13 Movement Trigger Levels

13.1 Movement Trigger Levels

13.1.1 Trigger levels will be used to identify limits on the monitored results and to confirm/identify actions if these levels are reached. The traffic light system will be adopted, with green, amber and red trigger levels set. Trigger levels are to be agreed with the partywall surveyors.

13.1.2 The setting of appropriate trigger levels is to consider the following factors:

- The amount of predicted movement
- Accuracy of the monitoring equipment
- Normal/ preconstruction movements of the buildings
- Likely damage resulting from the predicted movement.

13.1.3 The amount of movement predicted has been assessed by the GEA, and the damage resulting from these movements has also formed part of their assessment. The underpinning specifications will give performance specifications for the temporary works, which limit movements and damage criteria to appropriate levels for the type and age of buildings surrounding the site.

13.1.4 The accuracy of the monitoring equipment for reading horizontal and vertical movements is to be limited to +/- 2mm.

13.1.5 The impact of normal movements of a building, such as thermal movements will need to be judged during the monitoring. The extent of this will need to be assessed during the early stages of the monitoring.

13.1.6 Actions to be taken by the design team and the contractor if these trigger levels are reached are summarised in the table below:

Actions		
Alert Level	Design Team	Contractor
Green	Continue to review monitoring as normal	Continue work as programmed and monitor as normal
Amber	a) Review monitoring results with contractor b) Review contractors amber action plan c) Make comments on contractors proposals and discuss with CA	Contractor to implement amber level action plan. This should include the following: a) Recheck monitoring to confirm readings b) Review method of working and highlight any activity relating to measured movements c) Propose revised methodology in to reduce trend in increasing movements d) Agree revised proposals wit CA prior to implementing. e) Increase frequency of monitoring
Red	a) Review monitoring results with contractor b) Review contractors red level action plan c) Make comments on contractor's proposals and discuss with CA d) Carry out condition survey with PW surveyor on affected buildings.	Contractor to implement his red level action plan. This should include the following: a) Stop work b) Recheck monitoring to confirm readings c) Install additional temporary works where required. d) Submit new methodology/ proposals to stop further movements. e) Agree revised proposals with CA prior to implementing f) Increase frequency of monitoring

14 Other Structural Works to the Party Walls

14.1 General

Other structural works to the party walls include:

1. Making good of the masonry party wall where existing structure built into the wall is removed.
2. Fixing/supporting of temporary works to the party wall

14.2 Making Good of Masonry Party Wall

Parts of the existing structure are built into partywalls, this includes:

1. Timber roof
2. Various fixings

As part of the proposal all of the above existing structure will be removed and the masonry made good to Architects details.

14.3 Fixing/Support of Temporary Works

External temporary works will be provided to the party wall as required.

Where feasible we have avoided fixing into party wall, but in order to provide lateral support to the party wall some fixing and temporary shoring will be necessary, these fixings into the party wall will be simple resin anchor bolts.

Temporary works drawings will be issued to the contractor carrying out the works for his information. The contractor however will be responsible for the preparation of his own proposals for temporary works for which he will remain solely responsible. The contractor's proposals shall be submitted to the contract administrator for comment prior to the commencement of the works on site, and may be different to those assumed by the Parmarbrook.

15 Stability of Surrounding Buildings

15.1 Temporary Works/Phasing

The following assumptions have been made during the design of the substructure of the building:

- Final phasing will need to be developed further by the appointed contractor and following further opening up works on site.
- Method Statements of the proposed demolition and sequencing of the temporary propping will need to be agreed prior to commencement of all works, to ensure proposals do not adversely impact the structure of the retained buildings.

15.1.1 Stability of Surrounding Buildings

Stability of the surrounding buildings will be ensured both during the demolition phase and during the construction phase. This will be achieved through the following measures:

- A full ground movement analysis has been carried out by GEA, this has assessed the effect of the works. This analysis will inform the design and phasing of the works, so that a suitable temporary works design and sequence can be installed to limit damage to surrounding properties.
- All works will be carried out in an agreed sequence, working to a method statement approved by all parties.
- Movement monitoring will be installed to all surrounding properties, so that actual movements during demolition and construction can be monitored with appropriate trigger levels and precautionary measures adopted.
- Propping of sensitive walls will be required to ensure that the displacement are maintained.

15.1.2 Summary

The predicted ground movements shown in the report do not present a significant global stability issue for the neighbouring buildings as they are small, ground movements which may take place as a result of the works will be closely monitored and appropriate action be taken should larger than anticipated movements be observed. Temporary shoring or tying will be provided as a mitigation measure and any necessary remedial work will be undertaken.

16 Site Management

At the planning stage an early indication of the systems and processes which will be undertaken by the main contractor can be outlined. The processes ensure that the preparatory and construction work is well planned and executed, and care is taken to minimise the impacts on the surrounding environment.

16.1 General

The Contractor is expected to minimise the impact of the construction activities on the surrounding area and follow industry best practice guidelines. There are a number of mitigation measures which are listed below.

16.1.1 Airborne Pollutants Mitigation Measures

1. In dry periods the works can be damped down to reduce dust
2. Ensuring all materials are properly contained or covered with secured sheeting
3. Inclusion of physical barriers
4. Appropriate ground covering.
5. Avoid cutting down of materials where possible.

16.1.2 Noise Disruption Mitigation Measures

1. Strict adherence to site working hours
2. Avoid deliveries during peak traffic times
3. Utilise sound reduction equipment for plant

16.2 Demolition

The environmental impact of the demolition process will be reduced with a series of mitigation measures:

1. Solid site hording will be erected prior to any works to minimise dust and noise pollution, and provide security for the site.
2. Encapsulating scaffolding maintained 2m above working level
3. Demolition materials will be removed from site on a daily basis to reduce the amount of material which can generate airborne pollutants at any one time.
4. The pavement will be washed down at the end of each day with any significant amounts of particulate matter being removed as it occurs.
5. Broken out material shall we watered to reduce airborne particulates.
6. Dust monitoring
7. Traffic Monitoring with controlled, planned, and staggered deliveries/removals

16.3 Excavation

A detailed method statement will be produced by the Contractor/Subcontractor for the excavation works which will detail the measures used to provide an excavation that is stable, safe, and minimises environmental impact.

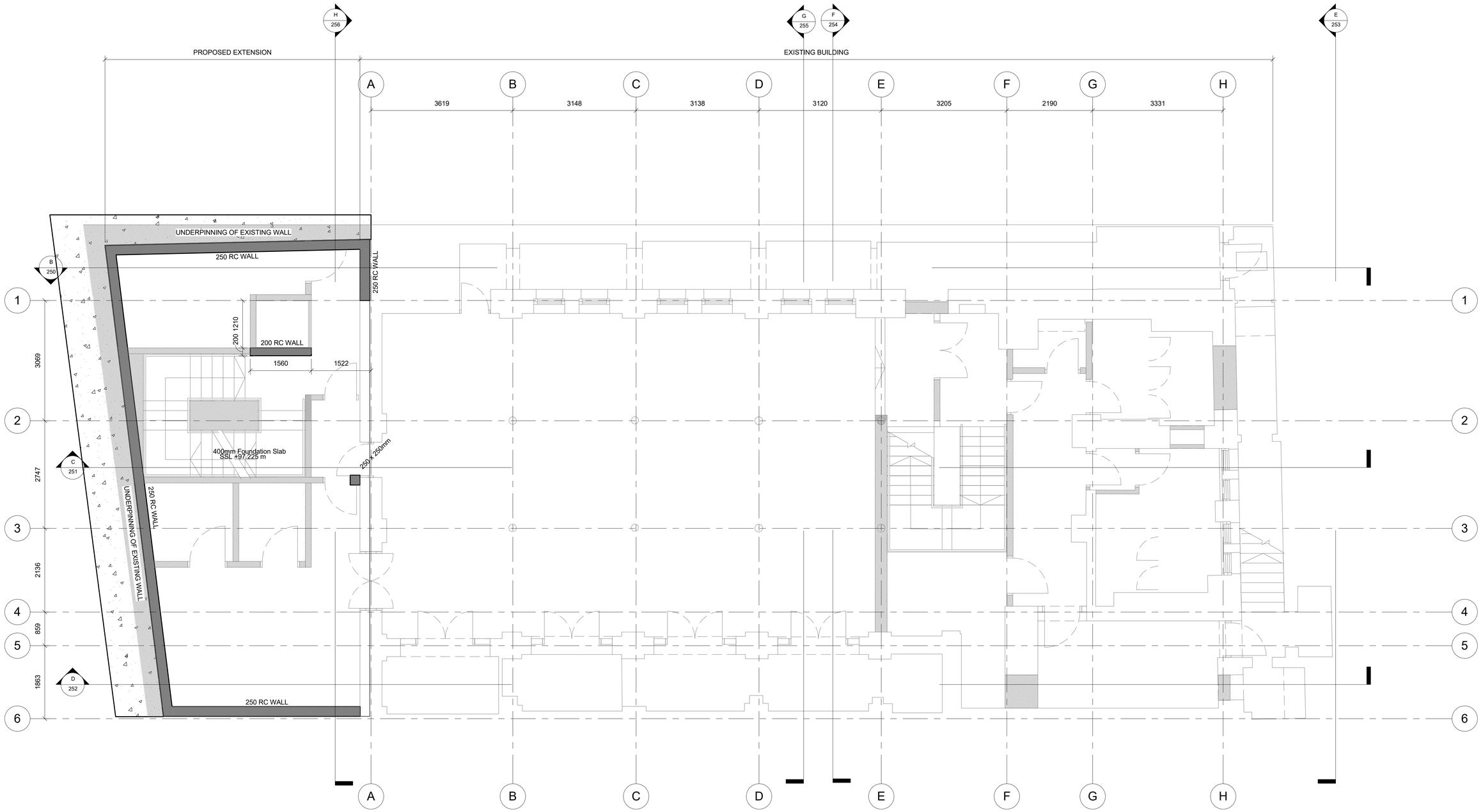
1. Solid site hording will be erected prior to any works to minimise dust and noise pollution, and provide security for the site.

16.4 Recycling, Reuse, and Disposal

Any opportunity to recycle or reuse materials made available during the demolition phase will be taken, this will include:

1. Recycles/Reuse of stock bricks, steel beams, and timbers as appropriate.
2. Separating of waste materials onsite to facilitate recycling, materials will then be taken to recycling stations where records will be produced by the recycling stations.
3. Ensuring that all Duty of Care requirements are complied with.
4. The contractor will ensure that the site is kept free from build-up of materials which are to be removed from site

17 Appendix A – Proposed Structural Drawings



GENERAL NOTES:

1. No dimensions are to be scaled from this drawing, all dimensions are to be established on site.
2. This drawing is to be read in conjunction will the 'General Notes Drawing' PB-1712-001.
3. This drawing is to be read in conjunction with all relevant Architect's and Services Engineer's drawings.
4. The contractor is to notify the Contract administrator (c.a) of any discrepancies between this drawing and site conditions before implementing the work. Details on this drawing are to be checked on site by the contractor and any discrepancies reported to the engineer so that adjustment may be made to the necessary.
5. The contractor is responsible for establishing and checking the setting out of all gridlines, levels and datum's.
6. The contractor shall be responsible for the stability of the existing structures on the site and must take all necessary precautions to safeguard the stability.
7. Any temporary works including, needling, shoring, strutting and propping shall be the sole responsibility of the contractor.
8. All demolition works shall be undertaken strictly in accordance with the party wall agreements.

REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Architect: BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	090	Revision:	P01

Project: 25 OLD GLOUCESTER STREET

Title: GENERAL ARRANGEMENT BASEMENT GA

Client: NILKANTH ESTATES LTD.

parmarbrook
2nd Floor, 345 Old Street, Shoreditch, London. EC1V 9LL
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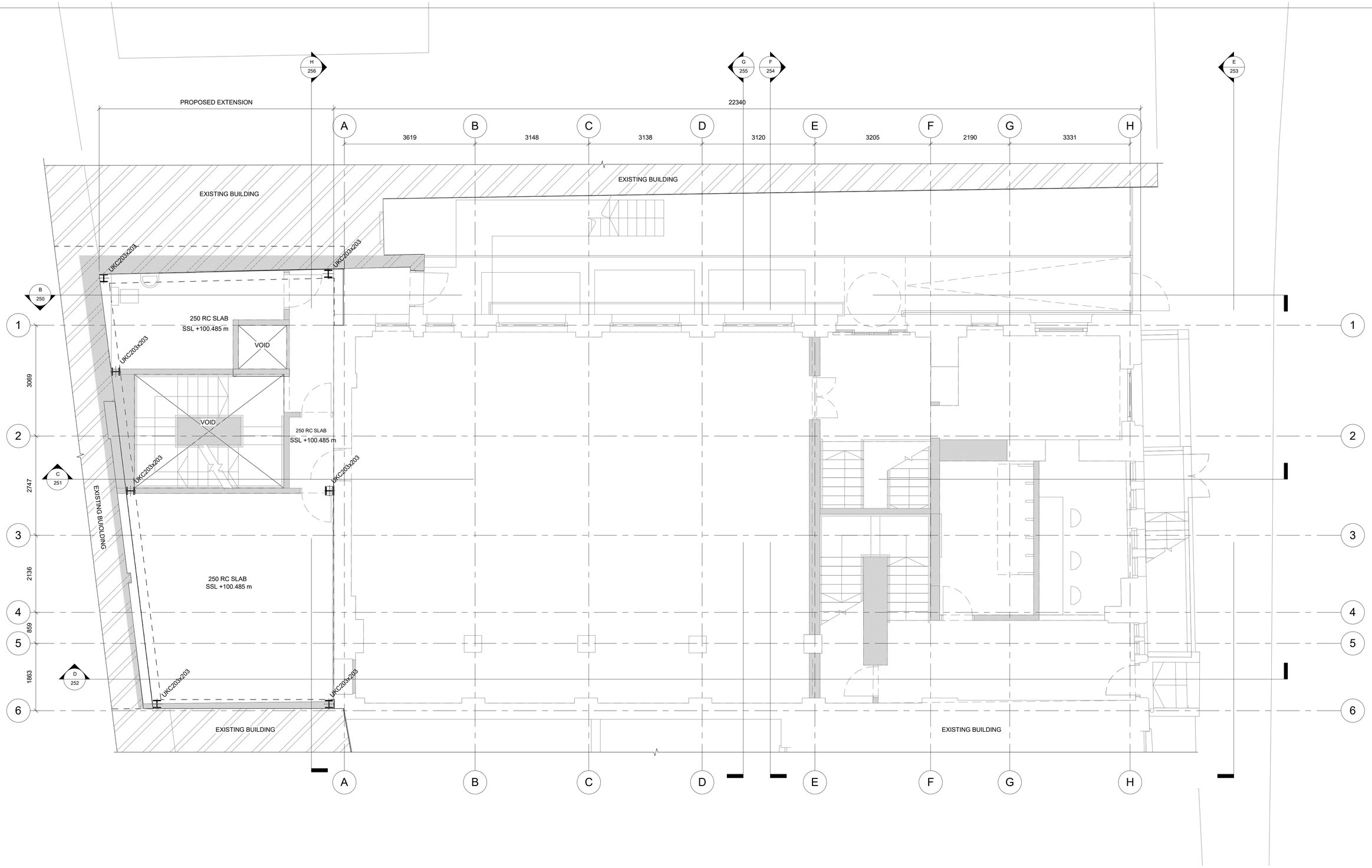
03-May-17 2:55:52 PM



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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Architect: BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	100	Revision:	P01

Project: 25 OLD GLOUCESTER STREET

Title: GENERAL ARRANGEMENT GROUND FLOOR GA

Client: NILKANTH ESTATES LTD.

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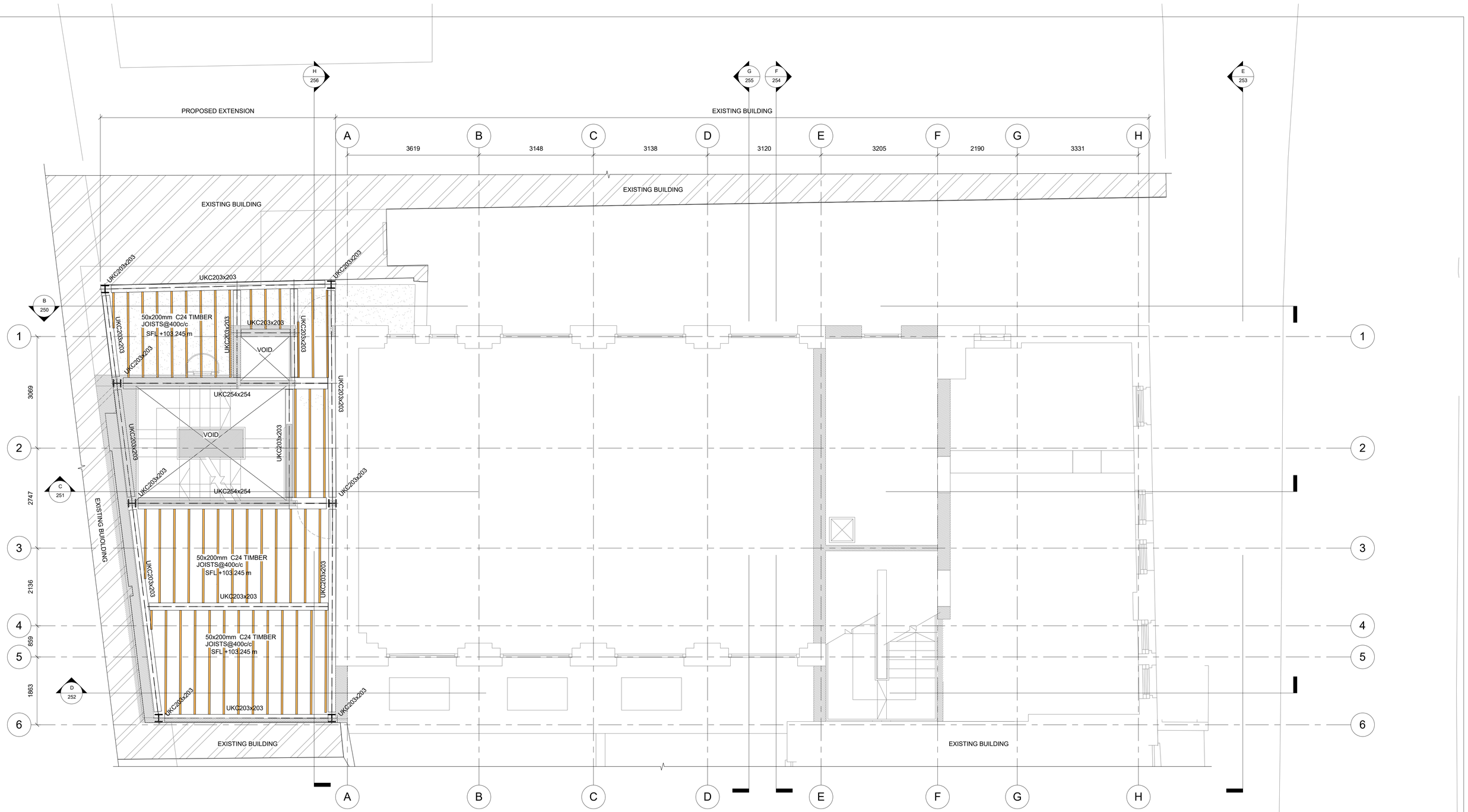

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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Architect: BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	105	Revision:	P01

Project:
25 OLD GLOUCESTER STREET

Title:
GENERAL ARRANGEMENT MEZZANINE GA

Client:
NILKANTH ESTATES LTD.

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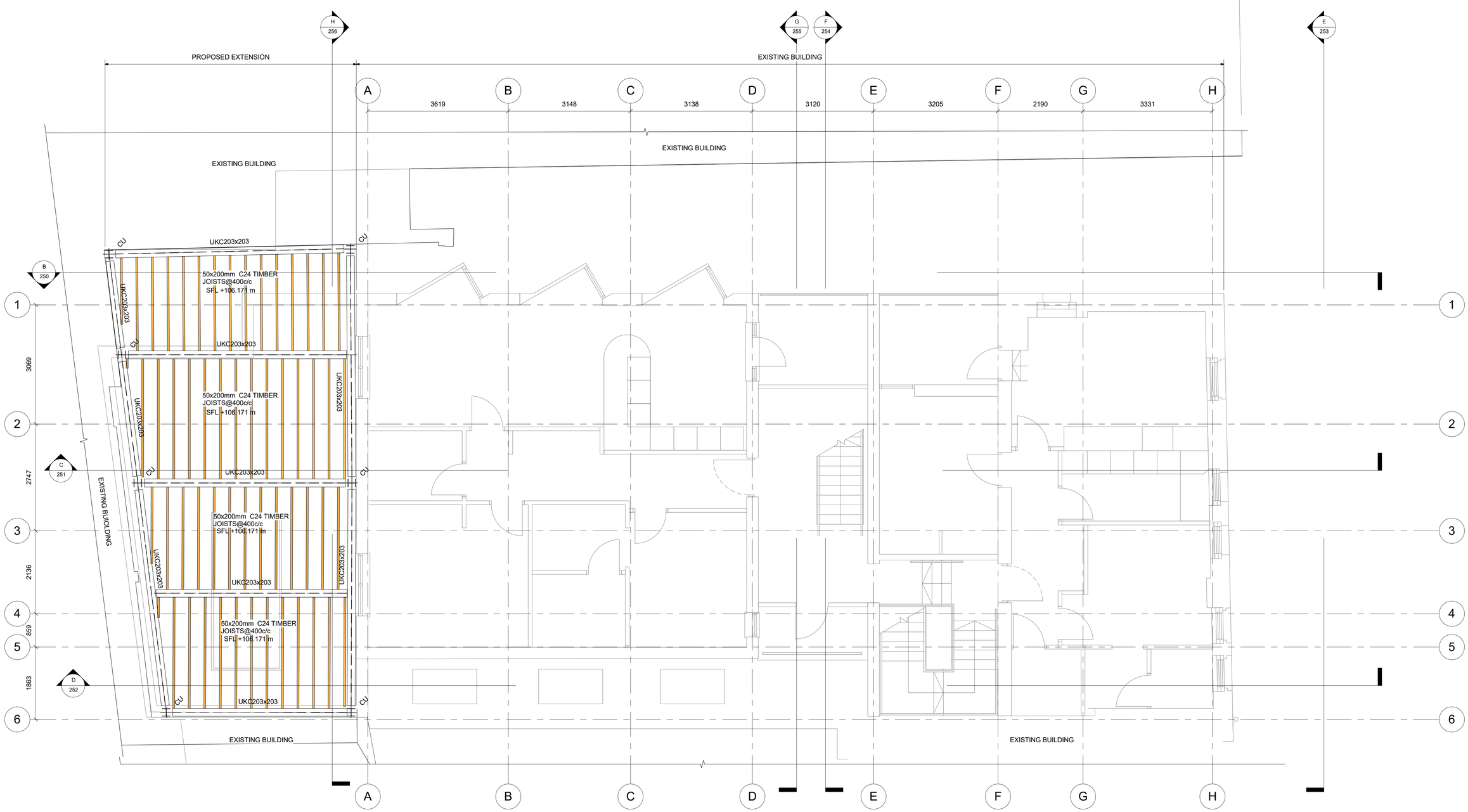

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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Architect: BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	110	Revision:	P01

Project: 25 OLD GLOUCESTER STREET

Title: GENERAL ARRANGEMENT FIRST FLOOR GA

Client: NILKANTH ESTATES LTD.

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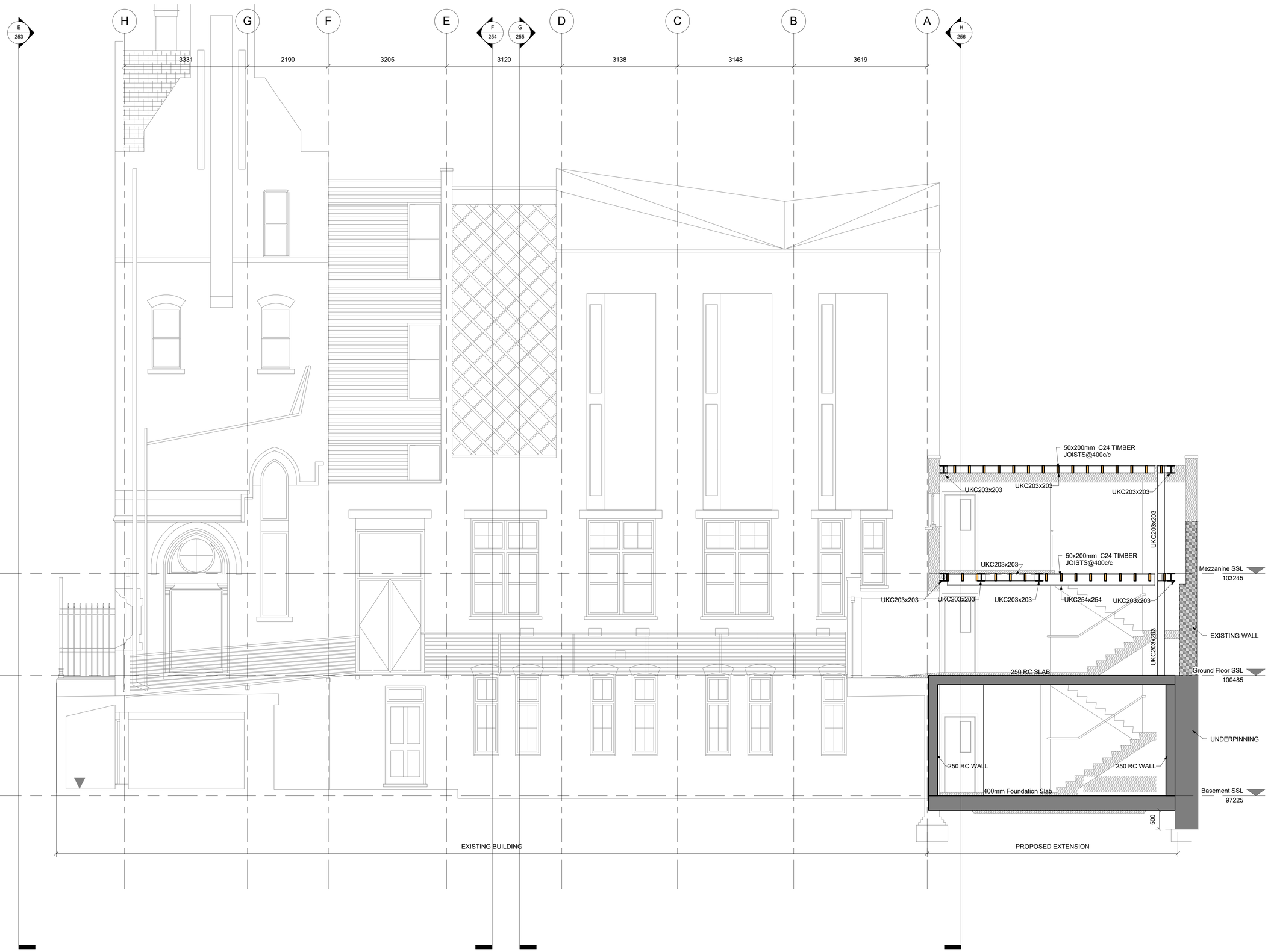
03-May-17 2:56:18 PM



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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Project:
25 OLD GLOUCESTER STREET

Title:
BUILDING SECTION B-B

Client:
NILKANTH ESTATES LTD.

Architect:
BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	250	Revision:	P01

03-May-17 2:56:31 PM

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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Project:
25 OLD GLOUCESTER STREET

Title:
BUILDING SECTION C-C

Client:
NILKANTH ESTATES LTD.

Architect:
BHA

PRELIMINARY

Designed:	Designer	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	251	Revision:	P01

03-May-17 2:56:41 PM

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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Project:
25 OLD GLOUCESTER STREET

Title:
BUILDING SECTION D-D

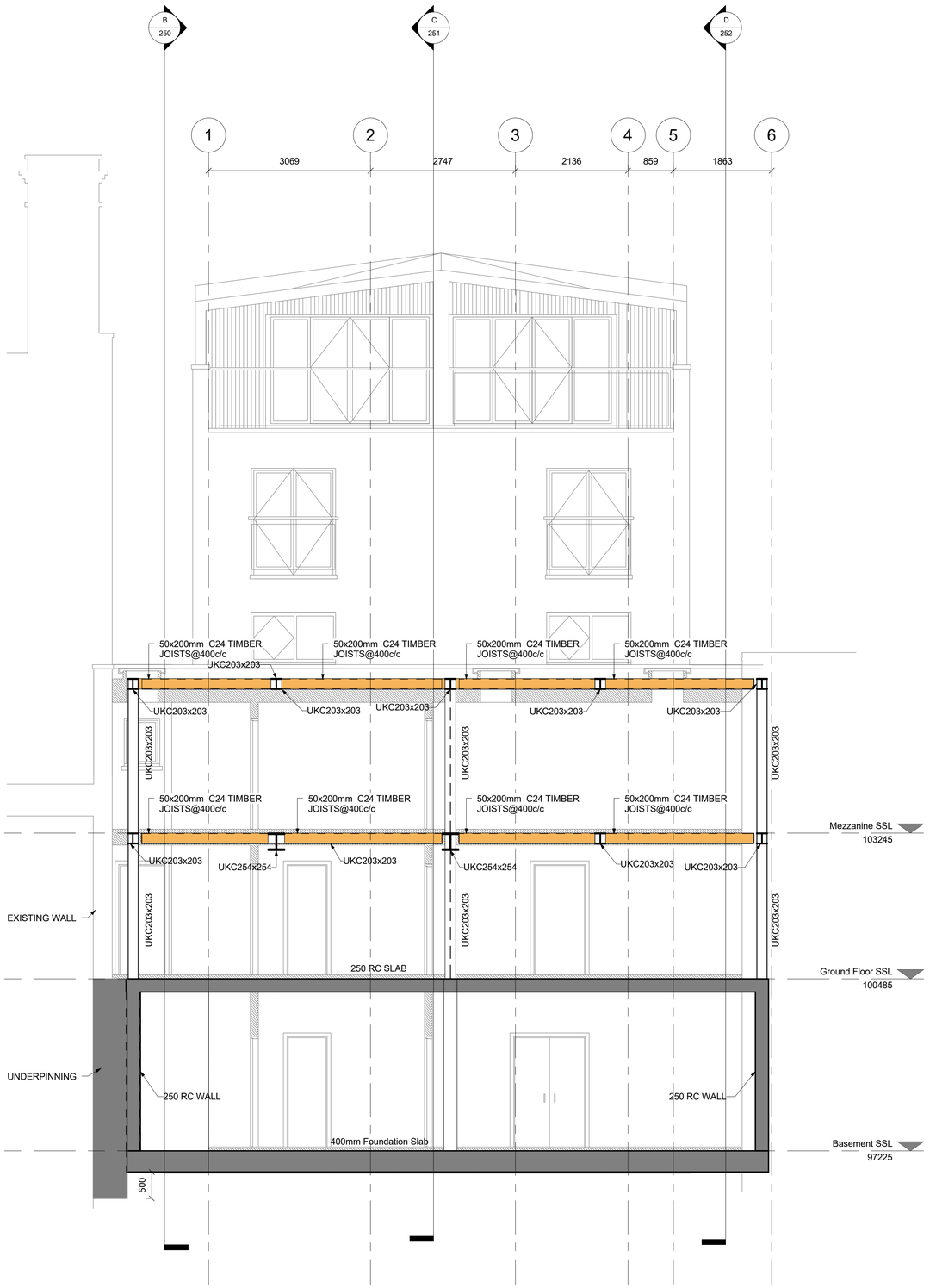
Client:
NILKANTH ESTATES LTD.

Architect:
BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	252	Revision:	P01

03-May-17 2:56:49 PM



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REV	DATE	DESCRIPTION	BY
P01	03.05.17	PRELIMINARY	DB

AMENDMENTS

Project:
25 OLD GLOUCESTER STREET

Title:
BUILDING SECTION H-H

Client:
NILKANTH ESTATES LTD.

Architect:
BHA

PRELIMINARY

Designed:	AM	Drawn:	DB
Checked:	BP	Date:	APR' 17
Project No:	1712	Scale @ A1:	1 : 50
Drawing No:	256	Revision:	P01

03-May-17 2:57:00 PM

18 Appendix B – Thames Water Asset Search

Asset location search

Property Searches

Parmarbrook

LONDON
EC1V 9LL

Search address supplied 25
Old Gloucester Street
London
WC1N 3AF

Your reference 25 Old Gloucester

Our reference ALS/ALS/24/2017_3573941

Search date 22 May 2017

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

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

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

0845 070 9148

searchcode

Asset location search

Search address supplied: 25, Old Gloucester Street, London, WC1N 3AF

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

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

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

Clean Water Services

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

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

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

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

Asset location search

Property Searches

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

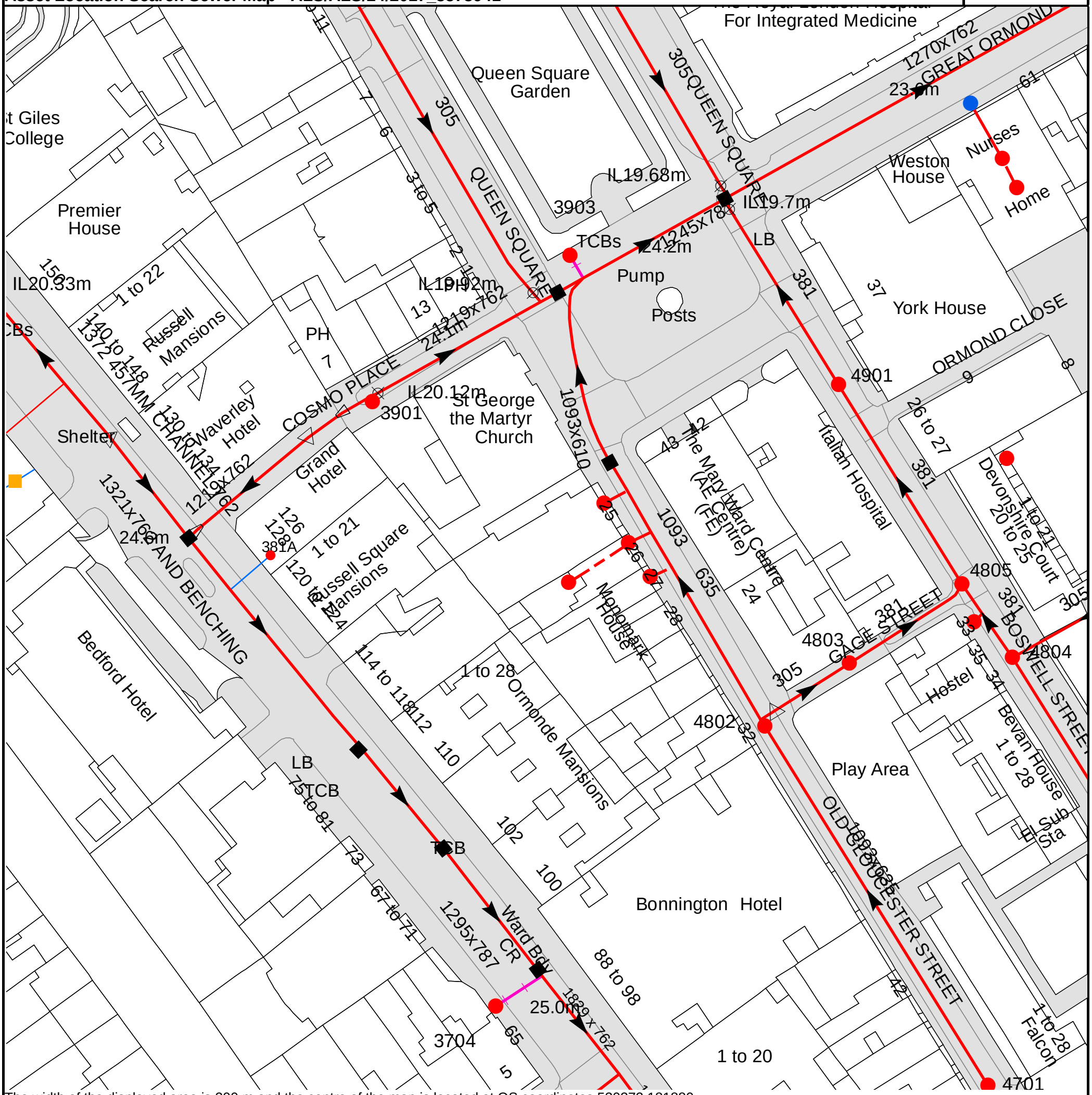
Clean Water queries

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/24/2017_3573941



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 530372,181880

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
4804	24.27	19.97
49CA	n/a	n/a
4701	25	21.09
3704	n/a	n/a
381A	n/a	n/a
3901	24.05	n/a
3811	n/a	n/a
3903	n/a	n/a
3812	n/a	n/a
3814	n/a	n/a
3813	n/a	n/a
4802	24.03	20.3
4901	23.93	19.79
4803	24.17	20.76
4805	24.15	19.93
49CC	n/a	n/a
481A	n/a	n/a
49CB	n/a	n/a
48CI	n/a	n/a

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

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

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

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

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

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

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

2) All measurements on the plans are metric.

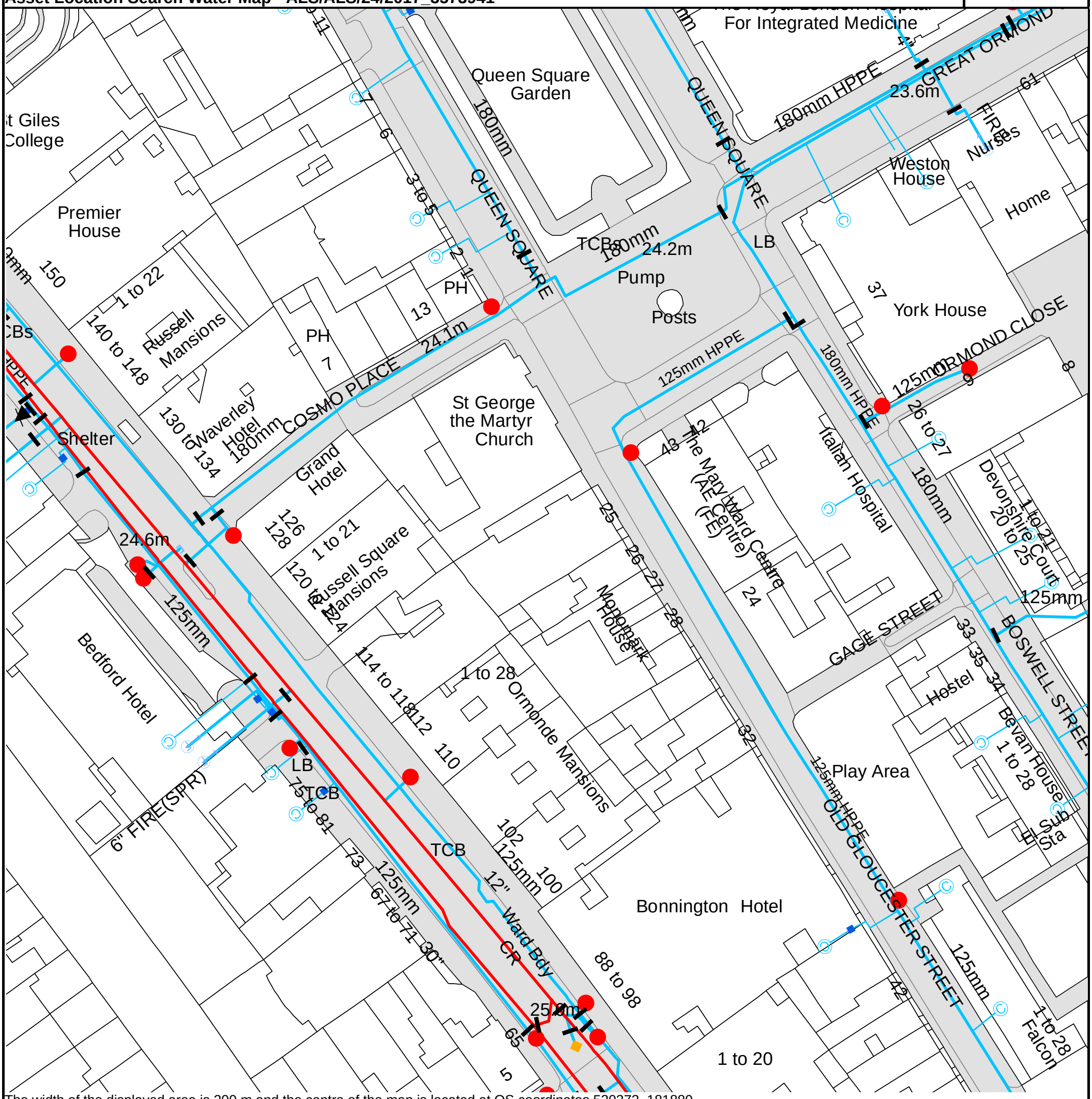
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

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

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

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

Asset Location Search Water Map - ALS/ALS/24/2017_3573941



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 530372, 181880.

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.

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

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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.
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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**

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

19 Appendix C – GEA Initial Report

DESK STUDY & GROUND INVESTIGATION REPORT

25 Old Gloucester Street
London
WC1N 3AF

Client: Nilkanth Estates

Engineers: Parmarbrook

J17059

May 2017




GEA Geotechnical & Environmental Associates

Document Control

Project title	25 Old Gloucester Street, London, WC1N 3AF	**Project ref**	J17059
Report prepared by			
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Report checked and approved for issue by			
	Steve Branch BSc MSc CGeol FGS FRGS MIEnvSc		
Issue No	**Status**	**Date**	**Approved for Issue**
1	Final	12 May 2017	

This report has been issued by the GEA office indicated below. Any enquiries regarding the report should be directed to the office indicated or to Steve Branch in our Herts office.

☑	Hertfordshire	tel 01727 824666	mail@gea-ltd.co.uk
☐	Nottinghamshire	tel 01509 674888	midlands@gea-ltd.co.uk

Geotechnical & Environmental Associates Limited (GEA) disclaims any responsibility to the Client and others in respect of any matters outside the scope of this work. This report has been prepared with reasonable skill, care and diligence within the terms of the contract with the Client and taking account of the manpower, resources, investigation and testing devoted to it in agreement with the Client. This report is confidential to the Client and GEA accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known, unless formally agreed beforehand. Any such party relies upon the report at their own risk. This report may provide advice based on an interpretation of legislation, guidance notes and codes of practice. GEA does not however provide legal advice and if specific legal advice is required a lawyer should be consulted.

This report is intended as a Ground Investigation Report (GIR) as defined in BS EN1997-2, unless specifically noted otherwise. The report is not a Geotechnical Design Report (GDR) as defined in EN1997-2 and recommendations made within this report are for guidance only.

CONTENTS

Part 1: INVESTIGATION REPORT

Part 2: DESIGN BASIS REPORT

Part 3: GROUND MOVEMENT ASSESSMENT

Part 4: BASEMENT IMPACT ASSESSMENT

EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

BRIEF

This report describes the findings of a site investigation carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of Parmarbrook Ltd, on behalf of Nilkanth Estates, with respect to the redevelopment of the site by the demolition of the existing rear single-storey, double height extension and the subsequent construction of a two-storey extension with a new single-level basement and an additional three-storeys to the main building behind the front five-storey section. The purpose of the investigation has been to research the history of the site with respect to possible contaminative uses, to determine the ground conditions and hydrogeology, to assess the extent of any contamination and to provide information to assist with the design of suitable foundations and retaining walls for the proposed development. The report also includes information required to comply with London Borough of Camden (LBC) Planning Guidance CPG4, relating to the requirement for a Basement Impact Assessment (BIA), including a ground movement analysis and building damage assessment.

DESK STUDY FINDINGS

The earliest map studied, dated 1878, shows the site to have already been developed with two terraced houses fronting onto Gloucester Street (now Old Gloucester Street) to the northeast, with rear gardens in the south west. Much of the existing road network and surrounding buildings are shown to have already been constructed by this time. By the time of the next map studied, dated 1896 the site is shown to have been redeveloped with the existing building which is labelled as a school. On the map dated 1916, a number of buildings located approximately 100 m to the northeast of the site are labelled as hospital buildings and on the map dated 1952 much of those buildings had been replaced with new buildings but were still in use as numerous Hospitals. Both the site and surrounding area have since remained essentially unchanged.

GROUND CONDITIONS

The investigation encountered the anticipated ground conditions in that beneath a moderate to significant thickness of made ground, the Lynch Hill Gravel was encountered and was underlain by the London Clay which extended to the full depth of the investigation, of 18.00 m. The made ground generally comprised brown silty clayey sand with gravel, brick, ash and concrete fragments and extends to a depth of 0.90 m below basement level and 3.00 m below ground floor level. The Lynch Hill Gravel generally comprised dense orange-brown slightly silty slightly clayey sandy fine to coarse sub-angular to sub-rounded gravel and extended to a depth of 6.50 m. The London Clay initially comprised stiff fissured brown silty clay, extending to a depth of 7.00 m, below which stiff fissured bluish grey slightly silty slightly sandy clay was encountered, and extended to the full depth of the investigation, of 18.00 m. Groundwater was encountered at a depth of 1.80 m in Borehole No 2, but was not encountered in Borehole No 3, which refused at a depth of 1.30 m, or Borehole No 1, where the necessary addition of water to aid drilling may have masked any such inflows.

The results of the testing have indicated one of the four samples tested to contain an elevated concentration of lead, while all other contaminant concentrations have been found to be below the respective guideline values.

RECOMMENDATIONS

The Llynch Hill Gravel should be suitable for the support of a moderately loaded raft foundation, although only a limited thickness of gravel will remain above the London Clay at formation level and a check of likely settlements should be carried out to ensure that the clay is not over-stressed. In addition, consideration will need to be given the presence of the deeper basement along the southern boundary. In order to ensure that additional load is not placed on the foundations of the adjacent structure to the south, the raft will not extend to the southern boundary.

GROUND MOVEMENT ASSESSMENT

The analysis has predicted that the proposed installation of the retaining wall underpins and excavation of the proposed basement are likely to result in the building damage for sensitive structures being Category 0 (negligible).The CPG4 document indicates that where possible all building damage should be restricted to a maximum of Category 1, as set out in CIRIA Report 760, and as a result, the predictions are in line with Camden's requirements.

Part 1: INVESTIGATION REPORT

This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation. Interpretation of the findings is presented in Part 2.

1.0 INTRODUCTION

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Parmarbrook, on behalf of Nilkanth Estates, to carry out a ground investigation at No 25 Old Gloucester Street, London WC1N 3AF.

The report also includes information required to comply with London Borough of Camden (LBC) Planning Guidance CPG4, relating to the requirement for a Basement Impact Assessment (BIA), including a ground movement analysis and building damage assessment.

1.1 Proposed Development

It is understood that it is proposed to demolish the existing rear single-storey, double-height extension and subsequently construct a two-storey extension with a new single-level basement beneath. It is also proposed to construct an additional three storeys to the main building behind the front five-storey section.

The existing building already has a partial single level basement spanning the majority of the site which has a finished floor level of 100.56 m TBM, approximately 3.25 m below existing ground floor level. The proposed basement beneath the remainder of the site will extend to a similar depth as the existing basement.

This report is specific to the proposed development and the advice herein should be reviewed if the proposals are amended.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to check the history of the site with respect to previous contaminative uses;
- to determine the ground conditions and their engineering properties;
- to assess the possible impact of the proposed development on the local hydrogeology and surrounding structures;
- to provide advice with respect to the design of suitable foundations and retaining walls;
- to provide an indication of the degree of soil contamination present; and
- to assess the risk that any such contamination may pose to the proposed development, its users or the wider environment.

1.3 Scope of Work

In order to meet the above objectives, a desk study was carried out, followed by a ground investigation. The desk study comprised:

- a review of readily available geological and hydrogeological maps;
- a review of historical Ordnance Survey (OS) maps and environmental searches sourced from the Envirocheck database; and
- a walkover survey of the site carried out in conjunction with the fieldwork.

In light of the desk study, an intrusive ground investigation was carried out which comprised, in summary, the following activities:

- a single cable percussion borehole advanced to a depth of 18.00 m;
- two boreholes advanced to depths of 1.30 m and 2.70 m by window sampling methods;
- installation of a single groundwater monitoring standpipe to a depth of 6.50 m;
- a series of three trial pits advanced to a maximum depth of 1.60 m;
- modelling of the movements associated with the proposed basement construction and their impact on nearby structures;
- laboratory testing of selected soil samples for geotechnical purposes and for the presence of contamination; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

The report includes a contaminated land assessment which has been undertaken in accordance with the methodology presented in Contaminated Land Report (CLR) 11[1] and involves identifying, making decisions on, and taking appropriate action to deal with, land contamination in a way that is consistent with government policies and legislation within the United Kingdom. The risk assessment is thus divided into three stages comprising Preliminary Risk Assessment, Generic Quantitative Risk Assessment, and Site-Specific Risk Assessment.

The exploratory methods adopted in this investigation have been selected on the basis of the constraints of the site including but not limited to access and space limitations, together with any budgetary or timing constraints. Where it has not been possible to reasonably use an EC7 compliant investigation technique a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon GEA's engineering experience, local precedent where applicable and relevant published information.

1.3.1 Basement Impact Assessment

The work carried out also includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment), all of which form part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG4[2] and their Guidance for Subterranean Development[3] prepared by Arup (the "Arup

1 *Model Procedures for the Management of Land Contamination* issued jointly by the Environment Agency and the Department for Environment, Food and Rural Affairs (DEFRA) Sept 2004
2 London Borough of Camden Planning Guidance CPG4 *Basements and lightwells*
3 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean*

report"). The aim of the work is to provide information on surface water, land stability and groundwater and in particular to assess whether the development will affect neighbouring properties or groundwater movements and whether any identified impacts can be appropriately mitigated by the design of the development.

1.3.2 Qualifications

The land stability element of the Basement Impact Assessment (BIA) has been carried out by Martin Cooper, a BEng in Civil Engineering, a chartered engineer (CEng), member of the Institution of Civil Engineers (MICE), and Fellow of the Geological Society (FGS) who has over 20 years' specialist experience in ground engineering. The subterranean (groundwater) flow assessment has been carried out by John Evans, MSc in Hydrogeology, Chartered Geologist (CGeol) and Fellow of the Geological Society of London (FGS). The surface water and flooding assessment has been carried out by Rupert Evans, a hydrologist with more than ten years consultancy experience in flood risk assessment, surface water drainage schemes and hydrology / hydraulic modelling. Rupert Evans is a Chartered Environmentalist, Chartered Water and Environmental Manager and a Member of CIWEM.

The assessments have been made in conjunction with Steve Branch, a BSc in Engineering Geology and Geotechnics, MSc in Geotechnical Engineering, a chartered geologist (CGeol) and Fellow of the Geological Society (FGS) with some 30 years' experience in geotechnical engineering and engineering geology.

All assessors meet the qualification requirements of the Council guidance.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the investigation. The results of the work should be viewed in the context of the range of data sources consulted, the number of locations where the ground was sampled and the number of soil, gas or groundwater samples tested; no liability can be accepted for information in other data sources or conditions not revealed by the sampling or testing. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by GEA.

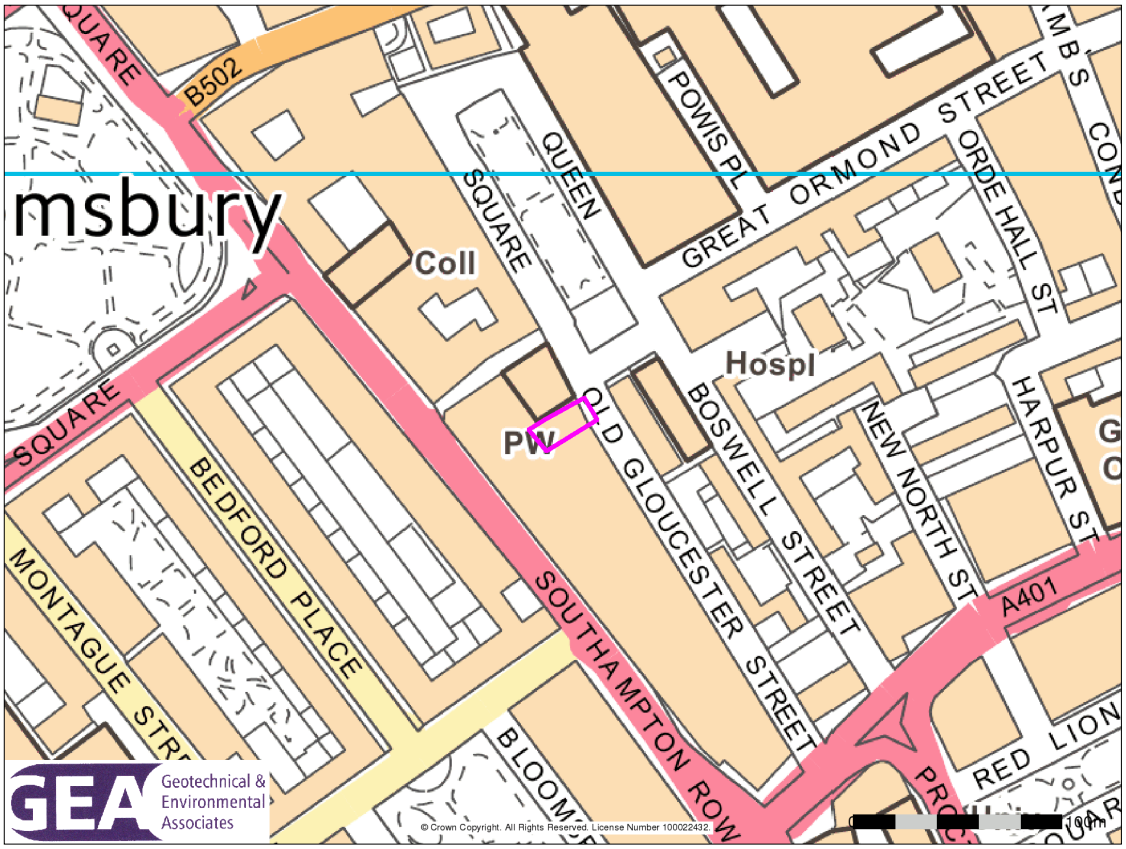
2.0 THE SITE

2.1 Site Description

The site is located within the London Borough of Camden, approximately 325 m south of Russell Square London Underground Station and 720 m northeast of Tottenham Court Road London Underground Station. The site fronts onto Old Gloucester Street to the east and is bounded by No 26 Old Gloucester Street to the south, an adjoined five-storey building with a single level basement, by St. Georges Church, a three storey church, to the north, and by a five-storey building with a single level basement fronting onto Southampton Row to the west. The site may additionally be located by National Grid Reference 530387, 181874 and is shown on the map extract overleaf.

The site forms a regular shaped area measuring 22 m east-west by 10 m north-south and is occupied by a vacant building with a single level basement beneath the front of the site, extending back to the existing rear extension. The building is generally three-storeys in

height, with a single storey, double height extension in the rear and a five storey section at the front. The building occupies the entire site and the site is essentially devoid of vegetation.



2.2 Site History

The history of the site and surrounding area has been researched by reference to historical Ordnance Survey (OS) maps sourced from the Envirocheck database.

The earliest map studied, dated 1878, shows the site to have already been developed with two terraced houses fronting onto Gloucester Street (now Old Gloucester Street) to the northeast, with rear gardens in the south west. Much of the existing road network and surrounding buildings are shown to have already been constructed by this time. By the time of the next map studied, dated 1896 the site is shown to have been redeveloped with the existing building which is labelled as a school. On the map dated 1916, a number of buildings located approximately 100 m to the northeast of the site are labelled as hospital buildings and on the map dated 1952 much of those buildings had been replaced with new buildings but were still in use as numerous Hospitals. Both the site and surrounding area have since remained essentially unchanged.

2.3 Other Information

A search of public registers and databases has been made via the Envirocheck database and relevant extracts from the search are appended. Full results of the search can be provided if required.

The search has revealed that there are no landfills, waste management, transfer, treatment or disposal sites within 750 m of the site. Additionally, there have been no pollution incidents to controlled waters within 200 m of the site.

The search has indicated that the site is located in an area where less than 1% of homes are affected by radon emissions; which is the lowest classification given by the Health Protection Agency (HPA) and therefore no radon protective measures will be necessary.

The site is not located within a nitrate vulnerable zone or any other sensitive land use.

2.4 Geology

The British Geological Survey (BGS) map of the area indicates the site to be underlain by the Lynch Hill Gravel over the London Clay Formation.

The Lynch Hill Gravel predominantly comprises sand and gravel, with localised lenses of clay and silt and is characteristically free-draining. The London Clay Formation is homogenous, slightly calcareous silty clay to very silty clay, with some beds of clayey silt grading to silty fine grained sand.

A historical BGS borehole drilled roughly 110 m south of the site encountered River Terrace Deposits to a depth of 3.0 m over the London Clay to a depth of 16.75 m. Below this depth, the Lambeth Group was encountered and extended to a depth of 32.30 m below which the Thanet Sand extends to a depth of 38.90 m. The Chalk was then encountered and extended to the maximum depth of the borehole, of 137.15 m. Reference to other nearby borehole archives confirms this geological succession to be accurate for the majority of the surrounding area

In addition, a previous ground investigation, carried out by GEA approximately 400 m to the northeast of the site, encountered gravel, extending to a depth of 4.40 m below which the London Clay was encountered and was found to extend to a depth of 16.20 m. Below this depth, the Lambeth Group was encountered and extended to the full depth of the investigation, of 20.45 m.

2.5 Hydrology and Hydrogeology

The Lynch Hill Gravel is classified as a Secondary 'A' Aquifer, which refers to strata that contain permeable layers capable of supporting water supply at a local level and in some cases may form an important source of base flow for local rivers, as defined by the Environment Agency (EA). The underlying London Clay is classified as a Non-Aquifer and Unproductive Stratum, which refers to a soil or rock with low permeability that has a negligible effect on local water supply or river base flow.

There are no EA designated Source Protection Zones (SPZs) on the site. The Envirocheck report indicates that the site is not located within 1 km of any surface water features. The site is not located in an area at risk of flooding from rivers or sea or surface water, as defined by the EA, although a section of Old Gloucester Street is shown to be at low risk of surface water flooding.

Reference to the Lost Rivers of London[4] indicates that a tributary of the River Fleet flowed along Euston Road in a easterly direction, approximately 200 m to the north of the site. The direction of groundwater flow beneath the site is likely to be in a south-easterly direction, downslope towards the River Thames.

[4] Nicholas Barton & Stephen Myers (2016) *The Lost Rivers of London*. Historical Publications Ltd

Any surface water runoff that infiltrates the shallow made ground and Lynch Hill Gravel above the London Clay is likely to flow southwards along the surface of the London Clay towards the River Thames which is located roughly 1.2 km to the south.

The permeability of the Lynch Hill Gravel is expected to range between about 1 x 10^{-6} m/s and 1 x 10^{-4} m/s, whereas in contrast, any groundwater flow within the London Clay will be at a very slow rate, due to its negligible permeability. Published data for the permeability of the London Clay indicates the horizontal permeability to generally range between 1 x 10^{-10} m/s and 1 x 10^{-8} m/s, with an even lower vertical permeability. The London Clay cannot therefore support groundwater flow and as such does not support a "water table" or continuous piezometric surface. Boreholes constructed within clays do fill with water due to the often high water content of shallow clays; however, this is not reflective of groundwater flow in a porous and permeable saturated stratum.

During the aforementioned nearby previous GEA investigation groundwater was measured at a depth of 2.21 m, within the single standpipe installed, during a single groundwater monitoring visit. However, groundwater is shown to generally be present at a depth of about 4.00 m closer to the site.

2.6 Preliminary Risk Assessment

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach.

2.6.1 Source

The desk study research has indicated that the site was developed with housing prior to the construction of the existing building and is therefore not considered to have had a contaminative history.

2.6.2 Receptor

The future end users of the commercial building will represent moderate sensitivity receptors. The site is underlain by a Secondary 'A' Aquifer and therefore groundwater is considered to be a relatively sensitive receptor. Similarly, perched water may also exist in the made ground or in the vicinity of existing foundations. Buried services are likely to come into contact with any contaminants present within the soils through which they pass and site workers are likely to come into contact with any contaminants present during demolition and construction works.

2.6.3 Pathway

The new building will cover the entire footprint of the site and it is likely that this will effectively form a barrier between any contaminants within the near-surface soils and end-users or infiltration of surface water. Furthermore it is understood that areas of soft landscaping will not form part of the proposed development.

Buried services will be exposed to any contaminants present within the soil through direct contact and site workers will come into contact with the soils during construction works. There is thus considered to be very low potential for a contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

2.6.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a low risk of there being a significant contaminant linkage at this site, which would result in a requirement for major remediation work. Furthermore as there is no evidence of filled ground within the vicinity, there is not considered to be a significant potential for hazardous soil gas to be present on or migrating towards the site; there should thus be no need to consider soil gas exclusion systems.

3.0 SCREENING

The London Borough of Camden guidance suggests that any development proposal that includes a subterranean basement should be screened to determine whether or not a full Basement Impact Assessment (BIA) is required.

3.1 Screening Assessment

A number of screening tools are included in the Arup document and for the purposes of this report reference has been made to Appendix E which includes a series of questions within a screening flowchart for three categories; groundwater flow, land stability and surface water flow. Responses to the questions are tabulated on the following pages.

3.1.1 Subterranean (groundwater) Screening Assessment

Question	Response for 25 Old Gloucester Street
1a. Is the site located directly above an aquifer?	*Yes, a Secondary 'A' Aquifer.*
1b. Will the proposed basement extend beneath the water table surface?	No. On the basis of the findings of previous nearby investigations the groundwater level in the area of the site is within the bottom two meters of the gravel at a depth of about 4 m, which is 1 m below the depth of the proposed basement. In addition, the site is already partially underlain by a basement that currently extends to the same depth as the proposed basement extension.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No. The closest water course to the site is a tributary to the River Fleet which is located approximately 200 m to the north of the site.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. The entire site is and will remain hardcovered.
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No. The site is entirely occupied by the existing building and will remain so after the completion of the development. Therefore the drainage situation will remain unchanged.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No.

The above assessment has identified the following potential issues that need to be assessed.

Q1a The site is located directly above the Lynch Hill Gravel, which is a Secondary 'A' Aquifer.

3.1.2 Stability Screening Assessment

Question	Response for 25 Old Gloucester Street
1. Does the existing site include slopes, natural or manmade, greater than 7°?	No. The site is entirely occupied by the existing building and does not contain any slopes at all.
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No. The site profile is unlikely to change significantly.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	No, reference to Fig 16 of the Arup report indicates no slopes of greater than 7° on neighbouring land
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	No. Fig 16 of the Arup indicates the area around the site to be essentially level.
5. Is the London Clay the shallowest stratum at the site?	No.
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	No.
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	No.
8. Is the site within 100 m of a watercourse or potential spring line?	No. The site is not located within 1 km of any watercourses.
9. Is the site within an area of previously worked ground?	No. Historical maps indicate that the site has been in its existing condition since the early 20th Century and there is no evidence of extraction having taken place.
10a. Is the site within an aquifer?	*Yes, a Secondary 'A' Aquifer.*
10b. Will the proposed basement extend beneath the water table such that dewatering may be required during construction?	Unlikely. The proposed basement excavation is unlikely to require dewatering as the excavation will not extend beneath the water table.
12. Is the site within 5 m of a highway or pedestrian right of way?	No. The proposed basement is located at the rear of the building which is located more than 15 m from the nearest highway or pedestrian right of way.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	*Possibly. The founding depths of some of the surrounding properties are unknown and as such the proposed founding depth could be significantly deeper.*
14. Is the site over (or within the exclusion zone of) any tunnels, eg railway lines?	No. A search of publicly available maps has not indicated tunnels under the site.

The above assessment has identified the following potential issues that need to be assessed.

Q10a The site is located within the Secondary 'A' Aquifer of the Lynch Hill Gravel.
Q13 The development will potentially increase the foundation depths relative to the neighbouring properties.

3.1.3 Surface Flow and Flooding Screening Assessment

Question	Response for 25 Old Gloucester Street
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. The Arup report confirms that the site is not located within this catchment area.
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?	No. There will not be an increase in impermeable area across the ground surface above the basement, so the surface water flow regime will be unchanged. The basement will be beneath the footprint of the existing building, therefore the 1m distance between the roof of the basement and ground surface as recommended by the Arup report and para 2.16 of the CPG4 does not apply across these areas.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	No. There will not be an increase in impermeable area across the ground surface above the basement.
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No. There will not be an increase in impermeable area across the ground surface above the basement, so the surface water flow regime will be unchanged. The basement will be beneath the footprint of the existing building, therefore the 1m distance between the roof of the basement and ground surface as recommended by the Arup report and para 2.16 of the CPG4 does not apply across these areas.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. The proposed basement is very unlikely to result in any changes to the quality of surface water being received by adjacent properties or downstream watercourses as the surface water drainage regime will be unchanged and the land uses will remain the same.
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 of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	No. The findings of this BIA together with the Camden Flood Risk Management Strategy dated 2013 and Figures 3i, 4e, 5a and 5b of the SFRA dated 2014, in addition to the Environment Agency online flood maps show that the site has a low flooding risk from surface water, sewers, reservoirs (and other artificial sources), groundwater and fluvial/tidal watercourses. It is possible that the basement will be constructed within a perched water table and the recommendations outlined in the BIA with regards to water-proofing and tanking of the basement will reduce the risk to acceptable levels. In accordance with paragraph 5.11 of the CPG a positive pumped device will be installed in the basement in order to further protect the site from sewer flooding. The site is located within the Critical Drainage Area Group03_003 but not within a Local Flood Risk Zone, as identified in the Camden SWMP and Updated SFRA Figure 6/Rev 2.

The above assessment has not identified any potential issues that need further assessment, although the hydrological setting is discussed further within this report.

4.0 SCOPING AND SITE INVESTIGATION

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified potential impact factors.

The potential impacts of the proposed development on surface flow and flooding and subterranean flow will need to be dealt with in separate assessments, such that the following section focuses on the potential impacts that may have an impact on slope stability.

4.1 Potential Impacts

The following potential impacts have been identified.

Potential Impact	Consequence
The site is located directly above an aquifer	The site is underlain by the Lynch Hill Gravel, which is classified as a Secondary 'A' Aquifer. This has the potential of being able to support local water supplies as well as forming an important source of base flow for local rivers. There is the potential for the hydrogeological setting to be affected by a basement development.
The development will increase the founding depths relative to neighbours.	If not designed and constructed appropriately, the excavation of a basement may result in structural damage to neighbouring buildings and structures.

These potential impacts have been investigated through the site investigation, as detailed in Section 9.0.

4.2 Exploratory Work

In order to meet the objectives described in Section 1.2, as far as possible within the access restrictions, a single borehole was advanced to a depth of 18.00 m using a dismantlable cable percussion rig which was supplemented by two hand held window sampler boreholes, which were drilled from basement level, and a series of three hand excavated trial pits, advanced to a maximum depth of 1.60 m below ground level and 1.28 m below existing basement level. It was initially proposed to advance the window sampler boreholes to a depth of 5.00 m but the boreholes could only be advanced to depths of 1.30 m and 2.70 m below basement level due to the density of the gravel encountered.

During boring, disturbed samples were obtained from the boreholes for subsequent laboratory examination and testing. Standard Penetration Tests (SPTs) were carried out at regular intervals in the cable percussion borehole to provide quantitative data on the strength of soils encountered. It was also proposed to retrieve undisturbed samples from the cable percussion borehole, which was not possible in practice as the suspended floor supporting the rig was not considered strong enough to allow the sampling to take place.

All of the above work was carried out under the part time supervision of a geotechnical engineer from GEA.

The borehole records, trial pit records and results of the laboratory testing are enclosed, together with a site plan indicating the exploratory positions.

4.3 Sampling Strategy

The scope of the works was specified by the consulting engineers, with input from GEA. The borehole positions were positioned on site by GEA with due regard to the proposed development, whilst avoiding areas of known services.

Four samples of the made ground was subjected to analysis for a range of common industrial contaminants and contamination indicative parameters. For this investigation the analytical suite for the soil included a range of metals, speciation of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols for the purposes of general coverage. The soil sample was selected to provide a general view of the chemical conditions of the soils that are likely to be involved in a human exposure or

groundwater pathway and to provide advice in respect of re-use or for waste disposal classification.

The contamination analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. Details of the MCERTs accreditation and test methods are included in the Appendix together with the analytical results.

5.0 GROUND CONDITIONS

The investigation encountered the anticipated ground conditions in that beneath a moderate to significant thickness of made ground, the Lynch Hill Gravel was encountered and was underlain by the London Clay which extended to the full depth of the investigation, of 18.00 m.

5.1 Made Ground

The made ground generally comprised brown silty clayey sand with gravel, brick, ash and concrete fragments and extends to a depth of 0.90 m below basement level and 3.00 m below ground floor level.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed during the fieldwork. Four samples of the made ground were tested for the presence of contamination and the results are detailed within Section 5.5.

5.2 Lynch Hill Gravel

The Lynch Hill Gravel generally comprised dense orange-brown slightly silty slightly clayey sandy fine to coarse sub-angular to sub-rounded gravel and extended to a depth of 6.50 m below ground floor level.

5.3 London Clay

The London Clay initially comprised stiff fissured brown silty clay, extending to a depth of 7.00 m below ground level, below which stiff fissured bluish grey slightly silty slightly sandy clay was encountered, and proved to the full depth of the investigation, of 18.00 m.

5.4 Groundwater

Groundwater was encountered at a depth of 1.80 m in Borehole No 2, but was not encountered in Borehole No 3, which refused at a depth of 1.30 m, or Borehole No 1, where the necessary addition of water to aid drilling may have masked any such inflows. A groundwater monitoring standpipe was installed in each of the boreholes which have been monitored on a single occasion to date. The findings of the monitoring visit are detailed in the table overleaf.

Date	Borehole No	Depth to water (m)
27/04/2017 (during fieldwork)	1	4.50
	2	DRY
	3	DRY

5.5 Soil Contamination

The table below sets out the values measured within the four samples of the made ground analysed; all concentrations are in mg/kg unless otherwise stated.

Determinant	TP3 0.40 m	TP1 0.30 m	TP2 0.60 m	BH3 0.10 m
pH	9.1	8.0	8.1	10.4
Arsenic	21	22	12	20
Cadmium	<0.2	<0.2	<0.2	<0.2
Chromium	19	15	15	16
Copper	63	61	38	33
Mercury	2.0	<0.3	<0.3	<0.3
Nickel	20	17	14	13
Lead	260	**400**	250	180
Selenium	<1.0	<1.0	<1.0	<1.0
Zinc	65	62	44	76
Total Cyanide	<1	<1	<1	<1
Total Phenols	<1.0	<1.0	<1.0	<1.0
Sulphide	4.1	1.2	1.1	2.3
Total PAH	<1.60	<1.60	8.38	3.10
Benzo(a)pyrene	<0.10	<0.10	0.67	0.21
Naphthalene	<0.05	<0.05	<0.05	<0.05
TPH	<10	<10	35	10
Total organic carbon %	1.2	0.9	0.5	0.3

Notes: Figure in **bold** indicates concentration in excess of risk-based soil guideline values, as discussed in Part 2 of this report.

The results of the testing have indicated one of the four samples tested to contain an elevated concentration of lead, while all other contaminant concentrations have been found to be below the respective guideline values.

5.5.1 Generic Quantitative Risk Assessment

The use of a risk-based approach has been adopted to provide an initial screening of the test results to assess the need for subsequent site-specific risk assessments. To this end, the table below indicates those contaminants of concern that have values in excess of a generic human health risk based guideline values which is either the CLEA[5] Soil Guideline Value where available, or is a Generic Screening Value calculated using the CLEA UK Version 1.06[6] software assuming a residential end use without plant uptake, or is based on the DEFRA Category 4 Screening values[7]. The key generic assumptions for this end use are as follows:

- that groundwater will not be a critical risk receptor;
- that the critical receptor for human health will be young female children aged zero to six years old;
- that the exposure duration will be six years;
- that the critical exposure pathways will be direct soil and indoor dust ingestion, skin contact with soils and indoor dust, and inhalation of indoor and outdoor dust and vapours; and
- that the building type equates to a two-storey small terraced house.

It is considered that these assumptions are acceptable for this generic assessment of this site, albeit somewhat conservative as a portion of the site will be used for commercial usage. The tables of generic screening values derived by GEA and an explanation of how each value has been derived are included in the Appendix.

Where contaminant concentrations are measured at concentrations below the generic screening value it is considered that they pose an acceptable level of risk and thus further consideration of these contaminant concentrations is not required. However where concentrations are measured in excess of these generic screening values there is considered to be a potential that they could pose an unacceptable risk and thus further action will be required which could include;

- additional testing to zone the extent of the contaminated material and thus reduce the uncertainty with regard to its potential risk;
- site specific risk assessment to refine the assessment criteria and allow an assessment to be made as to whether the concentration present would pose an unacceptable risk at this site; or
- soil remediation or risk management to mitigate the risk posed by the contaminant to a degree that it poses an acceptable risk.

The results of the testing have indicated one of the four samples tested to contain elevated concentrations of lead.

The significance of these results is considered further in Part 2 of the report.

5 *Updated Technical Background to the CLEA Model (Science Report SC050021/SR3) Jan 2009* and Soil Guideline Value reports for specific contaminants; all DEFRA and Environment Agency.
6 Contaminated Land Exposure Assessment (CL|EA) Software Version 1.06 Environment Agency 2009
7 CL:AIRE (2013) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Final Project Report SP1010 and DEFRA (2014) *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination* Policy Companion Document SP1010

5.6 Existing Foundations

A summary of the findings of the trial pits is tabulated below and the trial pit records are included in the Appendix.

Trial Pit No	Section	Structure	Foundation detail	Bearing Stratum
1	B-B'	Northern boundary (at rear)	Brick wall extending to the full depth of the trial pit of 1.60 m.	Unconfirmed
1	A-A'	Western boundary (at rear)	Brick wall extending to the full depth of the trial pit of 1.60 m.	Unconfirmed
2	A-A'	Southern Boundary (at rear)	Brick Corbels over concrete strip footing bearing at a depth of 1.28 m	Made Ground (brown silty clayey sand with gravel, brick, ash and concrete fragments)
3	A-A'	Internal columns	Brick corbels over concrete pad foundation extending to a depth of 0.87 m	Made Ground (brown silty clayey sand with gravel, brick, ash and concrete fragments)

Part 2: DESIGN BASIS REPORT

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the proposed development.

6.0 INTRODUCTION

It is understood that it is proposed to demolish the existing rear single-storey, double-height extension and subsequently construct a two-storey extension with a new single-level basement beneath. It is also proposed to construct an additional three storeys to the main building behind the front five-storey section of the building. It is proposed to construct the retaining walls for the development through concrete underpinning and the loads of the development are anticipated to be about 50 kN/m^2 along the walls, with a raft slab which will have a pressure of 35 kN/m^2. The loads of the three-storey upwards extension are not known at this stage.

7.0 GROUND MODEL

The desk study has revealed that the site has not had a potentially contaminative history on the basis that it has been occupied by housing and the existing building for its entire developed history. On the basis of the fieldwork, the ground conditions at this site can be characterised as follows:

- below a moderate to significant thickness of made ground, the Lynch Hill Gravel was encountered over London Clay, which was found to extend to the maximum depth of the investigation, of 18.00 m below ground level;
- the made ground generally comprises brown silty clayey sand with gravel, brick, ash and concrete fragments and extends to a depth of 0.90 m below basement level and 3.00 m below ground floor level where the existing basement is not present;
- the Lynch Hill Gravel comprises dense orange-brown slightly silty slightly clayey sandy fine to coarse sub-angular to sub-rounded gravel and extends to a depth of 6.50 m;
- the London Clay initially comprises a 0.50 m thick horizon of stiff fissured brown silty clay, below which stiff fissured bluish grey slightly silty slightly sandy clay is present and extends to the full depth of the investigation, of 18.00 m;
- groundwater is considered to be present within the Lynch Hill Gravel at a depth of about 4.50 m; and
- contamination testing indicated a single sample of the made ground to contain an elevated concentration of lead.

8.0 ADVICE AND RECOMMENDATIONS

The ground investigation has indicated that formation level for the proposed 3.00 m deep basement will be within the Lynch Hill Gravel. Significant groundwater inflows are not anticipated in the basement excavation and in view of the anticipated light loads it should be possible to adopt spread foundations or a raft foundation constructed from basement level to support the building.

8.1 Basement Construction

8.1.1 Basement Excavations

The formation level for the basement is likely to be within the sandy gravel of the Lynch Hill Gravel at a depth of approximately 3.00 m below ground level. On the basis of the groundwater observations to date, groundwater is not expected to be encountered in the basement excavation, having been measured at a depth of 4.50 m below ground level, which equates to about 1.00 m below the level of the proposed basement. It would be prudent to continue to monitor the standpipes for as long as possible in order to determine equilibrium level and the extent of any seasonal variations.

There are a number of methods by which the sides of the basement excavation could be supported in the temporary and permanent conditions. The choice of wall may be governed to a large extent by whether it is to be incorporated into the permanent works and have a load bearing function. The final choice will depend to a large extent on the need to protect nearby structures from movements, the required overall stiffness of the support system, and the need to control groundwater movement through the wall in the temporary condition. In this respect the stability of the existing building will be paramount.

It is likely that most appropriate method of supporting the basement will be through conventional concrete underpinning. Significant inflows of groundwater are not expected to be encountered in the basement excavation, but it would be prudent for the chosen contractor to have a contingency plan in place to deal with any perched groundwater inflows from within the made ground, particularly in the vicinity of the existing foundations, as a precautionary measure.

The use of underpinning will require the soils being underpinned to stand unsupported and difficulties may be encountered with unsupported excavations in the made ground and the underlying sandy horizons of the Lynch Hill Gravel, particularly where groundwater is encountered. Ideally a number of trial excavations should be carried out, to depths as close to the proposed basement depth in order to check the stability of the soil and to provide an indication of the extent to which the basement excavation will be affected by groundwater inflows, although it is understood that in view of the access restrictions this is unlikely to be possible.

Alternatively, consideration could be given to the use of a bored pile wall. On the basis of the monitoring results to date, the use of a contiguous bored pile wall should be suitable, with localised grouting between piles to prevent any minor inflows.

The ground movements associated with the basement excavation will depend on the method of excavation and support and the overall stiffness of the basement structure in the temporary condition. Thus, a suitable amount of propping will be required to provide the necessary rigidity and the timing of the provision of support to the wall will have an important effect on movements. The stability of the existing foundations will need to be ensured at all times and the retaining walls will need to be designed to support the loads from these foundations unless they

are underpinned. Careful workmanship will be required in the construction of the underpins and it is recommended that a suitable specialist contractor is consulted in this respect. A Ground Movement Analysis has been carried out in accordance with the requirements of CPG4 and is presented in Part 3 of this report.

8.1.2 Basement Retaining Walls

The following parameters are suggested for the design of the permanent basement retaining walls.

Stratum	Bulk Density (kg/m^3)	Effective Cohesion (c' – kN/m^2)	Effective Friction Angle (Φ' – degrees)
Made Ground	1700	Zero	20
Lynch Hill Gravel	1900	Zero	32
London Clay	1950	Zero	23

Groundwater is unlikely to be encountered within the excavation, although monitoring of the standpipes should be continued in order to establish equilibrium levels and seasonal high levels. At this stage, it is recommended that for the design of the retaining walls, groundwater level can be assumed to be below the depth of the basement, as indicated by the investigation carried out to date. However, it is recommended that this is reviewed following further monitoring and investigation into the presence of perched groundwater within the made ground, as consideration should be given to the risk of groundwater and surface water collecting behind the retaining walls within granular horizons. The use of a fully effective drainage system would be prudent in this respect. The advice in BS8102:2009[8] should be followed in the design of the basement retaining walls and with regard to waterproofing requirements.

8.2 Spread Foundations

The excavation of the proposed basement is likely to result in formation level within the Lynch Hill Gravel and it should be possible to adopt moderate width pad or strip foundations in the sandy gravel, designed to apply a net allowable bearing pressure of 300 kN/m^2 below basement level. The recommended bearing pressure provides an adequate factor of safety against bearing capacity failure and should ensure that settlement remains within normal tolerable limits.

8.3 Re-use of Existing Foundations

The existing and proposed loads for the upwards extension are not currently known. The existing building was constructed during the late 19th century and, as such, settlements associated with the existing loads should now be complete. It should therefore be possible to apply the same magnitude of load onto the foundations and expect the same magnitude of settlement, provided that the gross pressure applied by the foundations does not exceed the ultimate bearing capacity of the bearing stratum and that the footings are bearing on natural soil.

The trial pits have indicated the foundations of the internal columns to be bearing within the Lynch Hill Gravel but further trial pitting will be required in due course to determine the configuration of the foundations of the boundary walls. If foundations are found to be bearing on made ground, they will need to be locally underpinned to extend to the natural soil.

8 BS8102 (2009) *Code of practice for protection of below ground structures against water from the ground*

In order to confirm the size of the pads required and once all levels and loads are finalised, it is recommended that a full settlement analysis be carried out in order to estimate the likely expected settlements.

8.4 Basement Raft Foundation

A basement raft foundation may be an appropriate foundation solution, as it would take advantage of the unloading at formation level as a result of the excavation; the suitability of a raft foundation will depend on the resultant net pressure to be applied by the new structure, taking into consideration the overburden and potential heave associated with the basement excavation. The raft would need to be designed to be rigid to resist any variation in upwards and downwards forces, in order to prevent differential movements. In this respect, if a raft is considered and once the loads have been finalised, it would be prudent to carry out additional analysis in order to determine the likely heave / settlements associated with the use of a raft foundation.

8.5 Piled Foundations

For the ground conditions at this site, some form of bored pile is likely to be the most appropriate. A conventional rotary augered pile may be appropriate but consideration will need to be given to the possible instability and water ingress in the made ground and Lynch Hill Gravel. The use of bored piles installed using continuous flight auger (cfa) techniques may therefore be the most appropriate, especially as the use of a limited access rig may be required.

The following table of ultimate coefficients may be used for the preliminary design of bored piles from ground floor level, based on the measured SPT and cohesion / depth graph in the appendix.

Stratum	Depths m	kN / m²
Ultimate Skin Friction		
Made Ground & Basement Excavation	GL to 3.00	Ignore (Basement excavation)
Lynch Hill Gravel (Gravel)	3.00 to 6.50	49.5
London Clay (α = 0.5)	6.50 to 18.00	Increasing linearly from 45 to 105
Ultimate End Bearing		
London Clay	10.00 to 18.00	Increasing linearly from 1170 to 1890

In the absence of pile tests, guidance from the London District Surveyors Association (LDSA)[9] suggests that a factor of safety of 2.6 should be applied to the above coefficients in the computation of safe theoretical working loads. On the basis of the above coefficients, the following preliminary pile capacities have been estimated.

[9] LDSA (2009) *Foundations No 1 – Guidance notes for the design of straight shafted bored piles in London Clay*. LDSA Publications

Pile diameter mm	Depth Below Ground Level m	Safe Working Load kN
450	10	285
	12	365

The above examples are not intended to constitute any form of recommendation with regard to pile size or type, but merely serve to illustrate the use of the above coefficients. Specialist piling contractors should be consulted with regard to the design of an appropriate piling scheme and their attention should be drawn to potential groundwater within the made ground Lynch Hill Gravel.

8.6 Basement Floor Slab

Following the excavation of the basement, it should be possible to adopt a lightly loaded ground bearing floor slab within the Lynch Hill Gravel which will need to be designed to cope with potential uplift forces due to the presence of groundwater and the heave of the underlying London Clay.

8.7 Shallow Excavations

On the basis of the borehole and trial pit findings, it is considered that shallow excavations for foundations and services that extend through the made ground or Lynch Hill Gravel should remain generally stable in the short term, although some instability may occur. However, should deeper excavations be considered or if excavations are to remain open for prolonged periods it is recommended that provision be made for battered side slopes or lateral support. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

Groundwater inflows may be encountered within the made ground, particularly within the vicinity of existing foundations. Some form of groundwater may therefore be required and should be suitably controlled by sump pumping, although this should be confirmed by additional investigations, ideally in the form of trial excavations to the full depth of the proposed basement.

8.8 Effect of Sulphates

Chemical analyses carried out on two samples of the Lynch Hill Gravel and a single sample of the London Clay have revealed concentrations of soluble sulphate and near-neutral pH in accordance with Class DS-1. The measured pH value of the samples show that an ACEC class of AC-1 of Table C2 would be suitable. This assumes a mobile water condition at the site. The guidelines contained in the above digest should be followed in the design of foundation concrete.

8.9 Site Specific Risk Assessment

The desk study research has indicated that the site has not had a potentially contaminative history, having been occupied by housing and the existing building for its entire known developed history. In addition, no sources of potential contamination have been identified across the site or the immediate surrounding area. The contamination testing has however indicated one of the four samples of made ground tested to contain an elevated concentration of lead.

The exact source of the contamination is unknown, however the made ground was noted as containing variable inclusions of extraneous material such as ash, which if present in the samples tested may have accounted for the elevated concentrations. In any case, the contamination is not considered likely to be in a soluble form and therefore does not pose a risk to groundwater and thus neighbouring sites.

The majority of the soil is likely to be excavated and removed from site in any case as part of reducing the level of the site to that of the proposed basement and no areas of soft landscaping are proposed. As a result, a risk to site users is not envisaged. The contamination poses a risk to site workers during the groundworks, as discussed in turn below.

8.9.2 Site Workers

Site workers should be made aware of the potential contamination and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE[10] and CIRIA[11] and the requirements of the Local Authority Environmental Health Officer.

A watching brief should also be maintained during the groundwork, and if suspicious soils are encountered then a suitably qualified engineer should inspect the soils and further testing carried out if required.

8.10 Waste Disposal

Under the European Waste Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a contaminated site. It should however be noted that the Environment Agency guidance WM3[12] states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE[13] guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the standard rate of £ £84.40 per tonne (about £150 per m^3) or at the lower rate of £2.65 per tonne (roughly £5 per m^3). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the 'standard' rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the 'lower rate' of landfill tax.

Based on the technical guidance provided by the Environment Agency it is considered likely that the soils encountered during this ground investigation, as represented by the chemical analyses carried out, would be generally classified as follows;

[10] HSE (1992) HS(G)66 *Protection of workers and the general public during the development of contaminated land* HMSO
[11] CIRIA (1996) *A guide for safe working on contaminated sites* Report 132, Construction Industry Research and Information Association
[12] Environment Agency 2015. *Guidance on the classification and assessment of waste.* Technical Guidance WM3 First Edition
[13] CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Comments
Made ground	Non-hazardous (17 05 04)	No	-
Lynch Hill Gravel & London Clay	Inert (17 05 03)	Should not be required but confirm with receiving landfill	-

Under the requirements of the European Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper[14] which states that in certain circumstances, segregation at source may be considered as pre-treatment and thus excavated material may not have to be treated prior to landfilling if the soils can be segregated onsite prior to excavation by sufficiently characterising the soils insitu prior to excavation.

The above opinion with regard to the classification of the excavated soils is provided for guidance only and should be confirmed by the receiving landfill once the soils to be discarded have been identified.

The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material but may require further testing

[14] Environment Agency 23 Oct 2007 *Regulatory Position Statement Treating non-hazardous waste for landfill - Enforcing the new requirement*

Part 3: GROUND MOVEMENT ANALYSIS

This section of the report comprises an analysis of the ground movements arising from the proposed basement and foundation scheme discussed in Part 2 and the information obtained from the investigation, presented in Part 1 of the report.

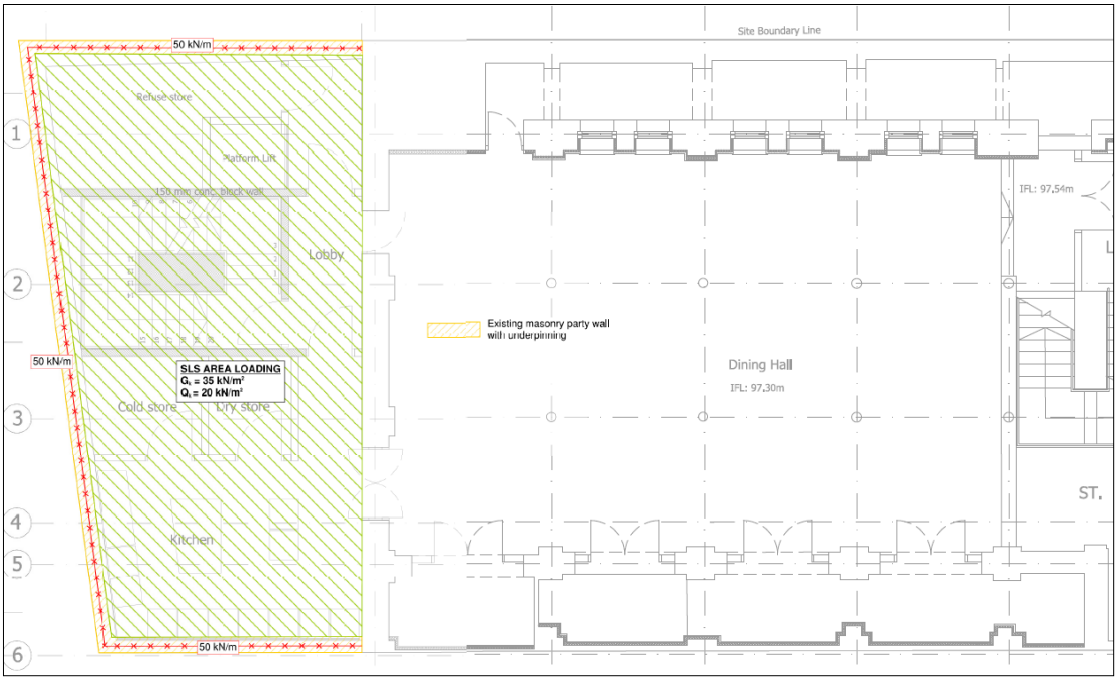
9.0 INTRODUCTION

The sides of a basement excavation will move to some extent regardless of how they are supported. The movement will typically be both horizontal and vertical and will be influenced by the engineering properties of the ground, groundwater level and flow, the efficiency of the various support systems employed during underpinning and the efficiency or stiffness of any support structures used to form the basement.

An analysis has been carried out of the likely movements arising from the proposed basement excavation and the results of this analysis have been used to predict the effect of these movements on surrounding structures.

9.1 Construction Sequence

The proposed basement layout is shown in the diagram below, which has been annotated with the proposed loading.



For the purposes of the ground movement assessment the depth of foundations and heights of sensitive structures have been measured from ground level. During the site walkover, an engineer from GEA looked at the adjacent properties to check for the presence of existing basements. The majority of the buildings nearby are known to have a basement which is assumed to be single level extending to a depth of 3.00 m. Where the buildings do not obviously have a basement, it has been assumed that they do not have a basement and that the foundations of the buildings extend to a depth of 0.50 m to provide a conservative analysis.

It is proposed to construct the new basement using traditional reinforced concrete underpinning methods to a depth of about 3.00 m beneath the rear section of the existing building. The remainder of the building already has a basement extending to a similar depth.

The sequence of construction operations has been provided by Parmarbrook, the consulting engineers for the project, to enable the accurate analysis of the ground movements around the proposed basement both during and after construction. This sequence has been summarised below.

1. Construct underpinned retaining walls. The underpins are commonly formed in a 'hit and miss' sequence using a trench box excavation, commonly sheet lined, shored and strutted; all temporary shoring and propping to be inspected by a suitably qualified person; and
2. excavate new basement and temporarily retain and strengthen, with sufficient propping and walling beams, the new retaining walls. Construct new ground slab.

The underpins will be adequately laterally propped and sufficiently dowelled together, and the concrete will be cast and adequately cured prior to excavation of the basement and removal of the formwork and supports. It is assumed that the corners of the excavation will be locally stiffened by cross-bracing or similar and that the new retaining walls will not be cantilevered at any stage during the construction process. It is assumed that adequate temporary propping of the new retaining walls, particularly at the top level, will occur at all times prior to the construction of permanent concrete floor slabs.

The detail of the support provided to adjacent walls is beyond the scope of this report at this stage and the structural engineer will be best placed to agree a methodology with the underpinning contractor once appointed.

When the final excavation depths have been reached the permanent works will be formed, which are likely to comprise reinforced concrete walls with a drained cavity lining the inside of the underpinned walls. A reinforced concrete raft slab foundation is to be adopted and following construction of the raft slab the temporary props will be removed.

9.2 Ground Movements

An assessment of ground movements within and surrounding the excavation has been undertaken using the P-Disp Version 19.3 – Build 12 package licensed from the OASYS suite of geotechnical modelling software from Arup. This program is commonly used within the ground engineering industry and is considered to be an appropriate tool for the analysis of an underpinned retained wall.

Published data for ground movements associated with underpinned retaining walls and subsequent excavation of a new basement is limited compared to other types of retaining wall. It is possible to use the well-documented predictions and movement curves for embedded retaining walls contained within CIRIA C760, although this approach is considered to be unnecessarily conservative. A manual approach has therefore been adopted in conjunction with the results of a P-Disp analysis to assess the effects of the construction of the proposed underpinned retaining walls and the subsequent excavation of the new basement in granular soils.

9.3 P-Disp Model

At this site, unloading of the London Clay at depth will take place as a result of the installation of the proposed underpinned retaining walls and excavation of the new basement, such that the reduction in vertical stress in the short term will cause heave to take place. Undrained soil parameters have been used to estimate the potential short term movements, which include the "immediate" or elastic movements as a result of the basement excavation. The model is based on the assumption that the soils behave elastically, which provides a reasonable approximation to soil behaviour at small strains. Drained parameters have been used to provide an estimate of the total movement, which includes long term swelling that will continue for a number of years.

The elastic analysis requires values of soil stiffness at various levels to calculate displacements. Values of stiffness for the soils at this site are readily available from published data and we have used a well-established method to provide our estimates. This relates values of E_u and E', the drained and undrained stiffness respectively, to values of undrained cohesion, as described by Padfield and Sharrock[15] and Butler[16] and more recently by O'Brien and Sharp[17]. Relationships of $E_u = 500\ C_u$ and $E' = 300\ C_u$ for the cohesive soils have been used to obtain values of Young's modulus. More recent published data[18] indicates stiffness values of 750 x Cu for the London Clay and a ratio of E' to Eu of 0.75, and it is considered that the use of the more conservative values provides a sensible approach for this stage in the design. The profile of the London Clay below the depth of the borehole has been interpolated from the ground investigation by GEA that was previously carried out at nearby sites.

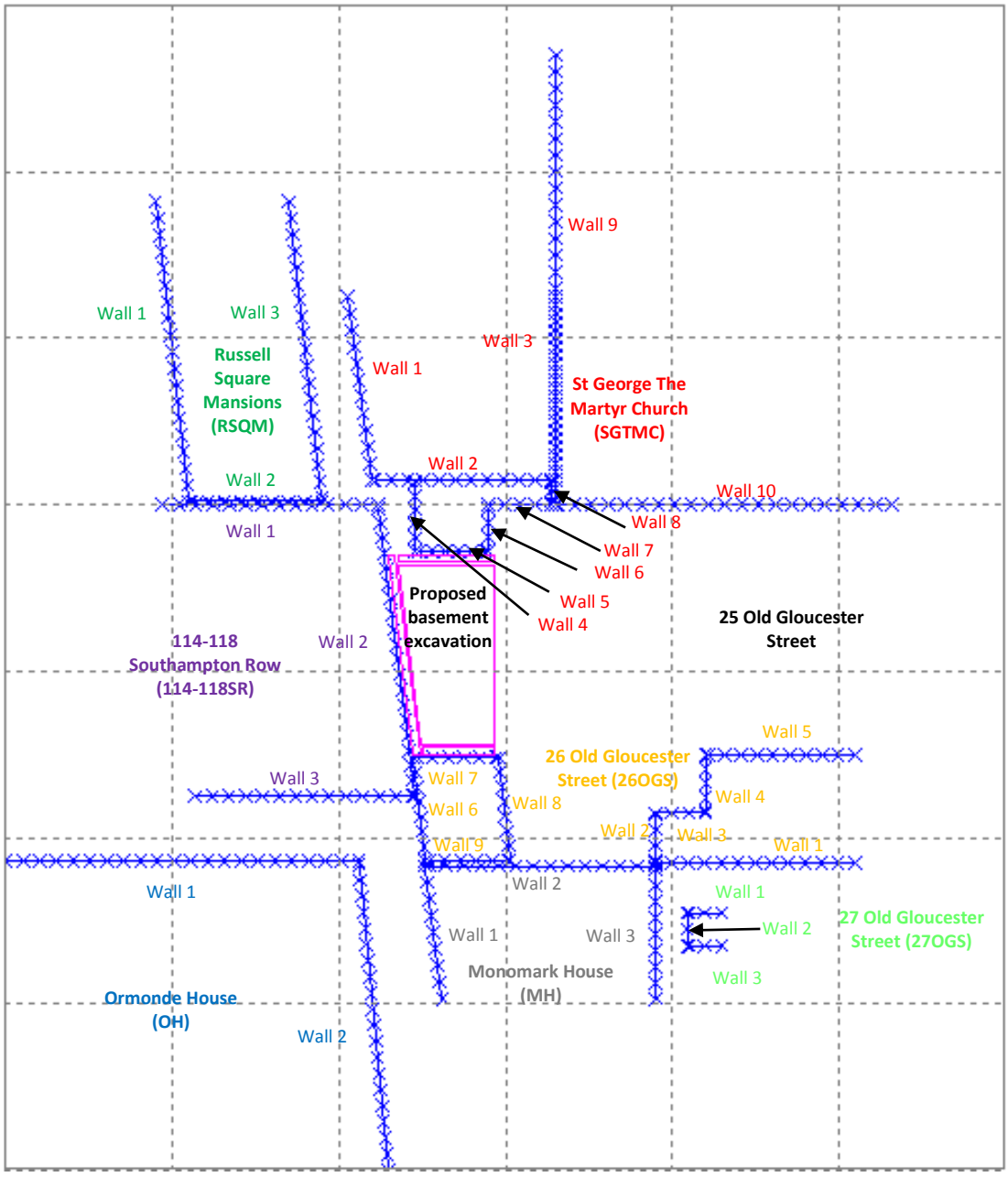
For the purpose of this analysis, the corners have been defined by x and y coordinates, with the y-direction is parallel with the orientation of Old Gloucester Street, whilst the x-direction is orientated perpendicular to Old Gloucester Street. Vertical movement is in the z-direction. All wall lengths have been modelled as 1 m long structural elements to provide a conservative assessment. The full outputs of all the analyses and P-Disp movement contour plots are included within the appendix. The proposed basement excavation will result in a short term unloading of around 55 kN/m^2, which is assumed to act at the excavation depth of 3.00 m below existing ground level.

The soil parameters used in this assessment are tabulated below.

Stratum	Depth range (m)	Eu (MPa)	E' (MPa)
Made Ground	GL to 3.0	12.0	12.0
Lynch Hill Gravel	3.0 to 6.5	88.0	88.0
London CLay	6.5 to 18.0	47.5 to 95.0	28.5 to 57.0
Lambeth Group	18.0 to 39.0	95.0 to 180.0	57.0 to 108.0

A rigid boundary for the analysis has been set at a depth of 39 m below ground level, which is considered to be the bottom of the Lambeth Group beneath the site, below which significant movements would not be expected.

15 Padfield CJ and Sharrock MJ (1983) *Settlement of structures on clay soils*. CIRIA Special Publication 27
16 Butler FG (1974) *Heavily overconsolidated clays: a state of the art review*. Proc Conf Settlement of Structures, Cambridge, 531-578, Pentech Press, Lond
17 O'Brien AS and Sharp P (2001) *Settlement and heave of overconsolidated clays - a simplified non-linear method.* Part Two, Ground Engineering, Nov 2001, 48-53
18 Burland JB, Standing, JR, and Jardine, FM (2001) *Building response to tunnelling, case studies from construction of the Jubilee Line Extension* CIRIA Special Publication 200



9.4 Ground Movements – Surrounding the Basement

Wall Installation

As noted previously, predictions of the vertical and horizontal ground movements behind the wall, as a result of wall installation, can be based on case study information from CIRIA for a planar diaphragm wall installed into stiff clay. There are no data sets available for the installation of an underpinned wall in granular material and the predicted movements for a wall in clay are considered to be a conservative approach.

Underpinned walls are unlikely to move horizontally to any significant degree as they are subject to a continued vertical loading from the structure above. The use of datasets derived from case studies of embedded retaining walls will therefore be expected to overestimate horizontal movements for these walls, but will provide an indication of the pattern of possible horizontal and vertical movements.

Table 6.1 of CIRIA C760 indicates that for a planar diagram wall installed into stiff clay, predicted vertical and horizontal movements behind the wall will be in the region of 1.5 times the retained height and for a 3.0 m wall this equates to a zone of influence of 4.50 m. 16 walls of the adjacent structures fall within this 4.50 m distance and Table 6.1 also indicates that maximum horizontal and vertical movements of 0.05 % of the retained height may arise immediately behind the wall, which for a 3.0 m deep basement gives a movement of 1.5 mm. Whilst this is considered to be a reasonable approximation of the likely movement, the horizontal and vertical movements are likely to be most sensitive to the quality of workmanship and appropriate sequencing during the underpin construction.

Following Excavation

There is a wealth of experience with respect to the construction of underpinned retaining walls, which suggests that overall horizontal ground movements should remain typically within the range of 2 mm to 5 mm following completion of the works, provided that they are installed by a reputable and experienced contractor in accordance with the guidelines published by the Association of Specialist Underpinning Contractors[19].

Settlement of the soil behind the new retaining wall may occur due to the excavation in front of the wall causing the wall to deflect, although in this case this movement is likely to be small due to the existing building remaining in place and effectively acting as additional support at ground level. Again, the magnitude of the settlement will be controlled to a large extent by the quality of workmanship of the underpins and by the existing building that is likely to provide additional rigidity. For this first assessment, the settlement of the ground behind the wall as a result of the proposed excavation is assumed to be zero.

P-Disp has been used to predict the effect of potential heave movements at the foundation depth of nearby sensitive structures, as a result of the unloading of the underlying soils following the proposed basement excavation. In order to assess which structures are likely to be affected by the excavation, reference has been made to CIRIA C760, which indicates that for a high support stiffness embedded retaining wall constructed within a high stiffness clay, vertical and horizontal ground surface movements following the basement excavation are likely to be negligible beyond 3.5 and 4 times the retained height respectfully, which for this assessment is around 10.85 m and 12.40 m for vertical and horizontal movements respectively. An initial assessment indicates that all sensitive structures modelled are likely to experience some degree of movement.

9.5 Movements within the Excavation

Results

Using the same P-Disp model, the analysis indicates that, by the time the basement excavation is complete, around 5 mm of heave is likely to have taken place at the centre of the proposed excavation, reducing to between 1 mm and 3 mm of settlement beneath the retaining walls. In the long term, as the loads of the building are similar to that of the soil removed, the pressure of the raft slab the movements will reduce to an overall heave at the centre of the basement to a further 2 mm. Beneath the proposed retaining walls a further heave movements will be limited to less than 1 mm.

[19] Haslam S, O'Connor L (2013) *Guidelines on safe and efficient basement construction directly below or near to existing structures* ASUC

10.0 BUILDING DAMAGE ASSESSMENT

In addition to the above assessment of the likely movements that will result from the proposed development, the neighbouring buildings are considered to be sensitive structures, requiring Building Damage Assessments, on the basis of the classification given in Table 6.4 of C760[1].

The results above have been used to manually predict the building damage category for each sensitive structure and these are shown in Section 10.1 below. A summary page showing the individual results for each sensitive structure is appended.

All structures are shown on the plan in Section 9.3.

10.1 Damage to Neighbouring Structures

P-Disp has been used to estimate the differential movement along the length of each sensitive structure and the results have been used in a manual assessment to predict the building damage category for each sensitive structure. The results of the building damage assessment are shown in the table below.

The plot for horizontal wall movements as a result of the excavation in front of a wall in stiff clay in CIRIA C760 (Fig 6.15a) has been adapted to reflect a trend line that assumes a movement of 2 mm immediately behind the wall as the existing foundations have been found to extend to a depth of about 2 m resulting in an effective excavation depth of about 1 m. The trend line is set such that the predicted movement diminishes with distance from the wall according to the trend line set by a wall within a high stiffness clay. The results of the assessment are shown in the table below for the overall term condition, which is considered to represent the worst case in view of the significantly higher expected settlements.

Structure	Wall Reference	Preliminary Assessment of Damage Category*
St George The Martyr Church (SGTMC)	Wall 1	Category 0 - Negligible
	Wall 2	Category 0 - Negligible
	Wall 3	Category 0 - Negligible
	Wall 4	Category 0 – Negligible
	Wall 5	Category 0 – Negligible
	Wall 6	Category 0 – Negligible
	Wall 7	Category 0 - Negligible
	Wall 8	Category 0 – Negligible
	Wall 9	Category 0 - Negligible
	Wall 10	Category 0 - Negligible
Russell Square Mansions (RSQM)	Wall 1	Category 0 - Negligible
	Wall 2	Category 0 - Negligible
	Wall 3	Category 0 - Negligible

Structure	Wall Reference	Preliminary Assessment of Damage Category*
114-118 Southampton Row (114-118SR)	Wall 1	Category 0 - Negligible
	Wall 2	Category 0 – Negligible
	Wall 3	Category 0 - Negligible
Ormonde House (OH)	Wall 1	Category 0 - Negligible
	Wall 2	Category 0 - Negligible
Monomark House (MH)	Wall 1	Category 0 - Negligible
	Wall 2	Category 0 - Negligible
	Wall 3	Category 0 - Negligible
27 Old Gloucester Street (27OGS)	Wall 1	Category 0 - Negligible
	Wall 2	Category 0 - Negligible
	Wall 3	Category 0 – Negligible
26 Old Gloucester Street (26OGS)	Wall 1	Category 0 – Negligible
	Wall 2	Category 0 – Negligible
	Wall 3	Category 0 - Negligible
	Wall 4	Category 0 - Negligible
	Wall 5	Category 0 - Negligible
	Wall 6	Category 0 – Negligible
	Wall 7	Category 0 – Negligible
	Wall 8	Category 0 – Negligible
	Wall 9	Category 0 – Negligible

**From Table 6.4 of C760[1]: Classification of visible damage to walls.*

The analysis has predicted that the proposed installation of the retaining wall underpins and excavation of the proposed basement may result in the building damage for sensitive structures of Category 0 (negligible).

The CPG4 document indicates that where possible all building damage should be restricted to a maximum of Category 1, as set out in CIRIA Report 760. Therefore any damage to nearby structures due to the basement construction should be within tolerable limits.

10.2 Monitoring of Ground Movements

The predictions of ground movement based on the ground movement analysis should be checked by monitoring of adjacent properties and structures. The structures to be monitored during the construction stages should include the existing building and neighbouring

structures. Condition surveys of the existing structures should be carried out before and after the proposed works.

The precise monitoring strategy will be developed at a later stage and it will be subject to discussions and agreements with the owners of the adjacent properties and structures. Contingency measures will be implemented if movements of the adjacent structures exceed predefined trigger levels. Both contingency measures and trigger levels will need to be developed within a future monitoring specification for the works.

11.0 BASEMENT IMPACT ASSESSMENT

The screening identified a number of potential impacts. The desk study and ground investigation information has been used to review the potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

The table below summarises the previously identified potential impacts and the additional information that is now available from the previous site investigation in consideration of each impact.

Potential Impact	Site Investigation Conclusions
The site is located directly above an aquifer	The site lies directly above a Secondary 'A' Aquifer but the investigation has indicated that the groundwater table is located 1 m below the proposed basement level. In addition, the investigation was carried out towards then end of winter when groundwater levels would be at their highest. No evidence of permeable contamination was recorded during the investigation and as a result, no additional engineering precautions should need to be made in this respect.
The development will increase the founding depths relative to neighbours.	The retention system will ensure the stability of the excavation and neighbouring properties at all times.

The results of the site investigation have been used below to review the remaining potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

The site is located directly above an aquifer.

There is a potential for groundwater to be present within the Secondary 'A' Aquifer beneath the site. This could arise to water ingress into the basement excavation and cause instabilities and difficulties during construction. Groundwater was not encountered during drilling and groundwater was subsequently measured at a depth of 4.50 m within one of the standpipes while the other standpipes were found to be dry. In addition, most of the site is already underlain by a basement extending to a similar depth as the proposed basement and the existing basement does not appear to have experienced any problems. As a result, it is deemed the proposed basement will not have any effect on groundwater flow, and that no significant perched groundwater inflows, that can't be dealt with by standard sump pumping, will be encountered.

The proposed basement will significantly increase differential depth of foundations to neighbouring properties

At the time of writing this report the presence of neighbouring basements and founding levels is not known for all possibly affected buildings. To this extent and to remain conservative it has

been assumed that any surrounding properties that do not clearly have a basement from observations made during the site walkover do not have basements and are founded on shallow foundations. Therefore the proposed basement will extend to a significant depth relative to the existing foundations of the neighbouring properties and will need to be designed to ensure the stability of the site and any potentially sensitive structures that are in close proximity to the site.

The results of the Ground Movement Analysis and building damage assessment have indicated that the movements arising on adjacent structures as a result of the development can be maintained within tolerable limits by careful control of movements.

11.1 BIA Conclusion

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden. Information from the site investigation has been used to assess potential impacts identified by the screening process.

It is concluded that the proposed development is unlikely to result in any specific land or slope stability issues, groundwater or surface water issues.

11.2 Non-Technical Summary of Evidence

This section provides a short summary of the evidence acquired and used to form the conclusions made within the BIA.

11.2.1 Screening

The following table provides the evidence used to answer the surface water flow and flooding screening questions.

Question	Evidence
1. Is the site within the catchment of the pond chains on Hampstead Heath?	Figures 12 and 14 of the Arup report.
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?	A site walkover and existing plans of the site have confirmed that the proposed basement scheme will not increase the amount of hardstanding.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	As above.
5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?	
6. Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because the proposed basement is below the static water level of a nearby surface water feature?	Flood risk maps acquired from the Environment Agency as part of the desk study, Figure 15 of the Arup report, the Camden Flood Risk Management Strategy dated 2013 and SFRA dated 2014.

The following table provides the evidence used to answer the subterranean (groundwater flow) screening questions.

Question	Evidence
1a. Is the site located directly above an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
1b. Will the proposed basement extend beneath the water table surface?	Site investigation.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	Historical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report.
3. Is the site within the catchment of the pond chains on Hampstead Heath?	Figures 12 and 14 of the Arup report.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	A site walkover and existing plans of the site have confirmed that the basement development will only replace existing hardstanding areas.
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	The details of the proposed development do not indicate the use soakaway drainage.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report.

The following table provides the evidence used to answer the slope stability screening questions.

Question	Evidence
1. Does the existing site include slopes, natural or manmade, greater than 7°?	Site survey drawing and Figures 16 and 17 of the Arup report and confirmed during a site walkover
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	The details of the proposed development provided do not include the re-profiling of the site to create new slopes.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	Topographical maps and Figures 16 and 17 of the Arup report and confirmed during a site walkover
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	
5. Is the London Clay the shallowest strata at the site?	Geological maps and Figures 3, 5 and 8 of the Arup report
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	There are no known plans to remove any trees and an arboriculturist should be consulted to ensure no damage to tree roots and if trees are to be removed
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	Knowledge on the ground conditions of the area and reference to NHBC guidelines were used to make an assessment of this, in addition to a visual inspection of the buildings carried out during the site walkover
8. Is the site within 100 m of a watercourse or potential spring line?	Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report and the Lost Rivers of London book.
9. Is the site within an area of previously worked ground?	Geological maps and Figures 3, 5 and 8 of the Arup report
10. Is the site within an aquifer?	Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3, 5 and 8 of the Arup report.
11. Is the site within 50 m of Hampstead Heath ponds?	Topographical maps acquired as part of the desk study and Figures 12 and 14 of the Arup report.
12. Is the site within 5 m of a highway or pedestrian right of way?	Site plans and the site walkover.

Question	Evidence
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Camden planning portal and the site walkover confirmed the position of the proposed basement relative the neighbouring properties.
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	Maps and plans of infrastructure tunnels were reviewed.

11.2.2 Scoping and Site Investigation

The questions in the screening stage that there were answered 'yes', were taken forward to a scoping stage and the potential impacts discussed in Section 4.0 of this report, with reference to the possible impacts outlined in the Arup report.

A ground investigation has been carried out, which has allowed an assessment of the potential impacts of the basement development on the various receptors identified from the screening and scoping stages. Principally the investigation aimed to establish the ground conditions, including the groundwater level and the engineering properties of the underlying soils to enable suitable design of the basement development. The findings of the investigation are discussed in Part 2 of this report and summarised in the Executive Summary.

11.2.3 Impact Assessment

Section 10.0 of this report summarises whether or not, on the basis of the findings of the investigation, the potential impacts still need to be given consideration and identifies ongoing risks that will require suitable engineering mitigation. Section 9.0 of this report also provides recommendations for the design of the proposed development.

A ground movement analysis and building damage assessment has been commissioned and will be used to provide a conclusion on any potential impacts from the proposed basement development to the surrounding structures.

12.0 OUTSTANDING RISKS AND ISSUES

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive, but covers the main areas where additional work is considered to be required.

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the ground conditions based on the discrete points at which the ground was sampled, but the ground conditions should be subject to review as the work proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

Groundwater monitoring should be continued out to confirm that significant groundwater inflows will not be encountered during basement excavation as well as trial excavations, ideally, to depths as close to the full basement depth as possible.

If during ground works any visual or olfactory evidence of contamination is identified it is recommended that further investigation be carried out and that the risk assessment is reviewed. These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

APPENDIX

Borehole Records

SPT Summary Sheet

SPT / Depth Plot

Trial Pit Records

Geotechnical laboratory Results

Chemical Analyses

Generic Risk Based Screening Values

Envirocheck Report Summary

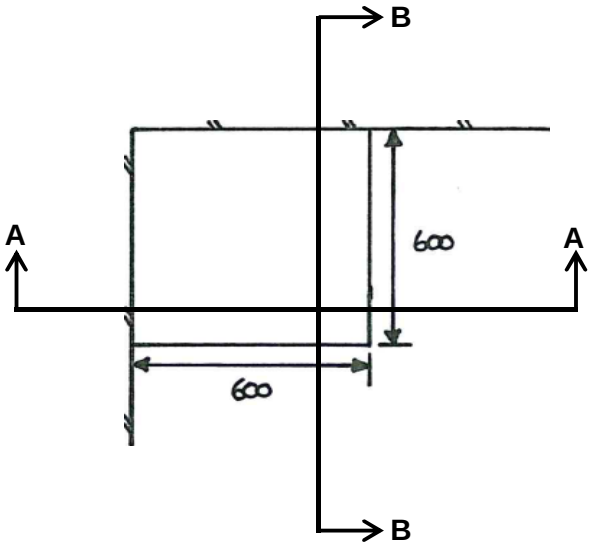
Historical Maps

Site Plan

GMA

GEA Geotechnical & Environmental Associates Widbury Barn Widbury Hill Ware Herts SG12 7QE			**Site** 25 Gloucester Road, London, WC1N 3AF	**Trial Pit Number** **1**
Excavation Method Manual	**Dimensions** 600 x 600 x 1600	**Ground Level (mOD)**	**Client** Nilkanth Estates	**Job Number** J17059
	Location	**Dates** 17/03/2017	**Engineer** Parmarbrook	**Sheet** 1 / 2

Plan: -



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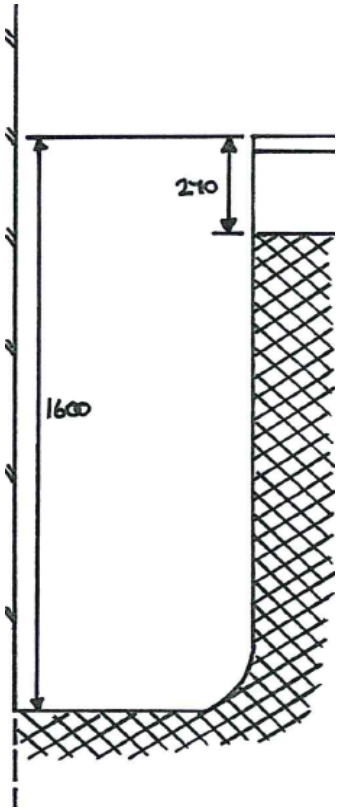


Floorboards

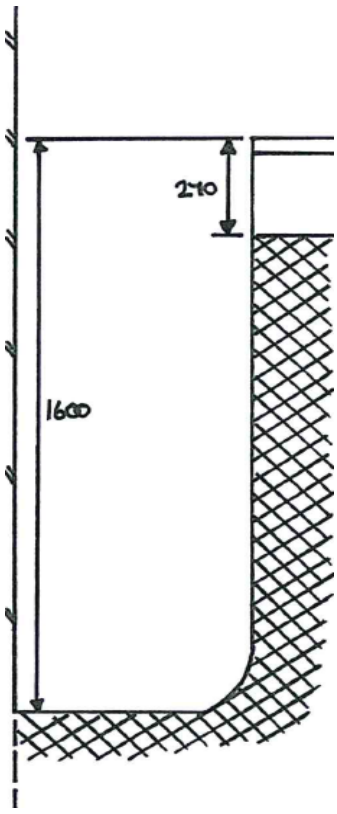
Void

Made Ground (brown silty clayey sand with gravel, brick, ash and concrete fragments)

Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Groundwater: Not encountered	Scale: 1:20 Logged by: AT

GEA Geotechnical & Environmental Associates Widbury Barn Widbury Hill Ware Herts SG12 7QE			**Site** 25 Gloucester Road, London, WC1N 3AF	**Trial Pit Number** **1**
Excavation Method Manual	**Dimensions** 600 x 600 x 1600	**Ground Level (mOD)**	**Client** Nilkanth Estates	**Job Number** J17059
	Location	**Dates** 17/03/2017	**Engineer** Parmarbrook	**Sheet** 2 / 2

Section B - B: -



Floorboards

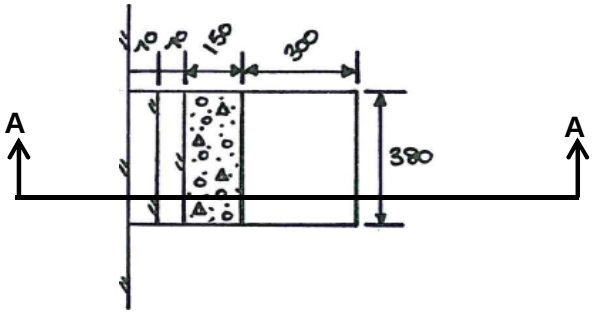
Void

Made Ground (brown silty clayey sand with gravel, brick, ash and concrete fragments)

Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Groundwater: Not encountered	Scale: 1:20 Logged by: AT

GEA Geotechnical & Environmental Associates Widbury Barn Widbury Hill Ware Herts SG12 7QE			**Site** 25 Gloucester Road, London, WC1N 3AF	**Trial Pit Number** 2
Excavation Method Manual	**Dimensions** 380 x 590 x 1430	**Ground Level (mOD)**	**Client** Nilkanth Estates	**Job Number** J17059
	Location	**Dates** 17/03/2017	**Engineer** Parmarbrook	**Sheet** 1 / 1

Plan: -



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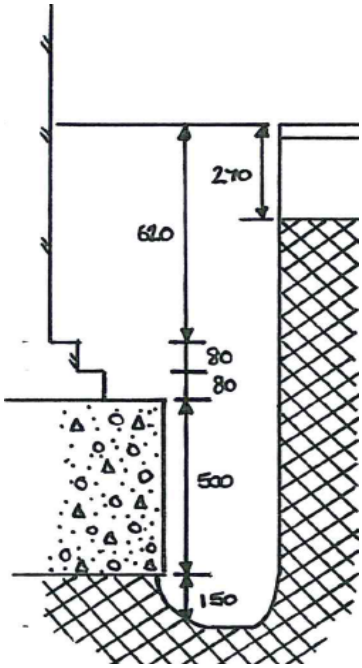


Floorboards

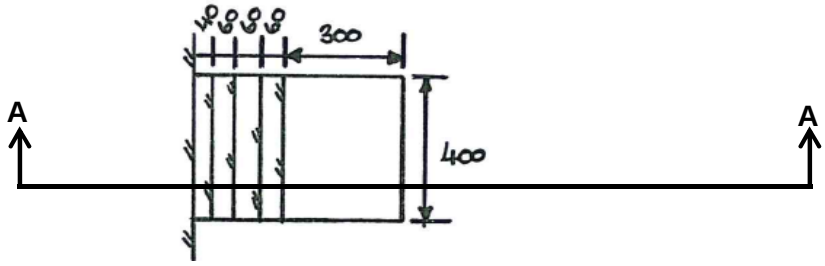
Void

Made Ground (brown silty clayey sand with gravel, brick, ash and concrete fragments)

Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Groundwater: Not encountered	Scale: 1:20 Logged by: AT

GEA Geotechnical & Environmental Associates Widbury Barn Widbury Hill Ware Herts SG12 7QE			**Site** 25 Gloucester Road, London, WC1N 3AF	**Trial Pit Number** 3
Excavation Method Manual	**Dimensions** 400 x 520 x 1070	**Ground Level (mOD)**	**Client** Nilkanth Estates	**Job Number** J17059
	Location	**Dates** 17/03/2017	**Engineer** Parmarbrook	**Sheet** 1 / 1

Plan: -



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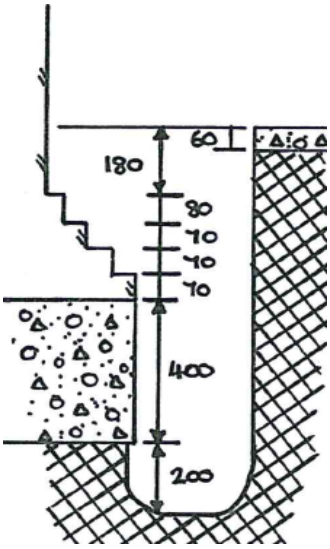


Concrete

Made Ground (brown silty clayey sand with gravel, brick, ash and concrete fragments)

Remarks: All dimensions in millimetres Sides of trial pit remained stable during excavation Ground water not encountered	Scale: 1:20 Logged by: AT

GEA Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 25 Old Gloucester Street, London WC1N 3AF	**Borehole Number** **BH1**
Boring Method Cable Percussion	**Casing Diameter** 150 mm to 7.00 m	**Ground Level (mOD)**	**Client** Nilkanth Estates	**Job Number** J17059
	Location	**Dates** 20/03/2017- 22/03/2017	**Engineer** Parmarbrook	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.07	Floorboards		
						(0.68)	VOID		
0.75	D1					0.75	Made Ground (brown silty clayey sand with gravel, brick, glass, ash and concrete fragments)		
1.20-1.65 1.20-1.65	SPT(C) N60=11 B1		DRY	1,2/1,1,3,3					
1.75	D2					(2.25)			
2.00-2.45 2.00-2.45	SPT(C) N60=11 B2		DRY	5,1/3,1,1,3					
2.75	D3								
3.00-3.45 3.00-3.45	SPT(C) N60=56 B3	3.00	DRY	6,12/9,9,12,11		3.00	Dense orange-brown slightly silty slightly clayey sandy fine to coarse sub-angular to sub-rounded GRAVEL		
3.75	D4								
4.00-4.45 4.00-4.45	SPT(C) N60=44 B4	3.00	DRY	6,8/7,8,8,9					
4.75	D5					(3.50)			
5.00-5.45 5.00-5.45	SPT(C) N60=36 B5	5.00	DRY	7,6/7,7,6,6					
6.00	D6								
6.50-6.95 6.50-6.95	SPT(C) N60=25 B6	6.00	5.00	1,2/3,4,5,6		6.50	Stiff fissured brown silty CLAY		
						(0.50)			
						7.00	Stiff high strength fissured bluish grey slightly silty slightly sandy CLAY with occasional pale grey veins		
7.50	D7								
8.00-8.45 8.00-8.45	SPT(C) N60=44 D8	7.00	DRY	12,10/8,11,6,7					
9.00	D9					(4.00)			
9.50-9.95 9.50-9.95	SPT N60=25 D10	7.00	DRY	2,3/3,5,5,5					

Remarks
Groundwater monitoring standpipe installed to a depth of 6.50 m.

Scale (approx)	Logged By
1:50	AT

Figure No.
J17059.BH1

GEA Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 25 Old Gloucester Street, London WC1N 3AF	**Borehole Number** **BH1**

Boring Method	**Casing Diameter**	**Ground Level (mOD)**	**Client**	**Job Number**
Cable Percussion	150 mm to 7.00 m		Nilkanth Estates	J17059
	Location	**Dates** 20/03/2017- 22/03/2017	**Engineer** Parmarbrook	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50	D11								
11.00-11.45	SPT N60=31	7.00	DRY	4,5/5,5,6,7		11.00	Stiff very high strength fissured bluish grey silty sandy CLAY with occasional lenses of fine pale grey sand		
11.00-11.45	D12								
12.00	D13								
12.50-12.95	SPT N60=34	7.00	DRY	4,5/5,6,6,8					
12.50-12.95	D14								
13.50	D15								
14.00-14.45	SPT N60=36	7.00	DRY	4,5/6,6,7,7					
14.00-14.45	D16					(7.00)			
15.00	D17								
15.50-15.95	SPT N60=38	7.00	DRY	5,6/6,7,7,8					
15.50-15.95	D18								
16.50	D19								
17.55-18.00	SPT N60=38	7.00	DRY	3,5/6,6,8,8					
17.55-18.00	D20					18.00	Complete at 18.00m		

Remarks

Scale (approx)	**Logged By**
1:50	AT

Figure No.
J17059.BH1

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 25 Old Gloucester Street, London WC1N 3AF	**Number** **BH2**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sampler			Nilkanth Estates	J17059
	Location	**Dates** 17/03/2017	**Engineer** Parmarbrook	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.90)	Made Ground (dark brown silty clayey sand with gravel, brick and ash fragments)		
					0.90			
1.20	D1				(0.70)	Orange-brown fine to coarse SAND and fine to coarse sub-angular to sub-rounded GRAVEL		
			Water strike(1) at 1.80m.		1.60			▽1
					(1.10)	Orange-brown fine to coarse SAND with rare fine to medium sub-rounded to sub-angular gravel		
2.50	D2				2.70			
						Complete at 2.70m		

Remarks
Borehole advanced through the base of Trial Pit No 3
Groundwater monitoring standpipe installed to a depth of 2.50 m

Scale (approx)	**Logged By**
1:50	AT

Figure No.
J17059.BH2

Geotechnical & Environmental Associates	Widbury Barn Widbury Hill Ware,Herts SG12 7QE	**Site** 25 Old Gloucester Street, London WC1N 3AF	**Number** **BH3**

Excavation Method	**Dimensions**	**Ground Level (mOD)**	**Client**	**Job Number**
Drive-in Windowless Sampler			Nilkanth Estates	J17059
	Location	**Dates** 17/03/2017	**Engineer** Parmarbrook	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05	Concrete floor slab		
0.10	D1				0.15	Made Ground (grey silty sand with abundant gravel and concrete fragments)		
0.40	D2				(0.75)	Made Ground (dark brown silty clayey sand with gravel, brick and ash fragments)		
					0.90	Orange-brown sandy fine to coarse sub-rounded to angular GRAVEL		
1.20	D3				(0.40)			
					1.30	Complete at 1.30m		

Remarks
Groundwater not encountered
Groundwater monitoring standpipe installed to a depth of 1.30 m

Scale (approx)	**Logged By**
1:50	AT

Figure No.
J17059.BH3

GEA Geotechnical & Environmental Associates

Widbury Barn
Widbury Hill
Ware,Herts
SG12 7QE

Standard Penetration Test Results

Site : 25 Old Gloucester Street, London WC1N 3AF

Client : Nilkanth Estates

Engineer : Parmarbrook

Job Number J17059

Sheet 1 / 1

Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
BH1	1.20	1.35	1.65	CPT	1	2	1	1	3	3	N60=11	
BH1	2.00	2.15	2.45	CPT	5	1	3	1	1	3	N60=11	
BH1	3.00	3.15	3.45	CPT	6	12	9	9	12	11	N60=56	
BH1	4.00	4.15	4.45	CPT	6	8	7	8	8	9	N60=44	
BH1	5.00	5.15	5.45	CPT	7	6	7	7	6	6	N60=36	
BH1	6.50	6.65	6.95	CPT	1	2	3	4	5	6	N60=25	
BH1	8.00	8.15	8.45	CPT	12	10	8	11	6	7	N60=44	
BH1	9.50	9.65	9.95	SPT	2	3	3	5	5	5	N60=25	
BH1	11.00	11.15	11.45	SPT	4	5	5	5	6	7	N60=31	
BH1	12.50	12.65	12.95	SPT	4	5	5	6	6	8	N60=34	
BH1	14.00	14.15	14.45	SPT	4	5	6	6	7	7	N60=36	
BH1	15.50	15.65	15.95	SPT	5	6	6	7	7	8	N60=38	
BH1	17.55	17.70	18.00	SPT	3	5	6	6	8	8	N60=38	

GEA Geotechnical & Environmental Associates
Widbury Barn
Widbury Hill
Ware
Herts SG12 7QE

SPT / Depth Graph

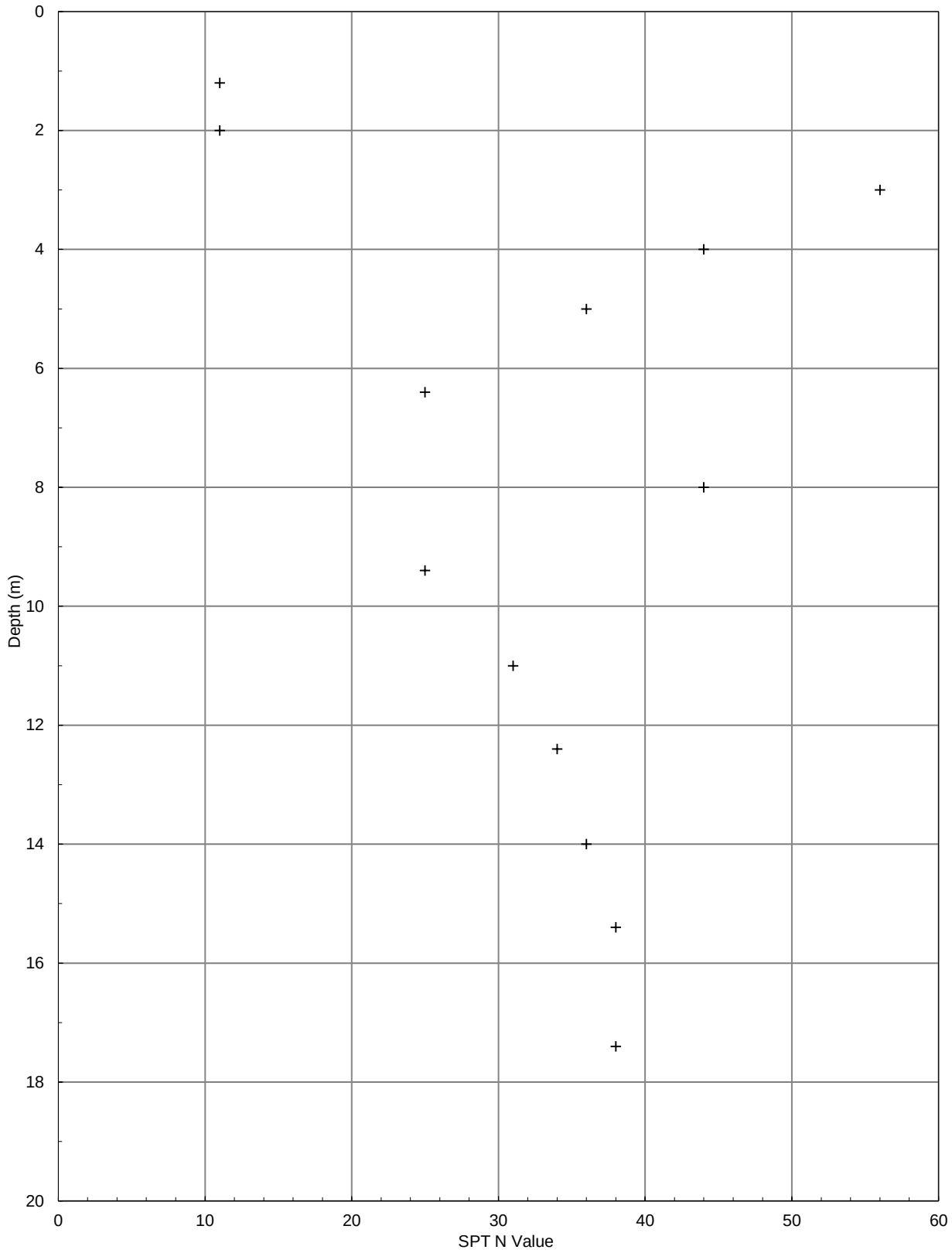
Site 25 Old Gloucester Street, London, WC1N 3AF

Client Nilkanth Estates

Engineer Parmarbrook

Job Number J17059

Sheet 1 / 1



+ - SPT 'N' values

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	
BH1		3.75	D												8.8	0.06		
BH1		4.00-4.45	B	Yellowish brown SAND and flint GRAVEL.														Particle Size Distribution
BH1		6.00	D	Yellowish brown slightly gravelly SAND. Gravel is fine to medium.														Particle Size Distribution
BH1		7.50	D	Dark brown CLAY with rare fine gravel.	31.6	77	26	51	98									
BH1		9.00	D												8.6	0.32		
BH1		13.50	D	Dark brown CLAY with rare fine gravel.	25.9	64	22	42	99									
BH2		1.20	D	Yellowish brown SAND and flint GRAVEL.														Particle Size Distribution
BH2		2.50	D												8.8	0.03		

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
10/04/2017

Project Number:

GEO / 25722

Project Name:

25 OLD GLOUCESTER STREET
J17059

GEOLABS®

BS1377 : Part 2 : Clause 9 : 1990

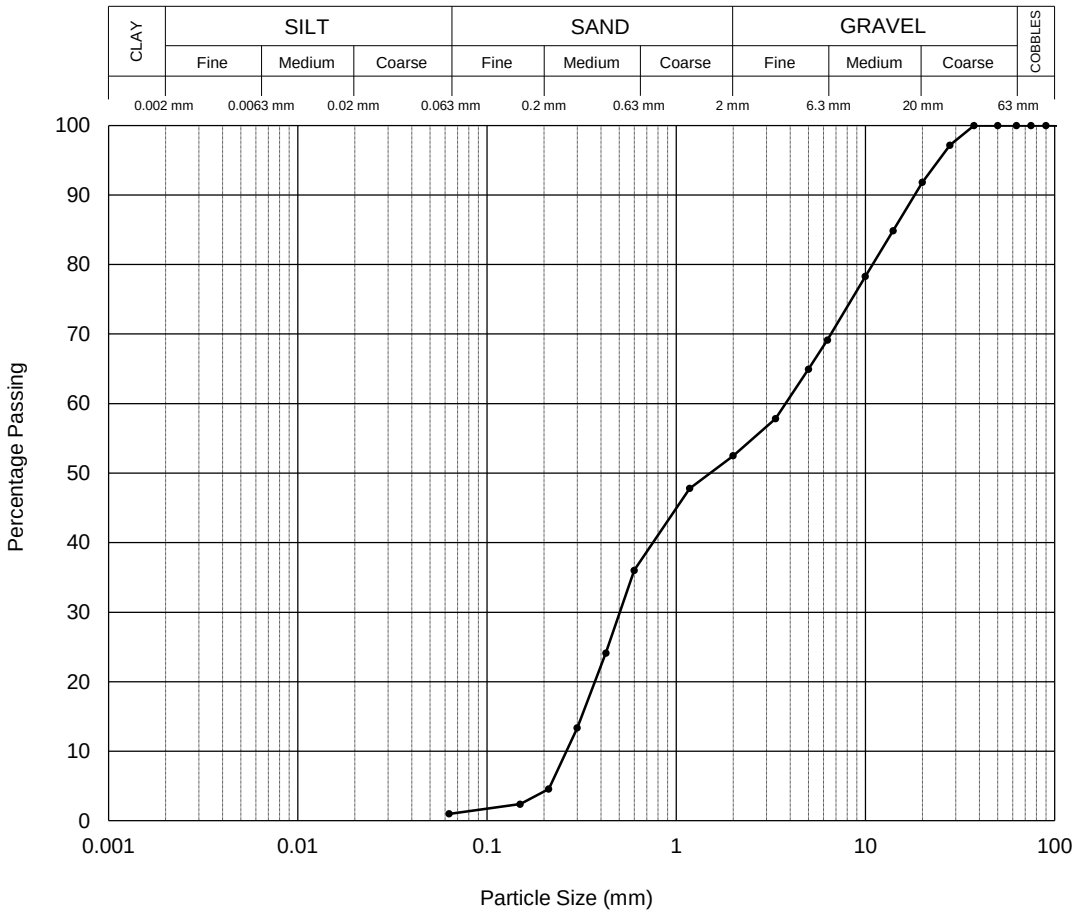
PARTICLE SIZE DISTRIBUTION

BH/TP No:	BH1
Depth (m):	4.00-4.45
Sample Type	B

Description:
Yellowish brown SAND and flint GRAVEL.

BS1377 : Part 2 : Clause 9.3 : 1990 Dry Sieving Method

Sieve	
Sieve (mm)	% pass
200	100
125	100
90	100
75	100
63	100
50	100
37.5	100
28	97
20	92
14	85
10	78
6.3	69
5	65
3.35	58
2	53
1.18	48
0.6	36
0.425	24
0.3	13
0.212	5
0.15	2
0.063	1



Particle Proportions	
Cobbles	0.0 %
Gravel	47.5 %
Sand	51.5 %
Silt & Clay	1.0 %

Checked and Approved by

S Burke

S Burke - Senior Technician
10/04/2017

Project Number:

GEO / 25722

Project Name:

25 OLD GLOUCESTER STREET
J17059

GEOLABS®
UKAS TESTING 1982

BS1377 : Part 2 : Clause 9 : 1990

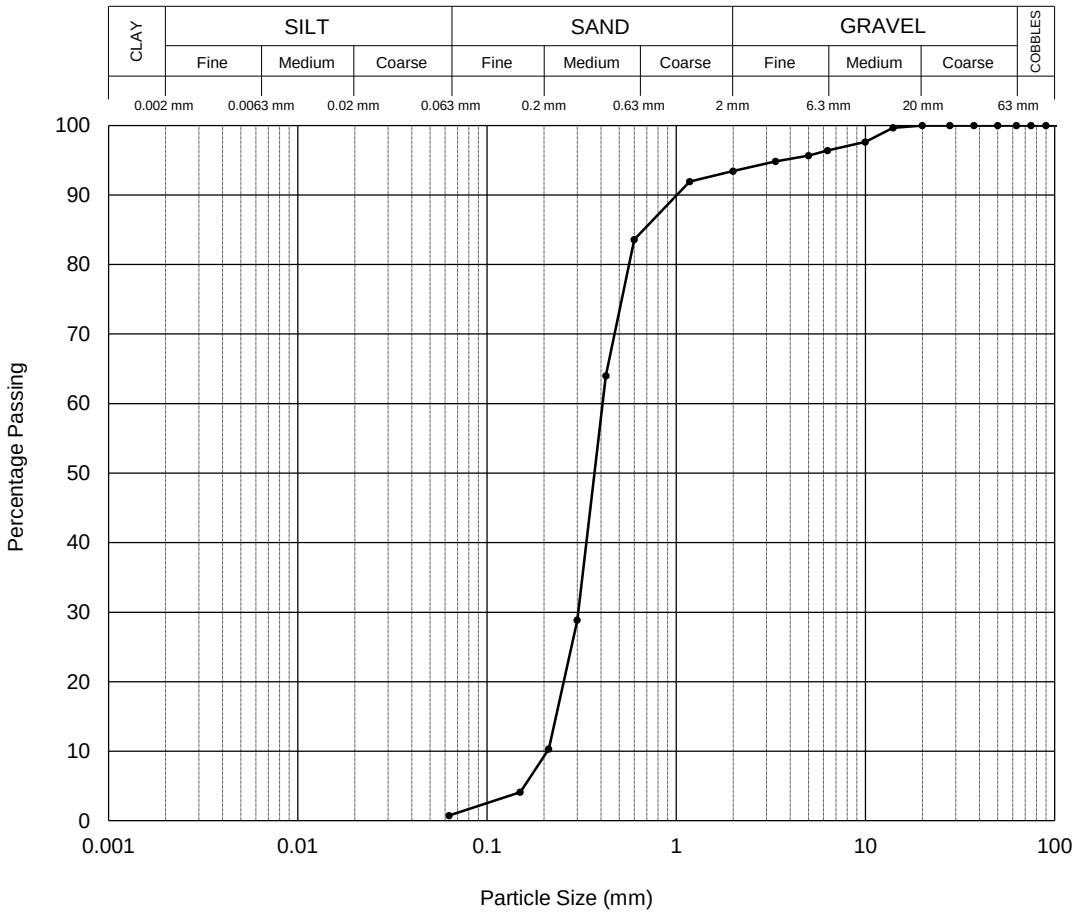
PARTICLE SIZE DISTRIBUTION

BH/TP No:	BH1
Depth (m):	6.00
Sample Type	D

Description:
Yellowish brown slightly gravelly SAND. Gravel is fine to medium.

BS1377 : Part 2 : Clause 9.3 : 1990 Dry Sieving Method

Sieve	
Sieve (mm)	% pass
200	100
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	98
6.3	96
5	96
3.35	95
2	93
1.18	92
0.6	84
0.425	64
0.3	29
0.212	10
0.15	4
0.063	1



Particle Proportions	
Cobbles	0.0 %
Gravel	6.6 %
Sand	92.7 %
Silt & Clay	0.8 %

Checked and Approved by

S Burke

S Burke - Senior Technician
10/04/2017

Project Number:

GEO / 25722

Project Name:

25 OLD GLOUCESTER STREET
J17059

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UKAS TESTING 1982

BS1377 : Part 2 : Clause 9 : 1990

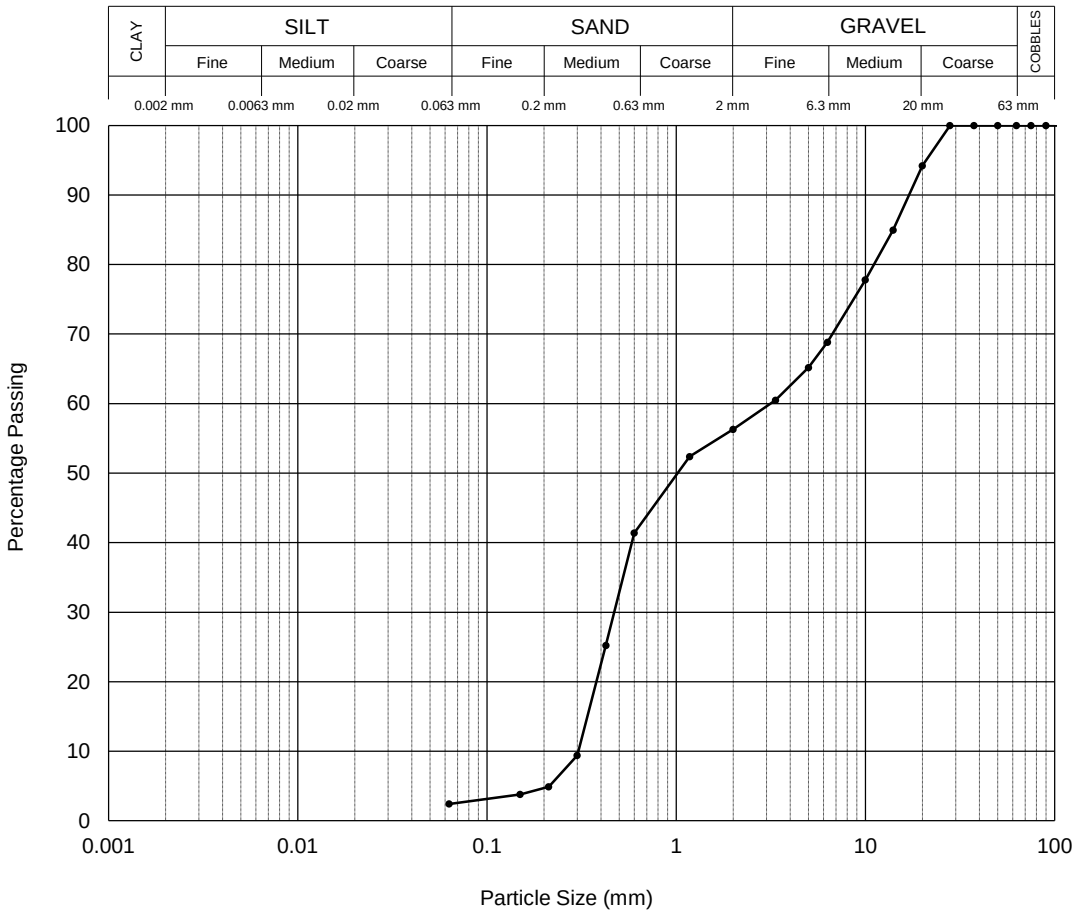
PARTICLE SIZE DISTRIBUTION

BH/TP No:	BH2
Depth (m):	1.20
Sample Type	D

Description:
Yellowish brown SAND and flint GRAVEL.

BS1377 : Part 2 : Clause 9.3 : 1990 Dry Sieving Method

Sieve	
Sieve (mm)	% pass
200	100
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	94
14	85
10	78
6.3	69
5	65
3.35	60
2	56
1.18	52
0.6	41
0.425	25
0.3	9
0.212	5
0.15	4
0.063	2



Particle Proportions	
Cobbles	0.0 %
Gravel	43.7 %
Sand	53.9 %
Silt & Clay	2.4 %

Checked and Approved by

S Burke

S Burke - Senior Technician
10/04/2017

Project Number:

GEO / 25722

Project Name:

25 OLD GLOUCESTER STREET
J17059

GEOLABS

UKAS TESTING 1982

Alex Taylor
Geotechnical & Environmental Associates
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7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 17-43874

Project / Site name:	25 Old Gloucester Street	**Samples received on:**	27/03/2017
Your job number:	J17059	**Samples instructed on:**	27/03/2017
Your order number:	J17059	**Analysis completed by:**	31/03/2017
Report Issue Number:	1	**Report issued on:**	31/03/2017
Samples Analysed:	4 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 17-43874

Project / Site name: 25 Old Gloucester Street
Your Order No: J17059

Lab Sample Number				724515	724516	724517	724518	
Sample Reference				TP3	TP1	TP2	BH3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.40	0.30	0.60	0.10	
Date Sampled				17/03/2017	17/03/2017	17/03/2017	17/03/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	18	13	10	6.5	
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.1	8.0	8.1	10.4	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	5300	5000	6200	12000	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.1	1.2	1.2	1.8	
Sulphide	mg/kg	1	MCERTS	4.1	1.2	1.1	2.3	
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	160	45	560	150	
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.2	0.9	0.5	0.3	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.35	0.26	
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	1.2	0.47	
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	1.1	0.39	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	1.2	0.38	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.1	0.34	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.87	0.33	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.59	0.18	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.67	0.21	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.57	0.22	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.71	0.32	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	8.38	3.10	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	22	12	20	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	15	15	16	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	63	61	38	33	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	260	400	250	180	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.0	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	17	14	13	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	65	62	44	76	
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	35	10	
TPH (C8 - C10)	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	8.5	2.9	
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0	26	6.5	

Analytical Report Number: 17-43874

Project / Site name: 25 Old Gloucester Street
Your Order No: J17059

Lab Sample Number				724515	724516	724517	724518	
Sample Reference				TP3	TP1	TP2	BH3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.40	0.30	0.60	0.10	
Date Sampled				17/03/2017	17/03/2017	17/03/2017	17/03/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

Analytical Report Number : 17-43874

Project / Site name: 25 Old Gloucester Street

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
724515	TP3	None Supplied	0.40	Brown clay and loam with gravel and rubble.
724516	TP1	None Supplied	0.30	Brown loam and sand with gravel and brick.
724517	TP2	None Supplied	0.60	Light brown loam and sand with rubble.
724518	BH3	None Supplied	0.10	Light brown loam and sand with gravel and rubble.

Analytical Report Number : 17-43874

Project / Site name: 25 Old Gloucester Street

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH3		S	17-43874	724518	c	Sulphide in soil	L010-PL	c
TP1		S	17-43874	724516	c	Sulphide in soil	L010-PL	c
TP2		S	17-43874	724517	c	Sulphide in soil	L010-PL	c
TP3		S	17-43874	724515	c	Sulphide in soil	L010-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

GEA Geotechnical & Environmental Associates
Widbury Barn
Widbury Hill
Ware
Herts SG12 7QE

Generic Risk-Based Soil Screening Values

Site	25 Old Gloucester Street, London, WC1N 3AF	**Job Number** J17059
Client	Nilkanth Estates	**Sheet** 1 / 2
Engineer	Parmarbrook	

Proposed End Use Residential without plant uptake

Soil pH 8

Soil Organic Matter content % 1.0

Contaminant	Screening Value mg/kg	Data Source
Metals		
Arsenic	40	C4SL
Cadmium	149	C4SL
Chromium (III)	3000	LQM/CIEH
Chromium (VI)	21	C4SL
Copper	2,330	LQM/CIEH
Lead	310	C4SL
Elemental Mercury	1.02	SGV
Inorganic Mercury	235	SGV
Nickel	99	LQM/CIEH
Selenium	595	SGV
Zinc	3,750	LQM/CIEH
Hydrocarbons		
Benzene	0.89	C4SL
Toluene	120	SGV
Ethyl Benzene	65	SGV
Xylene	42	SGV
Aliphatic C5-C6	30	LQM/CIEH
Aliphatic C6-C8	73	LQM/CIEH
Aliphatic C8-C10	19	LQM/CIEH
Aliphatic C10-C12	93	LQM/CIEH
Aliphatic C12-C16	740	LQM/CIEH
Aliphatic C16-C35	45,000	LQM/CIEH
Aromatic C6-C7	See Benzene	LQM/CIEH
Aromatic C7-C8	See Toluene	LQM/CIEH
Aromatic C8-C10	27	LQM/CIEH
Aromatic C10-C12	69	LQM/CIEH
Aromatic C12-C16	140	LQM/CIEH
Aromatic C16-C21	250	LQM/CIEH
Aromatic C21-C35	890	LQM/CIEH
PRO (C_5 –C_{10})	270	Calc
DRO (C_{12} –C_{28})	46,130	Calc
Lube Oil (C_{28} –C_{44})	45,890	Calc
TPH	**1000**	Trigger for speciated testing

Contaminant	Screening Value mg/kg	Data Source
Anions		
Soluble Sulphate	500 mg/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon (%)	6	Methanogenic potential
Total Cyanide	140	WRAS
Total Mono Phenols	310	SGV
PAH		
Naphthalene	2.33	C4SL exp & LQM/CIEH
Acenaphthylene	1,950	LQM/CIEH
Acenaphthene	2,020	LQM/CIEH
Fluorene	1,850	LQM/CIEH
Phenanthrene	837	LQM/CIEH
Anthracene	19,800	LQM/CIEH
Fluoranthene	972	LQM/CIEH
Pyrene	2,330	LQM/CIEH
Benzo(a) Anthracene	5.5	C4SL exp & LQM/CIEH
Chrysene	13	C4SL exp & LQM/CIEH
Benzo(b) Fluoranthene	10.6	C4SL exp & LQM/CIEH
Benzo(k) Fluoranthene	15.2	C4SL exp & LQM/CIEH
Benzo(a) pyrene	4.65	C4SL
Indeno(1 2 3 cd) Pyrene	6.3	C4SL exp & LQM/CIEH
Dibenzo(a h) Anthracene	1.31	C4SL exp & LQM/CIEH
Benzo (g h i) Perylene	71	C4SL exp & LQM/CIEH
Screening value for PAH	**66.4**	B(a)P / 0.15
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	12.9	LQM/CIEH
tetrachloroethane (PCA)	3.6	LQM/CIEH
tetrachloroethene (PCE)	1.46	LQM/CIEH
trichloroethene (TCE)	0.15	LQM/CIEH
1,2-dichloroethane (DCA)	0.00646	LQM/CIEH
vinyl chloride (Chloroethene)	0.00129	LQM/CIEH
tetrachloromethane (Carbon tetra	0.0362	LQM/CIEH
trichloromethane (Chloroform)	1.72	LQM/CIEH

Notes

Concentrations measured below the above values may be considered to represent 'uncontaminated conditions' which pose 'LOW' risk to human health. Concentrations measured in excess of these valuesindicate a potential risk which require further, site specific risk assessment.

SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009

LQM/CIEH - Generic Assessment Criteria for Human Health Risk Assessment 2nd edition (2009)derived using CLEA 1.04 model 2009

C4SL - Defra Category 4 Screening value based on Low Level of Toxicological Risk

C4SL exp & LQM/CIEH calculated using C4SL revisions to exposure assessment but LQM/CIEH health croiteria values

Calc - sum of nearest available carbon range specified including BTEX for PRO fraction

B(a)P / 0.15 - GEA experince indicates that Benzo(a) pyrene (one of the most common and most carcenogenic of the PAHs) rarely exceeds 15% of the total PAH concentration, hence this Total PAH threshold is regarded as being conservative

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
116693910_1_1

Customer Reference:
J17059

National Grid Reference:
530370, 181880

Slice:
A

Site Area (Ha):
0.04

Search Buffer (m):
1000

Site Details:

25, Old Gloucester Street
LONDON
WC1N 3AF

Client Details:

Mr S Branch
GEA Ltd
Widbury Barn
Widbury Hill
Ware
Herts
SG12 7QE

Contents

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Natural England Copyright Notice

Ove Arup Copyright Notice

Peter Brett Associates Copyright Notice

Radon Potential dataset Copyright Notice

Report Version v50.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				4
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices	pg 2			1	1
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 2		2	2	14
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature					
Pollution Incidents to Controlled Waters	pg 5		1	1	1
Prosecutions Relating to Authorised Processes	pg 5				2
Registered Radioactive Substances	pg 6		22	17	104
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions	pg 30			2	3 (*88)
Water Industry Act Referrals	pg 53				1
Groundwater Vulnerability	pg 53	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 53	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 53	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
Detailed River Network Lines	pg 53		Yes		n/a
Detailed River Network Offline Drainage					n/a

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 54				1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)					
Potentially Infilled Land (Water)					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites	pg 54				1
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)	pg 55				1
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 56	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry					
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry	pg 56		Yes	Yes	Yes
BGS Urban Soil Chemistry Averages	pg 59	Yes			
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities	pg 59				1
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 59	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 59	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 59	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 59	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 61		61	124	885
Fuel Station Entries	pg 150			1	4
Points of Interest - Commercial Services	pg 151		6	5	57
Points of Interest - Education and Health	pg 156		7	1	15
Points of Interest - Manufacturing and Production	pg 158		4	11	53
Points of Interest - Public Infrastructure	pg 164			11	13
Points of Interest - Recreational and Environmental	pg 166		3	4	25
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	0	2	530371 181881
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (NE)	128	2	530450 182000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NW (N)	223	2	530300 182100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NW (W)	256	2	530100 181900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	276	2	530650 181800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	340	2	530700 181750
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13SE (S)	347	2	530500 181550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	355	2	530000 181881
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (W)	462	2	529900 181800
1	**Discharge Consents** Operator: London School Of Hygiene And Tropical Medicine Property Type: EDUCATION/NURSERY/SCHOOL/COLLEGE/UNI/TRAINING VENUE Location: London Sch Of Hygine&Trop Medicine Keppel Street . London Wc1e 7ht Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Eprgp3123kg Permit Version: 1 Effective Date: 12th January 2011 Issued Date: 12th January 2011 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Into Land Receiving Water: Groundwater **Status: New issued under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A12NE (W)	516	3	529839 181892
1	**Discharge Consents** Operator: London School Of Hygiene And Tropical Medicine Property Type: EDUCATION/NURSERY/SCHOOL/COLLEGE/UNI/TRAINING VENUE Location: London Sch Of Hygine&Trop Medicine Keppel Street . London Wc1e 7ht Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Eprgp3123kg Permit Version: 1 Effective Date: 12th January 2011 Issued Date: 12th January 2011 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Into Land Receiving Water: Groundwater **Status: New issued under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A12NE (W)	520	3	529835 181897

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: University College London Property Type: MAKING OF COMPUTERS/ELECTRONICS/OPTICAL PRODUCTS Location: Bidborough House 20 Mabledon Place London London Wc1h 9bf Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Npswqd005471 Permit Version: 2 Effective Date: 8th March 2013 Issued Date: 8th March 2013 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Into Land Receiving Water: Gw Via Re-Inject Borehole **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	870	3	529996 182673
2	**Discharge Consents** Operator: London Borough Of Camden Property Type: MAKING OF COMPUTERS/ELECTRONICS/OPTICAL PRODUCTS Location: Bidborough House 20 Mabledon Place London London Wc1h 9bf Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Npswqd005471 Permit Version: 1 Effective Date: 20th February 2009 Issued Date: 20th February 2009 Revocation Date: 7th March 2013 Discharge Type: Trade Discharges - Cooling Water Discharge Environment: Into Land Receiving Water: Gw Via Re-Inject Borehole **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	870	3	529996 182673
3	**Enforcement and Prohibition Notices** Location: The School of Pharmacy, 29/39 Brunswick Square, Camden, LONDON, WC1N 1AX Permit Reference: Not Given Enforcement Date: 27th February 1995 Details: Press Release HM156, Minor breaches of accumulation and disposal limits; substandard lab & storage facilities; under RSA93. Positional Accuracy: Unknown	A18SW (N)	415	3	530300 182300
4	**Enforcement and Prohibition Notices** Location: Gower Street, LONDON, WC1E 6BT Permit Reference: Not Given Enforcement Date: Not Supplied Details: Inadequate record system for radioactive waste; under RSA93, served 1994/95. Positional Accuracy: Unknown	A17SW (NW)	887	3	529569 182288
5	**Local Authority Pollution Prevention and Controls** Name: Capri Cleaners Location: 148 Southampton Row, London, Wc1b 5ag Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC23 Dated: 24th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	69	4	530303 181923
6	**Local Authority Pollution Prevention and Controls** Name: Insititute of Child Health Location: University Of London, 30 Guildford Street, CAMDEN, WC1N 1EH Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 17th November 1992 Process Type: Local Authority Air Pollution Control Description: PG5/1Clinical waste incineration processes under 1 tonne an hour **Status: Authorisation revokedRevoked** Positional Accuracy: Manually positioned to the road within the address or location	A13NW (N)	210	4	530304 182088

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Local Authority Pollution Prevention and Controls** Name: Matthew Daniel Dry Cleaners Ltd Location: 13 Theobalds Road, London, Wc1x 8sl Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC26 Dated: 24th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A14SW (E)	358	4	530743 181846
8	**Local Authority Pollution Prevention and Controls** Name: Totalfinaelf Location: 3-16 Woburn Place, London, Wc1 9lw Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 1st April 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Site Closed** Positional Accuracy: Located by supplier to within 10m	A13NW (NW)	430	4	530075 182204
9	**Local Authority Pollution Prevention and Controls** Name: Tuxedo Express Location: 40 Drury Lane, London, Wc2b 5rr Authority: Westminster City Council, Environmental Health Department Permit Reference: 07/14093/EE1EP Dated: 5th September 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8SE (S)	682	5	530385 181187
10	**Local Authority Pollution Prevention and Controls** Name: Imperial Cancer Research Fund Location: Lincoln Inns Fields, WESTMINSTER, WC2A 3PX Authority: Westminster City Council, Environmental Health Department Permit Reference: Not Given Dated: 1st July 1992 Process Type: Local Authority Air Pollution Control Description: PG5/1Clinical waste incineration processes under 1 tonne an hour **Status: Authorisation has expiredExpired** Positional Accuracy: Manually positioned to the address or location	A9NW (SE)	738	5	530766 181250
11	**Local Authority Pollution Prevention and Controls** Name: Seven Dials Dry Cleaners Location: 37 Monmouth Street, London, Wc2h 9dd Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC25 Dated: 24th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A8SW (S)	797	4	530075 181125
12	**Local Authority Pollution Prevention and Controls** Name: Mastermelt Ltd Location: Baldwins Gardens, CAMDEN, EC1N 7RJ Authority: London Borough of Camden, Pollution Projects Team Permit Reference: Not Given Dated: 22nd June 1994 Process Type: Local Authority Air Pollution Control Description: PG2/1Furnaces for the extraction of non-ferrous metal from scrap **Status: Authorisation revokedRevoked** Positional Accuracy: Manually positioned to the road within the address or location	A14SE (E)	802	4	531186 181818
13	**Local Authority Pollution Prevention and Controls** Name: Sue Smart Location: 86 Leather Lane, London, Ec1n 7tt Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC29 Dated: 26th February 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A14NE (E)	850	4	531232 181968

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**Local Authority Pollution Prevention and Controls** Name: Alex 24hr Dry Cleaners Location: 289 Grays Inn Road, London, Wc1x 8qf Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC4 Dated: 26th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A18NE (N)	973	4	530467 182862
22	**Local Authority Pollution Prevention and Controls** Name: Royal Dry Cleaners Location: 46 Roseberry Avenue, London Authority: London Borough of Islington, Environmental Health Department Permit Reference: PPC/DC34/07 Dated: 5th July 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A19SE (NE)	976	6	531195 182430
	Nearest Surface Water Feature None				
23	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: LONDON, WC1 Authority: Environment Agency, Thames Region Pollutant: Miscellaneous - Fire water / Foam Note: Not Supplied Incident Date: 6th January 1996 Incident Reference: SE960007 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SE (SE)	215	3	530500 181700
24	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: ST PANCROS Authority: Environment Agency, Thames Region Pollutant: Unknown Sewage Note: Confirmed incident Incident Date: 10th January 1999 Incident Reference: THNE1999041585 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Approximate location provided by supplier	A12NE (W)	375	3	530001 182001
25	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: LONDON, WC1 Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 16th January 1996 Incident Reference: SE960017 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NE (NW)	552	3	529850 182100
26	**Prosecutions Relating to Authorised Processes** Location: The Courtyard, 12 Sutton Row, London Prosecution Text: Failure to comply with packaging waste regulations Prosecution Act: Pro97 Hearing Date: 27th July 2009 Verdict: Guilty Fine: 261278 Costs: 3755 Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	804	3	529808 181286

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
60	**Water Abstractions** Operator: London School Of Hygiene And Tropical Medicine Licence Number: Th/039/0039/031 Permit Version: 1 Location: Keppel Street, Bloomsbury, London - Borehole 1 Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	495	3	529860 181863
60	**Water Abstractions** Operator: London School Of Hygiene And Tropical Medicine Licence Number: Th/039/0039/031 Permit Version: 1 Location: Keppel Street, Bloomsbury, London - Borehole 2 Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 1st April 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	497	3	529858 181865
61	**Water Abstractions** Operator: University College London Licence Number: Th/039/0039/064 Permit Version: 2 Location: Borehole At Bidborough House, 20 Mabledon Place, London Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Bidborough House, 20 Mabledon Place London Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 21st November 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18NW (N)	889	3	530052 182718
61	**Water Abstractions** Operator: London Borough Of Camden Licence Number: Th/039/0039/064 Permit Version: 1 Location: Borehole At Bidborough House, 20 Mabledon Place, London Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Bidborough House, 20 Mabledon Place London Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 16th April 2013 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18NW (N)	889	3	530052 182718

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Sir Ritblat Licence Number: Th/039/0039/022 Permit Version: 1 Location: Doric Villa, York Terrace East, London Authority: Environment Agency, Thames Region Abstraction: Production of Energy: Electricity: Heat Pump Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th February 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(W)	1978	3	528407 182223
62	**Water Industry Act Referrals** Name: Aeromet International Plc Location: AEROMET INTERNATIONAL PLC, 10 NORWICH STREET, 10 NORWICH STREET, NORWICH, LONDON, EC4A 1BD Authority: Environment Agency, Thames Region Permit Reference: Bz0564 Dated: 10th March 2004 Process Type: Permissions or amendments to discharge under the Water Industry Act 1991 Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations **Status: Application cancelled** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	964	3	531241 181437
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 40 Thames Estuary Scale: 1:100,000	A13NE (NE)	0	3	530371 181881
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13NE (NE)	0	2	530371 181881
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (NE)	0	2	530371 181881
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
63	**Detailed River Network Lines** River Type: Extended Culvert (greater than 50m) River Name: Not Supplied Hydrographic Area: B06 River Flow Type: Primary Flow Path River Surface Level: Below Surface Drain Feature: Not a Drain Flood Risk Management Status: Other Rivers Water Course Name: Not Supplied Water Course Reference: Not Supplied	A13NE (NE)	7	3	530391 181891
	Detailed River Network Offline Drainage None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
64	**Historical Landfill Sites** Licence Holder: Not Supplied Location: Lincolns Inn Fields, London WC2A Name: Portugal Street Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD12040 First Input Date: Not Supplied Last Input Date: Not Supplied Specified Waste Type: Not Supplied EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: Not Supplied Other Ref: IMP006	A9NW (SE)	714	3	530731 181256
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		0	7	530371 181881
	Local Authority Landfill Coverage Name: Westminster City Council - Has supplied landfill data		619	5	530348 181249
	Local Authority Landfill Coverage Name: Corporation of London - Has no landfill data to supply		641	8	530967 181612
	Local Authority Landfill Coverage Name: London Borough of Islington - Has no landfill data to supply		717	6	530961 182315
65	**Registered Waste Treatment or Disposal Sites** Licence Holder: Imperial Cancer Research Fund Licence Reference: DL354 Site Location: 44-49 Lincoln's Inn Fields, WESTMINSTER, London, WC2A 3PX Operator Location: PO Box 123, Lincoln's Inn Fields, LONDON, Greater London, WC2A 3PH Authority: Environment Agency - Thames Region, North East Area Site Category: Incineration Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st October 1991 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Clinical - As In Coll/Disp.Regs Of '88 Lwra Cat. Bi Gen.Non-Putresc - Only Max.Waste Permitted By Licence-Stated Organic Solvents Paper/Cardboard Waste Plastics As Lab.Cont'Rs/Pack'G Mat'Ls Prohibited Waste: Special Wastes N.O.S. Waste N.O.S.	A9NW (SE)	732	3	530770 181260

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
66	**Control of Major Accident Hazards Sites (COMAH)** Name: London Borough of Camden Location: Bidborough House, 20 Mabledon St, LONDON, WC1H 9BT Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	887	9	530020 182703

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thames Group	A13NE (NE)	0	2	530371 181881
	BGS Estimated Soil Chemistry No data available				
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 530320, 181710 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 16.10 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 61.50 mg/kg Lead Measured Concentration: 331.40 mg/kg Nickel Measured Concentration: 22.10 mg/kg	A13SW (S)	164	2	530320 181710
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 530648, 181719 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 19.50 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 61.30 mg/kg Lead Measured Concentration: 500.80 mg/kg Nickel Measured Concentration: 25.30 mg/kg	A13SE (SE)	308	2	530648 181719
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 530370, 182313 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 26.90 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 73.30 mg/kg Lead Measured Concentration: 721.90 mg/kg Nickel Measured Concentration: 32.20 mg/kg	A18SW (N)	420	2	530370 182313
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 529792, 181638 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 32.80 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 90.60 mg/kg Lead Measured Concentration: 846.90 mg/kg Nickel Measured Concentration: 33.60 mg/kg	A12SE (SW)	612	2	529792 181638

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Urban Soil Chemistry Averages Source: British Geological Survey, National Geoscience Information Service Sample Area: London Count Id: 7209 Arsenic Minimum Concentration: 1.00 mg/kg Arsenic Average Concentration: 17.00 mg/kg Arsenic Maximum Concentration: 161.00 mg/kg Cadmium Minimum Concentration: 0.10 mg/kg Cadmium Average Concentration: 0.90 mg/kg Cadmium Maximum Concentration: 165.20 mg/kg Chromium Minimum Concentration: 13.00 mg/kg Chromium Average Concentration: 79.00 mg/kg Chromium Maximum Concentration: 2094.00 mg/kg Lead Minimum Concentration: 11.00 mg/kg Lead Average Concentration: 280.00 mg/kg Lead Maximum Concentration: 10000.00 mg/kg Nickel Minimum Concentration: 2.00 mg/kg Nickel Average Concentration: 28.00 mg/kg Nickel Maximum Concentration: 506.00 mg/kg	A13NE (NE)	0	2	530371 181881
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Natural Cavities Easting: 530600 Northing: 182400 Distance: 553 Quadrant Reference: A18 Quadrant Reference: SE Bearing Ref: NE Cavity Type: Unknown x 1 Solid Geology Detail: London Clay Formation Superficial Geology Detail: Alluvium	A18SE (NE)	553	10	530600 182400
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	65	2	530443 181915

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	2	530371 181881

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
67	**Contemporary Trade Directory Entries** Name: Simply Print Location: 27 Old Gloucester Street, London, WC1N 3AX Classification: Printers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: London Serenity Location: 27 Old Gloucester Street, London, WC1N 3AX Classification: Television & Video Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Thames Water Meter Company Location: Monomark House, 27 Old Gloucester Street, London, WC1N 3AX Classification: Meter Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Indent Uk Trading Ltd Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AF Classification: Builders' Tools & Equipment Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: A Commercial Waste Ltd Location: Old Gloucester Street, London, WC1N 3AX Classification: Waste Disposal Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: N A H Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Scotfax Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AF Classification: Photocopiers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Blitz It Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AF Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Euro Freight Forwarders Location: 27, Old Gloucester Street, London, WC1N 3AF Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Aquarama Ltd Location: Ground Floor Flat, 27, Old Gloucester Street, London, WC1N 3AF Classification: Boilers - Servicing, Replacements & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Damp Direct Ltd Location: 27, Old Gloucester Street, London, WC1N 3AF Classification: Damp & Dry Rot Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Standard Office Cleaning Uk Ltd Location: 27, Old Gloucester Street, London, WC1N 3AF Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	8	-	530387 181874

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
67	**Contemporary Trade Directory Entries** Name: Stonegate Cleaning Location: Ground Floor Flat, 27, Old Gloucester Street, London, WC1N 3AF Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Fresh Up Cleaning Location: Flat 1-4, 27, Old Gloucester Street, London, WC1N 3AF Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Imperial Cleaning Co Location: 27 Old Gloucester Street, London, WC1N 3AF Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Manually positioned to the address or location	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Autotrade-It Location: 27 Old Gloucester St, London, WC1N 3AF Classification: Car Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	8	-	530387 181874
67	**Contemporary Trade Directory Entries** Name: Gillsbrook F M Services Ltd Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: The London Gasworks Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: Uk Water Softeners Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Water Softeners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: Metropark Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Car Painters & Sprayers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: Proper House Cleaning Ltd Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: At Your Disposal Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AF Classification: Recycling Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: Fine Time Watches Ltd Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Clocks & Watches - Manufacturers & Wholesalers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: R S F Holdings Ltd Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Road Haulage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
67	**Contemporary Trade Directory Entries** Name: M J Cleaning Services London Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (S)	18	-	530379 181857
67	**Contemporary Trade Directory Entries** Name: G P Systems Ltd Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Window Film Manufacturers and Dealers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (S)	18	-	530380 181857
67	**Contemporary Trade Directory Entries** Name: Visual Cleaning Services Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (S)	19	-	530380 181857
67	**Contemporary Trade Directory Entries** Name: A S L Breakdown Assist Location: Monomark House, 27, Old Gloucester Street, London, WC1N 3AX Classification: Car Breakdown & Recovery Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SE (S)	19	-	530380 181857
68	**Contemporary Trade Directory Entries** Name: Capri Exclusive Location: 148, Southampton Row, London, WC1B 5AG Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	69	-	530306 181927
68	**Contemporary Trade Directory Entries** Name: Drew Marine Location: New Premier House, 150, Southampton Row, London, WC1B 5AL Classification: Marine Equipment & Supplies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	93	-	530296 181949
69	**Contemporary Trade Directory Entries** Name: Boswell Laundrette Location: 23, Boswell Street, London, WC1N 3BW Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (E)	77	-	530464 181879
69	**Contemporary Trade Directory Entries** Name: Boswell Cleaner Location: 25, Boswell Street, London, WC1N 3BW Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (E)	77	-	530464 181879
69	**Contemporary Trade Directory Entries** Name: Laundavista Location: 23, Boswell Street, London, WC1N 3BW Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (E)	77	-	530464 181879
70	**Contemporary Trade Directory Entries** Name: Dagwood Location: 4, Bloomsbury Place, London, WC1A 2QA Classification: Printers - Glass, Metal, Plastics Etc. **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	85	-	530357 181784
70	**Contemporary Trade Directory Entries** Name: Datawind Location: 3, Bloomsbury Place, London, WC1A 2QL Classification: Electronic Equipment - Manufacturers & Assemblers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SW (S)	92	-	530350 181778
71	**Contemporary Trade Directory Entries** Name: Kall Kwik Location: 72, Southampton Row, London, WC1B 4AR Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	92	-	530412 181790