

Patmore, Chris

From: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 09 June 2025 09:13
To: Patmore, Chris
Cc: Evans, Caitlin; Macbeth, Ryan; Ryan Bruty; David Joseph; Jason Woolliscroft
Subject: RE: RE: FW: RE: Foul Sewer and Potable Water Supply Check: Hemel North DS6137403

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Hi Chris

I’ve spoken to the asset planner who has reviewed the pump rates to see if there is an acceptable rate for the full development. Unfortunately they have been unable to lower the pump rate to achieve the desired outcome for the full development. The Highest pump rate that we can offer here is only 7.5 l/s and would be limited to just 64 no. dwellings equivalent.

He’s looked at the site, and asked could any of the dwellings have a gravity connection into our network, with some dwellings towards the southern end being pumped northwards into the proposed network for gravity? If your investigations find this is possible happy to review the capacity check and will just need to know the split of the development to the gravity and pumped connection points.

At this point this is as far as we can proceed without going down the modelling route.

Kind regards

Gemma Connolley
Adoptions & Pre-Planning Engineer
Developer Services
Mobile – 07747 647 613
Help Desk number – 0800 009 3921

Get advice – make your sewer connection correctly - [Plumbing and drainage misconceptions | Water UK](#)

Clearwater Court, Vastern Road, Reading, RG1 8DB
Find us online at [Developer services | Thames Water](#)

Original Text

From: "Patmore, Chris" <chris.patmore@rps.tetrattech.com>
To: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
CC: Evans, Caitlin <Caitlin.Evans@rps.tetrattech.com>;Macbeth, Ryan <Ryan.Macbeth@rps.tetrattech.com>;Ryan Bruty <r.buty@pigeon.co.uk>;David Joseph <patrick.joseph@bloorhomes.com>;Jason Woolliscroft <jason.woolliscroft@bloorhomes.com>
Sent: 27.05.25 09:52:56
Subject: RE: FW: RE: Foul Sewer and Potable Water Supply Check: Hemel North DS6137403

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Gemma

Many thanks for responding.

We are aware of the wider development and part of the client team has interests in some of the wider site.
At the moment, we are only involved in the site issued with our application.

In terms of the pumping rates, we are interested in knowing if we have to develop a staged approach as the development is quite large and will not come forward all at once, Is there a point at which the off-site reinforcement becomes a constraint? How many units can come forward and in which form to enable a start before the off-site works are complete.

That would be good to understand and if a meeting would be useful, we would like to arrange?

Patmore, Chris

Technical Director - Hydrology SuDS
RPS | Consulting UK & Ireland
M 07933 523542
E chris.patmore@rps.tetrattech.com

From: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>

Sent: 27 May 2025 09:33

To: Patmore, Chris <chris.patmore@rps.tetrattech.com>

Cc: Evans, Caitlin <Caitlin.Evans@rps.tetrattech.com>; Macbeth, Ryan <Ryan.Macbeth@rps.tetrattech.com>

Subject: RE: FW: RE: Foul Sewer and Potable Water Supply Check: Hemel North DS6137403

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Hi Chris

Thank you for providing the link about the Hemel Garden Communities project, are you developing more than one site within this project or in touch with the other developers?

In regards to options for the site, I've reached out to our asset planners and am currently awaiting an update about what would possibly be acceptable but would it be feasible to lower the pump rate at all?

Kind regards

[Gemma Connolley](#)

Adoptions & Pre-Planning Engineer

Developer Services

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It's everyone's water

Original Text

From: "Patmore, Chris" <Chris.Patmore@rps.tetrattech.com>

To: DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
CC: Evans, Caitlin <Caitlin.Evans@rps.tetrattech.com>;Macbeth, Ryan <Ryan.Macbeth@rps.tetrattech.com>
Sent: 19.05.25 14:36:41
Subject: FW: RE: Foul Sewer and Potable Water Supply Check: Hemel North DS6137403

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Gemma

Many thanks for the pre-development report.

As you have stated, the full site cannot be supplied until off-site works have been carried out.

Would it be possible to have a meeting to discuss the options as we are aware that this site is part of the larger Hemel Garden Communities project (<https://www.hemelgardencommunities.co.uk/>) and it may be useful to co-ordinate responses etc.?

Patmore, Chris
Technical Director - Hydrology SuDS
RPS | Consulting UK & Ireland
M 07933 523542
E chris.patmore@rps.tetrattech.com

From:DEVELOPER.SERVICES@THAMESWATER.CO.U <DEVELOPER.SERVICES@THAMESWATER.CO.UK>
Sent: 07 May 2025 12:09
To: Evans, Caitlin <caitlin.evans@rps.tetrattech.com>
Subject: RE: RE: Foul Sewer and Potable Water Supply Check: Hemel North DS6137403

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Hi Caitlin

Site Address: Hemel North- Land off Holtsmere Lane, Hemel Hamstead, HP2 7HP
Wastewater Pre-Planning Ref: DS6137403

Please find attache a Capcity Concerns letter.

Proposed site: development of green field site for 1560 general housing, 690 pupil primary school, 60 bed care home and 1000m2 of commercial property.

Proposed foul water: proposed connection via pumped at 77.92 l/s to TL0809**2802** to the 300mm foul water sewer

We have completed the assessment of the foul water flows and surface water run-off based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

We’ve assessed your **foul water** proposals and concluded that unfortunately we’re unable to meet the needs of your **full** development at this time.

In order to ensure we make the appropriate upgrades – or ‘off-site reinforcement’ – to serve the remainder of your development, we’ll need to carry out modelling work, design a solution and build the necessary improvements. This work is done at our cost.

What do you need to tell us before we start modelling?

We will only carry out modelling once we’re confident that your development will proceed. In order to have this confidence, we’ll need to know that you **own the land and have either outline or full planning permission**. Please email this information to us as soon as you have it.

If you’ve any further queries please don’t hesitate to get in touch.

Gemma Connolley
Adoptions & Pre-Planning Engineer
Service Delivery

Help Desk number – 0800 009 3921

Get advice – make your sewer connection correctly - [Plumbing and drainage misconnections | Water UK](#)

Clearwater Court, Vastern Road, Reading, RG1 8DB

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Original Text

From: "DEVELOPER.SERVICES@THAMESWATER.CO.U" <DEVELOPER.SERVICES@THAMESWATER.CO.UK>

To: caitlin.evans@rps.tetrattech.com

CC:

Sent: 03.04.25 12:03:03

Subject: RE: Foul Sewer and Potable Water Supply Check: Hemel North

Hi Caitlin

Site Address: Hemel North- Land off Holtsmere Lane, Hemel Hamstead, HP2 7HP
Wastewater Pre-Planning Ref: DS6137403

Thank you for providing information in support of your Pre-planning enquiry (DS6137403) for the development at the above location.

Your foul water application has now been passed on to our Asset Planning team for consultation. We will aim to get back to you with a formal response in 7 working days.

My Clean Water colleagues will process your Clean Water application under DS6137402.

If you've any further queries please don't hesitate to get in touch.

[Gemma Connolley](#)

Adoptions & Pre-Planning Engineer

Service Delivery

Help Desk number – 0800 009 3921

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Clearwater Court, Vastern Road, Reading, RG1 8DB

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Original Text

From: "Evans, Caitlin" <Caitlin.Evans@rps.tetratech.com>
To: developer.services@thameswater.co.uk <developer.services@thameswater.co.uk>
CC:
Sent: 27.03.25 14:20:01
Subject: Foul Sewer and Potable Water Supply Check: Hemel North

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Hello,

Can the attached Foul and Potable water capacity checks be undertaken?

Please also see attached information required.

Please also note estimates have been used for phasing and peak water supply, this is yet to be confirmed.

Any queries, please don't hesitate to get in touch.

Best wishes,
Caitlin

CaitlinEvans
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Appendix D – Affinity Water Pre-development Report

07850605698 Alexandra Mielusica
Rushden Hall, Hall Avenue
Rushden
NN10 9NG

21/01/2025

Pre-Development report for DS0062075

Dear 07850605698 Alexandra Mielusica,

Thank you for your Pre-Planning Enquiry application for your proposed development at Hemel Hempstead Road.

Based upon the information provided in your application, we are pleased to share this report for the new water supply to your proposed development.

Please be advised that any figures included within this report are indicative and are based upon the information you have provided at this stage. All values remain subject to change and will be partially dependent on the provision of your finalised site plans. Where information has not been provided or is vague, assumptions have been made.

For more information about our charges, and the circumstances under which these rates are fixed, please refer to [Our Charges](#) page on our website.

Once you are ready to proceed with your development, you will need to progress this application by logging onto our online portal.

If you need any further advice, please do not hesitate to contact us.

Yours sincerely,

Nithya Thomas
Development Experience Affinity Water
0345 357 24 28



Call us on
0345 357 2428

Visit our portal
affinitywater.custhelp.com

Visit our website
affinitywater.co.uk/developing

Your Proposed Development

The information within this report has been based upon the following information that was submitted as part of your application. The purpose of this report is to confirm if the development can be supplied with water, if any reinforcement work will be required to supply the site and, to identify any existing assets crossing the site which may require diverting or protecting.

Property Type	No. of Properties
Residential	1,500
Commercial	3
Industrial	0
Other (inc. fire supply)	0

Anticipated Build Rate

Year	No. of Properties
2024/2025	0
2025/2026	300
2026/2027	300
2027/2028	300
2028/2029	300
2029/2030	300
2030/2031	0
Beyond 2031	0

Existing Assets

Our records indicate that we have no assets within the boundary of your development site.

Easement Information

We are unable to permit development either over or within the easement strip without our prior consent.

Pipe Size (mm)	Total Easement Required (m)
Less than 150mm (6")	6m (3m either side of the water main)
151mm – 600mm (6" – 24")	7m (3.5m either side of the water main)
>600mm (24")	9m (4.5m either side of the water main)

For further information, please see our [Developing and working near our pipes and apparatus](#) guide on our website.

If it is not possible to avoid our assets, then these may need to be diverted in accordance with Section 185 of the Water Industry Act (1991). You will need to make a separate formal application if you would like a diversion to be considered, this can be completed through our online portal.

Water mains should be located in highways or open space and not in private gardens, to ensure available access for any future maintenance and repair. Please consider this when planning your site.

Your New Water Supply Budget



Budget Costs

To support the budget forecast for your new development, please find below the estimated cost for delivering the new water mains for your site. All costs below are outlined in our 'New Connections Charging Arrangements' document, published on our [website](#). Please refer to this document for further information regarding these costs.

Description	Qty	Total exc. VAT
Mains: Fees		
Mains Application fee	1	£578.00
Mains Design Fee	1	£1,465.00
Mains: Construction		
Main (131-190mm) Road	305	£193,370.00
Under Pressure Connection / Branch Connection – (320mm-400mm diameter parent main)	1	£7,672.33
Connections: Fees		
Application fee - Company Laid Connection	1,503	£48,096.00
Total budget:		£251,181.33

Contestable work is open to competition and can be provided by alternative connections providers rather than the water company as long as they have the appropriate approvals on the Lloyd's register. Non-contestable work is that which us, as the water company, must carry out and may include works on the existing network.

You may wish to consider appointing a WIRS accredited Self-Lay Provider (SLP) to complete the contestable works related to your development. You can find more information on this option, including information on the industry codes for adoption on our [website](#).

You may prefer to use a Self-Lay Provider for several reasons, such as:

- SLPs may be able to provide a multi-utility option;
- SLPs may offer a more cost-effective solution when constructing your project;
- SLPs may provide greater flexibility in meeting your construction programmes.

Other Costs

In addition to the above, the following items, although not exhaustive, may be required and have not been included in the budget costs.

- Infrastructure charges and associated credits
- Any costs incurred due to exceptional circumstances including additional traffic management charges
- Building water charges
- Miscellaneous charges such as line stops, aborted visits etc.
- Administration fees if the full and proper application opts to be delivered by the water company
- Onsite services construction costs

A detailed design (including consultation with statutory bodies, e.g. fire authority and local authorities to establish traffic management requirements) and cost advice will be provided upon complete and accurate submission of the appropriate application relevant to your development.

All relevant and required charges are required to be paid in advance of any service undertakings by us, the water company. Where a self-lay provider is selected, separate agreements may be made between third parties, however, all relevant charges owed to the water company will be required in advance of any service undertakings.



Infrastructure Charges and Associated Credits

The purpose of our infrastructure charge is to ensure new connection customers contribute to the costs of reinforcing our network required as a result of increased pressures from new properties being connected.

Water efficiency credits will be provided where submission of suitable evidence against qualifying criteria is met and identified at time of full application, in advance of provision of a cost advice. Further information is available on all our charges on the [Our Charges](#) page on our website.

The infrastructure charges become due on completion of new service connections and are to be paid by the developer or NAV provider.

For indicative purposes, we have included below the current infrastructure charge and water efficiency discount on a per plot basis for standard household connections.

Description	Value
Water Infrastructure Charge	£589.00
Water Efficiency Credit	-£589.00
2024/25 Balance per plot	£0.00

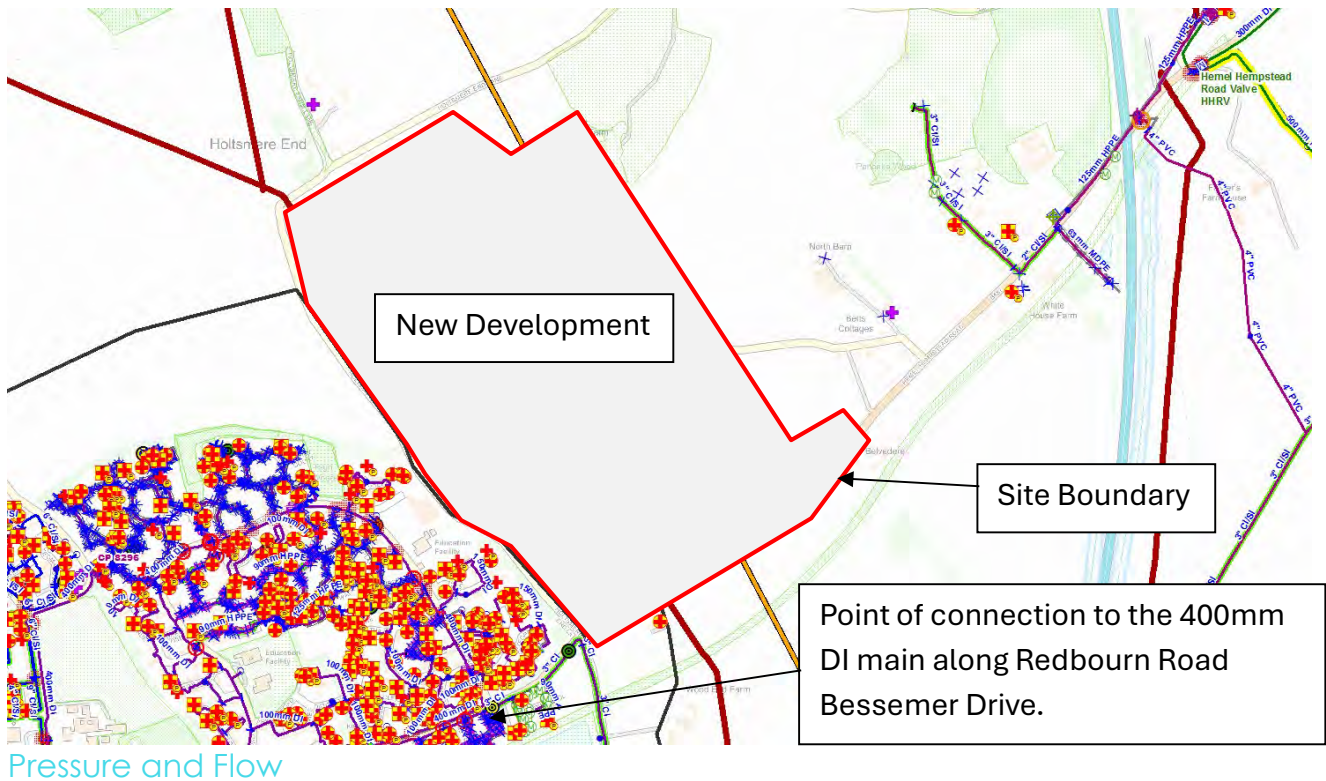
Your New Water Supply

Point of Connection

We determine your connection point using [OFWAT's charging rules for new connection services](#).

Please see the diagram below illustrating the point of connection to your site. The development should connect to the UPT connection on the 400mm main along Redbourn Road Bessemer Drive and laying approximately 305m of 180mm ALPE (Barrier) pipe to the site boundary. Please be advised these measurements are approximate and are subject to change upon finalisation of your site plans under a full and proper application.





Pressure and Flow

Under the Water Industry Act (1991) we are required to supply a water pressure of 7 meters head (0.7 bar) and a water flow of 9 litres per minute to the boundary of your property.

Internal plumbing systems should be designed appropriately and, should your requirements be greater than this you will need to install and maintain adequate plumbing systems to suit. It is recommended that you check with a water industry approved plumber that all systems will work efficiently at these minimums. Please note, there is no upper limit for water pressure.

Minimum and maximum pressures available based on the flows provided to service the site, at our point of connection at the site entrance.

Initial hydraulic studies have identified that the achievable pressure will fluctuate around off peak and peak times. The pressure at point of connection to the site will be 38.11MH (metres head) in off peak times and dip to 38.59MH during peak times, which are usually between 06:00 – 09:00 and 17:00 – 20:00.

Our modelling team has confirmed that a flow of 33.08 l/s (with solution) can be achieved for fire flow.

Reinforcement

During our assessment we have modelled the impact the new development would have on the existing network. This helps us understand and plan any work that could be required to maintain supply to our existing customers and the new properties being added to the network.

The modelling undertaken has identified reinforcement **is not** required.

Further investigation required: The phasing of this development should be confirmed.



Affinity Water are responsible for delivering the upgrades required. To ensure we deliver the most suitable and sustainable network upgrades, we plan these in accordance with any other development that may be happening in the area. This will help us to deliver the most suitable and cost-efficient solutions. Although each reinforcement is different, a typical solution can take up to 24 months to deliver.

The developer's contribution to the construction of the required network reinforcement will be covered by the payment of our infrastructure charges levied on a per property basis, unless reinforcement is required to support demand from non-domestic flow. Reinforcement required for non-domestic flows are liable to be recovered in full, from the developer in advance of the commencement of works.

Next Steps

If you wish to move forward with receiving a detailed design and cost advice for your development, we require submission of a full and proper application via our portal along with relevant supporting documentation.

Please note we cannot proceed if the application form is incomplete. Please provide estimates for items such as loading units and build rates if actuals are currently unknown.

The start of mains and service connections works on your site is dependent upon our current programme of works, although every effort will be made to accommodate your timetable. It should be noted that construction in the public highway is governed by statutory regulation and under certain circumstances commencement of offsite works may be delayed by up to 12 weeks from the receipt of your payment to gain permission from the Local Authority.

This report provides no guarantee of reservation of network capacity and due to the fluctuating nature of our network will be reviewed upon receipt of a full and proper application for your development.

Call us on
0345 357 2428

Visit our portal
affinitywater.custhelp.com

Visit our website
affinitywater.co.uk/developing



Appendix E – Topographic Survey

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service existence but not evidence by perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspectives.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, matches and/or inspection members.
QL-83	Permitted route by one perspective technique but not seen in open observation.	Q-1, based on fact		

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, Inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. **Fuel Pipes** and **Hot Water Pipes**
 GM/GS and/or VM/GS pipe work will have been attempted and located using both EMIL & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EMI, locate services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we

are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOP CORRELATIONAL SURVEY DATE 1/10/2015		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

PREREQUISITE SURVEY TYPES		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE

**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

0845 040 5969
survey-solutions.co.uk

IPSWICH DEPTFORD BIRMINGHAM BRISTOL COVENTRY DRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an inferred color.	Yes, 0.5 to 1.0	Q-L-0A	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no depth information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic: FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
 GMMG and/or WMMV pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductible materials, then we are able to use multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & taken from Records (QL-R4D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risks/scales/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

DRAWING NOTE

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

© Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This drawing should only be scaled using digital methods

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY D



**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

0845 040 5969
survey.solutions.co.uk

IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 2 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B./B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/202



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an inferred color.	Q-L-1: 100% Q-L-04: 75%	Q-L-01	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no depth information.			

DRAINAGE SURVEY
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UTILITIES & UNDERGROUND INVESTIGATIONS					
ABBREVIATIONS & SYMBOLS					
UTL 1: 1" Solid Cable	DRS	Depth 10 to 15 ft	RSC	Reinforcing Bar Chamber	
UTL 2: 2" Solid Cable	DRS	Depth 15 to 20 ft	RSC	Reinforcing Bar Chamber	
AC	Cable Connection	DRS	Depth 20 to 25 ft	RSC	Reinforcing Bar Chamber
AS	Asphalt	DRS	Depth 25 to 30 ft	SL	Soil Level
AS	Asphalt Road	UTW	Under 30 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 30 to 35 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 35 to 40 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 40 to 45 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 45 to 50 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 50 to 55 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 55 to 60 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 60 to 65 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 65 to 70 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 70 to 75 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 75 to 80 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 80 to 85 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 85 to 90 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 90 to 95 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 95 to 100 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 100 to 105 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 105 to 110 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 110 to 115 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 115 to 120 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 120 to 125 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 125 to 130 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 130 to 135 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 135 to 140 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 140 to 145 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 145 to 150 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 150 to 155 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 155 to 160 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 160 to 165 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 165 to 170 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 170 to 175 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 175 to 180 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 180 to 185 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 185 to 190 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 190 to 195 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 195 to 200 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 200 to 205 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 205 to 210 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 210 to 215 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 215 to 220 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 220 to 225 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 225 to 230 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 230 to 235 ft	SL	Soil Level
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CC	Concrete Chamber	DRS	Depth 370 to 375 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 375 to 380 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 380 to 385 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 385 to 390 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 390 to 395 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 395 to 400 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 400 to 405 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 405 to 410 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 410 to 415 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 415 to 420 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 420 to 425 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 425 to 430 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 430 to 435 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 435 to 440 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 440 to 445 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 445 to 450 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 450 to 455 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 455 to 460 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 460 to 465 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 465 to 470 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 470 to 475 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 475 to 480 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 480 to 485 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 485 to 490 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 490 to 495 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 495 to 500 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 500 to 505 ft	SL	Soil Level
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CC	Concrete Chamber	DRS	Depth 545 to 550 ft	SL	Soil Level
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CC	Concrete Chamber	DRS	Depth 555 to 560 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 560 to 565 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 565 to 570 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 570 to 575 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 575 to 580 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 580 to 585 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 585 to 590 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 590 to 595 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 595 to 600 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 600 to 605 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 605 to 610 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 610 to 615 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 615 to 620 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 620 to 625 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 625 to 630 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 630 to 635 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 635 to 640 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 640 to 645 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 645 to 650 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 650 to 655 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 655 to 660 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 660 to 665 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 665 to 670 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 670 to 675 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 675 to 680 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 680 to 685 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 685 to 690 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 690 to 695 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 695 to 700 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 700 to 705 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 705 to 710 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 710 to 715 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 715 to 720 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 720 to 725 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 725 to 730 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 730 to 735 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 735 to 740 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 740 to 745 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 745 to 750 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 750 to 755 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 755 to 760 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 760 to 765 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 765 to 770 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 770 to 775 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 775 to 780 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 780 to 785 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 785 to 790 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 790 to 795 ft	SL	Soil Level
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CC	Concrete Chamber	DRS	Depth 805 to 810 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 810 to 815 ft	SL	Soil Level
CC	Concrete Chamber	DRS	Depth 815 to 820 ft	SL	Soil Level
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CC	Concrete Chamber	DRS	Depth 995 to 1000 ft	SL	Soil Level

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

This drawing should only be scaled using digital methods.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 57769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/DWG DRAWING INFORMATION		
TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS	
AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

**DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B**

COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	N/A	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATA
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SURVEY SOLUTIONS	
LAND SURVEYING BUILDING SURVEYING UNDERGROUND SURVEYING UTILITY SURVEYING MONITORING	
0845 040 5969 survey-solutions.co.uk	
IPSWICH BISHOPS CLEEVE BRISTOL COVENTRY DRALEY GLASGOW LONDON LONGFORD LONDON LANCASTER NORWICH NOTTINGHAM THAMES VALLEY	
PROJECT TITLE LAND AT REDBOURNE ROAD HEMEL, HEMPSTEAD, HP2	
DRAWING DETAIL UTILITIES AND DRAINAGE SURVEY SHEET 3 OF 31	
CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED	
SURVEYOR M/B/H CHECKED BY J.A.B. APPROVED BY J.A.B. SCALE 1:200	
SURVIVATOR M/B/H SURVIVATE REVISION DATE STATUS	
DRAWING NUMBER ISSUE DATE	
077686020-G-01 24/02/2025	
ices    	

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an inferred color.	Yes, 100% to 75%	Q-L-0A	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no depth information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
 GMMG and/or WMMV pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductible materials, then we are able to use multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & taken from Records (QL-RA10)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risks/scales/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records, but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

This drawing should only be scaled using digital methods.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/DWG DRAWING INFORMATION		
TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
QS		
NTS		

GENERAL SITE CONDITIONS	
AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)		
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY D



SURVEY SOLUTIONS

**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

0845 040 5969
survey-solutions.co.uk

(PROMET) RECORDS SPENCERHAM BRISTOL COUNTRY CHAWLEY GLASGOW
 LONGLEATON LONDONLOCK WOODSTOCK WROTHAM WORTHINGTON THAMES VALLEY

PROJECT TITLE
LAND AT REBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DATE
UTILITIES AND DRAINAGE SURVEY.
SHEET 4 OF 31

CLIENT
PIGCEAN INVESTMENT MANAGEMENT LIMITED

SURVEYOR
M/B/H

SURVEY DATE
SURVDATE

CHECKED BY
J.A.B

APPROVED BY
J.A.B

REVISION

SCALE
1:200

DWG STATUS
FINAL

ISSUE DATE
24/02/2002

DRAWING NUMBER
677698DU-G01



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an inferred color.	Q-L-1: 100% Q-L-04: 75%	Q-L-01	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no depth information.			

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DP's, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. **Fuel Pipes** and **Hot Water Pipes**
 GM/GS and/or VM/GS pipe work will have been attempted and located using both EMIL & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & taken from Records (QL-RA10)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risks/scales/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any

The contractor must check and verify all site and building dimensions, levels, utilities

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This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY D



**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

0845 040 5969
survey.solutions.co.uk

IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 5 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2021



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service existence but not evidence by perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspectives.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, matches and/or inspection members.
QL-83	Permitted route by one perspective technique but not seen at same time.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Birth Telecoms
BT Telecoms will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic:
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

GMGS and/or WMMWS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe, or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
ATTE		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
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SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATA
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LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE

LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.

SHEET 8 OF 31

PIGEON INVESTMENT MANAGEMENT LIMITED	1:200
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SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	DWG STATUS
M.B / B.H	SURVDATE	J.A.B	J.A.B	FINAL

DRAWING NUMBER	REVISION	ISSUE DATE
67769BDUG-01		24/02/2025

ICES ASSOCIATION  ASSOCIATION  ASSOCIATION

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an inferred color.	Yes, 0.5 to 1.0	Q-L-0A	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no depth information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, Inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically directed depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against recent information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. **Fuel Pipes** and **Hot Water Pipes**
 GMMGS and/or WMMWS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EMI, locate services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/c/s/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

EV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
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**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

0845 040 5969
survey-solutions.co.uk

IPSWICH DEPOED BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M/B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 87769BDUG-01			REVISION	ISSUE DATE 24/02/2025



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an inferred color.	Yes, 6/10	Q-L-0A	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no depth information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. **Fuel Pipes** and **Hot Water Pipes**
 GM/GS and/or VM/GS pipe work will have been attempted and located using both EMIL & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UI's will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/08/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

 SURVEY

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

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LEWIS & CLARK
LONDON
MANCHESTER
MILTON KEYNES
NEWCASTLE
NOTTINGHAM
PETERBOROUGH
PLYMOUTH
READING
SHEFFIELD
SOUTHAMPTON
STAMFORD
TOTTENHAM
WARRINGTON
WOLVERHAMPTON

LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 10 OF 31

M.B./B.H	SURVDATE	J.A.B	J.A.B	FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service evidence but not taken from any perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspective techniques.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, sketches and/or perspective drawings.
QL-83	Reconstructed evidence by one perspective technique but not taken from actual scene.	Q-1, based on fact		

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, Inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

GMGS and/or WMMWS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (CL-84/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

FOR COLORADO SURVEY DATE 2/10/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

DD/	DATE RECEIVED	FROM	CHECKED	AND	SUBJECT

 SURVEY SURVEL SOLUTIONS

LAND CLEARING 1

BUILDING SURVEYING
UNDERGROUND SURVEYING

MONITORING

LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT BEDBOURNE ROAD

HEMEL HEMPSTEAD, HP2

UTILITIES AND DRAINAGE SURVEY.

CLIENT	SCALE
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PIGEON INVESTMENT MANAGEMENT LIMITED				1.200
SURVEYOR	SURVEY DATE	CHECKED BY	APPROVED BY	NAV STATUS

M.B / B.H	SURVDATE	J.A.B	J.A.B	FINAL
00-00-00-00-00-00	00-00-00	00-00-00	00-00-00	00-00-00

67769BDUG-01		24/02/2025
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Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector proven as an assumed false.	Q-L-1: 100% Q-L-2: 75%	Q-L-1	Interpolate a vector position regardless by open boundaries, variables, solid, irregular, irregular.
Q-L-03	Interpolate evidence by open geophysical techniques but with some of open geophysical information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMI methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic: FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
 GMMG and/or WMMV pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductible materials, then we are able to use multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (AR-B4/D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/cavities/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

DRAWING NOTE

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

© Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/DWG DRAWING INFORMATION		
TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS	
AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE



**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

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IPSWICH BEXFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 12 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025



PAS 128: 2014 QUALITY LEVEL GUIDE

QUALITY LEVEL	DESCRIPTION	REQUIREMENTS
Q1.0	Excellent	100% of all data points are within the required accuracy and all data points are confirmed by a second surveyor.
Q1.1	Very Good	95% of all data points are within the required accuracy and all data points are confirmed by a second surveyor.
Q1.2	Good	90% of all data points are within the required accuracy and all data points are confirmed by a second surveyor.
Q1.3	Fair	85% of all data points are within the required accuracy and all data points are confirmed by a second surveyor.

DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

Drainage Survey

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and templates have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

Electricity

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collated for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV change and will be shown as indicative only.

Gas

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collated for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV change and will be shown as indicative only.

Water

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SURVEY RECOMMENDATIONS

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

10 IC	Duct To Cables	DO	Depth To Down	ABC	Rectangular Box Chamber
11 G	Gas	DI	Depth To Invert	ABC	Rectangular Box Chamber
12 AC	Assumed Connection	OS	Depth To Soil	BE	Building Easement
13 AG	Assumed Ground	OTB	Depth To Base	BA	Boundary Marker
14 AR	Assumed Route	OTW	Depth To Water	BL	Bottom Level
15 BL	Blank Level	OTB	Depth To Base	BL	Bottom Level
16 CB	Concrete Borehole	EDD	External Depth	TTR	Taken From Records
17 CFC	Concrete Block Chamber	EDT	End Of Trace - 4m	UTC	Underground Utility
18 CFC	Concrete Block Chamber	EDT	End Of Trace - 4m	UTC	Underground Utility
19 CFC	Concrete Block Chamber	EDT	End Of Trace - 4m	UTC	Underground Utility
20 CL	Cable Under Water	EDT	End Of Trace - 4m	UTC	Underground Utility
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100 CL	Cable Under Water	EDT	End Of Trace - 4m	UTC	Underground Utility

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solutions use electromagnetic and/or ground penetration radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not reliable and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and during where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as taken from records (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature. GPR depths to the top of a feature and drainage depth shown to invert, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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This drawing should only be scaled using digital methods.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 57768 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final survey layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL DWG DRAWING INFORMATION

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
100%	SURVEY SOLUTIONS	
OUTDATED		
DATE		

GENERAL SITE CONDITIONS

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS
AVERAGE	

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
100%	N/A	
WATER MAIN	N/A	
GAS MAIN	N/A	
TELECOM	N/A	
CABLE TV	N/A	
ELECTRICITY	N/A	
OIL PRESS	N/A	
OTHER	N/A	

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service evidence but not taken from any perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspective techniques.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, sketches and/or perspective drawings.
QL-83	Reconstructed evidence by one perspective technique but not taken from actual scene.	Q-1, based on fact		

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, Inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically directed depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against recent information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (CL-84/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained usually will be taken from records when available.

services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

[illegible]

**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

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IPSWICH DEPTFORD BIRMINGHAM BRISTOL COVENTRY DRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 14 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service evidence but not taken from any perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspective techniques.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, matches and/or inspection members.
QL-83	Reconstructed evidence by one perspective technique but not taken from other than perspective.	Q-1, based on fact		

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DP's, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMI methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic: FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
 GMMG and/or WMMV pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductible materials, then we are able to use multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EMI located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

© Land Survey Solutions Limited hold the copyright to all the information contained within this document and their written consent must be obtained before copying or using the data other than for the purpose it was originally supplied.

This drawing should only be scaled using digital methods.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY D



**LAND SURVEYING
BUILDING SURVEYING
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IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 15 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2021



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service evidence but not taken from any perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspectives.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, matches and/or fingerprint matches.
QL-83	Reconstructed evidence by one perspective technique but not taken from any other source.	Q-1, based on fact		

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, Inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the base water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UI's will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & taken from Records (QL-RA10)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risks/scales/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B		
COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE
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MONITORING

IPSWICH BEDFORD BIRMINGHAM BRISTOL COVENTRY CRAWLEY GLASGOW
LONDON-CENTRAL LONDON-EAST MANCHESTER NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 16 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025





PAS 128: 2014 QUALITY LEVEL GUIDE

QUALITY LEVEL	DESCRIPTION	QUALITY LEVEL	DESCRIPTION
Q1	Assumed Routes (AR)	Q4	Assumed Routes (AR)
Q2	Assumed Routes (AR)	Q5	Assumed Routes (AR)
Q3	Assumed Routes (AR)	Q6	Assumed Routes (AR)

DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

Drainage Survey

All accessible Manholes and Inspection chambers have had their respective covers fitted with pipe sizes, inverts, chamber sizes/depths and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and temples have been given wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

Electricity

All accessible Manholes and Inspection chambers have had their respective covers fitted with pipe sizes, inverts, chamber sizes/depths and service data recorded from ground level. Pipework has been traced, accessed and collected at post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV change and will be shown as indicative only.

Electricity

Electric cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecom

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation regarding BT separate, valid only be located vertically. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amounts of cable data are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications

CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fire Cables

Fire cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Gas & Water

Gas and/or Water cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

Gas and/or Water pipes will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter. When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar

GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø30mm, Ø35mm, as size increments increase, so does the chance of detection. The GPR can produce varying results and as such, wouldn't be used as an independent utility surveying instrument.

Underground Traces

All UTIs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identify and depth where applicable.

Scanning (LiDAR)

Scanning has been identified on site with a potential of an undetectable service present.

Assumed Routes & Assumed Services (AR & AS)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various manholes/connections (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

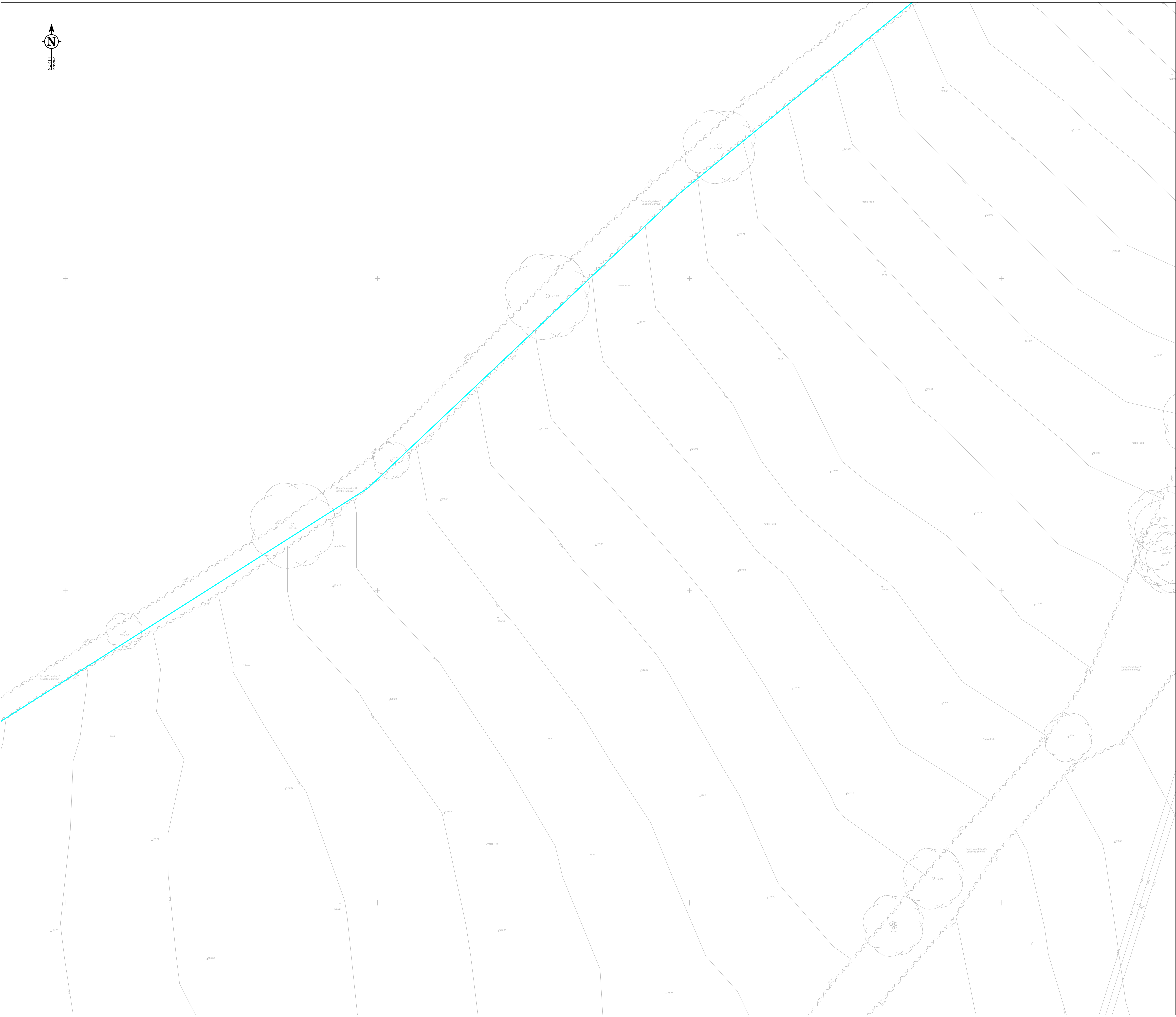
SURVEY RECOMMENDATIONS

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector proven as an assumed false.	Yes or No	Q-L-0A	Interpolate a vector position regardless by open examples, variables, and/or specific direction.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or open depth information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (CL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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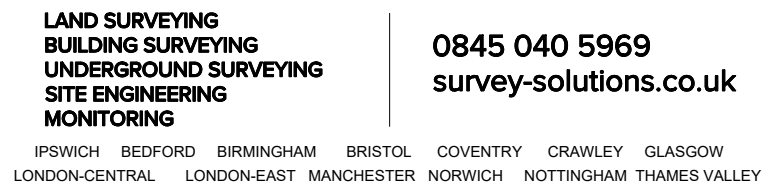
This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE



CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025



Original Sheet Size A/H

PAS 128: 2014 QUALITY LEVEL GUIDE				
Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	Service provision based Network.	Unconnected	Q-L-02	Networked & service oriented using only one geographic technique
Q-L-C	Visual evidence of service provision but not underpinned by geospatial technology	Unconnected	Q-L-01	Networked & service oriented using multiple geographic techniques
Q-L-04	Networked & service provision shown on an internet map	Q-L-0, Q-L-01, Q-L-02, Q-L-03, Q-L-04, Q-L-05, Q-L-06, Q-L-07, Q-L-08, Q-L-09, Q-L-10, Q-L-11, Q-L-12, Q-L-13, Q-L-14, Q-L-15, Q-L-16, Q-L-17, Q-L-18, Q-L-19, Q-L-20, Q-L-21, Q-L-22, Q-L-23, Q-L-24, Q-L-25, Q-L-26, Q-L-27, Q-L-28, Q-L-29, Q-L-30, Q-L-31, Q-L-32, Q-L-33, Q-L-34, Q-L-35, Q-L-36, Q-L-37, Q-L-38, Q-L-39, Q-L-40, Q-L-41, Q-L-42, Q-L-43, Q-L-44, Q-L-45, Q-L-46, Q-L-47, Q-L-48, Q-L-49, Q-L-50, Q-L-51, Q-L-52, Q-L-53, Q-L-54, Q-L-55, Q-L-56, Q-L-57, Q-L-58, Q-L-59, Q-L-60, Q-L-61, Q-L-62, Q-L-63, Q-L-64, Q-L-65, Q-L-66, Q-L-67, Q-L-68, Q-L-69, Q-L-70, Q-L-71, Q-L-72, Q-L-73, Q-L-74, Q-L-75, Q-L-76, Q-L-77, Q-L-78, Q-L-79, Q-L-80, Q-L-81, Q-L-82, Q-L-83, Q-L-84, Q-L-85, Q-L-86, Q-L-87, Q-L-88, Q-L-89, Q-L-90, Q-L-91, Q-L-92, Q-L-93, Q-L-94, Q-L-95, Q-L-96, Q-L-97, Q-L-98, Q-L-99, Q-L-100	Q-L-0A	Networked & service provision underpinned by open geospatial techniques and/or public domain data
Q-L-03	Networked & service provision shown on an internet map	Q-L-0, Q-L-01, Q-L-02, Q-L-03, Q-L-04, Q-L-05, Q-L-06, Q-L-07, Q-L-08, Q-L-09, Q-L-10, Q-L-11, Q-L-12, Q-L-13, Q-L-14, Q-L-15, Q-L-16, Q-L-17, Q-L-18, Q-L-19, Q-L-20, Q-L-21, Q-L-22, Q-L-23, Q-L-24, Q-L-25, Q-L-26, Q-L-27, Q-L-28, Q-L-29, Q-L-30, Q-L-31, Q-L-32, Q-L-33, Q-L-34, Q-L-35, Q-L-36, Q-L-37, Q-L-38, Q-L-39, Q-L-40, Q-L-41, Q-L-42, Q-L-43, Q-L-44, Q-L-45, Q-L-46, Q-L-47, Q-L-48, Q-L-49, Q-L-50, Q-L-51, Q-L-52, Q-L-53, Q-L-54, Q-L-55, Q-L-56, Q-L-57, Q-L-58, Q-L-59, Q-L-60, Q-L-61, Q-L-62, Q-L-63, Q-L-64, Q-L-65, Q-L-66, Q-L-67, Q-L-68, Q-L-69, Q-L-70, Q-L-71, Q-L-72, Q-L-73, Q-L-74, Q-L-75, Q-L-76, Q-L-77, Q-L-78, Q-L-79, Q-L-80, Q-L-81, Q-L-82, Q-L-83, Q-L-84, Q-L-85, Q-L-86, Q-L-87, Q-L-88, Q-L-89, Q-L-90, Q-L-91, Q-L-92, Q-L-93, Q-L-94, Q-L-95, Q-L-96, Q-L-97, Q-L-98, Q-L-99, Q-L-100		

DETECTION METHOD
IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective manholes fitted with ring signs, locates, chamber signposts and manhole date

recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV drainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic: FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. **Fuel Pipes** and **Hot Water Pipes**
 GM/GS and/or VM/GS pipe work will have been attempted and located using both EMIL & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-R4D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully define an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

SURVEY RECOMMENDATIONS

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

DRAWING NOTE

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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This drawing should only be scaled using digital methods

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/DWG DRAWING INFORMATION		
TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS	
AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATA

SURVEY SOLUTIONS

**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING**

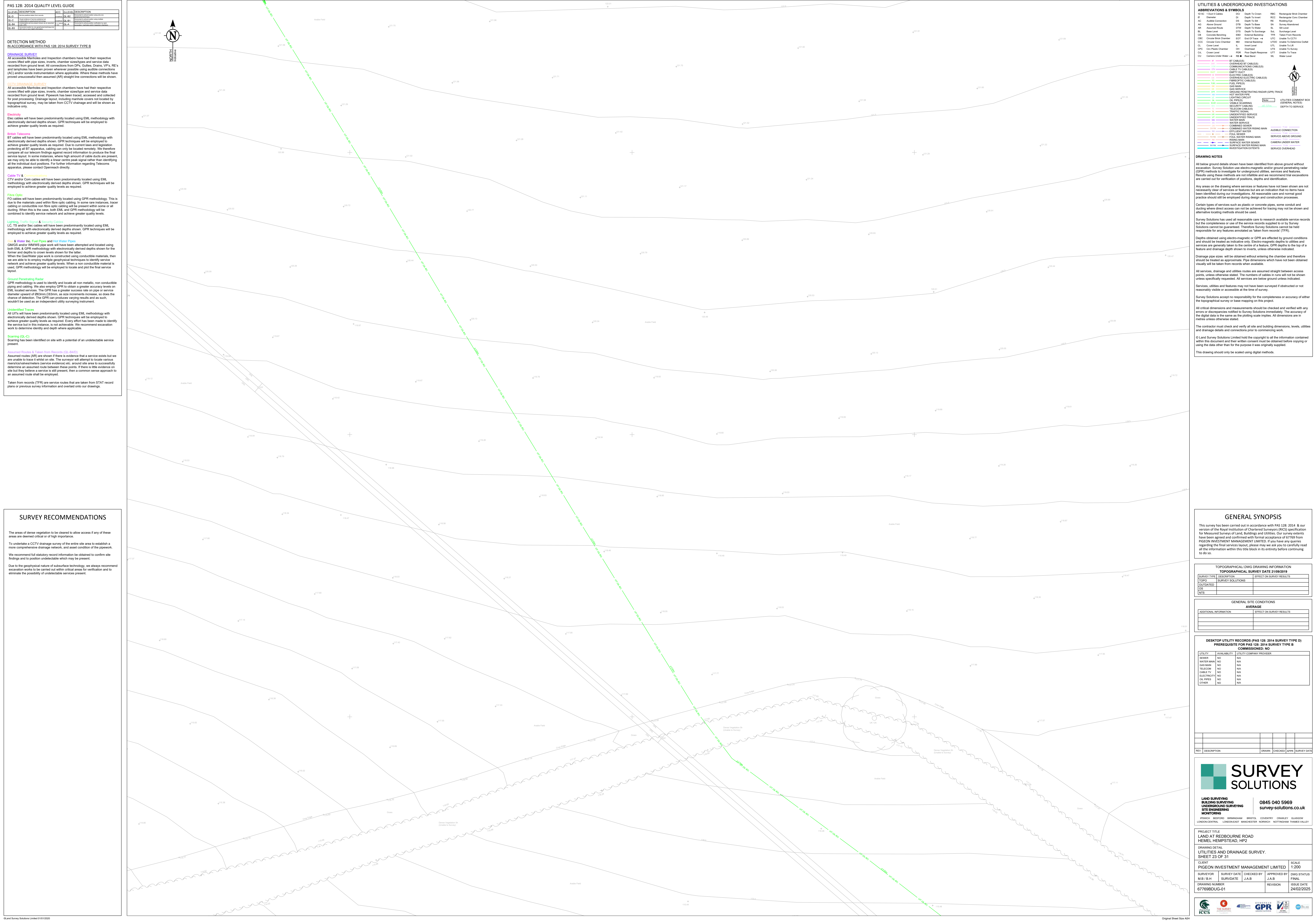
**0845 040 5969
survey-solutions.co.uk**

HITCHAM ROTHERHAM BIRMINGHAM BRISTOL COUNTRY DRAKELEY GLASGOW
LONDON/CENTRAL LONDON/CLACKNATH MANCHESTER NORTON NORTHAMPTON THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HUMLEY, HEMPESTADE, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 22 OF 31

PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SUPERVISOR M/B/H	SURVEY DATE -/-	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 677698DUJ-GU1			REVISION	ISSUE DATE 24/02/2025



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Analyses	QL-82	Horizontal & vertical location using only one perspective technique.
QL-C	Visual evidence of service evidence but not taken from any perspective technique.	Analyses	QL-81	Horizontal & vertical location using multiple perspectives.
QL-84	Undetectable service present shown as an assumed route only.	Q-1, based on fact	QL-A	Horizontal & vertical position corroborated by open observation, matches and/or fingerprint matches.
QL-83	Reconstructed evidence by one perspective technique but not taken from any other source.	Q-1, based on fact		

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic: FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
 GMMG and/or WMMV pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
 When the Gas/Water pipe work is constructed using conductible materials, then we are able to use multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & taken from Records (QL-RA10)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risks/scales/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

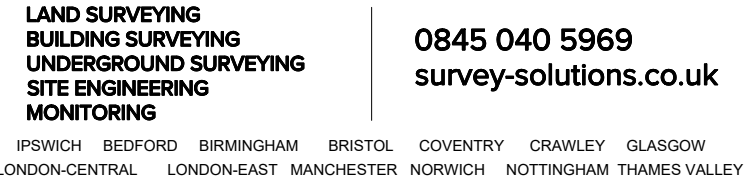
Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
QS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

[illegible]

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 24 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B./B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2025



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	Positive position labels: front-back.	100%	Q-L-82	Reinforce 4 vertical colorbar using only one polypropylene technique.
Q-L-C	Visual evidence of service location held consistently by graphical technique.	100%	Q-L-81	Reinforce 4 vertical colorbar using multiple polypropylene techniques.
Q-L-84	Unidirectional decision process (front or back) not used (JMF)	0% (no data)	Q-L-A	Reinforce 4 vertical position colorbar by open construction, clutches and/or expansion members.
Q-L-83	Reinforced location by one polypropylene technique for all colorbar in each reinforcement.	100%		

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic: FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of 663mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify

work to determine identity and depth where applicable.

Scarring (QL-C)
 Scarring has been identified on site with a potential of an undetectable service

Assumed Routes & Taken from Records (QL-84/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

[illegible]

DRAWING NOTE

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

This drawing should only be scaled using digital methods.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL / DWG DRAWING INFORMATION

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)

PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE



SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

ITCHINGHAM ROTHERHAM BIRMINGHAM BRISTOL COVENTRY DRAKELEY GLASGOW
LONDON/CLIFTON LONDON/ST. MARKS MANCHESTER NANTWICH NOTTINGHAM THAMES VALLEY

0845 040 5969

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PROJECT TITLE

LAND AT REDBOURNE ROAD,
HEMEL, HEMPELSTEAD, HP2

DRAWING DETAIL

UTILITIES AND DRAINAGE SURVEY.
SHEET 25 OF 31

CLIENT

PIGGEON INVESTMENT MANAGEMENT LIMITED

SURVEYOR

MJB / E.H.

SURVEY DATE

01/01/2021

DRAWING NUMBER

677698DUG-01

CHECKED BY

J.A.B

APPROVED BY

J.A.B

REVISION

SCALE

1:200

DWG STATUS

FINAL

ISSUE DATE

24/02/2025



ICCS



GPR



GPR



GPR

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
Q-L-0	General problem label: both methods.	Unknown	Q-L-02	Interpolate a vector color using only one of the methods.
Q-L-1	Most evidence of vector evidence but undetectable by geophysical techniques.	Unknown	Q-L-01	Interpolate a vector location using multiple geophysical techniques.
Q-L-04	Most evidence of vector present even as an assumed false color.	Q-L-1: 100% Q-L-04: 75%	Q-L-0A	Interpolate a vector position regardless of open boundaries, channels, solid, irregular, etc.
Q-L-03	Interpolate evidence by open geophysical techniques but with some or no open depth information.			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been manhole, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Birth Telecoms
BT Telecoms will have been predominantly located using EMIL methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic:
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

GMGS and/or WMMWS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe, or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

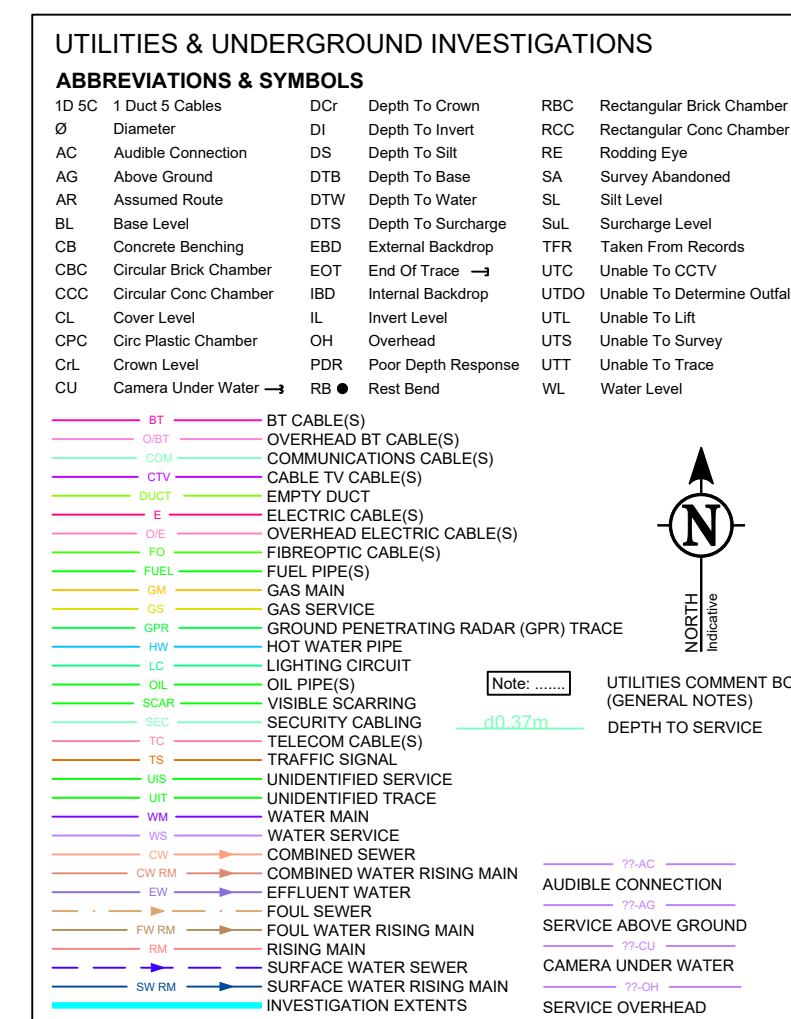
Assumed Routes & Taken from Records (QL-84/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.



This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
QS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

COMMISSIONED: NO		
UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPROV.	SURVEY D



**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

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IPSWICH BEDFORD BRIMINGHAM BRISTOL
CARDIFF CANTONVILLE LONDON/UKAST MANCHESTER
NEWCASTLE NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2
DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 26 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M.B./B.H.	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 67769BDUG-01			REVISION	ISSUE DATE 24/02/2021



Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION	
Q-LD	Service positions taken from customers	100%	Q-LB2	Reposition a vehicle outside using only the <i>push/pull</i> technique	
Q-LC	Short evidence of service evidence but <i>not</i> verifiable by geophysical techniques	80%	Q-JB1	Reposition a vehicle outside using multiple <i>push/pull</i> techniques	
Q-LB4	Underlie service position shown as an assumed <i>not</i> taken	60%	Q-LA	Reposition a vehicle outside by using <i>push/pull</i> , <i>pushes</i> and/or <i>pulls</i> technique	
Q-LB3	Reposition vehicle by one geophysical technique but <i>not</i> by <i>one or more</i> other techniques	40%			

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPs, REs and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, Inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EMIL methodology with electronically directed depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all RT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against recent information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.

When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EMI, locate services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm, C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITS will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (CL-84/D)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 67769 from PIGEON INVESTMENT MANAGEMENT LIMITED. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL SURVEY DATE 21/09/2019		
SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
QS		
NTS		

AVERAGE	
ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

E.V.	DESCRIPTION	DRAWN	CHECKED	APPR SURVEY DATE



**LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING**

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IPSWICH BEDFORD BIRMINGHAM BRISTOL
LONDON-CENTRAL LONDON-EAST MANCHESTER
COVENTRY CRAWLEY GLASGOW
NORWICH NOTTINGHAM THAMES VALLEY

PROJECT TITLE
LAND AT REDBOURNE ROAD
HEMEL HEMPSTEAD, HP2

DRAWING DETAIL
UTILITIES AND DRAINAGE SURVEY.
SHEET 27 OF 31

CLIENT PIGEON INVESTMENT MANAGEMENT LIMITED				SCALE 1:200
SURVEYOR M/B / B.H	SURVEY DATE SURVDATE	CHECKED BY J.A.B	APPROVED BY J.A.B	DWG STATUS FINAL
DRAWING NUMBER 87769BDUG-01			REVISION	ISSUE DATE 24/02/2025



PAS 128: 2014 QUALITY LEVEL GUIDE

Method	Level	Description
EM	1	Electromagnetic Induction
EM	2	Electromagnetic Induction
EM	3	Electromagnetic Induction
EM	4	Electromagnetic Induction
EM	5	Electromagnetic Induction
EM	6	Electromagnetic Induction
EM	7	Electromagnetic Induction
EM	8	Electromagnetic Induction
EM	9	Electromagnetic Induction
EM	10	Electromagnetic Induction
EM	11	Electromagnetic Induction
EM	12	Electromagnetic Induction
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EM	97	Electromagnetic Induction
EM	98	Electromagnetic Induction
EM	99	Electromagnetic Induction
EM	100	Electromagnetic Induction

DETECTION METHOD

IN ACCORDANCE WITH PAS 128: 2014 SURVEY TYPE B

Drainage Survey

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VPA, RE's and templates have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

Drainage Survey

All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV change and will be shown as indicative only.

Electricity

Electric cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecom

BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation regarding all BT separate, using only be located vertically. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable data is present, we may only be able to identify a linear centre peak signal rather than identifying the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications

CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fire Cables

Fire cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductive non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting

LIC's and/or Svc cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water

Gas & Water Inc. Fuel Pipes and Hot Water Pipes

CMGS and/or WMMVS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter. When the Gas/Water pipe work is constructed using conductive materials, then we are able to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductive material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar

GPR methodology is used to identify and locate all non metallic, non conductive piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of 603mm/23.7in, as size increments increase, so does the chance of detection. The GPR can produce varying results and as such, would not be used as an independent utility surveying instrument.

Underground Traces

All UTR's will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, it is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scanning (LIDAR)

Scanning has been identified on site with a potential of an undetectable service present.

Assumed Routes & Service Connections (AR & Svc)

Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various manholes/connections (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

SURVEY RECOMMENDATIONS

The areas of dense vegetation to be cleared to allow access if any of these areas are deemed critical or of high importance.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and assess condition of the pipework.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

10	IC	10	IC	10	IC
11	IC	11	IC	11	IC
12	IC	12	IC	12	IC
13	IC	13	IC	13	IC
14	IC	14	IC	14	IC
15	IC	15	IC	15	IC
16	IC	16	IC	16	IC
17	IC	17	IC	17	IC
18	IC	18	IC	18	IC
19	IC	19	IC	19	IC
20	IC	20	IC	20	IC
21	IC	21	IC	21	IC
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25	IC	25	IC	25	IC
26	IC	26	IC	26	IC
27	IC	27	IC	27	IC
28	IC	28	IC	28	IC
29	IC	29	IC	29	IC
30	IC	30	IC	30	IC
31	IC	31	IC	31	IC
32	IC	32	IC	32	IC
33	IC	33	IC	33	IC
34	IC	34	IC	34	IC
35	IC	35	IC	35	IC
36	IC	36	IC	36	IC
37	IC	37	IC	37	IC
38	IC	38	IC	38	IC
39	IC	39	IC	39	IC
40	IC	40	IC	40	IC
41	IC	41	IC	41	IC
42	IC	42	IC	42	IC
43	IC	43	IC	43	IC
44	IC	44	IC	44	IC
45	IC	45	IC	45	IC
46	IC	46	IC	46	IC
47	IC	47	IC	47	IC
48	IC	48	IC	48	IC
49	IC	49	IC	49	IC
50	IC	50	IC	50	IC
51	IC	51	IC	51	IC
52	IC	52	IC	52	IC
53	IC	53	IC	53	IC
54	IC	54	IC	54	IC
55	IC	55	IC	55	IC
56	IC	56	IC	56	IC
57	IC	57	IC	57	IC
58	IC	58	IC	58	IC
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67	IC	67	IC	67	IC
68	IC	68	IC	68	IC
69	IC	69	IC	69	IC
70	IC	70	IC	70	IC
71	IC	71	IC	71	IC
72	IC	72	IC	72	IC
73	IC	73	IC	73	IC
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75	IC	75	IC	75	IC
76	IC	76	IC	76	IC
77	IC	77	IC	77	IC
78	IC	78	IC	78	IC
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86	IC	86	IC	86	IC
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