Basement Impact Assessment (BIA) – Addendum 02

Project: Gloucester Lodge

Job No: 15060

Date: 04.10.2016

Introduction

This is a complementary design note to the BIA made in support of proposals for Gloucester Lodge, 12 Gloucester Gate and 12 and 13 Gloucester Gate Mews, London NW1 4AD (planning reference 2016/4549/P) It is made in response to the queries raised in Campbell Reith audit reference 12466-04 Revision D1. Material additional to the BIA is submitted following the numbering set out in the audit query tracker. The findings of stages 1, 2, 3 and 4 of the BIA and addendum 01 remain unchanged. Audit query numbers are followed.

1. Desk Study

Appendix 1 shows water mains and sewerage around the site. There are no installations beneath the site. Existing buildings were constructed on original ground in the 1830's and so gas, oil, electricity and telecom assets can be discounted. Overground and underground railways are remote. No installations impact on the proposals.

2. Land Stability

Architects proposals, oil investigation information and baseline parameters are summarized in a 'Conceptual Site Model'.

Conceptual Ground Model. The site is in London on the north-east corner of Regents Park. The geology of the locality comprises London Clay without workings to a depth of 11 metres overlying mudstone. Superficial aquifers to the south are remote and the ground has negligible permeability. No groundwater has been detected and surface water is isolated from the Lower Aquifer.

The existing buildings comprise a brick-built house of two and three storeys with one lower ground floor and timber floors and roof. A pair of two storey mews houses of similar construction to the east are separated from the main building by a paved courtyard with small planting areas.

The front garden to the west includes a large carriage drive and surrounding planted areas. There are no watercourses near the buildings. Run off is dispersing by evaporation and drainage with minimal percolation into the small areas of planting and impermeable ground.

The site is effectively flat and no significant groundwater flows are anticipated. There are no slope stability concerns.

To the west is parkland. The terrace is bounded by similar properties to north and south with the usual party wall conditions. The east boundary of the site is the mews.

The house and mews foundations are conventional spread footings at shallow depths. A single storey basement in reinforced concrete across part of the site is proposed. This will have a formation approximately three metres below existing ground-levels and therefore approximately seven metres above the mudstone. The basement is surrounded by several party wall conditions and it is anticipated construction will be by conventional underpinning. If piled wall construction is used the pile depth will be nine metres and therefore approximately two metres above the mudstone.

The new construction will result in a nominal net decrease in bearing pressures. Significant heave is not anticipated.

All nearby buildings are of historical significance and Burland category 1 is applied to the on-site and existing structures. The zone of influence is taken as the area which may cause this level of damage in a loadbearing masonry building near the works and therefore includes the immediate neighbouring buildings which are all of similar brick construction and not buildings beyond the mews or further down the terrace.

A model drawing is shown in appendix 2.

3. Geotechnical parameters.

With regards to the comments on Sections 4.8 and 4.9 on page 10, the SPT values recorded within the borehole indicate that the London Clay is medium to high strength, not low strength, based on the recorded SPT results within BH01 which range between 6 to15 and from 1m to 5m below ground level.

GRM have correlated SPT blow counts to relative strengths and density's, accordingly an SPT range between 4 – 10 is indicated as a firm, medium strength material and stiff, high strength material is indicated with SPTs between 10 to 20.

Moreover, the engineer's description is recorded as stiff, locally firm, which whilst not directly transferable, generally equate to a high and medium strength.

Accordingly, the net allowable bearing capacity of 110kN/m2 which was produced in the letter report is considered to be more than sufficient based on material largely recorded as stiff by the engineer and medium strength by the SPT results. A cautious approach has been taken when determining an appropriate bearing capacity and the lower value is used to increase the factor of safety.

Detailed groundwater monitoring has been conducted using a data logger and showed a nominal level of groundwater at the base of the borehole, which we have attributed to pore water release within the London Clay. Given this, the cohesive material of London Clay, and the confirmed absence of significant levels of groundwater, we consider the groundwater monitoring undertaken to be sufficient.

Groundwater below the London Clay is unlikely to affect the ability to construct the proposed basement with circa 5m of stiff London Clay below the base of the proposed 5m underpin. This thickness of cohesive material is considered to be sufficient to inhibit upward migration of potential groundwater.

The following baseline figures are adopted:

Design Ground Model

Soil Type	Top of Layer	Thickness	SPT
Made Ground	+9.5	1.0	-
London Clay	+8.5	10.5	11
Mudstone	-2	-	-

Summary of Geotechnical Parameters

Weathered London Clay	
Liquefied limit (%)	70
Plastic limit (%)	25
Plasticity index (%)	40
Void ratio (%)	0.7
Natural water content (%)	25
Bulk density (Mgm^3)	2.0
Undrained Shear Strength (kPa)	110
Effective cohesion (kPa)	12
Effective angle of friction (degrees)	17
Residual Shear strength (degrees)	12
Coefficient of volume change (m^2MN^{-1})(q)	0.5
Coefficient of consolidation ($m^2yr^{1)}$	0.5
Permeability ($ms^{-1)}$	10^{-6}
Effective stress ratio (K_0)	0.5

4. Ground Water Monitoring.

Notwithstanding the comments made in response to query 4 ground water monitoring is being undertaken monthly.

5. Surface Water Flow A.

Flooding to adjacent basements is reported. It appears unlikely that this is due to infiltration from the small areas of open ground in the current site arrangement. The new works will preclude any water leaving site except through new sewerage to the mains provision and will rectify any historical damage. Prior to the commencement of works a full drainage provision will be installed to safeguard the construction stage. An additional flood risk assessment for the works is therefore not proposed.

An outline drainage scheme is described below.

6. Surface Water Flow B.

A preliminary drainage design has been prepared for this project. The site is in an area of low flood risk. Foul and surface water requirements are unaltered. There is a surface water sewer west of the site and a combined sewer in the mews to the east.

The main building and front garden are of historical significance. All drainage provisions in front of and within the main house remain unaltered. In the courtyard and mews area the foul drainage is relocated with the existing connection to the main sewer maintained.

Surface water run-off levels from part of the main house roof, the courtyard and the mews roofs are unaltered. The small area of planting along each side of the existing courtyard is replaced by an area of lawn 1metre deep (8.423 AOD top level 7.4 AOD level on finishes above gym), This area together with a volume of attenuation beneath the proposed terrace area improves on the current discharge rates. SuDs provisions are limited by the site layout and ground conditions. Soakaways are not practical and additional attenuation can only be placed at levels already occupied by accommodation except in the front area which is not to be disturbed.

A scheme drawing is included in appendix 3.

7. Surrounding buildings.

A ground movement assessment (appendix 4) indicates that for conventional underpinning the basement installation will have a zone of influence of approximately 4 metres beyond the retaining wall. This will therefore take in the neighbouring buildings north and south and the mews sewer but not the buildings beyond.

The only location where a piled retaining wall is practical in is along the east side where the old sewer may be significantly affected and the building beyond come into the zone of influence. It is therefore proposed to complete the construction in underpins and a fully restrained temporary propping provision.

The proposed sequence of works for the basement installation will be:

1. Commence monitoring
2. Underpin all party wall conditions.
3. Underpin adjacent to existing house rear wall
4. Complete retaining wall on mews side in panels and prop across. Commence excavation and install horizontal propping at ground level mid-level and basement level.

5. Cast basement slab
6. Cast ground floor slab
7. Retain propping during superstructure construction and remove for fitting out.

8. Ground Impact Assessment.

Additional ground impact assessment information and additional damage impact assessments are included in appendix 4.

Signatures

This report is produced by the following qualified signatories, in line with the requirements set out in the LBC documents CGHSS and DP27.

Names: Fardad Ghaffari

Role: Associate

Company: Techniker

Qualifications: MSc CEng MIStructE

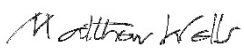
Signature: 

Name: Matthew Wells

Role: Director

Company: Techniker

Qualifications: RIBA CEng FICE FIStructE

Signature: 

Name: Christopher Jerram

Role: Director

Company: GRM Development Solutions Ltd

Qualifications: FGS CGeol

Signature: 

Appendices

Appendix 1 – Utilities

Appendix 2 – Conceptual Ground Model

Appendix 3 – Drainage Scheme

Appendix 4 – Additional GMA Information

Asset Location Search

Amir Alwan
Techniker
13-19
Vine Hill
LONDON
EC1R 5DW

Search address supplied 12
Gloucester Gate
London
NW1 4HG

Your reference N/A

Our reference ALS/ALS/24/2016_3423898

Search date 5 October 2016

Notification of Price Changes…
From **1 September 2016** Thames Water Property Searches will be increasing the prices of its Asset Location Searches. This will be the first price rise in three years and is in line with the RPI at 1.84%. The increase follows significant capital investment in improving our systems and infrastructure.

Enquiries received with a higher payment prior to 1 September 2016 will be non-refundable. For further details on the price increase please visit our website at

www.thameswater-propertysearches.co.uk

Asset Location Search

Search address supplied: 12, Gloucester Gate, London, NW1 4HG

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

Thank you for your payment covering the cost of this enquiry. We have enclosed a VAT Receipt for your records.

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

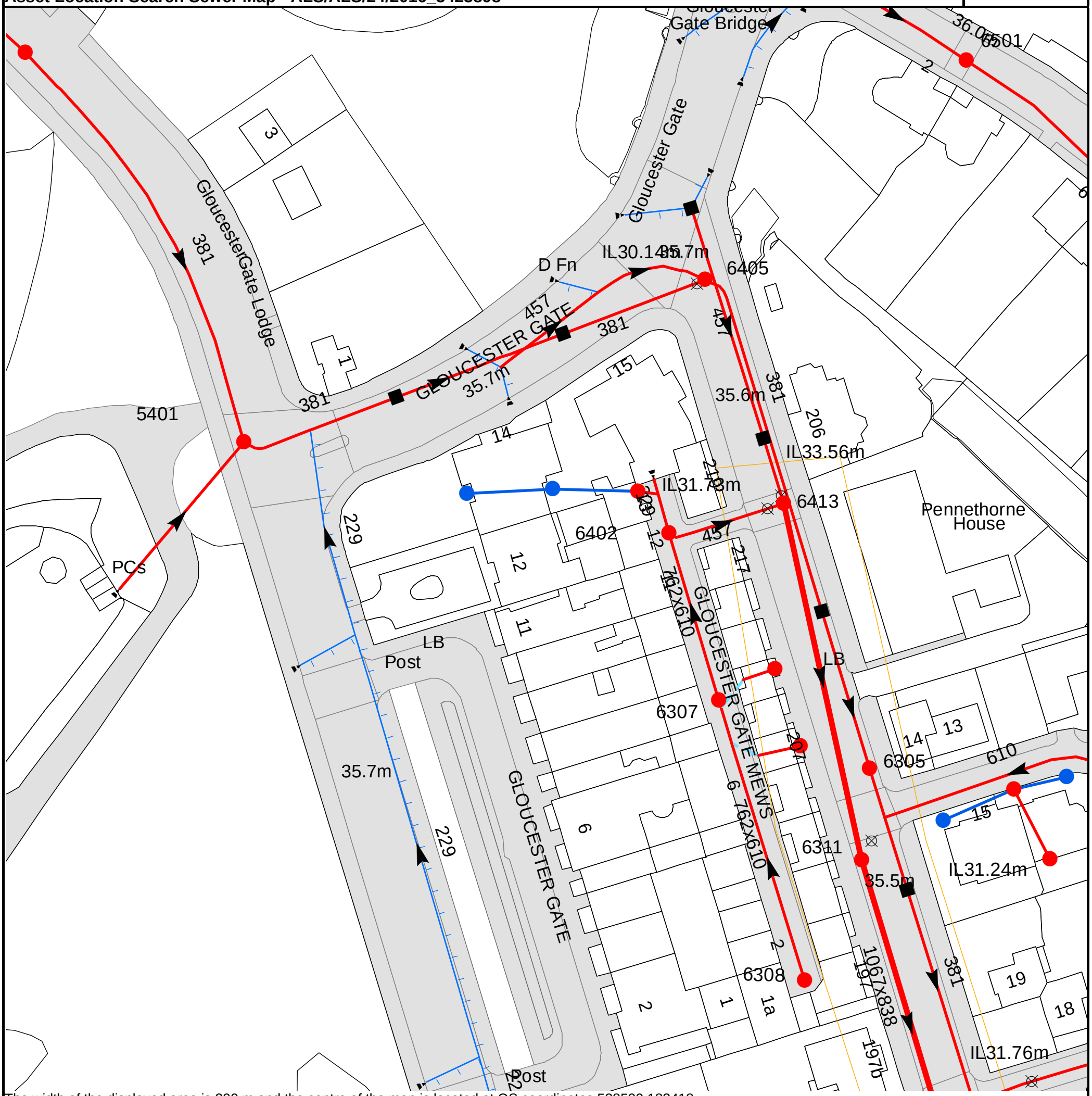
Clean Water queries

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/24/2016_3423898



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 528590,183418

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

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4501	35.46	30.41
5401	35.54	30.29
54CB	n/a	n/a
54AC	n/a	n/a
64BJ	n/a	n/a
6402	35.05	n/a
6405	35.49	n/a
6307	n/a	n/a
63BH	n/a	n/a
6413	35.48	30.57
63CE	n/a	n/a
6308	n/a	n/a
6311	35.34	30.01
6305	35.37	29.84
63EB	n/a	n/a
6501	35.91	32.46
63DJ	n/a	n/a
63DI	n/a	n/a
63EA	n/a	n/a

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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.

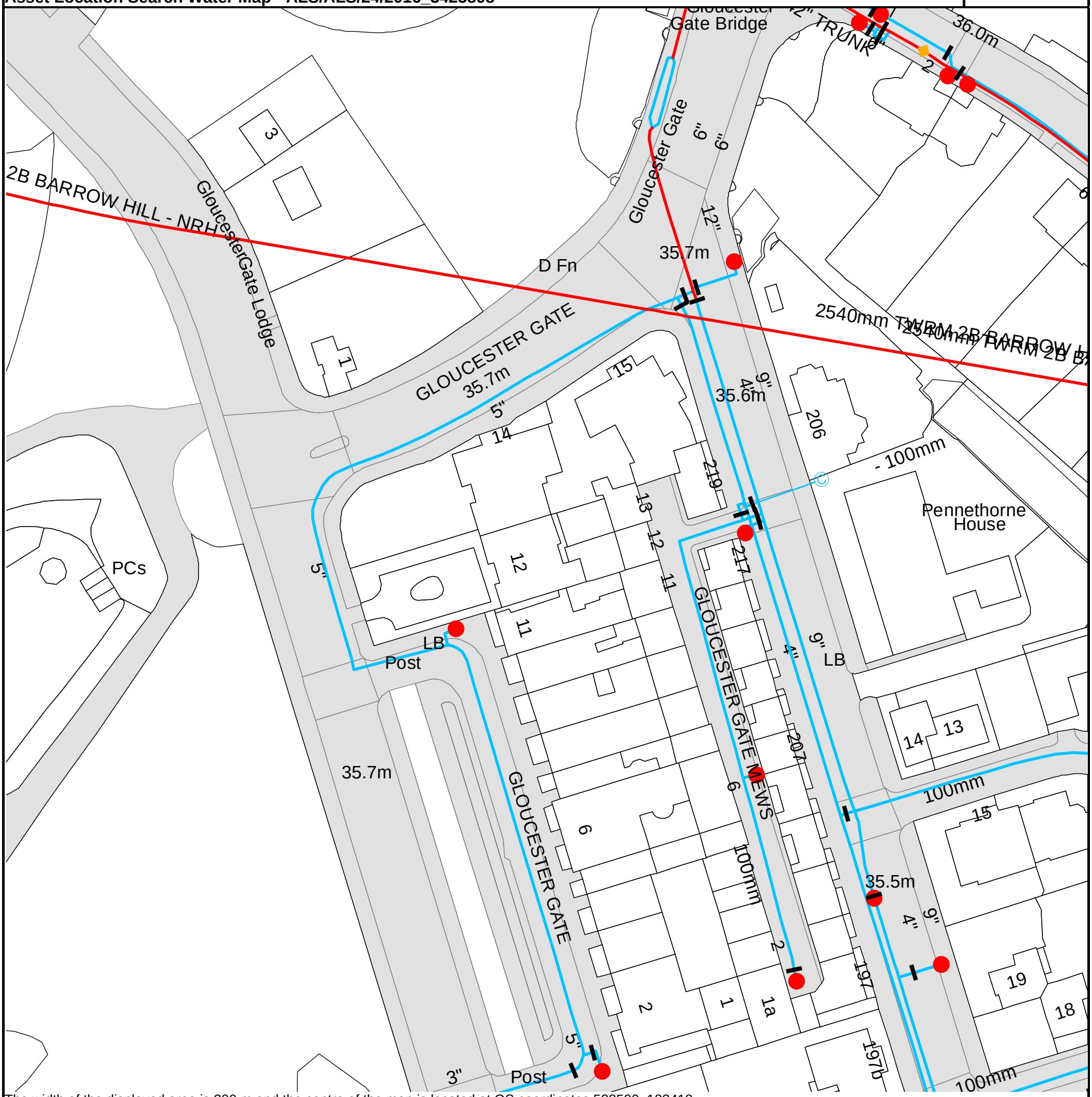
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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/24/2016_3423898



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 528590, 183418.

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.

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.

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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.

Invoice

Amir Alwan
Techniker

Vine Hill
London
EC1R 5DW

Thames Water Utilities Ltd.
PO Box 3189
Slough
SL1 4WW

Invoice No: ADS16392728
Customer Reference: N/A **Our Ref:** ALS/ALS/24/2016_3423898

Customer Number: ADS129763 **Posting Date:** 05-10-2016
Purchase Order No: **Due Date:** 19-10-2016

Search Address Supplied: 12, Gloucester Gate, London, NW1 4HG

Description of Charges	Qty	Unit Price	VAT (20%)	Amount (Inc VAT)
Asset Location Search	1	£96.14	£19.23	£115.37

Thank you for your payment of 111111 £115.37

OUTSTANDING AMOUNT (Inc. VAT) £0.00

Please send any outstanding amount to Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.

For queries please contact the Property Searches Customer Support Team on Tel: 0845 070 9148.

VAT Reg. No GB 537456915

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

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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.

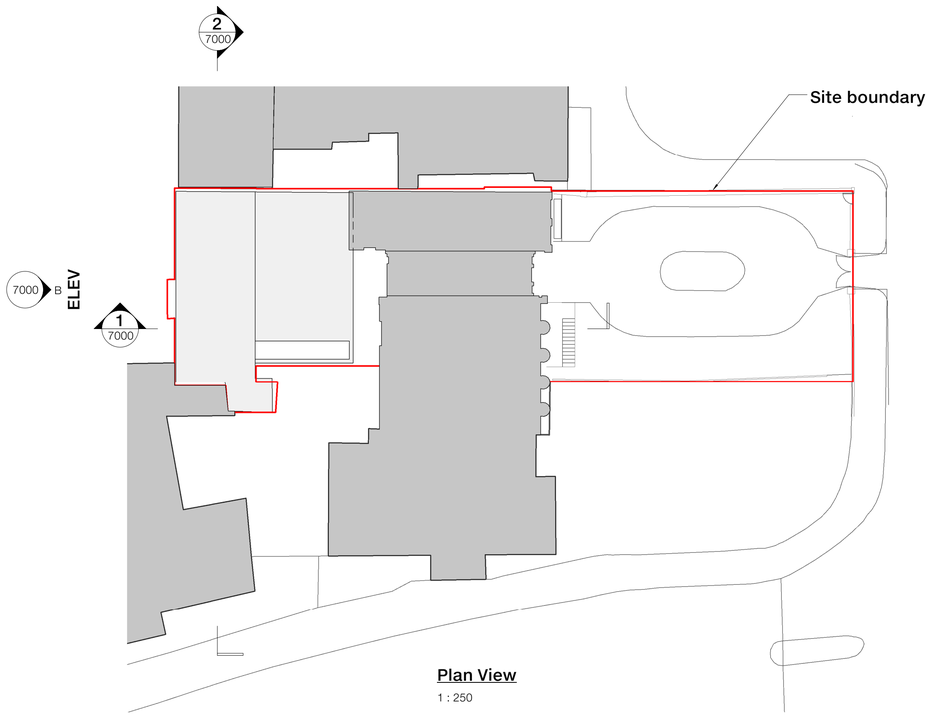
Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

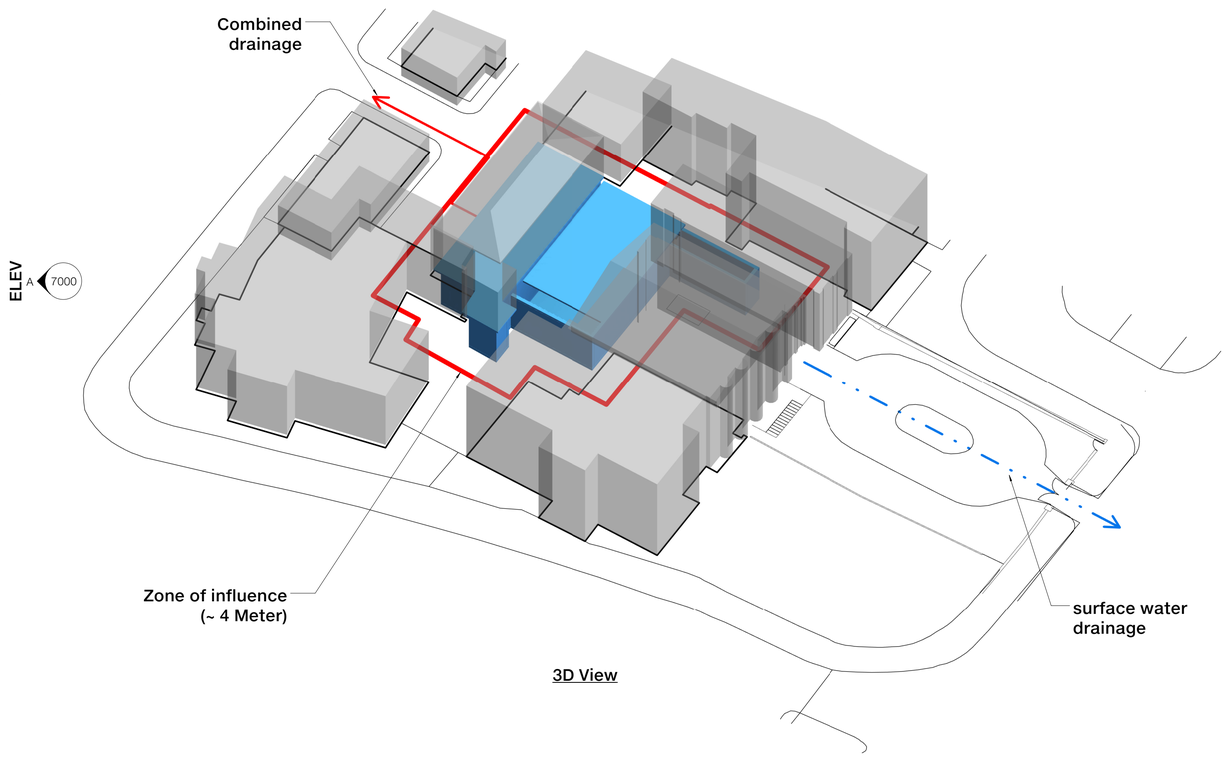
The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

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

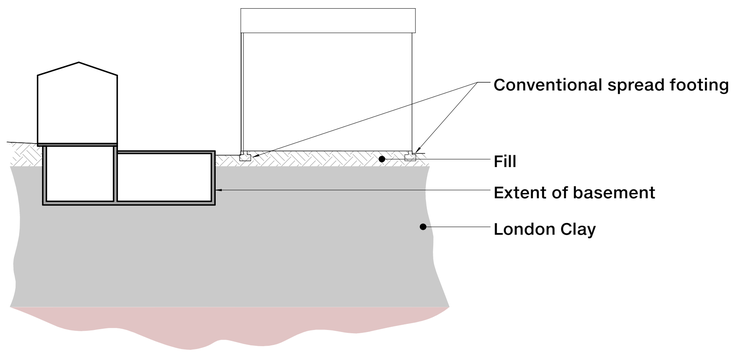
PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE



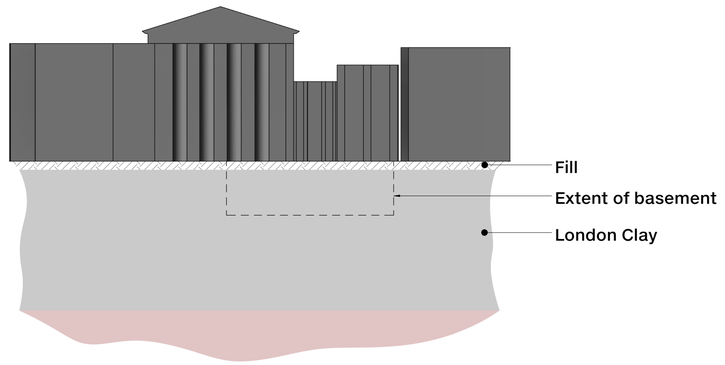
Plan View
1 : 250



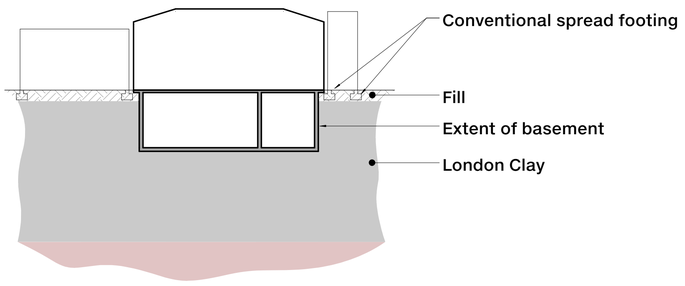
3D View



Section 1
1 : 250



Elevation A
1 : 250



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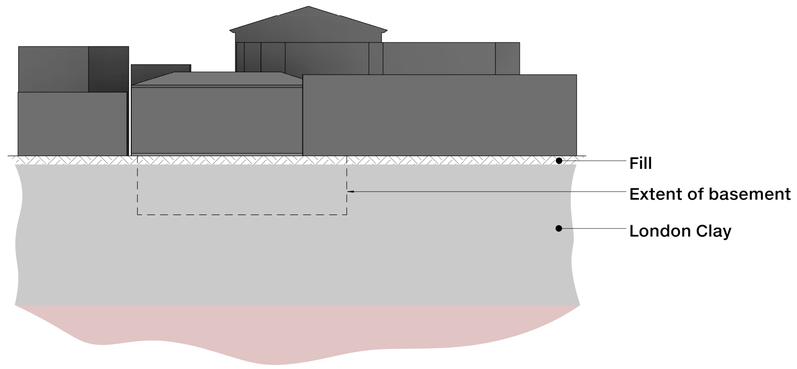
1 : 250



Elevation B
1 : 250

Notes:

1. This drawing is to be read in conjunction with all relevant architects and engineers drawings and specifications.
2. Do not scale this drawing.

REV	COMMENTS	DATE	ENG	APP
01	Issued For Information	07.10.16	MW	MW

STATUS
Preliminary

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PROJECT
Gloucester Lodge

SUBJECT
Conceptual Site Model

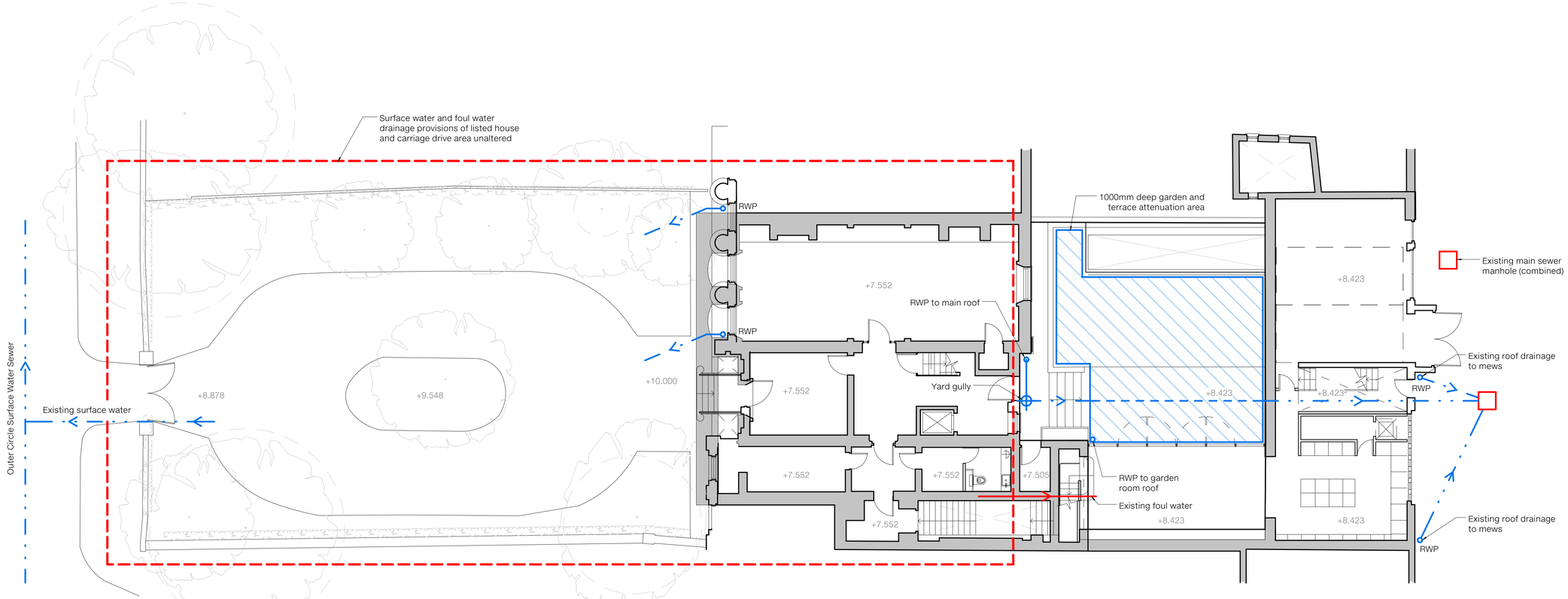
SCALE @ A1
1 : 250

BY
SN

DATE
07/10/16

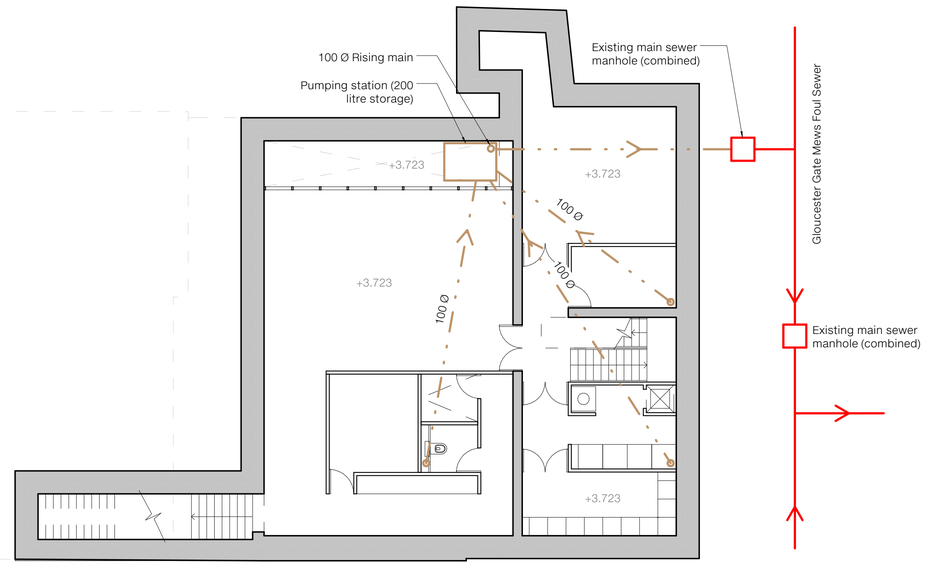
DRAWING No.
15060-7000

REV
01



Lower Ground

1 : 100



Basement

1 : 100

Notes:

1. This drawing is to be read in conjunction with all relevant architects and engineers drawings and specifications.
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PROJECT
Gloucester Lodge

SUBJECT
Drainage Layout

SCALE @ A1
1 : 100

BY **SN** DATE **07/10/16**

DRAWING No. **15060-8001** REV **01**

07/10/2016 17:19:28

Design Note – Ground Movement Assessment

Project: Gloucester Lodge

Job No: 15060

Date: 07.10.2016

By: AA

Chk: MW

Introduction

A single storey basement extension to an existing residential building is to be constructed and is situated adjacent to Gloucester Gate Mews, London. The building neighbours the Mews to the east and existing buildings to the remaining sides as can be seen in the aerial view in Figure 1 below.

This design note provides an assessment of the ground movement and damage classification onto the existing adjacent structures. The calculations of the structural behaviour of proposed basement structure in the temporary and permanent conditions are also presented.

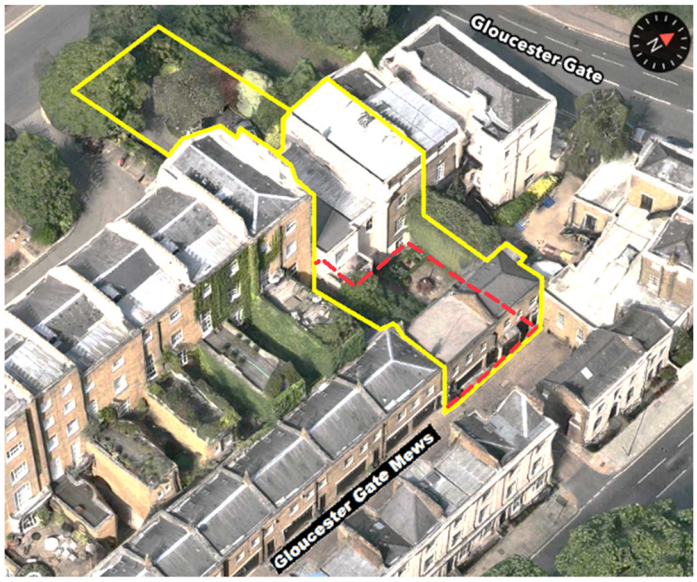


Fig. 1 Aerial view of Gloucester Lodge, dashed line represents extent of basement extension

Existing Structure

The existing buildings date to the late 19th century and are a Victorian house style of construction with traditional load bearing masonry with timber floors. The buildings have a lower ground level and vary in height between two to four storeys. Above the proposed basement the existing building is two storeys in height.

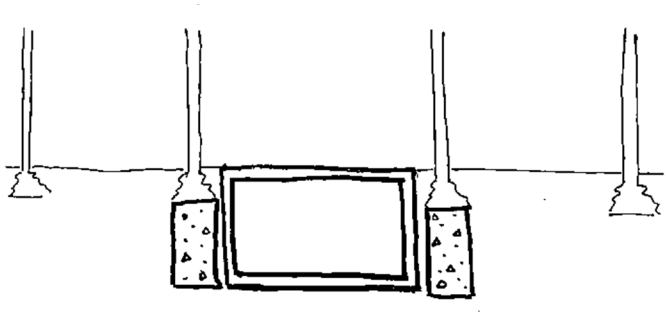
Proposed Construction

The proposed basement is formed of reinforced concrete construction and forms a box structure with perimeter retaining walls that are propped by the lower ground floor slab. The basement slab behaves as a ground bearing raft transferring the forces onto the subsoil.

In relation to supporting the existing superstructure, there are two options that are considered and outlined below:

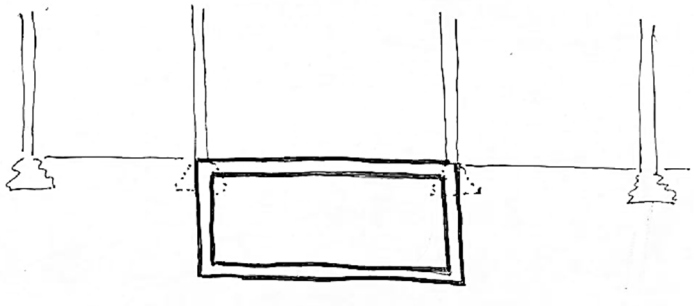
Option 1

The existing masonry walls will be underpinned with mass concrete to the same level as the basement. This means that the vertical loads transferred from the existing superstructure to its existing foundations will be unchanged. The new basement will be independent while supporting the lateral loads.



Option 2

The existing masonry walls will be underpinned by new basement structure itself making the existing foundations redundant. This means the basement structure will support itself and the superstructure. Susceptible



Assumptions and Loadings

Temporary Condition (Options 1 and 2)

The basement structure will be temporarily propped during construction and designed for an applied internal construction load of 2.5kN/m² and an applied external surcharge traffic loading of 10kN/m².

Permanent Condition

The retaining walls are propped by the lower ground floor slab and a 10kN/m² traffic load has been conservatively assumed to act on all sides of the basement. This will prevent uncertainty in any unknown present or future built adjacent basements.

An imposed residential loading of 1.50kN/m² plus lightweight partitions of 0.50kN/m² is assumed for the floors.

Option 1

The basement structure is vertically self-supporting and retaining the soil only. The existing superstructure is supported on its existing foundations which are underpinned.

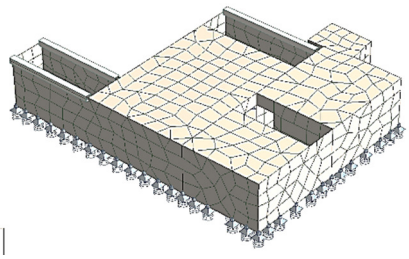
Option 2

The basement structure supports itself and the existing superstructure as well as retaining the soil.

Soil Conditions

A safe allowable bearing pressure of 110kPa for London soil at 4m depth and a water table at 1m below ground level is conservatively assumed in the analysis. An elastic settlement of maximum 25mm is assumed at 110kPa.

Detailed breakdown of applied loadings is presented at the end of this note.



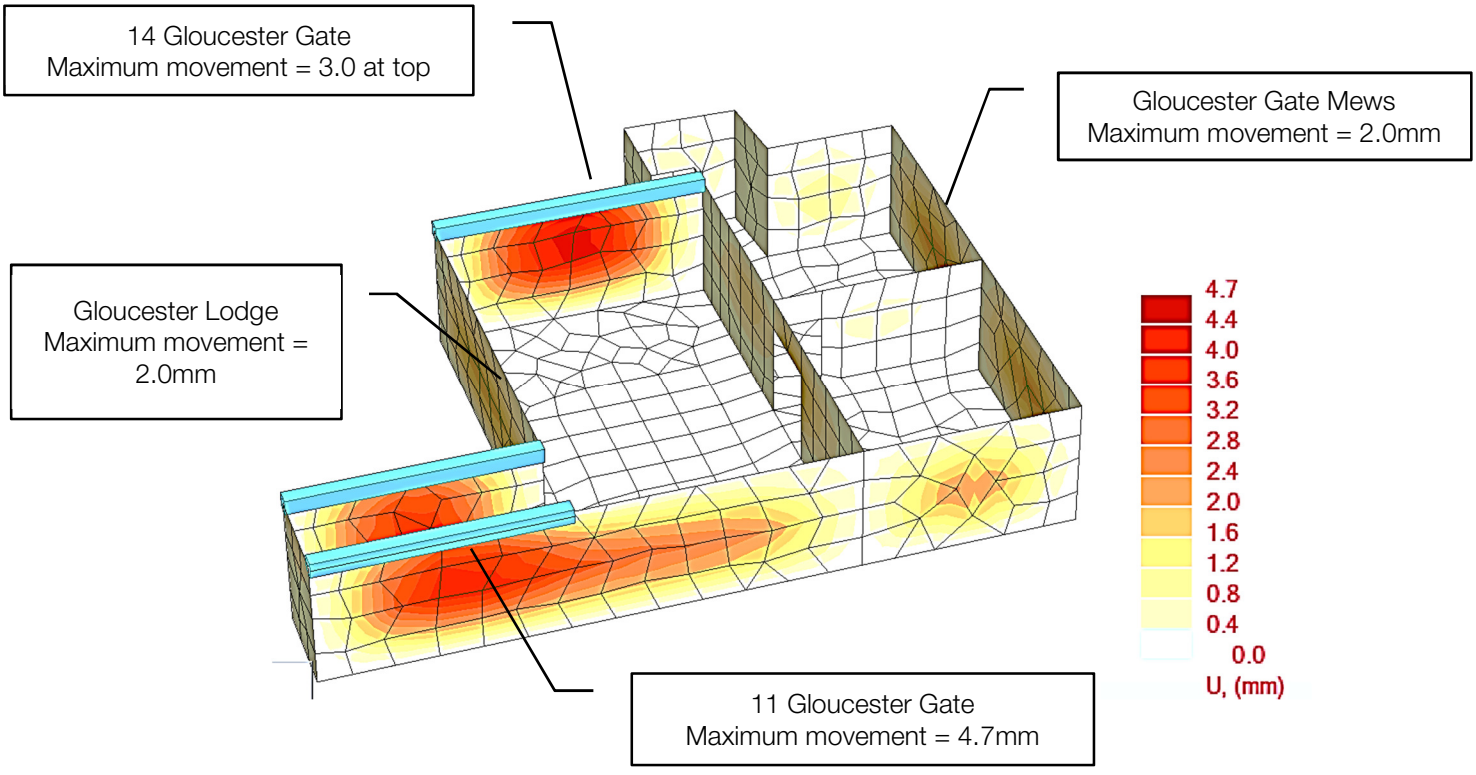
Structural Analysis

A finite element model of the basement RC structure has been established and used to accurately determine structural displacements. The applied loadings are presented at the end of this design note.

Movement Assessment Summary

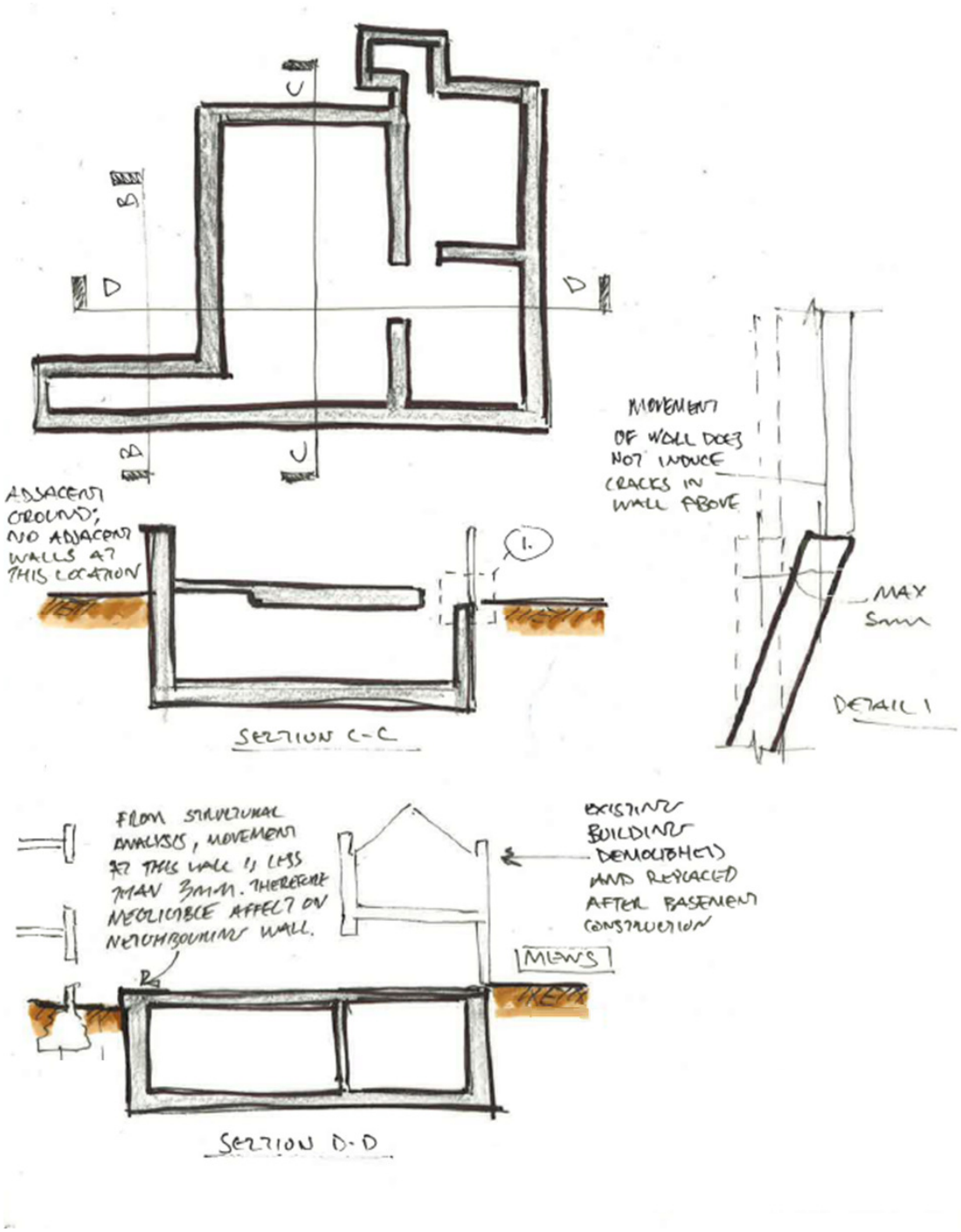
The maximum movement of the basement walls is less than 5mm at the worst case positions which are adjacent to openings in the slab because it props the top of the basement structure.

The maximum potential crack width induced is in the existing wall above at 11 Gloucester gate and corresponds to 0.92mm as calculated in the following page. This corresponds to a Burland scale category of damage of *1 (very slight)*. The movement in the remaining sides of the basement are less than this and are illustrated in the diagram below. The basement forms an extremely rigid RC box structure and reduces displacements.

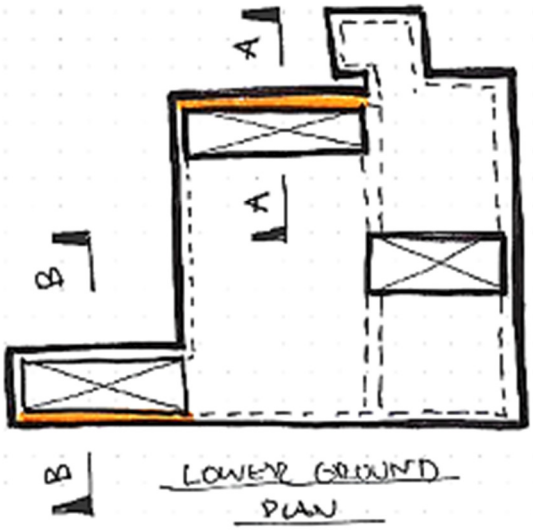


Local Movement Assessment

The boundaries surrounding the basement walls are explored below as follows:



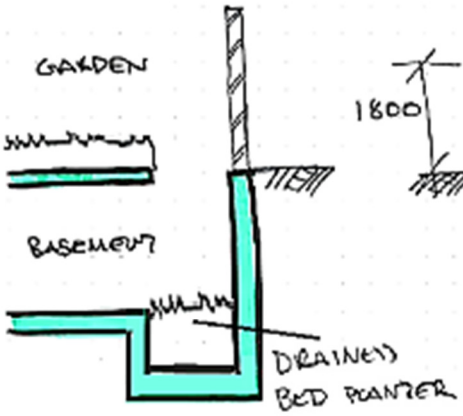
Title: GLOUCESTER LODGE	By: AA	Job No: 15060	
Subject: MOVEMENT ASSESSMENT	Chk:	Date: AUG-16	



LOWER GROUND PLAN

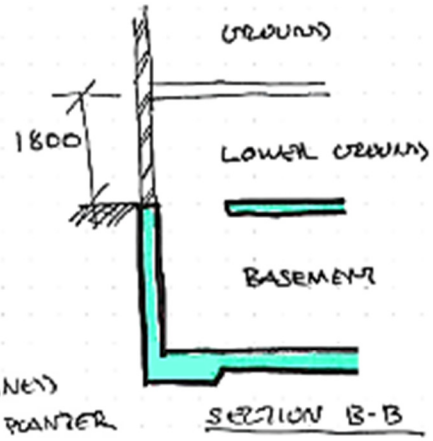
AREAS SUSCEPTIBLE TO MOVEMENT

ALL OTHER AREAS ARE PROPPED BY THE RC SLAB THEREFORE NO MOVEMENT IS EXPECTED ACCORDING TO ANALYSIS.



SECTION A-A

GARDEN WALL WILL MOVE WITH BASEMENT RC WALL. NO CRACKS OCCUR



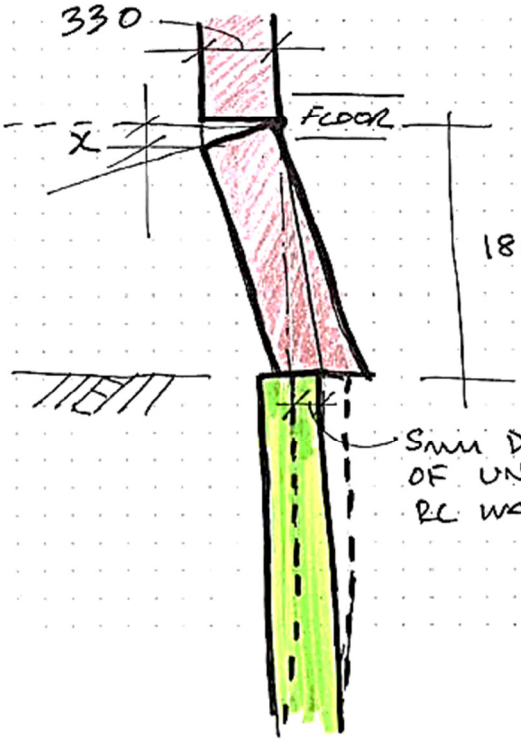
SECTION B-B

MASONRY WALL ABOVE RESTRAINED BY GROUND FLOOR SLAB. POSSIBLE CRACK OCCURANCE. SEE NEXT PAGE FOR ASSESSMENT.

Crack Width Calculation for the Maximum Movement

Title: GLOUCESTER LODGE		By: AA	Job No: 15060
Subject: MOVEMENT ASSESSMENT		Chk:	Date: AUG-16

FROM THE FE ANALYSIS, THE RC WALL ADJACENT TO THE OPENING SHOWN IN SECTION B-B IN PREVIOUS PAGE IS EXPECTED TO MOVE LATERALLY BY 5MM. THE CORRESPONDING CRACK WIDTH INDUCED IN THE EXISTING WALL ABOVE IT, IS CALCULATED HEREIN.



$$x = \frac{330}{1800} \times 5$$

$$= 0.92\ \text{mm}$$

CRACK WIDTH < 1.0 mm

THEREFORE CATEGORY I

Burland Scale

Gloucester Lodge →

Category of damage	Description of typical damage	Approximate crack width (mm)	Limiting tensile strain ε_{lim} (per cent)
0 Negligible	Hairline cracks of less than about 0.1 mm are classed as negligible	<0.1	0.0-0.05
1 Very slight	Fine cracks that can easily be treated during normal decoration. Perhaps isolated slight fracture in building. Cracks in external brickwork visible on inspection	<1	0.05-0.075
2 Slight	Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks are visible externally and some repointing may be required externally to ensure weathertightness. Doors and windows may stick slightly.	<5	0.075-0.15
3 Moderate	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable lining. Repointing of external brickwork and possibly a small amount of brickwork to be replaced. Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5-15 or a number of cracks > 3	0.15-0.3
4 Severe	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Windows and frames distorted, floor sloping noticeably. Walls leaning or bulging noticeably, some loss of bearing in beams. Service pipes disrupted.	15-25 but also depends on number of cracks	>0.3
5 Very severe	This requires a major repair involving partial or complete rebuilding. Beams lose bearings, walls lean badly and require shoring. Windows broken with distortion, Danger of instability.	Usually > 25 but depends on number of cracks	

Damage Category Chart (CIRIA C580)

Detailed Applied Loadings

The applied loads in the FE model are listed below

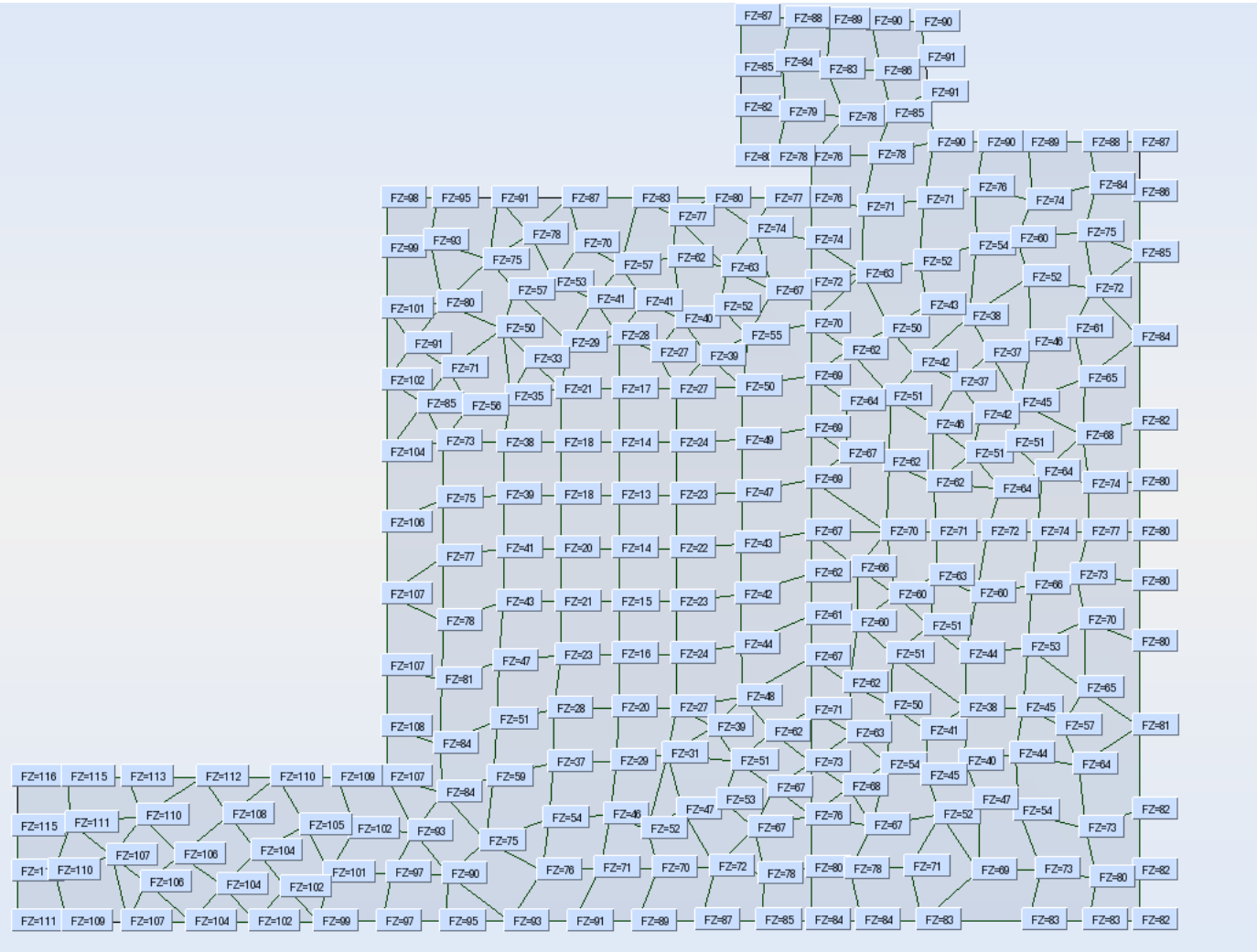
Loads on Floors	**Description**	**Dead Loads kN/m²**	**Live Loads kN/m²**
Basement	Screed and finishes	2.50	
	Domestic live load and partitions		2.00
Lower Ground	Screed and finished	2.50	
	Domestic live load and partitions		2.00
Floors above	Timber floors	1.00	
	Domestic live load and partitions		2.00

Lateral Loads on Retaining Walls	**Description**	**Dead Loads kN/m²**	**Live Loads kN/m²**
Soil	Soil pressure at 4m	27	
Water Table	Water pressure at 3m	29	
Surcharge	10 kN/m² Surcharge	3.33	
Floors above	Timber floors	1.00	
	Domestic live load and partitions		2.00

Vertical Line Loads on Retaining Walls	**Description**	**Dead Loads kN/m**	**Live Loads kN/m**
	Two storey 330mm masonry wall above	50.0	
	Average 3m tributary width dead loads from 3 floors above	9.0	
	Average 3m tributary width live loads from 3 floors above		18.0

Applied Bearing Pressure

Basement Slab – Unfactored bearing pressures kPa (kN/m²)



Maximum applied bearing pressure < allowable 110 kPa OK