporated into the Flood Risk Assessment.

2.0 Location

The site is located in Hampstead in the London Borough of Camden. The site is bounded along its southern edge by Kidderpore Avenue. There is a church to the west and a residential area to the east. Immediately to the north of the site boundary there is a covered Thames Water reservoir and some sports facilities.

The local post-code is NW3 7ST. A site location plan is provided in Appendix A.

3.0 Existing Conditions

Layout & Topography

A topographic survey of the existing development is shown on Drawing 11316-CIV-100 in Appendix B. The site covers a total area of 1.2255Ha and is approximately rectangular in shape (170mx70m) with the longer east-west axis running parallel with Kidderpore Avenue.

The eastern half of the site contains eight buildings each of which provides student accommodation. The names of the buildings are shown on the above-mentioned drawing. Most of these buildings are to be retained and refurbished as part of the proposed redevelopment. Several of the buildings surround a landscaped courtyard in which protected trees are located.

The western half of the site features some extensive garden areas including more trees that are scheduled for retention. There is an existing chapel in the north western corner of the site and a building known as the Queen Mother Hall which also provides student accommodation in the south western corner.

The total impermeable area within the existing site = 5000m² as can be seen on Drawing 11316-CIV-100 in Appendix B.

Drawing 11316-CIV-100 also shows that the site levels generally reflect the vertical alignment of Kidderpore Avenue and the location of the centre of the site on a "finger" of high ground extending into the site from the north. The highest point along the site frontage is at approximately 97.5m AOD at a location 65m from the south-western corner of the site which lies at approximately 94.0m AOD. To the east levels fall at an increasing gradient away from the high point such that the level of the road adjacent to the south-eastern

corner of the site is approximately 90.0m AOD.

On a front to back axis within the site the levels generally also reflect the above regime however there is a level plateau at approximately 97.75m AOD between the chapel and the main buildings. The courtyard surrounded by the main building falls in a south-easterly direction from approximately 94.75m to 93.25mAOD.

Drainage

The local sewer network is shown on the Thames Water sewer mapping provided in Appendix C.

The local sewer network in this part of London consists of combined (foul and surface water) sewers. A 300mm diameter sewer runs westwards along Kidderpore Avenue at a depth to invert of 4m to 5m. The head of this sewer is located at the above-mentioned high-point in the road.

A 900x600 egg-shaped sewer runs eastwards from the high-point in Kidderpore Avenue at a depth to invert of 3m to 4m.

The existing drainage within the site is shown on Drawing 11316-CIV-100 in Appendix B. As can be seen the vast majority of the existing drainage runs southwards and connects to the Thames Water sewers in Kidderpore Avenue. Much of the existing drainage becomes "combined" within the site. To date no surface water connection has been identified for the Queen Mother Hall and no drainage connections have yet been identified for the chapel. No drainage connections have been detected running into the site from adjacent areas.

Whilst there were several water courses passing through the area these have been culverted for many years and now form part of Thames Water's sewer network. The nearest open water course is the River Brent which, at its closest point, runs 2.8km to the north-west of the site.

Ground Conditions

There is no evidence of any existing soakaways within the site. Based upon a Desk Study (Soiltechnics, July 2014) and borehole logs (Soiltechnics, June 2015) received to date the site would appear to be underlain by 6m to 8m of Claygate Member on London Clay. Both materials have a very low soakage potential and will not support the use of soakaways. Evidence of perched water tables was found within the Claygate Member at the time of the site investigation to minimum depth below ground level of 2.7m.

Soiltechnics' Desk Study also suggested that there are possible sources of gaseous contamination within the site albeit to a relatively low extent. We await the results of the recent intrusive investigation work and subsequent laboratory testing in order to clarify this scenario.

4.0 Development Proposals

The proposed development will provide 156 dwellings. The proposals involve the retention of the site's five Grade II statutorily listed buildings. Kidderpore Hall, the Maynard Wing, the Chapel and the old Skeel Library will all be sensitively converted to residential use, and the Summerhouse will be restored in a new location on the site close to the Chapel.

Other unlisted buildings will also be retained and sensitively converted to residential use, namely Bay House, Dudin Brown, and Lady Chapman Hall.

Three existing buildings will be demolished and replaced with new residential buildings. These are Lord Cameron, Rosalind Franklin and the Queen Mother's Hall. All of these buildings will include basement facilities. The replacement buildings will retain the names of the demolished buildings.

Integrated in the Kidderpore Avenue elevation of the reconstructed Queen Mother's Hall will be an access to a basement area where car parking for residents and visitors will be provided. In total 95 spaces are proposed on two basement levels.

A row of seven town houses will be located along the northern side of the car park with an additional town house to be located to the west of the chapel. A row of three residential units known as the Pavillions will be located along the western side of the car park. These will be two-storey in height and will be completely

submerged below ground level at the same levels as the basement car park.

The proposed development will also include residents' facilities and a concierge.

In terms of both the trees and the existing buildings the site is considered to have a very high conservation value and this is reflected in the proposals as agreed to date between the project team and the London Borough of Camden. Accordingly, along with the listed buildings, many of the existing trees will be retained within the proposed site layout. The cobbled terrace area immediately to the east of Maynard House is also to be retained.

The proposed layout is shown on Drawing 11316-CIV-101 in Appendix D. This illustrates that the total impermeable area created by the new development will be 8180m² This figure includes the landscaped areas over the basement car park which for the purposes of drainage design will be considered as impermeable green-roof areas.

5.0 Drainage Proposals

5.1 Discharge of Surface Water

The most favourable form of surface water discharge involves the retention of surface water within the development, where it is allowed to soak into the underlying ground. This requires suitable permeable and un-contaminated ground conditions beneath the site. In addition maximum ground water levels should be at least 8m to 10m below ground level. However in view of the poor ground infiltration conditions as reported in Section 3, above ground infiltration will not be feasible and the new development will need to drain away from the site. This will replicate the existing surface water regime.

As there are no water courses available within the vicinity the proposed development will need to drain into the existing sewer networks as is the case with the existing site.

5.2 Flows, Volumes and Attenuation

5.2.1 Comparison of Impermeable Areas

The relative existing and proposed impermeable areas (see Appendices B and D) are as stated below.

Existing Impermeable Area = 5000m^2

Proposed Impermeable Area = 8180m^2

Therefore the total impermeable area associated with the proposed development will represent an increase of 3180m² (63.6%) from that associated with the original development.

5.2.2 Requirements for the Control of Surface Water Flows from the Development

In line with the London Borough of Camden's current guidance, designers should aim for surface water runoff rates not to exceed the calculated greenfield run-off rate for each respective storm event up to and including the critical 1in100 year event. The guidance further advises that, as an absolute maximum, discharge rates associated with the proposed development should not exceed 50% of the existing run–off rate for each respective storm event. This will apply to all storm events falling on the proposed development up to and including the 1in100 year event with an additional 30% intensity added for climate change.

The greenfield discharge rates for this site (1.2255Ha) have been calculated using Micro Drainage software's Source Control programme IH124. The greenfield rates and absolute maximum permitted outfall rates are:

Table 5A

Storm Return Period	Greenfield Rate	Absolute Max Outfall Rate (50% of existing)
Qbar	4.7l/s	/
1 in 1 year	4.0l/s	34.7l/s
1 in 30 year	10.7l/s	78.5l/s
1 in 100 year	15.1l/s	100.0l/s

The above details are also included in Section 3 of the London Borough of Camden's Drainage Assessment Form as included in Appendix E. The calculation details are shown on MD/01 and Hand/01, 02 as included in Appendix F.

Design modelling will also need to show that the above 1in100 year maximum flow rate is not exceeded by all 1in100 year storm events with an additional 30% intensity to allow for climate change.

Flow control that complies with the above parameters is normally provided by a "complex control". This would be located within a man-entry chamber with a vortex flow control device such as a Hydrobrake located at invert level and an orifice plate located at a higher level within the chamber.

As discussed in Section 4.0 the proposed development consists of a mixture of new buildings and the refurbishment of existing buildings. As can be seen on Drawing No 11316-CIV-101 in Appendix D the six accommodation buildings in the centre of the site are to be retained. This drawing also shows that much of the drainage for these buildings runs internally and becomes combined (foul and surface water) prior to emerging at the site frontage and connecting to the sewer network. Accordingly the flow control and attenuation of the flows entering these drainage networks will not be feasible in view of their foul content.

It would however seem feasible to intercept some of the surface water down-pipes and gullies around these buildings prior to their connection into the combined system where there are no overriding conservation issues such as protected trees and terrace areas adjacent to the building. The areas from which these potential connections could occur are shown on Drawing No 11316-CIV-101 in Appendix D. These assumptions will, however be subject to further drainage survey work involving CCTV surveys of the various connections in order to determine their existing condition.

In spite of the interception of some of the surface water connections on the retained buildings we have estimated that a total impermeable area of 1605m² will continue to discharge via the existing combined connections to the frontage of the retained buildings. This area will have peak discharges as tabulated in the central column of Table 5B below (see calculations on Hand/02 in Appendix F). In order to comply with the maximum discharge requirements as stated in the right-hand column of Table 5A above, (as repeated in the left hand column of Table 5B below), the maximum discharge from the remainder of the proposed development must therefore not exceed the rates as stated in the right-hand column of Table 5B below.

Table 5B

Storm Return Period	Absolute Max Permitted Outfall Rate From Development	Flow From Un-Attenuated Areas of Existing Building (1605m^2)	Absolute Max Permitted Discharge From Other Areas (Controlled Flows)
1 in 1 year	34.7l/s	22.3l/s	12.4l/s
1 in 30 year	78.5l/s	50.4l/s	28.1l/s
1 in 100 year	100.0l/s	64.2l/s	35.8l/s
1 in 100 year + 30%	100.0l/s	83.5l/s	16.5l/s

5.2.3 Requirements for the Control of Surface Water Volumes from the Development

Inevitably the volume of run-off from an impermeable area, irrespective of flow control and attenuation, will exceed that associated with the same area of permeable, greenfield land unless a means of disposal of the excess volume can be found within the site. The principle means of on-site disposal of excess surface water volumes is ground infiltration. However, as discussed in Sections 3 and 5.1 above this is not feasible at this site.

The London Borough of Camden's surface water pro-forma for new developments is supported by "Rainfall Runoff Management for Developments" (DEFRA & EA – 2012). This advises that rainwater run-off volumes from new developments should ideally not exceed those associated with the site in its original greenfield, un-developed state.

The London Borough of Camden's Pro-Forma also reflects this requirement and adds that if it is the case that volumes exceed those associated with the green field site they must not exceed existing volumes of run-off. The DEFRA & EA publication however acknowledges that, in some instances where ground infiltration is not feasible, it is not technically feasible to avoid an increase in the volume of run-off from the developed site. In such instances a more stringent form of flow control and attenuation than that discussed in Section 5.2.2 is imposed requiring all surface water discharges from the site not to exceed a rate of 2l/s/Ha or Qbar depending upon which is the higher rate. This applies to all storms with a return period of up to and including 1in100 years with an additional 30% intensity added for climate change. The attenuation required in this instance is referred to as "long-term" attenuation. Flow control is generally provided by a single vortex flow control device with no additional orifice plate to increase flows in severe storms. In the case of this development Qbar (4.7l/s) would be the appropriate rate.

The above flow control and long-term attenuation requirement is further modified within the DEFRA & EA publication by recognition of the fact that the incorporation of flow control outlets below 75mm in diameter introduces an increased risk of blockage to the system. This diameter equates to a flow-rate of approximately 5l/s for a vortex flow control device although the actual figure varies with the head of water above the device. This flow rate is generally accepted as the minimum achievable within flow control attenuation systems if the risk of blockage is to be reduced to an acceptable level. It is worth also noting here that the many water authorities will not accept the incorporation of vortex flow control devices or other orifices with outlets smaller than 100mm into their adopted networks.

Due to the increase in impermeable area that will be associated with this development and the lack of any ground infiltration options volumes of surface water discharging from the proposed development will exceed those associated with the existing development albeit that the increase will be reduced by the inclusion of various SuDS options as discussed in Section 5.2.5 below. The increased volumes are detailed in Section 5 of the London Borough of Camden Pro Forma in Appendix E.

Accordingly whilst certain “retained” impermeable areas will discharge unconstrained the majority of the proposed development will drain via “long-term” attenuation storage in accordance with the above-mentioned DEFRA & EA publication. This discharge will take place via two outfalls at either end of the site. Each outfall will discharge at a maximum controlled flow rate of 5l/s therefore restricting flows from the majority of the site to a maximum value of 10l/s for all storms with a return period of up to and including 1in100 years with an additional 30% intensity added for climate change.

5.2.4 Drainage Strategy – Flow Control, Attenuation and Outfalls

Clearly in view of the above requirements, the increase in impermeable area and the poor ground infiltration parameters present at the site there will be a need to both control flows and attenuate excess surface water volumes. The proposed regime for discharging surface water from the site will be as follows and as shown on our Drawing No 11316-CIV-102 in Appendix D. The stated strategy also reflects the topography of the site in terms of the falls away to the west and east from a central high point.

Western Section of Site

Flows from the impermeable areas here, totalling 4300m² and including some of the existing roof areas on the retained buildings, will be directed to a flow control facility to be located at the front of the Queen Mother Hall. A vortex flow control device within the flow control chamber will control flows to a maximum rate of 5l/s and will discharge via a new connection to be provided into the existing 300mm dia sewer that runs westwards along Kidderpore Avenue.

We have calculated that a long-term attenuation storage volume of 210m³ will be required here. Due to the presence of the underground parking structure and the various tree-root protection zones, there are very limited options for the location of the attenuation storage facility in this section of the site. However, as can be seen on Drawing 11316-CIV-102, the required volume will be provided within a 2.4x2.4m culvert to be located at depth adjacent to the southern and eastern faces of the Queen Mother Hall over a total length of approximately 37m.

The relevant calculations are provided on sheets MD/02 to MD14 in Appendix F.

It should be noted that some of the drainage connections will need to run within the basement parking as suspended drainage.

One area that will not be able to drain to the control chamber via gravity due to its depth is the submerged light well to the rear of the Pavillion units. Flows from this area (approximately 100m²) will need to be pumped. Noting that a foul pump facility will also be required for these units and the basement car park in general it may be best to channel flows from here to a single combined pump facility. Alternatively a separate surface water facility could be provided discharging into the on-site gravity network and subsequently the attenuation facility.

Central Section of Site

Section 5.2.2 above discusses how a proportion of the impermeable area associated with the existing buildings to be retained in the central section of the site will discharge un-attenuated via the three existing combined connections along the building frontages. This is as shown on Drawing 11316-CIV-102.

Eastern Section of Site

Flows from Rosalind Franklin and Lord Cameron Houses will discharge to a flow-control and attenuation facility to be located beneath the vehicular access road that will run into this section of the site. This facility will also cater for flows from certain roof areas on the retained buildings from which the existing surface water drainage can be intercepted. The total impermeable area draining via this route will be 2275m².

Rainwater downpipes from the eastern side of Cameron House and from the northern end of Rosalind Franklin House will need to be connected to the attenuation facility via suspended drainage passing through the bin and cycle store basement areas within these two buildings.

There are several light wells located around these two buildings from which surface water pumping will be required. In view of the proposed floor and patio levels along the eastern side of Rosalind Franklin House an area of approximately 425m² will require a surface water pump-facility in order to provide the necessary drainage connection to the attenuation unit.

The maximum long-term attenuation storage requirement is 97m³. Storage will be provided by a buried 2.0x1.5m deep culvert approximately 32.5m in length beneath the access road. Flows, controlled to a maximum rate of 5l/s by a vortex flow control device, will discharge into the existing 225mm diameter surface water drain that runs eastwards along the site frontage and which continues into the adjacent property at the south-eastern corner of the site.

The relevant calculations regarding the attenuation facility are provided on sheets MD/02 to MD/05 and MD/15 to MD/23 in Appendix F

Generally it should be noted that where it is proposed to re-utilise existing sewer connections or on-site drainage a CCTV survey should be carried out to verify the condition of the existing pipe-work.

Summary of Flows from Development

In view of the above proposals and as demonstrated by the calculations the combined peak flows for the two "attenuated" sections of the development will not exceed 9.9l/s for all rainfall events with a return period of up to and including 1in100 years with an additional intensity of 30% added for future climate change. This flow rate significantly less than the absolute maximum permitted controlled flow rates in the right-hand column of Table 5B. Flow rates from the developed site will therefore comply with the London Borough of Camden's minimum requirement that discharge rates from a new development should not exceed 50% of existing. This is further summarised in Section 4 of the London Borough of Camden's Drainage Pro-Forma in Appendix E and on Hand/05 in Appendix F.

It is worth noting that 80.4% of the total impermeable area within the redeveloped site will drain via the attenuation facilities described above.

5.2.5 Drainage Strategy - SuDS

In addition to, and if possible in place of, the standard piped methods of drainage within a development various Sustainable Drainage Systems (SuDS) can be incorporated into a drainage network to both reduce surface water flow-rates and volumes. Other potential benefits are as follows:

- Encourage natural groundwater re-charge
- Reduce pollutant concentrations in storm water
- Provide habitats for wildlife.

Prior to the determination and final calculation of how much surface water flow attenuation and volume reduction is achievable within this development we have firstly considered the SuDS methods that are feasible in view of the various constraints that exist here. Those that are feasible have been incorporated into the drainage strategy for the development as is shown on our Drawing No 11316-CIV-102 in Appendix D.

Ground Infiltration

As discussed in Section 3 of this report there is insufficient permeability within the ground beneath the site for this method of drainage to be considered.

Rainwater Harvesting

Rainwater harvesting entails the provision of buried tanks that store filtered rainwater. The rainwater is then pumped into the domestic network for non-potable use such as irrigation for gardens, toilet flushing and clothes washing. Unfortunately the rainwater harvesting systems currently available do not cater for the catchment of surface water from non-roof external surfaces such as roads, car parks and pedestrian areas due to the increased levels of treatment required. The inclusion of rainwater harvesting can therefore increase the

complexity of the required surface water drainage network and thus the environmental impact involved in its construction. The complexity of the internal water services within buildings is also increased considerably.

In terms of the appraisal of the reduction in volumes leaving the site rainwater harvesting will provide a reduction on a long-term annual basis. However the volumes associated with a 6Hour 1in100 year storm may potentially not be reduced in any way by rainwater harvesting if the tanks are already full at the time at which the storm event occurs.

There are further longer-term environmental implications involved in the potential electrical consumption associated with rainwater harvesting. Rainwater harvesting will therefore not be provided.

Green/ Brown Roof

Green or brown roofs involve various types of soil and vegetation cover of roof areas including an underlying drainage blanket linked to the rainwater down-pipes. In dry climatic conditions they can reduce the volume of run-off from roof areas due to the water demand of the vegetation. They also attenuate peak flows from roof areas. By their very nature they are much better suited and considerably more effective with regards to flat, non-pitched roof areas.

Within the Kidderpore development the existing and many of the proposed buildings will have pitched roof areas therefore precluding the use of green or brown roofs. However the below-ground car park and the pavilion units in the western section of the site will both have ground level green roofs. Flows from the underlying drainage blankets in the landscaped roof cover to the basement parking and the Pavillion units will be intercepted around the edges of the basement plan areas by a collector drainage system similar in many respects to a land drainage system. This will subsequently connect into the flow-control attenuation system for the western section of the site to be provided adjacent to the Queen Mother Hall.

Similarly the single storey unit to be constructed immediately to the north of Skeel House will be provided with a green roof. This will be connected into the flow-control attenuation system for the eastern section of the site.

Permeable Paving

Permeable paving allows rainwater to infiltrate through a hard-standing surface into an underlying storage/filtration sub-base layer. The water can then either soak into the ground beneath the paving via a permeable geotextile or migrate through the permeable sub-base into a separate infiltration device (soakaway).

Alternatively, as will be the case for this development, surface water will infiltrate through the permeable paving construction and be collected by a permeable piped drainage network with both the drainage and permeable construction underlain by an impermeable geotextile.

Permeable paving can both improve water quality particularly beneath vehicular areas and provide attenuation storage for surface water. It can also attenuate peak flow rates and reduce volumes such that less attenuation storage is required elsewhere within the drainage network.

It is proposed that permeable paving will be used beneath the proposed vehicular access road into the site between Dudin Brown and Lord Cameron Houses. Similarly a permeable surface will be provided for the proposed hardstanding area to be provided at the eastern end of the chapel.

Swales, Ponds and Wetlands

These facilities can range from depressions in grassed areas that can remain dry to permanent ponds with the water level increasing during periods of rainfall. Excess surface water is subsequently discharged via a combination of evaporation and/or soakage and/or controlled discharge. In the right circumstances these facilities can also provide aesthetic and amenity value.

As with many developments in a relatively urban area it is difficult to accommodate SuDS

such as this in view of the limited space available noting also the need to protect many of the existing trees. It should also be appreciated that some of the residents will be young families with children. Ponds and semi-wet areas could potentially create a health and safety hazard in this environment.

Accordingly this form of SuDS will not be incorporated into the development.

Summary of SuDS

As advised above a large area of green roofing and some permeable paving will be incorporated into the western drainage network. Similarly areas of green roof and permeable paving will be incorporated into the eastern drainage network.

These facilities will attenuate the flow of surface water to the main long-term storage facilities thus helping reduce the size of the storage required. Perhaps more importantly they will also reduce the volume of water running off from the site due to absorption and long term evaporation. These benefits have been assessed within the Micro-Drainage modelling of the drainage networks as presented in Appendix F.

5.2.6 Volumes of Surface Water Run-Off

Utilising the Micro-Drainage Source Control Software we have appraised the volumes of surface water discharging from the site during a 6Hour 1in100 year storm event allowing not only for the proposed impermeable area but also the SuDS facilities discussed above. The results are presented in Sections 5 and 6 of the London Borough of Camden's Surface Water Drainage Pro-Forma as provided in Appendix E and as supported by the calculations on Hand/03,04 and MD/02 to MD/23 in Appendix F. The volume calculations are also summarised on Hand/05 in Appendix F.

As predicted in the absence of any available ground infiltration capabilities volumes of surface water run-off from the site will increase in comparison with the existing condition in spite of some reduction associated with the use of green roofs and permeable paving. This explains why the stringent long-term attenuation and flow control facilities have been provided as further discussed in 5.2.3 above.

5.3 Exceedance Storm Events

Proposed site levels including building finished floor levels will be set such that a storm event with a probability of return greater than a 1in100 year plus 30% (for climate change) will discharge from the site without flooding the buildings. The key locations at which surface water will surcharge above ground level and the routes that this water will subsequently take are indicated on Drawing No 11316-CIV-102 in Appendix D. These are similar to the exceedance routes associated with the existing site. Noting also that the existing drainage will not have been designed to accommodate storm events of the severity that will be considered within the detailed design for the proposed development the frequency of any such events should decrease in comparison with the current scenario.

5.4 Foul Drainage

Foul drainage from the proposed development will be connected, mostly by gravity, into the existing Thames Water sewer network the layout of which is shown in Appendix C and on Drawing No 11316-CIV-102.

A total of 156No residential dwellings will be provided by the new development. The existing development provides accommodation for 281No students. Peak foul flow rates generated by the proposed development will therefore increase from approximately 4.4l/s to 7.2l/s.

This relatively small increase in peak discharge of 2.8l/s should not present an issue with respect to capacity within Thames Water's local combined sewer network noting in particular that the local sewers lie at the head of the network and noting also that the comparatively much greater levels of surface water discharge from the site will be decreasing in accordance with the surface water proposals discussed above.

A pump facility will be required for the drainage of any foul connections located on the lower floor of the car park basement including those on the lowest floor within the Pavillion units. The ground floor on eastern side of Rosalind Franklin House will also require a foul pump facility as there is likely to be insufficient fall to the 900x600mm sewer from this location.

In accordance with Thames Water's requirements the final connection of any private pump facilities will need to run as a gravity drain from a rising main outfall chamber within the site.

6.0 Maintenance

6.1 Proposed Drainage

Maintenance of any drainage scheme is essential to ensure that it continues to perform as designed. Within the site's 'Health and Safety File' details of routine maintenance inspections should be included together with guidance as to how they should be undertaken, and at what intervals and/or events.

Generally the below-ground surface water drainage requires regular inspection and clearing to prevent blockages due to accumulation of silt. Trapped gullies, flow control devices and catch-pits should be inspected and cleared of silt and permeable paving surfaces should be jetted in order to remove silt from the open joints between the blocks.

It is recommended that all elements within the private sections of the proposed drainage network are initially inspected and cleared by a suitably trained person every six months for at least the first two years of operation in order to establish a long-term inspection/clearing interval appropriate for this site. Inspection/clearing should also be carried out after every major storm event.

We are advised that responsibility for this maintenance work will lie with our client's site management company.

6.2 Existing Sewers

It is important that the existing sewers and highway drains (road gullies) in the area are regularly maintained by Thames Water and Camden Highways respectively.

7.0 Conclusions

This Drainage Strategy Statement has demonstrated the following:

7.1 Surface Water Drainage

7.1.1 The redevelopment of the site will increase the impermeable area from 5000m² to 8180m². Therefore, if left uncontrolled, the likelihood of flooding from surface water discharging from the site towards lower lying areas will be increased due to the potential increase in flow rates and volumes. This report has detailed the means by which flow rates and volumes can be controlled so as not to increase flood risk.

7.1.2 In determination of this surface water drainage strategy the high-profile conservation aspects of the project have needed to be considered. Several listed buildings are to be retained along with protected trees. These issues have, to a large extent, dictated what is and isn't feasible in terms of providing controlled drainage flows from the site.

7.1.3 Ground infiltration is not feasible as a means of surface water discharge from this development. Therefore all surface water drainage will connect via gravity to the adjacent Thames Water sewer network as is currently the case. Accordingly, most of the surface water draining from the site will be attenuated (temporarily stored) on site within two storage

tanks formed by pre-cast concrete culverts. In recognition of the increased volumes discharging from the site discharge will be limited via two flow control chambers to a maximum combined rate of 9.9l/s for all storm events up to and including the 1in100 year storm with an additional 30% intensity considered to allow for future climate change.

7.1.4 Due to the layout of the existing combined drainage serving the buildings that are scheduled to be retained an existing roof area 1605m² (19.6% of impermeable area) will continue to drain from the site un-attenuated. However, due to the flow controls applied to the rest of the site, the total surface water flow rates discharging from the site will be less than 50% of existing peak flow rates.

7.1.5 The proposed incorporation of green roof areas within the development along with permeable paving will help reduce volumes of surface water run-off from the development and will also help reduce the attenuation storage requirement.

7.1.6 Due to certain proposed site levels surface water pump facilities will be required to serve various light wells and the eastern side of Rosalind Franklin House.

7.2 Foul Drainage

7.2.1 Foul drainage will connect, mostly via gravity, to the existing sewers. However pumped connections will be required in order to serve the below ground foul facilities in the western section of the site and the ground floor units on the eastern side of Rosalind Franklin House.

7.2.2 Peak foul flows will increase by approximately 2.8l/s. This should not present a problem in view of the much greater decrease in surface water flows to the same sewer network.

7.3 Maintenance

7.3.1 The surface water drainage including the SuDS elements will need to be maintained regularly in order to retain its effectiveness. This maintenance will be carried out by our client's management company.

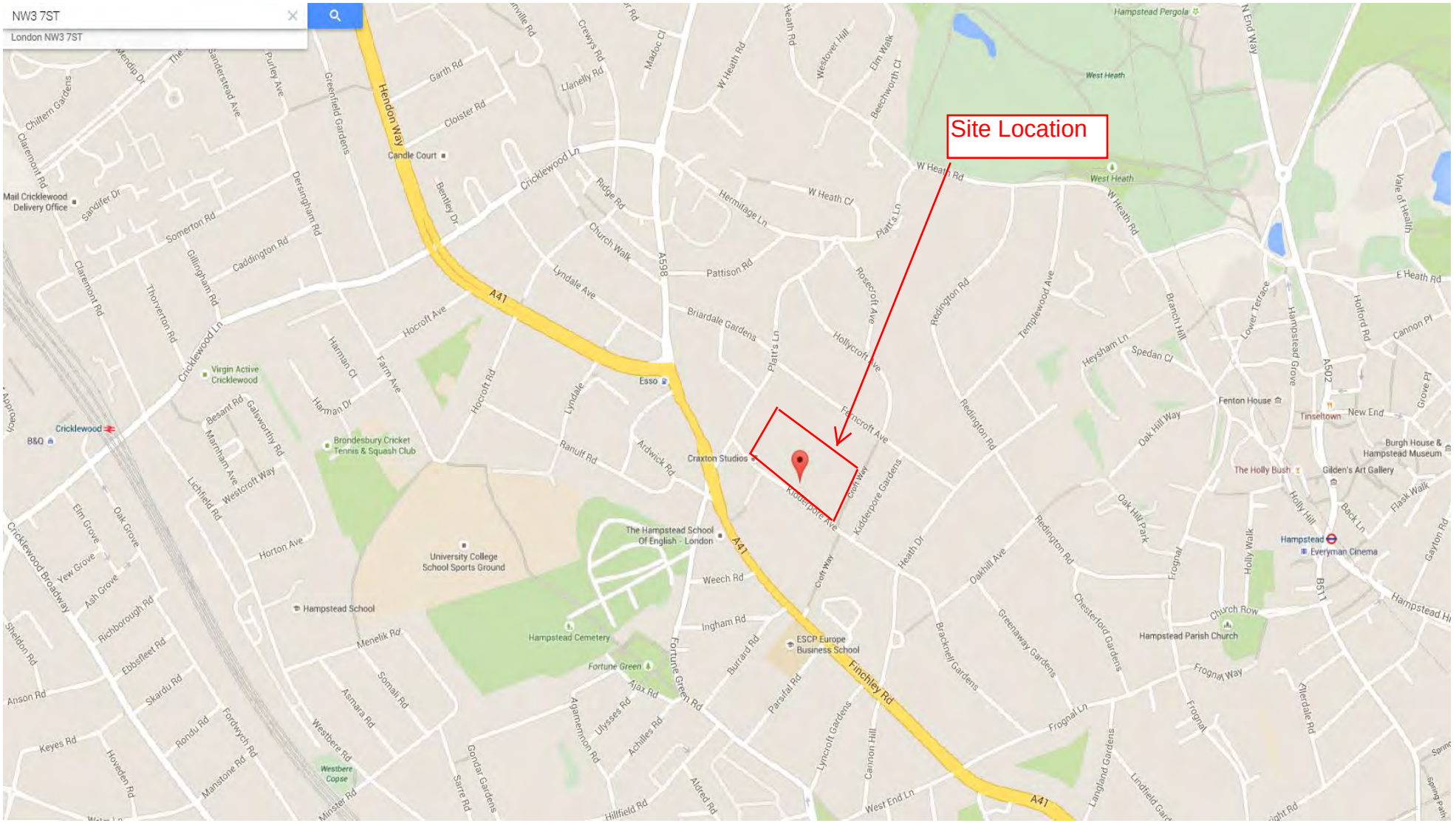
Signed by:

Simon Kaemena

Date: **June 2015**

For and on Behalf of Tully De'Ath Consultants Ltd

Appendix A - Site Location Plan


NW3 7ST
London NW3 7ST
Site Location
Hendon Way
A41
Finchley Rd
A598
A502
B511
Cricklewood Ln
Cricklewood Broadway
Hocroft Ave
Hocroft Rd
Lyndale
Lyndale Ave
Farm Ave
Harman Cl
Harman Dr
Besant Rd
Galsworthy Rd
Marnham Ave
Westcroft Way
Lichfield Rd
Horton Ave
Menelik Rd
Somali Rd
Asmara Rd
Westbere Rd
Westbere Copse
Sarre Rd
Gondar Gardens
Minster Rd
Hillfield Rd
Alfred Rd
Agamemnon Rd
Ulysses Rd
Achilles Rd
Ajax Rd
Fortune Green
Fortune Green Rd
Hampstead Cemetery
Hampstead School
University College School Sports Ground
The Hampstead School Of English - London
Weech Rd
Ingham Rd
Burrard Rd
Parsifal Rd
Lyncroft Gardens
Cannon Hill
West End Ln
ESCP Europe Business School
Craxton Studios
Ardwick Rd
Ranulf Rd
Kidderpore Ave
Kidderpore Gardens
Croft Way
Heath Dr
Platt's Ln
Pattison Rd
Briardale Gardens
Hollycroft Ave
Fitzjohn's Ln
Ridge Rd
Church Walk
Hermitage Ln
W Heath Cl
W Heath Rd
Platt's Ln
Rosecroft Ave
Redington Rd
Templewood Ave
Heysham Ln
Spedan Cl
Branch Hill
Lower Terrace
Hampstead Grove
Holford Rd
Cannon Pl
E Heath Rd
Vale of Health
N End Way
West Heath
Hampstead Pergola
Fenton House
Tinseltown
New End
Grove Pl
Burgh House & Hampstead Museum
The Holly Bush
Gilden's Art Gallery
Flask Walk
Back Ln
Holly Hill
Holly Walk
Hampstead
Everyman Cinema
Gaylon Rd
Hampstead H
Oak Hill Way
Oak Hill Park
Oakhill Ave
Frognal
Frognal Way
Frognal Ln
Church Row
Hampstead Parish Church
Chesterford Gardens
Greenaway Gardens
Bracknell Gardens
Langland Gardens
Lindfield Gard
Fleetdale Rd
Esso
Virgin Active Cricklewood
Brondesbury Cricket Tennis & Squash Club
Cricklewood
B&Q
Mail Cricklewood Delivery Office
Candle Court
Garth Rd
Cloister Rd
Crewys Rd
Llanelly Rd
Madoc Cl
Westover Hill
Elm Walk
Beechworth Cl
Greenfield Gardens
Purley Av
Sunderstead Ave
Chiltern Gardens
Claremont Rd
Sandifer Dr
Somerton Rd
Gillingham Rd
Caddington Rd
Dersingham Rd
Thorverton Rd
Bentley Dr
Elm Grove
Oak Grove
Yew Grove
Ash Grove
Richborough Rd
Ebbsfleet Rd
Skardu Rd
Rondu Rd
Fordwych Rd
Manstone Rd
Keyes Rd
Hoveden Rd
Sheldon Rd
Anson Rd

Appendix B – Existing Site Layout and Drainage

General Notes:

1. Any indication of site boundaries is to be considered diagrammatic. This Engineering Layout is based upon layouts prepared by others and our details are not in themselves intended to be any definition of land ownership.
2. The underlying survey information has been provided by Murphy Surveys (July. 2014). Tully De'Ath cannot be held responsible for any inaccuracies therein.
3. Only impermeable areas draining to the sewer network are shown. Impermeable areas draining to landscaping are not shown.

The Chapel
Area = 210m²

Queen Mother Hall
Area = 230m²

Kidderpore Hall

Bay House

Maynard House

Area=2755m²

Lady Chapman Hall

Rosalind Franklin

Area=60m²

Skeel House

Dudin Brown House

Area=1745m²

Lord Cameron

300ø

900x600

KIDDERPORE AVE

MHREF 3802
CL = 97.58
IL = 93.12

MHREF 3701
CL = 93.89
IL = 90.71

N

LEGEND

Impermeable Area to be retained within proposed development.
= 2965m²

Impermeable Area to be removed/reconstructed within proposed development. = 2035m²

Total Impermeable Area = 5000m²

Existing Combined Sewer

Existing Storm Sewer

Existing Foul Sewer

Existing Outfall (exact routes to be confirmed)

Existing Adopted Combined Sewer

Site Boundary

REV	DATE	DESCRIPTION	BY	CHK'D
A	26.06.15	Key amended. Hatching of chapel amended. Figures for areas amended.	SFK	

MOUNTAINVIL

TITLE:
Existing Site Layout Drainage & Impermeable Areas

PROJECT:
Kidderpore Avenue, NW3

SCALE: 1:200@A0 DATE: June 2015 DRAWN: JSR CHK'D: SFK

JOB NO. DRG NO. REV.

11316–CIV–100 A

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Appendix C – Thames Water Sewer Records

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
2901	89.17	n/a
3802	97.58	93.12
4902	100.08	95.55
491A	n/a	n/a
49AE	0	0
0801	88.37	81.2
0901	n/a	n/a
1803	88.57	n/a
191A	n/a	n/a
1901	87.13	78.33
1802	85.86	77.59
1801	n/a	n/a
25DA	n/a	n/a
2701	83.08	76.14
26CG	n/a	n/a
26CH	n/a	n/a
26CI	n/a	n/a
26CJ	n/a	n/a
2602	80.34	n/a
2606	80.34	n/a
25FA	n/a	n/a
35BE	n/a	n/a
35CF	n/a	n/a
3603	n/a	n/a
35BH	n/a	n/a
35AJ	n/a	n/a
35BI	n/a	n/a
35BA	n/a	n/a
35CG	n/a	n/a
3601	80.54	75.79
35DE	n/a	n/a
35AI	n/a	n/a
35DA	n/a	n/a
35CH	n/a	n/a
35CB	n/a	n/a
35BF	n/a	n/a
35BG	n/a	n/a
3501	76.74	73.19
35CC	n/a	n/a
45AG	n/a	n/a
44BD	n/a	n/a
451A	n/a	n/a
45AH	n/a	n/a
45BD	n/a	n/a
35CE	n/a	n/a
35CD	n/a	n/a
3502	77.59	75.9
35BD	n/a	n/a
35BC	n/a	n/a
35BB	n/a	n/a
3604	n/a	n/a
3602	83.88	82.09
4701	84.53	81.17
4703	87.94	85.04
3701	93.89	90.71
481B	n/a	n/a
481A	n/a	n/a
0501	75.42	74.43
0502	77.06	75.53
1503	78.29	71.46
16BG	n/a	n/a
16BF	n/a	n/a
16BE	n/a	n/a
16BH	n/a	n/a
171A	n/a	n/a
1601	n/a	n/a
1602	80.52	77.66
18CI	n/a	n/a
17AF	n/a	n/a
17AG	n/a	n/a
17AH	n/a	n/a
17AI	n/a	n/a
2503	79.14	75.01
2603	81.67	76.7
2501	78.53	74.75
0902	86.08	n/a
0802	89.08	82.08

SURVEY SAYS 86.98 m

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.

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

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

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

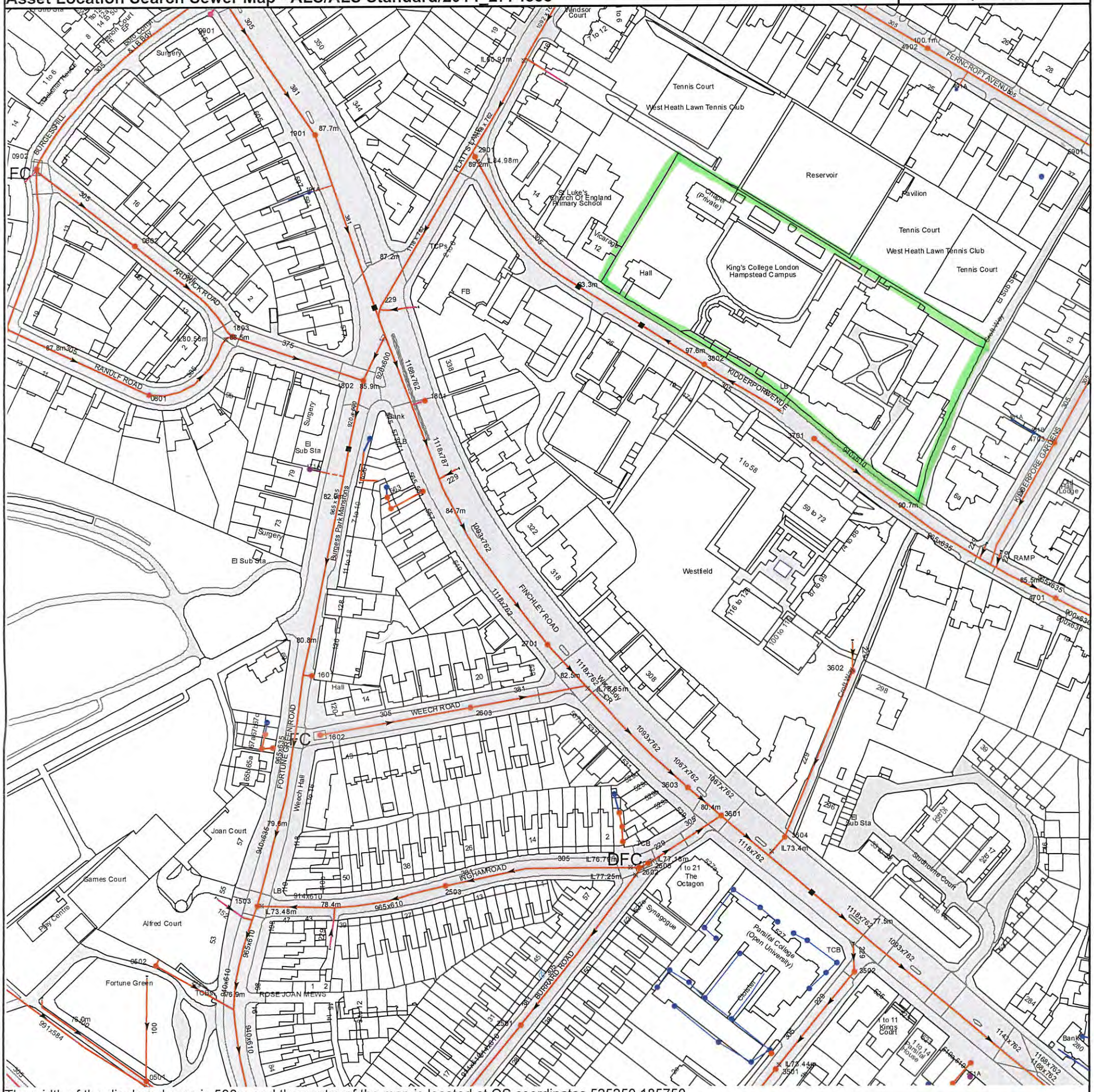
Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Sewer Map - ALS/ALS Standard/2014_2774333

TQ2585NW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 525250,185750

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.

Appendix D – Proposed Site Layout and Drainage Strategy