

**Land to the Rear of 61 High Street, Kimpton, Hitchin, North  
Hertfordshire, Hertfordshire, SG4 8PU**

## **Ground Investigation**



**Admiral UK Contracting Limited**

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**P24-064gi**

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| ISSUE                                                | DATE       | Written by:               | Comment |
|------------------------------------------------------|------------|---------------------------|---------|
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| For and on behalf of Paddock Geo Engineering Limited |            |                           |         |

## **1.0 INTRODUCTION**

Paddock Geo Engineering Limited (PGE) were instructed by Admiral UK Contracting Limited; the Client, to undertake a Ground Investigation and Generic Site Contamination Assessment as Stage 2 Tier 2 (formerly referred to as Phase 2) of a Site Contamination Assessment of the subject site, referred to as Land To The Rear of 61-69 High Street, Kimpton, Hertfordshire, SG4 8PU.

### **1.1 Terms of Reference**

- British Standards BS 10175:2011 Investigation of Potentially Contaminated Sites – Code of Practice.
- Land Contamination: Risk Management (LCRM), 2020, Environment Agency.
- PPG23 (PPS23) Planning and pollution control (contaminated land aspects), 2002
- GPLC1 Guiding Principles for Land Contamination, 2010, Environment Agency
- Environmental Protection Act: 1990 – Contaminated Land Statutory Guidance, April 2012, DEFRA
- BS EN 1997-2, Eurocode 7. Geotechnical design. Ground investigation and Testing
- BS EN ISO 22475 Series (1-3), Geotechnical investigation and testing. Sampling methods and groundwater measurements.
- NHBC Standards Chapter 4.2 2006, Building Near Trees
- TRL Laboratory Report 1132:1984 – The Structure of Bituminous Road, Appendix C Table C1
- BS 5930:1999+A2:2010 Site Investigation Code of Practice
- BS EN 1997-2, Eurocode 7. Geotechnical design. Ground investigation and testing
- BS EN ISO 22475 Series (1-3), Geotechnical investigation and testing. Sampling methods and groundwater measurements.
- BRE412 1996 Desiccation in Clay Soils
- BRE240 1993 Low Rise Buildings on Shrinkable Clay Soils: Part 1
- BRE241 1990 Low Rise Buildings on Shrinkable Clay Soils: Part 2
- BS 8485:2015 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- CIRIA C665 Assessing risks posed by hazardous ground gases to buildings. CIRIA 2007
- NHBC report No 10627-R01(04) Guidance on development proposals on sites where methane and carbon dioxide are present (March 2007)
- CL:AIRE Research Bulletin RB17 A pragmatic approach to ground gas risk assessment (November 2012)
- CIRIA C735 Good practice and verification of protection systems for buildings against hazardous ground gases.

## **1.2 Objective**

The objective of the Ground Investigation for the site comprised the following elements:

- An Intrusive Investigation
- A Geotechnical Appraisal
- Intrusive Site Contamination Assessment
  - Generic Human Health Risk Assessment

The scope of work was discussed and agreed with the Client prior to commencement. The investigation was carried out in order to provide data on the sub-soil characteristics of the site, the groundwater regime and also to recover samples for geotechnical laboratory testing and chemical analysis. This data was employed to derive a ground model for the site, foundation design criteria, and a generic human health contamination risk assessment.

## **2.0 THE SITE**

### **2.1 Site Description**

The site is situated to the west of the centre of the village of Kimpton and c.9km southeast from Luton city centre. The site comprises an approximately squared shaped parcel of land that is currently occupied by several timber shed like buildings and lorry box containers in different states of repair, several mature and semi-mature trees and a grass area.

The site area is bordered to the north by the rear gardens of the private property along the High Street. To the east, south and west are also domestic garden areas with a metal barn like building present along the east boundary and some semi-mature and mature trees along the north, east and west boundaries. The main access to the site is an unpaved road off High Street (B652) between the private properties no.59 and no.61 High Street.

The subject site covers an area of approximately 0.17 hectares, with the centre of the site at approximate national grid reference 517340, 218280 and postcode SG4 8PU.

A Site Location Plans and an Aerial Photograph are presented in Appendix A.

### **2.2 Proposed Development**

The proposed development scheme involves the demolition of existing buildings followed by the erection of one detached 4-bed dwelling with integral garage including parking and landscaping.

As the proposed development will have private garden areas, the soil contamination exposure characteristics for the proposed development will be comparable to residential with plant uptake.

A proposed development plan is presented within Appendix A.

### **2.3 Tree Locations**

No arboricultural reports or plans have been provided for the site at the time of writing this report to determine the species and height of trees on site that are potentially within influencing distance of the proposed structures. Based upon site observations various mature and semi-mature deciduous and coniferous trees are generally present to the north and west of the site. In the approximate centre of the site are a number of large stumps from felled trees, aerial photography and Google images show the site to be generally covered with mature tree canopies, likely those whose stumps remain in the approximate centre of the site.

### **3.0 PRELIMINARY CONTAMINATION RISK ASSESSMENT SUMMARY**

An associated Preliminary Contamination Risk Assessment (PRA) has been carried out for the site by PGE (reference P24-064pra, dated March 2024), with which reference should be made. Salient data from the PRA is summarised and extracted from the PRA and presented in the following Sections.

#### **3.1 Geology, Hydrogeology and Hydrology**

Information on the underlying geology at the site has been obtained from the British Geological Survey (BGS) Geological Map Viewer and Geological Mapping provided by Landmark within the EnviroCheck Report.

The geological maps indicate that the part of the subject site is underlain by sedimentary superficial deposits comprising clay, silt, sand and gravel from the Head deposit formed between 2.588 million years ago and the present during the Quaternary period. The superficial deposits are underlain by Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated) a sedimentary bedrock formed between 100.5 and 89.8 million years ago during the Cretaceous period.

The groundwater vulnerability maps for the site and the surrounding areas indicates a Superficial Aquifer Secondary Aquifer – Undifferentiated.

The underlying bedrock geology of the Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated) is the Principal Aquifer.

The combined groundwater vulnerability on site is recorded to be High, a pollutant speed of intermediate, a bedrock flow of Well-Connected Fractures a dilution of <300mm/year, a base flow index of <90% and a superficial thickness of <3m.

Given the hydrogeological status of the site, the groundwater beneath the site could be considered to be of high sensitivity.

The BGS groundwater flood susceptibility mapping area indicates the site is situated within an area with Potential for 'Groundwater Flooding of Property Situated Below Ground Level' and in area with 'Potential for Groundwater Flooding to Occur at Surface'. This information does not constitute a groundwater flood risk assessment. A specialist should be consulted for a flood risk assessment of this site.

The EnviroCheck Report identifies the nearest surface water feature to be an unknown feature located 546m south.

No pollution incidents to controlled waters are recorded by Envirocheck within 1km of the site.

No surface water abstractions are located within 1km of the subject site.

The site does not fall within an area at risk of flooding and/or at risk of extreme flooding.

### 3.2 Historic Land Use on the Site and Surrounding Area

A review of available historical topographic mapping obtained from the EnviroCheck Report has been carried out for the associated PRA and comprises County Series, Ordnance Survey Plans and Aerial Survey Information (at various scales). Maps covering the site were published between 1884 and 2023.

The areas site surrounding the site were depicted as largely an open field from 1881 up to 1972 when some structures were noted on the site, likely similar to the current sheds. The site is not indicated to have been developed throughout the mapping period.

The area surrounding the site was developed for residential land use to the north and west throughout the mapping period. The area to the south remains open land.

A brewery was noted c.150m northeast of the site from the earliest mapping to before 1924. A garage was noted c 30m north of the site from 1972 to before current and has been redeveloped for residential land use sometime after 1995. An electrical sub-station was noted c. 80m southwest of the site from 1972.

### 3.3 Waste Management, Landfills and Infilled Land

No BGS recorded landfill sites or historic landfill sites are recorded within 1km of the site.

No Licensed Waste Management Facilities are located within 1km of the site.

No Local Authority Recorded Landfill Sites are located within 1km of the site.

A total of 12no. BGS Recorded Mineral Sites are recorded within 1km of the subject site. The nearest and only one of these records within 500m of the site relates to Kimpton Hall Pit, Kimpton, located 466m southeast of the site and is identified to be for the extraction of Chalk from White Chalk Subgroup soils as open cast mining and is recorded as ceased.

The EnviroCheck Report identifies no Natural Cavities located within 1km of the subject site.

### 3.4 Potential Contaminant Sources Summary

The potential contamination sources identified as part of this Preliminary Contamination Risk Assessment are summarised in the table below. The potential contaminants are based on the data within CL8, Department of the Environment (DoE) Industry Profiles, the current and historic site uses.

| Current Potential On-Site Contaminant Sources                               | Potential Contaminants                                                                       |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Rubble piles and spillage of oils and fluids from old machinery on the site | Inorganics (heavy metals and metaloids), Organics, hydrocarbons (PAH and TPH), and asbestos. |

|                                                                                           |                                                                                              |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Possible ACM sheeting in piles and use in structures on the site                          | Asbestos.                                                                                    |
| <b>Historical Potential On-Site Contaminant Sources</b>                                   | <b>Potential Contaminants</b>                                                                |
| Made Ground associated with previous site use.                                            | Inorganics (heavy metals and metaloids), Organics, hydrocarbons (PAH and TPH), and asbestos. |
| Potential asbestos containing material (ACM) in the Made Ground and historical buildings. | Asbestos.                                                                                    |
| <b>Current Potential Off-Site Contaminant Sources</b>                                     | <b>Potential Contaminants</b>                                                                |
| Legacy contamination from former garage and petrol filling station (PFS).                 | Ground Gases and Volatile Hydrocarbons.                                                      |
| <b>Historical Potential Off-Site Contaminant Sources</b>                                  | <b>Potential Contaminants</b>                                                                |
| Electrical substation c. 80m east of site from 1972                                       | PCBs.                                                                                        |
| Former garage and PFS 30m north of the site, redeveloped after 2001 for residential use   | Ground Gases and Volatile Hydrocarbons.                                                      |

### 3.5 Conceptual Contaminant-Pathway-Receptor Model

The information gathered in this Preliminary Contamination Risk Assessment has been compiled to produce a Source-Pathway-Receptor (S-P-R) model, which is summarised in the table below and overleaf. A Contamination Conceptual Site Model Cross Section is presented in Appendix F.

The risk posed to site construction workers has not been assessed as any risks are considered to be mitigated through good site practices such as dust suppression and the use of Personal Protective Equipment (PPE).

| Potential Site Contaminant Sources                                                                                                                      | Potential Pathways            | Potential Receptors | Pathway Complete | Risk Level Classification |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------|------------------|---------------------------|
| <b>ONSITE</b><br>Rubble piles, Made Ground and spillage of oils and fluids from old machinery on the site<br><br>Potential asbestos containing material | Dermal / direct contact       | Current site users  | No               |                           |
|                                                                                                                                                         | Direct ingestion              |                     | No               |                           |
|                                                                                                                                                         | Direct inhalation             |                     | No               |                           |
|                                                                                                                                                         | Inhalation of Radon           |                     | No               |                           |
|                                                                                                                                                         | Inhalation of wind-blown dust |                     | No               |                           |
|                                                                                                                                                         | Vapour migration              |                     | No               |                           |
|                                                                                                                                                         | Ground gas migration          |                     | No               |                           |
|                                                                                                                                                         | Dermal / direct contact       |                     | Yes              | Low to Moderate           |

| Potential Site Contaminant Sources                                                                                                                                                                                                                                                                                                              | Potential Pathways                                     | Potential Receptors                               | Pathway Complete | Risk Level Classification |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|------------------|---------------------------|
| <p>(ACM) in Made Ground and current sheds.</p> <p><b>OFFSITE</b></p> <p><b>Current</b></p> <p>Legacy contamination from former garage and PFS c. 30m N.</p> <p><b>Historical</b></p> <p>Electrical substation c. 80m east of site from 1972.</p> <p>Former garage and PFS 30m north of the site, redeveloped after 2001 for residential use</p> | Direct ingestion                                       | Future site users (residential with plant uptake) | Yes              | Low to Moderate           |
|                                                                                                                                                                                                                                                                                                                                                 | Direct inhalation                                      |                                                   | Yes              | Low to Moderate           |
|                                                                                                                                                                                                                                                                                                                                                 | Inhalation of Radon gas                                |                                                   | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Inhalation of wind-blown dust                          |                                                   | Yes              | Low to Moderate           |
|                                                                                                                                                                                                                                                                                                                                                 | Vapour Migration onto the site                         |                                                   | Yes              | Low                       |
|                                                                                                                                                                                                                                                                                                                                                 | Ground gas migration                                   |                                                   | Yes              | Low                       |
|                                                                                                                                                                                                                                                                                                                                                 | Direct contact                                         | Services (Following redevelopment)                | Yes              | Low                       |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants: non-aqueous phase           |                                                   | Yes              | Low                       |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants: aqueous phase               |                                                   | Yes              | Low                       |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants off-site: non-aqueous phase  | Adjacent Properties                               | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants off site: aqueous phase      |                                                   | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Vapour migration                                       |                                                   | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Ground gas migration                                   |                                                   | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Inhalation of wind-blown dust                          | Ecological Impacts                                | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants: non-aqueous phase           |                                                   | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants: aqueous phase               |                                                   | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants from site: non-aqueous phase | Controlled groundwater                            | Yes              | Very Low                  |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants from site: aqueous phase     |                                                   | Yes              | Very Low                  |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of Contaminants: non-aqueous phase           | Surface Waters                                    | No               |                           |
|                                                                                                                                                                                                                                                                                                                                                 | Migration of contaminants: aqueous phase               |                                                   | No               |                           |

### 3.6 Preliminary Contamination Risk Assessment Conclusions

The preliminary contamination risk assessment has identified complete Contaminant-Pathway-Receptor (CPR) linkages with a maximum **Low to Moderate** risk level from the potential contamination sources and risk drivers identified on the site and surrounding area.

There is the potential for the presence of Inorganics (heavy metals and metaloids), Organics, hydrocarbons (PAH and TPH), and asbestos within the rubble piles and any Made Ground associated with the use of the site such as material used for stabilising access tracks.

Furthermore, there is the potential presence of Hydrocarbons (PAH and TPH) from spillage of machinery fluids on the site. There is also a feasible risk from potential asbestos containing material (ACM) associated with construction materials such as roofing of the former site structures and a pile of likely asbestos fibre cement sheeting on the north of the site and also potentially with rubble piles across the north and west of the site generally.

These features provide potential on-site sources of contamination which could impact future site users and services (following redevelopment) primarily through direct contact, direct ingestion, direct inhalation, inhalation of wind-blown dust and vapour migration and a possible risk from ground gas migration.

There are no landfills sites or suspected organic soils beneath the site which could give rise to ground gases to migrate and impact the site, however, a potential off-site sources of ground gases and volatile hydrocarbons was identified within close proximity to the site, these would be predominantly volatile hydrocarbons in nature and potentially sourced from a former garage and PFS located 30m north of the site which was redeveloped for residential use some time after 2001. It is assumed that given the age of this development that ground investigation works and associated remediation would have been completed to a sufficiently level to allow the site to be used for residential land use. Therefore, it is considered that there would be limited legacy contamination to mobilise and migrate to impact the site, so these sources are considered to represent a low likelihood of generating ground gases and volatile contamination.

There is also an identified risk from the potential presence of PCB's from an electrical substation c. 80m east of the site from the site dated c.1972s. However, any potential spillages/leaks of PCBs would remain localised to the substation itself. Should these leaks have been significant, these would have soaked into the underlying chalk aquifer and descended to depth. Therefore, these would not be likely to have migrated to impact the site, thus not posing a significant risk to identified end users of the site.

Given these factors there is considered to be a complete S-P-R linkage between any priority contaminant impacted soils on the site through direct contact, ingestion, inhalation pathways, and migrations pathways from off-site sources with the proposed sensitive end site user and new buried services.

The proposed site is likely to include areas of soft landscaping and thus will allow the proposed user to come into contact with potential contaminants through direct contact, ingestion and inhalation pathways.

Given the discussion above, to assess if a 'Significant Possibility of Significant Harm' is present from potential contamination sources to the identified current and future site users and new buried services it is recommended that an intrusive soil investigation be undertaken focusing on the highlighted potential contaminative features.

***Further to this, should any unexpected contamination be identified during the future development groundworks, then a suitably qualified and experienced Geo-Environmental Engineer should be consulted and if necessary further assessment should be undertaken.***

### 3.7 Potential Geotechnical and Ground Stability Risk Summary

A maximum “Very Low” geotechnical risk was identified on-site within the Envirocheck Report associated with the anticipated underlying natural geology.

The EnviroCheck Report records that the subject site is not located within an area with a history of non-coal mining activity. A total of 12no. BGS Recorded Mineral Sites are recorded within 1km of the subject site. The nearest and only one of these records within 500m of the site relates to Kimpton Hall Pit, Kimpton, located 466m southeast of the site and is identified to be for the extraction of Chalk from White Chalk Subgroup soils as open cast mining and is recorded as ceased. The EnviroCheck Report identifies no Natural Cavities located within 1km of the subject site.

Given the above it is considered that there is a lower bound risk of ground instability on the site from Chalk dissolution instability.

However, it is recommended that a geotechnical appraisal of the site be carried out to determine the geology and groundwater beneath the site and to derive foundation design criteria for the structures on the site.

### 4.0 INTRUSIVE INVESTIGATION FIELDWORKS

An intrusive investigation was designed with reference to the data from the associated Preliminary Contamination Risk Assessment and Geotechnical Desk Study to establish the ground conditions beneath the site in relation to the development of a Ground Model for the proposed development.

The works were also employed to gather geotechnical data to derive geotechnical design parameters, and to assess the contamination status of the near surface soils and potential for gaseous / volatile contamination on site.

The main fieldworks were carried out on the 15<sup>th</sup> March 2024 and comprised the forming of 6no. machine excavated trial pit (TP1 to TP6) excavated by the Client to a maximum depth of 2.10m below ground level (bgl).

The exploratory points were positioned in openly accessible areas and to clear buried services following a Cable Avoidance Tool (CAT) survey and consultation of buried services plans where available.

The exploratory points were formed to assess the geological succession beneath the site, near surface contamination and to gather geotechnical and groundwater data to derive geotechnical design parameters and to add data to the Ground Model for the site. The details and rationale of the exploratory point placement is summarised below.

#### Exploratory Location Details and Rationale

| Exploratory Location (Depth) | Location Details                                                                               |
|------------------------------|------------------------------------------------------------------------------------------------|
| TP1 (1.80m)                  | Towards the northeast corner of the site. To assess the general ground conditions of the site. |

| Exploratory Location (Depth) | Location Details                                                                                                                              |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| TP2 (1.80 m)                 | Towards the southeast corner of the of the site. To assess the general ground conditions.                                                     |
| TP3 (2.00 m)                 | Towards the south of the site and on the southeast corner of the proposed structure. To assess the general ground conditions of the site.     |
| TP4 (2.10 m)                 | Towards the north of the site and on the north side of the proposed structure. To assess the general ground conditions of the site.           |
| TP5 (2.00m)                  | Towards the northwest of the site and on the northwest corner of the proposed structure. To assess the general ground conditions of the site. |
| TP6 (2.10m)                  | Towards the southwest of the site and on the southwest corner of the proposed structure. To assess the general ground conditions of the site. |

The trial pits were formed by the Client to depths comprised between 1.80m and 2.10m bgl maximum depth achievable with the excavator employed in order to determine the ground conditions and recover samples.

Hand vane soil strength testing was not undertaken as suitable fine-grained soils were not encountered. Soil strength and densities were estimated through logging only in the field.

On site assessment of the arisings on site using a PID with a 10.6eV bulb calibrated on 100ppm Isobutylene did not indicate any detectable VOCs. Olfactory assessment of the samples recovered indicated no odourous identifiable contamination.

The depth of the trial pits, sample details, strata descriptions and comments on the groundwater conditions are detailed on the Logs which are presented in Appendix B along with an Exploratory Point Location Plan.

All of the trial pits were backfilled with arisings once logged and tested.

A series of photographs taken during the fieldworks are presented in Appendix B.

#### 4.1 Encountered Strata

The exploratory point arisings were logged by a Geotechnical Engineer generally in accordance with BS5930:2015. The encountered geology generally indicated Made Ground and locally Topsoil overlying superficial deposit of the Head Deposit overlaying Weathered Holywell Nodular Chalk Formation and New Pit Chalk Formation bedrock deposits.

#### TOPSOIL

Topsoil was encountered in exploratory point TP3 to depth of 0.30m bgl and can be described as dark grey slightly gravelly sandy loamy CLAY with frequent rootlets and roots up to 40mm diameter and frequent ash fragments, gravel is fine to coarse subangular to subrounded flint.

## MADE GROUND

Made Ground was encountered in all exploratory points except TP3 to a depth comprised between 0.20m and 0.60m bgl and can be described dark grey slightly gravelly sandy loamy CLAY and gravelly clayey loamy SAND. Gravel is fine to coarse subangular to subrounded flint, concrete and occasional brick fragments. Occasional metal and tarmac fragments have been noted within exploration point TP5 and TP6.

## HEAD DEPOSITS

The Head Deposits were generally fine grained with a coarse grained unit encountered in the majority of exploration point, except TP2 and TP3, at depths of between 1.20m and 2.00m bgl. The fine grained unit can be described generally as firm brown very gravelly sandy CLAY with gravel of fine to coarse subangular to subrounded flint. The coarse grained unit can generally be described as a loose to medium dense brown very clayey sandy fine to coarse subangular to subrounded GRAVEL of flint.

## WEATHERED HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION

Deposits suspected to be Weathered Holywell Nodular Chalk Formation and New Pit Chalk Formation was encountered at the base of all the exploration point except TP1 and can be described as Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint.

The base of the Chalk was not proven and also as the trial pits were terminated at a shallow depth the Chalk succession was not proven, we have necessarily considered the material encountered as chalk but it is recommended that deeper exploratory work be undertaken to ensure that the material encountered is the top of the Chalk stratum before the detailed design stage.

## ROOTS

Occasional to frequent roots and rootlets were observed within all the exploratory points except trial pit TP5, generally within the near surface Topsoil and Made Ground extending to a maximum depth of c.0.50m bgl. Roots of up to 10mm of diameter at depth of 1.00m bgl were encountered within exploration point TP2.

## 4.2 Visual Contamination

The trial pit and borehole arisings were assessed for visual contaminants and summarised below.

### Visual Contamination

| Exploratory Location (Depth) | Visual Contamination and Strata                                                               |
|------------------------------|-----------------------------------------------------------------------------------------------|
| TP1 (1.80 m)                 | Made Ground to 0.60m depth with brick and concrete fragments, no odours or staining observed. |
| TP2 (1.80 m)                 | Made Ground to 0.40m depth with brick and mortar fragments, no odours or staining observed.   |
| TP3 (2.00 m)                 | No Made Ground, no odours or staining observed.                                               |
| TP4 (2.10 m)                 | Made Ground to 0.20m depth with brick and mortar fragments, no odours or staining observed.   |

Report on behalf of Admiral UK Contracting Limited

P24-064gi – Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU

| Exploratory Location (Depth) | Visual Contamination and Strata                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------|
| TP5 (2.00m)                  | Made Ground to 0.30m depth with brick, metal, chalk and mortar fragments, no odours or staining observed. |
| TP6 (2.10m)                  | Made Ground to 0.30m depth with brick, mortar and tarmac fragments, no odours or staining observed.       |

### 4.3 Groundwater Conditions

No groundwater was encountered in all the exploration point during the ground investigation to the full depth penetrated of 2.10m bgl.

It should be noted that groundwater levels may vary seasonally and with other factors. The reviewer should satisfy themselves with the groundwater levels at the time of any construction works.

### 4.4 Ground Gas Conditions

The associated PRA indicated that a lower bound risk of contamination from ground gases. Further to this significant organic matter containing natural soils and significant Made Ground soils were not identified beneath the site.

Therefore, given the above the ground gas risk was deemed sufficiently low that ground gas monitoring and risk assessment was not considered necessary on the site at this stage.

### 4.5 Sampling Strategy

Disturbed samples of the strata encountered were recovered at regular intervals within selected exploratory points to the full depth of the investigation for geotechnical laboratory testing.

Samples were also recovered in suitable containers for chemical analysis generally from the top metre of soils from the general site area. Samples were also olfactorily screened for agrichemicals and screened using headspace analysis and a PID for VOCs.

## 5.0 CONTAMINATION ASSESSMENT

### 5.1 Chemical Analysis

A total of 6no. soil samples were sent to an external laboratory to obtain total soil concentrations for a range of priority contaminants.

The suite of analysis was decided based on consultation of the Contamination Exposure Assessment (CLEA) supporting documents and consideration for the former site and surrounding area land uses.

The suite of testing included:

- Asbestos screen, for near surface Made Ground samples
- Metals and Inorganic compounds
- Polyaromatic Hydrocarbons (PAH) USPEA Priority 16 Compounds
- Total Petroleum Hydrocarbons (TPH) EC10-EC40 screen

Results of the chemical analysis are presented in Appendix C.

## 5.2 Human Health Assessment Criteria

The assessment has been carried out in accordance with the Contaminated Land Exposure Assessment (CLEA) methodology as detailed within LCRM 2020.

The assessment criteria employed are based on the proposed school use of the site. For this site, a worst-case conservative proposed land use of 'Residential with Home Grown Produce' will be employed for all areas of the site as there is a potential for the grounds to be used for productive planting.

In March 2014 DEFRA published new guidance detailing the Category 4 Screening Levels (C4SL) system for the classification of contaminated land. The C4SL system was published to assist with revised statutory guidance published in 2012 for Part 2a of the Environmental Protection Act.

It introduces a new four category system for the classification of land under Part 2a where a Significant Possibility of Significant Harm to human health has been concluded. The categories correspond to Category 1 – land where the level of risk is clearly unacceptable, to Category 4 – where the level of risk posed is acceptably low. In short, land that passes the category 4 test “should not be capable of being determined as contaminated land under Part 2a”.

Currently no statutory chemical guidance levels for land and controlled waters contamination exist in the UK. Therefore, the reported soil total contaminants concentrations will be compared to In-House Generic Assessment Criteria (GAC) used as C4SLs.

These In-House GACs are presented in Appendix C and are generally based on the LQM/CIEH S4UL values.

The S4UL values employed are based on a Soil Organic Material (SOM) concentration of 2.5% for the initial screening.

A S4UL has not been published for lead. The GAC value employed has been derived using the DEFRA C4SL<sup>1</sup> toxicological data and exposure parameters and the CLEA Software V1.071:2015.

The C4SL value employed for the lead GAC, for a residential with plant uptake land use scenario, is based on a blood lead level of 3.5ug/dl for the lower level of toxicological concern employing the Integrated Exposure Uptake Biokinetic model (IEBUK) estimated blood lead concentrations in children and employs the exposure parameters within the DEFRA C4SL report.

A minimal risk approach was employed to derive the S4UL values, whereas the C4SL model uses a lower level for risk model, which is deemed generally less conservative than the minimal risk approach. However, the use of a lower level for risk model screening criteria is considered strongly precautionary and is generally considered appropriate for use within the planning regime.

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<sup>1</sup> DEFRA SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Final Project Report (Revision 2) 2014

However, with consideration of the C4SL and S4UL values there still remains some gaps in the available chemical and/or toxicological data for non-priority contaminants and therefore a limited number of previously used CLEA SGVs and ICRL guideline values have been retained and include those for pH, sulphide, sulphur and water-soluble boron.

Should an exceedance be noted when site priority contaminant concentrations are compared to the employed GACs, site specific assessment criteria can be derived using CLEA software or similar human health risk assessment software. This can also include consideration of bio-availability of the contaminants if required.

Further to the above, samples of near surface Topsoil and Made Ground are generally screened for asbestos presence. Generic assessment criteria do not exist currently for asbestos presence in soil within the UK. Therefore, where asbestos is identified in soil it is recommended that further risk assessment be carried out by suitably qualified and registered persons.

### **5.3 Groundwater Assessment Criteria**

A detailed controlled water risk assessment was outside the scope of this report. However, significant widespread or suspected readily leachable contamination was not encountered in the shallow soils which suggest that a low risk is posed to any controlled water or aquifer within the site environ.

## **6.0 GENERIC HUMAN HEALTH SITE CONTAMINATION RISK ASSESSMENT**

Statistical analysis of the data set is carried out employing the statistical method detailed in CL:AIRE Document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration', if exceedances are noted on individual comparison of the contaminant concentrations to the employed assessment criteria, which allows a derivation of a true mean concentration ( $\mu$ ).

The statistical analysis also assesses if the data is normally distributed and considers high levels to determine if they are part of the underlying data set due to 'site wide contamination' or due to contamination 'outliers'.

The statistical analysis derives a 95<sup>th</sup> percentile upper confidence limit of  $\mu$  for each determinands for comparison to the suitable employed guidance level (GAC) or 'Critical Concentration (Cc)'.

The reported soil sample total contaminant concentrations data set was placed into a single averaging area for assessment. Further to the statistical analysis the chemical results were compared individually to the relevant GACs.

### **6.1 Total Soil Concentrations – Shallow Soils <1.0m Depth**

The priority contaminant concentrations from the 6no. samples of Made Ground and natural soils from shallow soils analysed, and a summary of the results are presented in Appendix C and are detailed in the following section.

## Heavy Metals

The comparison of the reported heavy metal concentrations within the shallow soil samples analysed indicated 95<sup>th</sup> percentile upper confidence limit of  $\mu$  concentration for the determined lead which was in excess of the employed Residential with Home Grown Produce GACs.

Individual comparison of the reported heavy metal priority determinand concentrations within the samples analysed was carried out. This indicated exceedances for lead within near surface soils in three locations, namely shallow Made Ground in TP1, TP2 and TP4. The exceedances are detailed below.

The data set for copper and zinc were also compared to their respective phototoxicity guidance criteria. This noted elevated zinc concentrations when compared to the phytotoxicity assessment criteria.

The exceedances are detailed below.

### Heavy Metal Exceedances

| Determinand          | Assessment Criteria (mgkg <sup>-1</sup> ) | Location and Depth (m bgl) (strata)             | Maximum Reported Concentration (mgkg <sup>-1</sup> ) | 95th Percentile Upper Confidence Limit (mgkg <sup>-1</sup> ) |
|----------------------|-------------------------------------------|-------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------|
| Lead                 | 190                                       | TP1 0.10 (MG)<br>TP2 0.20 (MG)<br>TP4 0.10 (MG) | 850<br>460<br>220                                    | 489                                                          |
| Zinc (phytotoxicity) | 330                                       | TP1 0.10 (MG)<br>TP2 0.20(MG)<br>TP4 0.10 (MG)  | 860<br>1500<br>510                                   | 904                                                          |

## Hydrocarbons

The comparison of the reported hydrocarbon concentrations within the shallow soil samples analysed indicated 95<sup>th</sup> percentile upper confidence limit of  $\mu$  concentrations which were in excess of the employed Residential with Home Grown Produce GACs for Total TPH.

Individual comparison of the reported hydrocarbon priority determinand concentrations within the samples analysed was carried out. This indicated elevated Total TPH and PAH indicative compounds Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(a,h)anthracene which were in exceedance when compared to the relevant Residential with Home Grown Produce GACs employed. The noted elevated TPH and PAH indicative compound concentrations are attributed to macadam fragments with the shallow soils sampled.

On site assessment of the arisings was undertaken using a PID with a 10.6eV bulb calibrated prior to use with 100ppm isobutylene did not indicate any detectable VOCs. Olfactory assessment of the samples recovered indicated no identifiable odourous contamination.

### Hydrocarbon Exceedances

| Determinand            | Assessment Criteria<br>(mgkg <sup>-1</sup> ) | Location and Depth<br>(m bgl)<br>(strata) | Maximum Reported Concentration<br>(mgkg <sup>-1</sup> ) | 95 <sup>th</sup> Percentile Upper Confidence Limit<br>(mgkg <sup>-1</sup> ) |
|------------------------|----------------------------------------------|-------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------|
| Benzo(b)fluoranthene   | 3.3                                          | TP6 0.10m                                 | 11                                                      | 5.75                                                                        |
| Benzo(a)pyrene         | 2.7                                          | TP6 0.10m                                 | 12                                                      | 5.73                                                                        |
| Dibenzo(a,h)anthracene | 0.28                                         | TP6 0.10m                                 | 2.2                                                     | 1.06                                                                        |

### Other Priority Contaminants

The comparison of the reported total other priority contaminant concentrations within the shallow soil samples analysed indicated 95<sup>th</sup> percentile upper confidence limit of  $\mu$  concentrations which were below the relevant Residential with Home Grown Produce GACs employed for all determined.

Olfactory screening of the shallow samples did not indicate any significant odorous agrichemical concentrations.

### Asbestos

Analysis for the presence of asbestos was also carried out on all near surface Topsoil and Made Ground samples. This did not indicate any asbestos containing material or loose fibres to be present in any samples analysed.

The laboratory testing results are included within Appendix C.

## 6.2 Controlled Groundwater Risk Assessment

A detailed controlled water risk assessment was outside the scope of this report. However, significant widespread or suspected readily leachable contamination was not encountered in the shallow soils which suggest that a low risk is posed to any controlled water or aquifer within the site environ.

## 6.3 Ground Gas Risk Assessment

The associated PRA indicated that a lower bound risk of contamination from ground gases. Further to this, no significant organic matter containing natural soils and or significant putrescible Made Ground soils were not identified beneath the site.

Therefore, given the above the ground gas risk was deemed sufficiently low that ground gas monitoring and risk assessment was not considered necessary on the site at this stage.

#### **6.4 Potable Water Supply Pipe**

Guidance on the type of potable water supply pipe to be employed on residential development sites is given by UKWIR, who have published guidance for the type of potable water supply pipework to be employed for new structures on reused land.

Samples were recovered from shallow depth on the site in Made Ground and natural soils which extend below suspected pipe burial depths (c. 0.70m – 1.00m depth). These samples were analysed for a suite of contaminants which are considered to be in accordance with the UKWIR requirements. The analysis results indicated elevated concentrations of hydrocarbon determinands within the samples of shallow soil analysed.

Therefore, conventional PE pipe may not be suitable for the potable water supply pipework on the site and consideration should be given to the use of barrier pipe or removal of the impacted soils.

The classification will be decided by the local water company and their advice should be sought prior to the laying of any potable water supply pipework. The local water company may require further, more detailed sampling, testing and assessment prior to pipe selection.

All pipework should be laid in corridors of clean soil as best practice.

#### **6.5 Site Contamination Assessment Discussion**

Elevated heavy metal, phototoxic zinc, Total TPH and PAH indicative compound priority contaminant concentrations were identified in TP1, TP2, TP4, TP5 and TP6 across the area investigated when compared to the conservative Residential with Home Grown Produce land use scenario assessment criteria employed. These elevated concentrations were identified in shallow Made Ground soils noted to be impacted with macadam fragments and deleterious materials such as metal and brick, which are considered the likely source of the elevated priority contaminant concentrations.

Asbestos was not identified in any samples subjected to testing.

Further to the above, soil samples with exceeding values are within 0.50m of the existing site surface, therefore it is expected that general site strip will remove these soils for the area where the new building will be erected (TP3 – TP6) and it is considered likely these soils are destined for offsite disposal.

In area of the site where is proposed to have private residential garden, the contamination identified within the soft landscaped areas are considered to pose an unacceptable risk to the proposed highly sensitive residential end site users. Therefore, risk reduction or remediation works are considered necessary in relation to soil contamination on the site to ensure the site is suitable for the proposed end use.

Notwithstanding the above assessment, if any unexpected or previously unidentified contamination is discovered during the site development works, a suitably qualified and experienced person should be contacted so any further assessment required can be carried out.

## 6.6 Updated Conceptual Site Model

An assessment of the risk posed by the identified contaminant concentrations has been carried out employing the Source-Pathway-Receptor (S-P-R) methodology detailed within the CLEA methodology.

### Updated SPR Flowchart

| Potential On-Site Contaminant Sources                                                                                                                                               | Potential Pathways                                       | Potential Receptors                               | Pathway Complete |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|------------------|
| <b>Elevated heavy metals, TPH and PAH indicative compound concentrations in shallow Made Ground in TP1, TP2, TP4 , TP5 and TP6.</b><br><br><b>No putrescible soils encountered.</b> | Dermal/Direct Contact                                    | Current site users                                | No               |
|                                                                                                                                                                                     | Direct Ingestion                                         |                                                   | No               |
|                                                                                                                                                                                     | Direct Inhalation                                        |                                                   | No               |
|                                                                                                                                                                                     | Inhalation of Radon Gas                                  |                                                   | No               |
|                                                                                                                                                                                     | Inhalation of Wind Blown Dust                            |                                                   | No               |
|                                                                                                                                                                                     | Vapour Migration                                         |                                                   | No               |
|                                                                                                                                                                                     | Gas Migration                                            |                                                   | No               |
|                                                                                                                                                                                     | Dermal/Direct Contact                                    | Future site users (residential with plant uptake) | Yes              |
|                                                                                                                                                                                     | Direct Ingestion                                         |                                                   | Yes              |
|                                                                                                                                                                                     | Direct Inhalation                                        |                                                   | Yes              |
|                                                                                                                                                                                     | Inhalation of Radon Gas                                  |                                                   | No               |
|                                                                                                                                                                                     | Inhalation of Wind Blown Dust                            |                                                   | Yes              |
|                                                                                                                                                                                     | Vapour Migration                                         |                                                   | No               |
|                                                                                                                                                                                     | Ground Gas Migration                                     |                                                   | No               |
|                                                                                                                                                                                     | Direct Contact                                           | Services (following redevelopment)                | Yes              |
|                                                                                                                                                                                     | Migration of Contaminants – Non-Aqueous Phased           |                                                   | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Aqueous Phased               |                                                   | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Non-Aqueous Phased           | Adjacent Properties                               | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Aqueous Phased               |                                                   | No               |
|                                                                                                                                                                                     | Vapour Migration                                         |                                                   | No               |
|                                                                                                                                                                                     | Inhalation of Wind Blown Dust                            | Ecological Impacts                                | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Non-Aqueous Phased           |                                                   | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Aqueous Phased               |                                                   | No               |
|                                                                                                                                                                                     | Migration of Contaminants from site – Non-Aqueous Phased | Controlled groundwater                            | No               |
|                                                                                                                                                                                     | Migration of Contaminants from site – Aqueous Phased     |                                                   | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Non-Aqueous Phased           | Surface Waters                                    | No               |
|                                                                                                                                                                                     | Migration of Contaminants – Aqueous Phased               |                                                   | No               |

The risk to construction workers has not been assessed as generally any risks posed to site construction workers from identified contamination can be mitigated through good site practices and robust sitework risk assessment following guidance stated in CIRIA Report 132: 'A Guide for Safe Working on Contaminated Sites' and CIRIA Report C741: 'Environmental Good Practice on Site' during development works. Adequate standard personal protective equipment should be available, and the implementation of basic hygiene measures should be ensured.

Works carried out on sites where asbestos fibres have been identified **must** be carried out by a suitable contractor and a site specific Health and Safety Plan for site construction workers must be produced in line with CAR 2012<sup>2</sup>.

## 7.0 FOUNDATION DESIGN CRITERIA

### 7.1 Geotechnical Laboratory Testing

Representative samples were sent to an external laboratory following visual assessment and logging of the trial pit and borehole arisings. The testing programme was designed to classify the properties of the encountered soils and to determine the chemistry of the soil in relation to the design of buried concrete.

#### 7.1.1 Atterberg Limits

The results of 4no. Atterberg Limit determinations carried out on samples of fine-grained weathered Head Deposits and Chalk soils encountered are presented in Appendix E.

The soils tested have been assessed for their volume change potential (VCP) in accordance with NHBC Standards Chapter 4.2 and are detailed in the table below.

#### Atterberg Limit Testing

| Exploratory Point and Strata | Depth (m) | Natural Moisture Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | % Passing 0.425mm | NHBC Modified Plasticity Index | NHBC Volume Change Potential |
|------------------------------|-----------|------------------------------|------------------|-------------------|----------------------|-------------------|--------------------------------|------------------------------|
| TP3 (HD)                     | 0.50      | 21.9                         | 41               | 20                | 21                   | 83                | 17                             | Low                          |
| TP4 (HD)                     | 1.00      | 16.1                         | 61               | 26                | 35                   | 19                | 7                              | Non Shrinkable               |
| TP5 (HD)                     | 1.50      | 11.5                         | 69               | 28                | 41                   | 24                | 10                             | Low                          |
| TP6 (CH)                     | 2.00      | 15.3                         | 36               | 17                | 19                   | 37                | 7                              | Non Shrinkable               |

Note:

HD Head Deposits  
CH Chalk

<sup>2</sup> Control of Asbestos Regulations 2012

The 3no. samples of fine-grained portion of the Head Deposit soils have Modified Plasticity Indices of between 7% to 17% and therefore can be classified as being Non-Shrinkable to low Volume Change Potential employing the NHBC classification scheme, while deeper sample of the Weathered Chalk can was confirmed as non-shrinkable.

On this basis the Head Deposit soils should be categorised as **Low VCP** as a worst-case scenario for design purposes and the Weathered Chalk was confirmed as Non-Shrinkable.

### 7.1.2 Natural Moisture Content

Testing was performed to determine the natural moisture content (NMC) of the samples subjected to Atterberg Limit testing. These results are presented in the Laboratory Test Result Summaries in Appendix E.

### 7.1.3 pH and SO<sub>x</sub>

The level of pH, sulphate and other determinands within the BRE SD1 Suite have been determined for selected samples for a range of depths within the encountered soils from above to below the proposed likely foundation invert level to assess the appropriate Design Sulphate Class for buried concrete in accordance with BRE Special Digest 1 Table 2. The results of the analysis are presented in Appendix C.

The table below summarises the reported pH values, Total Sulphate and 2:1 Water Soluble Sulphate concentrations.

#### Design Sulphate Class for Site

| Exploratory Point (Strata)                        | TP3         | TP4         | TP5         | TP6         |
|---------------------------------------------------|-------------|-------------|-------------|-------------|
| Depth                                             | 1.50        | 2.00        | 0.50        | 1.00        |
| pH                                                | 8.4         | 8.4         | 8.5         | 8.0         |
| Total Sulphate (%)                                | 0.054       | 0.041       | 0.037       | 0.022       |
| Water Soluble Sulphate (2:1 Water Extract) (mg/l) | 11.1        | 11          | 12.2        | 9.66        |
| Appropriate Design Sulphate Class                 | <b>DS-1</b> | <b>DS-1</b> | <b>DS-1</b> | <b>DS-1</b> |

The Design Sulphate Class was relatively consistent beneath the site and with a worst-case Design Sulphate Class of **DS-1** for the soils encountered.

A worst case Aggressive Chemical Environment for Concrete (ACEC) site classification is **AC-1s** for the soils, assuming static groundwater.

The assessment assumes that all of the Total Sulphate (%) is in a suitable form that following ground disturbance could oxidise.

#### **7.1.4 Particle Size Distribution**

Particle Size Distribution (PSD Wet sieved) testing was carried out on 1no. composite sample of the coarse grained Head Deposits.

The results of the PSD testing indicate a fines ( $\phi < 0.063\text{mm}$ ) content of 28% for the coarse grained Head Deposit.

Soils with a fines content of less than 35% can be considered as non-plastic and hence non-shrinkable with associated volume change potential as outlined in NHBC and LABC guidance.

#### **7.2 In-Situ Testing**

Due to the relatively high gravel size content of any fine grained soils encountered, Hand Shear Vane testing was not possible to assess the shear strength of any fine-grained soils encountered.

In situ soil strength testing was not carried out on the soils encountered beneath the site. The soil strengths and densities quoted on the trial pit logs are based on logging of trial pits and arisings only and are accordingly estimates only.

The allowable bearing capacity for chalk is acceptable settlement related and based on the Chalk grading. To keep settlement within allowable levels the allowable bearing capacity for the structureless matrix dominated (CIRIA Grade Dm) chalk encountered is in the order of 125kPa for low density Chalk as detailed within CIRIA C574.

### **8.0 ENGINEERING EVALUATION**

#### **8.1 Introduction**

The proposed development scheme involves the demolition of existing buildings followed by the erection of one detached 4-bed dwelling with integral garage including parking and landscaping.

A proposed development plan is presented within Appendix A.

#### **8.2 Foundation Design Considerations**

The geology beneath the site generally indicated Topsoil or Made Ground overlying Superficial Head Deposit over Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated).

Topsoil was encountered only in exploratory points TP3 to depth of 0.30m bgl. Made Ground was encountered in all other exploratory points to a depth of between 0.20m and 0.60m bgl.

Beneath the Topsoil or Made Ground are Head Deposits soils which are generally fine grained with a coarse grained unit encountered in the majority of exploration point, except TP2 and TP3, at depths of between 1.20m and 2.00m bgl. The fine grained unit can be described generally as firm brown very gravelly sandy CLAY with gravel of fine to coarse subangular to subrounded flint. The coarse grained unit can generally be described as a loose to medium dense brown very clayey sandy fine to coarse subangular to subrounded GRAVEL of flint.

Weathered Holywell Nodular Chalk Formation and New Pit Chalk Formation was encountered at the base of all the exploration point except TP1 and can be described as Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint.

***As the trial pits were terminated at a shallow depth the Chalk succession was not proven, we have necessarily considered the material encountered as Chalk but it is recommended that deeper exploratory work be undertaken to ensure that the material encountered is the top of the Chalk stratum before the detailed design stage.***

Occasional to frequent roots and rootlets were observed within all the exploratory points except trial pit TP5, generally within the near surface Topsoil and Made Ground extending to a maximum depth of c.0.50m bgl. Roots of up to 10mm of diameter at depth of 1.00m bgl were encountered within exploration point TP2.

No groundwater was encountered in all the exploration point during the ground investigation to the full depth penetrated of 2.10m bgl. It should be noted that groundwater levels may vary seasonally and with other factors. The reviewer should satisfy themselves with the groundwater levels at the time of any construction works.

The Head Deposit soils should be categorised as **Low** VCP as a worst-case scenario for design purposes and the Weathered Chalk was confirmed as Non-Shrinkable.

Insitu soil strength testing was not carried out on the soils encountered beneath the site. The soil strengths and densities quoted on the trial pit logs are based on logging of trial pits and arisings only and are accordingly estimates only.

The allowable bearing capacity for chalk is acceptable settlement related and based on the Chalk grading. To keep settlement within allowable levels the allowable bearing capacity for the structureless matrix dominated (CIRIA Grade Dm) chalk encountered is in the order of 125kPa for low density Chalk as detailed within CIRIA C574.

### **8.3 New Structure Foundation Design Criteria**

#### **8.3.1 Building Near Trees Assessment**

No arboricultural reports or plans have been provided for the site at the time of writing this report to determine the species and height of trees on site that are potentially within influencing distance of the proposed structures. Based upon site observations various mature and semi-mature deciduous and coniferous trees are generally present to the north and west of the site and in the approximate centre of the site are a number of large stumps from felled trees, aerial photography and Google images show the site to be generally covered with mature tree canopies, likely those whose stumps remain in the approximate centre of the site, however, this would need to be confirmed when a survey detailing species and location is available.

The superficial Head Deposit soils have been identified as a worst case Low VCP from Atterberg Limit testing and the Weathered Chalk was confirmed as Non-Shrinkable.

Given this, a detailed assessment of minimum foundation depths and tree influence zones should be confirmed at detailed design and when an accurate tree survey including details of species and location has been produced. Given the trees present currently and recently on the site, minimum foundation depths may be significant, therefore, foundations could to be deepened to bear onto the Chalk strata encountered from c. 1.80m depth.

Where foundations lay outside the zone of influence of any trees the minimum foundation depth of 1.00m bgl is recommended to be considerate of restrictive new planting given the worst case Low VCP soils encountered beneath the site.

### **8.3.2 Excavations**

Excavations should be readily achieved within the near surface soils using conventional plant.

No groundwater was encountered in all of the exploratory points during the ground investigation to a depth of 2.10m bgl.

It should, however, be noted that groundwater tables can fluctuate both seasonally and rapidly during inclement weather. The reviewer should satisfy themselves with the groundwater levels at the time of any construction works.

All exploration points remained stable during and immediately after excavation.

Given the above, provision for dewatering and groundwater control is considered unlikely except at time of inclement weather.

At no time should any excavations be entered by personnel without correct shoring and only after an assessment of whether the task can be completed without entry to the excavation has been completed.

### **8.3.3 Ground Floor Slabs**

Where fine grained material or Made Ground are present below proposed floor slabs, then the use of ground bearing floors is not recommended for **movement sensitive structures** as detailed in Section 5.1 of the NHBC Standards.

## **8.4 Foundation Options Discussion**

Conventional foundations, such as spread and isolated pads, placed into Made Ground, variable or soft soils are generally subjected to increased risk of settlement, especially differential settlement.

Conventional spread foundations (strips / pads) are considered suitable across the site, founding within the natural Head Deposit soils at a depth of at least 1.00m bgl assuming a worst case Low VCP across the site.

Given the Low VCP of the Head Deposit soils encountered, this depth will also be considerate of restrictive new planting. However, notwithstanding the above, the requirement for a detailed Building Near Trees assessment should be fully considered prior to detailed design.

*Therefore, given the above assessment it is considered that conventional foundations may be suitable across the site. The foundation depths in areas where within the influence of trees should be based on a detailed building near trees assessment if it is found that trees are within influencing distance. Given the recently felled trees on the centre of the site and the related potentially desiccated soils, foundations depths may be significant, therefore, it may be prudent to construct foundations to bear onto the Chalk strata encountered from 1.80m bgl.*

*Further to this, as the trial pits were terminated at a shallow depth, a sufficient depth of the Chalk succession was not considered to be proven, therefore, we have necessarily considered the material encountered at the base of the trial pits as Chalk for this assessment, but it is recommended that deeper exploratory work be undertaken to ensure that the material encountered is the top of the Chalk stratum before the detailed design stage.*

It is recommended that all foundation footings are inspected by a suitably qualified person to confirm suitability of the founding material.

Alternative deeper foundations, such as piled solution would also provide a suitable foundation solution, should the building near trees assessment indicate the requirement for deeper foundations.

The above foundation options and design approaches are subject to detailed Structural Engineer design and regulator agreement.

## **8.5 Bearing Capacity**

For a conventional spread foundation within the Weathered Holywell Nodular Chalk Formation and New Pit Chalk Formation bedrock at a minimum depth of 1.80m bgl, a conservative allowable bearing capacity would be of the order of **125kPa**.

The allowable bearing capacity for chalk is acceptable settlement related. To keep settlement within allowable levels the allowable bearing capacity for the Structureless matrix dominated Chalk encountered is in the order of 125kPa for low density Chalk as detailed within CIRIA C574.

These estimates further include a factor of safety of 3 against general shear failure and should keep settlements within tolerable limits.

*Any excavations for the footings should be inspected by a suitably qualified person to assess the variability of the soils and groundwater conditions. If, following inspection, the soil conditions differ from those identified within this geotechnical appraisal the recommendations may require reassessment. Any roots, organic matter, and in particular any 'soft/loose' or otherwise unsuitable material encountered at the founding depth should be removed prior to pouring of any concrete.*

## **8.6 Piled Foundations**

In the unlikely event that assessed minimum foundation depths be too deep for conventional foundations or the bearing capacities derived above not be sufficient for the proposed development then consideration of alternative foundation solutions such as piles may provide the required improvement in bearing capacities.

Piled foundations are likely to provide a satisfactory foundation option for the proposed development with piles extending deeper into the underlying Chalk bedrock.

Where trees are removed, depending upon pile types and design, piles should be sleeved within the zone of potential desiccation to prevent uplift forces whilst the ground recovers soil water deficits to stable moisture contents.

A deep borehole with attendant sampling, testing and supplementary ground investigation report will be required to provide a further range of geotechnical parameters and to assist structural engineer and piling contractor with the piled foundation design. The advice of a specialist piling contractor should be sought who can provide an assessment of the suitability of their piles.

### **8.7 Sub-Surface Concrete**

The Design Sulphate Class was relatively consistent beneath the site and with a worst-case Design Sulphate Class of **DS-1** for all soils.

A worst case Aggressive Chemical Environment for Concrete (ACEC) site classification is **AC-1s** assuming static groundwater.

### **8.8 Access Roadways and Parking Areas**

In-situ CBR determinations were carried out at 4no. locations across the site in areas indicated to be access roads and parking areas.

The determinations were carried out using the TRL DCP Light weight penetrometer apparatus. The CBR results have been derived utilising the UK DCP Version 3.1 software for the TRL DCPs and provide a direct correlation in terms of California Bearing Ratio (CBR) value.

The tests were carried out as close to the proposed roadway areas (as indicated on the Illustrative Layout Plan) as possible in areas of soft surfacing currently present on site. The strata in the test locations are considered likely to be deposits of Made Ground to c. 0.30m depth onto fine and coarse grained Head Deposit soils.

The locations of the DCP tests are detailed on the Exploratory Point Location Plan presented in Appendix B.

The results of the DCP testing are presented in Appendix E and are summarised below.

#### TRL DCP CBR Results:

| Location | Test Depth (m bgl) | Representative CBR Value (%) |
|----------|--------------------|------------------------------|
| DCP01    | 0.11               | 19                           |
|          | 0.58               | 12                           |
|          | 0.87               | 37                           |
| DCP02    | 0.89               | 11                           |
| DCP03    | 0.20               | 5                            |
|          | 0.41               | 22                           |
|          | 0.82               | 9                            |
| DCP04    | 0.09               | 3                            |
|          | 0.87               | 11                           |

The DCP results indicate the ground to be relatively consistent both laterally and with depth, with a general pattern of higher CBR's at shallow and greater depth with lower values between.

CBR values ranged between 3% and 19% within the shallow soils (c. 0.10m – 0.20m bgl) and between 11% and 37% for the deeper soils (c. 0.20m – 0.80m bgl) at exception for DCP03 a depth greater of 0.40m bgl values going down to 9%.

Therefore, given the above results a conservative initial design CBR value of 3% is considered appropriate across the site assuming a formation level of c. 0.30m - 0.60m bgl onto natural Head Deposit soils below any Topsoil or Made Ground.

## 9.0 CERTIFICATION

This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.

The conclusions and recommendations given in this report are based on our understanding of the future plans for the site and based on a scope of works agreed by the Client and afforded by the agreed budget. No responsibility is accepted for conditions not encountered, which are between exploratory points or outside of the agreed scope of work or if construction is commenced before regulatory approval of designs.

If the future plans for the site are changed, such as the site is developed for a more or less sensitive use, then a different interpretation might be appropriate.

The report has been prepared generally following the guidelines and principles established in the British Standards, BS5930:1999+A2:2010, BS 10175:2011, entitled 'Investigation of Potentially Contaminated Sites – Code of Practice' and the DEFRA/EA Contaminated Land Reports CLR7 and CLR8.

It necessarily relies on the co-operation of other organisations and the free availability of information and total access. No responsibility can, therefore, be accepted for conditions arising from information that was not available to the investigating team as a result of information being withheld or access being denied.

This report may suggest an opinion on a suspected configuration of strata or conditions between exploratory points and below the maximum depth of investigation. However, this is for guidance only and no liability can be accepted for its accuracy. Comments on the groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. It should be noted, however, that groundwater levels might vary due to seasonal or other effects.

It should be noted that this report is based solely on the samples collected in the borehole locations investigated. During the works and following general site clearance, should the sub-soil conditions in other areas of the site appear to be inconsistent with those found in the areas sampled then this geotechnical appraisal and site contamination assessment may need to be reviewed.

This report is prepared and written in the context of the proposals stated in the introduction to this report and it should not be used in a differing context. Furthermore, new information, improved practices and changes in legislation may require an alteration to the report in whole or in part after its submission. Therefore, with any changes in circumstances, or after one year from the date of the report, the report should be referred back to Paddock Geo Engineering Limited for re-assessment (and, if necessary, for an estimate for the cost of such).

The copyright of this report and any associated plans and documents prepared by Paddock Geo Engineering Limited is owned by them and should not be reproduced, published or adapted, in whole or part, without their written consent.

## REFERENCES

Investigation of Potentially Contaminated Sites – Code of Practice, British Standards Institution BS 10175:2001.

Code of Practice for Site Investigations, British Standards Institution BS5930: 1999

Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination, R&D Technical Report P5-066/TR, 2000, Environment Agency.

National House-Building Council, NHBC Standards Chapter 4.2 'Building near Trees', 2003

CLR8 Potential Contaminants for the assessment of Land, 2002, DEFRA/Environment Agency.

Health and Safety Executive, Protection of workers and the general public during the development of contaminated land, HMSO, London 1991.

BRE Special Digest 1 'Concrete in Aggressive Ground', 2001.

Contaminated Land Exposure (CLEA) Model version 1.03 developed by the Environment Agency, Department for Environment, Food and Rural Affairs and the Scottish Environment Protection Agency. 2008

CLR7 Assessment of Risks to Human Health from Land Contamination, 2002, DEFRA/Environment Agency.

CLR8 Potential Contaminants for the assessment of Land, 2002, DEFRA/Environment Agency.

Land Contamination: Risk Management (LCRM), 2020, Environment Agency.

Rudland, D., Lancefield, R.M., Mayal, P.N. (2001) Contaminated Land Risk Assessment: A Guide to Good Practice. CIRIA C552. UK.

Method for Deriving Site-Specific Human Health Criteria for Contaminants in Soil, SNIFFER, 2003.

Technical evaluation of the Intervention Values for Soil/Sediment and Groundwater, RIVM Report 711701 023, National Institute of Public Health and the Environment, 2001.

Tonks D M and Whyte I L 'Dynamic soundings in site investigation: some observations and correlations', Proceedings of ICE Geotechnology Conference, Paper 10, 1988.

The Water Supply (Water Quality) Regulations. HMSO. 2000

Code of Practice for Investigation and Mitigation of Possible Petroleum –Based Land Contamination, 1993, Institute of Petroleum, London.

Contaminated Land Management – Ready Reference, J Nathanail, P Bardos and P Nathanail, Land Quality Press, 2002.

BRE Digest 412 'Desiccation in Clay Soils', 1996

DTI/CIRIA Publication 'Engineering in Chalk'

<http://www.silsoerresearch.org.uk/> Silsoe Research Organisation. Viewed July 2007.

Hydrogeological Risk Assessment for Land Contamination Remedial Targets Worksheet, release 3.1 – October 2006

Assessing risks posed by hazardous ground gases to buildings – CIRIA C665, 2007 – Wilson, Oliver, Mallet, Hutchings and Card

Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings - British Standards Institution BS 8485:2015

NHBC & RSK Group publication 'Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present' (March 2007).

Mobilising Natures Army: Monitored Natural Attenuation – dealing with pollution using natural processes, Environment Agency. 2004

Remediation Targets Methodology: Hydrogeological Risk Assessment for Land Contamination, Environment Agency. 2006

BRE Report BR211 - Radon: Protective measures for new dwellings, November 2015

GPLC1 - Guiding Principles for Land Contamination Environment Agency, 2010

Environment Agency Landfill Environmental Permit EPR/FP3399VV

Perimeter soil gas emissions criteria and associated management. Industry Guidance v1.01. BIFFA et al. January 2011

Environment Agency, Briefing Note – Monitoring Frequencies and Non-Compliance Recording

LFTGN03. Guidance on the Management of Landfill Gas. Environment Agency. 2003

Environment Agency, Final R&D Technical Report P1-471 Techniques for the Interpretation of Landfill Monitoring Data – Guidance Notes

## **APPENDIX A – MAPS AND PLANS**

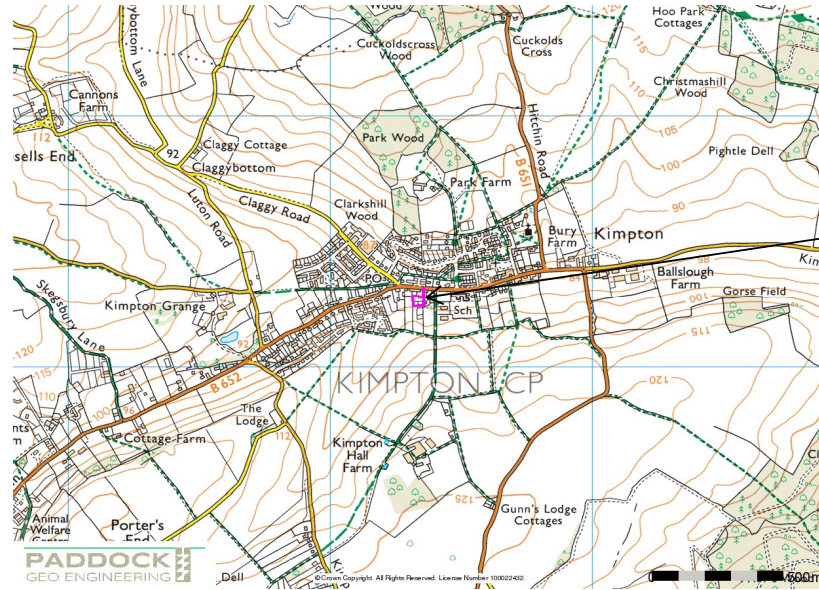
Site Location Plan

Site Plan

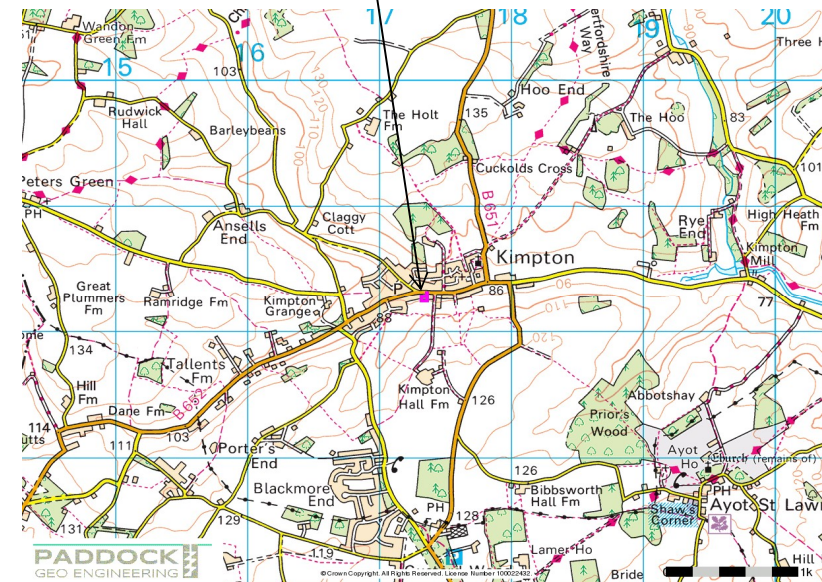
Aerial Photograph

Proposed Development Plans

## SITE LOCATION PLAN



Site Location

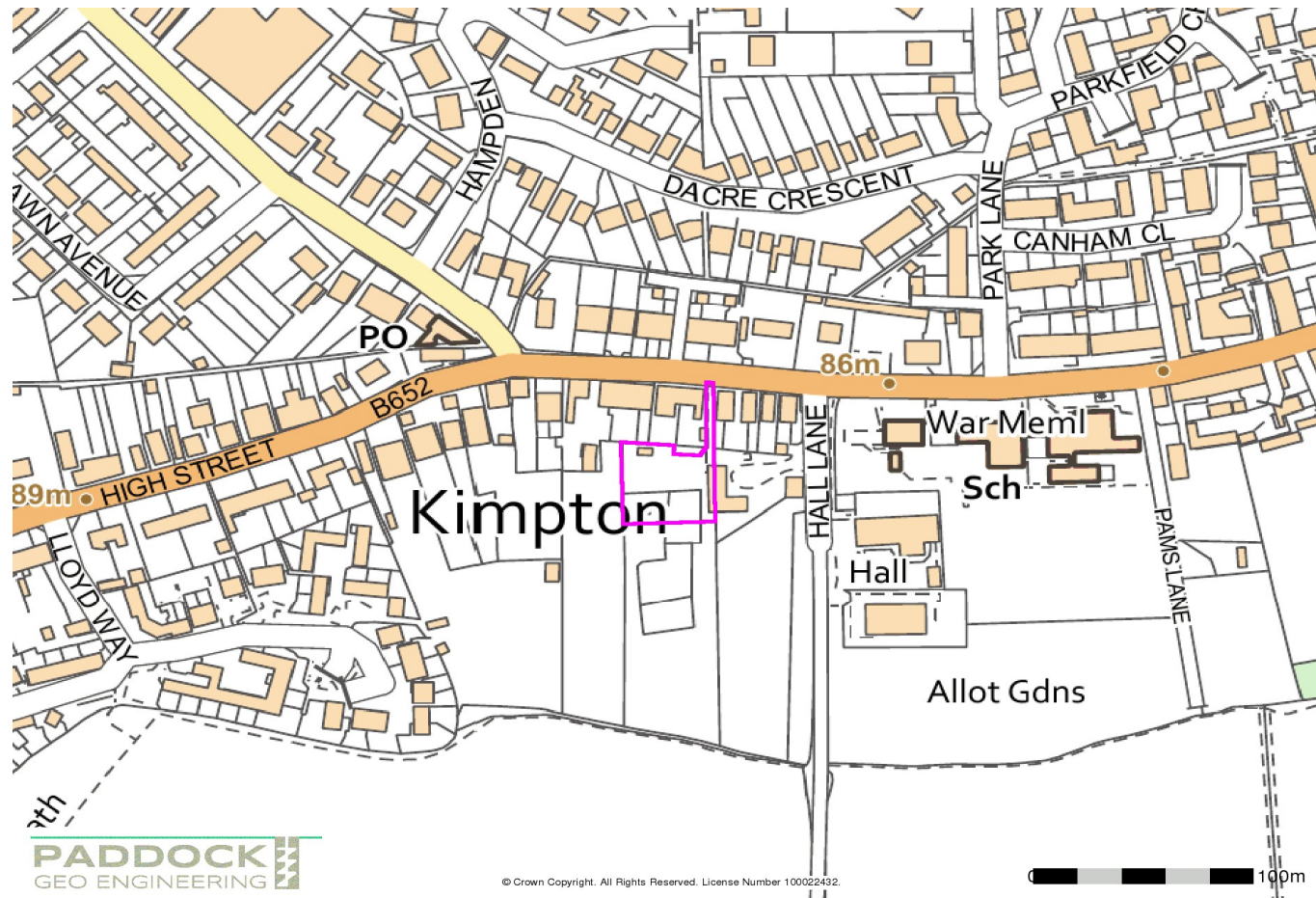


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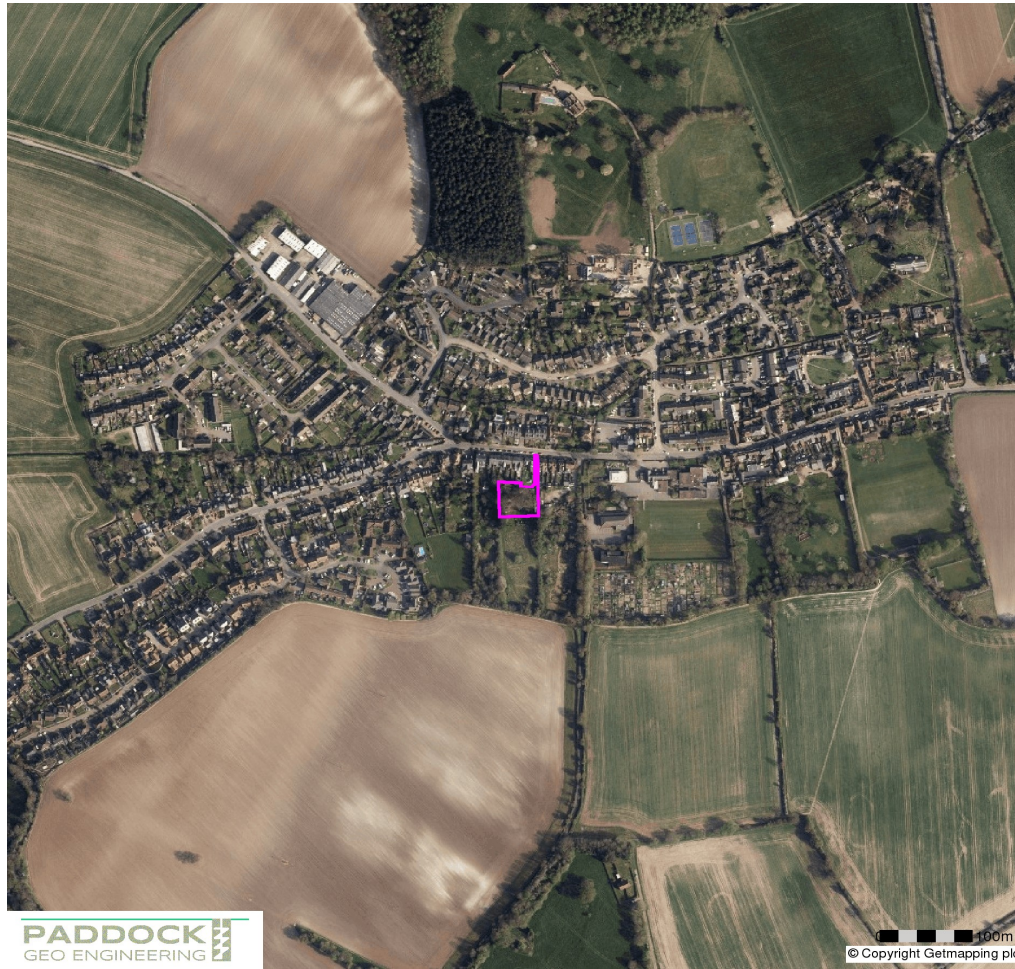
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**PROJECT No:**  
**PROJECT TITLE:**

Admiral UK Contracting Limited  
P24-064  
Land To The Rear Of 61-69, High Street, Kimpton,  
Hertfordshire, SG4 8PU

## SITE PLAN



## AERIAL PHOTOGRAPH



**CLIENT:**

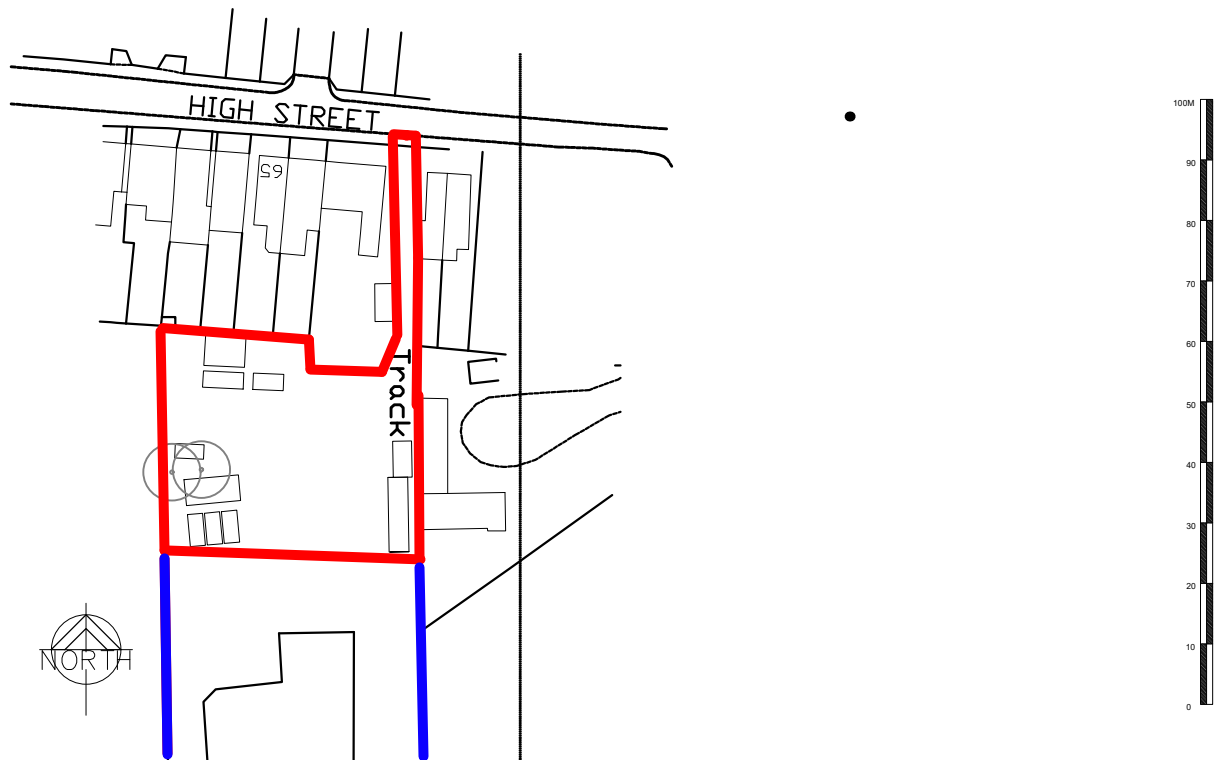
**PROJECT No:**

**PROJECT TITLE:**

Admiral UK Contracting Limited

P24-064

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Hertfordshire, SG4 8PU



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Home Extension Designs

HOME EXTENSION DESIGNS  
HED HOUSE  
60a BRIDGE ROAD EAST  
WELWYN GARDEN CITY  
HERTS AL7 1JU  
tel : 01707 393971  
e:info@hed.co.uk

Project:

LAND SOUTH OF HIGH STREET  
KIMPTON

Drawing Title:

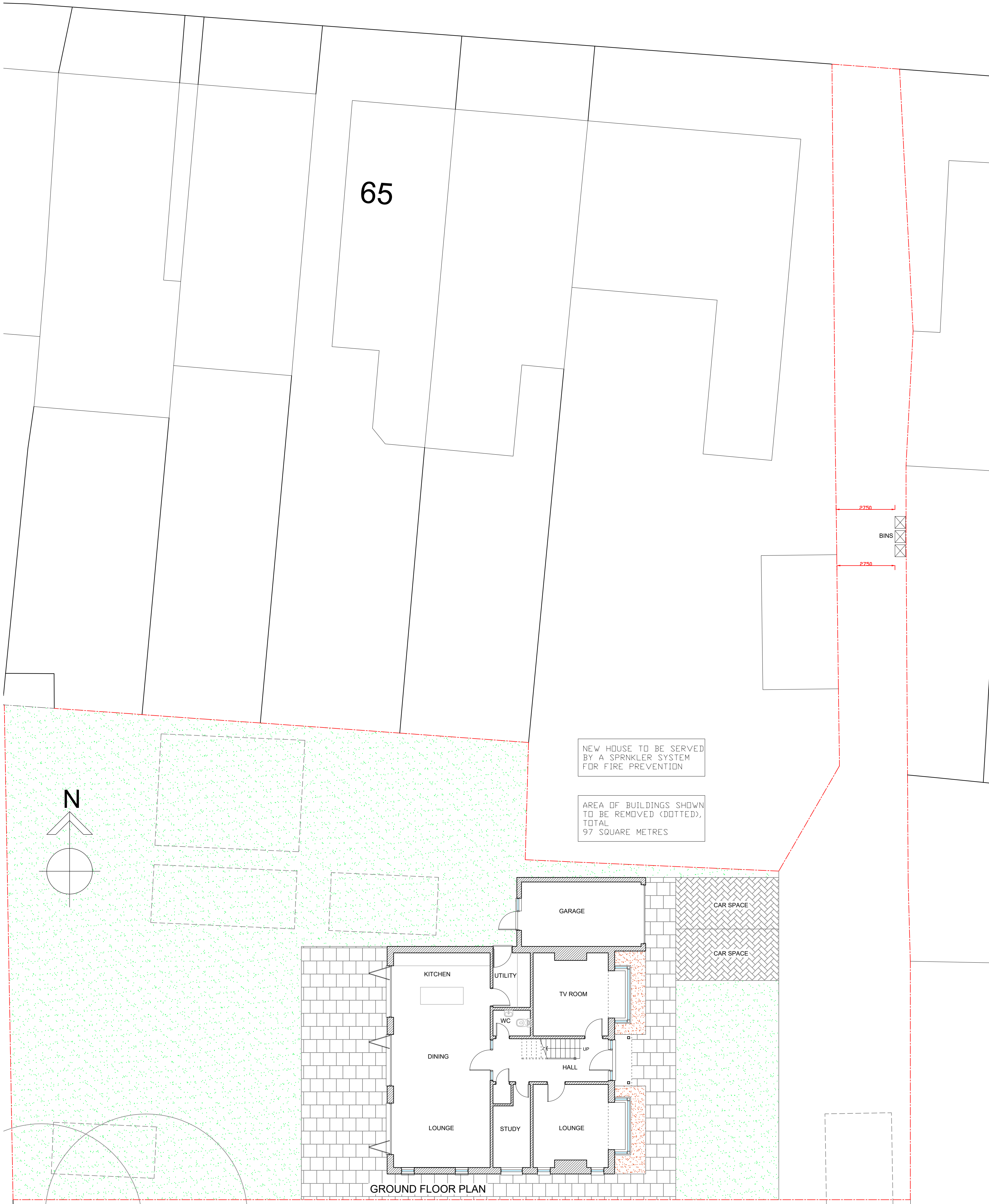
LOCATION PLAN

## LOCATION PLAN

1:1250



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| Drig Status: | PLANNING | Checked:  |        |       |          |
| Drawing No : | 5701-OS1 | Revision: |        |       | B        |



FRONT ELEVATION



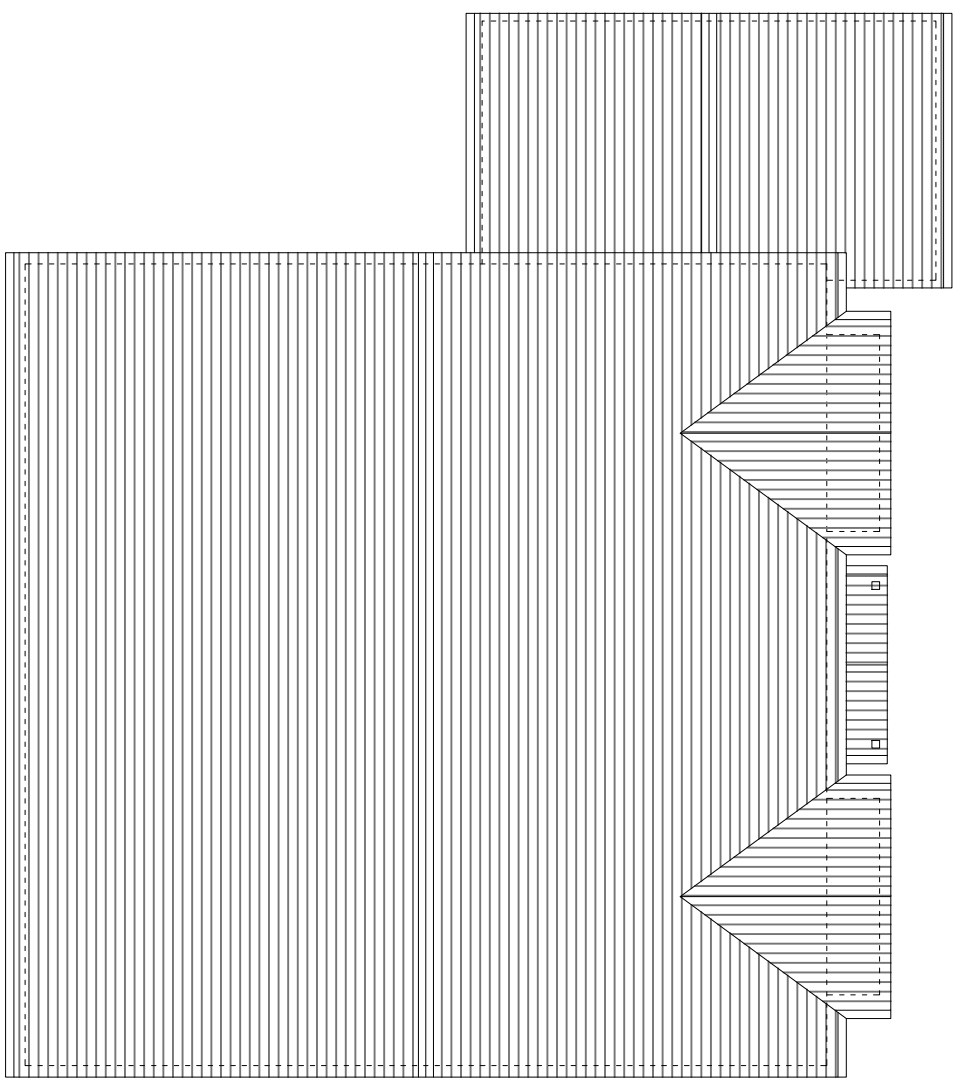
SIDE ELEVATION



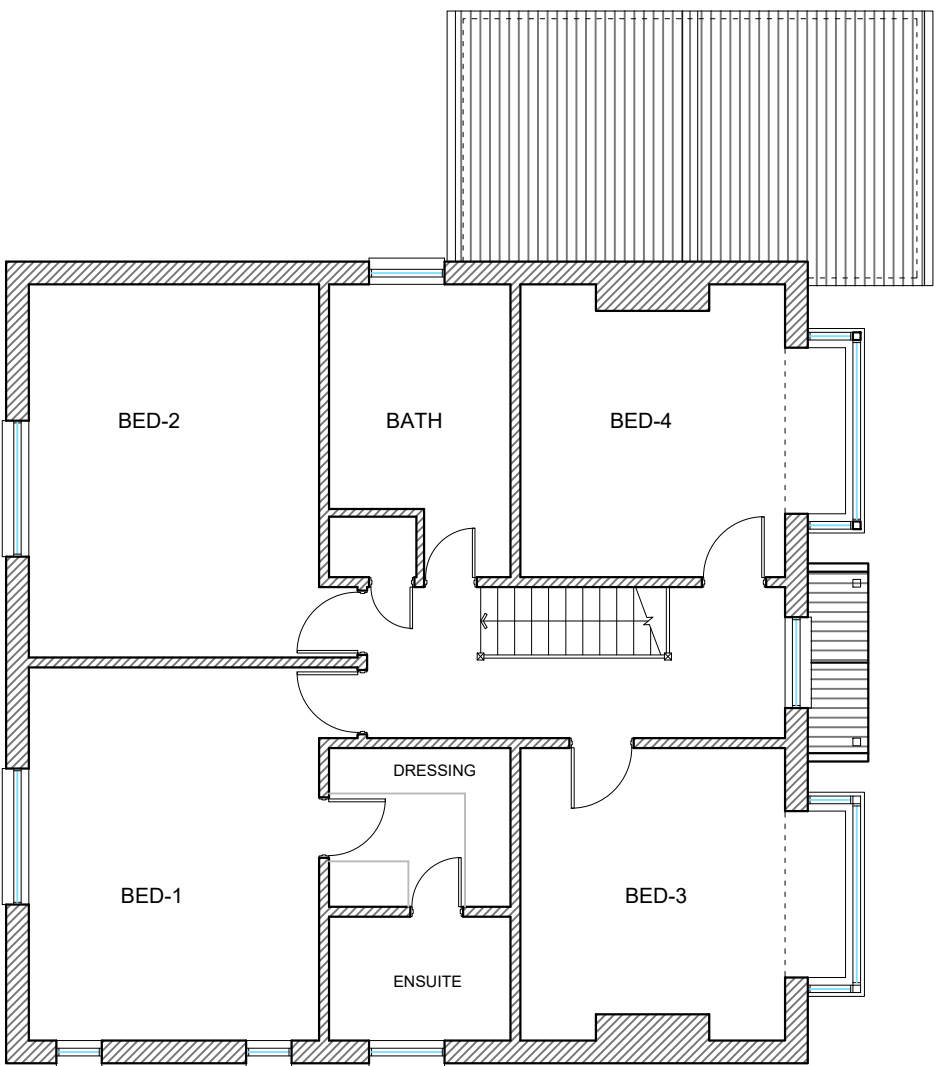
REAR ELEVATION



SIDE ELEVATION



ROOF PLAN



FIRST FLOOR PLAN

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HOME EXTENSION DESIGNS  
HED HOUSE  
60a BRIDGE ROAD EAST  
WELWYN GARDEN CITY  
HERTS AL7 1JU  
tel : 01707 393971  
e:info@hed.co.uk

Project: LAND AT REAR AND SOUTH OF  
61 HIGH STREET  
KIMPTON

Drawing Title: PLANS AND ELEVATIONS  
PROPOSED

|              |          |          |       |           |          |
|--------------|----------|----------|-------|-----------|----------|
| Drawn By:    | ALI      | Scale:   | 1:100 | Date:     | Sep 2023 |
| Orig Status: | PLANNING | Checked: |       | Revision: | E        |
| Drawing No:  | 5838-P01 |          |       |           |          |

## **APPENDIX B – SITE DETAILS**

Exploratory Point Location Plans

Borehole Logs

Trial Pit Logs

Sitework Photographs

**Exploratory Point  
Location Plan**

**Land to the Rear of  
61 High Street, Kimpton,  
Hitchin, Hertfordshire,  
SG4 8PU**

**Admiral UK  
Contracting Limited**

**March 2024**

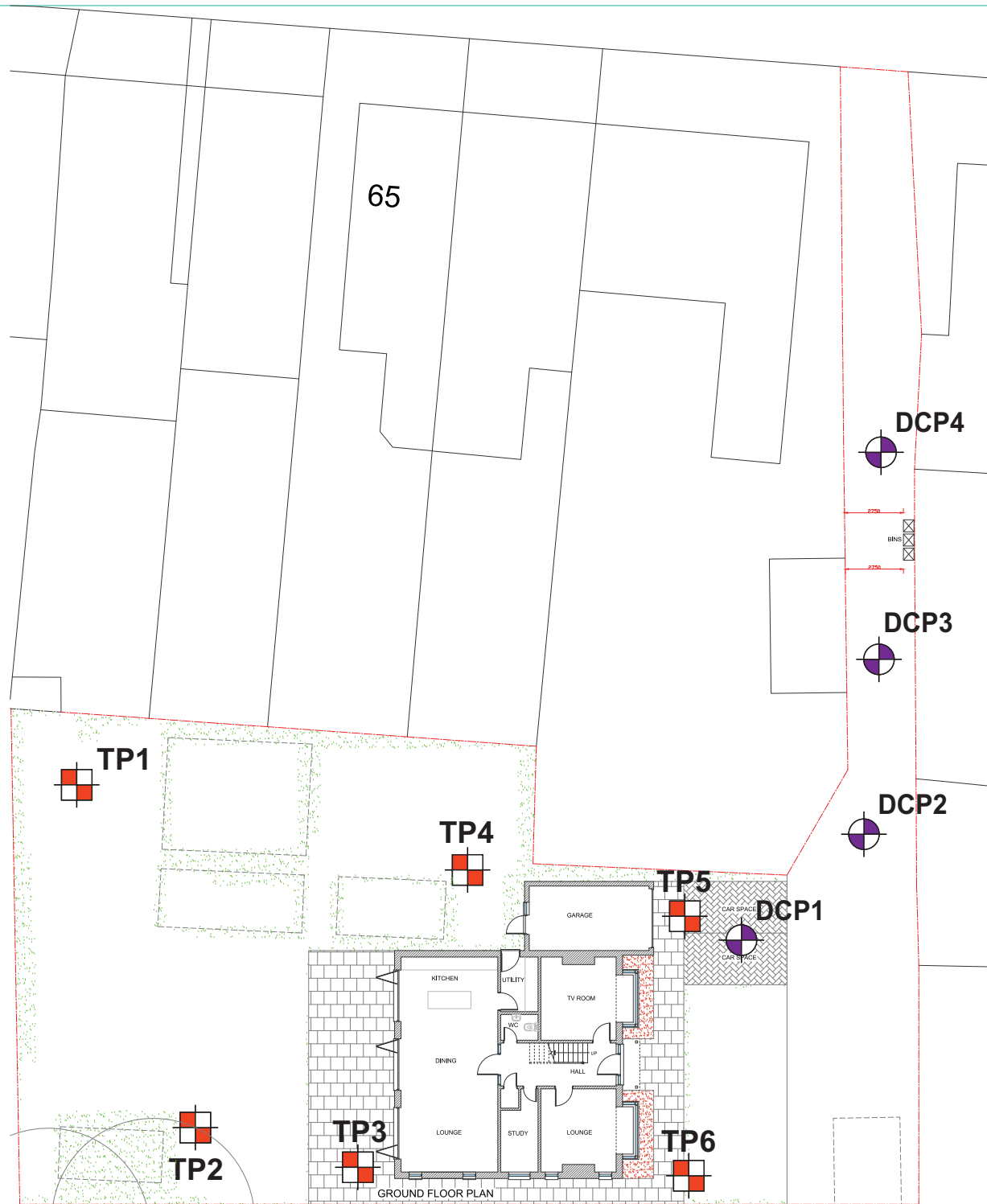


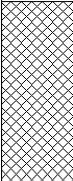
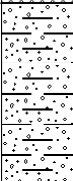
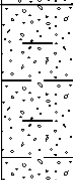
**Trial Pit Locations**



**Dynamic Probe  
Locations**

**Not to scale.  
All positions are approximate.  
Based on Topographic Survey  
Plan provided by the Client.**



|                                                                                     |                       |                                   |                      |                            |                              |                                                                                                                                                                                                                                                                        |                                                                                     |                                       |  |                                  |  |
|-------------------------------------------------------------------------------------|-----------------------|-----------------------------------|----------------------|----------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|--|----------------------------------|--|
|      |                       |                                   |                      |                            |                              | <b>Site</b><br>Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU                                                                                                                                                       |                                                                                     | <b>Trial Pit Number</b><br><b>TP1</b> |  |                                  |  |
| <b>Machine :</b> 3 Tonne Excavator<br><b>Method :</b> Trial Pit                     |                       | <b>Dimensions</b><br>1.50 x 0.30m |                      | <b>Ground Level (mOD)</b>  |                              | <b>Client</b><br>Admiral UK Contracting Limited                                                                                                                                                                                                                        |                                                                                     | <b>Job Number</b><br>P24-064          |  |                                  |  |
|                                                                                     |                       | <b>Location</b>                   |                      | <b>Dates</b><br>15/03/2024 |                              | <b>Engineer</b><br>PGE                                                                                                                                                                                                                                                 |                                                                                     | <b>Sheet</b><br>1/1                   |  |                                  |  |
| <b>Depth (m)</b>                                                                    | <b>Sample / Tests</b> | <b>Water Depth (m)</b>            | <b>Field Records</b> | <b>Level (mOD)</b>         | <b>Depth (m) (Thickness)</b> | <b>Description</b>                                                                                                                                                                                                                                                     | <b>Legend</b>                                                                       | <b>Water</b>                          |  |                                  |  |
| 0.10<br>0.10                                                                        | C<br>D                |                                   |                      |                            | (0.60)                       | Dark grey sandy slightly gravelly loamy CLAY with frequent rootlets and roots up to 10mm diameter. Gravel is fine to coarse subangular to subrounded flint, concrete and occasional brick fragments. (MADE GROUND)                                                     |  |                                       |  |                                  |  |
|                                                                                     |                       |                                   |                      |                            | 0.60<br>(0.60)               | Firm brown very gravelly sandy CLAY with occasional rootlets. Gravel is fine to coarse subangular to subrounded flint. (HEAD)                                                                                                                                          |  |                                       |  |                                  |  |
| 1.00<br>1.00                                                                        | C<br>D                |                                   |                      |                            | 1.20<br>(0.60)               | Loose to medium dense brown very clayey sandy fine to coarse subangular to subrounded GRAVEL of flint. (HEAD)                                                                                                                                                          |  |                                       |  |                                  |  |
|                                                                                     |                       |                                   |                      |                            | 1.80                         | Complete at 1.80m                                                                                                                                                                                                                                                      |                                                                                     |                                       |  |                                  |  |
|  |                       |                                   |                      |                            |                              | <b>Remarks</b><br><br>Soil strength and density estimated from logging only<br>Trial pit back filled with arising<br>No groundwater encountered<br>Trial pit stable upon completion<br>Trial pit terminated at 1.80m depth<br><br><br>Logged in accordance BS5930:2015 |                                                                                     |                                       |  |                                  |  |
|                                                                                     |                       |                                   |                      |                            |                              | <b>Scale (approx)</b><br>1:25                                                                                                                                                                                                                                          |                                                                                     | <b>Logged By</b><br>EA                |  | <b>Figure No.</b><br>P24-064.TP1 |  |
|                                                                                     |                       |                                   |                      |                            |                              |                                                                                                                                                                                                                                                                        |                                                                                     |                                       |  |                                  |  |

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| <div><div>PADDOCK</div><div>GEO ENGINEERING</div></div>             |                           |                                               |                          |                                        | <div>Site</div> <div>Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU</div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <div>Trial Pit Number</div> <div>TP2</div>                                                                                                                                                                          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| <div>Machine : 3 Tonne Excavtor</div> <div>Method : Trial Pit</div> |                           | <div>Dimensions</div> <div>1.50 x 0.30m</div> |                          | <div>Ground Level (mOD)</div>          |                                                                                                                              | <div>Client</div> <div>Admiral UK Contracting Limited</div>                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                     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|                                                                     |                           | <div>Location</div>                           |                          | <div>Dates</div> <div>15/03/2024</div> |                                                                                                                              | <div>Engineer</div> <div>PGE</div>                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                     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| <div>Depth (m)</div>                                                | <div>Sample / Tests</div> | <div>Water Depth (m)</div>                    | <div>Field Records</div> | <div>Level (mOD)</div>                 | <div>Depth (m) (Thickness)</div>                                                                                             | <div>Description</div>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <div>Legend</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <div>Water</div>                         |  |
| <div>0.20</div> <div>0.20</div>                                     | <div>C</div> <div>D</div> |                                               |                          |                                        | <div>(0.40)</div> <div>0.40</div>                                                                                            | <div>Dark grey sandy gravelly clayey loamy SAND with frequent rootlets and roots up to 20mm diameter. Gravel is fine to coarse subangular to subrounded mortar and brick fragments. (MADE GROUND)</div>                                                                                                                                                                                                                                                     | <div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| <div>0.80</div> <div>0.80</div>                                     | <div>C</div> <div>D</div> |                                               |                          |                                        | <div>(1.20)</div> <div>1.60</div> <div>(0.20)</div> <div>1.80</div>                                                          | <div>Firm brown very gravelly sandy CLAY with occasional rootlets. Gravel is fine to coarse subangular to subrounded flint. (HEAD)</div> <div>...Occasional roots up to 10mm diameter noted at 1.00m depth</div> <div>Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint. (WEATHERED HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION)</div> <div>Complete at 1.80m</div> | <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> 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|      |                |                                   |               |                            |                       | <b>Site</b><br>Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU                                                                                                                                                  |                                                                                     | <b>Trial Pit Number</b><br><b>TP3</b> |
|-------------------------------------------------------------------------------------|----------------|-----------------------------------|---------------|----------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|
| <b>Machine</b> : 3 Tonne Excavator<br><b>Method</b> : Trial Pit                     |                | <b>Dimensions</b><br>1.50 x 0.30m |               | <b>Ground Level (mOD)</b>  |                       | <b>Client</b><br>Admiral UK Contracting Limited                                                                                                                                                                                                                   |                                                                                     | <b>Job Number</b><br>P24-064          |
|                                                                                     |                | <b>Location</b>                   |               | <b>Dates</b><br>15/03/2024 |                       | <b>Engineer</b><br>PGE                                                                                                                                                                                                                                            |                                                                                     | <b>Sheet</b><br>1/1                   |
| Depth (m)                                                                           | Sample / Tests | Water Depth (m)                   | Field Records | Level (mOD)                | Depth (m) (Thickness) | Description                                                                                                                                                                                                                                                       | Legend                                                                              | Water                                 |
| 0.10                                                                                | C              |                                   |               |                            | (0.30)                | Dark grey sandy slightly gravelly sandy loamy CLAY with frequent rootlets and roots up to 40mm diameter and frequent ash fragments. Gravel is fine to coarse subangular to subrounded flint. (TOPSOIL)                                                            |  |                                       |
| 0.50                                                                                | D              |                                   |               |                            | 0.30                  | Soft to firm brown slightly gravelly very sandy silty CLAY with occasional rootlets. Gravel is fine to coarse subangular to subrounded flint. (HEAD)                                                                                                              |  |                                       |
|                                                                                     |                |                                   |               |                            | (0.90)                |                                                                                                                                                                                                                                                                   |  |                                       |
| 1.00                                                                                | B              |                                   |               |                            | 1.20                  | ...Becoming gravelly from 1.10m depth                                                                                                                                                                                                                             |  |                                       |
| 1.50                                                                                | D              |                                   |               |                            | (0.80)                | Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint. (WEATHERED HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION)                                                                |  |                                       |
| 2.00                                                                                | D              |                                   |               |                            | 2.00                  | Complete at 2.00m                                                                                                                                                                                                                                                 |  |                                       |
|                                                                                     |                |                                   |               |                            |                       | <b>Remarks</b><br><br>Soil strength and density estimated from logging only<br>Trial pit backfilled with arising<br>No groundwater encountered<br>Trial pit stable upon completion<br>Trial pit terminated at 2.00m depth<br><br>Logged in accordance BS5930:2015 |                                                                                     |                                       |
|  |                |                                   |               |                            |                       | <b>Scale (approx)</b><br>1:25                                                                                                                                                                                                                                     | <b>Logged By</b><br>EA                                                              | <b>Figure No.</b><br>P24-064.TP3      |

|                                                                     |                           |                                               |                          |                                        |                                                                                                                              |                                                                                                                                                                                                                                                                                                                           |                                            |                                          |  |                                              |  |
|---------------------------------------------------------------------|---------------------------|-----------------------------------------------|--------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------|--|----------------------------------------------|--|
| <div>PADDOCK<br/>GEO ENGINEERING</div>                              |                           |                                               |                          |                                        | <div>Site</div> <div>Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU</div> |                                                                                                                                                                                                                                                                                                                           | <div>Trial Pit Number</div> <div>TP4</div> |                                          |  |                                              |  |
| <div>Machine : 3 Tonne Excavtor</div> <div>Method : Trial Pit</div> |                           | <div>Dimensions</div> <div>1.50 x 0.30m</div> |                          | <div>Ground Level (mOD)</div>          |                                                                                                                              | <div>Client</div> <div>Admiral UK Contracting Limited</div>                                                                                                                                                                                                                                                               |                                            | <div>Job Number</div> <div>P24-064</div> |  |                                              |  |
|                                                                     |                           | <div>Location</div>                           |                          | <div>Dates</div> <div>15/03/2024</div> |                                                                                                                              | <div>Engineer</div> <div>PGE</div>                                                                                                                                                                                                                                                                                        |                                            | <div>Sheet</div> <div>1/1</div>          |  |                                              |  |
| <div>Depth (m)</div>                                                | <div>Sample / Tests</div> | <div>Water Depth (m)</div>                    | <div>Field Records</div> | <div>Level (mOD)</div>                 | <div>Depth (m) (Thickness)</div>                                                                                             | <div>Description</div>                                                                                                                                                                                                                                                                                                    | <div>Legend</div>                          | <div>Water</div>                         |  |                                              |  |
| 0.10                                                                | C                         |                                               |                          |                                        | (0.20)<br>0.20                                                                                                               | Dark grey brown slightly gravelly sandy loamy CLAY with frequent rootlets and roots up to 40mm diameter. Gravel is fine to coarse flint, brick and mortar fragments. (MADE GROUND)                                                                                                                                        |                                            |                                          |  |                                              |  |
| 0.50                                                                | B                         |                                               |                          |                                        | (1.00)                                                                                                                       | Soft to firm brown slightly gravelly very sandy silty CLAY with occasional flint cobble and with occasional rootlets. Gravel is fine to coarse subangular to subrounded flint. (HEAD)                                                                                                                                     |                                            |                                          |  |                                              |  |
| 1.00                                                                | D                         |                                               |                          |                                        | 1.20                                                                                                                         | Loose to medium dense brown sandy clayey to very clayey fine to coarse subangular to subrounded GRAVEL and COBBLE of flint. (HEAD)                                                                                                                                                                                        |                                            |                                          |  |                                              |  |
| 1.50                                                                | B                         |                                               |                          |                                        | (0.80)                                                                                                                       |                                                                                                                                                                                                                                                                                                                           |                                            |                                          |  |                                              |  |
| 2.00                                                                | D                         |                                               |                          |                                        | 2.00<br>(0.10)<br>2.10                                                                                                       | Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint. (WEATHERED HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION)                                                                                                                        |                                            |                                          |  |                                              |  |
|                                                                     |                           |                                               |                          |                                        |                                                                                                                              | Complete at 2.10m                                                                                                                                                                                                                                                                                                         |                                            |                                          |  |                                              |  |
|                                                                     |                           |                                               |                          |                                        |                                                                                                                              | <div>Remarks</div> <div>Soil strength and density estimated from logging only</div> <div>Trial pit backfilled with arising</div> <div>No groundwater encountered</div> <div>Minor collapses at the base of the trial pit</div> <div>Trial pit terminated at 2.10m depth</div> <div>Logged in accordance BS5930:2015</div> |                                            |                                          |  |                                              |  |
|                                                                     |                           |                                               |                          |                                        |                                                                                                                              | <div>Scale (approx)</div> <div>1:25</div>                                                                                                                                                                                                                                                                                 |                                            | <div>Logged By</div> <div>EA</div>       |  | <div>Figure No.</div> <div>P24-064.TP4</div> |  |

|                                                                                                                  |  |                                                 |
|------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------|
| <b>Site</b><br>Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU |  | <b>Trial Pit Number</b><br><b>TP5</b>           |
| <b>Machine</b> : 3 Tonne Excavator<br><b>Method</b> : Trial Pit                                                  |  | <b>Client</b><br>Admiral UK Contracting Limited |
| <b>Dimensions</b><br>1.50 x 0.30m                                                                                |  | <b>Job Number</b><br>P24-064                    |
| <b>Location</b>                                                                                                  |  | <b>Engineer</b><br>PGE                          |
| <b>Dates</b><br>15/03/2024                                                                                       |  | <b>Sheet</b><br>1/1                             |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness)  | Description                                                                                                                                                                                                                                    | Legend | Water |
|-----------|----------------|-----------------|---------------|-------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|
| 0.10      | C              |                 |               |             | (0.30)                 | Dark grey brown mottled white slightly gravelly sandy loamy CLAY with occasional rootlets and occasional tarmac and metal fragments. Gravel is fine to coarse subangular to subrounded flint, chalk, brick and mortar fragments. (MADE GROUND) |        |       |
| 0.50      | B              |                 |               |             | (0.80)                 | Soft to firm brown gravelly slightly sandy silty CLAY. Gravel is fine to coarse subangular to subrounded flint. (HEAD)                                                                                                                         |        |       |
| 1.00      | D              |                 |               |             | 1.10                   | Loose to medium dense brown slightly clayey SAND and GRAVEL of flint. Gravel is fine to coarse subangular to subrounded flint. (HEAD)                                                                                                          |        |       |
| 1.50      | B              |                 |               |             | (0.70)                 |                                                                                                                                                                                                                                                |        |       |
| 2.00      | D              |                 |               |             | 1.80<br>(0.20)<br>2.00 | Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint. (WEATHERED HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION)                                             |        |       |
|           |                |                 |               |             |                        | Complete at 2.10m                                                                                                                                                                                                                              |        |       |



|                                                                                                                                                                                                                                                                               |                            |                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------|
| <b>Remarks</b><br><br>Soil strength and density estimated from logging only<br>Trial pit backfilled with arising<br>No groundwater encountered<br>Minor collapses at the base of the trial pit<br>Trial pit terminated at 2.10m depth<br><br>Logged in accordance BS5930:2015 |                            |                                      |
| <b>Scale (approx)</b><br><br>1:25                                                                                                                                                                                                                                             | <b>Logged By</b><br><br>EA | <b>Figure No.</b><br><br>P24-064.TP5 |

|                                                                |                       |                                   |                      |                            |                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                               |                                       |                              |                                      |  |
|----------------------------------------------------------------|-----------------------|-----------------------------------|----------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------|--------------------------------------|--|
| <div><div>PADDOCK</div><div>GEO ENGINEERING</div></div>        |                       |                                   |                      |                            | <b>Site</b><br>Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU                                                                                                                                                              |                                                                                                                                                                                                               | <b>Trial Pit Number</b><br><b>TP6</b> |                              |                                      |  |
| <b>Machine</b> : 3 Tonne Excavtor<br><b>Method</b> : Trial Pit |                       | <b>Dimensions</b><br>1.50 x 0.30m |                      | <b>Ground Level (mOD)</b>  |                                                                                                                                                                                                                                                                               | <b>Client</b><br>Admiral UK Contracting Limited                                                                                                                                                               |                                       | <b>Job Number</b><br>P24-064 |                                      |  |
|                                                                |                       | <b>Location</b>                   |                      | <b>Dates</b><br>15/03/2024 |                                                                                                                                                                                                                                                                               | <b>Engineer</b><br>PGE                                                                                                                                                                                        |                                       | <b>Sheet</b><br>1/1          |                                      |  |
| <b>Depth (m)</b>                                               | <b>Sample / Tests</b> | <b>Water Depth (m)</b>            | <b>Field Records</b> | <b>Level (mOD)</b>         | <b>Depth (m) (Thickness)</b>                                                                                                                                                                                                                                                  | <b>Description</b>                                                                                                                                                                                            |                                       | <b>Legend</b>                | <b>Water</b>                         |  |
| 0.10                                                           | C                     |                                   |                      |                            | (0.30)                                                                                                                                                                                                                                                                        | Grass onto dark grey brown gravelly very sandy CLAY with frequent rootlets and roots up to 80mm diameter. Gravel is fine to coarse subangular to subrounded brick, tarmac and mortar fragments. (MADE GROUND) |                                       |                              |                                      |  |
| 0.50                                                           | D                     |                                   |                      |                            | 0.30                                                                                                                                                                                                                                                                          | Soft to firm brown slightly sandy silty CLAY with occasional fine to coarse subrounded gravel of flint. (HEAD)                                                                                                |                                       |                              |                                      |  |
|                                                                |                       |                                   |                      |                            | (0.80)                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                               |                                       |                              |                                      |  |
| 1.00                                                           | D                     |                                   |                      |                            | 1.10                                                                                                                                                                                                                                                                          | Loose to medium dense brown slightly clayey SAND and GRAVEL of flint. Gravel is fine to coarse subangular to subrounded flint. (HEAD)                                                                         |                                       |                              |                                      |  |
| 1.50                                                           | D                     |                                   |                      |                            | (0.70)                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                               |                                       |                              |                                      |  |
|                                                                |                       |                                   |                      |                            | 1.80                                                                                                                                                                                                                                                                          | Structureless CHALK composed of light brown to cream slightly gravelly sandy SILT with occasional coarse gravel of flint. (WEATHERED HOLYWELL NODULAR CHALK FORMATION AND NEW PIT CHALK FORMATION)            |                                       |                              |                                      |  |
| 2.00                                                           | D                     |                                   |                      |                            | (0.30)                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                               |                                       |                              |                                      |  |
|                                                                |                       |                                   |                      |                            | 2.10                                                                                                                                                                                                                                                                          | Complete at 2.10m                                                                                                                                                                                             |                                       |                              |                                      |  |
|                                                                |                       |                                   |                      |                            |                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                               |                                       |                              |                                      |  |
|                                                                |                       |                                   |                      |                            | <b>Remarks</b><br><br>Soil strength and density estimated from logging only<br>Trial pit backfilled with arising<br>No groundwater encountered<br>Minor collapses at the base of the trial pit<br>Trial pit terminated at 2.10m depth<br><br>Logged in accordance BS5930:2015 |                                                                                                                                                                                                               |                                       |                              |                                      |  |
|                                                                |                       |                                   |                      |                            | <b>Scale (approx)</b><br><br>1:25                                                                                                                                                                                                                                             |                                                                                                                                                                                                               | <b>Logged By</b><br><br>EA            |                              | <b>Figure No.</b><br><br>P24-064.TP6 |  |
|                                                                |                       |                                   |                      |                            |                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                               |                                       |                              |                                      |  |



Photo of the area. Facing south



Photo of the area. Facing west



**Photo of the area. Facing north**



**Photo of the area. Facing east**



**Soil profile of trial pit TP1**



**Soil arisings of trial pit TP1**



**Soil profile of trial pit TP2**



**Soil arisings of trial pit TP2**



**Soil profile of trial pit TP3**



**Soil arisings of trial pit TP3**



**Soil profile of trial pit TP4**



**Soil arisings of trial pit TP4**



**Soil profile of trial pit TP5**



**Soil arisings of trial pit TP5**



**Soil profile of trial pit TP6**



**Soil arisings of trial pit TP6**

## **APPENDIX C – CONTAMINATION ASSESSMENT DATA**

Chemical Analysis Reports

CLEA Analysis Results Summary

Chemical Statistical Analysis Sheets

PGE In-House GACs

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Whaddon Road  
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## **Analytical Report Number : 24-010211**

|                             |                                                                               |                                                        |            |
|-----------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Land to the Rear of 61 High Street,<br>Kimpton, Hitchin, North Hertfordshire, | <b>Samples received on:</b>                            | 20/03/2024 |
| <b>Your job number:</b>     | P24-064 (1)                                                                   | <b>Samples instructed on/<br/>Analysis started on:</b> | 20/03/2024 |
| <b>Your order number:</b>   | P24-064 GI                                                                    | <b>Analysis completed by:</b>                          | 27/03/2024 |
| <b>Report Issue Number:</b> | 1                                                                             | <b>Report issued on:</b>                               | 29/03/2024 |
| <b>Samples Analysed:</b>    | 6 soil samples                                                                |                                                        |            |

**Signed:**

Joanna Wawrzeczko  
Senior Reporting Specialist  
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.  
Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-010211

Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Your Order No: P24-064 GI

| Lab Sample Number                       | 150673        | 150674             | 150675               | 150676        | 150677        |
|-----------------------------------------|---------------|--------------------|----------------------|---------------|---------------|
| Sample Reference                        | TP1           | TP2                | TP4                  | TP5           | TP5           |
| Sample Number                           | None Supplied | None Supplied      | None Supplied        | None Supplied | None Supplied |
| Depth (m)                               | 0.10          | 0.20               | 0.10                 | 0.10          | 1.00          |
| Date Sampled                            | 15/03/2024    | 15/03/2024         | 15/03/2024           | 15/03/2024    | 15/03/2024    |
| Time Taken                              | None Supplied | None Supplied      | None Supplied        | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units         | Limit of detection | Accreditation Status |               |               |

|                               |    |      |      |       |       |      |      |       |
|-------------------------------|----|------|------|-------|-------|------|------|-------|
| Stone Content                 | %  | 0.1  | NONE | < 0.1 | < 0.1 | 49.6 | 26.8 | < 0.1 |
| Moisture Content              | %  | 0.01 | NONE | 22    | 13    | 14   | 12   | 9.2   |
| Total mass of sample received | kg | 0.1  | NONE | 0.4   | 0.4   | 0.4  | 0.4  | 0.4   |

#### Asbestos

|                                        |      |     |           |              |              |              |              |   |
|----------------------------------------|------|-----|-----------|--------------|--------------|--------------|--------------|---|
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | - |
| Asbestos Analyst ID                    | N/A  | N/A | N/A       | MBI          | MBI          | MBI          | MBI          | - |

#### General Inorganics

|                                   |          |     |        |      |      |     |     |     |
|-----------------------------------|----------|-----|--------|------|------|-----|-----|-----|
| pH (L099)                         | pH Units | N/A | MCERTS | 7.5  | 8.3  | 7.6 | 7.9 | 8   |
| Total Sulphate as SO <sub>4</sub> | mg/kg    | 50  | MCERTS | 1200 | 1900 | 740 | 950 | 370 |
| Loss on Ignition @ 450°C          | %        | 0.2 | MCERTS | 8.6  | 4.6  | 7.2 | 11  | 2.5 |

#### Speciated PAHs

|                        |       |      |           |      |        |        |        |        |
|------------------------|-------|------|-----------|------|--------|--------|--------|--------|
| Naphthalene            | mg/kg | 0.05 | MCERTS    | 0.1  | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS    | 0.14 | 0.16   | 0.07   | 0.12   | < 0.05 |
| Acenaphthene           | mg/kg | 0.05 | MCERTS    | 0.24 | < 0.05 | < 0.05 | 0.09   | < 0.05 |
| Fluorene               | mg/kg | 0.05 | MCERTS    | 0.23 | < 0.05 | < 0.05 | 0.06   | 0.05   |
| Phenanthrene           | mg/kg | 0.05 | MCERTS    | 2.7  | 0.14   | 0.32   | 0.96   | 0.17   |
| Anthracene             | mg/kg | 0.05 | MCERTS    | 0.68 | 0.07   | 0.09   | 0.25   | < 0.05 |
| Fluoranthene           | mg/kg | 0.05 | MCERTS    | 4.3  | 0.31   | 0.91   | 2      | 0.33   |
| Pyrene                 | mg/kg | 0.05 | MCERTS    | 3.7  | 0.39   | 0.85   | 1.8    | 0.29   |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS    | 1.7  | 0.27   | 0.42   | 0.93   | 0.18   |
| Chrysene               | mg/kg | 0.05 | MCERTS    | 1.8  | 0.29   | 0.47   | 1.1    | 0.19   |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | ISO 17025 | 1.8  | 0.51   | 0.53   | 1.3    | 0.31   |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | ISO 17025 | 1.2  | 0.19   | 0.22   | 0.78   | 0.1    |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS    | 1.7  | 0.63   | 0.43   | 1.3    | 0.26   |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS    | 0.9  | 0.41   | 0.28   | 0.8    | 0.17   |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS    | 0.27 | 0.24   | 0.09   | 0.27   | < 0.05 |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS    | 1    | 0.94   | 0.33   | 0.98   | 0.21   |

#### Total PAH

|                             |       |     |           |      |      |      |      |      |
|-----------------------------|-------|-----|-----------|------|------|------|------|------|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 22.4 | 4.55 | 5.01 | 12.7 | 2.25 |
|-----------------------------|-------|-----|-----------|------|------|------|------|------|

#### Heavy Metals / Metalloids

|                                    |       |      |        |       |       |       |       |         |
|------------------------------------|-------|------|--------|-------|-------|-------|-------|---------|
| Arsenic (aqua regia extractable)   | mg/kg | 1    | MCERTS | 19    | 20    | 12    | 11    | 16      |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 1.2   | 0.78  | 1.1   | 0.54  | 1.1     |
| Boron (water soluble)              | mg/kg | 0.2  | MCERTS | 3     | 1     | 1.3   | 2     | 1.1     |
| Cadmium (aqua regia extractable)   | mg/kg | 0.2  | MCERTS | 1.6#  | 1#    | 1.1#  | 0.5#  | < 0.2## |
| Chromium (aqua regia extractable)  | mg/kg | 1    | MCERTS | 29    | 25    | 27    | 20    | 40      |
| Copper (aqua regia extractable)    | mg/kg | 1    | MCERTS | 110   | 18    | 35    | 25    | 15      |
| Lead (aqua regia extractable)      | mg/kg | 1    | MCERTS | 850   | 460   | 220   | 63    | 24      |
| Mercury (aqua regia extractable)   | mg/kg | 0.3  | MCERTS | 2.6   | < 0.3 | < 0.3 | 1.1   | < 0.3   |
| Nickel (aqua regia extractable)    | mg/kg | 1    | MCERTS | 24    | 19    | 26    | 16    | 26      |
| Selenium (aqua regia extractable)  | mg/kg | 1    | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0   |
| Vanadium (aqua regia extractable)  | mg/kg | 1    | MCERTS | 36    | 42    | 38    | 27    | 43      |
| Zinc (aqua regia extractable)      | mg/kg | 1    | MCERTS | 860   | 1500  | 510   | 200   | 49      |

Analytical Report Number: 24-010211

Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Your Order No: P24-064 GI

| Lab Sample Number                       |  |  |  | 150673        | 150674             | 150675                  | 150676        | 150677        |
|-----------------------------------------|--|--|--|---------------|--------------------|-------------------------|---------------|---------------|
| Sample Reference                        |  |  |  | TP1           | TP2                | TP4                     | TP5           | TP5           |
| Sample Number                           |  |  |  | None Supplied | None Supplied      | None Supplied           | None Supplied | None Supplied |
| Depth (m)                               |  |  |  | 0.10          | 0.20               | 0.10                    | 0.10          | 1.00          |
| Date Sampled                            |  |  |  | 15/03/2024    | 15/03/2024         | 15/03/2024              | 15/03/2024    | 15/03/2024    |
| Time Taken                              |  |  |  | None Supplied | None Supplied      | None Supplied           | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) |  |  |  | Units         | Limit of detection | Accreditation<br>Status |               |               |

**Petroleum Hydrocarbons**

|                                               |       |    |        |    |     |    |      |    |
|-----------------------------------------------|-------|----|--------|----|-----|----|------|----|
| TPH (C10 - C40) <small>EH_CU_1D_TOTAL</small> | mg/kg | 10 | MCERTS | 24 | 200 | 11 | 1100 | 17 |
|-----------------------------------------------|-------|----|--------|----|-----|----|------|----|

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-010211

Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North

He Your Order No: P24-064 GI

|                                         |               |                    |                         |  |
|-----------------------------------------|---------------|--------------------|-------------------------|--|
| Lab Sample Number                       | 150678        |                    |                         |  |
| Sample Reference                        | TP6           |                    |                         |  |
| Sample Number                           | None Supplied |                    |                         |  |
| Depth (m)                               | 0.10          |                    |                         |  |
| Date Sampled                            | 15/03/2024    |                    |                         |  |
| Time Taken                              | None Supplied |                    |                         |  |
| Analytical Parameter<br>(Soil Analysis) | Units         | Limit of detection | Accreditation<br>Status |  |

|                               |    |      |      |      |
|-------------------------------|----|------|------|------|
| Stone Content                 | %  | 0.1  | NONE | 58.6 |
| Moisture Content              | %  | 0.01 | NONE | 2.9  |
| Total mass of sample received | kg | 0.1  | NONE | 0.4  |

#### Asbestos

|                                        |      |     |           |              |
|----------------------------------------|------|-----|-----------|--------------|
| Asbestos in Soil Detected/Not Detected | Type | N/A | ISO 17025 | Not-detected |
| Asbestos Analyst ID                    | N/A  | N/A | N/A       | MBI          |

#### General Inorganics

|                                   |          |     |        |     |
|-----------------------------------|----------|-----|--------|-----|
| pH (L099)                         | pH Units | N/A | MCERTS | 8   |
| Total Sulphate as SO <sub>4</sub> | mg/kg    | 50  | MCERTS | 250 |
| Loss on Ignition @ 450°C          | %        | 0.2 | MCERTS | 8.8 |

#### Speciated PAHs

|                        |       |      |           |      |
|------------------------|-------|------|-----------|------|
| Naphthalene            | mg/kg | 0.05 | MCERTS    | 0.21 |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS    | 1.1  |
| Acenaphthene           | mg/kg | 0.05 | MCERTS    | 0.5  |
| Fluorene               | mg/kg | 0.05 | MCERTS    | 0.72 |
| Phenanthrene           | mg/kg | 0.05 | MCERTS    | 7.2  |
| Anthracene             | mg/kg | 0.05 | MCERTS    | 2.7  |
| Fluoranthene           | mg/kg | 0.05 | MCERTS    | 14   |
| Pyrene                 | mg/kg | 0.05 | MCERTS    | 13   |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS    | 7.4  |
| Chrysene               | mg/kg | 0.05 | MCERTS    | 8.1  |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | ISO 17025 | 12   |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | ISO 17025 | 4.8  |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS    | 12   |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS    | 7.6  |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS    | 2.2  |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS    | 8.9  |

#### Total PAH

|                             |       |     |           |     |
|-----------------------------|-------|-----|-----------|-----|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | ISO 17025 | 102 |
|-----------------------------|-------|-----|-----------|-----|

#### Heavy Metals / Metalloids

|                                    |       |      |        |         |
|------------------------------------|-------|------|--------|---------|
| Arsenic (aqua regia extractable)   | mg/kg | 1    | MCERTS | 6.5     |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.37    |
| Boron (water soluble)              | mg/kg | 0.2  | MCERTS | 0.3     |
| Cadmium (aqua regia extractable)   | mg/kg | 0.2  | MCERTS | < 0.2## |
| Chromium (aqua regia extractable)  | mg/kg | 1    | MCERTS | 9.3     |
| Copper (aqua regia extractable)    | mg/kg | 1    | MCERTS | 17      |
| Lead (aqua regia extractable)      | mg/kg | 1    | MCERTS | 23      |
| Mercury (aqua regia extractable)   | mg/kg | 0.3  | MCERTS | < 0.3   |
| Nickel (aqua regia extractable)    | mg/kg | 1    | MCERTS | 9.3     |
| Selenium (aqua regia extractable)  | mg/kg | 1    | MCERTS | < 1.0   |
| Vanadium (aqua regia extractable)  | mg/kg | 1    | MCERTS | 36      |
| Zinc (aqua regia extractable)      | mg/kg | 1    | MCERTS | 77      |



Analytical Report Number: 24-010211  
 Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North  
 He Your Order No: P24-064 GI

|                                               |       |                    |                         |               |
|-----------------------------------------------|-------|--------------------|-------------------------|---------------|
| Lab Sample Number                             |       |                    |                         | 150678        |
| Sample Reference                              |       |                    |                         | TP6           |
| Sample Number                                 |       |                    |                         | None Supplied |
| Depth (m)                                     |       |                    |                         | 0.10          |
| Date Sampled                                  |       |                    |                         | 15/03/2024    |
| Time Taken                                    |       |                    |                         | None Supplied |
| Analytical Parameter<br>(Soil Analysis)       | Units | Limit of detection | Accreditation<br>Status |               |
|                                               |       |                    |                         |               |
|                                               |       |                    |                         |               |
| Petroleum Hydrocarbons                        |       |                    |                         |               |
| TPH (C10 - C40) <small>EH_CU_1D_TOTAL</small> | mg/kg | 10                 | MCERTS                  | 3100          |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

**Analytical Report Number : 24-010211**

**Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,**

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

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

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description *                  |
|-------------------|------------------|---------------|-----------|---------------------------------------|
| 150673            | TP1              | None Supplied | 0.1       | Brown loam and sand with vegetation   |
| 150674            | TP2              | None Supplied | 0.2       | Brown loam and sand with vegetation   |
| 150675            | TP4              | None Supplied | 0.1       | Brown sand with vegetation and stones |
| 150676            | TP5              | None Supplied | 0.1       | Brown sand with vegetation and stones |
| 150677            | TP5              | None Supplied | 1         | Brown clay and sand with gravel       |
| 150678            | TP6              | None Supplied | 0.1       | Brown sand with gravel and stones     |

**Analytical Report Number : 24-010211**

**Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name                                                 | Analytical Method Description                                                                                                          | Analytical Method Reference                                                         | Method number | Wet / Dry Analysis | Accreditation Status |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Asbestos identification in Soil                                      | Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques                  | In-house method based on HSG 248, 2021                                              | A001B         | D                  | ISO 17025            |
| Moisture Content                                                     | Moisture content, determined gravimetrically (up to 30°C)                                                                              | In-house method                                                                     | L019B         | W                  | NONE                 |
| Stones content of soil                                               | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight             | In-house method based on British Standard Methods and MCERTS requirements.          | L019B         | D                  | NONE                 |
| Metals in soil by ICP-OES                                            | Determination of metals in soil by aqua-regia digestion followed by ICP-OES                                                            | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil | L038B         | D                  | MCERTS               |
| Boron, water soluble, in soil                                        | Determination of water soluble boron in soil by hot water extract followed by ICP-OES                                                  | In-house method based on Second Site Properties version 3                           | L038B         | D                  | MCERTS               |
| Total sulphate (as SO <sub>4</sub> in soil)                          | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES                                                 | In-house method                                                                     | L038B         | D                  | MCERTS               |
| Loss on ignition of soil @ 450°C                                     | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace                         | In-house method                                                                     | L047          | D                  | MCERTS               |
| Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil | Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS | In-house method based on USEPA 8270                                                 | L064B         | D                  | MCERTS               |
| Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil              | Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS                                                               | In-house method                                                                     | L076B/L088    | D/W                | MCERTS               |

**Analytical Report Number : 24-010211**

**Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name   | Analytical Method Description                                                                    | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|------------------------|--------------------------------------------------------------------------------------------------|-----------------------------|---------------|--------------------|----------------------|
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement | In-house method             | L099          | D                  | MCERTS               |

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

### Information in Support of Analytical Results

#### List of HWOL Acronyms and Operators

| Acronym | Descriptions                                                           |
|---------|------------------------------------------------------------------------|
| HS      | Headspace Analysis                                                     |
| MS      | Mass spectrometry                                                      |
| FID     | Flame Ionisation Detector                                              |
| GC      | Gas Chromatography                                                     |
| EH      | Extractable Hydrocarbons (i.e. everything extracted by the solvent(s)) |
| CU      | Clean-up - e.g. by Florisil®, silica gel                               |
| 1D      | GC - Single coil/column gas chromatography                             |
| 2D      | GC-GC - Double coil/column gas chromatography                          |
| Total   | Aliphatics & Aromatics                                                 |
| AL      | Aliphatics                                                             |
| AR      | Aromatics                                                              |
| #1      | EH_2D_Total but with humics mathematically subtracted                  |
| #2      | EH_2D_Total but with fatty acids mathematically subtracted             |
| _       | Operator - underscore to separate acronyms (exception for +)           |
| +       | Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total     |

# - Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised

## - Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised

**Human Health Generic Contamination Risk Assessment - Land to the Rear of 61 High Street, Kimpton,  
Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU (6 Samples)**

| Determinand             | Units               | 95th Percentile Upper Confidence Limit (Mean) | Assessment Criteria Residential with Home Grown Produce Concentration (cc) | Mean Exceeds 95th Percentile | Exceeding Samples                   |
|-------------------------|---------------------|-----------------------------------------------|----------------------------------------------------------------------------|------------------------------|-------------------------------------|
| <b>Metals/Metaloids</b> |                     |                                               |                                                                            |                              |                                     |
| Arsenic                 | mg kg <sup>-1</sup> | 17.49                                         | 37.0                                                                       |                              |                                     |
| Beryllium               | mg kg <sup>-1</sup> | 1.07                                          | 1.7                                                                        |                              |                                     |
| Cadmium                 | mg kg <sup>-1</sup> | 1.14                                          | 11.0                                                                       |                              |                                     |
| Chromium                | mg kg <sup>-1</sup> | 32                                            | 910                                                                        |                              |                                     |
| Inorganic Mercury       | mg kg <sup>-1</sup> | 1.43                                          | 40.0                                                                       |                              |                                     |
| Nickel                  | mg kg <sup>-1</sup> | 24                                            | 180                                                                        |                              |                                     |
| Lead                    | mg kg <sup>-1</sup> | 489                                           | 190                                                                        | Y                            | TP1 0.10m<br>TP2 0.20m<br>TP4 0.10m |
| Selenium                | mg kg <sup>-1</sup> | 1.00                                          | 250                                                                        |                              |                                     |
| Copper                  | mg kg <sup>-1</sup> | 61                                            | 2400                                                                       |                              |                                     |
| Zinc                    | mg kg <sup>-1</sup> | 904                                           | 3700                                                                       |                              |                                     |
| Vanadium                | mg kg <sup>-1</sup> | 40.77                                         | 410                                                                        |                              |                                     |

|                                          |                     |     |     |   |                                     |
|------------------------------------------|---------------------|-----|-----|---|-------------------------------------|
| <b>Phytotoxic Metals (Phytotoxicity)</b> |                     |     |     |   |                                     |
| Copper                                   | mg kg <sup>-1</sup> | 61  | 111 |   |                                     |
| Zinc                                     | mg kg <sup>-1</sup> | 904 | 330 | Y | TP1 0.10m<br>TP2 0.20m<br>TP4 0.10m |

|                                     |                     |         |        |   |                        |
|-------------------------------------|---------------------|---------|--------|---|------------------------|
| <b>Hydrocarbons</b>                 |                     |         |        |   |                        |
| <b>Total Petroleum Hydrocarbons</b> |                     |         |        |   |                        |
| TPH EC6-EC10 (PRO)                  | mg kg <sup>-1</sup> | N/A     | 65     |   |                        |
| TPH EC10-EC21 (DRO)                 | mg kg <sup>-1</sup> | N/A     | 300    |   |                        |
| TPH EC21-EC40 (Min.Oil)             | mg kg <sup>-1</sup> | N/A     | 1500   |   |                        |
| Total TPH                           | mg kg <sup>-1</sup> | 1550.55 | 600    | Y | TP5 0.10m<br>TP6 0.10m |
| <b>Poly Aromatic Hydrocarbons</b>   |                     |         |        |   |                        |
| Benzo(a)anthracene                  | mg kg <sup>-1</sup> | 3.65    | 11.00  |   |                        |
| Benzo(b)fluoranthene                | mg kg <sup>-1</sup> | 5.75    | 3.30   | N | TP6 0.10m              |
| Benzo(a)pyrene                      | mg kg <sup>-1</sup> | 5.73    | 2.70   | Y | TP6 0.10m              |
| Napthalene                          | mg kg <sup>-1</sup> | 0.13    | 5.60   |   |                        |
| Dibenzo(a,h) anthracene             | mg kg <sup>-1</sup> | 1.06    | 0.28   | Y | TP6 0.10m              |
| Flourene                            | mg kg <sup>-1</sup> | 0.37    | 400.00 |   |                        |
| Phenols                             | mg kg <sup>-1</sup> | NE      | 420.00 |   |                        |

|                         |                     |              |              |  |  |
|-------------------------|---------------------|--------------|--------------|--|--|
| <b>OTHER</b>            |                     |              |              |  |  |
| pH                      | -                   | 8.1          | <5, >12      |  |  |
| Sulphur                 | mg kg <sup>-1</sup> | N/A          | 2500         |  |  |
| Water Soluble Boron     | mg kg <sup>-1</sup> | 2.07         | 290          |  |  |
| Asbestos Screen         | Detection           | Not Detected | Not Detected |  |  |
| Asbestos Quantification | %                   | -            | N/A          |  |  |

NOTE:

na - Not applicable

ne - Not evaluated, all results below the appropriate guideline level

nc - not displayed as results are not meaningful due to large uncertainty from small data set

**GENERIC HUMAN HEALTH SCREENING TOTAL SOIL CONCENTRATION ASSESSMENT CRITERIA (GAC)**

| DETERMINAND                                |                       | RESIDENTIAL (mg/kg)     |                            | COMMERCIAL (mg/kg) |
|--------------------------------------------|-----------------------|-------------------------|----------------------------|--------------------|
| Chemical                                   | GAC Sources and units | With Home Grown produce | Without Home Grown produce |                    |
| Asbestos Screen & ID*                      | -                     | Detected                | Detected                   | Detected           |
| Cyanide - Total                            | SNIFFER               | 53.25                   | 53.25                      | 53.25              |
| Cyanide - Free                             | SNIFFER               | 53.25                   | 53.25                      | 53.25              |
| Loss on Ignition @ 450°C                   | -                     | -                       | -                          | -                  |
| Sulphate (as SO <sub>4</sub> ) - Total     | BRE****               | 2400                    | 2400                       | 2400               |
| Sulphide                                   | ICRCL                 | 2500                    | 2500                       | 2500               |
| Sulphur - Total                            | ICRCL                 | 2500                    | 2500                       | 2500               |
| Phenol (Total Monohydric)                  | CLEA                  | 420                     | 420                        | 3200               |
| pH                                         | ICRCL                 | <5,>12                  | <5,>12                     | -                  |
| <b>Metals and Metalloids (CLEA Metals)</b> |                       |                         |                            |                    |
| Arsenic                                    | LQM S4UL              | 37                      | 40                         | 640                |
| Beryllium                                  | LQM S4UL              | 1.7                     | 1.7                        | 12                 |
| Cadmium                                    | LQM S4UL              | 11                      | 85                         | 190                |
| Chromium III                               | LQM S4UL              | 910                     | 910                        | 8600               |
| Lead                                       | DEFRA C4SL            | 190                     | 310                        | 2300               |
| Mercury (Total)                            | LQM S4UL (Inorganic)  | 40                      | 56                         | 1100               |
| Selenium                                   | LQM S4UL              | 250                     | 430                        | 12000              |
| Copper (phytotoxicity)                     | LQM S4UL              | 2400 (111)              | 7100                       | 68000              |
| Nickel                                     | LQM S4UL              | 180                     | 180                        | 980                |
| Zinc (phytotoxicity)                       | LQM S4UL              | 3700 (330)              | 40000                      | 730000             |
| Vanadium                                   | LQM S4UL              | 410                     | 1200                       | 9000               |
| Boron - Water Soluble                      | LQM S4UL              | 290                     | 11000                      | 240000             |
| <b>Total Petroleum Hydrocarbons**</b>      |                       |                         |                            |                    |
| TPH (EC6-EC10) - PRO                       | LQM S4UL (2.5% SOM)   | 65                      | 100                        | 4800               |
| TPH (EC10-EC21) - DRO                      | LQM S4UL (2.5% SOM)   | 300                     | 600                        | 23000              |
| TPH (EC21-EC40) - Min. Oil                 | LQM S4UL (2.5% SOM)   | 1500                    | 1900                       | 28000              |
| Total TPH (EC10-EC40)                      | LQM S4UL (2.5% SOM)   | 600                     | 900                        | 23000              |
| <b>Polycyclic Aromatic Hydrocarbons***</b> |                       |                         |                            |                    |
| Benzo(a)anthracene                         | LQM S4UL (2.5% SOM)   | 11                      | 14                         | 170                |
| Benzo(b)fluoranthene                       | LQM S4UL (2.5% SOM)   | 3.3                     | 4                          | 44                 |
| Naphthalene                                | LQM S4UL (2.5% SOM)   | 5.6                     | 5.6                        | 460                |
| Flourene                                   | LQM S4UL (2.5% SOM)   | 400                     | 3800                       | 68000              |
| Benzo[a]pyrene                             | LQM S4UL (2.5% SOM)   | 2.7                     | 3.2                        | 35                 |
| Dibenzo[a,h]anthracene                     | LQM S4UL (2.5% SOM)   | 0.28                    | 0.32                       | 3.6                |

**Notes**

The Generic Assessment Criteria (GAC) are based on CLEA Soil Guidance Values published values and CIEH/LQM S4CLs where available or ICRCL, DoE, BRE and HSE levels where necessary. Where gaps remain GACs were calculated using the latest CLEA spreadsheet using DEFRA C4SL toxicology and physiochemical parameters from DEFRA SP1010.

\* Guidance level set at any fibre identification.

\*\* TPH 3 band is employed as a screening tool to instigate detailed speciated analysis to the TPHCWG methodology. Based on mean of fractions included

\*\*\* Testing based on USEPA Priority 16 compounds. GACs for four compounds and total PAH with published GACs only, used as a screening tool.

\*\*\*\* BRE SD1 - DS-1 Concrete Sulphate Design Class limit. Sulphate is not considered to pose a significant risk to human health under normal circumstances.



**CLIENT:**

**PROJECT No:**

**PROJECT TITLE:**

Admiral UK Contracting Limited

P24-064

Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU

## **APPENDIX D – GEOTECHNICAL ASSESSMENT DATA**

Geotechnical Laboratory Testing Results

Geotechnical Site Data Summaries



## TEST CERTIFICATE

### DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,  
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,  
cl 5.3, 6

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB



Environmental Science

4041

Client: Paddock Geo Engineering  
Client Address: The Log Cabin, Manor Farm,  
Whaddon Road, Newton Longville,  
Milton Keynes, MK17 0AU  
Contact: Matt Paddock  
Site Address: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Client Reference: P24-064 (G)  
Job Number: 24-010019-1  
Date Sampled: Not Given  
Date Received: 20/03/2024  
Date Tested: 27/03/2024  
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

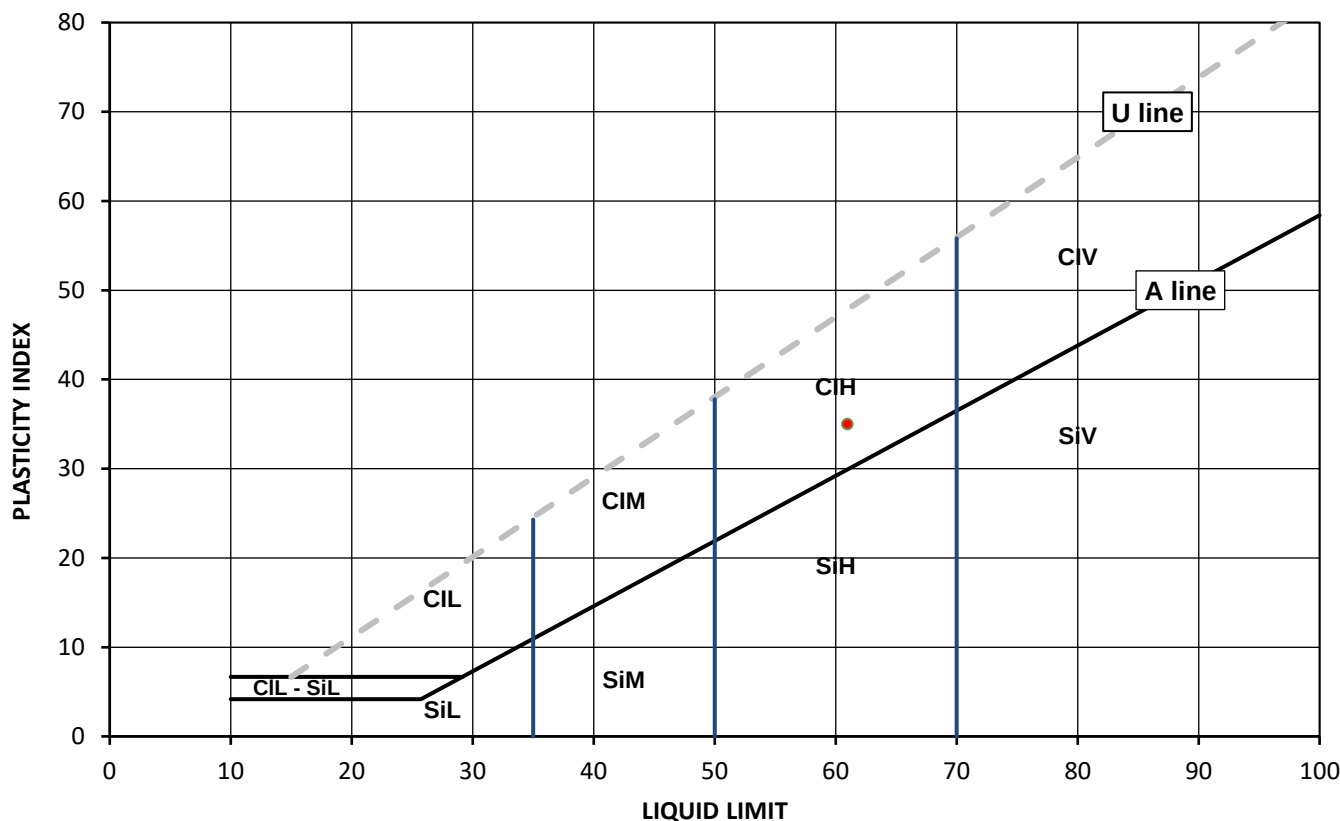
#### Test Results:

Laboratory Reference: 149929  
Hole No.: TP4  
Sample Reference: Not Given  
Sample Description: Reddish brown clayey GRAVEL

Depth Top [m]: 1.00  
Depth Base [m]: Not Given  
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;  
Cone Type: 80g/30deg

| As Received Water Content [W] % | Corrected Liquid Limit [WL] % | Correlation Factor | Plastic Limit [Wp] % | Plasticity Index [Ip] % | Liquidity index [IL] % # | Consistency index [IC] % # | % Passing 425µm BS Test Sieve |
|---------------------------------|-------------------------------|--------------------|----------------------|-------------------------|--------------------------|----------------------------|-------------------------------|
| 16.1                            | 61                            | 0.967              | 26                   | 35                      | -0.29                    | 1.29                       | 19                            |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|    |      | Plasticity  | Liquid Limit                                            |
|----|------|-------------|---------------------------------------------------------|
| Cl | Clay | L Low       | below 35                                                |
| Si | Silt | M Medium    | 35 to 50                                                |
|    |      | H High      | 50 to 70                                                |
|    |      | V Very high | exceeding 70                                            |
|    |      | O Organic   | append to classification for organic material (eg ClHO) |

Note: Water Content by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks: Not enough the material to carry out 4 Point Atterberg test/A 1-point test was performed

Signed:

Katarzyna Koziel  
Senior Reporting Specialist  
for and on behalf of i2 Analytical Ltd

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## TEST CERTIFICATE

### DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,  
cl 5.3.14, 5.5, Fall Cone Method, 1 Pt Test, BS 1377-2:2022,  
cl 5.3, 6

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Brackmills Industrial Estate  
Northampton NN4 7EB



Environmental Science

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Client: Paddock Geo Engineering  
Client Address: The Log Cabin, Manor Farm,  
Whaddon Road, Newton Longville,  
Milton Keynes, MK17 0AU  
Contact: Matt Paddock  
Site Address: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Client Reference: P24-064 (G)  
Job Number: 24-010019-1  
Date Sampled: Not Given  
Date Received: 20/03/2024  
Date Tested: 27/03/2024  
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

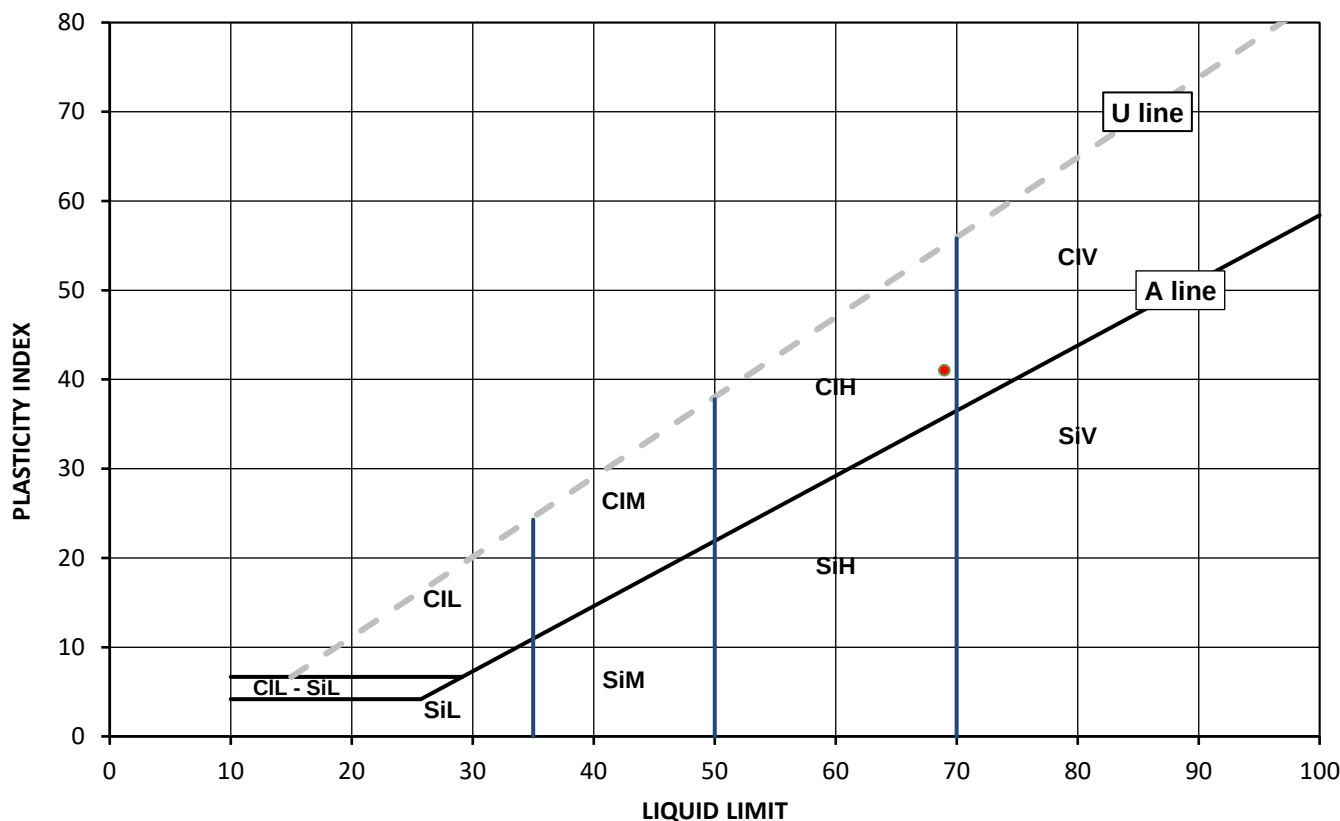
#### Test Results:

Laboratory Reference: 149930  
Hole No.: TP5  
Sample Reference: Not Given  
Sample Description: Reddish brown clayey GRAVEL

Depth Top [m]: 1.50  
Depth Base [m]: Not Given  
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425 mm;  
Cone Type: 80g/30deg

| As Received Water Content [W] % | Corrected Liquid Limit [WL] % | Correlation Factor | Plastic Limit [Wp] % | Plasticity Index [Ip] % | Liquidity index [IL] % # | Consistency index [IC] % # | % Passing 425µm BS Test Sieve |
|---------------------------------|-------------------------------|--------------------|----------------------|-------------------------|--------------------------|----------------------------|-------------------------------|
| 11.5                            | 69                            | 1.055              | 28                   | 41                      | -0.39                    | 1.39                       | 24                            |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|    | Plasticity | Liquid Limit                                            |
|----|------------|---------------------------------------------------------|
| Cl | Clay       | below 35                                                |
| Si | Silt       | 35 to 50                                                |
|    | L          | Low                                                     |
|    | M          | Medium                                                  |
|    | H          | High                                                    |
|    | V          | Very high                                               |
|    | O          | Organic                                                 |
|    |            | append to classification for organic material (eg CIHO) |

Note: Water Content by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes A.W (1978); # Non accredited

Remarks: Not enough the material to carry out 4 Point Atterberg test/A 1-point test was performed

Signed:

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## TEST CERTIFICATE

### DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,  
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,  
cl 5.2 and 6

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Environmental Science

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Client: Paddock Geo Engineering  
Client Address: The Log Cabin, Manor Farm,  
Whaddon Road, Newton Longville,  
Milton Keynes, MK17 0AU  
Contact: Matt Paddock  
Site Address: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Client Reference: P24-064 (G)  
Job Number: 24-010019-1  
Date Sampled: Not Given  
Date Received: 20/03/2024  
Date Tested: 27/03/2024  
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

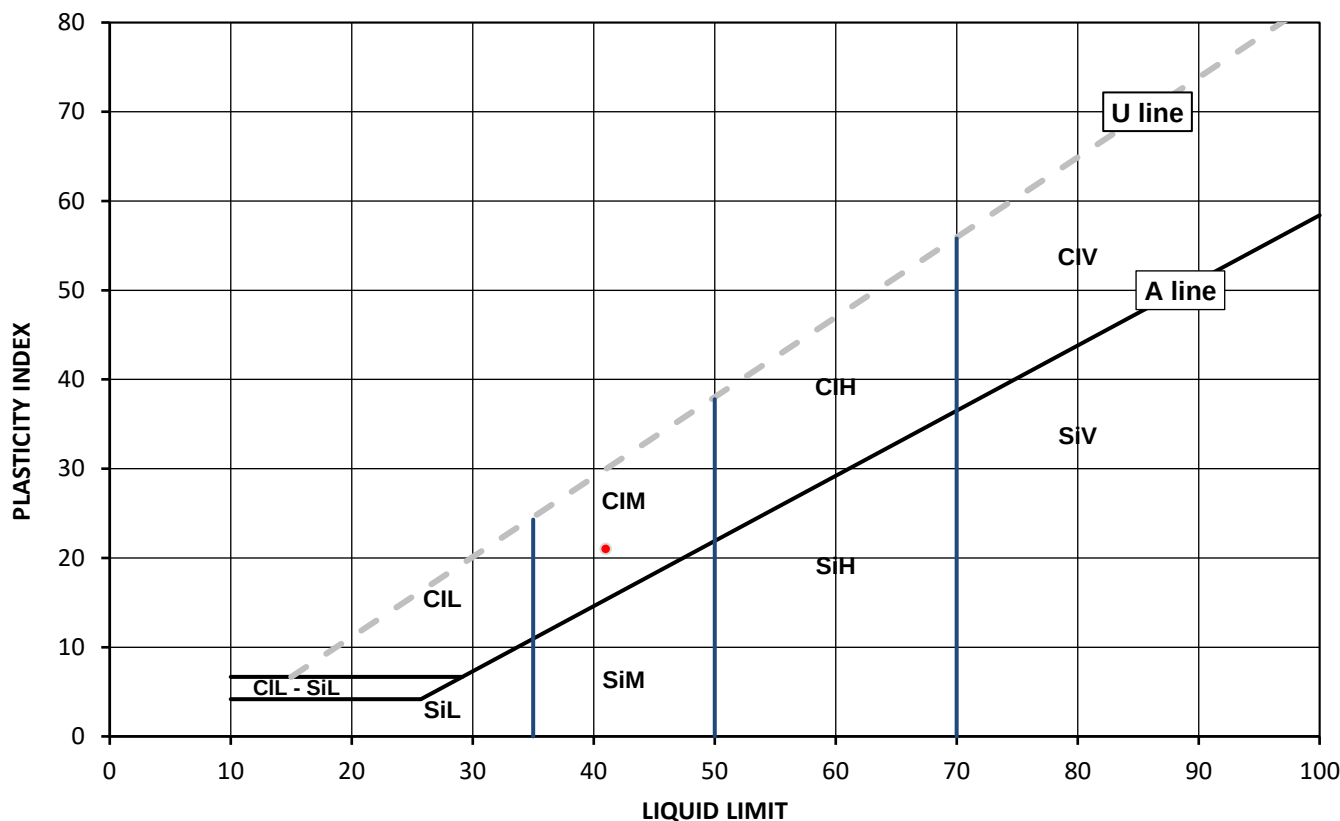
#### Test Results:

Laboratory Reference: 149928  
Hole No.: TP3  
Sample Reference: Not Given  
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 0.50  
Depth Base [m]: Not Given  
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425mm; The water content in the sample was increased  
Cone Type: 80g/30deg

| As Received Water Content [W] % | Liquid Limit [WL] % | Plastic Limit [Wp] % | Plasticity Index [Ip] % | Liquidity Index [IL] % # | Consistency Index [IC] % # | % Passing 425µm BS Test Sieve |
|---------------------------------|---------------------|----------------------|-------------------------|--------------------------|----------------------------|-------------------------------|
| 21.9                            | 41                  | 20                   | 21                      | 0.10                     | 0.90                       | 83                            |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|    | Plasticity | Liquid Limit                                            |
|----|------------|---------------------------------------------------------|
| Cl | Clay       | below 35                                                |
| Si | Silt       | 35 to 50                                                |
|    | L          | Low                                                     |
|    | M          | Medium                                                  |
|    | H          | High                                                    |
|    | V          | Very high                                               |
|    | O          | Organic                                                 |
|    |            | 50 to 70                                                |
|    |            | exceeding 70                                            |
|    |            | append to classification for organic material (eg ClHO) |

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

Signed:

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Senior Reporting Specialist  
for and on behalf of i2 Analytical Ltd

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## TEST CERTIFICATE

### DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,  
cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,  
cl 5.2 and 6

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Environmental Science

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Client Address: The Log Cabin, Manor Farm,  
Whaddon Road, Newton Longville,  
Milton Keynes, MK17 0AU  
Contact: Matt Paddock  
Site Address: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Client Reference: P24-064 (G)  
Job Number: 24-010019-1  
Date Sampled: Not Given  
Date Received: 20/03/2024  
Date Tested: 27/03/2024  
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

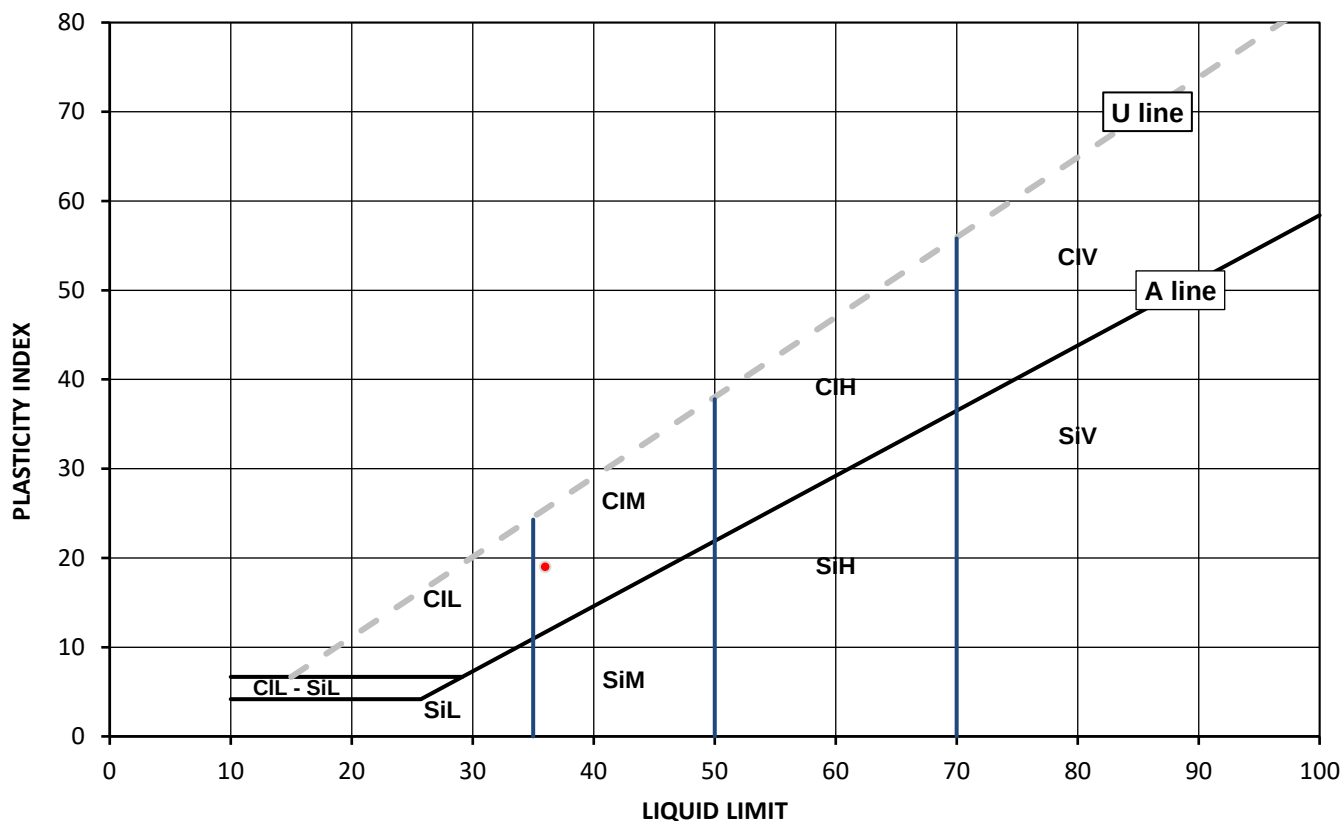
#### Test Results:

Laboratory Reference: 149931  
Hole No.: TP6  
Sample Reference: Not Given  
Sample Description: Light brown very gravelly sandy CLAY with chalk

Depth Top [m]: 2.00  
Depth Base [m]: Not Given  
Sample Type: D

Sample Preparation: Tested after washing to remove >0.425mm; The water content in the sample was increased  
Cone Type: 80g/30deg

| As Received Water Content [W] % | Liquid Limit [WL] % | Plastic Limit [Wp] % | Plasticity Index [Ip] % | Liquidity Index [IL] % # | Consistency Index [IC] % # | % Passing 425µm BS Test Sieve |
|---------------------------------|---------------------|----------------------|-------------------------|--------------------------|----------------------------|-------------------------------|
| 15.3                            | 36                  | 17                   | 19                      | -0.11                    | 1.11                       | 37                            |



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

|    | Plasticity | Liquid Limit                                            |
|----|------------|---------------------------------------------------------|
| Cl | Clay       | below 35                                                |
| Si | Silt       | 35 to 50                                                |
|    | L          | Low                                                     |
|    | M          | Medium                                                  |
|    | H          | High                                                    |
|    | V          | Very high                                               |
|    | O          | Organic                                                 |
|    |            | 50 to 70                                                |
|    |            | exceeding 70                                            |
|    |            | append to classification for organic material (eg ClHO) |

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

Signed:

Katarzyna Koziel  
Senior Reporting Specialist  
for and on behalf of i2 Analytical Ltd

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## SUMMARY REPORT

### SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test,  
BS 1377-2:2022, cl 5.2 and 6

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB



Environmental Science

4041

Client: Paddock Geo Engineering  
Client Address: The Log Cabin, Manor Farm,  
Whaddon Road, Newton Longville,  
Milton Keynes, MK17 0AU  
Contact: Matt Paddock  
Site Address: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

W by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes  
A.W (1978)

Client Reference: P24-064 (G)  
Job Number: 24-010019-1  
Date Sampled: Not Given  
Date Received: 20/03/2024  
Date Tested: 27/03/2024  
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

### Test results

| Laboratory Reference | Hole No. | Sample    |           |            |      | Description                                     | Remarks           | W    | Liquid & Plastic Limit |     |                    |    |    |            |                    | Density |       |       |
|----------------------|----------|-----------|-----------|------------|------|-------------------------------------------------|-------------------|------|------------------------|-----|--------------------|----|----|------------|--------------------|---------|-------|-------|
|                      |          | Reference | Depth Top | Depth Base | Type |                                                 |                   |      | % Passing 425um        | WL* | Correlation Factor | Wp | Ip | Cone type  | Sample Preparation | bulk    | dry   | PD    |
|                      |          |           | m         | m          |      |                                                 |                   |      |                        |     |                    |    |    |            |                    | Mg/m3   | Mg/m3 | Mg/m3 |
| 149928               | TP3      | Not Given | 0.50      | Not Given  | D    | Brown slightly gravelly sandy CLAY              | Atterberg 4 Point | 21.9 | 83                     | 41  | -                  | 20 | 21 | 80g/30 deg | W / I              |         |       |       |
| 149929               | TP4      | Not Given | 1.00      | Not Given  | D    | Reddish brown clayey GRAVEL                     | Atterberg 1 Point | 16.1 | 19                     | 61  | 0.967              | 26 | 35 | 80g/30 deg | W                  |         |       |       |
| 149930               | TP5      | Not Given | 1.50      | Not Given  | D    | Reddish brown clayey GRAVEL                     | Atterberg 1 Point | 11.5 | 24                     | 69  | 1.055              | 28 | 41 | 80g/30 deg | W                  |         |       |       |
| 149931               | TP6      | Not Given | 2.00      | Not Given  | D    | Light brown very gravelly sandy CLAY with chalk | Atterberg 4 Point | 15.3 | 37                     | 36  | -                  | 17 | 19 | 80g/30 deg | W / I              |         |       |       |
|                      |          |           |           |            |      |                                                 |                   |      |                        |     |                    |    |    |            |                    |         |       |       |
|                      |          |           |           |            |      |                                                 |                   |      |                        |     |                    |    |    |            |                    |         |       |       |
|                      |          |           |           |            |      |                                                 |                   |      |                        |     |                    |    |    |            |                    |         |       |       |
|                      |          |           |           |            |      |                                                 |                   |      |                        |     |                    |    |    |            |                    |         |       |       |
|                      |          |           |           |            |      |                                                 |                   |      |                        |     |                    |    |    |            |                    |         |       |       |
|                      |          |           |           |            |      |                                                 |                   |      |                        |     |                    |    |    |            |                    |         |       |       |

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased ,  
D - The water content in the sample was decreased; \* - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed:



Katarzyna Koziel  
Senior Reporting Specialist  
for and on behalf of i2 Analytical Ltd

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4041



# TEST CERTIFICATE

## DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016,  
BS 1377-2:2022 cl. 10

i2 Analytical Ltd  
Unit 8 Harrowden Road  
Brackmills Industrial Estate  
Northampton NN4 7EB



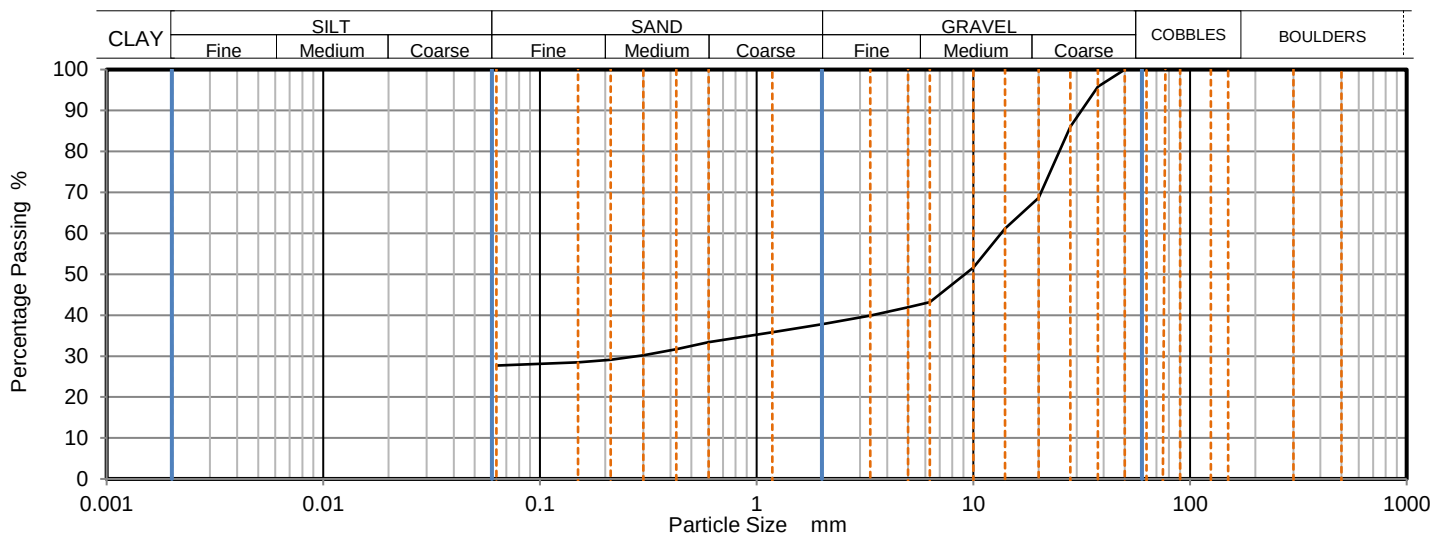
Client: Paddock Geo Engineering  
Client Address: The Log Cabin, Manor Farm,  
Whaddon Road, Newton Longville,  
Milton Keynes, MK17 0AU  
Contact: Matt Paddock  
Site Address: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,  
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: P24-064 (G)  
Job Number: 24-010019-1  
Date Sampled: Not Given  
Date Received: 20/03/2024  
Date Tested: 28/03/2024  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 150491  
Hole No.: TP3+TP4+TP5+TP6  
Sample Reference: Not Given  
Sample Description: Brown gravelly slightly sandy CLAY with flintstones and chalk  
Sample Preparation: Sample was quartered, oven dried at 106.2 °C and broken down by hand.

Depth Top [m]: 0.50  
Depth Base [m]: 2.00  
Sample Type: B



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 500              | 100       |                  |           |
| 300              | 100       |                  |           |
| 150              | 100       |                  |           |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 100       |                  |           |
| 63               | 100       |                  |           |
| 50               | 100       |                  |           |
| 37.5             | 96        |                  |           |
| 28               | 86        |                  |           |
| 20               | 69        |                  |           |
| 14               | 61        |                  |           |
| 10               | 52        |                  |           |
| 6.3              | 43        |                  |           |
| 5                | 42        |                  |           |
| 3.35             | 40        |                  |           |
| 2                | 38        |                  |           |
| 1.18             | 36        |                  |           |
| 0.6              | 33        |                  |           |
| 0.425            | 32        |                  |           |
| 0.3              | 30        |                  |           |
| 0.212            | 29        |                  |           |
| 0.15             | 29        |                  |           |
| 0.063            | 28        |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Very coarse        | 0.00       |
| Gravel             | 62.00      |
| Sand               | 10.00      |
| Fines <0.063 mm    | 28.00      |

| Grading Analysis       |    |       |
|------------------------|----|-------|
| D100                   | mm | 50    |
| D60                    | mm | 13.4  |
| D30                    | mm | 0.283 |
| D10                    | mm |       |
| Uniformity Coefficient |    | 210   |
| Curvature Coefficient  |    |       |

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Koziel  
Senior Reporting Specialist  
for and on behalf of i2 Analytical Ltd

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## **Analytical Report Number : 24-010020**

Replaces Analytical Report Number: 24-010020, issue no. 1  
Client references/information amended.  
Project Number amended as per client's requested.

|                             |                                                                               |                                                        |            |
|-----------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | Land to the Rear of 61 High Street,<br>Kimpton, Hitchin, North Hertfordshire, | <b>Samples received on:</b>                            | 20/03/2024 |
| <b>Your job number:</b>     | P24-064                                                                       | <b>Samples instructed on/<br/>Analysis started on:</b> | 21/03/2024 |
| <b>Your order number:</b>   | P24-064                                                                       | <b>Analysis completed by:</b>                          | 02/04/2024 |
| <b>Report Issue Number:</b> | 2                                                                             | <b>Report issued on:</b>                               | 15/04/2024 |
| <b>Samples Analysed:</b>    | 4 soil samples                                                                |                                                        |            |

**Signed:**

Dominika Liana  
Junior Reporting Specialist  
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.  
Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-010020

Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,

Your Order No: P24-064

|                                         |  |  |  |               |                    |                      |               |
|-----------------------------------------|--|--|--|---------------|--------------------|----------------------|---------------|
| Lab Sample Number                       |  |  |  | 149932        | 149933             | 149934               | 149935        |
| Sample Reference                        |  |  |  | TP3           | TP4                | TP5                  | TP6           |
| Sample Number                           |  |  |  | None Supplied | None Supplied      | None Supplied        | None Supplied |
| Depth (m)                               |  |  |  | 1.50          | 2.00               | 0.50                 | 1.00          |
| Date Sampled                            |  |  |  | Deviating     | Deviating          | Deviating            | Deviating     |
| Time Taken                              |  |  |  | None Supplied | None Supplied      | None Supplied        | None Supplied |
| Analytical Parameter<br>(Soil Analysis) |  |  |  | Units         | Limit of detection | Accreditation Status |               |

|                               |    |      |      |     |      |       |       |
|-------------------------------|----|------|------|-----|------|-------|-------|
| Stone Content                 | %  | 0.1  | NONE | 53  | 76.9 | < 0.1 | < 0.1 |
| Moisture Content              | %  | 0.01 | NONE | 11  | 6.3  | 12    | 17    |
| Total mass of sample received | kg | 0.1  | NONE | 1.3 | 1.4  | 1.3   | 1.4   |

#### General Inorganics

|                                                                         |          |         |        |         |         |         |         |
|-------------------------------------------------------------------------|----------|---------|--------|---------|---------|---------|---------|
| pH (L099)                                                               | pH Units | N/A     | MCERTS | 8.4     | 8.4     | 8.5     | 8       |
| Total Sulphate as SO <sub>4</sub>                                       | mg/kg    | 50      | MCERTS | 540     | 410     | 370     | 220     |
| Water Soluble Sulphate as SO <sub>4</sub> 16hr extraction (2:1)         | mg/kg    | 2.5     | MCERTS | 22      | 22      | 24      | 19      |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | g/l      | 0.00125 | MCERTS | 0.01109 | 0.01099 | 0.01222 | 0.00966 |
| Water Soluble SO <sub>4</sub> 16hr extraction (2:1 Leachate Equivalent) | mg/l     | 1.25    | MCERTS | 11.1    | 11      | 12.2    | 9.66    |

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

**Analytical Report Number : 24-010020**

**Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,**

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

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

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description *                           |
|-------------------|------------------|---------------|-----------|------------------------------------------------|
| 149932            | TP3              | None Supplied | 1.5       | Brown clay and sand with gravel and stones     |
| 149933            | TP4              | None Supplied | 2         | Brown clay and sand with gravel and stones     |
| 149934            | TP5              | None Supplied | 0.5       | Brown clay and sand with gravel                |
| 149935            | TP6              | None Supplied | 1         | Brown clay and sand with gravel and vegetation |

**Analytical Report Number : 24-010020**

**Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

| Analytical Test Name                               | Analytical Method Description                                                                                              | Analytical Method Reference                                                | Method number | Wet / Dry Analysis | Accreditation Status |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------|--------------------|----------------------|
| Moisture Content                                   | Moisture content, determined gravimetrically (up to 30°C)                                                                  | In-house method                                                            | L019B         | W                  | NONE                 |
| Stones content of soil                             | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight | In-house method based on British Standard Methods and MCERTS requirements. | L019B         | D                  | NONE                 |
| Total sulphate (as SO <sub>4</sub> in soil)        | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES                                     | In-house method                                                            | L038B         | D                  | MCERTS               |
| Sulphate, water soluble, in soil (16hr extraction) | Sulphate, water soluble, in soil (16hr extraction)                                                                         | In-house method                                                            | L038B         | D                  | MCERTS               |
| pH in soil (automated)                             | Determination of pH in soil by addition of water followed by automated electrometric measurement                           | In-house method                                                            | L099          | D                  | MCERTS               |

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

## Sample Deviation Report



**Analytical Report Number : 24-010020**

**Project / Site name: Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire,**

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

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

| Sample ID | Other ID | Sample Type | Lab Sample Number | Sample Deviation | Test Name                                          | Test Ref | Test Deviation |
|-----------|----------|-------------|-------------------|------------------|----------------------------------------------------|----------|----------------|
| TP3       | N/A      | S           | 149932            | a                | Sulphate, water soluble, in soil (16hr extraction) | L038B    | a              |
| TP3       | N/A      | S           | 149932            | a                | Total sulphate (as SO <sub>4</sub> in soil)        | L038B    | a              |
| TP3       | N/A      | S           | 149932            | a                | pH in soil (automated)                             | L099     | a              |
| TP4       | N/A      | S           | 149933            | a                | Sulphate, water soluble, in soil (16hr extraction) | L038B    | a              |
| TP4       | N/A      | S           | 149933            | a                | Total sulphate (as SO <sub>4</sub> in soil)        | L038B    | a              |
| TP4       | N/A      | S           | 149933            | a                | pH in soil (automated)                             | L099     | a              |
| TP5       | N/A      | S           | 149934            | a                | Sulphate, water soluble, in soil (16hr extraction) | L038B    | a              |
| TP5       | N/A      | S           | 149934            | a                | Total sulphate (as SO <sub>4</sub> in soil)        | L038B    | a              |
| TP5       | N/A      | S           | 149934            | a                | pH in soil (automated)                             | L099     | a              |
| TP6       | N/A      | S           | 149935            | a                | Sulphate, water soluble, in soil (16hr extraction) | L038B    | a              |
| TP6       | N/A      | S           | 149935            | a                | Total sulphate (as SO <sub>4</sub> in soil)        | L038B    | a              |
| TP6       | N/A      | S           | 149935            | a                | pH in soil (automated)                             | L099     | a              |