# SITE INVESTIGATION PROPOSAL

19-37 Highgate Road
London
NW5 1NT

*for* GM Developments London

January 2022

J21343A Rev 1

GEA

# Document control

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| **Project title** | *19-37 Highgate Road, London NW5 1NT* | **Project No** | J21343A |

**Report title** SITE INVESTIGATION PROPOSAL

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Managing Director

| Rev No | Status | Amendment Details | Date | Approved for Issue |
|---|---|---|---|---|
| 0 | Final | | 8 December 2021 | |
| 1 | Final | Amended following comments from council | 31 January 2022 | |

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

| | | |
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# Contents

# 1.0 INTRODUCTION

Consideration is being given to the demolition of the existing building and subsequent construction of a part five-storey and part six-storey mixed use building. Parking and communal garden areas are also included in the proposals.

Conditional planning permission was granted in 2013 for a wider scheme that included this site, and this report details the sampling strategy for the proposed ground investigation at the above site to satisfy planning condition 21a issued by London Borough of Camden.

GEA previously carried out a desk study of a wider area incorporating the proposal site (report ref J10098 Issue 2, dated June 2010), and an updated desk study for this site is in preparation. Revision 0 of this SI proposals report was issued in December 2021. The Environmental Health department at Camden subsequently provided comments, dated 6 January 2022, and these were forwarded to GEA on 18 January 2022. This report has been updated to address those comments.

A preliminary land quality statement report, including the findings of a ground investigation, has also been completed for the same wider site by Campbell Reith (report ref EJBsrm-11167-230813-LQS-F2, dated September 2013).

The previous reports contain data that is pertinent to the site and should be read in conjunction with this report at this stage.

GEA has completed an initial site-specific ground investigation to provide geotechnical parameters of the soil and to enable the design of the proposed development to progress. Samples of the soil were collected and tested for the presence of contamination whilst on site and standpipes were installed to facilitate future monitoring. The following report summarises the scope of the work completed to date and sets out the proposals for additional investigation to fully assess the presence of contamination at this site. The findings of the completed investigation including test results, and the proposed additional investigation, will be reported separately to this report in a single comprehensive ground investigation report.

# 2.0 THE SITE

The site is located in the London Borough of Camden, approximately 200 m to the northwest of Kentish Town railway and London Underground station. The site is accessed by Greenwood Place to the northwest and is bounded by Highgate Place to the northeast, by the Christ Apostolic Church to the southeast and by a part single-storey, part two-storey self-storage warehouse to the southwest. The site may additionally be located by National Grid Reference 528871, 185418.

A walkover of the site was carried out by a geotechnical engineer from GEA on 24th November 2021. It is approximately rectangular in shape, measuring roughly 60 m northwest to southeast by 20 m northeast to southwest. The site is occupied by a two-storey community centre in the southeast half, with a tarmac parking area and small soft landscaped area in the northwest. The car park is roughly 1 m below the surrounding roads, such that the northeastern boundary is supported by a brick retaining wall. A narrow, paved courtyard is also located at the southeastern end of the site, at an elevation approximately 1 m above the rest of the site, and the community centre stretches across both levels.

A recent CCTV survey (report ref 29903, dated 17 November 2021, created by Amber Group and provided by the consulting engineers) identified the presence of an apparent petrol interceptor within the car park close to the north-western elevation of the building.

## 2.1 Site History

The research has indicated that at the time of the earliest map studied, dated 1871, the site was developed with terraced housing fronting onto Highgate Road. The remainder of the site appeared to comprise gardens associated with

these houses. The church that adjoins the site to the southeast and Greenwood Place had been established by this time. A number of railway lines and associated sidings had been built by this time as close as 70 m to the south and southwest of the site, with a large structure comprising the 'Kentish Town Sheds' located approximately 175 m to the west of the site. At some time between 1873 and 1879, two factory buildings, referred to as bottling stores, were constructed 50 m to the west and 90 m northwest of the site.

The site and surrounding area remained essentially unaltered until some time between 1896 and 1915, when the bottling store had been extended to within 30 m of the southwest of the site. The terraced houses fronting onto Highgate Road were still present, although a large rectangular warehouse had been constructed adjacent to the southwest of the site within the garden area of a number of the houses. The terraced housing, formerly present adjacent to the northwest of the site, had also been demolished over the same period, with this area now occupied by two long rectangular buildings understood to have been used as a warehouse and depository respectively. Further works buildings were also present from approximately 90 m to the northwest of the site.

The Kentish Town Sheds expanded over the period between 1896 and 1915 and remained essentially unaltered until some time between 1954 and 1968 when the railway sidings were removed, and the former railway sheds are shown as being used as a civil engineering depot. The depot remains in use to the present day and is currently occupied by the Murphy Group.

Goad insurance plans from 1930 show that the bottling stores, which occupied much of the area adjacent to the southwest of this site, were owned and operated by Read Bros Ltd and used as an ale store, with the rectangular warehouse immediately to the southeast of the site labelled as a timber yard including store, saw mill and fuel store.

The previously reported Preliminary UXO Risk Assessment report records a bomb strike in the south of the site during WWII and an incendiary shower over the entire area. However limited damage was recorded on site.

Subsequent plans from 1957 indicate that the bottling stores to the southwest were owned by Imperial Chemical Industries (ICI) Ltd. Whilst the exact use of these buildings is not known, ICI was involved in the production of chemicals, explosives, fertilisers, insecticides, dyestuffs, non-ferrous metals, fabrics and paints, as well as the development and production of pharmaceuticals. However, the former bottling stores remained listed throughout this period as warehouses and are therefore unlikely to have been involved in any form of production. A small garage was constructed during this time in the loading area of the ICI compound, approximately 35 m to the southwest.

The site remained essentially unaltered until between 1974 and 1979, when the terraced houses fronting onto Highgate Road were demolished and replaced with the existing irregular shaped building, later referred to as a day centre, with an adjoining car park on the northwestern part of the site. The site has since remained essentially unchanged. The warehouse adjacent to the southwest had been extended in a southeasterly direction over the same period and the former bottling store building was redeveloped with the existing Greenwood Centre, now also shown to be in use as a day centre, and the site surroundings have since remained essentially unchanged.

## 2.2 Geological and Environmental Setting

The Geological Survey map of the area (BGS sheet 256) indicates that the site is underlain by the London Clay Formation. Reference to The Lost Rivers of London[1] indicates that a tributary of the "lost" River Fleet flowed through the site, as such Alluvium may be present beneath the site. The BGS map also indicates the presence of areas of worked ground less than 150 m to the west of the site.

The previous investigation carried out by Campbell Reith on the wider area included a number of boreholes within this site. They found that, beneath a moderate to significant thickness of made ground including reworked Alluvium, and a localised layer of Alluvium, the London Clay was initially found to be

1 Barton, N, & Meyers, S (2016) *The Lost Rivers of London* (revised and extended edition with colour maps). Historical Publications Ltd.

reworked, beneath which unweathered London Clay was proved to the full depth of the investigation, of 35.00 m (1.90 m OD). Desiccation was observed within the shallow soils to a maximum depth of 1.20 m (36.30 m OD).

The London Clay is classified by the Environment Agency (EA) as Unproductive Strata, referring to rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. Alluvium is likely to be classified as Secondary Undifferentiated.

Apart from a small area of soft landscaping, the site is entirely covered by the existing building and surrounding hardstanding. As such, infiltration of rainwater is therefore generally restricted to surface water drains, with the majority of surface runoff draining into combined sewers in the road.

## 3.0 ANTICIPATED GROUND MODEL

On the basis of the previous work on the site, the ground conditions at this site can be characterised as follows;

- beneath a moderate to significant thickness of made ground including reworked Alluvium, and a localised layer of Alluvium, London Clay is present;
- the made ground generally comprises brown clayey gravelly sand to sandy gravelly clay with fragments of extraneous material, roots and rootlets, and extended to depths of between 1.10 m (36.40 m OD) and 2.40 m (34.50 m OD);
- Alluvium is present at the northern end of the site and comprises firm becoming stiff brown gravelly clay to a depth of 3.15 m (33.75 m OD);
- the London Clay is initially naturally reworked to depths of between 2.10 m (32.40 m OD) and 4.15 m (34.60 m OD);
- the London Clay then comprises medium to extremely high strength firm becoming stiff and very stiff fissured brown becoming greyish brown silty clay with selenite crystals and silt partings, and was proved to the full depth of the previous investigation, of 35.00 m (1.90 m OD);
- desiccation was observed within the shallow soils to a maximum depth of 1.20 m (36.30 m OD).;
- groundwater was not encountered during drilling but was measured in combined standpipes installed through made ground, Alluvium and reworked London Clay at depths of between 2.56 m (34.34 m OD) and 3.75 m (33.15 m OD);
- elevated concentrations of lead and PAHs and fibres of asbestos were identified within the made ground on the site;
- elevated concentrations of chromium and selenium were measured in samples of groundwater; and
- gas monitoring as part of the previous investigation measured low concentrations of carbon dioxide and negligible flow rates. No methane was recorded. As such, the site was deemed to fall within Characteristic Situation 1.

As mentioned previously, the findings of the recent ground investigation completed by GEA will be reported in a separate ground investigation report, but the ground conditions encountered do not differ significantly from the ground model above.

## 3.1 Conceptual Site Model

On the basis of the desk study research and the initial investigation results, the following potential contamination linkages were noted, and methods of investigation have been identified below.

| SOURCE | CONTAMINANTS | RECEPTOR | PATHWAY | PROPOSED INVESTIGATION | METHOD |
|---|---|---|---|---|---|
| Inorganic and organic contamination within near surface soils resulting from existing and past activities on and off site, including possible hydrocarbon contamination associated with the suspected petrol interceptor identified during the CCTV survey | Heavy metals, PAH, TPH, inorganic and organic contaminants<br><br>(Lead and PAH have been identified in shallow soils) | End users | Ingestion of contaminated soil or dust, skin contact, inhalation | Sampling of shallow soils. Investigate gas and vapour (shallow depth) | Trial pits, boreholes, gas and vapour monitoring |
| | | Vegetation | Plant uptake in landscaped areas | Sampling shallow soils | Trial pits, boreholes |
| | | Groundwater (Secondary Aquifer) | Percolation and leaching of surface run-off mobilising soluble contaminants | Sampling shallow soils, gas and vapour investigation of shallow soils | Trial pits, boreholes<br>Groundwater testing not considered to be necessary, but this requirement will be re-assessed following the ground investigation |
| | | Buried services / foundation concrete | Direct contact | Sampling shallow soils, including screening of selected samples for hydrocarbon vapour | Trial pits, boreholes, screening for vapours |
| | | Buildings on adjacent sites | Surface water flow or drain runs | | |
| | | Human receptors on adjacent sites | Ingestion of contaminated soil or dust, skin contact, inhalation | | |
| | | Construction workers | Ingestion of contaminated soil or dust, skin contact, inhalation | | |
| Soil gas and vapour contamination resulting from existing and past activities off site | Methane, carbon dioxide, hydrogen sulphide, carbon monoxide, hydrocarbon vapour | Human receptors, residential end users on site | Vapour: Inhalation including via ingress into building<br>Gas: Ingress and accumulation leading to explosion | Screening of selected samples with PID.<br>Gas monitoring, including PID, on six occasions over three months | Screening of selected samples with PID.<br>Install standpipes at a range of depths to ensure sampling of made ground and unsaturated zone above groundwater and carry out monitoring. |
| | | Buildings on site | Vapour ingress leading to degradation of services<br>Gas: Ingress and accumulation leading to explosion | | |
| | | Site workers | Vapour: Inhalation including via ingress into building<br>Gas: Ingress and accumulation leading to explosion | | |

# 4.0 INVESTIGATION OBJECTIVES

This section summarises the scope of work completed to date and details the proposed works to be completed within a second phase of investigation in order to fully assess the presence of contamination at the site. On the basis of the conceptual model above, the following objectives have been identified for investigation;

1. Testing of shallow soils across the site to assess the presence of a range of contaminants;
2. Testing of soils in proximity to the petrol interceptor to identify the presence of associated hydrocarbon contamination;
3. Installation of combined groundwater and gas and vapour standpipes within specific strata across the site to facilitate monitoring;
4. Testing of selected shallow soils with a PID during sampling;
5. Gas and vapour monitoring of the shallow soils.

The preliminary phase of ground investigation recently completed comprised a single cable percussion borehole advanced to a depth of 30.00 m, mainly to provide geotechnical parameters, and six opendrive sampler boreholes advanced to depths of between 0.50 m and 5.45 m to provide additional coverage of the site. Six trial pits were also manually excavated to investigate existing foundations. Gas and groundwater monitoring standpipes were installed to a maximum depth of 5.00 m in four of the boreholes.

Additional investigation work is proposed in order to fully address the above objectives. In summary, additional boreholes will be advanced to collect further samples of the soil for contamination testing and to facilitate the installation of additional standpipes.

The above objectives will be achieved by the following activities. The locations of the completed and proposed sampling locations are shown on the plan included in the appendix.

| OBJECTIVE | LOCATION | TRAGET STRTA AND SAMPLE DEPTH (m) | TESTS |
|---|---|---|---|
| 1) | BH2 to BH4<br>TP2 to TP4<br>(completed) | Made ground - between 0.20 m and 0.50 m | Suite 1 + asbestos screen |
| | BH6 to BH9<br>(proposed) | Made ground, depth TBC | |
| 2) | BH10 & BH11<br>(proposed) | Made ground and natural soils, depth TBC | Suite 1 + asbestos screen |
| 3) | BH1 (completed) | Standpipe installed with response zone within Alluvium and London Clay | |
| | BH2 & BH3 (completed) and BH7 (proposed) | Standpipes installed with response zones within Alluvium | |
| | BH4 (completed) and BH6, BH8 & BH9 (proposed) | Standpipes installed with response zones within Made Ground | |
| | BH10 & 11<br>(proposed) | Standpipes to be installed with response zones within either Made Ground or Alluvium depending on ground conditions encountered around suspected petrol interceptor | |
| 4) | Screening of selected samples, especially in BHs 5, 10 and 11 around the suspected petrol interceptor | | |
| 5) | BH1 to BH4 and BH6 to BH11 | - | Groundwater, gas and vapour monitoring<br>6 visits over 3 months |

## 4.1 Proposed Testing

Six samples of made ground were collected during the preliminary phase of ground investigation and chemical testing is currently underway. An additional six samples will be collected from across the site from the additional boreholes. All samples have and will be scheduled for the GEA General Suite 1 analysis, which includes a range of common industrial contaminants including a range of metals, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. Samples are also screened for the presence of asbestos.

If any soils are visibly impacted by contaminants or if any other suspected contamination is encountered, samples will be screened on site with the PID and additional samples will be collected and tested where necessary. If any soils recovered from the trial pits are suspected of containing contamination either by visual inspection or as indicated by screening with the PID, additional samples will be scheduled for contamination testing. Additional standpipes will also be installed where necessary.

## 4.2 Standpipe Installations

During the initial phase of the investigation, standpipes were installed in four of the boreholes to measure groundwater levels and to monitor for the presence of ground gas and vapour. The response zones of two standpipes are solely within the Alluvium, a single standpipe has a response zone within the made ground, and one standpipe is installed with a response zone within the Alluvium and upper London Clay.

As part of the proposed additional investigation, an additional two standpipes will be installed with response zones within the Made Ground while an additional standpipe will be installed with a response zone within the Alluvium. Additional standpipes will be installed within the boreholes around the petrol interceptor. A well head, gas tap and lockable metal cover will be installed at the surface.

The standpipes will provide an indication of the shallow groundwater conditions and rising head tests could be carried out to assess likely inflow rates into shallow excavations.

If evidence of vapour contamination is identified during drilling or during screening of samples with the PID, the proposed installations will be adjusted accordingly, or an additional standpipe added to capture response zones within the potentially contaminated strata.

## 4.3 Soil Gas and Vapour Monitoring

Despite the absence of a significant risk of ground gas or vapour indicated by the desk study, standpipes will be installed and monitored for gas and vapour in accordance with the protocol below.

- CIRIA C665 (2007). *Assessing risks posed by hazardous ground gases to building.*
- BS 8485:2015+A1:2019. *Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.*
- BS 8576: 2013 *Guidance on Investigations for Ground Gas – Permanent gases and Volatile Organic Compounds (VOCs).*
- NHBC (2007). *Guidance on the Evaluation of Development proposals on sites where methane and carbon dioxide are present*.
- CIRIA C682 (2009). *The VOCs Handbook. Investigating, assessing and managing risks from inhalation of VOCs at land affected by contamination*.

### 4.3.1 Gas Monitoring Parameters

The standpipes installed will be monitored for the presence of oxygen, methane, carbon dioxide, Lower Explosive Limit (LEL), carbon monoxide and hydrogen sulphide using a *GA 2000* gas analyser. A Tiger Ion Photo-ionisation Detector (PID) fitted with a 10.6 eV lamp, which detects a broad range of volatiles, will be used to determine the presence of volatile vapours. During monitoring, bulk ground gas concentrations will be allowed to equilibrate over at least a three minute duration prior to taking a final reading, with the peak values, in addition to any final or constant values, recorded.

The site is considered to have low gas generation potential and the sensitivity of the end use is considered to be moderate to high. Based on the guidance provided by CIRIA, a minimum of six rounds of monitoring is proposed over a period of three months at a range of atmospheric pressures. If it is not possible

to carry out monitoring during significant falls in atmospheric pressure the limitations of the observations will be noted, and the readings will be assessed in accordance with the guidance. The acquired data will be used to complete a ground gas risk assessment to assess potential risks associated with bulk ground gases (carbon dioxide and methane) and volatile vapours to future site users and built development. Assessment of the results will be carried out by reference to BS 8576: 2013 Guidance on Investigations for Ground Gas and C682.

## 5.0 CONCLUSIONS

The results of the initial and proposed investigations will provide a minimum total of 12 general suite analyses on samples of made ground, plus asbestos. Gas and vapour monitoring will be carried out on six occasions over a period of three months.

The investigation uses soil testing plus gas monitoring including soil vapour headspace analysis, as multiple lines of evidence to determine the presence of any contamination which warrants remediation. The above proposals are considered to be sufficient for this site.

If unexpected, additional or significant contamination is encountered during the ground investigation, there will be a requirement for additional investigation and testing. In the event that both phases of investigation described above do not achieve the objectives, the requirement for additional investigation will be reviewed and agreed with the local authority.

The findings of the ground investigation will be published in a Ground Investigation Report, which will include a comprehensive ground model and site-specific final contamination risk assessment. Where necessary, a separate Remediation Method Statement will be produced to outline the proposals for remedial measures. These reports should be submitted to the local authority to discharge associated conditions.

If any remedial measures are required, once the measures have been implemented, they will be verified, after which a final verification report would be produced.

## APPENDIX

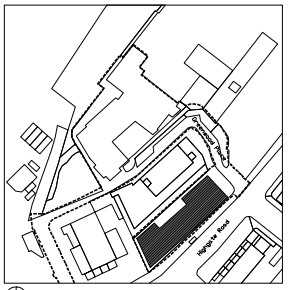
Development proposals

Proposed site plan

Laboratory testing suites & i2 Analytical accreditations

Generic Guideline Values

PID certificate

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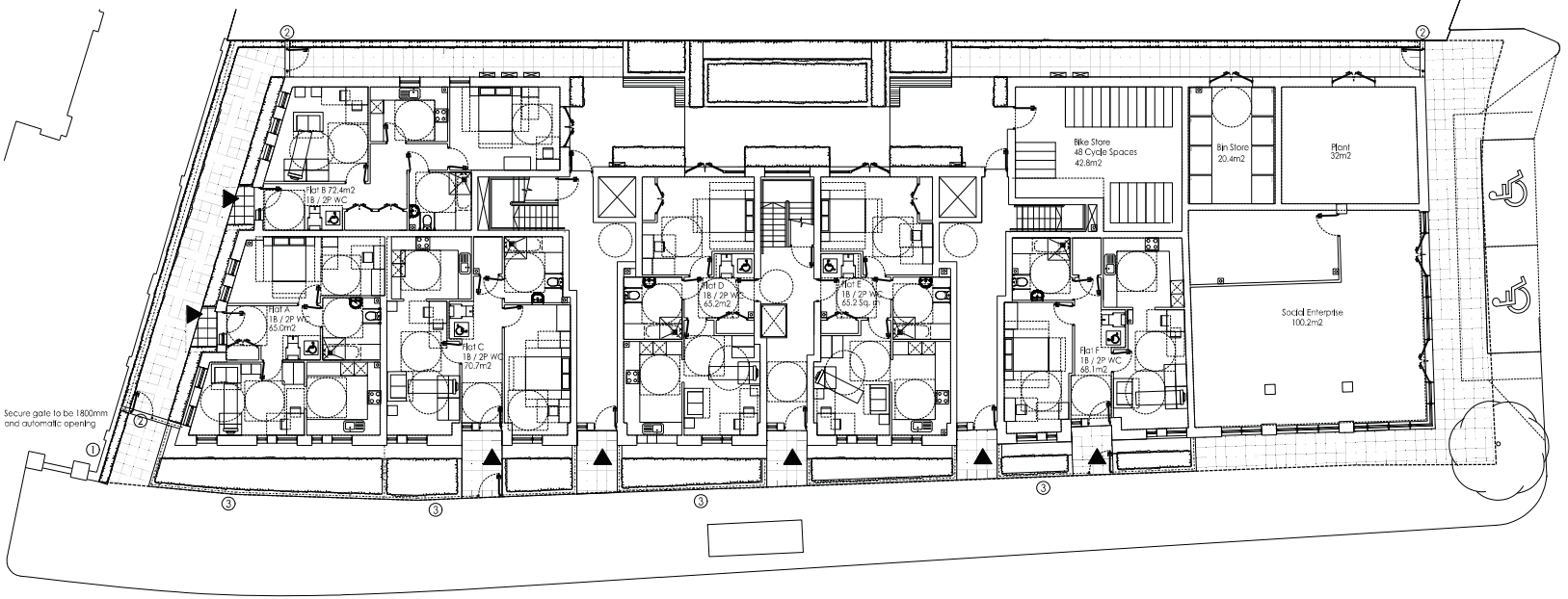


KEY:

1. Existing church wall with steel railings to 2.1m
2. Secure access gate
3. Low brick wall with steel railings to 1.2m

▲ Entrance

Indicative cooling unit location

GENERAL NOTES

NOTE:
All flats to achieve Lifetime Homes Standards. Please refer to section 7.32 of the Design, Planning and Access statement for full detail.

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| REVISION | / |

PCKO ARCHITECTS | INTERIOR DESIGNERS | MASTERPLANNERS | URBAN DESIGNERS
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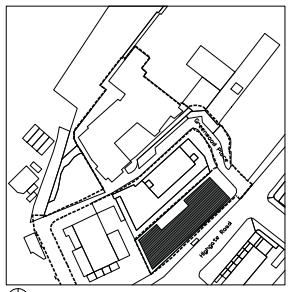


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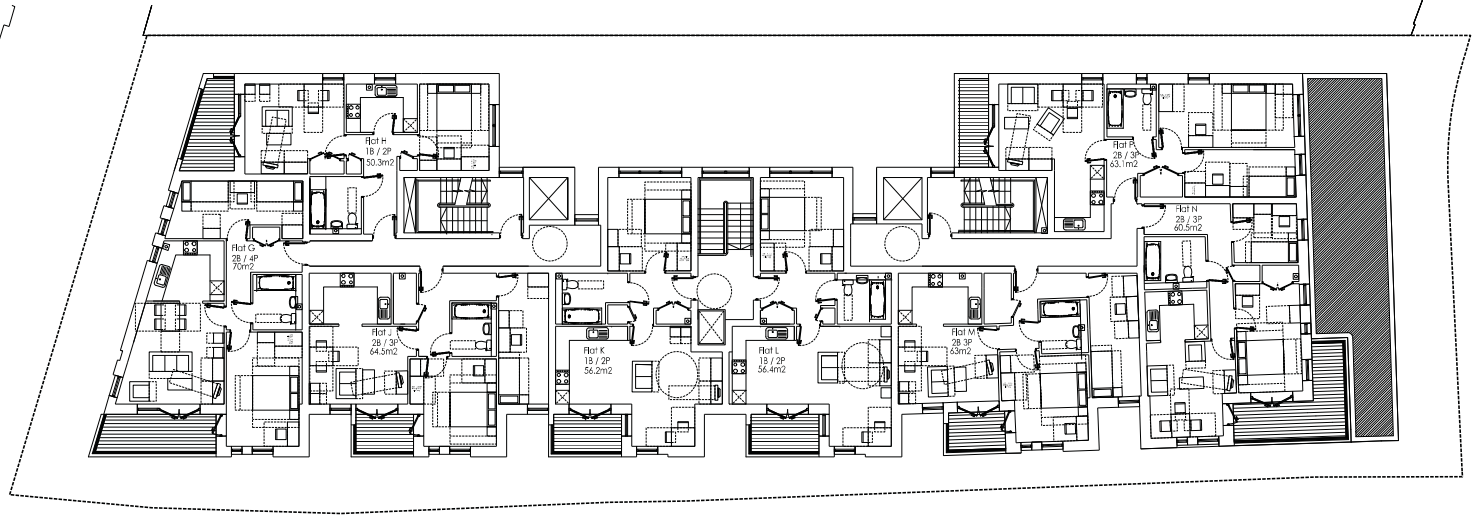


GENERAL NOTES

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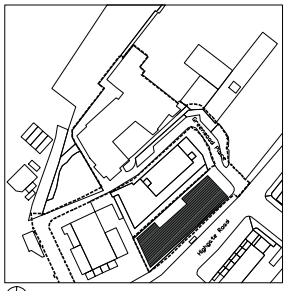


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GENERAL NOTES:

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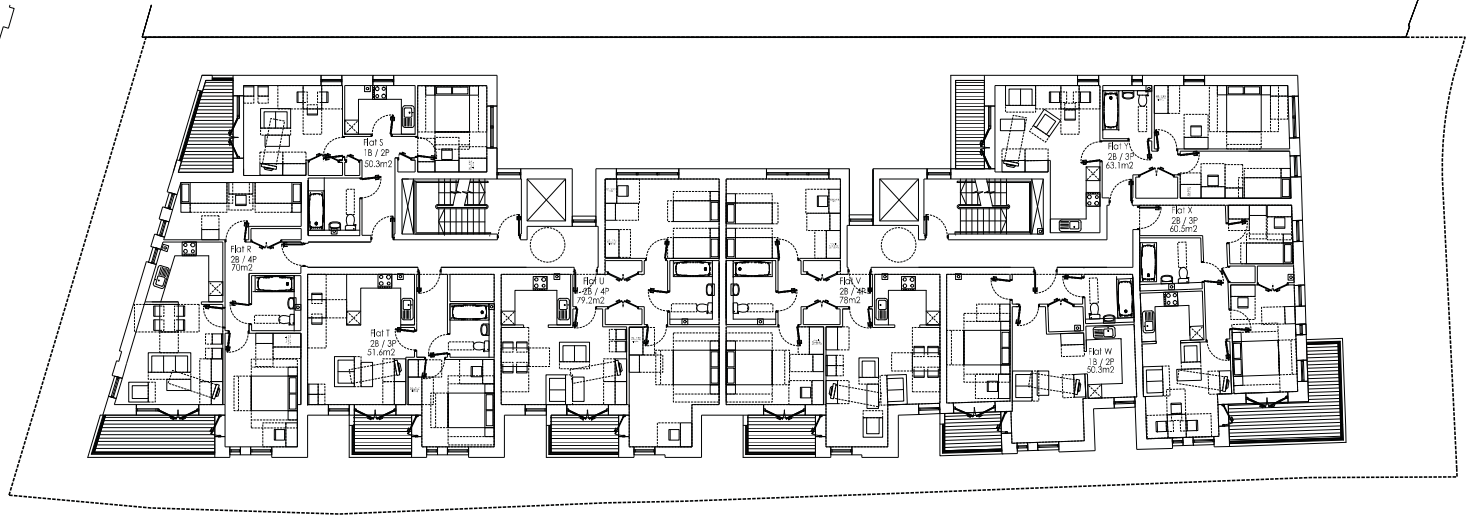



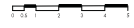

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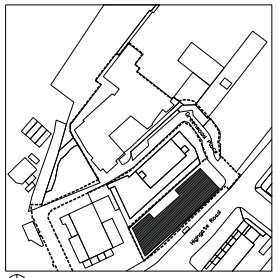


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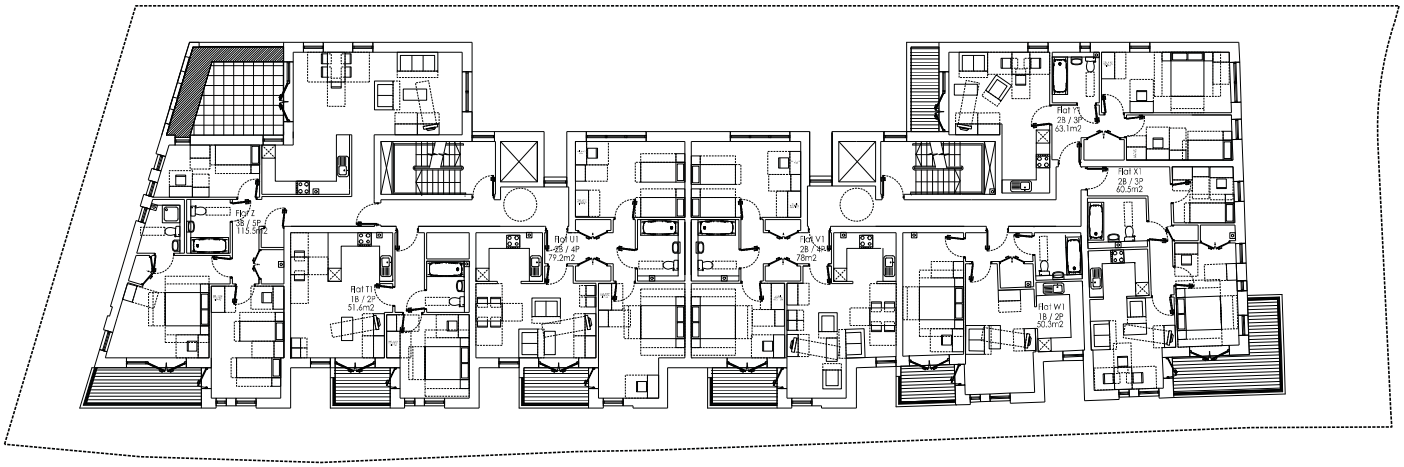


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ARCHITECTS PRINCIPAL DESIGNERS
MASTER PLANNERS URBAN DESIGNERS

CLIENT: LB Camden

PROJECT: Greenwood Place

DRAWING TITLE: 4th Floor Plan
Highgate Site

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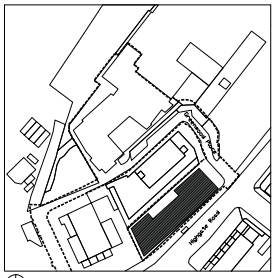


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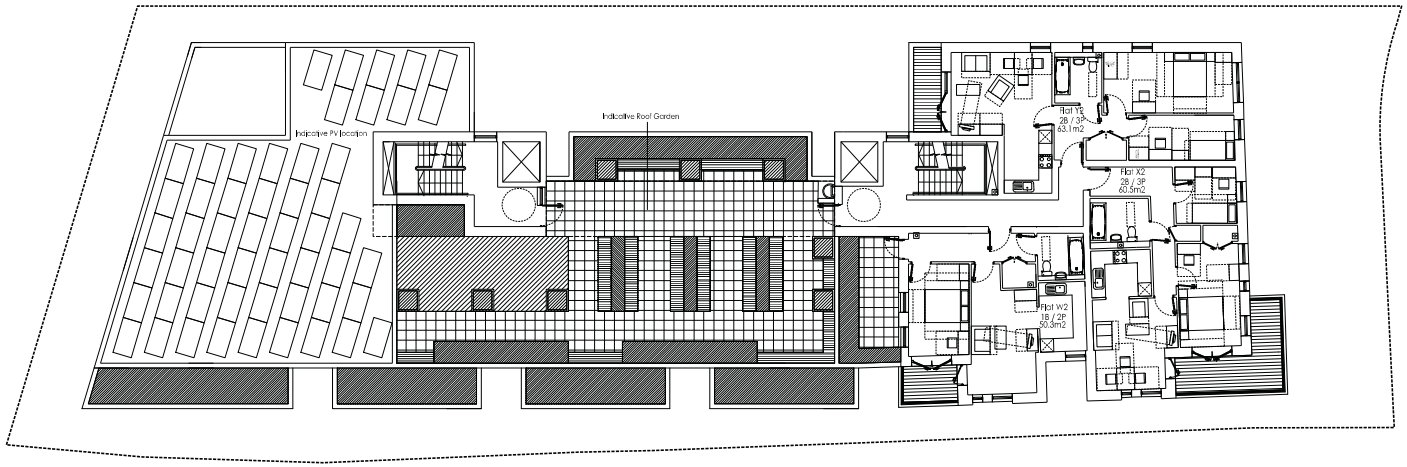



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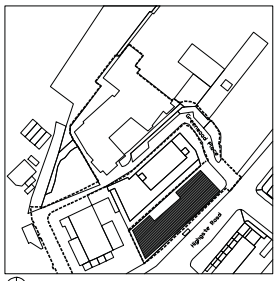
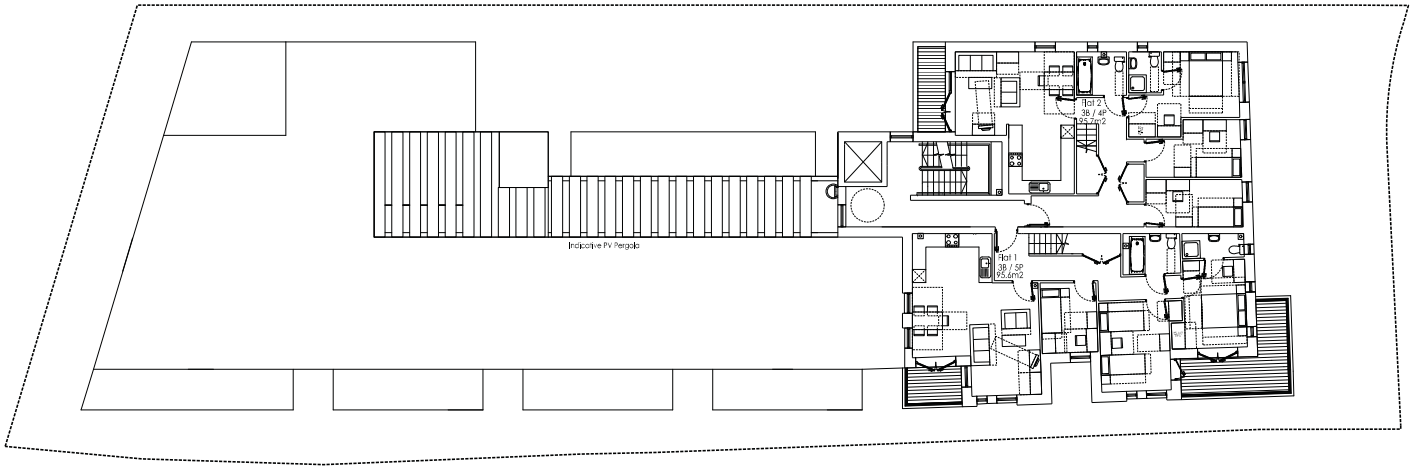



KEY PLAN 1:1250

GENERAL NOTES

NOTE:
All flats to achieve Lifetime Homes Standards.
Please refer to section 7.32 of the Design Planning and Access statement for full detail.








DATE REVISION NOTES BY CHECKED

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ARCHITECTS INTERIOR DESIGNERS
MASTERPLANNERS URBAN DESIGNERS

CLIENT: LB Camden

PROJECT: Greenwood Place

DRAWING TITLE: 6th Floor Plan
Highgate Site

STATUS: PLANNING

SCALE: 1:100@A1 1:200@A3 | DRAWN BY: TM

DATE: 2013.08 | CHECKED BY: GM

DRAWING NO.: PL 115 | REVISION: /

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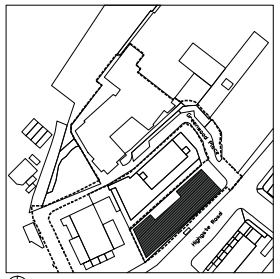
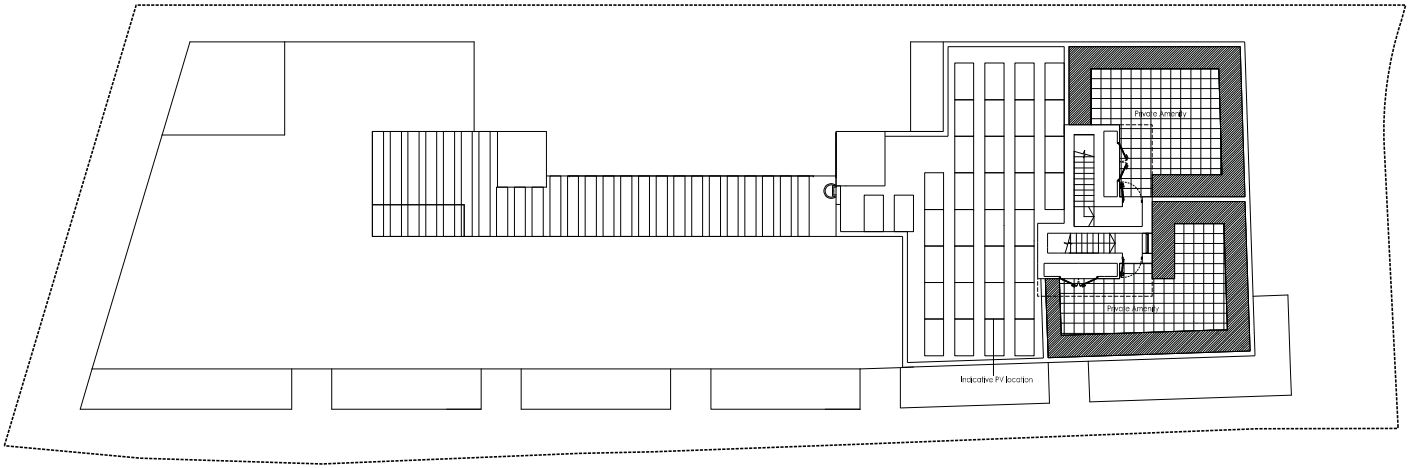



KEY PLAN 1:1250

GENERAL NOTES

NOTE:
All flats to achieve Lifetime Homes Standards. Please refer to section 7.32 of the Design Planning and Access statement for full detail.

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0 0.5 1 2 3 4 5

REV DESCRIPTION BY CHECKED

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ARCHITECTS INTERIOR DESIGNERS
MASTER PLANNERS URBAN DESIGNERS

CLIENT: LB Camden

PROJECT: Greenwood Place

DRAWING TITLE: Roof Plan Highgate Site

STATUS: PLANNING

SCALE: 1:100@A1 1:200@A3 DRAWN BY: TM

DATE: 2013.08 CHECKED BY: GM

DRAWING NO.: PL 116 REVISION: /

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GEA

Geotechnical & Environmental Associates

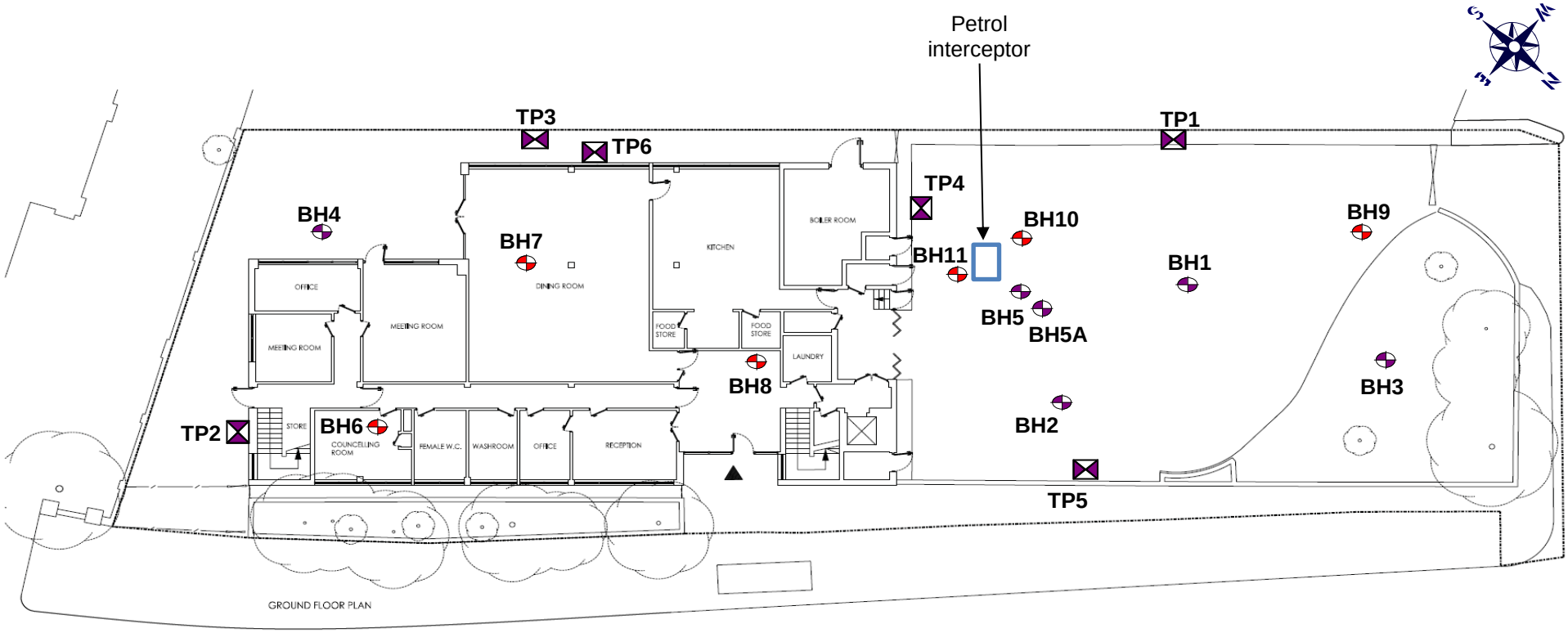
www.gea-ltd.co.uk

# Site Plan

| | |
|---|---|
| **Site** | 19-37 Highgate Road, London NW5 1NT |
| **Client** | GM Developments London |
| **Engineer** | Engineeria |

**Job Number** J21343

**Sheet** 1 / 1




Position of borehole during preliminary phase of investigation

Position of trial pit during preliminary phase of investigation

Proposed position of borehole during secondary phase of investigation

**Highgate Road**

0 10 20

Approximate Scale in metres

**GEA Suite 1**

| Matrix | Determinand | Accreditation Status | | Methodology | Detection Limit |
|---|---|---|---|---|---|
| Soil | pH | ISO17025 | MCERTS | Potentiometric | + / - 0.1 |
| Soil | Arsenic (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Cadmium (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <0.2 |
| Soil | Chromium (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Copper (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Lead (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Mercury (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <0.3 |
| Soil | Nickel (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Selenium (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Zinc (aqua regia extractable) | ISO17025 | MCERTS | ICP-OES | <1 |
| Soil | Chloride - Water Soluble (2:1) | ISO17025 | MCERTS | Titrimetry | <5 |
| Soil | Sulphate (as SO4) - Total | ISO17025 | None | ICP-OES | <100 |
| Soil | Sulphate (as SO4) - Water Soluble (2:1) | ISO17025 | MCERTS | ICP-OES | <0.005 |
| Soil | Sulphide | ISO17025 | MCERTS | ISE | <1 |
| Soil | Phenols - Total (monohydric) | ISO17025 | MCERTS | Skalar CFA | <2 |
| Soil | Cyanide - Total | ISO17025 | MCERTS | Skalar CFA | <1 |
| Soil | Total Organic Carbon (TOC) | ISO17025 | MCERTS | Titrimetry | <0.1 |
| Soil | PAH - Speciated (EPA 16) | ISO17025 | MCERTS | GC/MS | <0.05 - <0.1 |
| Soil | TPH Banded | None | None | GC/MS | <0.1 - <10 |

**TPH**

| Matrix | Determinand | Accreditation Status | | Methodology | Detection Limit | Unit |
|---|---|---|---|---|---|---|
| Soil | TPH CWG - Aromatic (EC5 - EC7) | ISO17025 | MCERTS | HS-GC/MS | <0.1 | mg/kg |
| Soil | TPH CWG - Aromatic (EC7 - EC8) | ISO17025 | MCERTS | HS-GC/MS | <0.1 | mg/kg |
| Soil | TPH CWG - Aromatic (EC8 - EC10) | ISO17025 | MCERTS | HS-GC/MS | <0.1 | mg/kg |
| Soil | TPH CWG - Aromatic (EC10 - EC12) | ISO17025 | MCERTS | GC/FID | <1 | mg/kg |
| Soil | TPH CWG - Aromatic (EC12 - EC16) | ISO17025 | MCERTS | GC/FID | <2 | mg/kg |
| Soil | TPH CWG - Aromatic (EC16 - EC21) | ISO17025 | MCERTS | GC/FID | <10 | mg/kg |
| Soil | TPH CWG - Aromatic (EC21 - EC35) | ISO17025 | MCERTS | GC/FID | <10 | mg/kg |
| Soil | TPH CWG Total - Aromatic (EC5-EC35) | ISO17025 | MCERTS | GC/MS | <10 | mg/kg |

| Matrix | Determinand | Accreditation Status | | Methodology | Detection Limit | Unit |
|---|---|---|---|---|---|---|
| Soil | TPH CWG - Aliphatic (C5 - C6) | ISO17025 | MCERTS | HS-GC/MS | <0.1 | mg/kg |
| Soil | TPH CWG - Aliphatic (C6 - C8) | ISO17025 | MCERTS | HS-GC/MS | <0.1 | mg/kg |
| Soil | TPH CWG - Aliphatic (C8 - C10) | ISO17025 | MCERTS | HS-GC/MS | <0.1 | mg/kg |
| Soil | TPH CWG - Aliphatic (C10 - C12) | ISO17025 | MCERTS | GC/FID | <1 | mg/kg |
| Soil | TPH CWG - Aliphatic (C12 - C16) | ISO17025 | MCERTS | GC/FID | <2 | mg/kg |
| Soil | TPH CWG - Aliphatic (C16 - C21) | ISO17025 | MCERTS | GC/FID | <10 | mg/kg |
| Soil | TPH CWG - Aliphatic (C21 - C34) | ISO17025 | MCERTS | GC/FID | <10 | mg/kg |
| Soil | TPH CWG Total - Aliphatic (C5-C34) | ISO17025 | MCERTS | GC/MS | <10 | mg/kg |

| Matrix | Determinand | Accreditation Status | | Methodology | Detection Limit | Unit |
|---|---|---|---|---|---|---|
| Soil | MTBE (Methyl Tertiary Butyl Ether) inc BTE | ISO17025 | MCERTS | HS-GC/MS | <1 | µg/kg |

**SVOC (Semi Volatile Organic Compounds) - Soil**

| Matrix | Determinand | Accreditation Status | | Methodology | Detection Limit | Unit |
|---|---|---|---|---|---|---|
| Soil | Aniline | None | None | GC/MS | <0.05 | mg/kg |
| Soil | Phenol | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | 2-Chlorophenol | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Bis(2-chloroethyl)ether | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 1,3-Dichlorobenzene | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | 1,2-Dichlorobenzene | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 1,4-Dichlorobenzene | ISO 17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Bis(2-chloroisopropyl)ether | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 2-Methylphenol | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Hexachloroethane | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Nitrobenzene | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | 4-Methylphenol | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Isophorone | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 2-Nitrophenol | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |

| | | | | | | |
|---|---|---|---|---|---|---|
| Soil | 2,4-Dimethylphenol | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Bis(2-chloroethoxy)methane | ISO17025 | MCERTS | GC/MS | <0.3 | mg/kg |
| Soil | 1,2,4-Trichlorobenzene | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Naphthalene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 2,4-Dichlorophenol | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | 4-Chloroaniline | None | None | GC/MS | <0.05 | mg/kg |
| Soil | Hexachlorobutadiene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 4-Chloro-3-methylphenol | None | None | GC/MS | <0.1 | mg/kg |
| Soil | 2,4,6-Trichlorophenol | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | 2,4,5-Trichlorophenol | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | 2-Methylnaphthalene | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 2-Chloronaphthalene | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Dimethylphthalate | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 2,6-Dinitrotoluene | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Acenaphthylene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Acenaphthene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 2,4-Dinitrotoluene | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Dibenzofuran | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 4-Chlorophenyl phenyl ether | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Diethyl phthalate | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | 4-Nitroaniline | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Fluorene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Azobenzene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Bromophenyl phenyl ether | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Hexachlorobenzene | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Phenanthrene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Anthracene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Carbazole | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Dibutyl phthalate | ISO 17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Anthraquinone | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Fluoranthene | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Pyrene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Butyl benzyl phthalate | None | None | GC/MS | <0.05 | mg/kg |
| Soil | Benzo(a)anthracene | ISO17025 | MCERTS | GC/MS | <0.2 | mg/kg |
| Soil | Chrysene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Benzo(b)fluoranthene | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Benzo(k)fluoranthene | ISO17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Benzo(a)pyrene | ISO17025 | MCERTS | GC/MS | <0.1 | mg/kg |
| Soil | Indeno(1,2,3-cd)pyrene | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Dibenz(a,h)anthracene | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |
| Soil | Benzo(ghi)perylene | ISO 17025 | MCERTS | GC/MS | <0.05 | mg/kg |

**VOC (Volatile Organic Compounds) - Soil**

| Matrix | Determinand | Accreditation Status | | Methodology | Detection Limit | Unit |
|---|---|---|---|---|---|---|
| Soil | Chloromethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Chloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Bromomethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Vinyl chloride | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Trichlorofluoromethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1-Dichloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1,2-Trichloro 1,2,2-Trifluoroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | cis-1,2-Dichloroethene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | MTBE (Methyl Tertiary Butyl Ether) | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1-Dichloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 2,2-Dichloropropane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Trichloromethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1,1-Trichloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2-Dichloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1-Dichloropropene | ISO17025 | None | HS-GC/MS | 1 | µg/kg |
| Soil | trans-1,2-Dichloroethene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Benzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Tetrachloromethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2-Dichloropropane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Trichloroethene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Dibromomethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Bromodichloromethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | cis-1,3-Dichloropropene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | trans-1,3-Dichloropropene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Toluene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1,2-Trichloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,3-Dichloropropane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Dibromochloromethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Tetrachloroethene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |

| | | | | | | |
|---|---|---|---|---|---|---|
| Soil | 1,2-Dibromoethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Chlorobenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,1,1,2-Tetrachloroethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Ethylbenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | p & m-xylene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Styrene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Tribromomethane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | o-Xylene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Isopropylbenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Bromobenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | n-Propylbenzene | ISO17025 | None | HS-GC/MS | 1 | µg/kg |
| Soil | 2-Chlorotoluene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 4-Chlorotoluene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,3,5-Trimethylbenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | tert-Butylbenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2,4-Trimethylbenzene | ISO17025 | None | HS-GC/MS | 1 | µg/kg |
| Soil | sec-Butylbenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,3-Dichlorobenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | p-Isopropyltoluene | ISO17025 | None | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2-Dichlorobenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,4-Dichlorobenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Butylbenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2-Dibromo-3-chloropropane | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2,4-Trichlorobenzene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | Hexachlorobutadiene | ISO17025 | MCERTS | HS-GC/MS | 1 | µg/kg |
| Soil | 1,2,3-Trichlorobenzene | ISO17025 | None | HS-GC/MS | 1 | µg/kg |

GEA
Widbury Barn
Widbury Hill
Ware
SG12 7QE

# Generic Risk-Based Soil Screening Values

| | | |
|---|---|---|
| **Site** | 19-37 Highgate Road, London NW5 1NT | **Job Number** J21343A |
| **Client** | GM Developments London | **Sheet** 1 / 2 |
| **Engineer** | Engineeria | |

**Proposed End Use** Residential without plant uptake

**Soil Organic Matter content %** 2.5

| Contaminant | Screening Value mg/kg | Data Source |
|---|---|---|
| ***Metals*** | | |
| Arsenic | 40 | C4SL |
| Cadmium | 149 | C4SL |
| Chromium (III) | 910 | S4UL |
| Chromium (VI) | 21 | C4SL |
| Copper | 7,100 | S4UL |
| Lead | 310 | C4SL |
| Elemental Mercury | 1.2 | S4UL |
| Inorganic Mercury | 56 | S4UL |
| Nickel | 180 | S4UL |
| Selenium | 595 | SGV |
| Zinc | 40,000 | S4UL |
| ***Anions*** | | |
| Soluble Sulphate | 500 mg/l | Structures |
| Sulphide | 50 | Structures |
| Chloride | 400 | Structures |
| ***Others*** | | |
| Organic Carbon (%) | 6 | Methanogenic potential |
| Total Cyanide | 140 | WRAS |
| Total Mono Phenols | 420 | SGV |
| ***PAH*** | | |
| Naphthalene | 5.60 | S4UL |
| Acenaphthylene | 4,600 | S4UL |
| Acenaphthene | 4,700 | S4UL |
| Fluorene | 3,800 | S4UL |
| Phenanthrene | 1,500 | S4UL |
| Anthracene | 35,000 | S4UL |
| Fluoranthene | 1,600 | S4UL |
| Pyrene | 3,800 | S4UL |
| Benzo(a)anthracene | 14.0 | S4UL |
| Chrysene | 31 | S4UL |
| Benzo(b)fluoranthene | 4.0 | S4UL |
| Benzo(k)fluoranthene | 110.0 | S4UL |
| Benzo(a)pyrene | 4.70 | C4SL |
| Indeno(1 2 3 cd)pyrene | 46.0 | S4UL |
| Dibenz(a h)anthracene | 0.32 | S4UL |
| Benzo (g h i)perylene | 360 | S4UL |
| **Total PAH Screen** | **67.1** | B(a)P / 0.15 |

| Contaminant | Screening Value mg/kg | Data Source |
|---|---|---|
| ***Hydrocarbons*** | | |
| Banded TPH (8-10) | 169 | Calc1 |
| Banded TPH (10-12) | 908 | Calc1 |
| Banded TPH (12-16) | 3538 | Calc1 |
| Banded TPH (16-21) | 2923 | Calc1 |
| Banded TPH (21-35) | 2923 | Calc1 |
| Benzene | 1.4 | C4SL |
| Toluene | 320 | SGV |
| Ethyl Benzene | 180 | SGV |
| Xylene | 120 | SGV |
| Aliphatic C5-C6 | 78 | S4UL |
| Aliphatic C6-C8 | 230 | S4UL |
| Aliphatic C8-C10 | 65 | S4UL |
| Aliphatic C10-C12 | 330 | S4UL |
| Aliphatic C12-C16 | 2400 | S4UL |
| Aliphatic C16-C35 | 92,000 | S4UL |
| Aromatic C6-C7 | See Benzene | S4UL |
| Aromatic C7-C8 | See Toluene | S4UL |
| Aromatic C8-C10 | 110 | S4UL |
| Aromatic C10-C12 | 590 | S4UL |
| Aromatic C12-C16 | 2300 | S4UL |
| Aromatic C16-C21 | 1900 | S4UL |
| Aromatic C21-C35 | 1900 | S4UL |
| PRO ($C_5$ –$C_{10}$) | 804 | Calc2 |
| DRO ($C_{12}$ –$C_{28}$) | 98,600 | Calc2 |
| Lube Oil ($C_{28}$ –$C_{44}$) | 93,900 | Calc2 |
| **TPH** | **500** | Trigger to consider speciated testing |
| ***Chlorinated Solvents*** | | |
| 1,1,1 trichloroethane (TCA) | 18 | S4UL |
| tetrachloroethane (PCA) | 3.5 | S4UL |
| tetrachloroethene (PCE) | 0.4 | S4UL |
| trichloroethene (TCE) | 0.036 | S4UL |
| 1,2-dichloroethane (DCA) | 0.013 | S4UL |
| vinyl chloride (Chloroethene) | 0.001 | S4UL |
| tetrachloromethane (Carbon tetra | 0.056 | S4UL |
| trichloromethane (Chloroform) | 2.1 | S4UL |

*Notes*

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

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

SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009 - where not superseded by C4SL

S4UL - LQM/CIEH Suitable for use Level (2015) based on 'minimal' level of risk

Calc1 - sum of thresholds for Ali & Aro fractions - assuming a 35% Aro:65% Ali ratio as is commonly encountered in the soil

Calc2 - sum of nearest available carbon range specified including BTEX for PRO fraction

Total PAH based on B(a)P / 0.15 - GEA experience indicates that Benzo(a) pyrene rarely exceeds 15% of the total PAH concentration

# SERVICE / INSPECTION SHEET

Instrument House
91-92 Shrivenham Hundred Business Park
Watchfield
Oxfordshire
SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

JOB NUMBER: 69040
INSTRUMENT: Phocheck Tiger

SERIAL NUMBER: T-114545
DATE RECEIVED: 15/09/2020

FIRMWARE: V0.5.12
UPGRADED TO:

CUSTOMER: Geotechnical & Environmental Associates Ltd

| ITEMS RECEIVED | Received | RTN? |
|---|---|---|
| Instrument | yes | |
| Rubber Boot | yes | |
| Battery Charger | | |
| Charging Cradle | | |
| Operation Manual | | |
| Quick Start Guide | | |
| Spares Kit | | |
| Comms Cable | | |
| Probe FLEXI | | |
| Peli Case | | |
| Tubing | | |
| Regulator | | |
| Software (Memory Stick) | | |
| PLASTIC CASE | | |
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| | SIGNED: | |

| TESTS | Pre Service | Post Service |
|---|---|---|
| Charger Test | | N/A |
| Battery charge Test | | OK |
| Lamp Test | | OK |
| Air Flow Test ≥ 200ml/min | 682ml/min | 258ml/min |
| Block Flow Test ≤ 15ml/min | | OK |
| Moisture Sensitivity = 0.0ppm | | 0.0ppm |
| Switch Test | | OK |
| Sensor Test | | OK |
| Alarm Test | | OK |
| PC Comms Test | | OK |
| Datalog Test | | OK |
| Display Test | | OK |
| Physical Inspection | | OK |
| PAT Test | | N/A |
| Firmware Upgrade | | N/A |
| Software Upgrade (usb) | | N/A |
| Function Test | FAIL | OK |
| | | |

Pump flow error when unit first turned on
Upon further inspection, found pump was blowing out and not drawing in. Replaced the pump
Screw housing damaged on sensor basket, replaced
Sensor cover damaged while removing basket as screw was only free spinning, replaced
Replaced inlet outlet seals, stack and filter as part of the service
Flow measured at 147ml/min with new pump, replaced pneumatics and now flow is reading 258ml/min
Cleaned the lamp with aluminium oxide
Unit has been repaired, calibrated and tested

TECHNICIAN: Jack Cheshire DATE: 22/09/2020

shawcity LIMITED
LIFE-SAVING SOLUTIONS

# CERTIFICATE OF CALIBRATION
Phocheck Tiger

## CALIBRATION CERTIFICATE NO: 69040

ISSUED BY: SHAWCITY LIMITED
DATE: 22-Sep-20

APPROVED SIGNATORY: JCheshire

NAME: Jack Cheshire

CUSTOMER: Geotechnical & Environmental Associates Ltd
INSTRUMENT: PhoCheck Tiger
SERIAL NUMBER: T-114545

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

## CALIBRATION RESULTS

| GAS | LOT No | REF. VALUE | INDICATED VALUE |
|---|---|---|---|
| Isobutylene | WO260295-3 | 100 ppm | 100 ppm |
| Isobutylene | WO163878-1 | 5000 ppm | 5000 ppm |

**COMMENTS:**
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.



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## PARTS REQUIRED FOR JOB NUMBER:

| DESCRIPTION | PART NO. | QTY | Serial No. | LOC |
|---|---|---|---|---|
| 10.6 Lamp | LA4TM600 | | | S4H B1 |
| Lamp Stack | A-846267 | | | S4H B3 |
| PTFE Filter Disk | 861221-1 | 1 | | S4H B2 |
| Probe O-Ring | 5/OV-02 | | | S4H B4 |
| Sensor seal | A-861214 | | | S4H B1 |
| Probe | 880207 | | | S4E B1 |
| Probe Kit | A-880210 | | | S4H B4 |
| Filter Clamp (black) | 880201 | | | S4E B1 |
| Probe Seal | 880202 | | | S4E B5 |
| Filter Clamp (clear) | 861219 | | | S4H B6 |
| Pump | A-861298 | 1 | | S4F B2 |
| Manifold | 861213 | | | S4E B6 |
| Outlet Barbs | 5/JHS-03 | | | S4E B6 |
| Sensor Basket | 861203-8 | 1 | | S4H B2 |
| Sensor Cover | A-861259 | 1 | | S4G B5 |
| Tubing Inv Cone | 5/JO-01 | | | S4D B1 |
| Tiger Battery | A-861240 | | | S4G B1 |
| Inlet Outlet Seal | 861215 | 2 | | S4H B5 |
| Display | 1/OM-05 | | | S4E B3 |
| Battery Charging Cradle/Dock | A-861220 | | | S4F B2 |
| Charger Lead | 1/VS-22 | | | S4F B3 |
| Fuse FU100/101/103/105/106 | 1/FB-10 | | | S4G B3 |
| FU1 fuse | 1/FB-12 | | | S3A B1 |
| Top Housing | A-861551 | | | service |
| Charging Dock Magnet | 2/AP-08 | | | S4C B2 |
| Bottom Housing | 861203-2 | | | S4F B4 |
| Pneumatics Kit | A-861509 | 1 | | S4F B3 |
| Tiger Battery | A-861240 | | | S4G B1 |
| Sensor PCB | A-861103 | | | S4E B5 |
| Orange stack for Tiger LT | A-846496 | 1 | | S4C B1 |
| PAT Test | PAT 1 | | | |
| Mainboard Assembly | A-861120 | | | |