LUSTRE CONSULTING

14 ELDON GROVE, CAMDEN

DRAINAGE ASSESSMENT

This report forms part of a wider Basement Impact Assessment

JUNE 2014

1303/ML/06-14/214

14 ELDON GROVE, CAMDEN
DRAINAGE ASSESSMENT

JUNE 2014

REPORT REF: 1303/ML/06-14/214

CLIENT: Schneider Designers Ltd

CONSULTANT: Lustre Consulting Limited
Admiral's Offices
The Historic Dockyard
Chatham
Kent
ME4 4TZ

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Report Prepared By:

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Report Reviewed By:

……..
M Larkin BSc (Hons) MSc
Senior Consultant

CONTENTS

APPENDICES

REGISTRATION OF AMENDMENTS

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By

1.0 INTRODUCTION

1.1 Lustre Consulting has been instructed by Schneider Designers Limited to carry out a Drainage Assessment for a proposed basement development at 14 Eldon Grove in the London Borough of Camden.

1.2 The site, which currently comprises a semi-detached three storey residential building with an existing basement (beneath the rear part of the property) and loft conversion, is being considered for a basement extension (beneath the front part of the property). It is understood that a planning application has been submitted to the London Borough of Camden for the basement development, which will provide an additional self-contained residential basement apartment to the building.

1.3 Basement developments within the London Borough of Camden have to comply with several internal policies and Planning Guidance, namely:

- Local Development Framework (LDF) DP23 Water (Ref. 1)
- Local Development Framework (LDF) DP27: Basements and lightwells (Ref. 2)
- Camden Planning Guidance (CPG 4) Basements and lightwells (Ref. 3)

1.4 The various investigations and assessments required by these documents form a Basement Impact Assessment (BIA). This Drainage Assessment report, in conjunction with a Hydrogeological Risk Assessment and a Structural Assessment (completed by others), forms part of the wider BIA.

1.5 Within the requirements of DP23 of the LDF (Ref. 1), a Drainage Assessment must be undertaken to give due consideration to the volume and rate of storm water run-off that the development will generate. Appropriate sustainable means of managing future flows have to be described to limit them to existing, thereby not increasing the load on the sewerage serving the property, or increase the risk of flooding.

1.6 In addition to the requirements of DP23 and DP27, this assessment has also been carried out in accordance with the Camden Planning Guidance note 4 (CPG 4), which describes additional planning guidance for the development of basements and lightwells and prepared by the London Borough of Camden to support the LDF (Ref. 3). CPG 4 requires a Basement Impact Assessment (BIA) for all proposed below ground developments in order to assess the potential risks posed to the local hydrological and hydrogeological regimes and ground stability.

Scope of Works

1.7 The Drainage Assessment has been carried out in accordance with CPG 4 and follows the stages recommended in that document and summarised in Table 1:

Table 1 - Basement Impact Assessment Process

Stage	Description	Purpose
Stage 1	Screening	Identification of any matters of concern which should be investigated (in line with CPG 4 screening flow charts)
Stage 2	Scoping	Identification of the potential impacts of the proposed scheme which have been shown in Stage 1 to need further investigation
Stage 3	Site Investigation and Study	Site investigation (including desk studies, investigations, monitoring and reporting) to develop further understanding of the site)
Stage 4	Impact Assessment	Evaluation of the direct and indirect implications of the proposed scheme on the receptors identified during Stage 1
Stage 5	Review and Decision Making	This stage is carried out by the London Borough of Camden and comprises an audit of the information supplied and a decision on the acceptability of the impacts of the basement proposal

1.8 In line with the requirements of CPG 4 this report has been prepared by a suitably qualified person.

1.9 A Drainage Assessment comprises an initial screening exercise in line with the requirements of CPG 4 and the "Surface flow and flooding screening flowchart". This is followed by a scoping assessment which includes a calculation to compare the differences between the current and proposed rates and volumes of surface water runoff, and consideration of the likely impacts and how they can be ameliorated. A site investigation was not considered necessary for the completion of this Assessment. The primary concern is surface water runoff and pluvial flooding, as opposed to groundwater intrusion which is described in the Hydrogeological Risk Assessment that forms part of the wider BIA.

1.10 During the preparation of this assessment reference has been made to the following documents:-

- Camden Planning Guidance 4 (CPG 4), Basements and Light wells
- Camden Development Policies 2010 – 2025 (in particular DP23 and DP27)
- North London Strategic Flood Risk Assessment (SFRA) 2008 (Mouchel)
- Camden Geological, Hydrogeological and Hydrological Study 2010 (ARUP)
- Sewer Records and Flood Details (Thames Water)
- Flood Zone Maps (Environment Agency)

1.11 The SFRA states that "*To ensure damage to property is minimised, floor levels should be raised above the floodwater level by a specified amount known as the 'freeboard'. By adding freeboard above the floodwater level it allows for uncertainty in the prediction of the floodwater level as well as for wave movement. The current recommended flood level is the 1% annual*

probability peak flood level, taking into account the effect of climate change. Wherever possible, floor levels should be situated a minimum of 0.3m above the 1% with climate change flood level."

1.12 This report has been prepared using published information and information provided by the Client which was made available at the time of writing only. No liability is extended to any information which has become available since this time. No third party liability or duty of care is extended. Third parties using information contained in this report do so at their own risk.

Report Structure

1.13 The report structure includes an Introduction in Chapter 1 describing the references used in forming the Assessment, outline details of the proposed construction and the procedures to be followed. The Scope of Work in Chapter 2 describes in further detail the references and sources of background information used in the preparation of the Assessment. Chapter 3 describes and illustrates the Site Location with reference to street mapping, flood mapping and sewer records. Chapter 4 is the Screening stage of the Assessment showing in detail the requirements of CPG 4 and providing answers to the screening questionnaire. Chapter 5, Scoping Details, describes in detail the proposals and further drainage and flooding information. Chapter 6, the Impact Assessment, describes the effect of the proposed development on existing infrastructure and water features. Chapter 7 provides the Conclusions to the Assessment. The report Appendices are included after Chapter 7, at the end of the Assessment.

2.0 SUMMARY OF BASEMENT SCHEME

Basement Development

2.1 The proposed development comprises the addition of a second basement at the site, which will extend north-east from the south-western site boundary to the north-eastern wall of the existing basement. The basement footprint will therefore extend approximately 4.5m beyond the footprint of the current structure to the site boundary and occupy approximately 85% of the width of the front garden area. The proposed basement will cover an approximate area of 93.6m^2 (approximately 57.6m^2 beneath the current building footprint and 36m^2 to the south-west).

2.2 The basement is to be used as a residential flat, comprising two bedrooms, a bathroom, a kitchen and a lounge (as shown in Figures 1 to 3) and will be constructed to a maximum depth of approximately 3.6m bgl, (ground floor level at 85.43m AOD and basement floor at 82.44m AOD, plus an allowance for basement floor slab). It is noted that the south-western corner of the basement (approximately 19m^2) is open at ground level, with an external stairwell to the basement floor level and stepped planters on the south-western site boundary.

2.3 It is noted that the adjacent property at 15 Eldon Grove also has a basement which extends across the front of the adjacent property. As such, the proposed basement will border the existing on site basement to the north-east and the adjacent property's basement to the south-east. It is understood that the basement excavation will comprise a staged underpinning of the north-western and south-western boundaries whilst the excavation advances.

2.4 Basement construction will comprise a cast-in-sequence reinforced concrete structure with concrete perimeter retaining walls along the north-western and south-western boundaries and a concrete ground bearing slab.

2.5 The basement footprint will extend beyond the footprint of the current structure. This will reduce the area currently occupied by the front garden which is made up of planted and paved areas. The proposed development will include new planter boxes and a bin storage area that will drain to the planters. There will be no overall change in the percentage impermeable area as a result of the development. This is described in detail later.

Figure 1 – Proposed Side Elevation

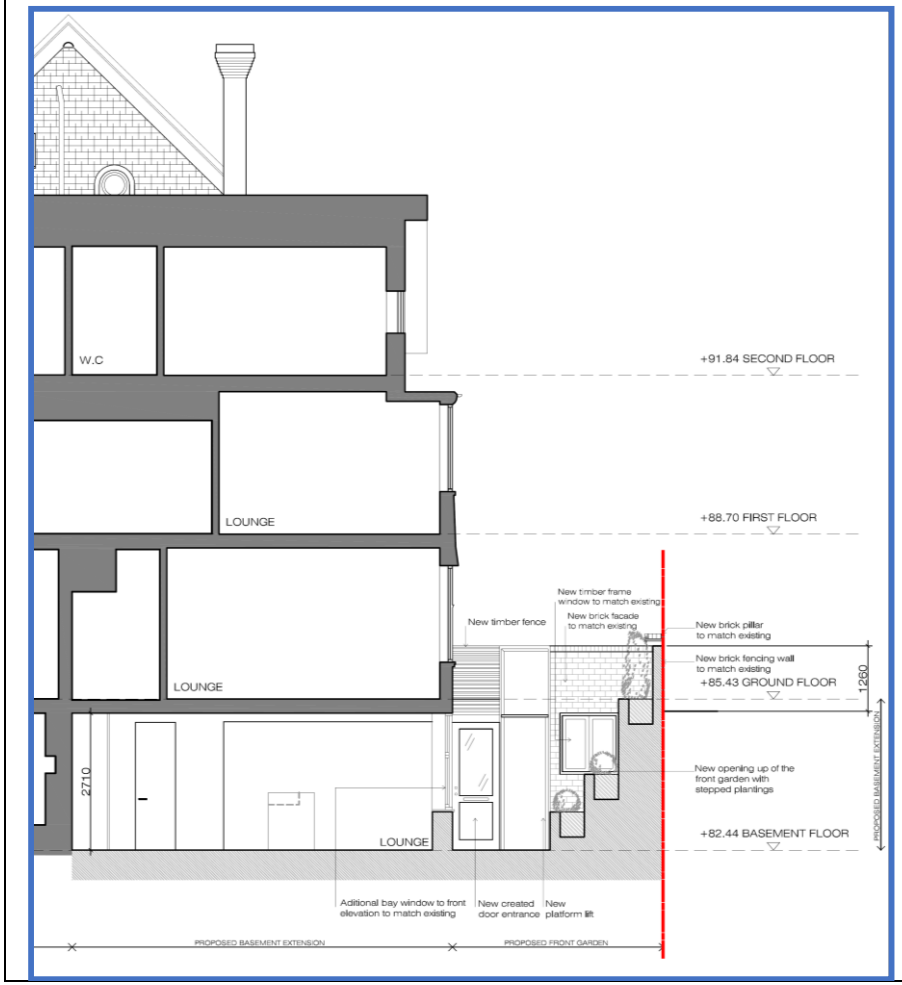


Figure 2 – Proposed Front Elevation

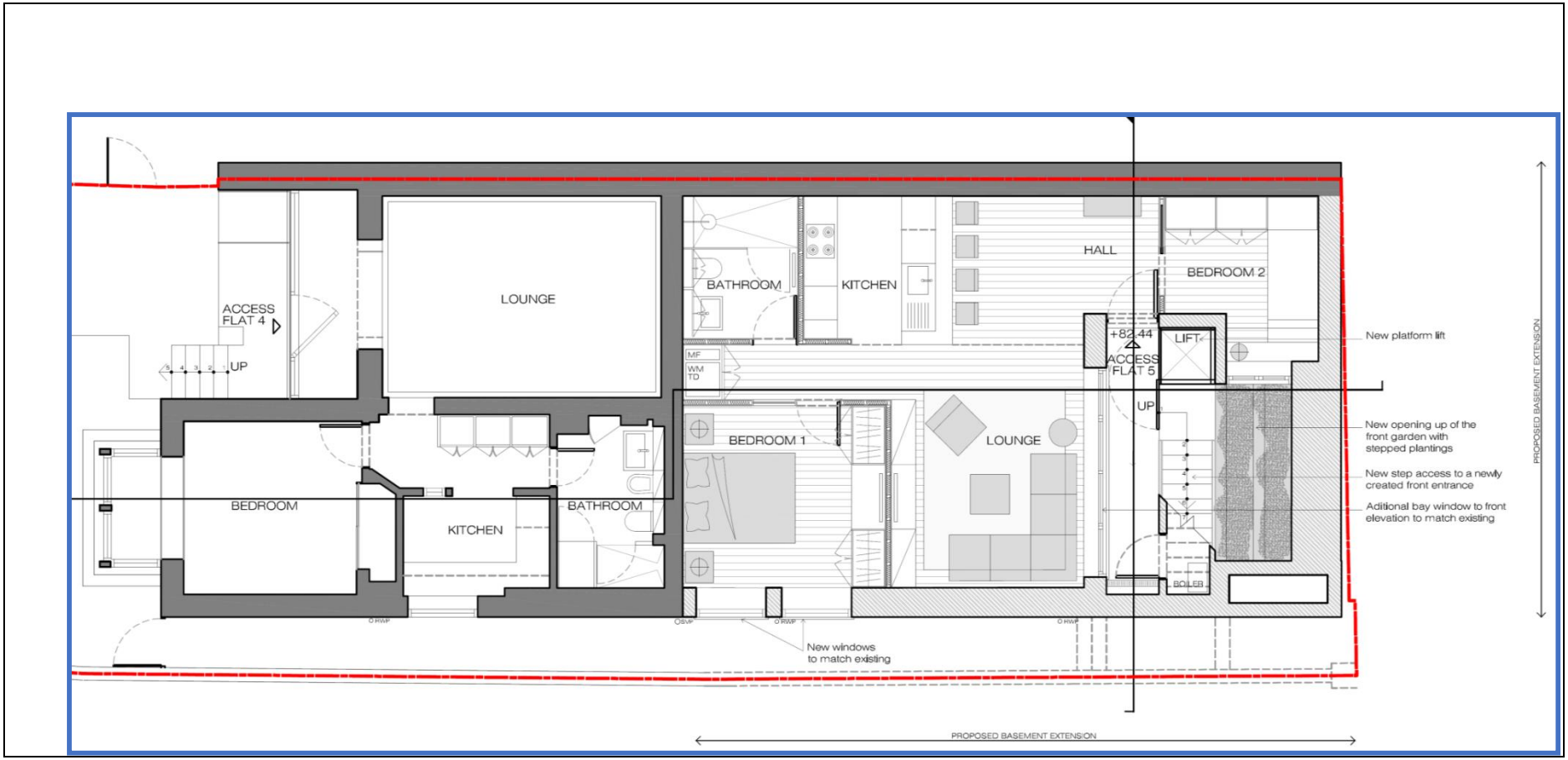


Figure 3 – Proposed Floor Plan

3.0 SITE LOCATION

Site Location

3.1 The site is located at 14 Eldon Grove, Camden, London NW3 5PT and centred within OS grid reference E527720 N184090, as shown in Figure 4, and excluding the rear garden comprises an approximate area of 0.02ha.

Figure 4 – Site Location Plan

Site Inspection

3.2 A walkover of the site was carried out by Lustre Consulting on Thursday 20th June 2014. The site was found to comprise a three storey semi-detached dwelling with existing basement and loft conversion, as shown in Plates 1 and 2. The property is understood to comprise four residential apartments (ground floor, first floor, loft conversion and basement) and was occupied at the time of the walkover. A small front garden area made up of permeable and impermeable areas, as shown in Plate 3, and domestic waste bin store, as shown in Plate 4, was present at the front of the property. Along the north-western site boundary a narrow footpath was present, as shown in Plate 5, extending from the front of the property along the site boundary to a rear garden area. This footpath provides access to the existing basement.

3.3 The rear garden present to the north-east of the property comprises a rectangular shaped area of turf and vegetation.

3.4 The rainwater downpipes from the property exit on the north-western side of the building and around the bay windows at the front and rear respectively. Two manhole covers were identified on site, although could not be lifted at the time of the walkover.

3.5 It is understood that drainage from the rear of the property, including a small surface water drain located at the lowest part of the site (external to the rear entrance of the existing basement), extends to a manhole located approximately 1.0m from the rear of the property within the footpath area. This drain is understood to extend to the side of the property and extend and flow south-west along the length of the path towards Eldon Grove. A second manhole was identified in the front garden situated at the end of the footpath as shown in Plate 6. It is understood from the Client that drainage from within the existing basement joins this drainage run. A third manhole was noted within the bathroom of the existing basement.

3.6 The adjacent property to the east, 15 Eldon Grove, comprised a similar structure, with residential use on the ground floor and above, and office use within a basement. The footprint of the proposed basement will border the existing basement in the adjacent plot.

3.7 The sewers within the existing building fall by gravity towards the road to the south of the property. Copies of the sewer records have been obtained from Thames Water and a 305 mm diameter combined sewer is shown in the road. Details of the depth of this sewer at this location are not shown on the record plans and will have to be determined on site. Figure 5 refers.

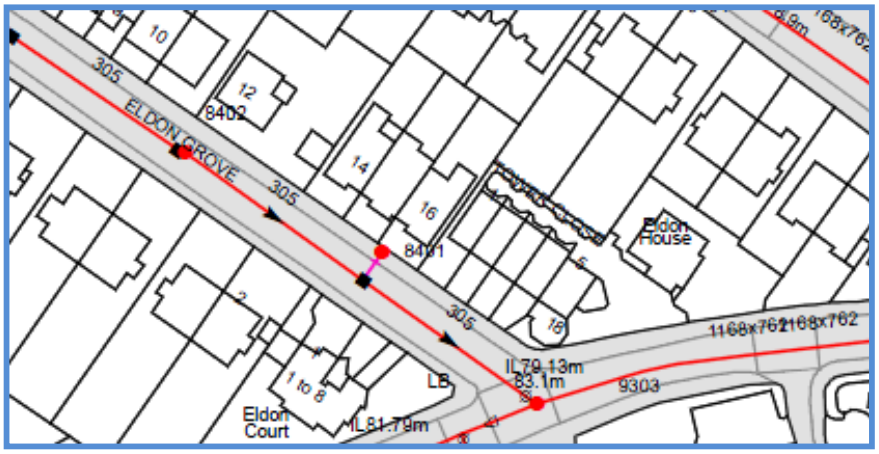


Figure 5 – Sewer Record Plan (Thames Water)

Plate 1: View of the property – South Western Elevation

Plate 2: Side view along north west boundary of the property and showing storm water down pipes

Plate 3: Front garden showing permeable and impermeable areas.

Plate 4: Front garden showing planter and bin storage

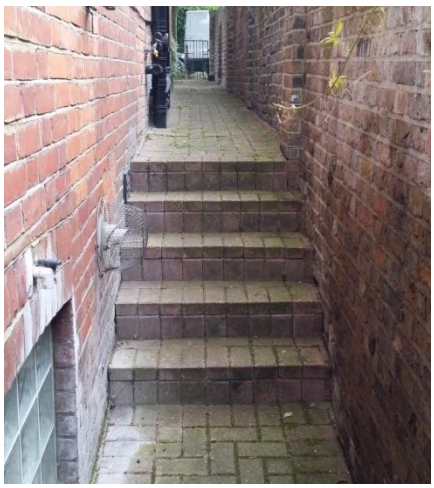


Plate 5: Looking along the footpath towards the road.

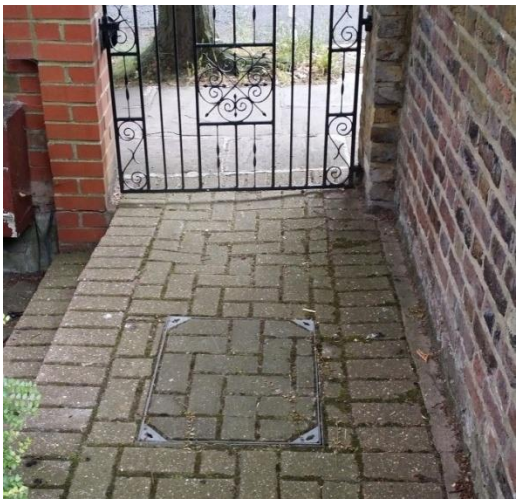


Plate 6: Manhole adjacent to proposed access to new basement.

4.0 SCREENING

4.1 Screening is the first stage of the Basement Impact Assessment (BIA) required by Camden Planning Guidance for development of basements and light wells (CPG 4). Screening enables identification of any matters of concern to the development which should be further investigated and is a process of determining whether or not a full BIA is required. The screening assessment has been undertaken in accordance with the "surface flow and flooding screening flowchart" which forms Figure 3 of CPG 4.

4.2 Camden Planning Guidance 4 - Figure 3 Surface Flow and Flooding Screening Flowchart:

> ***Question 1:*** *Is the site within the catchment of the pond chains on Hampstead Heath?*
> ***Question 2:*** *As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?*
> ***Question 3:*** *Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?*
> ***Question 4:*** *Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?*
> ***Question 5:*** *Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?*
> ***Question 6****: Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature*

The screening flowchart requires consideration of the six questions and an answer of "yes", "no" or "unknown" to each. Consideration is given to both the temporary and permanent works, along with the proposed surrounding landscaping and drainage associated with the proposed basement development.

4.3 **Question 1: Answer "No".** The site is approximately 0.5km south west of the pond chains. Water levels in the ponds vary from approximately 80m down to 70m AOD. Whilst ground levels at the site are considerably higher, approximately 85m AOD, the natural fall from the property is south east. The ponds are no longer used for water supply but are used for recreational activities and wildlife habitat and protected under the Reservoirs Act. The site is located outside of the Hampstead Heath surface water catchment area as described in Figure 14 of the Camden Geological, Hydrogeological and Hydrological Study (Ref. 4).

4.4 **Question 2: Answer "No".** Surface water runoff rates and volumes will not change as a result of the basement development. This is achieved by the inclusion of planters within the basement well and the redirection of storm water from the proposed bin store towards the planters. In accordance with CPG 4, paragraph 2.66, the proposed planters as shown in Figures 1 and 3, will reduce run-off and increase bio-diversity.

The areas of permeable and impermeable land cover have been measured from the AutoCad detailed drawings for the existing and proposed situations. The results are shown in summary in the two figures 6a and 6b showing the pre and post development areas respectively. It is evident from the two figures that the overall impermeable and permeable areas remain the same.

The storm water run-off will continue to be served by the 305 mm diameter combined sewer in Eldon Grove. Refer to the sewer details shown in Figure 5.

Figure 6a – Ground Cover Plan - Existing

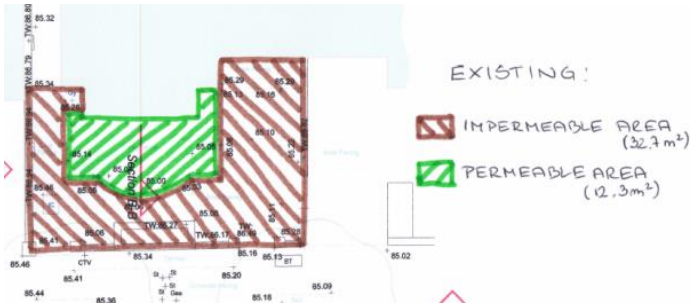
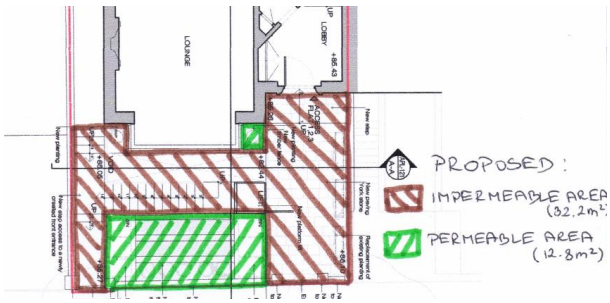


Figure 6b – Ground Cover Plan - Proposed



4.5 **Question 3: Answer "No".** As a result of the development there will be no change in the proportion of hard surfaced / paved external areas on site.

4.6 **Question 4: Answer "No".** The profile of surface water runoff will remain unaltered.

4.7 **Question 5: Answer "No".** Surface water runoff will remain unaltered. There is nothing proposed within the proposed construction to alter the quality either during the construction stage or in the long term.

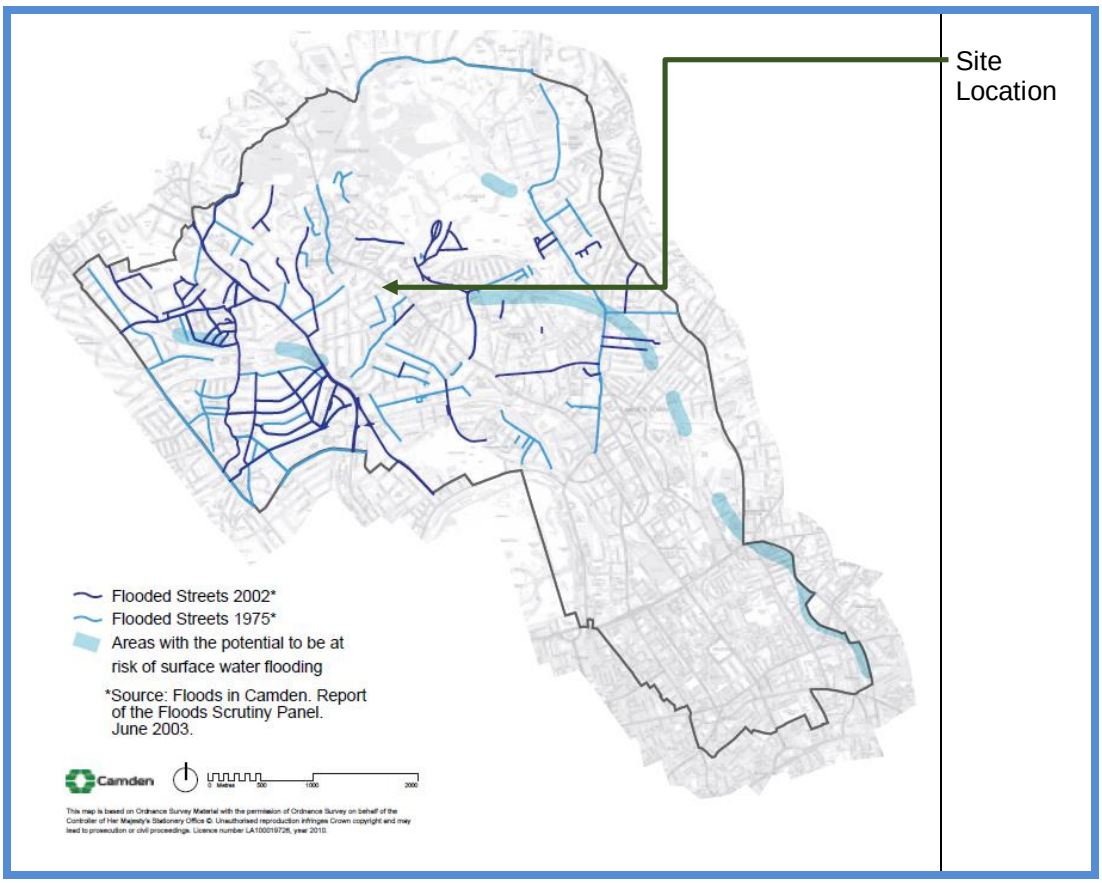
4.8 **Question 6: Answer "No".** The site does not fall within areas of Camden described in CPG 4 as being at risk of surface water flooding. Reference has been made to the Camden

Development Policies, Section 3, Map 2 which is reproduced as Figure 7 herein. It is apparent there is no historical record of any flooding occurring in the general vicinity to the site.

Sewer Flooding Information has been obtained from Thames Water and this confirms there has been no recorded incidence of sewer flooding at the property. See Appendix A.

With reference to the sewer record drawings it is clear that ground levels within a short distance from the property are at or below 81.00 m AOD. As there is no record of flooding in these areas it could be concluded that surcharge levels are well below the basement level of 82.44 m AOD.

Figure 7 – Street Flooding (Source Camden Development Policies, Section 3, Map 2)



4.9 Within Section 10.4 of the Strategic Flood Risk Assessment the following conclusions are made for Camden:-

> *The LB of Camden has a particularly high risk of flooding from sewer and surface water flooding, while fluvial flood risk remains low due to the lack of watercourses. At present the Canal presents an unknown risk to the borough. A more detailed assessment of the flood risk posed by the Canal to the surrounding properties is required in close partnership with British Waterways.*

Surface water flooding zones are in need of further investigation within Camden due to the high level of risk and historic precedent. A more detailed assessment of sewer flooding would also be desirable but this would require the cooperation of Thames Water in releasing the necessary data for a review and analysis to be undertaken. Where sewer and surface water flooding may occur the consequences are unlikely to restrict development providing that mitigation for surface water flooding is applied using the precautionary approach.

Groundwater flooding was found to be a relatively low risk. The two small reservoirs on Hampstead Heath are considered to present a low risk to Camden. It is anticipated that the Flood Management Plans and associated inundation mapping will provide a more accurate appraisal and assessment of flood risk presented by the reservoir.

4.10 As the answers to Questions 1-5 are “no” a full BIA will not be required for these matters of concern.

4.11 As the answer to Question 6 is “no” a Flood Risk Assessment will not be required.

5.0 SCOPING DETAILS

5.1 The screening process discussed in Chapter 4 identified there will be no change in the proportion of hard surfaces on the site and therefore no change in surface water runoff rates and volumes resulting from the proposed development.

5.2 As shown on Figure 4 the site is accessed off Eldon Grove. There is a garden area to the rear of the property, which will remain unchanged. The proposed basement is accessed down stairs from an existing access path running the length of the northwest boundary of the property and as shown it extends beyond the footprint of the building, but within the front garden area. The extent of the construction area is limited to the footprint of the building, the access path and the front garden area.

Flood Zoning

5.3 With reference to the Flood Zone Map shown in Figure 8 it is evident that the site lies within Zone 1 (Low Risk, less than 0.1% chance of flooding from rivers or the sea in any single year).

5.4 There are no surface water abstractions recorded within 1km of the site. However, Camden's Geological, Hydrogeological and Hydrological study indicates that there are operational abstractions from Regents Canal (approximately 2000m south of the site) and other abstractions are known to be carried out further afield from reservoirs owned by TWUL, the River Thames and the River Lee.

Storm Water Run-Off

5.5 The storm water drainage is shown in Figure 9. Most of the run-off is to a manhole in the footpath to the front of the property and the rest to the rear.

5.6 The property, excluding the rear garden, has an area of 170m^2 of which the building footprint occupies 136 m^2. The permeable area within the 170 m^2 is 12 m^2. This is true of both the pre and post development situations. Thus there will be no short term or long term effect on the rate and volume of storm water run-off resulting from the proposed basement development and this is therefore not considered in any more detail.

Figure 8 – Flood Map (Source Environment Agency)

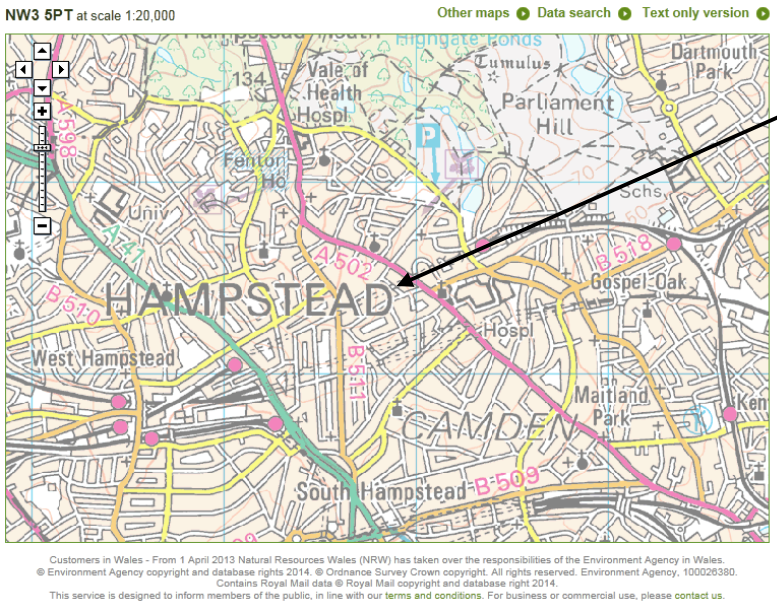


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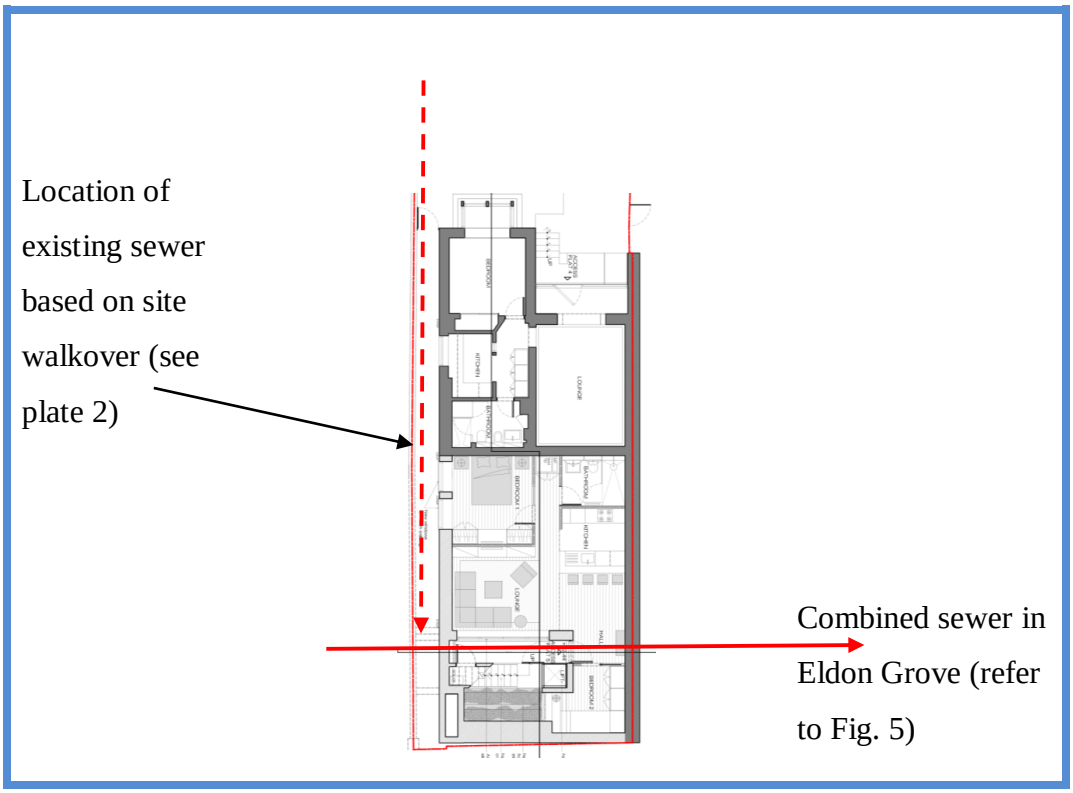
Figure 9 – Existing and Proposed Drainage



6.0 IMPACT ASSESSMENT & CONCLUSIONS

6.1 As discussed the proposed development will not incur any change to either the existing permeable or impermeable areas. Thus:

- There will be no impact on existing drainage from storm water.
- There will be no impact on fluvial or river flooding.
- There will be no impact on existing water features.

6.2 The proposed development will have no impact on the rate or volume of storm water run-off.

6.3 There is no record of historical flooding. The development is not influenced in any way by the Regents Canal to the south or the Hampstead Ponds to the north east.

6.4 Although the proposed development will not result in any reduction of storm water run-off it is understood that to meet the requirements of DP23 overall runoff in the future will need to be reduced compared to the existing situation. Therefore measures should be taken to minimise foul water run-off.

6.5 The existing sewer will be used for the drainage of the new basement. Prior to connecting the basement to the sewer the levels of the sewer should be determined. This will require lifting manhole covers within the passageway to the side of the property. The levels of the proposed basement are lower than the existing basement. If on inspection the sewer is not deep enough to allow a connection from the new basement it will be necessary to install a small basement pump, suitable for storm and w.c. waste, to lift the effluent into the sewer. A pump rated at 0.5 l/s would be sufficient.

7.0 REFERENCES

1. London Borough of Camden, Camden Development Policies, 2010 – 2025, Water, DP23, 2010.

2. London Borough of Camden, Camden Development Policies, 2010 – 2025, Basements and Lightwells DP27, 2010.

3. London Borough of Camden, Camden Planning Guidance, Basements and Lightwells, CPG4.

4. London Borough of Camden, Camden Geological, Hydrogeological and Hydrological Study, Guidance for subterranean development, Issue 01, November 2010.

5. Information from Environment Agency Website: www.environment-agency.gov.uk consulted November 2013.

APPENDICES

APPENDIX A:
THAMES WATER SEWER AND FLOOD RECORDS

Asset Location Search

Search address supplied: 14, Eldon Grove, London, NW3 5PT

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 0845 920 0800. 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

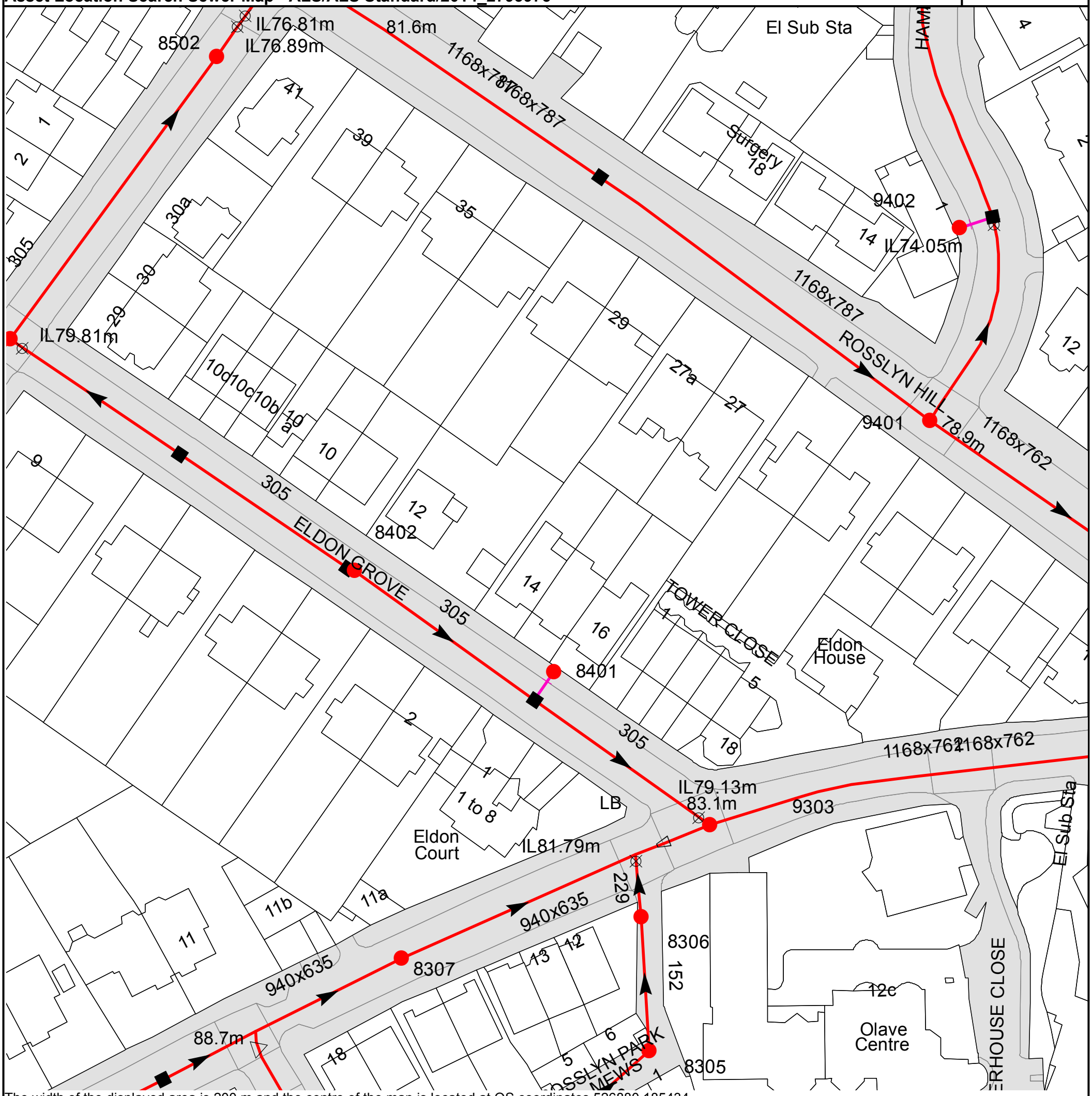
Clean Water queries

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/2014_2793975



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 526880,185434

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
8401	n/a	n/a
8306	84.01	82.32
8305	84.91	83.93
9303	82.92	79.05
9401	78.9	74.93
9402	n/a	n/a
7402	87.41	79.58
8502	83.24	77.38
8402	n/a	n/a
8307	86.75	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.

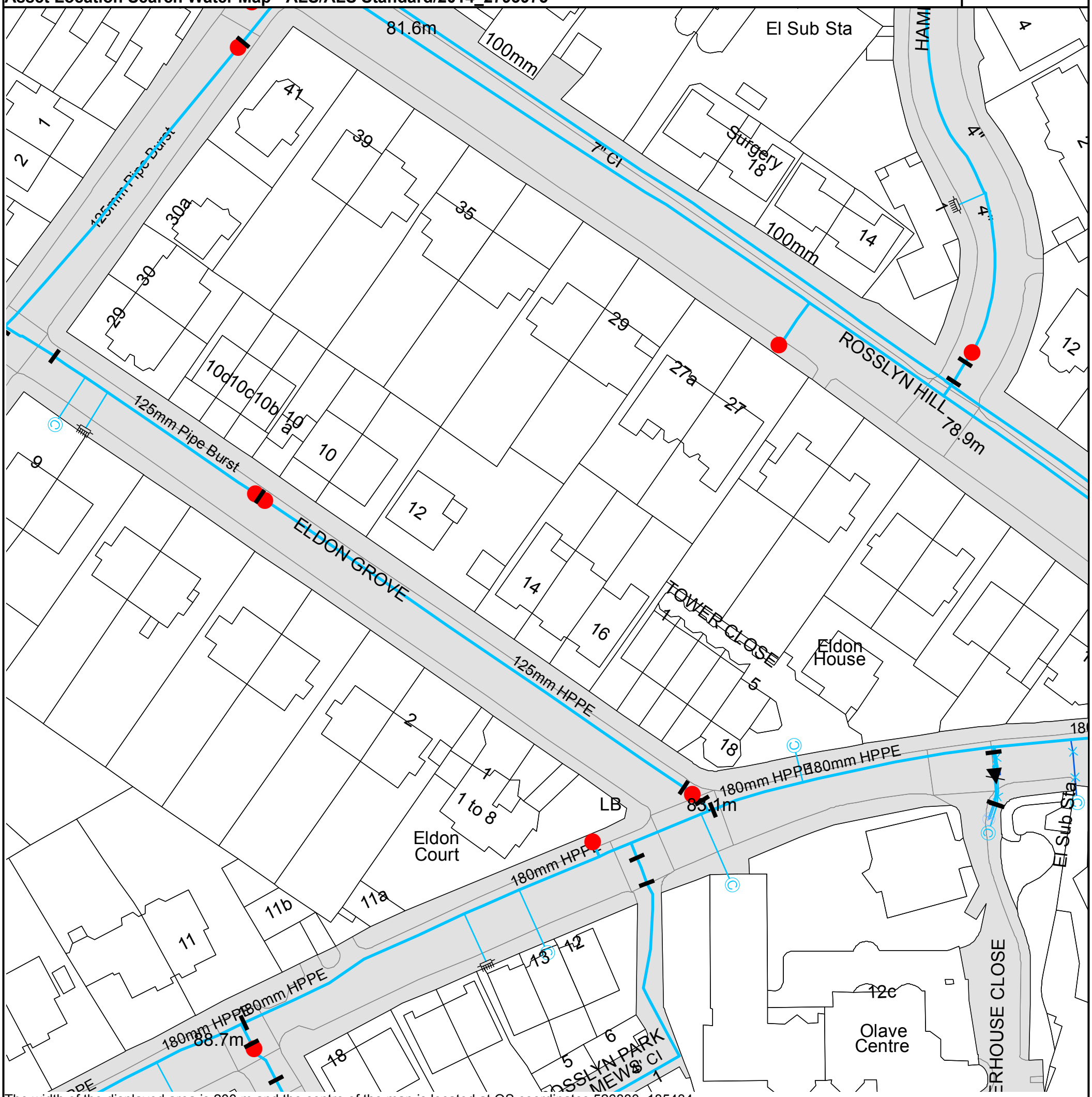
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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/2014_2793975



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 526880, 185434.

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 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.

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

Valves

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

Hydrants

- Single Hydrant

Meters

- Meter

End Items

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

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

Operational Sites

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

Other Symbols

- Data Logger

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 0845 9200 800.

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

Search address supplied: 14,Eldon Grove,London,NW3 5PT

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

Thames Water Utilities Ltd

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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: 0845 9200 800 or website www.thameswater.co.uk

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APPENDIX B:
DEVELOPMENT POLICIES 23 AND 27.

DP POLICY

DP23 – Water

The Council will require developments to reduce their water consumption, the pressure on the combined sewer network and the risk of flooding by:

a) incorporating water efficient features and equipment and capturing, retaining and re-using surface water and grey water on-site;

b) limiting the amount and rate of run-off and waste water entering the combined storm water and sewer network through the methods outlined in part a) and other sustainable urban drainage methods to reduce the risk of flooding;

c) reducing the pressure placed on the combined storm water and sewer network from foul water and surface water run-off and ensuring development in the areas identified by the North London Strategic Flood Risk Assessmer and shown on Map 2 as being at risk of surface water flooding are designed to cope with the potential flooding;

d) ensuring that developments are assesse for upstream and downstream groundwater flood risks in areas where historic underground streams are known to have been present; and

d) encouraging the provision of attractive and efficient water features.

DP **POLICY**

DP27 – Basements and lightwells

In determining proposals for basement and other underground development, the Council will require an assessment of the scheme's impact on drainage, flooding, groundwater conditions and structural stability, where appropriate. The Council will only permit basement and other underground development that does not cause harm to the built and natural environment and local amenity and does not result in flooding or ground instability. We will require developers to demonstrate by methodologies appropriate to the site that schemes.

a) maintain the structural stability of the building and neighbouring properties;

b) avoid adversely affecting drainage and run-off or causing other damage to the water environment;

c) avoid cumulative impacts upon structural stability or the water environment in the local area;

and we will consider whether schemes:

d) harm the amenity of neighbours;

e) lead to the loss of open space or trees o townscape or amenity value;

f) provide satisfactory landscaping, includi adequate soil depth;

g) harm the appearance or setting of the property or the established character of surrounding area; and

h) protect important archaeological remains

The Council will not permit basement schem which include habitable rooms and other sensitive uses in areas prone to flooding.

In determining applications for lightwells, th Council will consider whether:

i) the architectural character of the building protected;

j) the character and appearance of the surrounding area is harmed; and

k) the development results in the loss of mo than 50% of the front garden or amenity area.

APPENDIX C:
NOTES ON LIMITATIONS

LUSTRE CONSULTING, ENVIRONMENTAL AND GEOTECHNICAL CONSULTANCY SERVICES

NOTES ON LIMITATIONS

General

Lustre Consulting have completed the attached report for the use of the Client detailed on the front cover and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Third parties should not use or rely upon the contents of the report unless written approval has been gained from Lustre Consulting; (due to legal requirements, a charge may be levied against such approval).

Lustre Consulting accepts no responsibility or liability for:

a) the consequences of this documentation being used for any purpose or project other than that for which it was commissioned, and

b) this document to any third party with whom approval for use has not been agreed.

Phase I Environmental Risk Assessments, Desk Studies and Site Audits

The work completed and utilised to provide this report comprises a study of available documentation. The opinions and results presented in this report have been arrived at by utilising the finite amount of data available at the time of writing and are relevant only to the purpose for which the report was commissioned. The data which has been reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative information pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, Lustre Consulting reserves the right to review this information and, if warranted, to modify the opinions presented in the report accordingly.

It should be noted that the risks which are identified in this report are perceived risks based on the available information at the time of writing and that the actual risks associated can only be assessed following a physical investigation of the site.

Phase II Site Investigations

The intrusive investigation has been completed to provide information concerning the type and degree of contamination present along with ground and groundwater conditions which facilitates a reasonable risk assessment to be completed. The stated objectives of the ground investigation have been limited to assessing the proven risks which are associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work, chemical testing and monitoring completed as part of this project has potentially been restricted by the short timescale available, and the locations of exploratory holes undertaken have potentially been restricted to areas unoccupied by buildings(s) and buried services. A more comprehensive post demolition / decommission investigation may be required if the site is to be redeveloped. For these reasons any costs included in relation to site remediation must be considered as tentative only at this time.

The exploratory holes investigate only a small volume of the ground in relation to the size of the site and therefore, can only provide a “snap shot” or general indication of ground conditions located on the site. The fact that the site has been investigated does not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided in this report take into account currently available guidance values relating to acceptable contamination concentrates; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

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