



**Report prepared at**  
Land at Johnson Drive  
Finchampstead  
RG40 3NW

**On behalf of**  
Palatine Homes Limited

**Report reference**  
23-176.01

**Report date**  
August 2023

**Prepared by**  
Aviron Associates Limited

| Report Quality Management |                                                    |                              |             |
|---------------------------|----------------------------------------------------|------------------------------|-------------|
| <b>Project Name</b>       | Land at Johnson Drive, Finchampstead, RG40 3NW     |                              |             |
| <b>Project Title</b>      | Preliminary Risk Assessment and Site Investigation |                              |             |
| <b>Client</b>             | Palatine Homes Limited                             |                              |             |
| <b>Project Number</b>     | 23-176.01                                          |                              |             |
| <b>Version</b>            | 1                                                  |                              | <b>Date</b> |
| <b>Prepared by</b>        | Vanessa Bell<br>MSc (Hons)                         | Geo-Environmental Consultant | 18/08/2023  |
| <b>Prepared by</b>        | Orlando Blackwell<br>BEng (Hons) MSc (Eng)         | Principal Engineer           | 18/08/2023  |
| <b>Approved by</b>        | James Burkitt<br>BEng (Hons) CEnv MRICS            | Managing Director            | 22/08/2023  |

Aviron Associates Limited (Aviron) has prepared this report in accordance with our fee proposal to the above listed Client or their agents and subsequent instructions pertinent to this which were received from the above listed Client.

This report is confidential and non-assignable by the Client. Aviron shall not be responsible for any use of the report or its contents for any other purpose than for which, and to whom, it was prepared and provided.

Should the Client pass copies of this report to other parties for further comment and advice the whole of the report should be provided and used in the context to which it was prepared.

No professional liability or warranty shall be extended to other parties by Aviron in this connection without the explicit written agreement thereto by Aviron.

Should this report be submitted to stakeholders or statutory bodies by any party other than the above listed Client a copyright law may be infringed and the party submitting the report may not be entitled to do so unless accompanied by a covering letter from Aviron or the Client. For the avoidance of doubt and litigation Aviron should be contacted to establish lawful use of this report.

© Aviron Associates Limited 2023

Aviron Associates Limited  
Badgemore House  
Badgemore Park  
Gravel Hill  
Henley on Thames  
Oxfordshire  
RG9 4NR

Telephone numbers 01491 413 722  
07787 771 686

james@aviron.co.uk  
www.aviron.co.uk

## Contents

|      |                                                       |    |
|------|-------------------------------------------------------|----|
| 1.0  | PROJECT AND SITE INFORMATION .....                    | 1  |
| 2.0  | DESK STUDY REVIEW .....                               | 5  |
| 3.0  | REGULATORY INFORMATION, CONSULTATIONS AND OTHER ..... | 17 |
| 4.0  | PRELIMINARY RISK ASSESSMENT .....                     | 20 |
| 5.0  | SITE INVESTIGATION WORK .....                         | 27 |
| 6.0  | LABORATORY ANALYSIS .....                             | 34 |
| 7.0  | ENVIRONMENTAL INTERPRETATIVE GUIDANCE .....           | 37 |
| 8.0  | ASSESSMENT OF GEOCHEMICAL SOIL RESULTS .....          | 39 |
| 9.0  | HAZARDOUS GROUND GAS MONITORING .....                 | 42 |
| 10.0 | REVISED RISK ASSESSMENT .....                         | 45 |
| 11.0 | GEOTECHNICAL ASSESSMENT .....                         | 51 |
| 12.0 | CONCLUSIONS AND RECOMMENDATIONS .....                 | 62 |
| 13.0 | PROJECT INSTRUCTION AND LIMITATIONS .....             | 64 |
| 14.0 | REFERENCES AND OTHER SOURCES OF INFORMATION .....     | 67 |

## Figures

|   |                                                         |
|---|---------------------------------------------------------|
| 1 | Site Location Plan                                      |
| 2 | Existing Site Layout Plan                               |
| 3 | Site Photographs                                        |
| 4 | Site Photographs                                        |
| 5 | Proposed Development Plan                               |
| 6 | Southern Testing Soil Contamination Identification Plan |
| 7 | Exploratory Hole Location Plan - Existing Site Layout   |
| 8 | Exploratory Hole Location Plan - Proposed Development   |
| 9 | Combined Soil Contamination Identification Plan         |

## **Appendices**

- |     |                                                    |
|-----|----------------------------------------------------|
| I   | Exploratory Hole Logs and Photographs              |
| II  | Field Monitoring Results                           |
| III | Soil Contamination Results and Assessment Criteria |
| IV  | Soil Geotechnical Results                          |

## 1.0 PROJECT AND SITE INFORMATION

### 1.1 APPOINTMENT

Aviron Associates Limited (Aviron) was retained by Palatine Homes Limited (the “Client”) to prepare a tier 1 Preliminary Risk Assessment (PRA) and complete a Site Investigation (SI) leading towards a tier 2 Generic Quantitative Risk Assessment (GQRA) of the following premises:

**Land at Johnson Drive, Finchampstead, RG40 3NW** (hereafter referred to as the “site”).

The PRA forms a tier 1 assessment by completing a desk-based study with site walkover to identify potential areas of contaminative concern associated with the proposed development of the site. The PRA will then form a preliminary Conceptual Site Model (CSM) with recommendations for any further investigation or risk assessment.

The PRA will be supplemented with information supplied by the Client including the following:

-  Southern Testing Environmental & Geotechnical (Southern Testing), Geoenvironmental Site Investigation Report (reference JT0117, dated October 2017)
-  STM Environmental Consultants (STM), Contaminated Land Risk Assessment, Phase I Desk Study Report (reference PH1-2022-0000101, dated 10 November 2022)

The SI will investigate the pollutant linkages established within the PRA in order to produce suitable data for the preparation of a tier 2 GQRA to refine the CSM and as necessary provide recommendations for any further investigation or tier 3 Detailed Quantitative Risk Assessment (DQRA). Alternatively, it may be possible to make remediation recommendations immediately following the GQRA. In addition, geotechnical issues shall be investigated to provide recommendations for new foundations, drainage and pavement design.

Aviron has relied upon information received from the Client and their agents as accurate, unless contradicted by written documentation or site observations.

## 1.2 THE SITE

Table 1.2 provides a summary of site details and surrounding area.

| Table 1.2: Site Details     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site Location</b>        | The site is located at the northern end of Johnson Drive, off Nine Mile Ride (B3430), approximately 2km to the north-east of Finchampstead.<br><b>Figure 1</b> is presented as a Site Location Plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>National Grid Ref.</b>   | Centred at 480592 165179.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Current Land Use</b>     | The site is split into two distinct areas, one in the north of the site accessed using a tree-lined gravel track leading off Johnson Drive in the south-west of the site, and the other in the south of the site via the garden of 6 Johnson Drive to the south.<br><br><b>Northern two-thirds</b> of the site: an area comprising disused land and woodland, used for the storage of a number of vehicles and stockpiles of building materials.<br><br>Two buildings/workshops are also located in the south-east of this area.<br><br><b>Southern third</b> of the site: a section of the rear garden of the adjacent number 6 Johnson Drive, including landscaped borders and trees.<br><br>An equestrian building is also located in the north-east of this area.<br><br><b>Figure 2</b> is presented as the Existing Site Layout Plan.<br><b>Figures 3 and 4</b> are presented as the Site Photographs. |
| <b>Surrounding Land Use</b> | The site is located within an urban area with homes to the south and west, and woodland to the north and east.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Proposed Land Use</b>    | The proposed development comprises the construction of five new detached homes and garages with private gardens, and an access road running along the northern boundary and into the centre of the site at two locations.<br><br><b>Figure 5</b> is presented as the Proposed Development Plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## 1.3 SITE WALKOVER SURVEY

A site walkover survey was undertaken on 26 July 2023 and included an inspection of the site and surrounding area, where safe and accessible. The purpose of the survey is to identify any potential on-site or nearby contaminative activities or potential sources of land contamination.

Additionally, as part of the survey any features which may affect site re-development in terms of physical site and ground conditions were noted.

Table 1.3 provides a description of site features observed during the walkover survey and also current Ordnance Survey maps made available at the time of report writing.

**Table 1.3: Summary of Site Walkover Survey**

| Physical Site Characteristics                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Existing Structures</b>                          | Two single storey warehouse/workshop type buildings in the northern two-thirds of the site along the eastern boundary. The buildings are of block construction clad and roofed with corrugated metal sheeting.<br><br>Wooden equestrian building in the southern two-thirds of the site along the eastern boundary.                                                                                                                                                                                                                             |
| <b>Basements</b>                                    | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Visual Topography and Site Surfacing</b>         | The site slopes gently downwards from approximately 66.5 metres (m) above Ordnance Datum (AOD) in south to 63.3m AOD in the north, as noted on the Site Plan by Paul Edwards Architecture (reference 2554 - 14A, dated November 2022) supplied by the Client.<br><br>With the exception of the gravel access track in the south-west and further gravel tracks through the centre of the site, the site is predominantly covered in grass/scrub.<br><br>Bare earth is located around the equestrian building in the southern third of the site. |
| <b>Retaining Structures and Slopes</b>              | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Drainage Issues</b>                              | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Surface Waters</b>                               | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Trees and Hedges</b>                             | Significant number of mature trees, including numerous cypresses, oak, poplar and hedges around the northern, eastern and western site boundaries, as well within the southern third of the site.                                                                                                                                                                                                                                                                                                                                               |
| <b>Made and Infilled Ground</b>                     | Slightly raised mounds observed locally across the north of the site and around a group of trees in the south, which could indicate the presence of made ground.<br><br>Made ground should be anticipated beneath the buildings along the eastern boundary.                                                                                                                                                                                                                                                                                     |
| Contaminative Characteristics                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Above or Underground Storage Tanks and Drums</b> | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Fuel Interceptors</b>                            | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Waste Storage and Disposal</b>                   | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Hazardous Material Storage and Use</b>           | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Asbestos Containing Materials (ACMs)</b>         | None observed.<br><br>An asbestos survey is recommended prior to the redevelopment works.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Boiler Houses</b>                                | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Sub-stations</b>                                 | None observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**Table 1.3: Summary of Site Walkover Survey**

|                                             |                                                                                                                               |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Surface Staining</b>                     | None observed.                                                                                                                |
| <b>Potentially Contaminative Activities</b> | Limited contaminative activities associated with the storage of building materials including potential for undiscovered ACMs. |

#### **1.3.1 Summary of Physical Site Characteristics**

Consideration should be made towards the make-up and competency of the underlying strata and the influence of trees on the proposed development buildings.

#### **1.3.2 Summary of Contaminative Site Characteristics**

No significant evidence of potentially contaminative activities, however the storage of a variety of building materials observed in the northern two-thirds of the site, may include the potential for undiscovered ACMs.

## 2.0 DESK STUDY REVIEW

Historical Ordnance Survey (OS) maps as part of a Groundsure report within STMs Contaminated Land Risk Assessment, Phase I Desk Study Report, were reviewed to determine the historical development of the site. Database information within the Groundsure report, which also includes reference to the hydrogeology, hydrology, subsidence and mining risk and ground gas hazards in the site area, is summarised in the following sections. A summary of the ground hazards for construction purposes is also included.

### 2.1 HISTORICAL REVIEW

Historical Ordnance Survey (OS) maps were reviewed, and the historical development of the site and the surrounding land is summarised in the following table.

| Table 2.1: History of the Site and Surrounding Land                     |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date (scale)                                                            | Site History                                                                                                                                                                                                                      | Surrounding Land History                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1871 (1:2,500)                                                          | The earliest available historical mapping edition indicates that the site comprised undeveloped land set back from Nile Mile Ride.                                                                                                | <p>The earliest available historical mapping indicates that the site is surrounded by undeveloped land and coniferous woodland.</p> <p>Nine Mile Ride is located approximately 60m to the south of the site.</p> <p>Residential premises marked as 'California' are located immediately south-west of the site. A well is marked amongst the premises.</p> <p>A rifle range is located 100m to the east.</p> <p>Brick kilns and a clay pit, as well as a saw mill and timber yard are located some 120m to the west of the site. The California Tramway is shown to have serviced these facilities.</p> |
| 1898 (1:10,560)<br>1899 (1:2,500)                                       | The site is shown to have remained undeveloped; however, the western site boundary had been defined at this time.                                                                                                                 | Brick manufacture to the west of the site appears to have all but ceased.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1910 (1:10,560)<br>1911 (1:2,500)                                       | The site is shown to have remained undeveloped.                                                                                                                                                                                   | <p>The tramway to the west of the site is no longer marked.</p> <p>A number of ponds are evident within the area of the former brick kilns.</p> <p>The saw mill and timber yard appear to be in use still.</p>                                                                                                                                                                                                                                                                                                                                                                                          |
| 1932 (1:10,560)<br>1933 (1:2,500)<br>1938 (1:10,560)<br>1956 (1:10,560) | The site remained undeveloped; however, the eastern and southern site boundaries are shown to have been defined at this time. The site may have been contained within the grounds of a detached dwelling noted to the south-east. | <p>Residential development noted immediately south of the site.</p> <p>A series of rear gardens to residential premises are also marked along the north-western site boundary.</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Table 2.1: History of the Site and Surrounding Land                                                                                                           |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date (scale)                                                                                                                                                  | Site History                                                                                                                                                                                                                                                                                                                                           | Surrounding Land History                                                                                                                                                                                             |
|                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                        | <p>The rifle range to the east is no longer in use.</p> <p>Linear housing development noted along the length of Nine Mile Ride to the south.</p> <p>A drain is marked approximately 40m to the west of the site.</p> |
| <p>1964 (1:2,500)</p> <p>1969 (1:10,000)</p> <p>1973 (1:2,500)</p>                                                                                            | <p>The site is shown to have been located within the grounds of number 287 Nine Mile Ride.</p> <p>A small rectangular building is marked in the south-east of the site.</p> <p>The northern and western sections of the site are noted to have comprised coniferous and deciduous trees.</p>                                                           | <p>No notable changes identified in the nearby surrounding area.</p>                                                                                                                                                 |
| <p>1975 (1:10,000)</p> <p>1977 (1:1,250)</p> <p>1980 (1:10,000)</p> <p>1988 (1:10,000)</p> <p>1993 (1:1,250)</p> <p>2001 (1:10,000)</p> <p>2003 (1:1,250)</p> | <p>The site is shown in its current configuration, split between undeveloped land in the northern two-thirds and the rear garden of number 279a Nine Mile Ride (6 Johnson Close) in the southern third.</p> <p>A pond is marked in the north of the site.</p> <p>The small rectangular building in the south-east of the site is no longer marked.</p> | <p>Residential development noted to the south-west of the site along Tomlinson Drive.</p>                                                                                                                            |
| <p>2010 (1:1,250)</p>                                                                                                                                         | <p>The site is shown in its current layout including two rectangular buildings inside the eastern boundary of the site.</p> <p>The pond is no longer marked.</p>                                                                                                                                                                                       | <p>No notable changes identified in the nearby surrounding area.</p>                                                                                                                                                 |
| <p>2023 ground investigation</p>                                                                                                                              | <p>The site is shown to have remained essentially the same.</p> <p>A wooden equestrian building is noted in the east of the site, within the rear garden of number 6 Johnson Drive.</p>                                                                                                                                                                | <p>No notable changes identified in the nearby surrounding area.</p>                                                                                                                                                 |
| <p><b>Note:</b> All distances are approximate.</p>                                                                                                            |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                      |

### 2.1.1 Planning History

The following table 2.1.1 includes a summary of the planning history associated with the site, forming a number of the previous applications associated with 6 Johnson Drive, as held on the planning portal of Wokingham Borough Council.

A selection of the planning history, irrelevant of status is included where there is pertinent information available for the subject site.

**Table 2.1.1: Summary of Planning History**

| Reference, Date      | Status                   | Description of Planning Application                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 223592<br>09/06/2023 | Approve                  | Full application for the erection of 5no. dwellings with double garages following removal/demolition of the existing outbuildings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 222138<br>18/01/2023 | Approve                  | Householder application for proposed single storey detached outbuilding with roof lantern to the eastern boundary (Retrospective).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 203433<br>10/12/2020 | Breach alleged           | Breach alleged without planning permission, the material change of use of the land to a mixed use including the external storage of builder's materials, plant and equipment, fencing, builder bulk bags, shipping containers, general/assorted waste products, inert waste and the like and the storage of motor vehicles, vehicle breaking, vehicle disassembly and the sale of vehicle parts. (Lead appeal 3264819/203432).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 203432<br>10/12/2020 | Breach alleged           | Breach alleged: 1) On 15 October 2003, planning permission was granted with conditions by the Council under reference F/2003/9103 for the proposed erection of two storage buildings to replace seven existing storage buildings and open storage area. 2) It was noted in the officer planning report for F/2003/9103 that the two buildings would replace seven existing storage buildings and all of the surrounding open air storage. Condition 3 of the planning permission reiterated and reinforced this: No materials, containers or equipment shall be stored on the site outside buildings except for waste materials contained within suitable and sufficient waste containers for removal. Reason: In the interests of visual amenity. 3) The storage of items, equipment, plant and tools outside of the buildings hatched black on the attached plan occurs in breach of Condition 3 of F/2003/9103. Please refer to Enforcement Notice online. (Linked appeal 326827/203433). |
| 183555<br>05/03/2019 | Refused                  | Application for a certificate of existing lawful development for storage of builders plant and materials.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 183548<br>04/03/2019 | Refused                  | Application for a certificate of existing lawful development for storage of inert waste B-8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 172230<br>11/05/2018 | Refused                  | Full planning application for the erection of 25no. dwellings (10 no. affordable) following removal of the existing use and buildings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 051373<br>05/10/2005 | Refused                  | Application For Certificate of Lawful Existing Use For Storage Of Unregistered Motor Vehicles.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 030610<br>15/10/2003 | Approve                  | Proposed erection of 2 storage buildings to replace 7 existing storage buildings and open storage area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 020178<br>22/01/2003 | Approve                  | Proposed erection of a detached garage/carport.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 011001<br>01/05/2002 | Appeal<br>Dismissed      | Outline application for the redevelopment of site from car storage to provide 30 dwellings including proportion of affordable housing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 011499<br>29/11/2001 | Application<br>Withdrawn | Outline application for the redevelopment of the site from car storage to provide 48 dwellings including proportion of affordable housing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### **2.1.2 Anecdotal Evidence**

No anecdotal evidence was available at the time of reporting.

### **2.1.3 Summary of Historical Landuses**

A review of the historical Ordnance Survey maps show that the site remained undeveloped from the late 19th century until the 1930s when the site may have been contained within the grounds of an adjacent residential premises. The site is shown to have remained relatively unchanged until the construction of the recent buildings in the east.

The surrounding area comprises undeveloped land or woodland, followed by residential housing.

Commercial premises in the area included a former clay pit, brick kilns, saw mill and timber yard to the west, as well as a tramway.

Review of the Southern Testing Geoenvironmental Site Investigation Report of October 2017 indicates that at that time, the site was being used in part as a builder's yard, including the two buildings/workshops in the east, which were reputed to have been used to store building materials. Materials stored in the north and east of the site are noted to have included brick and concrete blocks and paviours, plastic pipes, gas canisters and scaffolding rods. At the time of the Southern Testing works a bund and stockpile were present in the north of the site which during Aviron's walkover of 26 July 2023 were no longer present.

The Southern Testing report and aerial photography also indicates that the central section of the site has been used for the storage of numerous vehicles. The Southern Testing report indicates that an above ground gas oil storage tank (AST) and a gas oil dispenser barrel was located adjacent the northern and southern elevations of the two buildings in the east of the site respectively. During the Aviron walkover of 26 July 2023 the oil tank and dispenser have been removed from site.

The more recent history of the site most likely as a builder's yard is confirmed in the planning history records as detailed in table 2.1.1 above, where reference is made to the 'proposed erection of two storage buildings to replace seven existing storage buildings and open storage area' in October 2003.

Subsequent breaches of planning permission were recorded in December 2020 that confirm the external storage of builder's materials, plant and equipment, fencing, builder bulk bags, shipping containers, general/assorted waste products, inert waste and the like and the storage of motor vehicles, vehicle breaking, vehicle disassembly and the sale of vehicle parts within the site.

## 2.2 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

### 2.2.1 Anticipated Geology

Relevant geological information has been determined using the British Geological Survey (BGS) extract sheet 268 of Reading, which have been summarised in table 2.1.1 below.

| Table 2.2.1: Anticipated Geology                        |          |                        |                                                                                                                                |                       |
|---------------------------------------------------------|----------|------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Stratum                                                 | Age      | Possible Thickness (m) | Typical Description                                                                                                            | Aquifer Status        |
| <b>Artificial/Made Ground</b><br>None indicated on site | N/A      | N/A                    | N/A                                                                                                                            | N/A                   |
| <b>Superficial</b><br>None indicated on site            | N/A      | N/A                    | N/A                                                                                                                            | N/A                   |
| <b>Solid</b><br>Bagshot Formation                       | Ypresian | Up to 45m              | Fine to coarse grained sand that is frequently micaceous and locally clayey, with sparse glauconite and sparse seams of gravel | Secondary (A) aquifer |

The Groundsure report indicates that there are superficial strata recorded approximately 160m to the north, comprising alluvium (a secondary (A) aquifer).

The BGS extract indicates that there is an area of 'infilled ground – artificial deposit' located approximately 260m to the west of the site at the location of the former clay pit and brick kilns.

The Groundsure report indicates that there is one reference to artificial ground within 250m of the site, comprising 'infilled ground' at a location 146m to the north-west.

The Groundsure report indicates that there are no landslips or faults recorded within 500m of the site.

### 2.2.2 Ground Conditions and Observations – Previous Ground Investigation by Southern Testing

The following table 2.2.2 summarises the ground conditions encountered during the ground investigation work undertaken at the site by Southern Testing and reported in October 2017.

| Table 2.2.2: Summary of Ground Conditions               |                   |                                                                                                         |
|---------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------|
| Depth to Base                                           | Soil Type         | Description                                                                                             |
| 0.15/0.4/0.5m                                           | Topsoil           | Sandy Topsoil with occasional gravel                                                                    |
| 0.2/0.4/0.9m                                            | Made Ground       | Slightly gravelly Sand and sandy Gravel of mixed lithologies                                            |
| 3.0m                                                    | Bagshot Formation | Generally medium dense fine and medium SAND<br>Locally as stiff CLAY 0.5-1.5m (TP107), 0.4-2.5m (TP108) |
| Groundwater noted at 2.3-2.7m below ground level (bgl). |                   |                                                                                                         |

The results of the laboratory testing undertaken as part of the works by Southern Testing indicate the following:

-  **Lead.** A localised elevated lead concentration of 400mg/kg was recorded in the topsoil sampled in TP103 at 0.2m bgl. However, Southern Testing deemed the absence of risk from lead given the mean concretion recorded for lead from the wider dataset.
-  **Polycyclic Aromatic Hydrocarbons.** A localised elevated benzo(a)pyrene concentration of 22mg/kg was recorded in the Made Ground sampled in HA101 at 0.1m bgl. However, Southern Testing deemed the absence of risk from benzo(a)pyrene given the presence of asphalt within the soil matrix.
-  **Asbestos.** Loose asbestos fibres (chrysotile & amosite) with concentration of <0.001% were recorded in the stockpile material in the north of the site.
-  **Asbestos.** Traces of loose asbestos fibres (chrysotile & amosite) with concentrations <0.001% were recorded in the sample from TP102 at 0.2m and TP103 at 0.2m. A hard asbestos cement fragment (chrysotile) with concentration 1.15% was recorded in TP101 at 0.1m.
-  **Petroleum Hydrocarbons.** Trace aliphatic and aromatic hydrocarbons detected (below the assessment criteria for residential with home-grown produce (1% SOM)) were recorded in the samples taken from the locations of the AST (HA101) and the gas oil barrel (HA102). Trace Total Petroleum Hydrocarbons (TPH) were recorded in the area of vehicle storage (TP107).

Figure 6 is presented as the Southern Testing Soil Contamination Identification Plan

## 2.2.4 Hydrogeology

The hydrogeology of the site has been determined by the solid geology of the Bagshot Formation, which is

classified by the Environment Agency as a secondary (A) aquifer. Secondary (A) aquifers comprise permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The bedrock geology is noted as being of 'medium' vulnerability and the flow mechanism as 'intergranular'.

Both the Groundsure report and the Environment Agency website (August 2023) indicate that the site is not located within an Environment Agency source protection zone (SPZ).

The Groundsure report indicates that the site is not located in a groundwater flooding susceptibility area.

The Groundsure report indicates that there are no references to groundwater abstraction licences for premises within 500m of the site, and no licences for 'potable water supply' for premises within 2000m of the site.

#### **2.2.5 Hydrology**

The nearest surface water feature (an inland river) comprises what appears to be the drain marked on the historical mapping at a location approximately 30m to the north-west of the site.

The Groundsure report indicates that there are no references to surface water abstraction licences for premises within 500m of the site, and no licences for 'potable water supply' for premises within 2000m of the site.

The site is not located in an area that is at risk of 'extreme flooding' or 'flooding' from rivers or sea without defences. The site is located in a Flood Zone 1, where there is a low risk of flooding.

The Groundsure report indicates that the north-western boundary of the site is located in an area where there is a risk of surface water flooding.

### **2.3 LANDFILLS AND GROUND GAS**

The Groundsure report indicates that there are no landfill sites or waste sites located within a 250m search radius of the site.

The Groundsure report indicates that there is one reference to artificial ground within 250m of the site, comprising 'infilled ground', 146m to the north-west.

Table 2.3 summarises the gas risk for the site, based on the above information gained through the desk-based research. In accordance with current guidance (CIRIA C665), the gas generation potential for each source has

been individually assessed, with references to potential gassing risk made according to the following definitions: Negligible, Very Low, Low, Moderate, High and Very High. The definitions are explained in Section 10.0 of the guidance.

The objective of this exercise is to determine if potentially unacceptable ground gas risks exist, and whether further investigation and assessment is necessary.

| Table 2.3: Preliminary Risk Assessment (PRA) - Ground Gas              |                           |             |                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------|---------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Potential Source                                                       | Risk                      | Risk Rating | Rationale                                                                                                                                                                                                                                         |
| Made Ground<br>(CO <sub>2</sub> + CH <sub>4</sub> )                    | Human health<br>Explosion | Very Low    | Nominal Made Ground is anticipated, associated with the use of the site as a builder's yard.<br><br>Substantial organic degradable material is not expected, and the risk of ground gas generation from Made Ground is considered to be very low. |
| Alluvial Strata<br>(CO <sub>2</sub> + CH <sub>4</sub> )                | Human health<br>Explosion | Very Low    | Alluvial strata noted within 250m the site, at a location 160m to the north.                                                                                                                                                                      |
| Landfills<br>(CO <sub>2</sub> + CH <sub>4</sub> )                      | Human health<br>Explosion | Negligible  | No landfill sites located within 250m of the site.                                                                                                                                                                                                |
| Infilled Ground + Burial Sites<br>(CO <sub>2</sub> + CH <sub>4</sub> ) | Human health<br>Explosion | Very Low    | One reference to artificial ground and three references to surface ground workings within 250m of the site.<br><br>Possible infilled ponds also noted in the vicinity of the site on the historical mapping.                                      |
| Coal and Mining<br>(CO <sub>2</sub> + CH <sub>4</sub> )                | Human health<br>Explosion | Negligible  | Not located in a non-coal mining area of Great Britain.<br><br>The site is not located in a coal mining area.<br><br>Mining not anticipated.                                                                                                      |
| Radon                                                                  | Human health              | Very Low    | <1% of homes above action level. Radon protection not required.                                                                                                                                                                                   |
| Soil Vapours                                                           | Human health<br>Explosion | Very Low    | No soil vapour risks identified given limited hydrocarbon impact to soils.                                                                                                                                                                        |
| <b>COMBINED RISK RATING = VERY LOW</b>                                 |                           |             |                                                                                                                                                                                                                                                   |

A Very Low risk from ground gas ingress and explosion is considered. Precautionary gas monitoring would be prudent.

## 2.4 GROUND STABILITY, NATURAL CAVITIES AND MINING HAZARDS

Table 2.4 indicates potential ground stability, natural cavities and mining hazards identified within the Groundsure report for the site.

These will be considered in terms of the proposed development and detailed in the following section 2.5, Preliminary Ground Hazards Summary.

| Table 2.4: Ground Subsidence, Natural Cavities and Mining |                                                                                                    |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Hazard                                                    | Natural Ground Subsidence and Natural Cavities Hazard Rating                                       |
| Shrink-Swell Clay                                         | Negligible                                                                                         |
| Running Sands                                             | Low                                                                                                |
| Potential for Compressible Ground Stability               | Negligible                                                                                         |
| Potential for Collapsible Ground Stability                | Very Low                                                                                           |
| Landslides                                                | Very Low                                                                                           |
| Potential for Ground Dissolution                          | Negligible                                                                                         |
| Natural Cavities                                          | None within 500m                                                                                   |
| Hazard                                                    | Mining and Ground Workings                                                                         |
| BritPits                                                  | 409m NW: Radical Farm Sand Pit. Sand; ceased.                                                      |
| Surface Ground Workings                                   | 180m SW: Brick Kilns<br>225m W: Unspecified Ground Workings<br>225m W: Unspecified Ground Workings |
| Underground Workings                                      | None within 1000m                                                                                  |
| Historical Mineral Planning Areas                         | None within 500m                                                                                   |
| Non-Coal Mining                                           | None within 1000m                                                                                  |
| Mining Cavities                                           | None within 1000m                                                                                  |
| JPB Mining Areas                                          | No records on site                                                                                 |
| Coal Mining                                               | No records on site                                                                                 |
| Other mining/quarrying                                    | No records detailing other mining/quarrying on-site                                                |

Information from the Groundsure report indicates that there is no worked ground within the site extents. The Groundsure report also indicates that there are no references to made ground or artificial ground within the

site extents.

The site is not affected by man-made mining cavities, nor is it located in a coal mining affected area. The site is not located within a non-coal mining area of Great Britain.

## 2.5 PRELIMINARY GROUND HAZARDS SUMMARY

The following Table 2.5 provides a summary of the preliminary ground hazards identified with the ground and groundwater conditions and historical site use as determined from the desk-based information accumulated within the PRA.

| Table 2.5: Preliminary Ground Hazards Summary    |           |                                                                                                                                                                                                                     |
|--------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ground Hazard                                    | Plausible | Description                                                                                                                                                                                                         |
| <b>Topographic</b>                               |           |                                                                                                                                                                                                                     |
| Site constraints                                 | ○         | Restricted site access and substantial hard surfacing.                                                                                                                                                              |
| Slopes, embankments, cuttings                    | ○         | Foundation type and construction difficulties.<br>Remedial measures to stabilise slopes, embankments and cuttings, and mitigate risks of landslides.                                                                |
| <b>Man-made</b>                                  |           |                                                                                                                                                                                                                     |
| Filled ground/ made ground/ infilled basements   | ○         | Foundation type and construction difficulties.                                                                                                                                                                      |
| Existing foundations and below ground structures | ○         | Foundation type and construction difficulties.<br>Obstructions to new construction.<br>Influence of existing and adjacent foundations to new construction.<br>Vibration associated with the construction technique. |
| Mining instability                               | ○         | Foundation type and construction difficulties.<br>Appropriate mining investigation.                                                                                                                                 |
| Ground chemistry                                 | ○         | Sulphate and sulphide attack on buried concrete.<br>Design to BRE DS-1.<br>Expansive blast furnace slag.                                                                                                            |
| Unexploded Ordnance                              | ○         | Detailed unexploded ordnance (UXO) risk assessment did not form part of our project instruction.                                                                                                                    |
| <b>Geological</b>                                |           |                                                                                                                                                                                                                     |
| Frost action                                     | ○         | Susceptibility of soils affected at pavement and foundation formation.<br>Provision of non-frost susceptible materials.                                                                                             |

**Table 2.5: Preliminary Ground Hazards Summary**

| Ground Hazard                                                                                                                                   | Plausible | Description                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lateral soil instability                                                                                                                        | ○         | Foundation type and construction difficulties.<br>Provision of temporary works – shoring.                                                                                                                                                                                                                            |
| Soft clays, silts and compressible soils                                                                                                        | ○         | Foundation type and construction difficulties.<br>Sufficient bearing resistance to support the proposed construction.                                                                                                                                                                                                |
| Shrinkable soils                                                                                                                                | ○         | Foundation type and construction difficulties.<br>Influence of trees on foundation depths.<br>Potential for desiccation to have occurred and heave protection.<br>NHBC Standards Chapter 4.2, Building Near Trees.                                                                                                   |
| Ground dissolution of soluble rocks                                                                                                             | ○         | Foundation type and construction difficulties.<br>Dynamic probing, torque readings.                                                                                                                                                                                                                                  |
| Ground chemistry                                                                                                                                | ○         | Naturally occurring sulphate and sulphide attack on buried concrete.<br>Design to BRE DS-1.                                                                                                                                                                                                                          |
| <b>Hydrogeological/Hydrological</b>                                                                                                             |           |                                                                                                                                                                                                                                                                                                                      |
| Elevated or rising groundwater                                                                                                                  | ○         | Foundation type and construction difficulties.<br>Provision of temporary works – dewatering (possibly well-points) in shallow excavations.<br>Provision of temporary works – shoring.<br>Running sand.<br>Reduced bearing resistance.<br>Ongoing serviceability of basements.<br>Effectiveness of soakaway drainage. |
| Fluvial or coastal scour/erosion                                                                                                                | ○         | Foundation type and construction difficulties.<br>Remedial or preventative measures.                                                                                                                                                                                                                                 |
| <p>○ - Further action required. Potentially plausible hazard.</p> <p>○ - Unlikely to represent a hazard, no further consideration required.</p> |           |                                                                                                                                                                                                                                                                                                                      |

The Bagshot Formation would ordinarily be suitable for the construction of conventional shallow foundations; however, limiting factors would include the consistency of the overlying soils, clay soils locally, the required bearing resistance of the proposed buildings, the influence of trees, excavation stability and seasonally high groundwater. Consideration may therefore need be given to supporting the proposed buildings on piled foundations.

A suitable ground investigation would confirm an appropriate foundation solution.

Shallow soakaway drainage is unlikely to be successful given the potential for impermeable clay soils anticipated at shallow depth.

### 3.0 REGULATORY INFORMATION, CONSULTATIONS AND OTHER

Unless otherwise stated regulatory database information has been obtained from the Groundsure report included within the STM report

#### 3.1 STATUTORY REGISTERS AND AUTHORISATIONS

Table 3.1 includes the statutory registers and authorisations that relate to the site and surrounding area. Pertinent registers and authorisations will be used in conjunction with the desk-based review to determine the preliminary environmental risk.

| Table 3.1: Statutory Registers and Authorisations                                                                                          |                                                                                            |                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Item                                                                                                                                       | 0 – 250m                                                                                   | 251 – 500m                                                                                                                                              |
| Sites Determined as Contaminated Land                                                                                                      | 0                                                                                          | 0                                                                                                                                                       |
| Notification of Installations Handling Hazardous Substances (NIHHS)<br>Facilities and Control of Major Accident Hazards Facilities (COMAH) | 0                                                                                          | 0                                                                                                                                                       |
| Regulated Explosive Sites                                                                                                                  | 0                                                                                          | 0                                                                                                                                                       |
| Hazardous Substance Storage/Usage                                                                                                          | 0                                                                                          | 0                                                                                                                                                       |
| Historical Licensed Industrial Activities (IPC)                                                                                            | 0                                                                                          | 0                                                                                                                                                       |
| Licensed Industrial Activities (Part A (1))                                                                                                | 0                                                                                          | 0                                                                                                                                                       |
| Licensed Pollutant Release (Part A (2)/B)                                                                                                  | 0                                                                                          | 0                                                                                                                                                       |
| Radioactive Substance Authorisations                                                                                                       | 0                                                                                          | 0                                                                                                                                                       |
| Licensed Discharges to Controlled Waters                                                                                                   | 64m SE – Sewage Discharges (Queens Brook)<br><br>64m SE – Sewage Discharges (Queens Brook) | 278m S – Sewage Discharges (Bracklesham Beds)<br><br>307m S – Sewage Discharges (Bracklesham Beds)<br><br>461m S – Sewage Discharges (Bracklesham Beds) |
| Pollutant Release to Surface Waters                                                                                                        | 0                                                                                          | 0                                                                                                                                                       |
| Pollutant Release to Public Sewer                                                                                                          | 0                                                                                          | 0                                                                                                                                                       |
| List 1 Dangerous Substances                                                                                                                | 0                                                                                          | 0                                                                                                                                                       |
| List 2 Dangerous Substances                                                                                                                | 0                                                                                          | 0                                                                                                                                                       |

| Table 3.1: Statutory Registers and Authorisations                      |                                                                                                                                                                                                                                                                                                             |            |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Item                                                                   | 0 – 250m                                                                                                                                                                                                                                                                                                    | 251 – 500m |
| Pollution Incidents                                                    | 0                                                                                                                                                                                                                                                                                                           | 0          |
| Pollution Inventory Substances                                         | 0                                                                                                                                                                                                                                                                                                           | 0          |
| Pollution Inventory Waste Transfers                                    | 0                                                                                                                                                                                                                                                                                                           | 0          |
| Pollution Inventory Radioactive Waste                                  | 0                                                                                                                                                                                                                                                                                                           | 0          |
| Fuel Stations                                                          | 0                                                                                                                                                                                                                                                                                                           | 0          |
| Contemporary Trade Directory Entries                                   | No Contemporary Trade Directory Entries within the site, however, the following within 250m:<br>56m S – Electricity sub-station<br>112m SE – Garden Goods<br>157m SE – Electricity sub-station<br>193m W – Baking and confectionary<br>241m W – Electricity sub-station<br>242m W – Electricity sub-station |            |
| National Grid High Voltage Underground Electricity Transmission Cables | 0                                                                                                                                                                                                                                                                                                           | 0          |
| National Grid High Pressure Gas Transmission Pipelines                 | 0                                                                                                                                                                                                                                                                                                           | 0          |
| Item                                                                   | Immediate Vicinity                                                                                                                                                                                                                                                                                          |            |
| Sensitive Land Uses                                                    | No sensitive land uses within the immediate vicinity.<br>The site is located in a nitrate vulnerable zone in connection with the Emm Brook.                                                                                                                                                                 |            |

## 3.2 CONSULTEES

### 3.2.1 Local Authority - Contaminated Land Officer

The Local Environmental Health Department has not been contacted as part of our project instruction.

### 3.2.2 Local Authority - Building Control Officer

The Local Planning Authority Building Control Officer has not been contacted as part of our project instruction.

### 3.2.3 Local Authority - Petroleum Officer

The Local Planning Authority Petroleum Officer has not been contacted as part of our project instruction.

### **3.2.4 Environment Agency - Contaminated Land and Groundwater**

The Contaminated Land and Groundwater Team of Environment Agency has not been contacted as part of our project instruction.

### **3.2.5 Coal Authority and Mining Searches UK**

The Coal Authority and Mining Searches UK have not been contacted as part of our project instruction.

## 4.0 PRELIMINARY RISK ASSESSMENT

### 4.1 METHODOLOGY

A tier 1 PRA and CSM have been prepared in accordance with the technical approach on Land Contamination Risk Management (LCRM), which replaced 'CLR11'. Possible hazards identified by a potential source of contamination and sensitive receptors have been assessed via a source-pathway-receptor (SPR) model in accordance with current UK protocols. A risk may only exist where a plausible SPR linkage is viable and where the quantity or concentration of a contaminant (source) is sufficient to cause harm. Under the statutory definition "Contamination" may only exist where contaminants pose a risk of harm to a receptor. Risk may be defined as a function of the likelihood and severity of any adverse effects resulting from a contamination event in accordance with CIRIA C552. A summary of how risk is derived and the associated definition is presented in tables 4.1.1 and 4.1.2.

| Table 4.1.1: Risk Ratings Matrix |                   |                   |                   |                   |
|----------------------------------|-------------------|-------------------|-------------------|-------------------|
|                                  | Consequence       |                   |                   |                   |
| Probability                      | Severe            | Medium            | Mild              | Minor             |
| High Likelihood                  | Very high risk    | High risk         | Moderate Risk     | Moderate/low risk |
| Likely                           | High risk         | Moderate Risk     | Moderate/low risk | Low risk          |
| Low Likelihood                   | Moderate Risk     | Moderate/low risk | Low risk          | Very low risk     |
| Unlikely                         | Moderate/low risk | Low risk          | Very low risk     | Very low risk     |

| Table 4.1.2: Risk Ratings Definition |                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Risk Rationale                       | Definition                                                                                                                                                                                                                                                                                                        |
| Very high risk                       | A high probability that severe harm could occur to determined receptor from identified contaminant - OR - evidence exists that severe harm to receptor is currently occurring. Urgent investigation and remediation should be considered. If demonstrated this risk is likely to result in substantial liability. |
| High risk                            | Harm is likely to occur to determined receptor from identified contaminant. Urgent investigation and short-term risk minimisation remediation followed by longer term fit for purpose remediation should be considered. If demonstrated this risk is likely to result in substantial liability.                   |
| Moderate Risk                        | It is possible that harm could occur to a determined receptor from identified contaminant. It is relatively unlikely that any harm would be severe or should harm occur it is likely to be relatively mild.                                                                                                       |
| Moderate/low risk                    | It is possible that harm could occur to a determined receptor from identified contaminant. It is unlikely that any harm would be severe or should harm occur it is probable to be relatively mild.                                                                                                                |
| Low risk                             | It is possible that harm could occur to a determined receptor from identified contaminant. It is unlikely that such harm, if indeed present, would at worst be mild.                                                                                                                                              |
| Very low risk                        | There is a low possibility that harm could occur to a receptor. In such event the harm would not be severe.                                                                                                                                                                                                       |

## 4.2 POTENTIAL SOURCES OF CONTAMINATION

Based on the desk-study and walkover survey completed, table 4.2 presents a summary of the potential sources identified.

| Table 4.2: Potential Sources                                                                                                                                                                                                                            |                                                                                                                             |                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Source                                                                                                                                                                                                                                                  | Description                                                                                                                 | Key Contaminants of Concern                   |
| 1. Site-wide soil contamination                                                                                                                                                                                                                         | Risk of soil contamination within the site associated with recent use as a builder's yard, and the presence of Made Ground. | Metals, hydrocarbons (TPH/PAH), asbestos.     |
| 2. Local soil contamination                                                                                                                                                                                                                             | Risk of soil contamination from ACMs in the existing buildings and the AST and oil barrel.                                  | Metals, hydrocarbons (TPH/PAH), asbestos.     |
| 3. Asbestos                                                                                                                                                                                                                                             | Risk of Asbestos Containing Soils (ACS) and Asbestos Containing Materials (ACMs) from former and existing buildings.        | Asbestos.                                     |
| 4. Ground gases/vapours                                                                                                                                                                                                                                 | Low risk of hazardous ground gases is anticipated given the made ground and vapour risk from the AST and oil barrel         | Hazardous ground gas.<br>Complete monitoring. |
| TPH – Total Petroleum Hydrocarbons<br>PAH – Polycyclic Aromatic Hydrocarbons<br>Contaminated groundwater is not considered a source based on the site investigation findings of Southern Testing and Aviron's desk based study and walkover inspection. |                                                                                                                             |                                               |

## 4.3 PATHWAYS

A pathway is one or more routes or means that a receptor can be exposed to, or affected by, a contaminant.

| Table 4.3: Plausible Pathways                                                           |
|-----------------------------------------------------------------------------------------|
| On-Site and Locally                                                                     |
| Direct contact; to humans and infrastructure                                            |
| Underlying geology/hydrogeology; shallow solid geology comprising secondary (A) aquifer |
| Inhalation and ingestion                                                                |
| Surface run-off/drainage                                                                |

## 4.4 RECEPTORS

A receptor is either a living organism, a group of organisms, an ecological system, controlled waters or property that could be harmed or polluted by a contaminant. Table 4.4 examines the potential receptors.

| Table 4.4: Potential Receptors |                                                                                                    |                                                                                                                      |           |
|--------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------|
| Receptor                       | Description                                                                                        | Comments                                                                                                             | Plausible |
| Construction workers           | Groundworkers and general construction works                                                       | Construction works proposed within the site                                                                          | Yes       |
| End users                      | Occupants of the proposed development                                                              | Gardens proposed across the site.                                                                                    | Yes       |
| Adjacent land users            | Occupants of surrounding residencies                                                               | Adjacent residential dwellings which could be affected by run-off or migration.                                      | Yes       |
| Soft landscaping               | Areas of new planting including lawns                                                              | Gardens proposed across the site.                                                                                    | Yes       |
| Water supply pipes             | Plastic pipework for potable water supply to housing may be affected if laid in contaminated soils | New supply required for redevelopment.                                                                               | Yes       |
| Buildings & infrastructure     | Buried concrete for new foundations may be in contact with aggressive ground (sulphur attack)      | New building works proposed.                                                                                         | Yes       |
| Groundwater                    | Controlled waters (aquifers) beneath the site                                                      | Site underlain by secondary (A) aquifer.<br>Site not located in a SPZ.<br>No potable water abstraction within 2000m. | Yes       |
| Surface waters                 | Controlled water such as lakes, streams, rivers or coastal waters                                  | Drain (inland river) within the vicinity.                                                                            | Yes       |
| Ecological receptors           | Sensitive areas of ecological significance defined under Part 2A of EPA 1990                       | Site is semi-rurally located, but no sensitive ecological receptors in the immediate vicinity.                       | No        |

#### 4.5 SUMMARY OF POLLUTANT LINKAGES FOR PROPOSED LAND USE - INITIAL CSM

The initial CSM is based upon the proposed site end use and the information currently consulted relating to various risk sources and plausible pollutant linkages and is presented within table 4.5.

| Table 4.5: Initial Conceptual Site Model (for plausible pollutant linkage pathways) |                      |                |             |             |                                                                                                                                                                                                                                |             |
|-------------------------------------------------------------------------------------|----------------------|----------------|-------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Source                                                                              | Receptor             | Pathway        | Probability | Consequence | Risk & Justification                                                                                                                                                                                                           | Linkage No. |
| Source 1<br>Site-wide soil contamination                                            | Construction workers | Direct contact | Likely      | Medium      | Moderate<br><br><i>Note 1.</i> Site occupied with storage buildings.<br><br>Potential for made ground and contaminants associated with the recent builder's yard site use. Potential asbestos arising from building materials. | 1           |

**Table 4.5: Initial Conceptual Site Model (for plausible pollutant linkage pathways)**

| Source                               | Receptor                   | Pathway                                   | Probability    | Consequence | Risk & Justification                                                                                                                                                                                    | Linkage No. |
|--------------------------------------|----------------------------|-------------------------------------------|----------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                      | End users                  | Direct contact                            | Likely         | Medium      | Moderate<br><i>See Note 1.</i>                                                                                                                                                                          | 2           |
|                                      | Adjacent land users        | Direct contact via run-off                | Low likelihood | Medium      | Moderate/Low<br><i>Note 2.</i> The site is underlain by secondary (A) aquifer. Recent use as a builder's yard. No evidence of die-back of vegetation or abnormal surfacing towards adjacent land users. | 3           |
|                                      | Soft landscaping           | Root uptake                               | Low likelihood | Medium      | Moderate/Low<br><i>Note 3.</i> Although a potential for made ground and asbestos deposition has been identified, the pathway is not applicable for there to be a contaminant pathway.                   | 4           |
|                                      | Water supply pipes         | Direct contact                            | Low likelihood | Medium      | Moderate/Low<br><i>Note 2.</i>                                                                                                                                                                          | 5           |
|                                      | Buildings & infrastructure | Direct contact                            | Low likelihood | Medium      | Moderate/Low<br><i>Note 2.</i>                                                                                                                                                                          | 6           |
|                                      | Groundwater                | Migration through hydrogeology            | Unlikely       | Mild        | Very Low<br><i>Note 4.</i> The site is underlain by secondary (A) aquifer, with clay interbeds. No significant soil contamination identified by Southern Testing.                                       | 7           |
|                                      | Surface waters             | Run-off<br>Migration through hydrogeology | Unlikely       | Mild        | Very Low<br><i>See Note 4.</i>                                                                                                                                                                          | 8           |
| Source 2<br>Local soil contamination | Construction workers       | Direct contact                            | Low likelihood | Medium      | Moderate/Low<br><i>Note 5.</i> Local sources identified such as the former AST.                                                                                                                         | 9           |
|                                      | End users                  | Direct contact                            | Low likelihood | Medium      | Moderate/Low<br><i>See Notes 2+ 5.</i>                                                                                                                                                                  | 10          |
|                                      | Adjacent land              | Direct contact via                        | Low            | Medium      | Moderate/Low                                                                                                                                                                                            | 11          |

**Table 4.5: Initial Conceptual Site Model (for plausible pollutant linkage pathways)**

| Source                                                         | Receptor                   | Pathway                                   | Probability    | Consequence | Risk & Justification                                                                                                                                   | Linkage No. |
|----------------------------------------------------------------|----------------------------|-------------------------------------------|----------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                                                | users                      | run-off                                   | likelihood     |             | <i>See Notes 2 + 5.</i>                                                                                                                                |             |
|                                                                | Soft landscaping           | Root uptake                               | Low likelihood | Medium      | Moderate/Low<br><i>See Notes 3 + 5.</i>                                                                                                                | 12          |
|                                                                | Water supply pipes         | Direct contact                            | Low likelihood | Medium      | Moderate/Low<br><i>See Notes 2 + 5.</i>                                                                                                                | 13          |
|                                                                | Buildings & infrastructure | Direct contact                            | Low likelihood | Medium      | Moderate/Low<br><i>See Notes 2 + 5.</i>                                                                                                                | 14          |
|                                                                | Surface waters             | Migration through hydrogeology            | Unlikely       | Mild        | Very Low<br><i>See Note 4.</i>                                                                                                                         | 15          |
|                                                                | Surface waters             | Run-off<br>Migration through hydrogeology | Unlikely       | Mild        | Very Low<br><i>See Note 4.</i>                                                                                                                         | 16          |
| Source 3<br>Asbestos                                           | Construction workers       | Inhalation                                | Likely         | Medium      | Moderate<br><br><i>Note 6.</i> Potential for ACMs from previous and existing buildings.<br><br>Southern Testing report and debris identified in soils. | 17          |
|                                                                | End users                  | Inhalation                                | Likely         | Medium      | Moderate<br><br><i>See Note 6.</i>                                                                                                                     | 18          |
|                                                                | Adjacent land users        | Inhalation                                | Unlikely       | Mild        | Very Low<br><br><i>Note 7.</i> Potential for ACMs from previous and existing buildings.<br><br>Distance and dispersion in outdoor air limits risk.     | 19          |
| Source 4<br>Ground gases and Soil vapours (on/off site source) | Construction workers       | Inhalation of vapours/gas                 | Unlikely       | Mild        | Low<br><br><i>Note 8.</i> Sources of ground gas identified within the site (made ground, alluvium, infilled ground, soil vapours).                     | 20          |
|                                                                | End users                  | Inhalation of vapours/gas                 | Low likelihood | Mild        | Low<br><br><i>See Note 8, though indoor occupancy increases risk.</i>                                                                                  | 21          |

The overall environmental risk classification for the site is considered to be generally **MODERATE/LOW** and as such pollutant linkages resulting in a low risk or greater should be investigated in a suitable manner. Where risks are considered to be very low, further investigation is not considered necessary.

#### 4.5 CONSIDERATIONS FOR SITE INVESTIGATION

Table 4.5 provides a summary risk to outline further investigation in order complete the risk assessment.

| Table 4.5: Environment Risk Actions |                                                                                                                   |                                                                                                                                                          |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Media                               | Investigative Action                                                                                              | Risk Summary                                                                                                                                             |
| Soils                               | Complete site-wide soil contamination and soil asbestos testing.                                                  | Risk to construction workers, end users and adjacent land users in the event of soil contamination.<br>Construction workers should wear appropriate PPE. |
|                                     |                                                                                                                   | Risk to soft landscaping in the event of physically unsuitable strata and phytotoxic elements.                                                           |
|                                     |                                                                                                                   | Risk to water supply in the event of soil contamination.                                                                                                 |
|                                     |                                                                                                                   | Risk to buildings and infrastructure from sulphate attack.                                                                                               |
| Local Soils                         | Complete soil contamination testing adjacent the contaminative features of interest including AST and oil barrel. | Risk to construction workers, end users and adjacent land users in the event of soil contamination.<br>Construction workers should wear appropriate PPE. |
|                                     |                                                                                                                   | Risk to soft landscaping in the event of physically unsuitable strata and phytotoxic elements.                                                           |
|                                     |                                                                                                                   | Risk to water supply in the event of soil contamination.                                                                                                 |
|                                     |                                                                                                                   | Risk to buildings and infrastructure from sulphate attack.                                                                                               |
| Ground Gas                          | Install monitoring wells and complete hazardous ground gas and vapour monitoring.                                 | Risk to end users.                                                                                                                                       |

To assess the Moderate/Low risk the following analysis should be completed:

-  Aviron's "ES-1" of laboratory analysis shall be applied to future site investigations which includes; arsenic, barium, cadmium, total chromium, copper, nickel, zinc, lead, mercury, selenium, water soluble boron, total cyanide, total sulphate, water soluble sulphide, speciated Polycyclic Aromatic Hydrocarbons (PAH), speciated Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Xylenes (BTX) and Methyl Tert-Butyl Ether (MTBE), organic matter, total phenols, pH and asbestos. **Provides broad analysis of common soil contaminants.**

 **Waste Acceptance Criteria (WAC). To determine the classification of excess soils for off-site disposal.**

The listed suite of analysis is considered suitable and will provide a screening for the majority of commonly found soil contaminants, which shall be followed through into the site investigation.

## 5.0 SITE INVESTIGATION WORK

### 5.1 METHOD STATEMENT AND SITE INVESTIGATION APPROACH

A method statement detailing how the site investigation was to be conducted was produced in accordance with current statutory guidance, best practices and the Client's instructions.

A health and safety plan was completed before site work commenced. Site investigation staff were briefed on the potential contaminants likely to be encountered, and the appropriate personal protective equipment (PPE) to be adopted for this type of investigation.

The site investigation was conducted in accordance with British Standards; BS5930:2015+A1 'Code of Practice for Ground Investigation', BS1377-1:2016 'Methods of test for soils for Civil Engineering Purposes' and BS10175:2011+A2:2017 'Investigation of Potentially Contaminated sites'.

### 5.2 SITE INVESTIGATION METHODS

Section 4.5 prepared an initial CSM where pollutant linkages with a greater risk than low would require suitable investigation.

Table 5.2 presents what it considered to be a suitable method and rationale of investigation which was completed 26 and 27 July 2023.

| Table 5.2: Rationale of Site Investigation Positions |                                                                                                                                                                                                                                                |                                                        |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Location                                             | Rationale                                                                                                                                                                                                                                      | Monitoring Well                                        |
|                                                      | <b>Window Sample (WS) Boreholes</b>                                                                                                                                                                                                            |                                                        |
| WS1                                                  | South-west of the site beneath the proposed building in Plot 5, to determine ground conditions and enable soil sampling.<br>Positioned for spatial coverage and potential impact of adjacent trees.                                            | Gas and groundwater monitoring well installed to 4.0m. |
| WS2                                                  | South-east of the site beneath the proposed building in Plot 4, to determine ground conditions and enable soil sampling.<br>Positioned for spatial coverage and potential impact of removed trees.                                             | Gas and groundwater monitoring well installed to 4.0m. |
| WS3                                                  | Centre of the site in front of the proposed building in Plot 3, to determine ground conditions and enable land contamination assessment/testing.<br>Positioned for spatial coverage and as a control borehole located remote from known trees. | Not installed.                                         |
| WS4                                                  | West of the site to the rear of the proposed building in Plot 3, to determine ground conditions and enable land contamination assessment/testing.<br>Positioned for spatial coverage and in area of former car storage.                        | Not installed.                                         |

|      |                                                                                                                                                                                                                |                                                        |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| WS5  | North-west of the site between the proposed building and garage in Plot 1, to determine ground conditions and enable soil sampling.<br>Positioned for spatial coverage and potential impact of adjacent trees. | Gas and groundwater monitoring well installed to 2.0m. |
| WS6  | North-east of the site beneath the proposed building in Plot 2, to determine ground conditions and enable soil sampling.<br>Positioned for spatial coverage and potential impact of adjacent trees.            | Not installed.                                         |
|      | <b>Machine and hand excavated trial pits (TP)</b>                                                                                                                                                              |                                                        |
| TP1  | South-west of the site in the soft landscaped area, and rear garden of Plot 5, to determine shallow ground conditions and enable land contamination assessment/testing.                                        | Not installed.                                         |
| TP2  | South-east of the site in the soft landscaped area, and rear garden of Plot 4, to determine shallow ground conditions and enable land contamination assessment/testing.                                        | Not installed.                                         |
| TP3  | South-east of the site adjacent the wooden equestrian building, and side garden of Plot 4, to determine shallow ground conditions and enable land contamination assessment/testing.                            | Not installed.                                         |
| TP4  | East of the site in the former car storage area, and rear garden of Plot 3, to determine shallow ground conditions and enable land contamination assessment/testing.                                           | Not installed.                                         |
| TP5  | East of the site in the former car storage area, and rear garden of Plot 3, to determine shallow ground conditions and enable land contamination assessment/testing.                                           | Not installed.                                         |
| TP6  | West of the site in the former car storage area, and front garden of Plot 3, to determine shallow ground conditions and enable land contamination assessment/testing.                                          | Not installed.                                         |
| TP7  | Centre-north of the site in the former car storage area, and front garden of Plot 1, to determine shallow ground conditions and enable land contamination assessment/testing.                                  | Not installed.                                         |
| TP8  | Centre-north of the site in the former builder's yard, and rear garden of Plot 1, to determine shallow ground conditions and enable land contamination assessment/testing.                                     | Not installed.                                         |
| TP9  | North of the site in the former builder's yard, and rear garden of Plot 2, to determine shallow ground conditions and enable land contamination assessment/testing.                                            | Not installed.                                         |
| TP10 | North of the site in the former builder's yard, and rear garden of Plot 2, to determine shallow ground conditions and enable land contamination assessment/testing.                                            | Not installed.                                         |
|      | <b>Hand Auger (HA) Boreholes</b>                                                                                                                                                                               |                                                        |
| HA1  | South-east of the site adjacent the storage building/workshop of the former builder's yard, and former oil dispenser, as well as the side garden of Plot 4, to enable land contamination assessment/testing.   | Not installed.                                         |

|     |                                                                                                                                                                                                                                        |                |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| HA2 | South-east of the site inside the storage building/workshop of the former builder's yard, and rear garden of Plot 3, to enable land contamination assessment/testing.                                                                  | Not installed. |
| HA3 | East of the site adjacent the storage building/workshop of the former builder's yard, and rear garden of Plot 3, to enable land contamination assessment/testing.                                                                      | Not installed. |
| HA4 | East of the site inside the storage building/workshop of the former builder's yard, and proximity of former above ground gas oil storage tank, as well as the front garden of Plot 2, to enable land contamination assessment/testing. | Not installed. |

Exploratory Hole Location Plans are enclosed as **Figures 7 and 8**.

All intrusive locations were pre-cleared prior to the ground investigation works using Ground Penetrating Radar (GPR), Cable Avoidance Tool (CAT) and tracing of manhole covers, which was completed to endeavour service avoidance during this exercise.

### 5.2.1 Window Sample Drilling

Window sample boreholes WS1 to WS6 were drilled to depths of 5.0m bgl using an Archway Dart drilling rig.

The purpose of the window sampling was to evaluate ground conditions at shallow depths, collect soil samples for geochemical and geotechnical laboratory analysis and to determine soil strength by means of SPTs.

The action of window sampling also enables the installation of monitoring wells to determine standing groundwater levels and ground gas testing.

Standard Penetration Tests were undertaken at 1m intervals to depths of 5.0m bgl within the boreholes in accordance with BS EN SO 22476-3 "Standard Penetration Test 2005".

Disturbed soil samples were also collected from bored arisings for geochemical and geotechnical laboratory tests which are further discussed within section 6.0.

Hand penetrometer readings were also taken at 0.25m depth intervals, or where appropriate, to determine the shear strength profile within the fine soils encountered beneath the site.

### 5.2.2 Trial Pitting

Ten trial pits were excavated either using hand tools (TP1-TP3) in the rear garden of number 6 Johnson Drive or using a 2.5 tonne tracked 360-degree excavator (TP4-TP10) in the former builder's yard.

The trial pits were excavated at relatively shallow depths of up to 1.9m bgl, to enable soil sampling and laboratory testing for screening for human health risk assessment.

The trial pits complement the window sample boreholes targeting specific areas of the site and to assess the overlying ground conditions.

A composite sample was taken from TP1 (0.2m) and TP5 (0.1m) and added to the samples in HA1 (0.2m) and HA2 (0.3m) for Waste Acceptance Criteria (WAC) analysis.

### 5.2.3 Hand Auger Boreholes

Four hand auger boreholes (HA1-HA4) were drilled using a hand auger at shallow depths of up to 1.0m bgl, to enable soil sampling and laboratory testing for screening for human health risk assessment.

The hand auger boreholes complement the window sample boreholes and trial pits and were targeted at the specific area of the storage sheds/workshops in the east of the site, to assess the ground conditions and collect soil samples for geochemical laboratory analysis.

A composite sample was taken from HA1 (0.2m) and HA2 (0.3m) and added to the samples in TP1 (0.2m) and TP5 (0.1m) for Waste Acceptance Criteria (WAC) analysis.

### 5.2.3 Dynamic Cone Penetrometer (DCP/TRL)

Six Dynamic Cone Penetrometer (DCP) tests (DCP1-DCP6) were undertaken to determine design parameters (California Bearing Ratio, or CBR) for road pavement construction in accordance with the Transport Research Laboratory (TRL), commencing at ground level, to a depth of 0.9 m bgl.

The tests were undertaken at the locations included in **Figures 7 and 8**.

## 5.3 GROUND CONDITIONS

The exploratory hole logs and photographs are presented within **Appendix I**.

Detailed strata descriptions are shown on the respective exploratory hole logs though in general ground conditions comprise:

-  MADE GROUND and reworked TOPSOIL noted to depths of between 0.3m and 0.4m bgl, extending to greater depths of between 0.5m and 1.2m bgl at the locations of TP3, TP9, HA2 and HA4.

- 🌿 Overlying horizon of firm and stiff, silty very sandy CLAY (Bagshot Formation) to depths of between 0.6m and 2.9m bgl. The CLAY soils extend to relatively shallow depths of between 0.6m and 1.2m bgl in the north of the site, extending to 1.5m and 1.6m bgl in the centre of the site, and to maximum encountered depths of 2.9m and 2.8m bgl in WS1 and WS2 respectively, in the south of the site. Partings of coarse sand were observed within the CLAY horizon.
- 🌿 The CLAY horizon was noted to extend to depths of 1.5m bgl in TP107 in the centre of the site and 2.5m bgl (TP108) in the south of the site in the Southern Testing trial pits excavated across the site in 2017.
- 🌿 Medium dense becoming dense and very dense silty fine to medium SAND (Bagshot Formation) to the termination depths of drilling of up to 5.0m bgl. The coarse soils were noted to be clayey and very clayey locally, with occasional clay partings with depth.

### 5.3.1 Field Observations

No discernible odours or staining were noted during the ground investigation works in the soils encountered across the site.

Roots and rootlets were recorded routinely across the site during the site investigation work to depths of up to 0.9m bgl.

## 5.4 GROUNDWATER LEVELS

### 5.4.1 Groundwater Levels: During Site Investigation Works

Groundwater was encountered during the site investigation works completed on 26 and 27 July 2023 at the depths detailed in table 5.4.1 below.

| Table 5.4.1: Groundwater During Investigation |                                    |                                                                                                          |
|-----------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------|
| Location                                      | Depth – bgl (during GI)            | Comments                                                                                                 |
| WS1                                           | Dry to 5.0m bgl                    | The groundwater encountered is expected to represent the secondary (A) aquifer of the Bagshot Formation. |
| WS2                                           | Dry to 5.0m bgl                    |                                                                                                          |
| WS3                                           | 3.4m bgl, no rise after 20 minutes |                                                                                                          |
| WS4                                           | 3.4m bgl, no rise after 20 minutes |                                                                                                          |
| WS5                                           | Dry to 5.0m bgl                    |                                                                                                          |

| Table 5.4.1: Groundwater During Investigation |                                 |                                                                                                          |
|-----------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------|
| Location                                      | Depth – bgl (during GI)         | Comments                                                                                                 |
| WS6                                           | Dry to 4.7m bgl                 | The groundwater encountered is expected to represent the secondary (A) aquifer of the Bagshot Formation. |
| TP1-TP10                                      | Dry to depths of up to 1.9m bgl |                                                                                                          |
| HA1-HA4                                       | Dry to depths of up to 1.0m bgl |                                                                                                          |

#### 5.4.2 Groundwater and Gas Monitoring Wells

Selected boreholes were converted to monitoring wells to enable standing groundwater level monitoring and ground gas monitoring. Wells were installed into 101mm diameter window sample boreholes using 63mm external diameter and 50mm internal diameter HDPE standpipe.

Table 5.4.2 describes the construction of the wells.

| Table 5.4.2: Monitoring Well Construction |                                            |                                                             |                      |
|-------------------------------------------|--------------------------------------------|-------------------------------------------------------------|----------------------|
| Location                                  | Depth of plain pipe and bentonite seal (m) | Response zone; depth of slotted pipe with gravel screen (m) | Depth of install (m) |
| WS1                                       | Ground level (GL)-1.0                      | 1.0-4.0                                                     | 4.0                  |
| WS2                                       | GL-1.0                                     | 1.0-4.0                                                     | 4.0                  |
| WS5                                       | GL-1.0                                     | 1.0-2.1                                                     | 2.1                  |

#### 5.4.3 Groundwater and Gas Post-Investigation Monitoring

In all instances and prior to completing groundwater monitoring and field measurements bulk ground gases and soil vapours were monitored using a GFM 435 Gas Analyser and miniRAE Photon-Ionisation Detector (PID) on the dates shown in table 5.4.3, which provides standing level groundwater ‘dips’ during post-investigation monitoring.

| Table 5.4.3: Groundwater Monitoring Depths |                        |                        |                        |
|--------------------------------------------|------------------------|------------------------|------------------------|
| Location / Date                            | Depth – (m) bgl<br>WS1 | Depth – (m) bgl<br>WS2 | Depth – (m) bgl<br>WS5 |
| 4 August 2023                              | 3.67                   | 4.01                   | Dry to 2.1             |
| 11 August 2023                             | 3.43                   | 3.84                   | Dry to 2.1             |

Further to comments regarding groundwater made within table 5.4.1 it is likely the water encountered represents the secondary (A) aquifer of the Bagshot Formation.

Ground gas monitoring is discussed in section 9.0 of this report.

Field monitoring sheets are enclosed in **Appendix II**.

## 6.0 LABORATORY ANALYSIS

### 6.1 SOIL GEOCHEMICAL TESTING

Table 6.1 details the soil samples which were collected and submitted for geochemical analysis.

| Table 6.1: Soil Geochemical Testing |                  |                                                                                                                    |          |
|-------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------|----------|
| Location                            | Strata Sampled   | Objective                                                                                                          | Analysis |
| HA1 (0.2m)                          | Made Ground      | Shallow sample to determine baseline concentrations of Made Ground adjacent the building/workshop (east coverage). | ES-1     |
| HA4 (0.3m)                          | Made Ground      | Shallow sample to determine baseline concentrations of Made Ground inside the building/workshop (east coverage).   | ES-1     |
| TP1 (0.2m)                          | Made Ground      | Shallow sample to determine baseline concentrations of Made Ground (south-west coverage).                          | ES-1     |
| TP5 (0.1m)                          | Made Ground      | Shallow sample to determine baseline concentrations of Made Ground (east coverage).                                | ES-1     |
| TP6 (0.4m)                          | Natural Clay     | Sample to determine baseline concentrations of Natural Clay at depth (west coverage).                              | ES-1     |
| TP9 (0.5m)                          | Made Ground      | Shallow sample to determine baseline concentrations of Made Ground (north coverage).                               | ES-1     |
| WS1 (0.1m))                         | Reworked Topsoil | Shallow sample to determine baseline concentrations of Reworked Topsoil (south-west coverage).                     | ES-1     |
| WS2 (0.2m)                          | Reworked Topsoil | Shallow sample to determine baseline concentrations of Reworked Topsoil (south-east coverage).                     | ES-1     |
| WS2 (0.45m)                         | Natural Clay     | Sample to determine baseline concentrations of Natural Clay at depth (south-east coverage).                        | ES-1     |
| WS3 (0.7m)                          | Natural Clay     | Sample to determine baseline concentrations of Natural Clay at depth (central coverage).                           | ES-1     |
| WS4 (0.3m)                          | Reworked Topsoil | Shallow sample to determine baseline concentrations of Reworked Topsoil (west coverage).                           | ES-1     |
| WS5 (0.2m)                          | Reworked Topsoil | Shallow sample to determine baseline concentrations of Reworked Topsoil (north-west coverage).                     | ES-1     |
| WS5 (0.9m)                          | Natural Clay     | Sample to determine baseline concentrations of Natural Clay at depth (north-west coverage).                        | ES-1     |
| WS6 (0.2m)                          | Reworked Topsoil | Shallow sample to determine baseline concentrations of Reworked Topsoil (north-east coverage).                     | ES-1     |
| COMP (0.1-0.3m)<br>HA1/HA2/TP1/TP5  | Made Ground      | Composite Made Ground sample to determine classification for waste disposal. Sampled from HA1, HA2, TP1 and TP5.   | WAC      |

Chemical sampling and testing targeted the overlying units of reworked Topsoil, Made Ground and natural Clay strata whereby virtue of surface deposition, historical contaminants are most likely to be recorded. The purpose of sampling slightly deeper natural strata is to generate a baseline understanding of natural soil chemistry and to understand phytotoxic elements at depths of root growth.

The analytical suites were chosen to provide a suitable screening in accordance with the potential contaminants identified within the site conceptualisation presented within section 4.5.

Soil samples for environmental quality analysis were sent to i2 Analytical Limited.

## 6.2 SOIL GEOTECHNICAL TESTING

A programme of geotechnical laboratory testing was undertaken at Geo Site & Testing Services Limited and Eurofins Chemtest Limited. Testing was completed on the fine and coarse soils encountered beneath the site. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of testing used are provided in table 6.2.

| Table 6.2: Soil Geotechnical Testing                                                                                                                                                                                                                                    |                                            |                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------|
| Test                                                                                                                                                                                                                                                                    | Standard                                   | Number of Samples                             |
| <b>GSTL</b><br>Atterberg Limits (and Moisture Content)<br><i>The objective of Atterberg limits and moisture content testing is to determine plasticity and volume change potential of fine (clay and silt) soils and the potential for desiccation to have occurred</i> | BS1377: 1990: Part 2: Clause 3.2, 4.5, 5.0 | 12 (12)                                       |
| <b>GSTL</b><br>Particle Size Distribution (PSD)<br><i>The objective of PSD testing is to determine grading of coarse (sand and gravel) soils</i>                                                                                                                        | BS1377: 1990: Part 2: Clause 9.2           | 4                                             |
| <b>Eurofins Chemtest</b><br>Aviron LC Suite<br>- pH, water soluble sulphate, total sulphate & total sulphur<br><i>To enable concrete classification to be specified</i>                                                                                                 | UKAS accredited                            | 18 (including 14 within the Suite 1 analysis) |

## 6.3 SOIL SAMPLING PROTOCOL

All soil samples were collected from bored or excavated arisings using a trowel and following Aviron's standard protocols for soil sampling. To avoid cross contamination, the sampling equipment was cleaned using de-ionised water after each sample was retrieved.

Clean latex gloves were used each time a soil sample was collected, and all samples were placed into clean sterilised jars for submission to the UKAS/MCERTS accredited laboratory.

All sample containers were labelled on-site immediately prior to filling. These samples were identified by a label placed on the body of each container and the following information was recorded; site name, date collected, unique sample number, soil sample depth.

Samples for geochemical analysis were then placed into a cool box containing ice packs to maintain refrigerated conditions following collection and transport to the laboratory. Ice packs were changed every twenty-four hours where necessary to maintain cool conditions and suppress volatiles.

## 7.0 ENVIRONMENTAL INTERPRETATIVE GUIDANCE

### 7.1 GENERIC QUANTITATIVE RISK ASSESSMENT

The purpose of a tier 2 GQRA is to determine the suitability of the site for proposed development and end use.

The site investigation shall collect soil samples whereby determinant chemical measured in the soil through laboratory analysis have been compared with guidance values which are appropriate to the receptor under consideration. The guidance values or screening criteria applied shall be industry adopted generic values which following a screening of the laboratory analysis shall determine whether or not a site is contaminated, as defined under Part IIA of the EPA 1990 and specification in regard of the proposed development and identified receptors.

Where exceedances of guidance values or recorded a GQRA is can be used to appraise risk and make recommendations in regard of further investigation, remediation and/or tier 3 Detailed Quantitative Risk Assessment (DQRA).

### 7.2 GUIDANCE USED FOR ASSESSING SOIL CONTAMINATION

Aviron has followed the technical approach on Land Contamination Risk Management (LCRM), accessed on gov.uk website and other available guidance to assess contaminant concentrations.

Details of the methodology and Aviron's position on the adoption of guidance values is outlined below.

The available chemical data, from soil samples tested, is sorted into appropriate datasets depending on sampling regime and ground conditions. An initial GQRA is completed using the relevant and industry available screening criteria and where appropriate, statistical modelling. Risks to human health shall be initially assessed by comparing soil chemical data against various published screening criteria. These have been sourced from the following and in order of preference:

-  Category 4 Screening Levels (C4SLs) prepared by the Department of Environmental Food and Rural Affairs (DEFRA) and published March 2014.
-  Phase 2 C4SLs prepared by CL:AIRE and published May 2021.
-  Suitable 4 Use Levels (S4ULs) prepared by Land Quality Management/Chartered Institute of Environmental Health (LQM/CEIH) and published December 2014. LQM acknowledgement for use of S4ULs. *"Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3275. All rights reserved"*.

- 🌱 Soil Guidance Values (SGVs) prepared by the Environment Agency (EA)/DEFRA and published 2009.
- 🌱 Soil Generic Assessment Criteria (GAC) prepared by Environment Industries Commission (EIC)/Association of Geotechnical and Geoenvironmental Specialists (AGS)/Contaminated Land: Application In Real Environments (CL:AIRE) and published 2010.

Aviron have adopted the above hierarchy in response to LCRM recommendations.

### **7.3 GUIDANCE USED FOR THE ASSESSMENT OF HAZARDOUS GROUND GAS**

The principal influence for causing the migration of landgas in the ground is changes to barometric pressure. The most onerous landgas emission conditions on a site are usually observed following days of low or rapidly falling barometric pressure below 1000 millibars (mb).

Monitoring is usually performed over a period of several weeks or months in order to increase the chances of visiting the site on days when the conditions for monitoring worst-case results are correct. Gas monitoring results collected solely during high pressure conditions (>1000mb) may not provide a true value for worst case emission rates from the site.

Methane is produced by a number of processes, which can be biological or chemical in nature. The principal process is from the biogenic decay of organic material and is commonly found associated with landfill and organic marsh deposits or river silts. Methane can also be found associated with coal workings. It is explosive at concentrations of between 5 and 15%, with 5% being termed the lower explosive limit (LEL).

In assessing the risks from hazardous ground gas, reference has been made to the guidance from BS 8485:2015 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings' and CIRIA Report C665 'Assessing risks posed by hazardous ground gases to buildings' 2007 which adopts a risk characterisation strategy based on the maximum flow (L/hour) and maximum steady stated concentration (% v/v) of methane and carbon dioxide from a site to derive gas screening values (GSV) in litres/hour which are comparable with the Modified Wilson and Card classification (shown in Table 8.5 of C665) for any site which isn't intended to be developed as low-rise housing with vented underfloor void.

It is noted gas monitoring is precautionary.

## 8.0 ASSESSMENT OF GEOCHEMICAL SOIL RESULTS

Development proposed include predominantly private gardens and therefore the residential with homegrown produce from the guidance listed in section 7.2 shall be selected.

In order to select the appropriate Soil Organic Matter (SOM) value for appraisal of PAH and TPH the mean average SOM value was determined from the laboratory dataset and accordingly the 2.5% SOM value was selected.

Laboratory certificates of chemical analysis are presented in **Appendix III** along with the chemical assessment criteria.

### 8.1 ASSESSMENT OF SOIL GEOCHEMICAL RESULTS

Table 8.1 provides a summary of the results for each sample analysed when compared to the relevant assessment criteria.

| Table 8.1 : Summary of Geochemical Results |              |                                                        |                        |                        |
|--------------------------------------------|--------------|--------------------------------------------------------|------------------------|------------------------|
| Location                                   | Strata       | Determinant                                            | Measured Conc. (mg/kg) | Guidance Conc. (mg/kg) |
| HA1 (0.2m)                                 | Made Ground  | Benzo(a)anthracene                                     | 8.3                    | 7.2                    |
|                                            |              | Benzo(b)fluoranthene                                   | 11                     | 2.6                    |
|                                            |              | Benzo(a)pyrene                                         | 7.5                    | 2.7                    |
|                                            |              | Dibenzo(a,h)anthracene                                 | 1.8                    | 0.28                   |
| HA4 (0.3m)                                 | Made Ground  | Benzo(b)fluoranthene                                   | 3.2                    | 2.6                    |
|                                            |              | Benzo(a)pyrene                                         | 3.0                    | 2.7                    |
|                                            |              | Dibenzo(a,h)anthracene                                 | 0.59                   | 0.28                   |
| TP1 (0.2m)                                 | Made Ground  | All determinants recorded at acceptable concentrations | n/a                    | n/a                    |
| TP5 (0.1m)                                 | Made Ground  | Benzo(b)fluoranthene                                   | 3.6                    | 2.6                    |
|                                            |              | Benzo(a)pyrene                                         | 3.3                    | 2.7                    |
|                                            |              | Dibenzo(a,h)anthracene                                 | 0.68                   | 0.28                   |
| TP6 (0.4m)                                 | Natural Clay | All determinants recorded at acceptable concentrations | n/a                    | n/a                    |
| TP9 (0.5m)                                 | Made Ground  | All determinants                                       | n/a                    | n/a                    |

|                                                                                                                                                                                                                                                                                                                       |                  |                                                        |     |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------|-----|-----|
|                                                                                                                                                                                                                                                                                                                       |                  | recorded at acceptable concentrations                  |     |     |
| WS1 (0.1m)                                                                                                                                                                                                                                                                                                            | Reworked Topsoil | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS2 (0.2m)                                                                                                                                                                                                                                                                                                            | Reworked Topsoil | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS2 (0.45m)                                                                                                                                                                                                                                                                                                           | Natural Clay     | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS3 (0.7m)                                                                                                                                                                                                                                                                                                            | Natural Clay     | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS4 (0.3m)                                                                                                                                                                                                                                                                                                            | Reworked Topsoil | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS5 (0.2m)                                                                                                                                                                                                                                                                                                            | Reworked Topsoil | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS5 (0.9m)                                                                                                                                                                                                                                                                                                            | Natural Clay     | All determinants recorded at acceptable concentrations | n/a | n/a |
| WS6 (0.2m)                                                                                                                                                                                                                                                                                                            | Reworked Topsoil | All determinants recorded at acceptable concentrations | n/a | n/a |
| COMP (0.1-0.3m)<br>HA1/HA2/TP1/TP5                                                                                                                                                                                                                                                                                    | Made Ground      | Suggests inert waste landfill*                         | n/a | n/a |
| <b>Notes:</b><br>Barium EIC Generic Acceptance Criteria (EIC GAC) is 1300mg/kg (Residential)<br>Chromium is assumed to be chromium II (not chromium IV).<br>Waste soil classification should be confirmed by submitting all chemical results to a licensed waste management operator for formal waste classification. |                  |                                                        |     |     |

## 8.2 DISCUSSION OF SOIL GEOCHEMICAL EXCEEDANCES

With the exception of PAH, which has been recorded at elevated concentrations within the Made Ground sampled at HA1, HA4 and TP5 all concentrations of remaining chemical soil determinants, including metals, semi-metals, TPH and asbestos are acceptable.

It is considered the presence of PAH at HA1, HA4 and TP5 in the east of the site by the existing workshops is a result of asphalt (road plainings) which have been used to create a surfacing in front of the workshops. Southern Testing, at position HA101, recorded a similar result and observation.

At three positions (TP101, TP102 and TP103) as shown in **Figures 6 and 9** Southern Testing (in 2017) have recorded ACMs and Asbestos Containing Soils (ACS) containing two types of asbestos (chrysotile and amosite). TP101, TP102 and TP103 are located in the north of the site where building materials/rubble (were and) are stored in an area which shall become rear gardens to Plots 1 and 2. Contrary to the results recorded by Southern Testing, Aviron collected three samples of Made Ground in the northern area of the site at triangulated positions WS5, WS6 and TP9; which all recorded the absence of asbestos and acceptable determinant concentrations. It maybe, that following post-2017 earthworks (involving the removal of a bund and stockpile) after Southern Testing completed their investigation the earthworks disturbed and dispersed asbestos fibres from situ.

**Figure 9** is enclosed as enclosed as Combined Soil Contamination Plan which enable the following remedial works to be suggested:

-  **Asphalt Removal.** Removal of all asphalt/road plaining type material/Made Ground within the east of the site (HA1, HA4, TP5 and HA101) by the existing workshops towards the bottom of Plot 3 rear garden.
  
-  **Asbestos Screening.** The Made Ground in the north of the site is unlikely to be physically suitable for new planting. It is recommended that prior to forming the gardens of Plots 1 and 2 in the north of the site a watching brief is made to inspection, screen and as necessary sample in-situ soils for asbestos content. Alternatively the entire Made Ground unit (average thickness ~0.3m) can be removed and replaced with 'clean' imported Topsoil.

Once the above recommendations are appraised, a suitable Remediation Action Plan should be prepared for approval by the Local Planning Authority.

## 9.0 HAZARDOUS GROUND GAS MONITORING

### 9.1 STRATEGY

As previously presented within table 5.4.2 monitoring well installations were constructed in order to provide ground gas monitoring following the outcome of the preliminary ground gas assessment within section 2.3.

The installation of the monitoring wells have suitable response zones to enable the capture of ground gases which may possibly migrate through granular and fractured units beneath proposed homes. Each monitoring well was completed with a 1m thick bentonite seal from ground level to prevent atmospheric influence.

### 9.2 MONITORING

The presence of soil vapours was determined prior to bulk ground gas monitoring using a MiniRAE Photon Ionisation Detector (PID) from RAEs Systems. The presence of hazardous bio-gases including methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) was determined using a GFM Infra-Red Gas Analyser from Ribble Enviro Limited. The flow rate and atmospheric pressure, in millibars (mb), was also measured during the monitoring process. Depth to groundwater was measured using an electronic dip meter.

Monitoring work was completed on the dates specified within table 9.2 which also summarises weather conditions and atmosphere pressure. To determine rising or falling pressures local 'online' weather trends from the Met Office and/or the monitoring apparatus were consulted.

| Table 9.2: Background Gas Monitoring Data |                      |                          |                        |                                  |
|-------------------------------------------|----------------------|--------------------------|------------------------|----------------------------------|
| Date                                      | Atmospheric Pressure | Rising/Falling Pressure? | Worst Case Conditions? | Groundwater above response zone? |
| 4 August 2023                             | 1012mB               | Falling                  | No                     | No                               |
| 31 March 2023                             | 1013mB               | Steady                   | No                     | No                               |

Note 2 of C665 indicates 'worst case' conditions occur during falling and sub-1000mB atmospheric pressures. Section 5.5.1 of C665 indicates 'worst case' conditions are likely to occur during weather conditions such as rainfall, frost or dry weather.

### 9.3 MONITORING

Table 9.3 summaries the results obtained which are enclosed in **Appendix II**.

| Table 9.3: Summary of Monitoring Results |                                 |               |                                                                                                                                                                                       |
|------------------------------------------|---------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gas                                      | Measured Conc.<br>Range (% v/v) |               | Comments                                                                                                                                                                              |
|                                          | Low                             | High          |                                                                                                                                                                                       |
| CH <sub>4</sub>                          | 0.0<br>(<0.1)                   | 0.0<br>(<0.1) | Methane was not detected (<0.1%) and thus is below the guidance value of 1% at which point the characteristic situation is advised to increase to CS2.                                |
| CO <sub>2</sub>                          | 0.4                             | 2.8           | Carbon dioxide has been detected at concentrations below the guidance value of 5% at which point the characteristic situation is advised to increase to CS2.                          |
| O <sub>2</sub>                           | 17.8                            | 20.1          | Oxygen has been recorded at ambient concentrations, above 16% the point where it is considered there is potential for asphyxiation.                                                   |
| Vapour*                                  | 0.3                             | 2.8           | Very low (PID) concentrations have been recorded. This concurs with the ground conditions and geochemical laboratory results suggesting the absence of soil vapour risk to new homes. |

\*vapour concentration in parts per million (ppm)

Monitoring positions remained constant and intact. No replacement monitoring positions were installed during the period of this project. No damage was observed to the monitoring wells during works.

It is considered the integrity of the monitoring wells has not been compromised as there is no evidence of surface damage which may affect the underlying installations. There is a bentonite seal within the bored annulus preventing escape of ground gases and entry of atmospheric gases. The gas valve remained closed prior to all monitoring occasions so passive venting of ground gas is unlikely to have occurred as site visits were unannounced.

### 9.4 INTERPRETATION OF DATA

Under normal use of the site (i.e. above ground), the risk presented by methane and carbon dioxide is dependent on both the concentrations and the rate of flow. In accordance with Wilson and Card methodology specified in the CIRIA C655 document, Gas Screening Values (GSV) were determined using the formula below.

|                                        |                                                                                     |
|----------------------------------------|-------------------------------------------------------------------------------------|
| GSV =                                  | (Maximum steady concentration / 100) x Flow rate                                    |
| GSV measured in litres per hour (l/hr) | Maximum steady concentration measured in percent (%)<br>Flow rate measured in l/hr. |

Based on the maximum concentrations and flows recorded, the **GSV** for **methane** was **0.0 L/hr** and the **GSV** for **carbon dioxide** was **0.0 l/hr**.

Based on the GSV for carbon dioxide which is below 0.07l/h, along with the maximum recorded concentrations for carbon dioxide (<5%) and methane (<1%) the site is considered to fall within Characteristic Situation 1.

It is highly unlikely gas protection shall be required for the new units based on:

- 📍 the limited potential source of risk following the preliminary risk assessment;
- 📍 the GSV for carbon dioxide and methane is between 0.07l/h and 0.7l/h;
- 📍 the maximum concentrations carbon dioxide and methane are below 5% and 1% respectively;
- 📍 no abnormal ground conditions were recorded during the investigation;
- 📍 the monitoring dataset did not encounter worst-case conditions. Professional opinion suggests that given flow rates and gaseous concentrations these are unlikely to sufficiently increase such that the Characteristic Situation increases.

Nonetheless to following a minimal level of good practice at least a final round of monitoring should be completed which captures worst-case conditions.

## 10.0 REVISED RISK ASSESSMENT

### 10.1 REVISED SOURCES OF CONTAMINATION

Following completion of the site investigation and interpretation of test results the following sources of contamination are considered to exist.

| Table 10.1: Revised Sources     |                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source                          | Description                                                                                                                                                                                          | Key Contaminants of Concern                                                                                                                                                                                                                                                                              |
| 1. Site-wide soil contamination | Soil contamination is considered to be local to the north and east of the site.                                                                                                                      | n/a                                                                                                                                                                                                                                                                                                      |
| 2. Local soil contamination     | Soil contamination is shown to exist within the north of the site where building rubble/waste was stored and in the east of the site where road planning were used to surface the area by workshops. | North – asbestos<br>East - PAH                                                                                                                                                                                                                                                                           |
| 3. Asbestos                     | Risk of Asbestos Containing Soils (ACS) and Asbestos Containing Materials (ACMs) from former and existing buildings.                                                                                 | Asbestos – potentially in soils in the north of the site.                                                                                                                                                                                                                                                |
| 4. Groundwater                  | Site is underlain by secondary aquifer                                                                                                                                                               | No abnormal ground conditions.<br>Concentrations of Topsoil, Made Ground and natural strata across the site are broadly acceptable in term of risk to controlled waters.                                                                                                                                 |
| 5. Ground gases/vapours         | Potential for ground gas generation.                                                                                                                                                                 | Two rounds of ground gas monitoring have been completed which have recorded acceptable gases concentrations and GSV.<br><br>Gas protection is unlikely to be required, however, as a precaution a single round of worst-case monitoring should be completed when barometric pressure falls below 1000mB. |

### 10.2 REVISED CONCEPTUAL SITE MODEL

Following interpretation of the laboratory results, site dynamics and the revision of potential soil contaminants within table 10.1 a revised conceptual model has been prepared and is presented in table 10.2. Where sources of contamination are not no longer consider present (table 10.1) the pollutant linkages examined within the initial conceptual site model shall be omitted from the revised conceptual site model to limit the 'length' of the model.

**Table 10.2: Refined Conceptual Site Model (for plausible pollutant linkage pathways)**

| Source                                                  | Receptor                   | Pathway                                   | Probability    | Consequence | Risk & Justification                                                                                                                                | Linkage No. |
|---------------------------------------------------------|----------------------------|-------------------------------------------|----------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Source 1<br>Site-wide soil contamination                | Construction workers       | Direct contact                            | Unlikely       | Mild        | Low<br><i>Note 9.</i> Soil contamination is considered to be local to the north (possible ACS) and east (PAH) of the site.                          | 1           |
|                                                         | End users                  | Direct contact                            | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 2           |
|                                                         | Adjacent land users        | Direct contact via run-off                | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 3           |
|                                                         | Soft landscaping           | Root uptake                               | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 4           |
|                                                         | Water supply pipes         | Direct contact                            | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 5           |
|                                                         | Buildings & infrastructure | Direct contact                            | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 6           |
|                                                         | Groundwater                | Migration through hydrogeology            | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 7           |
|                                                         | Surface waters             | Run-off<br>Migration through hydrogeology | Unlikely       | Mild        | Low<br><i>See Note 9.</i>                                                                                                                           | 8           |
| Source 2<br>Local PAH soil contamination (east of site) | Construction workers       | Direct contact                            | Likely         | Mild        | Moderate/Low<br><i>Note 10.</i> Local PAH within road plainings in the east of the site by the workshops.<br><b>Prepare Remediation Action Plan</b> | 9           |
|                                                         | End users                  | Direct contact                            | Likely         | Medium      | Moderate<br><i>See Note 10.</i><br><b>Prepare Remediation Action Plan</b>                                                                           | 10          |
|                                                         | Adjacent land users        | Direct contact via run-off                | Low likelihood | Mild        | Low<br><i>See Note 10.</i>                                                                                                                          | 11          |

**Table 10.2: Refined Conceptual Site Model (for plausible pollutant linkage pathways)**

| Source                                                               | Receptor                              | Pathway                                   | Probability    | Consequence | Risk & Justification                                                                                                                                                                                                                      | Linkage No. |
|----------------------------------------------------------------------|---------------------------------------|-------------------------------------------|----------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                                                      | Soft landscaping                      | Root uptake                               | Likely         | Medium      | Moderate<br><i>See Note 10.</i>                                                                                                                                                                                                           | 12          |
|                                                                      | Water supply pipes                    | Direct contact                            | Low likelihood | Mild        | Low<br><i>See Note 10.</i>                                                                                                                                                                                                                | 13          |
|                                                                      | Buildings & infrastructure            | Direct contact                            | Low likelihood | Mild        | Low<br><i>See Note 10.</i>                                                                                                                                                                                                                | 14          |
|                                                                      | Surface waters                        | Migration through hydrogeology            | Unlikely       | Mild        | Very Low<br><i>See Note 10.</i>                                                                                                                                                                                                           | 15          |
|                                                                      | Surface waters                        | Run-off<br>Migration through hydrogeology | Unlikely       | Mild        | Very Low<br><i>See Note 10.</i>                                                                                                                                                                                                           | 16          |
| Source 3<br>Asbestos                                                 | Construction workers                  | Inhalation                                | Low likelihood | Medium      | Moderate/Low<br><br><i>Note 11. Potential for ACMs from previous and existing buildings. Southern Testing report and debris identified in soils. However, ACS not identified by Aviron.</i><br><br><b>Prepare Remediation Action Plan</b> | 17          |
|                                                                      | End users                             | Inhalation                                | Low likelihood | Medium      | Moderate<br><br><i>See Note 11.</i><br><br><b>Prepare Remediation Action Plan</b>                                                                                                                                                         | 18          |
|                                                                      | Adjacent land users                   | Inhalation                                | Unlikely       | Mild        | Very Low<br><br><i>See Note 11.</i><br><br>Distance and dispersion in outdoor air limits risk.                                                                                                                                            | 19          |
| Source 4<br>Ground gases and<br>Soil vapours<br>(on/off site source) | Construction workers<br><br>End users | Inhalation of vapours/gas                 | Unlikely       | Mild        | Very Low<br><br>Two rounds of monitoring have been completed which have recorded acceptable concentrations of carbon dioxide and methane; along with acceptable GSVs.<br><br>Gas protection measures unlikely for new home given          | 20          |

**Table 10.2: Refined Conceptual Site Model (for plausible pollutant linkage pathways)**

| Source | Receptor | Pathway | Probability | Consequence | Risk & Justification                                                                                                                                                                             | Linkage No. |
|--------|----------|---------|-------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|        |          |         |             |             | distance to site, intersecting infrastructure and underlying Clay limiting gaseous migration.<br><br><b>Complete worst-case ground gas monitoring to confirm Characteristic Situation (CS1).</b> |             |

### 10.3 RISK COMMENTARY

#### 10.3.1 Contamination Risk from Soil to Human Health – Construction Workers

With the exception of ‘suspected’ asbestos fibres in the north of the site, concentrations of soil determinants are unlikely to present a short-term exposure risk to adult construction workers, specifically from the dermal contact, ingestion and inhalation pathways. Nonetheless it is customary to advise that groundworkers should ensure suitable PPE is worn as a precaution during development which would include:

-  Gloves to prevent dermal contact with any contaminated soils. It is advised that disposable latex gloves are worn beneath the outer ‘work’ gloves.
-  To prevent ingestion of contaminated soils construction workers should avoid putting hands or objects in their mouth whilst on-site.
-  To prevent ingestion of contaminated soils prior to eating or drinking, construction workers should ensure their hands are properly washed, rinsed and dried.
-  To prevent inhalation of contaminated soils and **asbestos fibres** construction workers should wear dust masks on dry and windy days **and when working around the northern section of the site face-fit P3 filter masks**. On damp or wet still days the risk of dust inhalation is low.
-  **An Asbestos Management Plan and where necessary a Remediation Action Plan should be prepared. This preparation of these plans may benefit from further sampling and testing; ideally once carefully managed site clearance has been completed.**

### 10.3.2 Contamination Risk from Soil to Human Health – End Users

**Figure 9** is enclosed as enclosed as Combined Soil Contamination Plan which indicates potential risks to end users are from:

-  **PAH.** Detected within the east of the site (HA1, HA4, TP5 and HA101) by the existing workshops towards the bottom of Plot 3 rear garden. The impacted Made Ground (asphalt/road plaining type material) shall require removal from site and verification of the remaining soils in the bottom of Plot 3 garden.
-  **Asbestos.** ACS may exist within the soil in the north of the site where Plots 1 and 2 shall have their gardens and as a result residual fibres may present a risk to end users. It is recommended that prior to forming the gardens of Plots 1 and 2 in the north of the site a watching brief is made to inspection, screen and as necessary sample in-situ soils for asbestos content. Alternatively, the entire Made Ground unit (average thickness ~0.3m) can be removed and replaced with 'clean' imported Topsoil.

Once the above recommendations are appraised, a suitable **Remediation Action Plan** should be prepared for approval by the Local Planning Authority.

### 10.3.3 Contamination Risk from Soil to Human Health – Domestic Water Supply

Special design for domestic water supply are unlikely. However, to be certain, it is advised that the report should be provided to the local water authority to ensure the correct materials are chosen for water supply pipes. Following the formal withdrawal of WRAS Guidance Note No. 9-04-03 (October 2002), it is recommended that the following reference should be consulted:

*Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites" (Ref 10/WM/03/21 by the UK Water Industry Research Ltd (UKWIR) ; ISBN: 1 84057 5697*

Generally, all services should be placed within dedicated runs, and then backfilled with clean imported material.

### 10.3.4 Contamination Risk from Soils to Controlled Waters

Geological mapping indicated that the site to be underlain by a secondary aquifer.

Given that sources of contamination were not identified in the investigation there is not considered to be a risk to controlled waters.

### 10.3.5 Contamination Risk from Groundwater

Contaminated groundwater is not considered to exist beneath the site, based on the absence of widespread soil contamination and the lack of locally contaminative activities.

### 10.3.6 Risk from Ground Gas

No potential ground gas risks were determine following the preliminary risk assessment. To further evaluate ground gas risk two rounds of monitoring have been completed within the project timeframe which have recorded acceptable GSV and maximum concentrations within in site. The concentrations recorded suggest Characteristic Situation 1 (CS-1), which would not require ground gas protection to new homes.

To ensure the hypothesis that ground protection is not required **it is recommended a worst-case visit is completed.**

## 11.0 GEOTECHNICAL ASSESSMENT

This section provides a geotechnical assessment in connection with the proposed development as described above and considers the GEO Limit State: failure or excessive deformation of the ground, in accordance with EN 1997 Eurocode 7: Geotechnical Design (and the UK National Annex to Eurocode 7) where applicable.

It is assumed for the purposes of this assessment that the finished ground floor levels of the proposed development buildings are the same as the ground level at each of the exploratory hole locations.

The assessment of the stability of any slopes or retaining structures across or adjacent the site, the requirement for additional retaining structures and the requirements for cut and fill that may be required to facilitate construction is outside the scope of this report.

Where applicable the following assessment includes bearing resistance assuming conventional construction only and no allowances have been made for interaction between existing adjacent foundations and proposed foundations or loads.

Eurocode 7 Section 2.1 Basis for Geotechnical Design indicates that for each geotechnical design situation it shall be verified that no limit state is exceeded. Geotechnical design requirements have been established by three Geotechnical Categories, 1, 2 and 3. For the purpose of this assessment the development is Geotechnical Category 2: which include conventional types of structure and foundation with no exceptional risk or difficult or loading conditions. Designs for structures in Geotechnical Category 2 should normally include quantitative geotechnical data and analysis to ensure that the fundamental requirements are satisfied. Routine procedures for field and laboratory testing and for design and execution may be used for Geotechnical Category 2 designs.

### 11.1 GROUND MODEL

The following table 11.1 provides the ground model for the site as determined from ground conditions encountered during the site investigation works.

| Table 11.1: Ground Model |                           |                           |                              |                          |
|--------------------------|---------------------------|---------------------------|------------------------------|--------------------------|
| Stratum                  | Description               | Top of Stratum<br>(m bgl) | Bottom of Stratum<br>(m bgl) | Average Thickness<br>(m) |
| Reworked TOPSOIL         | Silty sandy gravelly CLAY | 0.0                       | 0.2 - 0.5                    | 0.31                     |
| MADE GROUND              | Various                   | 0.0                       | 0.2 - 1.2                    | 0.49                     |

| Table 11.1: Ground Model                                                                    |                           |                           |                              |                          |
|---------------------------------------------------------------------------------------------|---------------------------|---------------------------|------------------------------|--------------------------|
| Stratum                                                                                     | Description               | Top of Stratum<br>(m bgl) | Bottom of Stratum<br>(m bgl) | Average Thickness<br>(m) |
| CLAY                                                                                        | Silty sandy CLAY          | 0.2 - 0.5                 | 0.6 - 2.9                    | 1.37                     |
| CLAY                                                                                        | Silty fine to medium SAND | 0.6 - 2.9                 | 5.0                          | -                        |
| <b>Notes</b>                                                                                |                           |                           |                              |                          |
| Sand parting within the CLAY soils. Clay partings at depth within the SAND soils.           |                           |                           |                              |                          |
| <b>Groundwater</b>                                                                          |                           |                           |                              |                          |
| Groundwater at depths of between 3.43m and 3.84m bgl during return monitoring, August 2023. |                           |                           |                              |                          |

## 11.2 FOUNDATION DESIGN CONCEPT

The ground model and the following considerations will need to be taken in account in determining the foundation solution for the proposed development buildings:

- 🌳 Medium volume change potential CLAY soils and the influence of trees; a number of oak, cypresses and poplar trees are located around the site.
- 🌳 Desiccated CLAY soils overlying the site to depths of up to 2.5m bgl.
- 🌳 Adequate bearing resistance to support the proposed development buildings.
- 🌳 Excavation stability in SAND soils as well as CLAY soils with sand partings, and possibly elevated seasonal groundwater.

The CLAYS soils present at relatively shallow depth beneath the site are of low and intermediate plasticity showing low and medium-volume change potential, above SAND of negligible volume change potential.

Assumed maximum 'characteristic action' (or line load) of 130kN/m run on conventional shallow foundations 1.0m wide on firm to stiff CLAY at depths of between 1.0m and 2.5m bgl may be acceptable for the proposed development buildings subject to the above considerations.

An assumed maximum 'characteristic action' (or line load) of 150kN/m run on conventional shallow foundations 1.0m wide on medium dense SAND at depths of between 1.0m and 2.5m bgl, may also be acceptable for the proposed development buildings subject to the above considerations.

It is assumed that the 'characteristic action' comprises a vertical permanent action. Further information regarding the permanent actions and variable actions (making up the 'characteristic actions') applied to the foundations may be required along with confirmation of the foundation type and foundation dimensions.

## **11.2 EXCAVATION CONDITIONS**

Excavation of the materials encountered during the ground investigation should be achieved using conventional hydraulic excavation techniques.

### **11.2.1 Temporary Works**

From the ground investigation undertaken, excavations in the natural coarse (SAND) soils are not expected to remain stable in the short term. Due to the MADE GROUND, coarse soils as well as CLAY soils with sand partings, and the requirement for excavations to facilitate the construction in potentially elevated seasonal groundwater, care should be taken to ensure that instability of excavations does not affect existing structures and services (e.g. foundations, roads, boundary walls or buildings) both on and off-site, and temporary support is expected to be required in order to achieve this.

Further advice should therefore be sought from the appointed structural engineer and specialist contractor regarding temporary works. General guidance can be found within CIRIA Report 97: Trenching Practice, dated 2001.

Care should be taken to ensure that falls from excavation faces do not adversely affect the integrity of foundation concrete.

All excavations on site should be in accordance with HSE guidelines and stability should be practically maintained at all times.

### **11.2.2 Dewatering**

Groundwater was encountered during the ground investigation works at a depth of 3.4m bgl in WS3 and WS4 (as of July 2023). Groundwater was also encountered in the standpipes in WS1, WS2 and WS5 during the return monitoring at depths as shallow as 3.43m bgl (as of August 2023). The groundwater is likely to represent the secondary (A) aquifer of the Bagshot Formation.

On the basis of the data obtained; dewatering is not expected to be required in shallow excavations beneath the site (as of July/August 2023).

Groundwater is expected to rise in wetter winter months, and ongoing groundwater monitoring is recommended to determine the seasonal groundwater level below the site.

Consideration should be given to a summer build programme when groundwater is expected to be lower.

### **11.3 EXISTING SERVICES/SUBSTRUCTURES**

Due to the historical development of the site and site environs, existing services or sub-structures should be anticipated.

Where foundations or obstructions are encountered during excavations for the proposed foundations, all new foundations should be extended downwards to fully penetrate all redundant former construction.

### **11.4 BEARING STRATA**

As discussed below, there is a potential for desiccation to have occurred to depths of up to 2.5m bgl in the exploratory holes undertaken. Consideration should therefore be given to extending foundations beneath the desiccated zone. Foundations should also be extended beneath MADE GROUND noted locally to extend to depths of up to 1.2m bgl.

Bearing resistance for the firm to stiff CLAY and medium dense SAND soils at depths of between 1.0m and 2.5m bgl are provided below pending confirmation of the required foundation actions, foundations widths, foundation depths and tolerable settlement.

#### **11.4.1 Atterberg Limits and Material Properties**

Atterberg limits tests conducted on the fine soils and fine fraction overlying the site at depths of between 1.0m and 3.0m bgl indicate that the Bagshot Formation comprises inorganic CLAY of low and intermediate plasticity (CL/CI). The modified plasticity index was determined to be between 13% and 26% indicating soils of low and medium volume change potential.

For the purposes of this assessment and in accordance with NHBC Standards Chapter 4.2, Building Near Trees, the overlying clay soils across the site are classified as being of medium-volume change potential.

The results of particle size distribution analysis indicate that with depth, the coarse soils sampled of the Bagshot Formation comprise clayey and very clayey silty fine to medium SAND of negligible volume change potential.

#### **11.4.2 Desiccation**

Using the ratio of the moisture content (MC) to the liquid limit (LL) (an empirical indicator of desiccation, after Driscoll, 1983), the test results indicate that the overlying clay soils across the site are potentially desiccated (MC:LL ratio 0.37-0.46) to depths of up to 1.5m bgl locally (WS1, WS2, WS3 and WS4). An assessment in accordance with BRE Digest 412 Desiccation in Clay Soils 1996, also indicates that the shear strength, moisture content and liquidity index profiles are shown to be inconsistent between the sampling points indicating that desiccation is likely to have occurred locally to depths of up to 2.5m bgl.

Desiccated fine soils (silt and clay) result from moisture being withdrawn from the soil, typically by root action. Heave forces occur following the re-hydration of these soils, by swelling on account of increased moisture content.

Moisture content within fine soils can increase due to seasonal weather variations (rain) and also the removal of trees, whereby moisture is no longer being drawn from the soil by root action. The effect of heave is increased when trees are removed. The upward heave force can lift foundations causing structural damage (cracking of masonry, movement of door/window frames). Conversely during periods of dry weather, the moisture content reduces causing fine soils to shrink and the upward heave force to reduce; in such an event the foundation (re)settles. To remove the risk of continued and abnormal movement beneath the base of new foundations due to swelling and shrinking of fine soils the foundations should be placed beneath the desiccated zone.

Consideration should therefore be given to extending foundations beneath the desiccated zone in clay soils, to between 1.5m and 2.5m bgl.

Mitigation measures to prevent heave in the fine soils encountered across the site should be incorporated into the below ground construction.

The soil sampling and testing undertaken provides for a preliminary assessment only based on limited sampling and testing locations. To enable a comprehensive desiccation assessment, consideration should be given to additional soil sampling, in-situ testing and profiling and laboratory analysis including soil suction tests.

#### **11.4.3 Design Parameters**

Characteristic values for design parameters for the strata encountered beneath the site are included in Table 11.4.3 below.

| Table 11.4.3: Design Parameters |                         |                                                     |                                                                |
|---------------------------------|-------------------------|-----------------------------------------------------|----------------------------------------------------------------|
| Stratum                         | Volume Change Potential | Unit Weight -<br>$\gamma_{rk}$ (kN/m <sup>3</sup> ) | Critical State Angle of Friction -<br>$\phi'_{cv,k}$ (degrees) |
| CLAY                            | Medium                  | 18-19                                               | 30                                                             |
| SAND                            | Negligible              | 19                                                  | 32                                                             |

A characteristic value of undrained shear strength ( $C_{u,k}$ ) of 65kN/m<sup>2</sup> has been assumed for the firm to stiff CLAY at the anticipated foundation level of 1.0-2.5m bgl. The characteristic value of undrained shear strength was derived using the results of the empirical relationships between  $C_u$  and the SPT  $N_{60}$  value ( $N_{60}=15$ , Er 72%, SPT hammer reference, Dart 311), plasticity index after Stroud M.A and the results of laboratory testing. (The Standard Penetration Test in Insensitive Clays and Soft Rocks, Proceedings of the European Symposium on Penetration Testing, 2, 367-376 (1975).

A characteristic value of the angle of shearing resistance ( $\phi$ ) of 32° has been determined for the SAND strata at a minimum depth of 1.0m bgl. The characteristic value of the angle of shearing resistance was derived using the relationship between  $\phi$  and the SPT  $N_{60}$  value ( $N_{60}=15$ ) after Peck, Hanson and Thornburn (Foundation Engineering, 1967). Bearing capacity factors determined by Vesic (Analysis of Ultimate Loads of Shallow Foundations, 1973) have been applied.

Geotechnical laboratory material property test results are presented within **Appendix IV**.

## 11.5 TREE INFLUENCE ON FOUNDATIONS

When considering the influence of trees on foundations, the material properties of the strata beneath the site and the distance and species of the trees to the foundations are the determining factors.

For the purposes of this assessment the CLAY soils overlying the site are classified as being of medium-volume change potential, and an adjustment to foundation depths is therefore required in accordance with NHBC Standards Chapter 4.2, Building Near Trees, 2021.

Reference to the Site Plan, and a Tree Survey by MJC Tree Services Limited (reference MJC-22-0206, dated 25 November 2022) supplied by the Client indicates that a number of high water demand trees, including oak, cypresses and poplar species are located around the site, that will require foundations to be extended to greater depths due to their proximity to some of the proposed plots.

For illustrative purposes only and assuming high water demand trees and medium volume change potential soils, foundations would be required to maximum depths of approximately 1.8m bgl (Plot 1), 2.5m bgl (Plot 1 garage), 2.1m bgl (Plot 2), 1.9m bgl (Plot 3), 1.5m bgl (Plot 3 garage), 3.25m bgl (Plot 4), 2.8m bgl (Plot 4 garage), 2.0m bgl (Plot 5) and 2.6m bgl (Plot 4 garage) using the NHBC depth tables. Depths below 2.5m bgl have been extrapolated. Where SAND soils are encountered at shallower depths, no further adjustment to the foundation depths determined is required.

Mitigation measures to prevent heave in the overlying CLAY soils encountered across the site should be incorporated into the below ground construction.

Should roots or desiccated soils be encountered during the groundworks, and/or previously unidentified trees or tree stumps encountered during the site preparation works, foundations should be extended beneath the roots/desiccated soils and/or the depth adjusted to accommodate the species of tree/tree stump encountered. A record of the findings associated with roots, desiccated soils and trees/tree stumps should be kept during the groundworks phase.

Mitigation measures to protect existing tree species during the construction process will also need to be considered.

## **11.6 FOUNDATION TYPE, DEPTH AND ALLOWABLE BEARING PRESSURE**

### **11.6.1 Trench Fill/Strip Foundations**

Should the requirements of temporary works be overcome, conventional shallow foundations in the firm to stiff CLAY and medium dense SAND at depths of between 1.0m and 2.5m bgl may be viable for the proposed development buildings. Where foundations are required to depths in excess of 2.5m bgl, for example in Plot 4 and Plot 5 due to the influence of trees, a piled foundation solution may be required.

Foundations should be extended beneath Made Ground locally, and the desiccated zone of up to 2.5m bgl locally.

Using an assumed maximum vertical characteristic action of 130kN/m run and 150kN/m run, and Design Approach 1 of Eurocode 7 (checking for a limit state of rupture or excessive deformation), Combination 1 and Combination 2 are both satisfied where the vertical design action ( $V_d$ ) is less than the design value of the vertical bearing resistance ( $R_d$ ) in each case. The GEO limit state requirement is therefore satisfied.

It is assumed that the action is vertical, and it is also assumed that the base of the foundations and the ground surface are horizontal. The vertical design actions include the trench fill foundations, assumed to be a maximum thickness of 2.5m, and also accounts for overburden.

The vertical characteristic action of **130kN/m run** and **150kN/m run** corresponds to the bearing resistance in Table 11.6.1 of **130kN/m<sup>2</sup>** and **150kN/m<sup>2</sup>** when applied to trench fill foundations 1.0m wide constructed in firm to stiff **CLAY** and medium dense **SAND** at depths of 1.0m to 2.5m bgl, in the area of the proposed development buildings. The serviceability state is satisfied with the total settlement being restricted to **25mm**.

| Table 11.6.1: Bearing Resistance                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                        |                   |                                         |                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------|------------------------------------------------------------------------------------------------|
| Strata Type / Plot                                                                                                                                                                                                                                                                                                                                      | Depth BGL (m)                                                                                                                                          | Footing Width (m) | Bearing Resistance (kN/m <sup>2</sup> ) | Comment                                                                                        |
| Firm to stiff CLAY                                                                                                                                                                                                                                                                                                                                      | 1.0-2.5                                                                                                                                                | 1.0               | 130                                     | Adjustment to foundation depths also required in accordance with NHBC 4.2 Building Near Trees. |
| Medium dense SAND                                                                                                                                                                                                                                                                                                                                       | 1.0-2.5                                                                                                                                                | 1.0               | 150                                     |                                                                                                |
| <p>Foundations below 2.5m bgl may require piles.</p> <p>Where CLAY soils are encountered, the following (unsurveyed) adjustments to foundation depths would apply in accordance with the pertinent trees noted and NHBC guidance.</p> <p>Where SAND soils are encountered at shallower depths, no further adjustment to the foundation is required.</p> |                                                                                                                                                        |                   |                                         |                                                                                                |
| Plot 1                                                                                                                                                                                                                                                                                                                                                  | <p>Main building; T28 foundations to 1.8m, T30 foundations to 1.4m.</p> <p>Garage; T28 footings to 2.5m.</p> <p>SAND at 0.8-1.1m in WS5, TP7, TP8.</p> |                   |                                         |                                                                                                |
| Plot 2                                                                                                                                                                                                                                                                                                                                                  | <p>Main building; W31 foundations to 2.1m.</p> <p>SAND at 0.6-1.1m in WS6, TP5, TP10.</p>                                                              |                   |                                         |                                                                                                |
| Plot 3                                                                                                                                                                                                                                                                                                                                                  | <p>Main building; G32 foundations to 1.9m.</p> <p>Garage; G32 footings to 1.5m.</p> <p>SAND at 0.8-1.6m in WS3, WS4, TP6.</p>                          |                   |                                         |                                                                                                |
| Plot 4                                                                                                                                                                                                                                                                                                                                                  | <p>Main building; G32 foundations to 3.25m.</p> <p>Garage; G32 footings to 2.8m.</p> <p>SAND at 2.8m in WS2.</p>                                       |                   |                                         |                                                                                                |
| Plot 5                                                                                                                                                                                                                                                                                                                                                  | <p>Main building; G32 foundations to 2.0m.</p> <p>Garage; G32 footings to 2.6m.</p> <p>SAND at 2.9m in WS1.</p>                                        |                   |                                         |                                                                                                |

The total settlement beneath trench fill foundations 1.0m wide is anticipated to be up to 25mm for the CLAY and SAND soils encountered. Mitigation measures to accommodate differential movement between foundations spanning CLAY and SAND soils should be included in the structural design.

Please note that increasing foundation widths will result in an increase in the total settlement anticipated.

Notwithstanding the above it is recommended that the formation beneath each section of the proposed re-development works is inspected to assess the competency of the bearing strata prior to pouring of foundation concrete. The formation should not be allowed to soften due to surface water, rainwater or groundwater ingress prior to pouring of foundation concrete.

It should be noted that the design actions and design layout/dimensions of the proposed works have not been supplied and the above bearing resistance accounts for conventional construction only. The moments resulting in eccentricity of loadings, and the settlement, sliding and overturning and the requirements for propping would need to be considered in the design of any retaining structures.

It should also be noted that the above recommendations have been made using data in window sample boreholes WS1-WS6, trial pits TP1-TP10 and hand auger boreholes HA1-HA4 completed.

#### **11.6.2 Piled Foundations**

Should the depth of construction of up to 2.5m bgl locally, potentially deeper within the influence of trees in Plots 4 and 5, or the issues of temporary works in elevated seasonal groundwater be deemed uneconomical for conventional construction, a piled foundation solution may be required.

The advice of a piling specialist should be sought to determine the working loads of their proprietary piling technique when considering the ground and groundwater conditions encountered beneath the site, and the health and safety implications of working within the confines of the site and adjacent neighbouring properties.

Consideration should be given to undertaking additional ground investigation work such as cable and percussion drilling to a depth suitable to enable piled foundation design.

#### **11.6.3 Floor Slab**

Due to the potential for desiccation to have occurred, it is recommended that the ground floor slabs beneath the proposed development buildings are suspended on ground beams.

Mitigation measures to prevent heave in the overlying fine soils encountered should also be incorporated into the below ground construction.

## 11.7 CONCRETE CLASSIFICATION

In accordance with Building Research Establishment (BRE) Special Digest 1: 2005 - Concrete in Aggressive Ground, the following laboratory test data has been used to derive classifications for buried concrete (Table C1, natural ground locations) beneath the site:

|                                                                                                                  |                    |
|------------------------------------------------------------------------------------------------------------------|--------------------|
|  Soluble Sulphate (2:1 extract) | – 0.01 to 0.025g/l |
|  pH                             | – 5.1 to 8.2       |
|  Total Sulphate SO <sub>4</sub> | – 0.011 – 0.094%   |
|  Total Sulphur                  | – 0.01 – 0.17%     |
|  Total Potential Sulphate       | – 0.03 – 0.51%     |
|  Oxidisable Sulphide            | < 0.3% to 0.42%    |

*“BRE guidance suggests that ‘if significant number of determination of oxidisable sulphides is above 0.3%, then use the results of total potential sulphate to determine the concrete class”.*

Oxidisable sulphide has been calculated above 0.3% SO<sub>4</sub> in the Made Ground sample tested in HA1 at 0.2m bgl and exceeds the threshold where the concrete classification is based on oxidisable sulphide and total potential sulphate.

Based on the results obtained for soluble sulphate the Design Sulphate (DS) Class for shallow buried concrete beneath the site is DS-1. For foundations above the groundwater level, the Aggressive Chemical Environment for Concrete (ACEC) Class is AC-1s. For foundations below the groundwater level the ACEC Class is AC-2z.

Based on the results obtained for total potential sulphate, and where the Made Ground around HA2 is used as backfill against foundations, the DS Class would be DS-2 and the ACEC, AC-1s, where foundations are above the groundwater level.

It should be noted that additional considerations for the determination of concrete class and appropriate aggregate use are set out in BRE Special Digest 1. These are considerations specific to the soil type, the proposed development and the type of concrete foundations to be used at the site.

Laboratory results for the pH, sulphate and sulphur testing are included within **Appendix III**.

## **11.8 PAVEMENT DESIGN**

The results of DCP/TRL testing indicate CBR values typically reducing (bottoming out) to ~ 3.0% (DCP4), as the DCP probe penetrated the overlying surface.

A preliminary CBR value of 3% is therefore assumed for road pavement construction. It is recommended that in-situ CBR tests are undertaken at road pavement formation level (once known) to confirm the preliminary CBR value determined.

The results of DCP testing are enclosed in **Appendix IV**.

## **11.9 SOAKAWAY DRAINAGE**

The feasibility of shallow soakaway drainage has been reported to the Client under a separate cover by Lanmor Consulting.

## 12.0 CONCLUSIONS AND RECOMMENDATIONS

This tier 1 PRA desk study and Site Investigation including tier 2 GQRA has provided an assessment of the site's history, geo-environmental setting and an evaluation of ground conditions.

### 12.1 ENVIRONMENTAL

Table 12.1 summarises the pertinent environmental risks providing advice on further works and assessment.

| Table 12.1: Environment Risk Summary |      |                                                                                                            |                                                                                                                                                                                                                                                                            |
|--------------------------------------|------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Medium                               | Item | Risk Description                                                                                           | Comments/Recommendations                                                                                                                                                                                                                                                   |
| Soils                                | 1    | Local PAH contamination within Made Ground in the east of the site around existing workshops.              | Prepare Remediation Action Plan to remove local unit of PAH impacted Made Ground at the bottom of Plot 3 rear garden.                                                                                                                                                      |
|                                      | 2    | ACS detected in the north of the site (Plot 1 and 2 gardens) in 2017 but not in 2023.                      | An Asbestos Management Plan and where necessary a Remediation Action Plan should be prepared. This preparation of these plans may benefit from further sampling and testing; ideally once carefully managed site clearance has been completed.                             |
|                                      | 3    | Potential for undiscovered soil contamination during workshop removal                                      | Prepare a Discovery Strategy and enact watching brief during site clearance.                                                                                                                                                                                               |
|                                      | 4    | Any imported Topsoil should be chemically suitable for use in private gardens.                             | Import suitable Topsoil (BS3882) to sustain planting.                                                                                                                                                                                                                      |
|                                      | 5    | Ensure material encountered is suitable for desired water main.                                            | Consult local water authority prior to water main installation.                                                                                                                                                                                                            |
| Ground Gas                           | 6    | Ingress of hazardous ground gases (CH <sub>4</sub> + CO <sub>2</sub> ) into new homes and depleted oxygen. | Gas monitoring results at the time of issue are acceptable, however, worst-case conditions have not been captured during the fine summer period. Unlikely ground gas protection is necessary however complete at least a final round of worst-case monitoring to conclude. |
| Groundwater                          | n/a  | Ground conditions are not considered to present a notable risk to groundwater or controlled waters.        | n/a.                                                                                                                                                                                                                                                                       |

Once the above risks have been evaluated/implemented the environmental risk assessment can be considered complete and the development suitable for occupancy.

## 12.2 GROUND HAZARDS SUMMARY

This report and the Clients preferred foundation solution should be presented to the Local Authority or appropriate build warranty provider for approval prior to construction.

Table 12.2 summarises the pertinent Ground Hazards Summary.

| Table 12.2: Ground Hazards Summary |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction Issue                 | Ground Hazard                                                                                                                                                                                                                                                                                                                                                                                                                           | Recommendation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Below Ground Obstructions          | Foundations and filled ground should be anticipated at shallow depth beneath the site from the historical development.                                                                                                                                                                                                                                                                                                                  | Shallow obstructions likely to be removed with conventional excavation plant and hydraulic breaking equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Foundations                        | <p>Conventional shallow foundation solution subject to the requirements of temporary works and foundations depths of up to 2.5m bgl, possibly deeper due to trees.</p> <p>Shallow excavations in MADE GROUND and coarse soils and CLAY with sand partings unlikely to be stable in the short term.</p> <p>Ground water at depths as shallow as circa 3.4m bgl (July/August 2023). Groundwater expected to rise and fall seasonally.</p> | <p>Bearing resistance of 130kN/m<sup>2</sup> and 150kN/m<sup>2</sup> may be acceptable for trench fill foundations at 1.0-2.5m bgl in firm to stiff CLAY and medium dense SAND respectively.</p> <p>Foundations may however be required in excess of 2.5m bgl locally due to the influence of trees, therefore a piled foundation solution should be considered.</p> <p>Dewatering unlikely to be required (July/August 2023) in shallow excavations, however, programme ongoing seasonal groundwater monitoring.</p> <p>Shoring of excavations expected to be required.</p> <p>Overlying CLAY soils encountered are of medium volume change potential (NHBC Chapter 4.2, Building Near Trees) above SAND of negligible volume change potential.</p> |
| Floor Slabs                        | Suspended                                                                                                                                                                                                                                                                                                                                                                                                                               | Heave protection required in overlying shallow CLAY soils.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Buried Concrete                    | Low to moderately aggressive ground conditions encountered.                                                                                                                                                                                                                                                                                                                                                                             | Concrete classification determined generally as DS-1, AC-1s/AC-2z.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Drainage                           | Feasibility of soakaway drainage reported by Lanmor Consulting.                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Pavements                          | Preliminary design CBR value of 3.0% assumed.                                                                                                                                                                                                                                                                                                                                                                                           | Consider in-situ CBR tests at road pavement formation level once known.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Abnormals                          | A piled foundation solution may be required in Plot 4 and Plot 5.                                                                                                                                                                                                                                                                                                                                                                       | Consider cable and percussion drilling to a depth suitable to enable piled foundation design.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## 13.0 PROJECT INSTRUCTION AND LIMITATIONS

### 13.1 SCOPE OF WORKS

The following scope of work was undertaken to an agreed brief set out in Aviron's proposal and involves the following:

-  Undertake one day of window sample boreholes to depths of up to 5.0m bgl, including SPTs at 1m intervals.
-  Install three of the boreholes with monitoring pipe to enable return gas and groundwater readings.
-  Machine and hand trial pitting to enable a visual assessment of soils at relatively shallow depth and to enable spatial and targeted soil sampling to enhance the human health risk assessment.
-  Hand augering and targeted soil sampling to complement the human health risk assessment.
-  DCP/TRL testing to determine road pavement design parameters.
-  Log the strata within each exploratory hole noting any water strikes.
-  Collect disturbed soil samples from exploratory holes and submit for geochemical laboratory tests to determine the presence or absence of soil contaminants, and geotechnical material property tests to enable foundation recommendations and allow roadway and drainage design.
-  All soil samples shall be collected in accordance with the instruction and ground conditions and submitted to UKAS/MCERTS accredited laboratories for testing.
-  Prepare an interpretative GERA report to interpret ground conditions with respect to potential environmental risks and provide recommendations for foundation design and engineering parameters.

Aviron has relied upon information received from the Client and their agents as accurate, unless contradicted by written documentation or site observations.

### 13.2 PUBLISHED GUIDANCE

This report follows the technical approach presented on Land contamination risk management (LCRM), accessed on gov.uk website. The guidance replaced the Contaminated Land Report 11 (CLR11) "Model Procedures for the Management of Land Contamination" prepared by the Environment Agency in 2004.

CLR11, which was withdrawn in 2020, provided guidance on the application of management processes when assessing potentially contaminated land.

This project and report have been designed to fulfil the information requirements set out in LCRM.

This report is additionally prepared in accordance with current guidance notes, standards and practices as set out by the Environment Agency and statutory organisations in order to establish potential and significant contaminant linkages as defined in Part IIA of the Environmental Protection Act 1990.

### **13.3 LIMITATIONS**

Aviron's scope of work has been designed to meet the timeframe and as such it may follow that further work would be prudent upon evaluation of the ground conditions. The scope of work provided shall provide a view of site conditions and understanding of potential geo-environmental risks and possible mitigation procedures.

The information used in this report has been derived from the site investigation, which in turn were based on known current and historical land uses identified at the site and surrounding area, available to Aviron at the time of the investigation.

Intrusive points chosen relate to the data collected and the risk assessment and recommendations will rely on these points only. It therefore follows that some areas of the site will not be examined. It is always possible that some areas not investigated may contain conditions which would be impossible to determine due to lack of evidence or time and budget restrictions.

This report provides recommendations for foundation design based upon the ground conditions encountered and where possible makes predictions for possible variations in ground conditions. However, it is always possible that not all variations in ground conditions can be accounted for and shall also be dependent upon design loadings and foundation construction techniques used. It should be acknowledged that ground conditions may vary from intrusive point to intrusive point and without undertaking continuous investigation it is impossible to entirely understand variations in ground conditions. Our recommendations should therefore not supersede the project's Consulting Structural and Civil Engineers design.

This report comprises a Ground Investigation Report in accordance with BS EN 1997-2, unless otherwise stated. This report does not constitute a Geotechnical Design Report (BS EN 1997-2) and geotechnical recommendations in this report are for guidance only.

A survey and an assessment of invasive species such as Himalayan Balsam and Japanese Knotweed is beyond the scope of this report.

Should changes in legislation, statutory requirements or industry practices occurred following issue of this report, this report should be viewed in light of these changes.

Should a notable time period elapse between the date issue of this report and the date of application of this report changes to site dynamics may occur and in particular the site inspection notes may no longer be applicable should any change of use occur to the site in the interim.

## 14.0 REFERENCES AND OTHER SOURCES OF INFORMATION

### Previous Reports

Southern Testing Environmental & Geotechnical, Geoenvironmental Site Investigation Report (reference JT0117, dated October 2017)

STM Environmental Consultant, Contaminated Land Risk Assessment, Phase I Desk Study Report (reference PH1-2022-0000101, dated 10 November 2022)

### References

British Geological Survey Website. [www.bgs.ac.uk](http://www.bgs.ac.uk)

BRE Special Digest 1:2005. Concrete in Aggressive Ground

BRE D412. Desiccation in Clay Soils. 1996

BS1377-1:2016. Methods of test for soils for Civil Engineering Purposes

BS5930:2015+A1:2020. British Standards Institute. Code of Practice for Ground Investigations

BS10175:2011+A2:2017. British Standards Institute. Investigation of Potentially Contaminated Land - Code of Practice

BS EN ISO 14688-1:2002 Geotechnical investigation and testing – Identification and Classification of Soil – Identification and Description

BS EN ISO 14688-2:2004 Geotechnical investigation and testing – Identification and Classification of Soil – Principles for a Classification

BS EN ISO 22475-1:2006 Geotechnical investigation and testing - Sampling Methods and Groundwater Measurements

BS EN ISO 22476-3:2005 Standard Penetration Test

BS EN 1997-1:2004+A1:2013 Eurocode 7 Geotechnical Design Part 1 General Rules

BS EN 1997-2:2007 Eurocode 7 Geotechnical Design Part 2 Ground Investigation and Testing

NA to BS NA+A1:2014 to EN 1997-1.2004+A1:2013 UK National Annex to Eurocode 7 Geotechnical Design Part 1 General Rules

NA to BS EN 1997-2.2007 UK National Annex to Eurocode 7 Geotechnical Design Part 2 Ground Investigation and Testing

BS 8485:2015 Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

CIRIA Report C665 'Assessing risks posed by hazardous ground gases to buildings' 2007

DEFRA and Environment Agency, 2004. Model Procedures for the Management of Land Contamination, Contaminated Land Report 11

Environment Agency Website: [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

Jardine, Maswose, Burland. 1985. Field and Laboratory Measurements of Soil Stiffness. Proceedings of the 11<sup>th</sup> International Conference on Soil Mechanics and Foundation Engineering, San Francisco

London District Surveyors Association, 2017, Guidance Notes for the Design of Straight Shafted Bored Piles in London Clay

LQM/CIEH: Paul Nathanail, Caroline McCaffrey, Andy Gillett, Richard Ogden and Judith Nathanail. 2014. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham. ISBN 978-0-9931084-0-2. "Copyright Land Quality Management Limited reproduced with permission; Publication number S4UL3275. All rights reserved"

NHBC (2017). National House Building Council Standards. Chapter 4

NHBC Guidance on Methane and Carbon Dioxide 2007 (Boyle and Witherington, 2007)

Peck, Hanson and Thornburn. Foundation Engineering. 1967

Somerville, S. H., Control of groundwater for temporary works, CIRIA Report 113 (1986).

SP1010 - Development of Category 4 Screening Levels for Land Affected by Contamination. Final Project Report (Revision 2). Contaminated Land: Applications In Real Environmental (CL:AIRE). September 2014

SR2: Human health toxicological assessment of contaminants in soil, Science Report SC050021/SR2, Environment Agency, August 2008

SR7: Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values, Science Report SC050021/SR7, Environment Agency, November 2008

Stroud M A 1974. The Standard Penetration Test in Insensitive Clays and soft Rocks – Proc. ESOPTI 2(2) : 367-375

Stroud M 1988. The Standard Penetration Test - Its Application and Interpretation, ICE Geotechnical Conference on Penetration Testing in the UK

Vesic. 1973. Analysis of Ultimate Loads of Shallow Foundations

## Figures

- 1 Site Location Plan
- 2 Existing Site Layout Plan
- 3 Site Photographs
- 4 Site Photographs
- 5 Proposed Development Plan
- 6 Southern Testing Soil Contamination Identification Plan
- 7 Exploratory Hole Location Plan - Existing Site Layout
- 8 Exploratory Hole Location Plan - Proposed Development
- 9 Combined Soil Contamination Identification Plan



#### Legend



Approximate Development Site Boundary

Landscape/Wildlife Corridor

#### Notes

#### Figure 1

#### Drawing Title

Site Location Plan

**Project Number** 23-176.01

#### Project Title

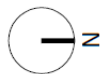
Land at Johnson Drive, Finchampstead, RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS





#### Legend

-  Approximate Development Site Boundary
-  Landscape/Wildlife Corridor
-  Photo Direction

#### Notes

#### Figure 2

##### Drawing Title

Existing Site Layout Plan

**Project Number** 23-176.01

##### Project Title

Land at Johnson Drive, Finchampstead,  
RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS





Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6

Legend

Notes

Taken 26 July 2023

Figure 3

Drawing Title

Site Photographs

Project Number 23-176.01

Project Title

Land at Johnson Drive, Finchampstead, RG40 3NW

Drawn by OB

Checked by JB

Scale NTS





Photo 7



Photo 8



Photo 9



Photo 10

Legend

Notes

Taken 26 July 2023

Figure 4

Drawing Title

Site Photographs

Project Number 23-176.01

Project Title

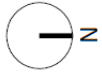
Land at Johnson Drive, Finchampstead, RG40 3NW

Drawn by OB

Checked by JB

Scale NTS





#### Legend



Approximate Development Site Boundary



Landscape/Wildlife Corridor

#### Notes

#### Figure 5

##### Drawing Title

Proposed Development Plan

**Project Number** 23-176.01

##### Project Title

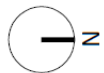
Land at Johnson Drive, Finchampstead, RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS





#### Legend

-  Approximate Development Site Boundary
-  Landscape/Wildlife Corridor
-  ST Contamination Identification

#### Notes

Southern Testing (ST) locations are approximate.

#### Figure 6

##### Drawing Title

Southern Testing Soil Contamination Identification Plan

**Project Number** 23-176.01

##### Project Title

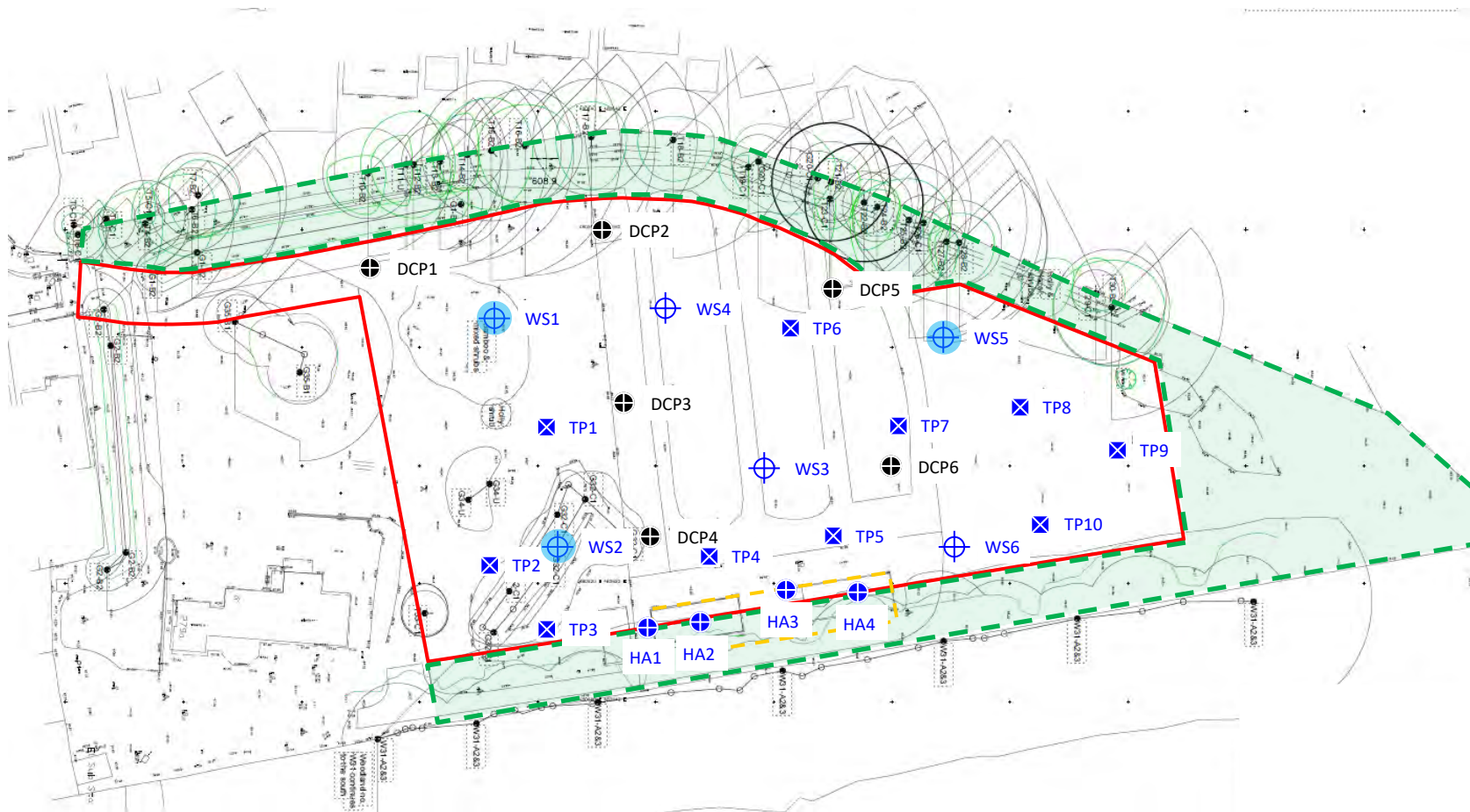
Land at Johnson Drive, Finchampstead, RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS





#### Legend

-  Window Sample Borehole
-  Monitoring Well
-  Trial Pit
-  DCP/CBR
-  Core and Hand Auger

#### Notes

#### Figure 7

##### Drawing Title

Exploratory Hole Location Plan -  
Existing Layout

**Project Number** 23-176.01

##### Project Title

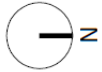
Land at Johnson Drive, Finchampstead,  
RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS





#### Legend

-  Window Sample Borehole
-  Monitoring Well
-  Trial Pit
-  DCP/CBR
-  Core and Hand Auger

#### Notes

#### Figure 8

##### Drawing Title

Exploratory Hole Location Plan -  
Proposed Development

**Project Number** 23-176.01

##### Project Title

Land at Johnson Drive, Finchampstead,  
RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS





## Legend

-  Window Sample Borehole
-  Trial Pit
-  Core and Hand Auger
-  ST Contamination Identification
-  Avron Contamination Identification
-  Avron 'Uncontaminated' Location

## Notes

## Figure 9

### Drawing Title

Combined Soil Contamination  
Identification Plan

**Project Number** 23-176.01

### Project Title

Land at Johnson Drive, Finchampstead,  
RG40 3NW

**Drawn by** OB

**Checked by** JB

**Scale** NTS



## **Appendices**

- I        Exploratory Hole Logs and Photographs
- II       Field Monitoring Results
- III      Soil Contamination Results and Assessment Criteria
- IV      Soil Geotechnical Results

## Appendix

### I Exploratory Hole Logs and Photographs



# WINDOW SAMPLE LOG

|                    |                                                |               |            |               |            |
|--------------------|------------------------------------------------|---------------|------------|---------------|------------|
| Site:              | Land at Johnson Drive, Finchampstead, RG40 3NW | Project No.   | 23-176.01  | Borehole:     | WS1        |
| Client:            | Palatine Homes Limited                         | Start:        | 26/07/2023 | End:          | 26/07/2023 |
| Method/Plant Used: | WS Rig (Archway Dart) - AD1                    | Co-ordinates: | NT         | Ground Level: | NT         |

| Description of Strata                                                                                                                                                        | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |       | SPT Results |      |      |      |      |        | N' Value | Notes     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|-------|-------------|------|------|------|------|--------|----------|-----------|
|                                                                                                                                                                              |        |                              |             | Depth         | No | Type  | 75mm        | 75mm | 75mm | 75mm | 75mm | 75mm   |          |           |
| Soft light brown silty very sandy gravelly CLAY with rootlets and rare angular brick fragments. Gravel is fine to medium sub-angular to rounded of flint. (Reworked TOPSOIL) |        | (0.2)<br>0.2                 |             | 0.1           | 1  | ES    |             |      |      |      |      |        |          |           |
| Firm to stiff and stiff light grey, yellowish and orange brown silty very sandy CLAY with partings of orange coarse sand. Rootlets to 0.7m. [BAGSHOT FORMATION]              |        | (2.7)                        |             |               |    |       |             |      |      |      |      |        |          |           |
|                                                                                                                                                                              |        |                              |             | 1.0           | 2  | D/SPT | 3           | 3    | 4    | 4    | 5    | 5      | 18       |           |
|                                                                                                                                                                              |        |                              |             | 1.25          |    |       |             |      |      |      |      |        |          | HP 11+    |
|                                                                                                                                                                              |        |                              |             | 1.5           | 3  | D     |             |      |      |      |      |        |          | HP 11+    |
|                                                                                                                                                                              |        |                              |             | 1.75          |    |       |             |      |      |      |      |        |          | HP 7.9    |
|                                                                                                                                                                              |        |                              |             | 2.0           | 4  | D/SPT | 2           | 2    | 3    | 3    | 4    | 4      | 14       | HP 7.6    |
|                                                                                                                                                                              |        |                              |             | 2.25          |    |       |             |      |      |      |      |        |          | HP 7.0    |
|                                                                                                                                                                              |        |                              |             | 2.5           | 5  | D     |             |      |      |      |      |        |          | HP 7.4    |
|                                                                                                                                                                              | 2.75   |                              |             |               |    |       |             |      |      |      |      | HP 5.5 |          |           |
|                                                                                                                                                                              | 2.9    |                              |             |               |    |       |             |      |      |      |      |        |          |           |
| Medium dense light grey and orange brown mottled clayey silty fine to coarse SAND. [BAGSHOT FORMATION]                                                                       |        | (0.9)                        |             | 3.0           | 6  | D/SPT | 2           | 3    | 4    | 6    | 7    | 7      | 24       |           |
|                                                                                                                                                                              |        | 3.8                          |             |               |    |       |             |      |      |      |      |        |          |           |
| Medium dense orange brown slightly silty fine SAND. [BAGSHOT FORMATION]                                                                                                      |        | (1.2)                        |             | 4.0           | 7  | SPT   | 2           | 2    | 2    | 2    | 2    | 4      | 10       |           |
|                                                                                                                                                                              |        |                              |             |               |    |       |             |      |      |      |      |        |          |           |
| ... becomes very dense                                                                                                                                                       |        | 5.0                          |             | 5.0           | 8  | SPT   | 10          | 12   | 12   | 18   | 16   | 4      | 50       | for 235mm |

| Casing record                                                                                                                                                          |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |      |                |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|------|----------------|----------------|
| Date                                                                                                                                                                   | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks        |
| 26/07/2023                                                                                                                                                             | -             | -         |                    |          |        | 26/07/2023                                           |              | -                          | -    |                |                |
| Remarks                                                                                                                                                                |               |           |                    |          |        |                                                      |              |                            | By   |                |                |
| Hand service pit to 1.0m.<br>Groundwater not encountered.<br>No visual or olfactory evidence of contamination.<br>Gas and groundwater monitoring installation to 4.0m. |               |           |                    |          |        |                                                      | Logged       | AC                         |      |                |                |
| SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample, R: Root Sample                                                             |               |           |                    |          |        |                                                      | Checked      | JB                         |      |                | Scale<br>01:25 |



# WINDOW SAMPLE LOG

|                                                                |  |                            |                             |                                 |                         |
|----------------------------------------------------------------|--|----------------------------|-----------------------------|---------------------------------|-------------------------|
| Site:<br><b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> |  |                            |                             | Project No.<br><b>23-176.01</b> | Borehole:<br><b>WS2</b> |
| Client:<br><b>Palatine Homes Limited</b>                       |  |                            | Start:<br><b>26/07/2023</b> | End:<br><b>26/07/2023</b>       | Sheet:<br><b>1 of 1</b> |
| Method/Plant Used:<br><b>WS Rig (Archway Dart) - AD1</b>       |  | Co-ordinates:<br><b>NT</b> |                             | Ground Level:<br><b>NT</b>      |                         |

| Description of Strata                                                                                                                                                | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |          | SPT Results |      |      |      |      |          | Notes     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|----------|-------------|------|------|------|------|----------|-----------|
|                                                                                                                                                                      |        |                              |             | Depth         | No | Type     | 75mm        | 75mm | 75mm | 75mm | 75mm | N' Value |           |
| Soft light brown silty very sandy gravelly CLAY with rootlets and rare brick fragments. Gravel is fine to medium sub-angular to rounded of flint. (Reworked TOPSOIL) |        | (0.4)                        |             | 0.2           | 1  | ES       |             |      |      |      |      |          |           |
| Firm to stiff light grey, yellowish and orange brown silty very sandy CLAY with partings of orange coarse sand. Rootlets to 0.8m. [BAGSHOT FORMATION]                |        | (2.4)                        |             |               |    |          |             |      |      |      |      |          |           |
|                                                                                                                                                                      |        |                              |             |               |    |          |             |      |      |      |      |          |           |
|                                                                                                                                                                      |        |                              |             | 0.55          | 2  | ES       |             |      |      |      |      |          | HP 11+    |
|                                                                                                                                                                      |        |                              |             | 0.75          |    |          |             |      |      |      |      |          | HP 11+    |
|                                                                                                                                                                      |        |                              |             | 1.0           | 3  | D/SPT    | 3           | 3    | 3    | 3    | 4    | 5        | 15 HP 11+ |
|                                                                                                                                                                      |        |                              |             | 1.25          |    |          |             |      |      |      |      |          | HP 11+    |
|                                                                                                                                                                      |        |                              |             | 1.5           | 4  | D        |             |      |      |      |      |          | HP 11+    |
|                                                                                                                                                                      |        |                              |             | 1.75          |    |          |             |      |      |      |      |          | HP 11+    |
| Medium dense light grey and orange brown mottled clayey silty fine to medium SAND. [BAGSHOT FORMATION]                                                               |        | (2.2)                        |             | 2.0           | 5  | D/LC/SPT | 2           | 2    | 4    | 3    | 4    | 4        | 15 HP 11+ |
|                                                                                                                                                                      |        |                              |             | 2.25          |    |          |             |      |      |      |      |          | HP 11+    |
|                                                                                                                                                                      |        |                              |             | 2.5           |    | D        |             |      |      |      |      |          | HP 11+    |
|                                                                                                                                                                      |        |                              |             | 3.0           | 5  | SPT      | 4           | 4    | 4    | 5    | 6    | 6        | 21        |
|                                                                                                                                                                      |        |                              |             | 4.0           | 6  | SPT      | 2           | 22   | 2    | 3    | 4    | 4        | 13        |
| ... becomes very dense                                                                                                                                               |        | 5.0                          |             | 5.0           | 6  | SPT      | 3           | 7    | 9    | 10   | 10   | 10       | 39        |

| Casing record                                                                                                                                                          |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |      |                |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|------|----------------|----------------|
| Date                                                                                                                                                                   | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks        |
| 26/07/2023                                                                                                                                                             | -             | -         |                    |          |        | 26/07/2023                                           |              | -                          | -    |                |                |
| Remarks                                                                                                                                                                |               |           |                    |          |        |                                                      |              |                            | By   |                |                |
| Hand service pit to 1.0m.<br>Groundwater not encountered.<br>No visual or olfactory evidence of contamination.<br>Gas and groundwater monitoring installation to 4.0m. |               |           |                    |          |        |                                                      | Logged       | AC                         |      |                |                |
| SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample, R: Root Sample                                                             |               |           |                    |          |        |                                                      | Checked      | JB                         |      |                | Scale<br>01:25 |



# WINDOW SAMPLE LOG

|                    |                                                |               |            |               |            |
|--------------------|------------------------------------------------|---------------|------------|---------------|------------|
| Site:              | Land at Johnson Drive, Finchampstead, RG40 3NW | Project No.   | 23-176.01  | Borehole:     | WS3        |
| Client:            | Palatine Homes Limited                         | Start:        | 26/07/2023 | End:          | 26/07/2023 |
| Method/Plant Used: | WS Rig (Archway Dart) - AD1                    | Co-ordinates: | NT         | Ground Level: | NT         |

| Description of Strata                                                                                                                                                | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |       | SPT Results |      |      |      |      |          | Notes        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|-------|-------------|------|------|------|------|----------|--------------|
|                                                                                                                                                                      |        |                              |             | Depth         | No | Type  | 75mm        | 75mm | 75mm | 75mm | 75mm | N' Value |              |
| Soft light brown silty very sandy gravelly CLAY with rootlets and rare brick fragments. Gravel is fine to medium sub-angular to rounded of flint. (Reworked TOPSOIL) |        | (0.3)                        |             |               |    |       |             |      |      |      |      |          |              |
|                                                                                                                                                                      |        | 0.3                          |             |               |    |       |             |      |      |      |      |          |              |
| Firm to stiff light grey, yellowish and orange brown silty very sandy CLAY with partings of orange coarse sand. Rootlets to 0.8m. [BAGSHOT FORMATION]                |        | (1.2)                        |             | 0.5           |    |       |             |      |      |      |      |          | HP 11+       |
|                                                                                                                                                                      |        |                              |             | 0.7           | 1  | ES    |             |      |      |      |      |          | HP 11+       |
|                                                                                                                                                                      |        |                              |             | 1.0           | 2  | D/SPT | 2           | 2    | 3    | 4    | 4    | 6        | HP 11+       |
|                                                                                                                                                                      |        |                              |             | 1.25          |    |       |             |      |      |      |      |          | HP 11+       |
|                                                                                                                                                                      |        | 1.5                          |             | 1.5           | 3  | D     |             |      |      |      |      |          | HP 11+       |
| Medium dense light grey and orange brown mottled clayey silty fine to coarse SAND. [BAGSHOT FORMATION]                                                               |        | (1.7)                        |             |               |    |       |             |      |      |      |      |          |              |
|                                                                                                                                                                      |        |                              |             | 2.0           | 4  | D/SPT | 2           | 3    | 3    | 3    | 3    | 4        | 13           |
|                                                                                                                                                                      |        |                              |             | 3.0           | 5  | D/SPT | 2           | 3    | 4    | 3    | 4    | 4        | 15           |
|                                                                                                                                                                      |        | 3.2                          |             |               |    |       |             |      |      |      |      |          |              |
| Medium dense orange brown slightly silty fine SAND. [BAGSHOT FORMATION]                                                                                              |        | (1.5)                        |             | 4.0           | 6  | D/SPT | 2           | 4    | 6    | 4    | 6    | 10       | 26           |
| ... becomes very dense                                                                                                                                               |        |                              |             |               |    |       |             |      |      |      |      |          |              |
|                                                                                                                                                                      |        | 4.7                          |             | 4.7           | 7  | D/SPT | 8           | 9    | 12   | 13   | 16   | 9        | 50 for 255mm |

| Casing record                                                                                                       |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |         |                |         |                |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|---------|----------------|---------|----------------|
| Date                                                                                                                | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks |                |
| 26/07/2023                                                                                                          | -             | -         |                    |          |        | 26/07/2023                                           | 3.40         | -                          | -       | 3.40           |         |                |
| Remarks                                                                                                             |               |           |                    |          |        |                                                      |              |                            | By      |                |         |                |
| Hand service pit to 1.0m.<br>Groundwater encountered at 3.40m.<br>No visual or olfactory evidence of contamination. |               |           |                    |          |        |                                                      |              |                            | Logged  | AC             |         |                |
|                                                                                                                     |               |           |                    |          |        |                                                      |              |                            | Checked | JB             |         | Scale<br>01:25 |
| SPT: Standard Penetration Test. HP: Hand Penetrometer. B: Bulk Sample. D: Disturbed Sample. R: Root Sample          |               |           |                    |          |        |                                                      |              |                            |         |                |         |                |



# WINDOW SAMPLE LOG

|                    |                                                |               |            |               |            |
|--------------------|------------------------------------------------|---------------|------------|---------------|------------|
| Site:              | Land at Johnson Drive, Finchampstead, RG40 3NW | Project No.   | 23-176.01  | Borehole:     | WS4        |
| Client:            | Palatine Homes Limited                         | Start:        | 26/07/2023 | End:          | 26/07/2023 |
| Method/Plant Used: | WS Rig (Archway Dart) - AD1                    | Co-ordinates: | NT         | Ground Level: | NT         |

| Description of Strata                                                                                                                                   | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |          | SPT Results |      |      |      |      |      |          | Notes     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|----------|-------------|------|------|------|------|------|----------|-----------|
|                                                                                                                                                         |        |                              |             | Depth         | No | Type     | 75mm        | 75mm | 75mm | 75mm | 75mm | 75mm | N' Value |           |
| Soft light brown silty very sandy gravelly CLAY with rare brick fragments. Gravel is fine to medium sub-angular to rounded of flint. (Reworked TOPSOIL) |        | (0.4)                        |             |               |    |          |             |      |      |      |      |      |          |           |
|                                                                                                                                                         |        | 0.4                          |             | 0.3           | 1  | ES       |             |      |      |      |      |      |          |           |
| Firm to stiff light grey, yellowish and orange brown silty very sandy CLAY with partings of orange coarse sand.                                         |        | (1.2)                        |             | 0.5           | 2  | D        |             |      |      |      |      |      |          | HP 11+    |
|                                                                                                                                                         |        |                              |             | 0.75          |    |          |             |      |      |      |      |      |          | HP 11+    |
|                                                                                                                                                         |        |                              |             | 1.0           | 3  | D/SPT    | 2           | 2    | 3    | 4    | 4    | 4    | 15       | HP 11+    |
|                                                                                                                                                         |        |                              |             | 1.25          |    |          |             |      |      |      |      |      |          | HP 11+    |
|                                                                                                                                                         |        |                              |             | 1.5           | 4  | D        |             |      |      |      |      |      |          | HP 9.9    |
|                                                                                                                                                         |        | 1.6                          |             |               |    |          |             |      |      |      |      |      |          |           |
| Medium dense light grey and orange brown mottled clayey silty fine to coarse SAND. Very sandy CLAY partings 3.0-3.2m. [BAGSHOT FORMATION]               |        | (1.6)                        |             | 2.0           | 5  | D/LC/SPT | 2           | 3    | 4    | 4    | 4    | 4    | 16       |           |
|                                                                                                                                                         |        |                              |             | 2.5           | 6  | D        |             |      |      |      |      |      |          |           |
|                                                                                                                                                         |        |                              |             | 3.0           | 7  | D/SPT    | 2           | 2    | 4    | 4    | 4    | 5    | 17       |           |
|                                                                                                                                                         |        |                              |             |               |    |          |             |      |      |      |      |      |          |           |
|                                                                                                                                                         |        | 3.2                          |             |               |    |          |             |      |      |      |      |      |          |           |
| Medium dense orange brown slightly silty fine SAND. [BAGSHOT FORMATION]                                                                                 |        | (1.6)                        |             | 3.5           | 8  | D        |             |      |      |      |      |      |          |           |
|                                                                                                                                                         |        |                              |             | 4.0           | 9  | D/SPT    | 2           | 2    | 3    | 4    | 6    | 7    | 20       |           |
|                                                                                                                                                         |        |                              |             | 4.5           | 10 | D        |             |      |      |      |      |      |          |           |
| ... becomes very dense                                                                                                                                  |        | 4.8                          |             | 4.8           | 11 | D/SPT    | 5           | 7    | 8    | 9    | 15   | 18   | 50       | for 285mm |
|                                                                                                                                                         |        |                              |             |               |    |          |             |      |      |      |      |      |          |           |

| Casing record                                                                                                       |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |         |                |         |                |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|---------|----------------|---------|----------------|
| Date                                                                                                                | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks |                |
| 26/07/2023                                                                                                          | -             | -         |                    |          |        | 26/07/2023                                           | 3.40         | -                          | -       | 3.40           |         |                |
| Remarks                                                                                                             |               |           |                    |          |        |                                                      |              |                            | By      |                |         |                |
| Hand service pit to 1.0m.<br>Groundwater encountered at 3.40m.<br>No visual or olfactory evidence of contamination. |               |           |                    |          |        |                                                      |              |                            | Logged  | AC             |         |                |
|                                                                                                                     |               |           |                    |          |        |                                                      |              |                            | Checked | JB             |         | Scale<br>01:25 |
| SPT: Standard Penetration Test. HP: Hand Penetrometer. B: Bulk Sample. D: Disturbed Sample. R: Root Sample          |               |           |                    |          |        |                                                      |              |                            |         |                |         |                |



# WINDOW SAMPLE LOG

|                                                |  |  |               |             |  |               |  |
|------------------------------------------------|--|--|---------------|-------------|--|---------------|--|
| Site:                                          |  |  |               | Project No. |  | Borehole:     |  |
| Land at Johnson Drive, Finchampstead, RG40 3NW |  |  |               | 23-176.01   |  | WS5           |  |
| Client:                                        |  |  |               | Start:      |  | End:          |  |
| Palatine Homes Limited                         |  |  |               | 26/07/2023  |  | 26/07/2023    |  |
|                                                |  |  |               |             |  | 1 of 1        |  |
| Method/Plant Used:                             |  |  | Co-ordinates: |             |  | Ground Level: |  |
| WS Rig (Archway Dart) - AD1                    |  |  | NT            |             |  | NT            |  |

| Description of Strata                                                                                                                                                | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |        |             | SPT Results |      |      |      |      |      |          | Notes |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|--------|-------------|-------------|------|------|------|------|------|----------|-------|
|                                                                                                                                                                      |        |                              |             | Depth         | No     | Type        | 75mm        | 75mm | 75mm | 75mm | 75mm | 75mm | N' Value |       |
| Soft light brown silty very sandy gravelly CLAY with rootlets and rare brick fragments. Gravel is fine to medium sub-angular to rounded of flint. (Reworked TOPSOIL) |        | (0.3)<br><b>0.3</b>          |             | 0.15          | 1      | ES          |             |      |      |      |      |      |          |       |
| Firm light grey, yellowish and orange brown silty very sandy CLAY with partings of orange coarse sand. [BAGSHOT FORMATION]                                           |        | (0.8)<br><b>1.1</b>          |             | 0.9<br>1.0    | 2<br>3 | ES<br>D/SPT | 3           | 5    | 6    | 7    | 8    | 7    | 28       |       |
| Medium dense light grey and orange brown mottled clayey silty fine to medium SAND. Very sandy CLAY partings 2.5-3.0m. [BAGSHOT FORMATION]                            |        | (2.0)<br><b>3.1</b>          |             | 2.0           | 4      | SPT         | 3           | 4    | 5    | 5    | 6    | 6    | 22       |       |
|                                                                                                                                                                      |        |                              |             | 2.5           |        | D           |             |      |      |      |      |      |          |       |
|                                                                                                                                                                      |        |                              |             | 3.0           | 5      | SPT         | 3           | 3    | 4    | 4    | 3    | 3    | 14       |       |
|                                                                                                                                                                      |        |                              |             | 3.5           |        | D           |             |      |      |      |      |      |          |       |
| Medium dense becoming dense orange brown slightly silty fine SAND. [BAGSHOT FORMATION]                                                                               |        | (0.9)<br><b>4.0</b>          |             | 3.7           | 6      | SPT         | 7           | 9    | 9    | 10   | 8    | 9    | 36       |       |
|                                                                                                                                                                      |        |                              |             | 4.1           | 6      | SPT         | 5           | 6    | 6    | 7    | 11   | 12   | 36       |       |
| Dense dark grey fine SAND. [BAGSHOT FORMATION]                                                                                                                       |        | 4.1                          |             |               |        |             |             |      |      |      |      |      |          |       |
|                                                                                                                                                                      |        |                              |             |               |        |             |             |      |      |      |      |      |          |       |

| Casing record                                                                                                                                                          |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |      |                |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|------|----------------|----------------|
| Date                                                                                                                                                                   | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks        |
| 26/07/2023                                                                                                                                                             | -             | -         |                    |          |        | 26/07/2023                                           |              | -                          | -    |                |                |
| Remarks                                                                                                                                                                |               |           |                    |          |        |                                                      |              |                            | By   |                |                |
| Hand service pit to 1.0m.<br>Groundwater not encountered.<br>No visual or olfactory evidence of contamination.<br>Gas and groundwater monitoring installation to 2.0m. |               |           |                    |          |        |                                                      | Logged       | AC                         |      |                |                |
| SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample, R: Root Sample                                                             |               |           |                    |          |        |                                                      | Checked      | JB                         |      |                | Scale<br>01:25 |



# WINDOW SAMPLE LOG

|                                                                |  |                            |                             |                                 |                         |
|----------------------------------------------------------------|--|----------------------------|-----------------------------|---------------------------------|-------------------------|
| Site:<br><b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> |  |                            |                             | Project No.<br><b>23-176.01</b> | Borehole:<br><b>WS6</b> |
| Client:<br><b>Palatine Homes Limited</b>                       |  |                            | Start:<br><b>26/07/2023</b> | End:<br><b>26/07/2023</b>       | Sheet:<br><b>1 of 1</b> |
| Method/Plant Used:<br><b>WS Rig (Archway Dart) - AD1</b>       |  | Co-ordinates:<br><b>NT</b> |                             | Ground Level:<br><b>NT</b>      |                         |

| Description of Strata                                                                                                                                                | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |        | SPT Results |      |      |      |      |          | Notes |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|--------|-------------|------|------|------|------|----------|-------|
|                                                                                                                                                                      |        |                              |             | Depth         | No | Type   | 75mm        | 75mm | 75mm | 75mm | 75mm | N' Value |       |
| Soft light brown silty very sandy gravelly CLAY with rootlets and rare brick fragments. Gravel is fine to medium sub-angular to rounded of flint. (Reworked TOPSOIL) |        | (0.3)<br><b>0.3</b>          |             | 0.2           | 1  | ES     |             |      |      |      |      |          |       |
| Firm light grey, yellowish and orange brown silty very sandy CLAY with partings of orange coarse sand. Rootlets to 0.8m. [BAGSHOT FORMATION]                         |        | (0.8)<br><b>1.1</b>          |             | 1.0           | 2  | SPT    | 5           | 5    | 4    | 6    | 5    | 5        | 20    |
| Medium dense light grey and orange brown mottled clayey silty fine to coarse SAND. Very sandy CLAY partings 1.5-2.0m. [BAGSHOT FORMATION]                            |        | (2.0)<br><b>2.8</b>          |             | 1.5           | 3  | D      |             |      |      |      |      |          |       |
|                                                                                                                                                                      |        |                              |             | 2.0           | 4  | D/SPT  | 3           | 4    | 4    | 5    | 5    | 4        | 18    |
| Medium dense orange brown slightly silty fine SAND. [BAGSHOT FORMATION]                                                                                              |        | (1.5)<br><b>4.3</b>          |             | 3.0           | 5  | LC/SPT | 3           | 3    | 5    | 6    | 6    | 5        | 22    |
|                                                                                                                                                                      |        |                              |             | 4.0           | 6  | SPT    | 2           | 4    | 5    | 7    | 8    | 9        | 29    |
| Dense dark grey fine SAND. [BAGSHOT FORMATION]                                                                                                                       |        | (0.4)<br><b>4.7</b>          |             | 4.7           | 7  | SPT    | 6           | 8    | 7    | 8    | 11   | 13       | 39    |
|                                                                                                                                                                      |        |                              |             |               |    |        |             |      |      |      |      |          |       |

| Casing record                                                                                                                                                                                                                                                                            |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |         |                |         |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|---------|----------------|---------|----------------|
| Date                                                                                                                                                                                                                                                                                     | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks |                |
| 26/07/2023                                                                                                                                                                                                                                                                               | -             | -         |                    |          |        | 26/07/2023                                           |              | -                          | -       |                |         |                |
| Remarks                                                                                                                                                                                                                                                                                  |               |           |                    |          |        |                                                      |              |                            | By      |                |         |                |
| Hand service pit to 1.0m.<br>Groundwater not encountered.<br>No visual or olfactory evidence of contamination.<br>Gas and groundwater monitoring installation to 2.0m.<br><br>SPT: Standard Penetration Test. HP: Hand Penetrometer. B: Bulk Sample. D: Disturbed Sample. R: Root Sample |               |           |                    |          |        |                                                      |              |                            | Logged  | AC             |         |                |
|                                                                                                                                                                                                                                                                                          |               |           |                    |          |        |                                                      |              |                            | Checked | JB             |         | Scale<br>01:25 |



| Dimensions (m) |       |       | Water level observations (depths in metres below gl) |              |                            |      |                |         |
|----------------|-------|-------|------------------------------------------------------|--------------|----------------------------|------|----------------|---------|
| Length         | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks |
| 0.30           | 0.30  | 1.10  | 27/07/2023                                           | -            | -                          | -    | -              |         |
|                |       |       |                                                      |              |                            |      |                |         |
|                |       |       |                                                      |              |                            | By   |                |         |
|                |       |       |                                                      |              | Logged                     | AC   |                |         |
|                |       |       |                                                      |              | Checked                    | OB   | Scale<br>01:25 |         |



| Dimensions (m) |       |       | Water level observations (depths in metres below gl) |              |                            |      |                |         |
|----------------|-------|-------|------------------------------------------------------|--------------|----------------------------|------|----------------|---------|
| Length         | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks |
| 0.20           | 0.20  | 1.00  | 27/07/2023                                           | -            | -                          | -    | -              |         |
|                |       |       |                                                      |              |                            |      |                |         |
|                |       |       |                                                      |              |                            | By   |                |         |
|                |       |       |                                                      |              | Logged                     | AC   |                |         |
|                |       |       |                                                      |              | Checked                    | OB   | Scale<br>01:25 |         |



| Dimensions (m) |       |       | Water level observations (depths in metres below gl) |              |                            |      |                |                |
|----------------|-------|-------|------------------------------------------------------|--------------|----------------------------|------|----------------|----------------|
| Length         | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks        |
| 0.25           | 0.25  | 1.00  | 27/07/2023                                           | -            | -                          | -    | -              |                |
|                |       |       |                                                      |              |                            |      |                |                |
|                |       |       |                                                      |              |                            | By   |                |                |
|                |       |       |                                                      |              | Logged                     | AC   |                |                |
|                |       |       |                                                      |              | Checked                    | OB   |                | Scale<br>01:25 |



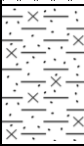
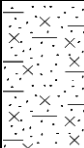
# TRIAL PIT LOG

| Project: Land at Johnson Drive, Finchampstead, RG40 3NW                                                                                              |        |                              |                   | Project No. 23-176.01 |                  | Trial Pit: TP4 |               |  |  |  |  |  |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------------|-----------------------|------------------|----------------|---------------|--|--|--|--|--|-------------------------|
| Client: Palatine Homes Limited                                                                                                                       |        |                              | Start: 27/07/2023 |                       | End: 27/07/2023  |                | Sheet: 1 of 1 |  |  |  |  |  |                         |
| Method/Plant Used: 2.5T Excavator                                                                                                                    |        | Co-ordinates: NT             |                   |                       | Ground Level: NT |                |               |  |  |  |  |  |                         |
| Description of Strata                                                                                                                                | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr.       | Samples/Tests         |                  |                |               |  |  |  |  |  | Laboratory Test Details |
|                                                                                                                                                      |        |                              |                   | Depth                 | No               | Type           |               |  |  |  |  |  |                         |
| Brown dark grey silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to rounded of type 1 and flint. Large brick fragments. (MADE GROUND) |        | (0.3)<br>0.3                 |                   |                       |                  |                |               |  |  |  |  |  |                         |
| Firm light grey locally orange very sandy silty CLAY. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION)                         |        | (0.8)<br>1.1                 |                   |                       |                  |                |               |  |  |  |  |  |                         |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                         |        | (0.3)<br>1.4                 |                   |                       |                  |                |               |  |  |  |  |  |                         |
|                                                                                                                                                      |        |                              |                   |                       |                  |                |               |  |  |  |  |  |                         |

| Dimensions (m)                                                                                                                                                                    |       |       | Water level observations (depths in metres below gl) |              |                            |         |                |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------------------------------------------------------|--------------|----------------------------|---------|----------------|----------------|
| Length                                                                                                                                                                            | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks        |
| 1.20                                                                                                                                                                              | 0.35  | 1.40  | 27/07/2023                                           | -            | -                          | -       | -              |                |
| Remarks<br>No roots present in trial pit.<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. |       |       |                                                      |              |                            | By      |                | Scale<br>01:25 |
|                                                                                                                                                                                   |       |       |                                                      |              |                            | Logged  | AC             |                |
|                                                                                                                                                                                   |       |       |                                                      |              |                            | Checked | OB             |                |



# TRIAL PIT LOG

| Project: Land at Johnson Drive, Finchampstead, RG40 3NW                                                                                                             |                                                                                   |                                     |                  |               |                   |      | Project No. 23-176.01 |  | Trial Pit: TP5 |  |  |  |                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------|------------------|---------------|-------------------|------|-----------------------|--|----------------|--|--|--|----------------------------|
| Client: Palatine Homes Limited                                                                                                                                      |                                                                                   |                                     |                  |               | Start: 27/07/2023 |      | End: 27/07/2023       |  | Sheet: 1 of 1  |  |  |  |                            |
| Method/Plant Used: 2.5T Excavator                                                                                                                                   |                                                                                   |                                     | Co-ordinates: NT |               |                   |      | Ground Level: NT      |  |                |  |  |  |                            |
| Description of Strata                                                                                                                                               | Legend                                                                            | Depth (m bgl)<br><i>(thickness)</i> | Well Cnstr.      | Samples/Tests |                   |      |                       |  |                |  |  |  | Laboratory Test<br>Details |
|                                                                                                                                                                     |                                                                                   |                                     |                  | Depth         | No                | Type |                       |  |                |  |  |  |                            |
| Brown dark grey silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to rounded of type 1 and flint. Large brick fragments. Roots to 0.2m. (MADE GROUND) |  | (0.2)                               |                  | 0.1           | 1                 | ES   |                       |  |                |  |  |  |                            |
| Firm light grey locally orange very sandy silty CLAY. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION)                                        |  | (0.7)                               |                  |               |                   |      |                       |  |                |  |  |  |                            |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                                        |  | (0.7)                               |                  |               |                   |      |                       |  |                |  |  |  |                            |
|                                                                                                                                                                     |                                                                                   | 1.6                                 |                  |               |                   |      |                       |  |                |  |  |  |                            |
|                                                                                                                                                                     |                                                                                   |                                     |                  |               |                   |      |                       |  |                |  |  |  |                            |

| Dimensions (m)                                                                                                                                                              |       |       | Water level observations (depths in metres below gl) |              |                            |         |                |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------------------------------------------------------|--------------|----------------------------|---------|----------------|----------------|
| Length                                                                                                                                                                      | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks        |
| 1.20                                                                                                                                                                        | 0.35  | 1.60  | 27/07/2023                                           | -            | -                          | -       | -              |                |
| Remarks<br>Roots noted to 0.2m bgl.<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. |       |       |                                                      |              |                            | By      |                |                |
|                                                                                                                                                                             |       |       |                                                      |              |                            | Logged  | AC             |                |
|                                                                                                                                                                             |       |       |                                                      |              |                            | Checked | OB             |                |
|                                                                                                                                                                             |       |       |                                                      |              |                            |         |                | Scale<br>01:25 |



# TRIAL PIT LOG

|                                                                |  |  |  |  |  |                              |  |                         |  |
|----------------------------------------------------------------|--|--|--|--|--|------------------------------|--|-------------------------|--|
| Project: <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> |  |  |  |  |  | Project No. <b>23-176.01</b> |  | Trial Pit: <b>TP6</b>   |  |
| Client: <b>Palatine Homes Limited</b>                          |  |  |  |  |  | Start: <b>27/07/2023</b>     |  | End: <b>27/07/2023</b>  |  |
| Method/Plant Used: <b>2.5T Excavator</b>                       |  |  |  |  |  | Co-ordinates: <b>NT</b>      |  | Ground Level: <b>NT</b> |  |

| Description of Strata                                                                                                                                    | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Laboratory Test Details |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------------------------|
|                                                                                                                                                          |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |                         |
| Brown dark grey silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded of flint and rarely type one. Whole bricks. (MADE GROUND) |        | (0.2)                        |             | 0.2           | 1  | ES   |  |  |  |  |  |  |                         |
| Firm light grey locally orange very sandy silty CLAY. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION)                             |        | (0.6)                        |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                          |        | 0.8                          |             |               |    |      |  |  |  |  |  |  |                         |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                             |        | (1.0)                        |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                          |        | 1.8                          |             |               |    |      |  |  |  |  |  |  |                         |

| Dimensions (m) |       |       | Water level observations (depths in metres below gl) |              |                            |      |                |         |
|----------------|-------|-------|------------------------------------------------------|--------------|----------------------------|------|----------------|---------|
| Length         | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks |
| 1.40           | 0.35  | 1.80  | 27/07/2023                                           | -            | -                          | -    | -              |         |

|                                                                                                                                                                                          |         |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|
| <b>Remarks</b><br>No roots present in trial pit.<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. | By      |                |
|                                                                                                                                                                                          | Logged  | AC             |
|                                                                                                                                                                                          | Checked | OB             |
|                                                                                                                                                                                          |         | Scale<br>01:25 |



# TRIAL PIT LOG

| Project: <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b>                                                                                                           |        |                              |                          | Project No. <b>23-176.01</b> |                         | Trial Pit: <b>TP7</b> |                      |  |  |  |  |  |                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|--------------------------|------------------------------|-------------------------|-----------------------|----------------------|--|--|--|--|--|-------------------------|
| Client: <b>Palatine Homes Limited</b>                                                                                                                                    |        |                              | Start: <b>27/07/2023</b> |                              | End: <b>27/07/2023</b>  |                       | Sheet: <b>1 of 1</b> |  |  |  |  |  |                         |
| Method/Plant Used: <b>2.5T Excavator</b>                                                                                                                                 |        | Co-ordinates: <b>NT</b>      |                          |                              | Ground Level: <b>NT</b> |                       |                      |  |  |  |  |  |                         |
| Description of Strata                                                                                                                                                    | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr.              | Samples/Tests                |                         |                       |                      |  |  |  |  |  | Laboratory Test Details |
|                                                                                                                                                                          |        |                              |                          | Depth                        | No                      | Type                  |                      |  |  |  |  |  |                         |
| Brown dark grey silty sandy slightly gravelly CLAY. Gravel is fine to medium sub-angular to rounded of flint. Fine brick fragments. Rootlets to 0.2m. (REWORKED TOPSOIL) |        | (0.2)                        |                          |                              |                         |                       |                      |  |  |  |  |  |                         |
| Firm light grey locally orange very sandy silty CLAY. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION)                                             |        | (1.0)                        |                          |                              |                         |                       |                      |  |  |  |  |  |                         |
| ...band of fine to coarse pale yellow sand at 0.3m to 0.35m.                                                                                                             |        | 1.2                          |                          |                              |                         |                       |                      |  |  |  |  |  |                         |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                                             |        | (0.5)                        |                          |                              |                         |                       |                      |  |  |  |  |  |                         |
|                                                                                                                                                                          |        | 1.7                          |                          |                              |                         |                       |                      |  |  |  |  |  |                         |

| Dimensions (m)                                                                                                                                                                |       |       | Water level observations (depths in metres below gl) |              |                            |         |                |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------------------------------------------------------|--------------|----------------------------|---------|----------------|----------------|
| Length                                                                                                                                                                        | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks        |
| 1.20                                                                                                                                                                          | 0.35  | 1.70  | 27/07/2023                                           | -            | -                          | -       | -              |                |
| Remarks<br>Rotlets noted to 0.2m bgl.<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. |       |       |                                                      |              |                            | By      |                |                |
|                                                                                                                                                                               |       |       |                                                      |              |                            | Logged  | AC             |                |
|                                                                                                                                                                               |       |       |                                                      |              |                            | Checked | OB             | Scale<br>01:25 |



# TRIAL PIT LOG

|                                                                |  |                         |  |  |  |                              |  |                        |  |
|----------------------------------------------------------------|--|-------------------------|--|--|--|------------------------------|--|------------------------|--|
| Project: <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> |  |                         |  |  |  | Project No. <b>23-176.01</b> |  | Trial Pit: <b>TP8</b>  |  |
| Client: <b>Palatine Homes Limited</b>                          |  |                         |  |  |  | Start: <b>27/07/2023</b>     |  | End: <b>27/07/2023</b> |  |
| Method/Plant Used: <b>2.5T Excavator</b>                       |  | Co-ordinates: <b>NT</b> |  |  |  | Ground Level: <b>NT</b>      |  |                        |  |

| Description of Strata                                                                                                                                                   | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Laboratory Test Details |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------------------------|
|                                                                                                                                                                         |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |                         |
| Dark brown dark grey humic silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to rounded of flint. Buried plastic waste. Roots to 0.2m. (REWORKED TOPSOIL) |        | (0.25)                       |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                                         |        | 0.25                         |             |               |    |      |  |  |  |  |  |  |                         |
| Firm light grey locally orange very sandy silty CLAY. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION)                                            |        | (0.55)                       |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                                         |        | 0.8                          |             |               |    |      |  |  |  |  |  |  |                         |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                                            |        | (1.1)                        |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                                         |        | 1.9                          |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                                         |        |                              |             |               |    |      |  |  |  |  |  |  |                         |

| Dimensions (m)                                                                                                                                              |       |       | Water level observations (depths in metres below gl) |              |                            |         |                |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------------------------------------------------------|--------------|----------------------------|---------|----------------|----------------|
| Length                                                                                                                                                      | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks        |
| 1.10                                                                                                                                                        | 0.35  | 1.90  | 27/07/2023                                           | -            | -                          | -       | -              |                |
| Remarks                                                                                                                                                     |       |       |                                                      |              |                            | By      |                |                |
| Roots noted to 0.2m<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. |       |       |                                                      |              |                            | Logged  | AC             | Scale<br>01:25 |
|                                                                                                                                                             |       |       |                                                      |              |                            | Checked | OB             |                |



# TRIAL PIT LOG

|                                                         |  |                  |                   |                       |                  |                |               |  |
|---------------------------------------------------------|--|------------------|-------------------|-----------------------|------------------|----------------|---------------|--|
| Project: Land at Johnson Drive, Finchampstead, RG40 3NW |  |                  |                   | Project No. 23-176.01 |                  | Trial Pit: TP9 |               |  |
| Client: Palatine Homes Limited                          |  |                  | Start: 27/07/2023 |                       | End: 27/07/2023  |                | Sheet: 1 of 1 |  |
| Method/Plant Used: 2.5T Excavator                       |  | Co-ordinates: NT |                   |                       | Ground Level: NT |                |               |  |

| Description of Strata                                                                                                                                                                                                                                    | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Laboratory Test Details |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------------------------|
|                                                                                                                                                                                                                                                          |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |                         |
| Soft to firm and firm brown grey silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded of flint and type 1. Whole bricks. Frequent concrete rubble. (MADE GROUND)<br><br>...solid concrete from 0.5m to 1.2m (excavated around) |        | (1.2)                        |             | 0.5           | 1  | ES   |  |  |  |  |  |  |                         |
|                                                                                                                                                                                                                                                          |        | 1.2                          |             |               |    |      |  |  |  |  |  |  |                         |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                                                                                                                             |        | (0.2)<br>1.4                 |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                                                                                                                                          |        |                              |             |               |    |      |  |  |  |  |  |  |                         |

| Dimensions (m) |       |       | Water level observations (depths in metres below gl) |              |                            |      |                |         |
|----------------|-------|-------|------------------------------------------------------|--------------|----------------------------|------|----------------|---------|
| Length         | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow | Standing level | Remarks |
| 1.60           | 0.50  | 1.40  | 27/07/2023                                           | -            | -                          | -    | -              |         |

|                                                                                                                                                                                   |  |  |  |  |  |         |    |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|---------|----|----------------|
| Remarks<br>No roots present in trial pit.<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. |  |  |  |  |  | By      |    | Scale<br>01:25 |
|                                                                                                                                                                                   |  |  |  |  |  | Logged  | AC |                |
|                                                                                                                                                                                   |  |  |  |  |  | Checked | OB |                |



# TRIAL PIT LOG

|                                                                |  |  |  |  |  |                              |  |                         |  |
|----------------------------------------------------------------|--|--|--|--|--|------------------------------|--|-------------------------|--|
| Project: <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> |  |  |  |  |  | Project No. <b>23-176.01</b> |  | Trial Pit: <b>TP10</b>  |  |
| Client: <b>Palatine Homes Limited</b>                          |  |  |  |  |  | Start: <b>27/07/2023</b>     |  | End: <b>27/07/2023</b>  |  |
| Method/Plant Used: <b>2.5T Excavator</b>                       |  |  |  |  |  | Co-ordinates: <b>NT</b>      |  | Ground Level: <b>NT</b> |  |

| Description of Strata                                                                                                                         | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Laboratory Test Details |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------------------------|
|                                                                                                                                               |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |                         |
| Grey brown silty sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to rounded of flint. Rootlets to 0.1m. (REWORKED TOPSOIL) |        | (0.3)                        |             |               |    |      |  |  |  |  |  |  |                         |
| Firm light grey locally orange very sandy silty CLAY. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION)                  |        | (0.3)                        |             |               |    |      |  |  |  |  |  |  |                         |
| Light grey orange pale yellow slightly silty clayey fine to medium SAND. (BAGSHOT FORMATION)                                                  |        | (1.2)                        |             |               |    |      |  |  |  |  |  |  |                         |
|                                                                                                                                               |        | 1.8                          |             |               |    |      |  |  |  |  |  |  |                         |

| Dimensions (m)                                                                                                                                                                 |       |       | Water level observations (depths in metres below gl) |              |                            |         |                |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------------------------------------------------------|--------------|----------------------------|---------|----------------|----------------|
| Length                                                                                                                                                                         | Width | Depth | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks        |
| 1.00                                                                                                                                                                           | 0.35  | 1.80  | 27/07/2023                                           | -            | -                          | -       | -              |                |
| Remarks<br>Rootlets noted to 0.1m bgl.<br>No groundwater encountered in trial pit.<br>No visual or olfactory evidence of contamination.<br>Trial pit backfilled with arisings. |       |       |                                                      |              |                            | By      |                | Scale<br>01:25 |
|                                                                                                                                                                                |       |       |                                                      |              |                            | Logged  | AC             |                |
|                                                                                                                                                                                |       |       |                                                      |              |                            | Checked | OB             |                |



# HAND AUGER LOG

|                                                |  |  |               |  |             |               |            |  |
|------------------------------------------------|--|--|---------------|--|-------------|---------------|------------|--|
| Site:                                          |  |  |               |  | Project No. |               | Borehole:  |  |
| Land at Johnson Drive, Finchampstead, RG40 3NW |  |  |               |  | 23-176.01   |               | HA1        |  |
| Client:                                        |  |  |               |  | Start:      |               | End:       |  |
| Palatine Homes Limited                         |  |  |               |  | 26/07/2023  |               | 26/07/2023 |  |
|                                                |  |  |               |  |             |               | Sheet:     |  |
|                                                |  |  |               |  |             |               | 1 of 1     |  |
| Method/Plant Used:                             |  |  | Co-ordinates: |  |             | Ground Level: |            |  |
| Hand Tools                                     |  |  | NT            |  |             | NT            |            |  |

| Description of Strata                                                                                                                                                                                  | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Notes |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------|
|                                                                                                                                                                                                        |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |       |
| Grey brown silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to rounded of flint. Large brick fragments. Roots to 0.3m. (MADE GROUND)                                                    |        | (0.4)                        |             | 0.2           | 1  | ES   |  |  |  |  |  |  |       |
|                                                                                                                                                                                                        |        | 0.4                          |             |               |    |      |  |  |  |  |  |  |       |
| Firm light grey locally orange very sandy silty rarely gravelly CLAY. Gravel is fine to coarse sub-rounded to rounded of flint. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION) |        | (0.6)                        |             |               |    |      |  |  |  |  |  |  |       |
|                                                                                                                                                                                                        |        | 1.0                          |             |               |    |      |  |  |  |  |  |  |       |
|                                                                                                                                                                                                        |        |                              |             |               |    |      |  |  |  |  |  |  |       |

| Casing record                                                                                                                             |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |          |                |         |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|----------|----------------|---------|
| Date                                                                                                                                      | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow     | Standing level | Remarks |
| 26/07/2023                                                                                                                                |               |           |                    |          |        | 26/07/2023                                           | 1.00         | 1.00                       | Standing | 1.00           |         |
| Remarks                                                                                                                                   |               |           |                    |          |        |                                                      |              |                            | By       |                |         |
| Standing water at 1.0m bgl.<br>No visual or olfactory evidence of contamination.<br>Roots noted to 0.3m.<br>Pit backfilled with arisings. |               |           |                    |          |        |                                                      |              |                            | Logged   | AC             |         |
|                                                                                                                                           |               |           |                    |          |        |                                                      |              |                            | Checked  | OB             |         |
| SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample                                                |               |           |                    |          |        |                                                      |              |                            |          |                |         |



# HAND AUGER LOG

|                                                |  |  |               |  |             |               |            |  |
|------------------------------------------------|--|--|---------------|--|-------------|---------------|------------|--|
| Site:                                          |  |  |               |  | Project No. |               | Borehole:  |  |
| Land at Johnson Drive, Finchampstead, RG40 3NW |  |  |               |  | 23-176.01   |               | HA2        |  |
| Client:                                        |  |  |               |  | Start:      |               | End:       |  |
| Palatine Homes Limited                         |  |  |               |  | 26/07/2023  |               | 26/07/2023 |  |
|                                                |  |  |               |  |             |               | Sheet:     |  |
|                                                |  |  |               |  |             |               | 1 of 1     |  |
| Method/Plant Used:                             |  |  | Co-ordinates: |  |             | Ground Level: |            |  |
| Hand Tools and core drill                      |  |  | NT            |  |             | NT            |            |  |

| Description of Strata                                                                                                                                                                                  | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Notes |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------|
|                                                                                                                                                                                                        |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |       |
| Concrete. (MADE GROUND)                                                                                                                                                                                |        | (0.2)<br><b>0.2</b>          |             |               |    |      |  |  |  |  |  |  |       |
| Dark grey silty sandy gravelly CLAY. Gravel is fine to medium sub-rounded to rounded of flint. Tarmac rubble. Large brick fragments. (MADE GROUND)                                                     |        | (0.3)<br><b>0.5</b>          |             |               |    |      |  |  |  |  |  |  |       |
| Orange silty sandy clayey GRAVEL. Gravel is fine to medium sub-angular to rounded of flint. (BAGSHOT FORMATION)                                                                                        |        | (0.2)<br><b>0.7</b>          |             |               |    |      |  |  |  |  |  |  |       |
| Firm light grey locally orange very sandy silty rarely gravelly CLAY. Gravel is fine to coarse sub-rounded to rounded of flint. Pockets of fine to coarse orange pale yellow sand. (BAGSHOT FORMATION) |        | (0.3)<br><b>1.0</b>          |             |               |    |      |  |  |  |  |  |  |       |
|                                                                                                                                                                                                        |        |                              |             |               |    |      |  |  |  |  |  |  |       |

| Casing record                                                                                                                                 |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                                                                                            |      |                |         |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------|------|----------------|---------|----------------|
| Date                                                                                                                                          | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins)                                                                 | Flow | Standing level | Remarks |                |
| 26/07/2023                                                                                                                                    |               |           |                    |          |        | 26/07/2023                                           | -            | -                                                                                          | -    | Dry            |         |                |
| Remarks                                                                                                                                       |               |           |                    |          |        |                                                      |              |                                                                                            | By   |                |         |                |
| No groundwater encountered.<br>No visual or olfactory evidence of contamination.<br>No roots present in pit.<br>Pit backfilled with arisings. |               |           |                    |          |        |                                                      |              | Logged                                                                                     | AC   |                |         |                |
|                                                                                                                                               |               |           |                    |          |        |                                                      |              | Checked                                                                                    | OB   |                |         | Scale<br>01:25 |
|                                                                                                                                               |               |           |                    |          |        |                                                      |              | SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample |      |                |         |                |





# HAND AUGER LOG

|                                                                |  |                            |                             |                                 |                         |
|----------------------------------------------------------------|--|----------------------------|-----------------------------|---------------------------------|-------------------------|
| Site:<br><b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> |  |                            |                             | Project No.<br><b>23-176.01</b> | Borehole:<br><b>HA4</b> |
| Client:<br><b>Palatine Homes Limited</b>                       |  |                            | Start:<br><b>26/07/2023</b> | End:<br><b>26/07/2023</b>       | Sheet:<br><b>1 of 1</b> |
| Method/Plant Used:<br><b>Hand Tools and core drill</b>         |  | Co-ordinates:<br><b>NT</b> |                             | Ground Level:<br><b>NT</b>      |                         |

| Description of Strata                                                                                                                                   | Legend | Depth (m bgl)<br>(thickness) | Well Cnstr. | Samples/Tests |    |      |  |  |  |  |  |  | Notes |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|-------------|---------------|----|------|--|--|--|--|--|--|-------|
|                                                                                                                                                         |        |                              |             | Depth         | No | Type |  |  |  |  |  |  |       |
| Concrete. (MADE GROUND)                                                                                                                                 |        | (0.1)<br><b>0.1</b>          |             | 0.3           | 1  | ES   |  |  |  |  |  |  |       |
| Dark grey brown silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to rounded of flint. Fine brick fragments. Tarmac rubble. (MADE GROUND) |        | (0.45)<br><b>0.55</b>        |             |               |    |      |  |  |  |  |  |  |       |
| Firm grey light brown silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to rounded of flint. (RELIC TOPSOIL)                              |        | (0.25)<br><b>0.8</b>         |             |               |    |      |  |  |  |  |  |  |       |
|                                                                                                                                                         |        |                              |             |               |    |      |  |  |  |  |  |  |       |

| Casing record                                                                                                                                 |               |           | Chiselling records |          |        | Water level observations (depths in metres below gl) |              |                            |         |                |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------|--------------------|----------|--------|------------------------------------------------------|--------------|----------------------------|---------|----------------|---------|
| Date                                                                                                                                          | Diameter (mm) | Depth (m) | Time               | From (m) | To (m) | Date                                                 | Water strike | Water level (after 20mins) | Flow    | Standing level | Remarks |
| 26/07/2023                                                                                                                                    |               |           |                    |          |        | 26/07/2023                                           | -            | -                          | -       | Dry            |         |
| Remarks                                                                                                                                       |               |           |                    |          |        |                                                      |              |                            | By      |                |         |
| No groundwater encountered.<br>No visual or olfactory evidence of contamination.<br>No roots present in pit.<br>Pit backfilled with arisings. |               |           |                    |          |        |                                                      |              |                            | Logged  | AC             |         |
|                                                                                                                                               |               |           |                    |          |        |                                                      |              |                            | Checked | OB             |         |
| SPT: Standard Penetration Test. HP: Hand Penetrometer. B: Bulk Sample. D: Disturbed Sample                                                    |               |           |                    |          |        |                                                      |              |                            |         |                |         |



WS1 arisings



WS2 arisings



WS3 arisings



WS4 arisings



WS5 arisings



WS6 arisings



HA1 arisings



HA2 arisings



HA3 arisings



HA4 arisings



TP1



TP2



TP3



TP1 arisings



TP2 arisings



TP3 arisings



TP4



TP5



TP6



TP4 arisings



TP5 arisings



TP6 arisings



TP7



TP8



TP9



TP7 arisings



TP8 arisings



TP9 arisings



TP10



TP10 arisings

## Appendix

### II Field Monitoring Results

## MONITORING DATA SHEET

**SITE** Land at Johnson Drive, Finchampstead, RG40 3NW  
**PROJECT** 23-176.01



**VISIT NUMBER** 1  
**DATE** 04/08/2023

**EQUIPMENT** GFM436 + MiniRAE  
**TAKEN BY** AC

| Record of Stable Concentrations |         |            |             |             |            |                  |           |               |                   | Interpretation |               |      |
|---------------------------------|---------|------------|-------------|-------------|------------|------------------|-----------|---------------|-------------------|----------------|---------------|------|
| Location                        | Time    | Flow (l/h) | CH4 (% v/v) | CO2 (% v/v) | O2 (% v/v) | Baro. Pres. (mB) | PID (ppm) | Water (m bgl) | Base Well (m bgl) | CH4 GSV (l/h)  | CO2 GSV (l/h) | CS   |
| Site                            | 9:40am  | n/a        | 0.0         | 0.0         | 20.6       | 1012             | 0.0       | n/a           | n/a               | n/a            | n/a           | n/a  |
| WS1                             | 10:40am | 0.0        | 0.0         | 2.0         | 18.4       | 1012             | 2.8       | 3.67          | 4.04              | 0              | 0             | CS-1 |
| WS2                             | 11:16am | 0.0        | 0.0         | 0.4         | 20.1       | 1012             | 0.9       | 4.01          | 4.13              | 0              | 0             | CS-1 |
| WS5                             | 10:00am | 0.0        | 0.0         | 2.8         | 17.8       | 1012             | 1.4       | dry           | 2.10              | 0              | 0             | CS-1 |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |         |            |             |             |            |                  |           |               |                   |                |               |      |

| Weather Observations |             |          |          |                    |    | Pressure Observations |                  |        |         | Notes                                        |    |
|----------------------|-------------|----------|----------|--------------------|----|-----------------------|------------------|--------|---------|----------------------------------------------|----|
| State of Ground      | Cloud Cover | Wind     | Rain     | Air Temperature °C |    | Source                | Pressure Records |        | Trend   |                                              |    |
|                      |             |          |          |                    |    | Metoffice             | Location         | Odiham | Falling |                                              |    |
| Dry                  | Clear       | Calm     | None     | Before             | 16 | GFM436                | Time             | 07:00  | Steady  | Worst case conditions? (<1000mB and Falling) |    |
| Moist                | Sunny       | Light    | Slight   |                    |    | Pressure              | 1017             | Rising |         |                                              |    |
| Wet                  | Slight      | Moderate | Moderate | After              | 16 |                       |                  |        |         |                                              | No |
| Snow                 | Cloudy      | Strong   | Heavy    |                    |    |                       |                  |        |         |                                              |    |
| Frozen               | Overcast    |          |          |                    |    |                       |                  |        |         |                                              |    |
|                      | Fog/Mist    |          |          |                    |    |                       |                  |        |         |                                              |    |

## MONITORING DATA SHEET

**SITE** Land at Johnson Drive, Finchampstead, RG40 3NW  
**PROJECT** 23-176.01



**VISIT NUMBER** 2  
**DATE** 11/08/2023

**EQUIPMENT** GFM436 + MiniRAE  
**TAKEN BY** AC

| Record of Stable Concentrations |        |            |             |             |            |                  |           |               |                   | Interpretation |               |      |
|---------------------------------|--------|------------|-------------|-------------|------------|------------------|-----------|---------------|-------------------|----------------|---------------|------|
| Location                        | Time   | Flow (l/h) | CH4 (% v/v) | CO2 (% v/v) | O2 (% v/v) | Baro. Pres. (mB) | PID (ppm) | Water (m bgl) | Base Well (m bgl) | CH4 GSV (l/h)  | CO2 GSV (l/h) | CS   |
| Site                            | 2:10pm | n/a        | 0.0         | 0.0         | 20.6       | 1013             | 0.0       | n/a           | n/a               | n/a            | n/a           | n/a  |
| WS1                             | 2:32pm | 0.0        | 0.0         | 1.3         | 19.0       | 1013             | 0.7       | 3.43          | 4.04              | 0              | 0             | CS-1 |
| WS2                             | 2:45pm | 0.0        | 0.0         | 0.9         | 19.5       | 1013             | 0.3       | 3.84          | 4.13              | 0              | 0             | CS-1 |
| WS5                             | 2:20pm | 0.0        | 0.0         | 1.3         | 18.4       | 1013             | 1.3       | Dry           | 2.10              | 0              | 0             | CS-1 |
|                                 |        |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |        |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |        |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |        |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |        |            |             |             |            |                  |           |               |                   |                |               |      |
|                                 |        |            |             |             |            |                  |           |               |                   |                |               |      |

| Weather Observations |             |          |          |                    |    | Pressure Observations |                  |        |         | Notes                                        |  |
|----------------------|-------------|----------|----------|--------------------|----|-----------------------|------------------|--------|---------|----------------------------------------------|--|
| State of Ground      | Cloud Cover | Wind     | Rain     | Air Temperature °C |    | Source                | Pressure Records |        | Trend   |                                              |  |
|                      |             |          |          |                    |    | Metoffice             | Location         | Henley | Falling |                                              |  |
| Dry                  | Clear       | Calm     | None     | Before             | 24 | GFM436                | Time             | 07:00  | Steady  | Worst case conditions? (<1000mB and Falling) |  |
| Moist                | Sunny       | Light    | Slight   |                    |    | Pressure              | 1013             | Rising |         |                                              |  |
| Wet                  | Slight      | Moderate | Moderate | After              | 24 |                       |                  |        |         |                                              |  |
| Snow                 | Cloudy      | Strong   | Heavy    |                    |    |                       |                  |        |         |                                              |  |
| Frozen               | Overcast    |          |          |                    |    |                       |                  |        |         |                                              |  |
|                      | Fog/Mist    |          |          |                    |    |                       |                  |        |         |                                              |  |

## **Appendix**

### **III      Soil Contamination Results and Assessment Criteria**



2183

## Amended Report

---

|                               |                                                                                            |                          |             |
|-------------------------------|--------------------------------------------------------------------------------------------|--------------------------|-------------|
| <b>Report No.:</b>            | 23-25721-2                                                                                 |                          |             |
| <b>Initial Date of Issue:</b> | 11-Aug-2023                                                                                | <b>Date of Re-Issue:</b> | 18-Aug-2023 |
| <b>Re-Issue Details:</b>      | This report has been revised and directly supersedes 23-25721-1 in its entirety            |                          |             |
| <b>Client</b>                 | Aviron Associates Ltd                                                                      |                          |             |
| <b>Client Address:</b>        | Badgemore House<br>Badgemore Park<br>Gravel Hill<br>Reading<br>Henley on Thames<br>RG9 4NR |                          |             |
| <b>Contact(s):</b>            | David Norman<br>James Burkitt<br>Orlando Blackwell                                         |                          |             |
| <b>Project</b>                | 23-176.01 Land at Johnson Drive                                                            |                          |             |
| <b>Quotation No.:</b>         |                                                                                            | <b>Date Received:</b>    | 31-Jul-2023 |
| <b>Order No.:</b>             | 23-176.01                                                                                  | <b>Date Instructed:</b>  | 31-Jul-2023 |
| <b>No. of Samples:</b>        | 19                                                                                         |                          |             |
| <b>Turnaround (Wkdays):</b>   | 15                                                                                         | <b>Results Due:</b>      | 18-Aug-2023 |
| <b>Date Approved:</b>         | 18-Aug-2023                                                                                |                          |             |
| <b>Approved By:</b>           |         |                          |             |
| <b>Details:</b>               | Stuart Henderson, Technical Manager                                                        |                          |             |

---

## Results - Soil

**Project: 23-176.01 Land at Johnson Drive**

|                                      |                             |            |              |            |                      |                      |                      |                      |                      |                      |                      |                      |                      |
|--------------------------------------|-----------------------------|------------|--------------|------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>Client: Aviron Associates Ltd</b> | <b>Chemtest Job No.:</b>    |            |              |            | 23-25721             | 23-25721             | 23-25721             | 23-25721             | 23-25721             | 23-25721             | 23-25721             | 23-25721             | 23-25721             |
| <b>Quotation No.:</b>                | <b>Chemtest Sample ID.:</b> |            |              |            | 1681560              | 1681561              | 1681562              | 1681563              | 1681564              | 1681565              | 1681566              | 1681567              | 1681568              |
| <b>Order No.: 23-176.01</b>          | <b>Client Sample Ref.:</b>  |            |              |            | 1                    | 2                    | 3                    | 4                    | 5                    | 6                    | 7                    | 8                    | 9                    |
|                                      | <b>Sample Location:</b>     |            |              |            | HA1                  | HA4                  | TP1                  | TP5                  | TP6                  | TP9                  | WS1                  | WS2                  | WS2                  |
|                                      | <b>Sample Type:</b>         |            |              |            | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 | SOIL                 |
|                                      | <b>Top Depth (m):</b>       |            |              |            | 0.2                  | 0.3                  | 0.2                  | 0.1                  | 0.4                  | 0.5                  | 0.1                  | 0.2                  | 0.55                 |
|                                      | <b>Date Sampled:</b>        |            |              |            | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          |
|                                      | <b>Asbestos Lab:</b>        |            |              |            | DURHAM               | DURHAM               | DURHAM               | DURHAM               | DURHAM               | DURHAM               | DURHAM               | DURHAM               | DURHAM               |
| <b>Determinand</b>                   | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |                      |                      |                      |                      |                      |                      |                      |                      |                      |
| ACM Type                             | U                           | 2192       |              | N/A        | -                    | -                    | -                    | -                    | -                    | -                    | -                    | -                    | -                    |
| Asbestos Identification              | U                           | 2192       |              | N/A        | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture                             | N                           | 2030       | %            | 0.020      | 8.0                  | 9.1                  | 11                   | 11                   | 11                   | 10                   | 13                   | 10                   | 11                   |
| pH                                   | U                           | 2010       |              | 4.0        | 8.2                  | 7.9                  | 6.9                  | 7.5                  | 7.7                  | 7.5                  | 6.9                  | 6.9                  | 6.7                  |
| Boron (Hot Water Soluble)            | U                           | 2120       | mg/kg        | 0.40       | < 0.40               | < 0.40               | < 0.40               | < 0.40               | < 0.40               | 0.50                 | < 0.40               | < 0.40               | < 0.40               |
| Sulphate (2:1 Water Soluble) as SO4  | U                           | 2120       | g/l          | 0.010      | < 0.010              | < 0.010              | < 0.010              | < 0.010              | < 0.010              | 0.025                | < 0.010              | < 0.010              | < 0.010              |
| Total Sulphur                        | U                           | 2175       | %            | 0.010      | 0.17                 | 0.081                | 0.019                | 0.087                | 0.017                | 0.025                | 0.017                | 0.024                | 0.012                |
| Cyanide (Total)                      | U                           | 2300       | mg/kg        | 0.50       | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | < 0.50               | 0.50                 | < 0.50               |
| Sulphate (Total)                     | U                           | 2430       | %            | 0.010      | 0.094                | 0.041                | 0.036                | 0.058                | 0.023                | 0.034                | 0.032                | 0.054                | 0.019                |
| Arsenic                              | U                           | 2455       | mg/kg        | 0.5        | 12                   | 6.7                  | 6.6                  | 8.9                  | 5.8                  | 5.0                  | 3.3                  | 4.9                  | 7.7                  |
| Barium                               | U                           | 2455       | mg/kg        | 0          | 100                  | 67                   | 26                   | 110                  | 57                   | 37                   | 16                   | 67                   | 22                   |
| Cadmium                              | U                           | 2455       | mg/kg        | 0.10       | 0.20                 | < 0.10               | < 0.10               | < 0.10               | 0.27                 | < 0.10               | < 0.10               | 0.14                 | < 0.10               |
| Chromium                             | U                           | 2455       | mg/kg        | 0.5        | 14                   | 10                   | 8.9                  | 15                   | 7.1                  | 7.5                  | 6.6                  | 8.5                  | 23                   |
| Copper                               | U                           | 2455       | mg/kg        | 0.50       | 13                   | 7.4                  | 8.0                  | 11                   | 5.1                  | 14                   | 5.0                  | 12                   | 6.4                  |
| Mercury                              | U                           | 2455       | mg/kg        | 0.05       | 0.06                 | 0.07                 | 0.08                 | 0.06                 | 0.05                 | 0.05                 | < 0.05               | 0.08                 | < 0.05               |
| Nickel                               | U                           | 2455       | mg/kg        | 0.50       | 11                   | 4.7                  | 3.2                  | 4.7                  | 2.7                  | 3.1                  | 3.0                  | 3.6                  | 3.2                  |
| Lead                                 | U                           | 2455       | mg/kg        | 0.50       | 38                   | 38                   | 41                   | 71                   | 39                   | 65                   | 79                   | 190                  | 19                   |
| Selenium                             | U                           | 2455       | mg/kg        | 0.25       | 1.4                  | 0.29                 | 0.26                 | 0.86                 | 0.25                 | < 0.25               | < 0.25               | 0.28                 | 0.40                 |
| Zinc                                 | U                           | 2455       | mg/kg        | 0.50       | 66                   | 69                   | 47                   | 52                   | 26                   | 81                   | 28                   | 120                  | 21                   |
| Aliphatic VPH >C5-C6                 | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7                 | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8                 | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C8 (Sum)           | N                           | 2780       | mg/kg        | 0.10       | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               | < 0.10               |
| Aliphatic VPH >C8-C10                | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10          | U                           | 2780       | mg/kg        | 0.25       | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12               | U                           | 2690       | mg/kg        | 2.00       | 5.2                  | 3.2                  | 3.6                  | 4.7                  | 3.3                  | 3.2                  | 3.3                  | 3.6                  | 4.2                  |
| Aliphatic EPH >C12-C16               | U                           | 2690       | mg/kg        | 1.00       | 3.7                  | 2.0                  | 1.2                  | 2.3                  | 2.0                  | 1.4                  | 1.3                  | 1.6                  | 3.0                  |
| Aliphatic EPH >C16-C21               | U                           | 2690       | mg/kg        | 2.00       | 2.4                  | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                | 2.4                  | < 2.0                |
| Aliphatic EPH >C21-C35               | U                           | 2690       | mg/kg        | 3.00       | 3.1                  | 5.0                  | 4.4                  | 5.1                  | 4.5                  | 3.9                  | 3.9                  | 5.3                  | < 3.0                |
| Aliphatic EPH >C35-C40               | N                           | 2690       | mg/kg        | 10.00      | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35         | U                           | 2690       | mg/kg        | 5.00       | 14                   | 11                   | 10                   | 14                   | 10                   | 8.9                  | 9.6                  | 13                   | 9.7                  |
| Total Aliphatic EPH >C10-C40         | N                           | 2690       | mg/kg        | 10.00      | 14                   | 11                   | 10                   | 14                   | 10                   | < 10                 | < 10                 | 13                   | < 10                 |
| Aromatic VPH >C5-C7                  | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8                  | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10                 | U                           | 2780       | mg/kg        | 0.05       | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| Total Aromatic VPH >C5-C10           | U                           | 2780       | mg/kg        | 0.25       | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               | < 0.25               |
| Aromatic EPH >C10-C12                | U                           | 2690       | mg/kg        | 1.00       | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                |

## Results - Soil

**Project: 23-176.01 Land at Johnson Drive**

|                                      |                             |            |              |            |             |             |             |             |             |             |             |             |             |
|--------------------------------------|-----------------------------|------------|--------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Client: Aviron Associates Ltd</b> | <b>Chemtest Job No.:</b>    |            |              |            | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    |
| <b>Quotation No.:</b>                | <b>Chemtest Sample ID.:</b> |            |              |            | 1681560     | 1681561     | 1681562     | 1681563     | 1681564     | 1681565     | 1681566     | 1681567     | 1681568     |
| <b>Order No.: 23-176.01</b>          | <b>Client Sample Ref.:</b>  |            |              |            | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           |
|                                      | <b>Sample Location:</b>     |            |              |            | HA1         | HA4         | TP1         | TP5         | TP6         | TP9         | WS1         | WS2         | WS2         |
|                                      | <b>Sample Type:</b>         |            |              |            | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        |
|                                      | <b>Top Depth (m):</b>       |            |              |            | 0.2         | 0.3         | 0.2         | 0.1         | 0.4         | 0.5         | 0.1         | 0.2         | 0.55        |
|                                      | <b>Date Sampled:</b>        |            |              |            | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 |
|                                      | <b>Asbestos Lab:</b>        |            |              |            | DURHAM      | DURHAM      | DURHAM      | DURHAM      | DURHAM      | DURHAM      | DURHAM      | DURHAM      | DURHAM      |
| <b>Determinand</b>                   | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |             |             |             |             |             |             |             |             |             |
| Aromatic EPH >C12-C16                | U                           | 2690       | mg/kg        | 1.00       | 2.5         | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| Aromatic EPH >C16-C21                | U                           | 2690       | mg/kg        | 2.00       | 110         | 9.1         | 3.7         | 6.6         | 3.1         | 3.9         | 4.3         | 5.6         | 2.9         |
| Aromatic EPH >C21-C35                | U                           | 2690       | mg/kg        | 2.00       | 370         | 92          | 34          | 96          | 23          | 20          | 33          | 41          | 10          |
| Aromatic EPH >C35-C40                | N                           | 2690       | mg/kg        | 1.00       | 160         | 41          | 3.8         | 82          | 3.6         | 2.0         | 2.6         | 3.3         | 2.0         |
| Total Aromatic EPH >C10-C35          | U                           | 2690       | mg/kg        | 5.00       | 480         | 100         | 38          | 100         | 26          | 24          | 37          | 47          | 13          |
| Total Aromatic EPH >C10-C40          | N                           | 2690       | mg/kg        | 10.00      | 650         | 140         | 42          | 180         | 30          | 26          | 40          | 50          | 15          |
| Total VPH >C5-C10                    | U                           | 2780       | mg/kg        | 0.50       | < 0.50      | < 0.50      | < 0.50      | < 0.50      | < 0.50      | < 0.50      | < 0.50      | < 0.50      | < 0.50      |
| Total EPH >C10-C35                   | U                           | 2690       | mg/kg        | 10.00      | 500         | 110         | 48          | 120         | 36          | 33          | 47          | 60          | 23          |
| Total EPH >C10-C40                   | N                           | 2690       | mg/kg        | 10.00      | 660         | 150         | 52          | 200         | 40          | 35          | 50          | 63          | 25          |
| Organic Matter                       | U                           | 2625       | %            | 0.40       | 14          | 3.7         | 2.3         | 5.2         | 3.6         | 2.0         | 1.7         | 2.8         | 0.49        |
| Naphthalene                          | U                           | 2700       | mg/kg        | 0.10       | 0.60        | 0.63        | < 0.10      | 0.90        | < 0.10      | 0.98        | < 0.10      | 1.4         | < 0.10      |
| Acenaphthylene                       | U                           | 2700       | mg/kg        | 0.10       | 0.97        | 0.37        | < 0.10      | 0.41        | < 0.10      | 0.26        | < 0.10      | 0.30        | < 0.10      |
| Acenaphthene                         | U                           | 2700       | mg/kg        | 0.10       | 0.49        | 0.17        | < 0.10      | 0.29        | < 0.10      | 0.14        | < 0.10      | 0.11        | < 0.10      |
| Fluorene                             | U                           | 2700       | mg/kg        | 0.10       | 0.28        | < 0.10      | < 0.10      | 0.13        | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      |
| Phenanthrene                         | U                           | 2700       | mg/kg        | 0.10       | 5.3         | 0.63        | < 0.10      | 1.1         | < 0.10      | 0.13        | < 0.10      | 0.18        | < 0.10      |
| Anthracene                           | U                           | 2700       | mg/kg        | 0.10       | 1.9         | 0.33        | < 0.10      | 0.53        | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      |
| Fluoranthene                         | U                           | 2700       | mg/kg        | 0.10       | 15          | 2.4         | < 0.10      | 3.5         | < 0.10      | 0.28        | < 0.10      | 0.45        | < 0.10      |
| Pyrene                               | U                           | 2700       | mg/kg        | 0.10       | 13          | 2.6         | < 0.10      | 3.2         | < 0.10      | 0.40        | < 0.10      | 0.53        | < 0.10      |
| Benzo[a]anthracene                   | U                           | 2700       | mg/kg        | 0.10       | 8.3         | 1.6         | < 0.10      | 2.6         | < 0.10      | 1.3         | < 0.10      | 0.50        | < 0.10      |
| Chrysene                             | U                           | 2700       | mg/kg        | 0.10       | 8.7         | 1.6         | < 0.10      | 2.5         | < 0.10      | 0.46        | < 0.10      | 0.46        | < 0.10      |
| Benzo[b]fluoranthene                 | U                           | 2700       | mg/kg        | 0.10       | 11          | 3.2         | < 0.10      | 3.6         | < 0.10      | 0.44        | < 0.10      | 0.31        | < 0.10      |
| Benzo[k]fluoranthene                 | U                           | 2700       | mg/kg        | 0.10       | 3.9         | 1.2         | < 0.10      | 1.5         | < 0.10      | 0.16        | < 0.10      | < 0.10      | < 0.10      |
| Benzo[a]pyrene                       | U                           | 2700       | mg/kg        | 0.10       | 7.5         | 3.0         | < 0.10      | 3.3         | < 0.10      | 0.75        | < 0.10      | 0.79        | < 0.10      |
| Indeno(1,2,3-c,d)Pyrene              | U                           | 2700       | mg/kg        | 0.10       | 6.7         | 2.1         | < 0.10      | 2.0         | < 0.10      | 0.12        | < 0.10      | 0.21        | < 0.10      |
| Dibenz(a,h)Anthracene                | U                           | 2700       | mg/kg        | 0.10       | 1.8         | 0.59        | < 0.10      | 0.68        | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      |
| Benzo[g,h,i]perylene                 | U                           | 2700       | mg/kg        | 0.10       | 6.3         | 2.2         | < 0.10      | 2.4         | < 0.10      | 0.27        | < 0.10      | 0.34        | < 0.10      |
| Total Of 16 PAH's                    | U                           | 2700       | mg/kg        | 2.0        | 92          | 23          | < 2.0       | 29          | < 2.0       | 5.7         | < 2.0       | 5.6         | < 2.0       |
| Benzene                              | U                           | 2760       | µg/kg        | 1.0        | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| Toluene                              | U                           | 2760       | µg/kg        | 1.0        | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| Ethylbenzene                         | U                           | 2760       | µg/kg        | 1.0        | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| m & p-Xylene                         | U                           | 2760       | µg/kg        | 1.0        | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| o-Xylene                             | U                           | 2760       | µg/kg        | 1.0        | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| Methyl Tert-Butyl Ether              | U                           | 2760       | µg/kg        | 1.0        | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       | < 1.0       |
| Total Phenols                        | U                           | 2920       | mg/kg        | 0.10       | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      | < 0.10      |

## Results - Soil

**Project: 23-176.01 Land at Johnson Drive**

|                                      |                             |            |              |            |             |                      |             |                      |             |                      |                      |                      |
|--------------------------------------|-----------------------------|------------|--------------|------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|----------------------|----------------------|
| <b>Client: Aviron Associates Ltd</b> | <b>Chemtest Job No.:</b>    |            |              |            | 23-25721    | 23-25721             | 23-25721    | 23-25721             | 23-25721    | 23-25721             | 23-25721             | 23-25721             |
| <b>Quotation No.:</b>                | <b>Chemtest Sample ID.:</b> |            |              |            | 1681569     | 1681570              | 1681571     | 1681572              | 1681573     | 1681574              | 1681575              | 1681576              |
| <b>Order No.: 23-176.01</b>          | <b>Client Sample Ref.:</b>  |            |              |            | 10          | 11                   | 12          | 1                    | 2           | 3                    | 4                    | 5                    |
|                                      | <b>Sample Location:</b>     |            |              |            | WS2         | WS3                  | WS3         | WS4                  | WS4         | WS5                  | WS5                  | WS6                  |
|                                      | <b>Sample Type:</b>         |            |              |            | SOIL        | SOIL                 | SOIL        | SOIL                 | SOIL        | SOIL                 | SOIL                 | SOIL                 |
|                                      | <b>Top Depth (m):</b>       |            |              |            | 2.0         | 0.7                  | 3.0         | 0.3                  | 2.0         | 0.2                  | 0.9                  | 0.2                  |
|                                      | <b>Date Sampled:</b>        |            |              |            | 27-Jul-2023 | 27-Jul-2023          | 27-Jul-2023 | 27-Jul-2023          | 27-Jul-2023 | 27-Jul-2023          | 27-Jul-2023          | 27-Jul-2023          |
|                                      | <b>Asbestos Lab:</b>        |            |              |            |             | DURHAM               |             | DURHAM               |             | DURHAM               | DURHAM               | DURHAM               |
| <b>Determinand</b>                   | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |             |                      |             |                      |             |                      |                      |                      |
| ACM Type                             | U                           | 2192       |              | N/A        |             | -                    |             | -                    |             | -                    | -                    | -                    |
| Asbestos Identification              | U                           | 2192       |              | N/A        |             | No Asbestos Detected |             | No Asbestos Detected |             | No Asbestos Detected | No Asbestos Detected | No Asbestos Detected |
| Moisture                             | N                           | 2030       | %            | 0.020      | 10          | 15                   | 16          | 11                   | 13          | 7.1                  | 13                   | 11                   |
| pH                                   | U                           | 2010       |              | 4.0        | 5.7         | 6.2                  | 5.1         | 5.7                  | 6.2         | 6.4                  | 5.6                  | 6.7                  |
| Boron (Hot Water Soluble)            | U                           | 2120       | mg/kg        | 0.40       |             | < 0.40               |             | < 0.40               |             | < 0.40               | < 0.40               | < 0.40               |
| Sulphate (2:1 Water Soluble) as SO4  | U                           | 2120       | g/l          | 0.010      | < 0.010     | < 0.010              | < 0.010     | < 0.010              | < 0.010     | < 0.010              | < 0.010              | < 0.010              |
| Total Sulphur                        | U                           | 2175       | %            | 0.010      | 0.014       | < 0.010              | 0.016       | 0.029                | < 0.010     | 0.014                | 0.025                | 0.025                |
| Cyanide (Total)                      | U                           | 2300       | mg/kg        | 0.50       |             | < 0.50               |             | < 0.50               |             | < 0.50               | < 0.50               | < 0.50               |
| Sulphate (Total)                     | U                           | 2430       | %            | 0.010      | 0.044       | 0.020                | 0.058       | 0.056                | 0.046       | 0.045                | 0.012                | 0.058                |
| Arsenic                              | U                           | 2455       | mg/kg        | 0.5        |             | 9.1                  |             | 4.2                  |             | 3.7                  | 9.5                  | 7.1                  |
| Barium                               | U                           | 2455       | mg/kg        | 0          |             | 32                   |             | 21                   |             | 26                   | 9                    | 39                   |
| Cadmium                              | U                           | 2455       | mg/kg        | 0.10       |             | < 0.10               |             | < 0.10               |             | < 0.10               | < 0.10               | 0.22                 |
| Chromium                             | U                           | 2455       | mg/kg        | 0.5        |             | 38                   |             | 6.4                  |             | 6.2                  | 13                   | 8.1                  |
| Copper                               | U                           | 2455       | mg/kg        | 0.50       |             | 15                   |             | 4.7                  |             | 4.0                  | 6.4                  | 8.7                  |
| Mercury                              | U                           | 2455       | mg/kg        | 0.05       |             | 0.05                 |             | 0.05                 |             | 0.05                 | < 0.05               | 0.16                 |
| Nickel                               | U                           | 2455       | mg/kg        | 0.50       |             | 13                   |             | 2.5                  |             | 2.5                  | 1.8                  | 4.2                  |
| Lead                                 | U                           | 2455       | mg/kg        | 0.50       |             | 11                   |             | 25                   |             | 24                   | 8.6                  | 79                   |
| Selenium                             | U                           | 2455       | mg/kg        | 0.25       |             | 0.60                 |             | < 0.25               |             | < 0.25               | 0.35                 | 0.25                 |
| Zinc                                 | U                           | 2455       | mg/kg        | 0.50       |             | 24                   |             | 19                   |             | 21                   | 10                   | 110                  |
| Aliphatic VPH >C5-C6                 | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C7                 | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C7-C8                 | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Aliphatic VPH >C6-C8 (Sum)           | N                           | 2780       | mg/kg        | 0.10       |             | < 0.10               |             | < 0.10               |             | < 0.10               | < 0.10               | < 0.10               |
| Aliphatic VPH >C8-C10                | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Total Aliphatic VPH >C5-C10          | U                           | 2780       | mg/kg        | 0.25       |             | < 0.25               |             | < 0.25               |             | < 0.25               | < 0.25               | < 0.25               |
| Aliphatic EPH >C10-C12               | U                           | 2690       | mg/kg        | 2.00       |             | 3.1                  |             | < 2.0                |             | 3.1                  | 3.4                  | 2.2                  |
| Aliphatic EPH >C12-C16               | U                           | 2690       | mg/kg        | 1.00       |             | 1.8                  |             | < 1.0                |             | 1.1                  | 1.3                  | 1.5                  |
| Aliphatic EPH >C16-C21               | U                           | 2690       | mg/kg        | 2.00       |             | < 2.0                |             | < 2.0                |             | < 2.0                | < 2.0                | < 2.0                |
| Aliphatic EPH >C21-C35               | U                           | 2690       | mg/kg        | 3.00       |             | < 3.0                |             | 8.9                  |             | 5.2                  | < 3.0                | 7.6                  |
| Aliphatic EPH >C35-C40               | N                           | 2690       | mg/kg        | 10.00      |             | < 10                 |             | < 10                 |             | < 10                 | < 10                 | < 10                 |
| Total Aliphatic EPH >C10-C35         | U                           | 2690       | mg/kg        | 5.00       |             | 5.8                  |             | 12                   |             | 9.4                  | < 5.0                | 13                   |
| Total Aliphatic EPH >C10-C40         | N                           | 2690       | mg/kg        | 10.00      |             | < 10                 |             | 12                   |             | < 10                 | < 10                 | 13                   |
| Aromatic VPH >C5-C7                  | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C7-C8                  | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Aromatic VPH >C8-C10                 | U                           | 2780       | mg/kg        | 0.05       |             | < 0.05               |             | < 0.05               |             | < 0.05               | < 0.05               | < 0.05               |
| Total Aromatic VPH >C5-C10           | U                           | 2780       | mg/kg        | 0.25       |             | < 0.25               |             | < 0.25               |             | < 0.25               | < 0.25               | < 0.25               |
| Aromatic EPH >C10-C12                | U                           | 2690       | mg/kg        | 1.00       |             | < 1.0                |             | < 1.0                |             | < 1.0                | < 1.0                | < 1.0                |

## Results - Soil

**Project: 23-176.01 Land at Johnson Drive**

|                                      |                             |            |              |            |             |             |             |             |             |             |             |             |
|--------------------------------------|-----------------------------|------------|--------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Client: Aviron Associates Ltd</b> | <b>Chemtest Job No.:</b>    |            |              |            | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    | 23-25721    |
| <b>Quotation No.:</b>                | <b>Chemtest Sample ID.:</b> |            |              |            | 1681569     | 1681570     | 1681571     | 1681572     | 1681573     | 1681574     | 1681575     | 1681576     |
| <b>Order No.: 23-176.01</b>          | <b>Client Sample Ref.:</b>  |            |              |            | 10          | 11          | 12          | 1           | 2           | 3           | 4           | 5           |
|                                      | <b>Sample Location:</b>     |            |              |            | WS2         | WS3         | WS3         | WS4         | WS4         | WS5         | WS5         | WS6         |
|                                      | <b>Sample Type:</b>         |            |              |            | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        | SOIL        |
|                                      | <b>Top Depth (m):</b>       |            |              |            | 2.0         | 0.7         | 3.0         | 0.3         | 2.0         | 0.2         | 0.9         | 0.2         |
|                                      | <b>Date Sampled:</b>        |            |              |            | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 | 27-Jul-2023 |
|                                      | <b>Asbestos Lab:</b>        |            |              |            |             | DURHAM      |             | DURHAM      |             | DURHAM      | DURHAM      | DURHAM      |
| <b>Determinand</b>                   | <b>Accred.</b>              | <b>SOP</b> | <b>Units</b> | <b>LOD</b> |             |             |             |             |             |             |             |             |
| Aromatic EPH >C12-C16                | U                           | 2690       | mg/kg        | 1.00       |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| Aromatic EPH >C16-C21                | U                           | 2690       | mg/kg        | 2.00       |             | 3.4         |             | 4.5         |             | < 2.0       | 2.5         | 7.6         |
| Aromatic EPH >C21-C35                | U                           | 2690       | mg/kg        | 2.00       |             | 4.7         |             | 47          |             | 21          | 3.1         | 58          |
| Aromatic EPH >C35-C40                | N                           | 2690       | mg/kg        | 1.00       |             | < 1.0       |             | 3.3         |             | 3.2         | 2.4         | 4.8         |
| Total Aromatic EPH >C10-C35          | U                           | 2690       | mg/kg        | 5.00       |             | 8.1         |             | 51          |             | 22          | 5.6         | 65          |
| Total Aromatic EPH >C10-C40          | N                           | 2690       | mg/kg        | 10.00      |             | < 10        |             | 55          |             | 25          | < 10        | 70          |
| Total VPH >C5-C10                    | U                           | 2780       | mg/kg        | 0.50       |             | < 0.50      |             | < 0.50      |             | < 0.50      | < 0.50      | < 0.50      |
| Total EPH >C10-C35                   | U                           | 2690       | mg/kg        | 10.00      |             | 14          |             | 63          |             | 32          | 10          | 78          |
| Total EPH >C10-C40                   | N                           | 2690       | mg/kg        | 10.00      |             | 14          |             | 67          |             | 35          | 13          | 83          |
| Organic Matter                       | U                           | 2625       | %            | 0.40       |             | 0.45        |             | 4.0         |             | 1.7         | < 0.40      | 2.3         |
| Naphthalene                          | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Acenaphthylene                       | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Acenaphthene                         | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Fluorene                             | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Phenanthrene                         | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.24        |
| Anthracene                           | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.11        |
| Fluoranthene                         | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.69        |
| Pyrene                               | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.96        |
| Benzo[a]anthracene                   | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 1.8         |
| Chrysene                             | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.71        |
| Benzo[b]fluoranthene                 | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.87        |
| Benzo[k]fluoranthene                 | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.38        |
| Benzo[a]pyrene                       | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | 0.56        |
| Indeno(1,2,3-c,d)Pyrene              | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Dibenz(a,h)Anthracene                | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Benzo[g,h,i]perylene                 | U                           | 2700       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |
| Total Of 16 PAH's                    | U                           | 2700       | mg/kg        | 2.0        |             | < 2.0       |             | < 2.0       |             | < 2.0       | < 2.0       | 6.3         |
| Benzene                              | U                           | 2760       | µg/kg        | 1.0        |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| Toluene                              | U                           | 2760       | µg/kg        | 1.0        |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| Ethylbenzene                         | U                           | 2760       | µg/kg        | 1.0        |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| m & p-Xylene                         | U                           | 2760       | µg/kg        | 1.0        |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| o-Xylene                             | U                           | 2760       | µg/kg        | 1.0        |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| Methyl Tert-Butyl Ether              | U                           | 2760       | µg/kg        | 1.0        |             | < 1.0       |             | < 1.0       |             | < 1.0       | < 1.0       | < 1.0       |
| Total Phenols                        | U                           | 2920       | mg/kg        | 0.10       |             | < 0.10      |             | < 0.10      |             | < 0.10      | < 0.10      | < 0.10      |

## Results - 2 Stage WAC

Project: 23-176.01 Land at Johnson Drive

| Chemtest Job No: 23-25721<br>Chemtest Sample ID: 1687608<br>Sample Ref:<br>Sample ID: Composite Sample<br>Sample Location: HA1,HA2,TP1,TP5<br>Top Depth(m): 0.10<br>Bottom Depth(m): 0.30<br>Sampling Date: 27-Jul-2023 |      |         |           |           |           |                       | Landfill Waste Acceptance Criteria                                         |                                                                |                          |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------|-----------|-----------|-----------|-----------------------|----------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------|-------------|
|                                                                                                                                                                                                                         |      |         |           |           |           |                       | Inert Waste Landfill                                                       | Stable, Non-reactive hazardous waste in non-hazardous Landfill | Hazardous Waste Landfill |             |
| Determinand                                                                                                                                                                                                             | SOP  | Accred. | Units     |           |           |                       |                                                                            |                                                                |                          |             |
| Total Organic Carbon                                                                                                                                                                                                    | 2625 | U       | %         |           |           |                       | 0.88                                                                       | 3                                                              | 5                        | 6           |
| Loss On Ignition                                                                                                                                                                                                        | 2610 | U       | %         |           |           |                       | 5.1                                                                        | --                                                             | --                       | 10          |
| Total BTEX                                                                                                                                                                                                              | 2760 | U       | mg/kg     |           |           |                       | [C] < 0.010                                                                | 6                                                              | --                       | --          |
| Total PCBs (7 Congeners)                                                                                                                                                                                                | 2815 | U       | mg/kg     |           |           |                       | < 0.10                                                                     | 1                                                              | --                       | --          |
| TPH Total WAC                                                                                                                                                                                                           | 2670 | U       | mg/kg     |           |           |                       | [C] 340                                                                    | 500                                                            | --                       | --          |
| Total (Of 17) PAH's                                                                                                                                                                                                     | 2700 | N       | mg/kg     |           |           |                       | 43                                                                         | 100                                                            | --                       | --          |
| pH                                                                                                                                                                                                                      | 2010 | U       |           |           |           |                       | 8.4                                                                        | --                                                             | >6                       | --          |
| Acid Neutralisation Capacity                                                                                                                                                                                            | 2015 | N       | mol/kg    |           |           |                       | 0.013                                                                      | --                                                             | To evaluate              | To evaluate |
| Eluate Analysis                                                                                                                                                                                                         |      |         | 2:1 mg/l  | 8:1 mg/l  | 2:1 mg/kg | Cumulative mg/kg 10:1 | Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg |                                                                |                          |             |
| Arsenic                                                                                                                                                                                                                 | 1455 | U       | 0.0010    | 0.0010    | 0.0019    | 0.0095                | 0.5                                                                        | 2                                                              | 25                       |             |
| Barium                                                                                                                                                                                                                  | 1455 | U       | 0.077     | 0.071     | 0.15      | 0.72                  | 20                                                                         | 100                                                            | 300                      |             |
| Cadmium                                                                                                                                                                                                                 | 1455 | U       | < 0.00011 | < 0.00011 | < 0.00011 | < 0.00011             | 0.04                                                                       | 1                                                              | 5                        |             |
| Chromium                                                                                                                                                                                                                | 1455 | U       | < 0.0005  | < 0.0005  | < 0.0005  | < 0.0005              | 0.5                                                                        | 10                                                             | 70                       |             |
| Copper                                                                                                                                                                                                                  | 1455 | U       | 0.0045    | 0.0032    | 0.0090    | 0.0077                | 2                                                                          | 50                                                             | 100                      |             |
| Mercury                                                                                                                                                                                                                 | 1455 | U       | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005             | 0.01                                                                       | 0.2                                                            | 2                        |             |
| Molybdenum                                                                                                                                                                                                              | 1455 | U       | 0.0007    | 0.0005    | 0.0013    | 0.0048                | 0.5                                                                        | 10                                                             | 30                       |             |
| Nickel                                                                                                                                                                                                                  | 1455 | U       | < 0.0005  | < 0.0005  | < 0.0005  | < 0.0005              | 0.4                                                                        | 10                                                             | 40                       |             |
| Lead                                                                                                                                                                                                                    | 1455 | U       | < 0.0005  | < 0.0005  | < 0.0005  | < 0.0005              | 0.5                                                                        | 10                                                             | 50                       |             |
| Antimony                                                                                                                                                                                                                | 1455 | U       | 0.0005    | < 0.0005  | 0.0011    | 0.0009                | 0.06                                                                       | 0.7                                                            | 5                        |             |
| Selenium                                                                                                                                                                                                                | 1455 | U       | 0.0008    | 0.0008    | 0.0017    | 0.0081                | 0.1                                                                        | 0.5                                                            | 7                        |             |
| Zinc                                                                                                                                                                                                                    | 1455 | U       | 0.013     | 0.007     | 0.025     | 0.075                 | 4                                                                          | 50                                                             | 200                      |             |
| Chloride                                                                                                                                                                                                                | 1220 | U       | 27        | 27        | 54        | 270                   | 800                                                                        | 15000                                                          | 25000                    |             |
| Fluoride                                                                                                                                                                                                                | 1220 | U       | 0.24      | 0.22      | < 1.0     | 2.2                   | 10                                                                         | 150                                                            | 500                      |             |
| Sulphate                                                                                                                                                                                                                | 1220 | U       | 19        | 19        | 38        | 190                   | 1000                                                                       | 20000                                                          | 50000                    |             |
| Total Dissolved Solids                                                                                                                                                                                                  | 1020 | N       | 370       | 370       | 740       | 3700                  | 4000                                                                       | 60000                                                          | 100000                   |             |
| Phenol Index                                                                                                                                                                                                            | 1920 | U       | < 0.030   | < 0.030   | < 0.30    | < 0.50                | 1                                                                          | -                                                              | -                        |             |
| Dissolved Organic Carbon                                                                                                                                                                                                | 1610 | U       | 3.3       | 3.8       | < 50      | < 50                  | 500                                                                        | 800                                                            | 1000                     |             |

| Solid Information           |       |
|-----------------------------|-------|
| Dry mass of test portion/kg | 0.175 |
| Moisture (%)                | 9.1   |

| Leachate Test Information           |       |
|-------------------------------------|-------|
| Leachant volume 1st extract/l       | 0.333 |
| Leachant volume 2nd extract/l       | 1.400 |
| Eluant recovered from 1st extract/l | 0.298 |

### Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

**Deviations**

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

| Sample: | Sample Ref: | Sample ID:       | Sample Location:    | Sampled Date: | Deviation Code(s): | Containers Received: |
|---------|-------------|------------------|---------------------|---------------|--------------------|----------------------|
| 1687608 |             | Composite Sample | HA1,HA2,TP1,T<br>P5 | 27-Jul-2023   | C                  | Plastic Bag          |

## Test Methods

| SOP  | Title                                                               | Parameters included                                                                                                                                                                                                                                           | Method summary                                                                                                                       |
|------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1020 | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters  | Electrical Conductivity and Total Dissolved Solids (TDS) in Waters                                                                                                                                                                                            | Conductivity Meter                                                                                                                   |
| 1220 | Anions, Alkalinity & Ammonium in Waters                             | Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium                                                                                                                                              | Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.                                                               |
| 1455 | Metals in Waters by ICP-MS                                          | Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc                                                                                | Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).                     |
| 1610 | Total/Dissolved Organic Carbon in Waters                            | Organic Carbon                                                                                                                                                                                                                                                | TOC Analyser using Catalytic Oxidation                                                                                               |
| 1920 | Phenols in Waters by HPLC                                           | Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.                                                                                                                                                   | Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.                                      |
| 2010 | pH Value of Soils                                                   | pH                                                                                                                                                                                                                                                            | pH Meter                                                                                                                             |
| 2015 | Acid Neutralisation Capacity                                        | Acid Reserve                                                                                                                                                                                                                                                  | Titration                                                                                                                            |
| 2030 | Moisture and Stone Content of Soils(Requirement of MCERTS)          | Moisture content                                                                                                                                                                                                                                              | Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.                                 |
| 2040 | Soil Description(Requirement of MCERTS)                             | Soil description                                                                                                                                                                                                                                              | As received soil is described based upon BS5930                                                                                      |
| 2120 | Water Soluble Boron, Sulphate, Magnesium & Chromium                 | Boron; Sulphate; Magnesium; Chromium                                                                                                                                                                                                                          | Aqueous extraction / ICP-OES                                                                                                         |
| 2175 | Total Sulphur in Soils                                              | Total Sulphur                                                                                                                                                                                                                                                 | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.                                           |
| 2192 | Asbestos                                                            | Asbestos                                                                                                                                                                                                                                                      | Polarised light microscopy / Gravimetry                                                                                              |
| 2300 | Cyanides & Thiocyanate in Soils                                     | Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate                                                                                                                                                                               | Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.                                  |
| 2430 | Total Sulphate in soils                                             | Total Sulphate                                                                                                                                                                                                                                                | Acid digestion followed by determination of sulphate in extract by ICP-OES.                                                          |
| 2455 | Acid Soluble Metals in Soils                                        | Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc                                                                                                      | Acid digestion followed by determination of metals in extract by ICP-MS.                                                             |
| 2610 | Loss on Ignition                                                    | loss on ignition (LOI)                                                                                                                                                                                                                                        | Determination of the proportion by mass that is lost from a soil by ignition at 550°C.                                               |
| 2625 | Total Organic Carbon in Soils                                       | Total organic Carbon (TOC)                                                                                                                                                                                                                                    | Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.                                           |
| 2670 | Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID               | TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40                                                                                                                                                                                | Dichloromethane extraction / GC-FID                                                                                                  |
| 2690 | EPH A/A Split                                                       | Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40                                                                                                                                 | Acetone/Heptane extraction / GCxGC FID detection                                                                                     |
| 2700 | Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID | Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene | Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds) |

## Test Methods

| SOP  | Title                                                            | Parameters included                                                                                                                               | Method summary                                                                                                                                             |
|------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2760 | Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS    | Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule              | Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds. |
| 2780 | VPH A/A Split                                                    | Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8–C10<br>Aromatics: >C5–C7,>C7–C8,>C8–C10                                                                     | Water extraction / Headspace GCxGC FID detection                                                                                                           |
| 2815 | Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS | ICES7 PCB congeners                                                                                                                               | Acetone/Hexane extraction / GC-MS                                                                                                                          |
| 2920 | Phenols in Soils by HPLC                                         | Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded. | 60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.                                                   |
| 640  | Characterisation of Waste (Leaching C10)                         | Waste material including soil, sludges and granular waste                                                                                         | ComplianceTest for Leaching of Granular Waste Material and Sludge                                                                                          |
| 650  | Characterisation of Waste (Leaching WAC)                         | Waste material including soil, sludges and granular waste                                                                                         | ComplianceTest for Leaching of Granular Waste Material and Sludge                                                                                          |

## **Report Information**

---

### **Key**

|     |                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------|
| U   | UKAS accredited                                                                                               |
| M   | MCERTS and UKAS accredited                                                                                    |
| N   | Unaccredited                                                                                                  |
| S   | This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis     |
| SN  | This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis |
| T   | This analysis has been subcontracted to an unaccredited laboratory                                            |
| I/S | Insufficient Sample                                                                                           |
| U/S | Unsuitable Sample                                                                                             |
| N/E | not evaluated                                                                                                 |
| <   | "less than"                                                                                                   |
| >   | "greater than"                                                                                                |
| SOP | Standard operating procedure                                                                                  |
| LOD | Limit of detection                                                                                            |

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

---

### **Sample Deviation Codes**

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

---

### **Sample Retention and Disposal**

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



**Residential with Homegrown Produce  
Soil Screening Values  
Private Gardens**

| Determinant                                            | 1% SOM (mg/kg) | 2.5% SOM (mg/kg) | 6% SOM (mg/kg) | Criteria      | Determinant                         | 1% SOM (mg/kg) | 2.5% SOM (mg/kg) | 6% SOM (mg/kg) | Criteria             |
|--------------------------------------------------------|----------------|------------------|----------------|---------------|-------------------------------------|----------------|------------------|----------------|----------------------|
| <b>METALS, SEMI-METALS, INORGANICS + PAH (SUITE 1)</b> |                |                  |                |               | Pyrene                              | 620            | 1200             | 2000           | LQM S4UL             |
| Arsenic                                                | 37             | 37               | 37             | C4SL/LQM S4UL | Phenols                             | 78             | 0.98             | 1.1            | LQM S4UL             |
| Boron                                                  | 290            | 290              | 290            | LQM S4UL      | <b>TOTAL PETROLEUM HYDROCARBONS</b> |                |                  |                |                      |
| Cadmium                                                | 11             | 11               | 11             | LQM S4UL      | Benzene                             | 0.087          | 0.17             | 0.37           | LQM S4UL             |
| Chromium III                                           | 910            | 910              | 910            | LQM S4UL      | Toluene                             | 130            | 290              | 660            | LQM S4UL             |
| Chromium IV                                            | 6              | 6                | 6              | LQM S4UL      | Ethylbenzene                        | 47             | 110              | 260            | LQM S4UL             |
| Copper                                                 | 2,400          | 2,400            | 2,400          | LQM S4UL      | o-xylene                            | 60             | 140              | 330            | LQM S4UL             |
| Mercury                                                | 1.2            | 1.2              | 1.2            | LQM S4UL      | m-xylene                            | 59             | 140              | 320            | LQM S4UL             |
| Nickel                                                 | 180            | 180              | 180            | LQM S4UL      | p-xylene                            | 56             | 130              | 310            | LQM S4UL             |
| Lead                                                   | 200            | 200              | 200            | LQM S4UL      | Aliphatic EC 5-6                    | 42             | 78               | 160            | LQM S4UL             |
| Selenium                                               | 250            | 250              | 250            | LQM S4UL      | Aliphatic EC >6-8                   | 100            | 230              | 530            | LQM S4UL             |
| Zinc                                                   | 3,700          | 3,700            | 3,700          | LQM S4UL      | Aliphatic EC >8-10                  | 27             | 65               | 150            | LQM S4UL             |
| Free Cyanide                                           | 34             | 34               | 34             | ATRISK        | Aliphatic EC >10-12                 | 130            | 330              | 760            | LQM S4UL             |
| Acenaphthene                                           | 210            | 510              | 1100           | LQM S4UL      | Aliphatic EC >12-16                 | 1,100          | 2400             | 4300           | LQM S4UL             |
| Acenaphthylene                                         | 170            | 420              | 920            | LQM S4UL      | Aliphatic EC >16-35                 | 65,000         | 92000            | 110000         | LQM S4UL             |
| Anthracene                                             | 2,400          | 5400             | 11000          | LQM S4UL      | Aliphatic EC >35-44                 | 65,000         | 92000            | 110000         | LQM S4UL             |
| Benzo(a)anthracene                                     | 7.2            | 11               | 13             | LQM S4UL      | Aromatic EC 5-7 (benzene)           | 70             | 140              | 300            | LQM S4UL             |
| Benzo(a)pyrene                                         | 2.2            | 2.7              | 3              | LQM S4UL      | Aromatic EC >7-8 (toluene)          | 130            | 290              | 660            | LQM S4UL             |
| Benzo(b)fluoranthene                                   | 2.6            | 3.3              | 3.7            | LQM S4UL      | Aromatic EC >8-10                   | 34             | 83               | 190            | LQM S4UL             |
| Benzo(ghi)perylene                                     | 320            | 340              | 350            | LQM S4UL      | Aromatic EC >10-12                  | 74             | 180              | 380            | LQM S4UL             |
| Benzo(k)fluoranthene                                   | 77             | 93               | 100            | LQM S4UL      | Aromatic EC >12-16                  | 140            | 330              | 660            | LQM S4UL             |
| Chrysene                                               | 15             | 22               | 27             | LQM S4UL      | Aromatic EC >16-21                  | 260            | 540              | 930            | LQM S4UL             |
| Dibenz(ah)anthracene                                   | 0.24           | 0.28             | 0.3            | LQM S4UL      | Aromatic EC >21-35                  | 1,100          | 1500             | 1700           | LQM S4UL             |
| Fluoranthene                                           | 280            | 560              | 890            | LQM S4UL      | Aromatic EC >35-44                  | 1,100          | 1500             | 1700           | LQM S4UL             |
| Fluorene                                               | 170            | 400              | 860            | LQM S4UL      | Aromatic EC >44-70                  | 1,600          | 1800             | 1900           | LQM S4UL             |
| Indeno(123-cd)pyrene                                   | 27             | 36               | 41             | LQM S4UL      | <b>ASBESTOS</b>                     |                |                  |                |                      |
| Naphthalene                                            | 2.3            | 5.6              | 13             | LQM S4UL      | None Detectable                     |                |                  |                | Aviron Adopted Value |
| Phenanthrene                                           | 95             | 220              | 440            | LQM S4UL      |                                     |                |                  |                |                      |

## **Appendix**

### **IV      Soil Geotechnical Results**



# Laboratory Report



## Contract Number: 67923

Client Ref: **23-176.01**

Client PO: **23-176.01**

Date Received: **31-07-2023**

Date Completed: **07-08-2023**

Report Date: **07-08-2023**

Client: **Aviron Associates LTD**  
**58 Herschel St, Slough**  
**SL1 1PG**

This report has been checked and approved by:

*B. Evans*  
**Brendan Evans**  
Office Administrator

Contract Title: **Land at Johnson Drive, Finchampstead, RG40 3NW**

For the attention of: **Orlando**

| Test Description                                                                        | Qty |
|-----------------------------------------------------------------------------------------|-----|
| <b>Moisture Content</b><br>BS 1377:1990 - Part 2 : 3.2 - * UKAS                         | 12  |
| <b>4 Point Liquid &amp; Plastic Limit</b><br>BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS | 12  |
| <b>PSD Wet Sieve method</b><br>BS 1377:1990 - Part 2 : 9.2 - * UKAS                     | 4   |
| <b>Disposal of samples for job</b>                                                      | 1   |

**Notes:** Observations and Interpretations are outside the UKAS Accreditation

\* - denotes test included in laboratory scope of accreditation

# - denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

#### Approved Signatories:

Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)  
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)  
Wayne Honey (Human Resources/ Health and Safety Manager)





**PARTICLE SIZE DISTRIBUTION  
BS 1377 Part 2:1990  
Wet Sieve, Clause 9.2**

Contract Number 67923

Borehole/Pit No. WS4

Project Name Land at Johnson Drive, Finchampstead, RG40 3NW

Sample No.

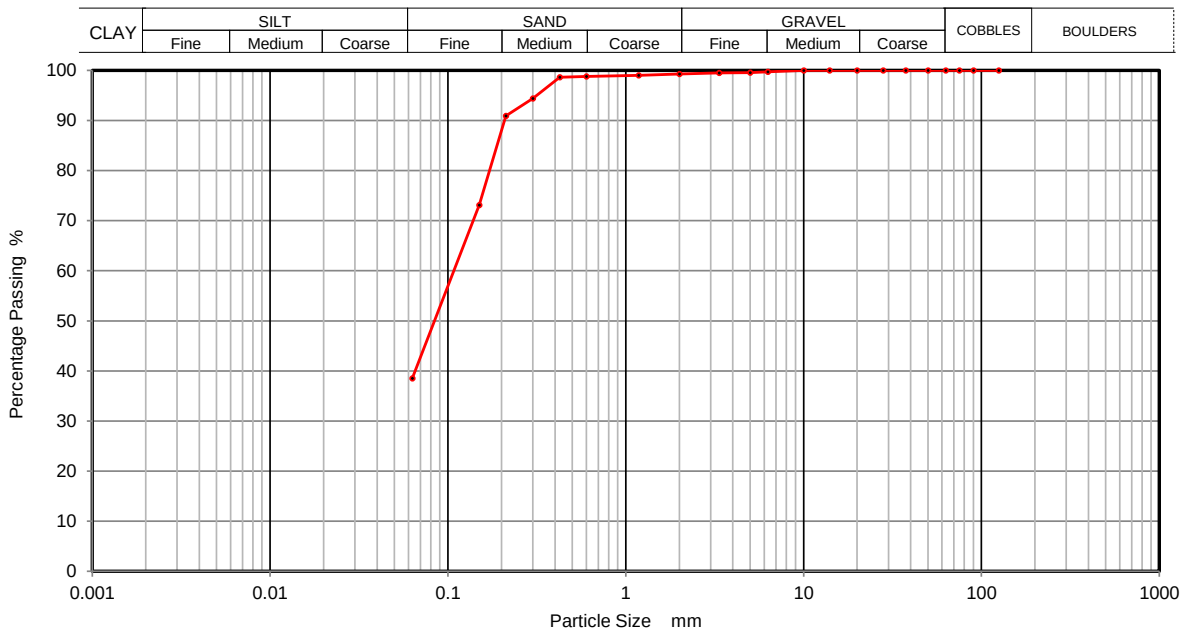
Soil Description Brown slightly gravelly fine to coarse sandy SILT/CLAY

Depth Top 3.00

Depth Base

Date Tested 03/08/2023

Sample Type D



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 100       |                  |           |
| 63               | 100       |                  |           |
| 50               | 100       |                  |           |
| 37.5             | 100       |                  |           |
| 28               | 100       |                  |           |
| 20               | 100       |                  |           |
| 14               | 100       |                  |           |
| 10               | 100       |                  |           |
| 6.3              | 100       |                  |           |
| 5                | 100       |                  |           |
| 3.35             | 99        |                  |           |
| 2                | 99        |                  |           |
| 1.18             | 99        |                  |           |
| 0.6              | 99        |                  |           |
| 0.425            | 99        |                  |           |
| 0.3              | 94        |                  |           |
| 0.212            | 91        |                  |           |
| 0.15             | 73        |                  |           |
| 0.063            | 39        |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Cobbles            | 0          |
| Gravel             | 1          |
| Sand               | 60         |
| Silt and Clay      | 39         |
|                    |            |
|                    |            |

**Remarks**

Preparation and testing in accordance with BS1377 unless noted below

Operator  
David Edwards



**PARTICLE SIZE DISTRIBUTION  
BS 1377 Part 2:1990  
Wet Sieve, Clause 9.2**

Contract Number 67923

Borehole/Pit No. WS5

Project Name Land at Johnson Drive, Finchampstead, RG40 3NW

Sample No.

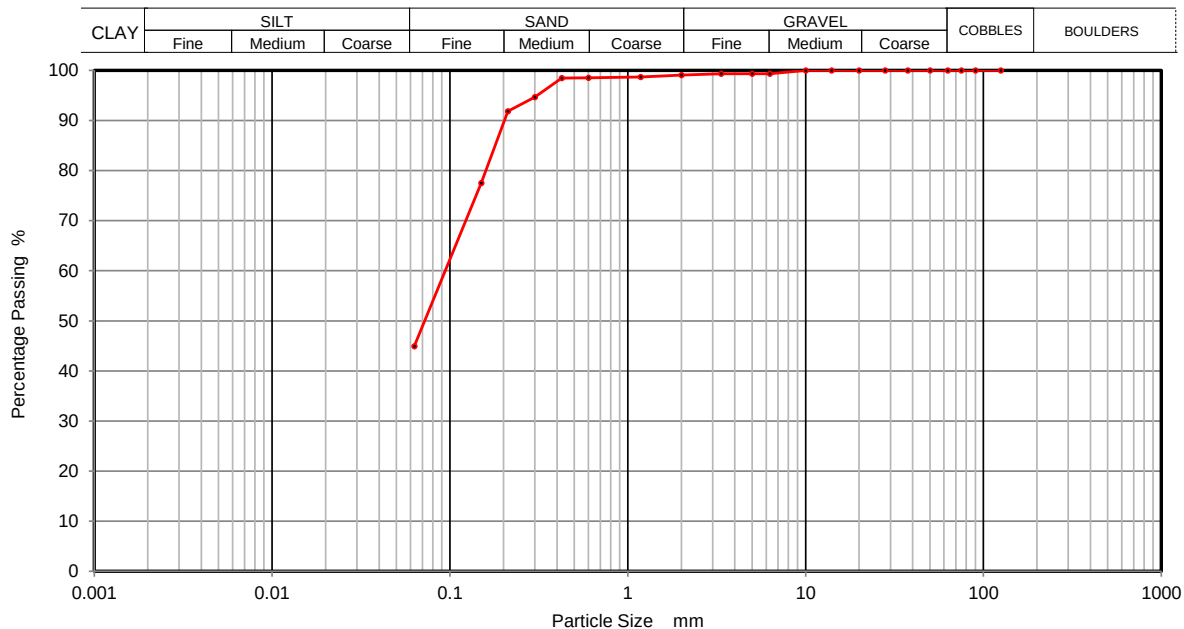
Soil Description Brown slightly gravelly fine to coarse sandy SILT/CLAY

Depth Top 2.50

Depth Base

Date Tested 03/08/2023

Sample Type D



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 100       |                  |           |
| 63               | 100       |                  |           |
| 50               | 100       |                  |           |
| 37.5             | 100       |                  |           |
| 28               | 100       |                  |           |
| 20               | 100       |                  |           |
| 14               | 100       |                  |           |
| 10               | 100       |                  |           |
| 6.3              | 99        |                  |           |
| 5                | 99        |                  |           |
| 3.35             | 99        |                  |           |
| 2                | 99        |                  |           |
| 1.18             | 99        |                  |           |
| 0.6              | 99        |                  |           |
| 0.425            | 98        |                  |           |
| 0.3              | 95        |                  |           |
| 0.212            | 92        |                  |           |
| 0.15             | 77        |                  |           |
| 0.063            | 45        |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Cobbles            | 0          |
| Gravel             | 1          |
| Sand               | 54         |
| Silt and Clay      | 45         |
|                    |            |
|                    |            |

Remarks  
Preparation and testing in accordance with BS1377 unless noted below

Operator  
David Edwards



**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number 67923

Borehole/Pit No. WS6

Project Name Land at Johnson Drive, Finchampstead, RG40 3NW

Sample No.

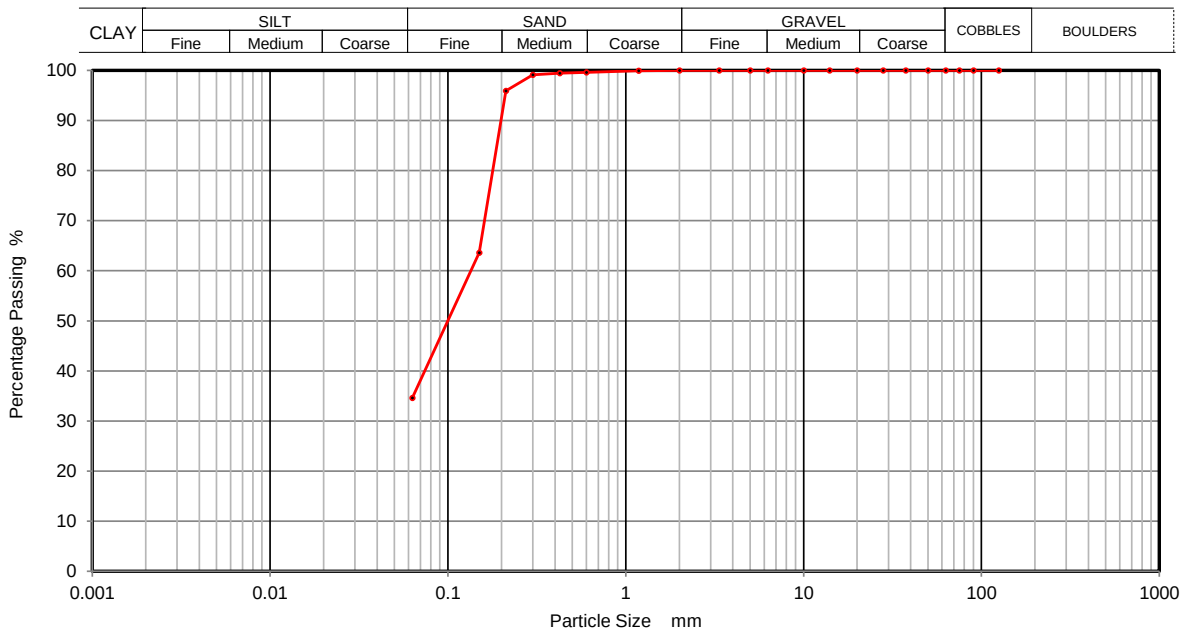
Soil Description Brown grey fine to coarse sandy SILT/CLAY

Depth Top 1.50

Depth Base

Date Tested 03/08/2023

Sample Type D



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 100       |                  |           |
| 63               | 100       |                  |           |
| 50               | 100       |                  |           |
| 37.5             | 100       |                  |           |
| 28               | 100       |                  |           |
| 20               | 100       |                  |           |
| 14               | 100       |                  |           |
| 10               | 100       |                  |           |
| 6.3              | 100       |                  |           |
| 5                | 100       |                  |           |
| 3.35             | 100       |                  |           |
| 2                | 100       |                  |           |
| 1.18             | 100       |                  |           |
| 0.6              | 100       |                  |           |
| 0.425            | 99        |                  |           |
| 0.3              | 99        |                  |           |
| 0.212            | 96        |                  |           |
| 0.15             | 64        |                  |           |
| 0.063            | 35        |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Cobbles            | 0          |
| Gravel             | 0          |
| Sand               | 65         |
| Silt and Clay      | 35         |
|                    |            |
|                    |            |

**Remarks**

Preparation and testing in accordance with BS1377 unless noted below

Operator

David Edwards



**PARTICLE SIZE DISTRIBUTION  
BS 1377 Part 2:1990  
Wet Sieve, Clause 9.2**

Contract Number 67923

Borehole/Pit No. WS6

Project Name Land at Johnson Drive, Finchampstead, RG40 3NW

Sample No.

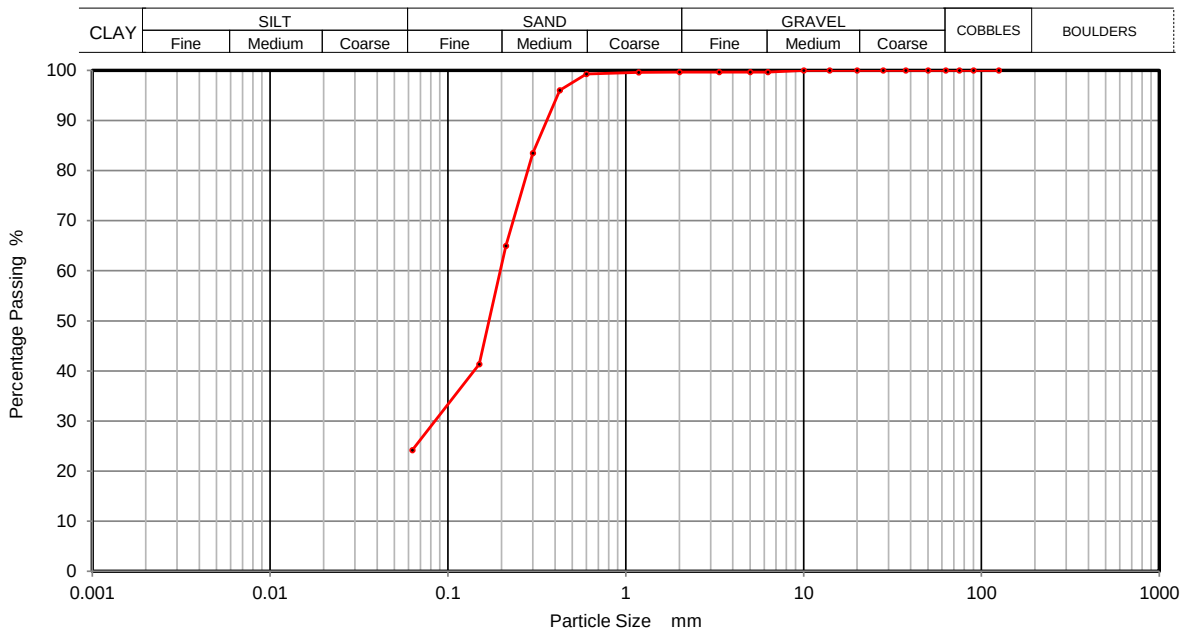
Soil Description Brown silty/clayey fine to coarse SAND

Depth Top 2.00

Depth Base

Date Tested 03/08/2023

Sample Type D



| Sieving          |           | Sedimentation    |           |
|------------------|-----------|------------------|-----------|
| Particle Size mm | % Passing | Particle Size mm | % Passing |
| 125              | 100       |                  |           |
| 90               | 100       |                  |           |
| 75               | 100       |                  |           |
| 63               | 100       |                  |           |
| 50               | 100       |                  |           |
| 37.5             | 100       |                  |           |
| 28               | 100       |                  |           |
| 20               | 100       |                  |           |
| 14               | 100       |                  |           |
| 10               | 100       |                  |           |
| 6.3              | 100       |                  |           |
| 5                | 100       |                  |           |
| 3.35             | 100       |                  |           |
| 2                | 100       |                  |           |
| 1.18             | 100       |                  |           |
| 0.6              | 99        |                  |           |
| 0.425            | 96        |                  |           |
| 0.3              | 84        |                  |           |
| 0.212            | 65        |                  |           |
| 0.15             | 41        |                  |           |
| 0.063            | 24        |                  |           |

| Sample Proportions | % dry mass |
|--------------------|------------|
| Cobbles            | 0          |
| Gravel             | 0          |
| Sand               | 76         |
| Silt and Clay      | 24         |
|                    |            |
|                    |            |

**Remarks**

Preparation and testing in accordance with BS1377 unless noted below

Operator

David Edwards



2788



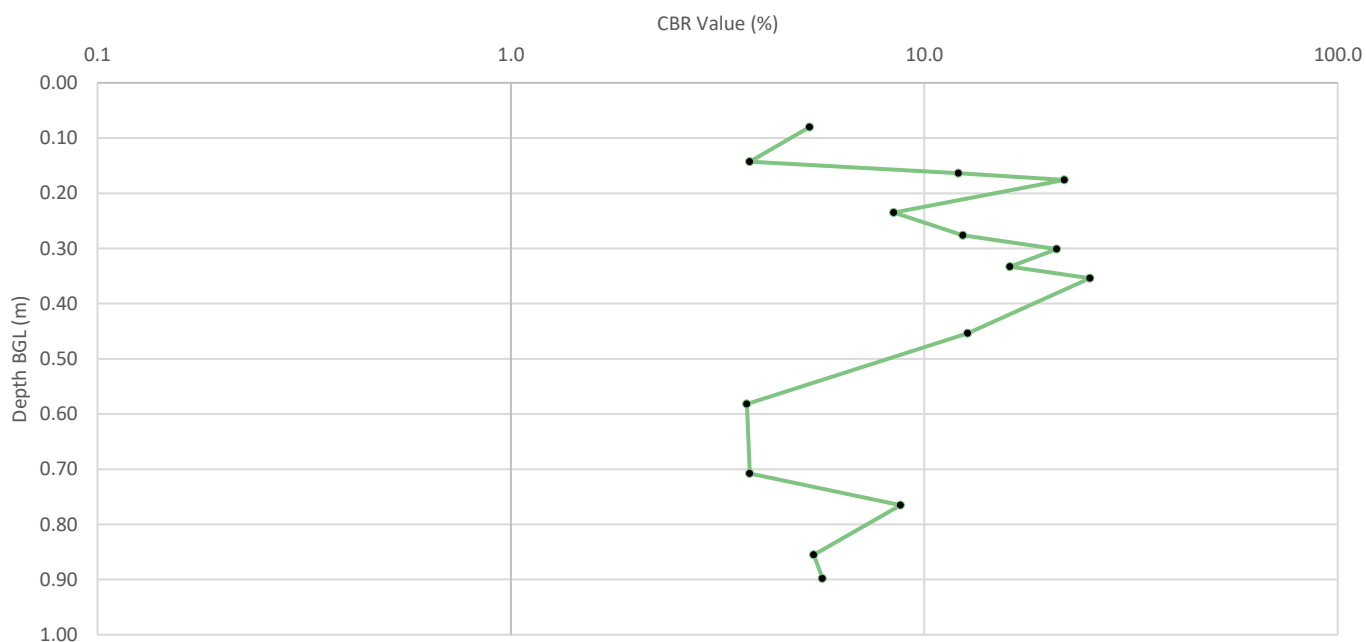
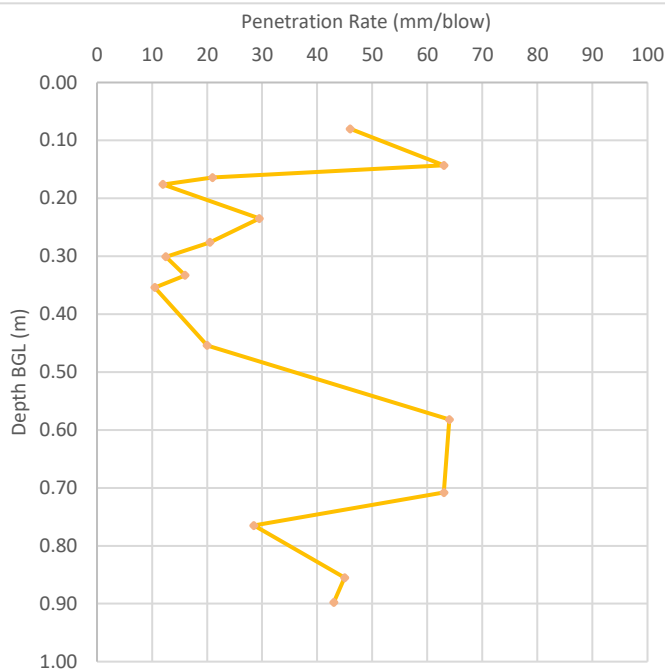
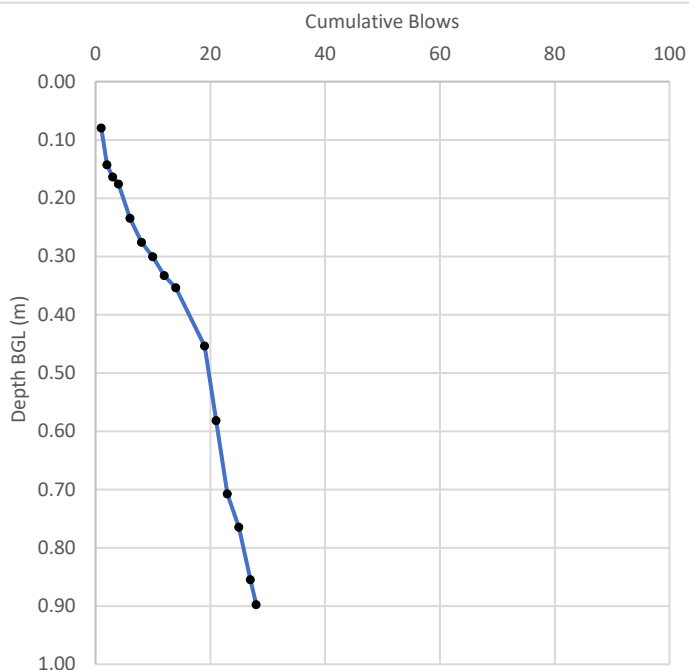
|                                    |                                                       |                  |                  |               |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|---------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location: | <b>DCP1</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:         | <b>27/07/2023</b> |
| Surface Conditions & Observations: |                                                       | Zero Error (mm): | Approx AOD (m):  |               |                   |
| <b>Rough ground</b>                |                                                       | <b>35</b>        |                  |               |                   |

[illegible]



# Dynamic Cone Penetrometer

|                                                                |                              |                           |
|----------------------------------------------------------------|------------------------------|---------------------------|
| Project: <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No: <b>23-176.01</b> | DCP Location: <b>DCP1</b> |
| Client: <b>Palatine Homes Limited</b>                          | Operator: <b>AC / DN</b>     | Date: <b>27/07/2023</b>   |
| Surface Conditions & Observations: <b>Rough ground</b>         | Zero Error (mm): <b>35</b>   | Approx AOD (m):           |





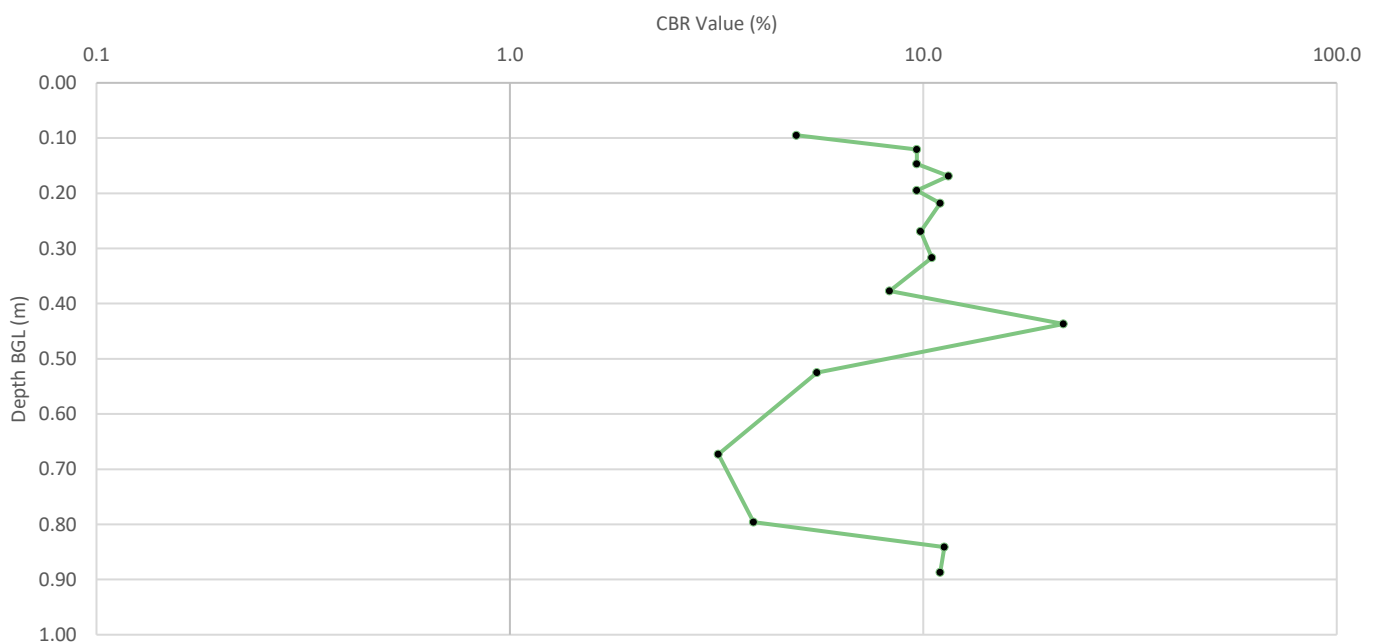
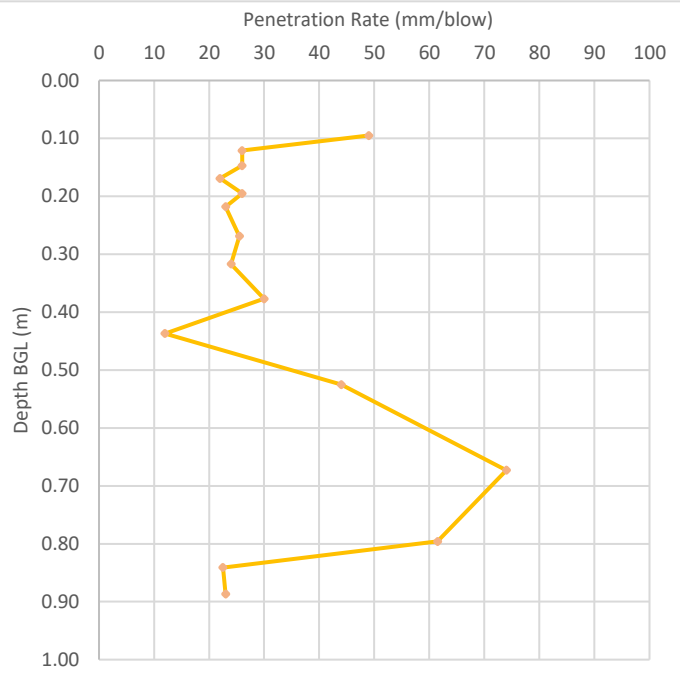
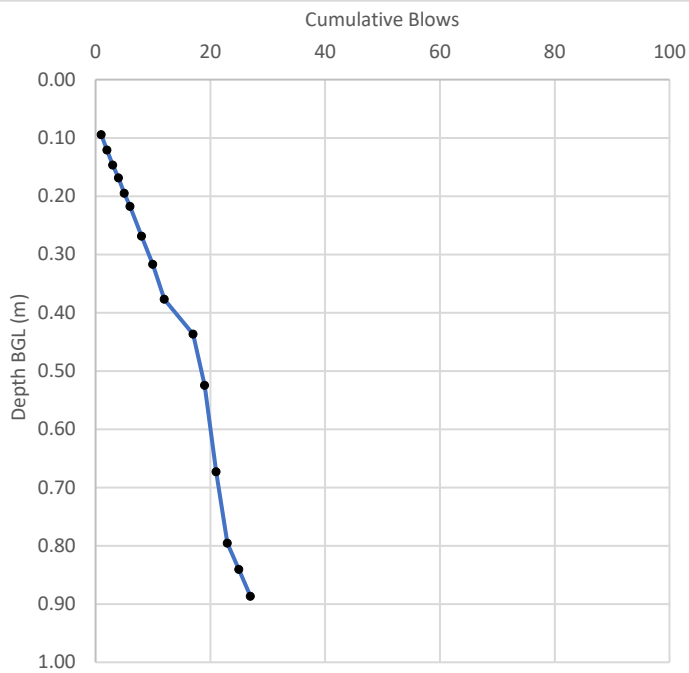
|                                    |                                                       |                  |                  |               |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|---------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location: | <b>DCP2</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:         | <b>27/07/2023</b> |
| Surface Conditions & Observations: |                                                       | Zero Error (mm): | Approx AOD (m):  |               |                   |
| <b>Rough ground</b>                |                                                       | <b>35</b>        |                  |               |                   |

[illegible]



# Dynamic Cone Penetrometer

|                                    |                                                       |                  |                  |                 |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|-----------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location:   | <b>DCP2</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:           | <b>27/07/2023</b> |
| Surface Conditions & Observations: | <b>Rough ground</b>                                   | Zero Error (mm): | <b>35</b>        | Approx AOD (m): |                   |





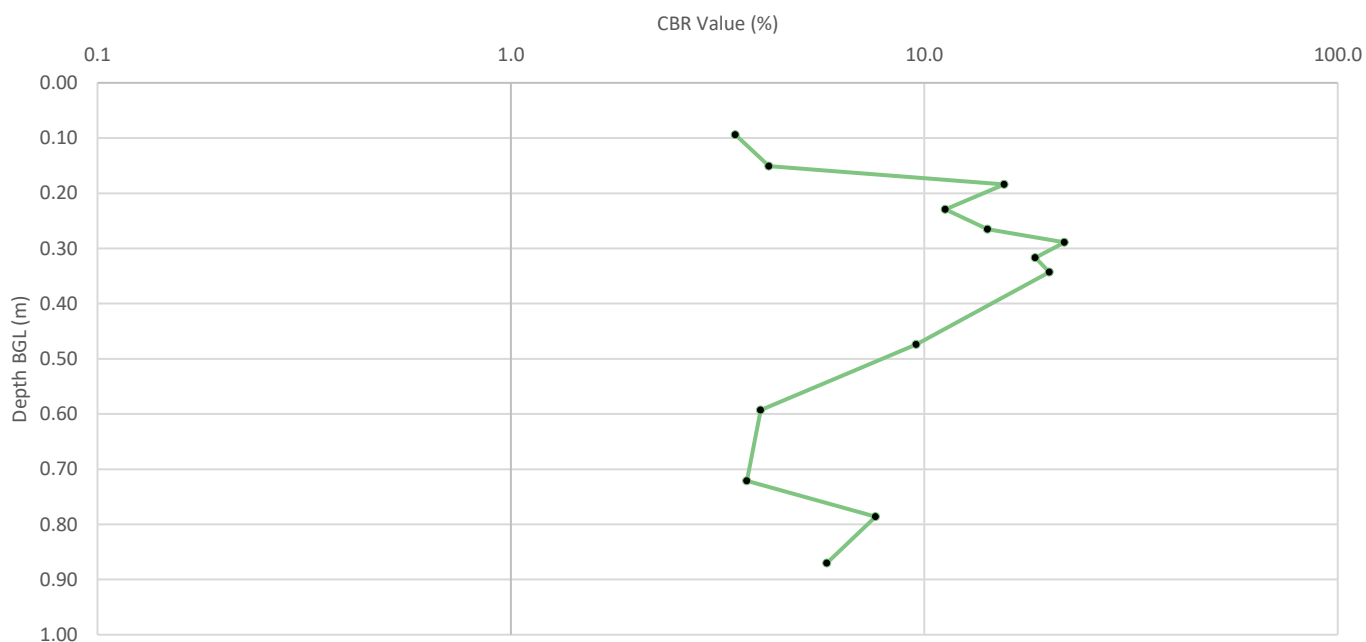
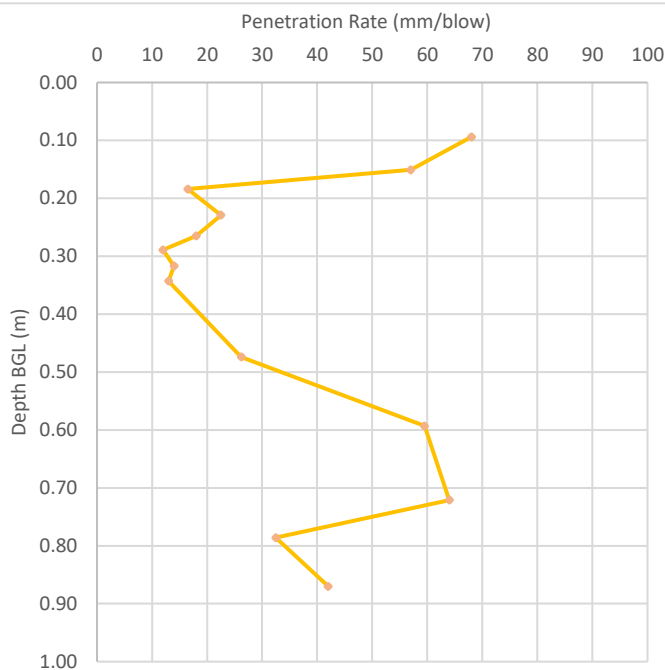
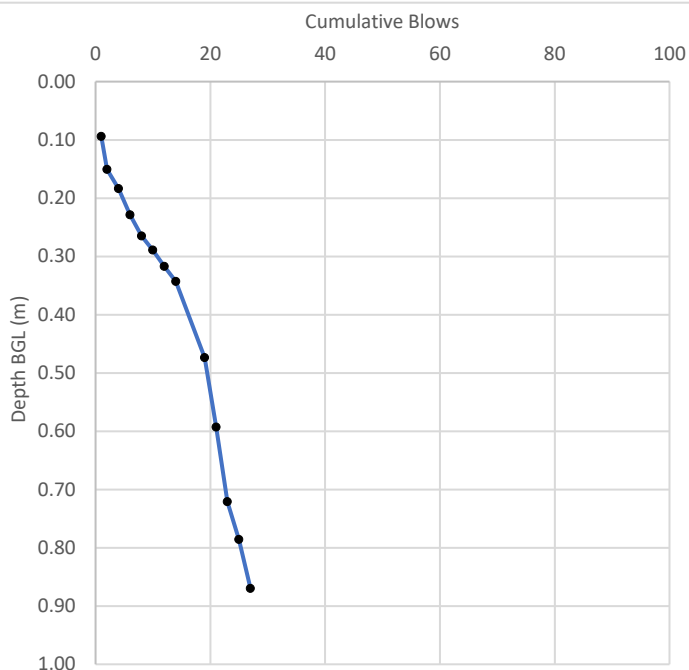
|                                    |                                                       |                  |                  |               |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|---------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location: | <b>DCP3</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:         | <b>27/07/2023</b> |
| Surface Conditions & Observations: |                                                       | Zero Error (mm): | Approx AOD (m):  |               |                   |
| <b>Rough ground</b>                |                                                       | <b>35</b>        |                  |               |                   |

[illegible]



# Dynamic Cone Penetrometer

|                                    |                                                       |                  |                  |                 |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|-----------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location:   | <b>DCP3</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:           | <b>27/07/2023</b> |
| Surface Conditions & Observations: | <b>Rough ground</b>                                   | Zero Error (mm): | <b>35</b>        | Approx AOD (m): |                   |





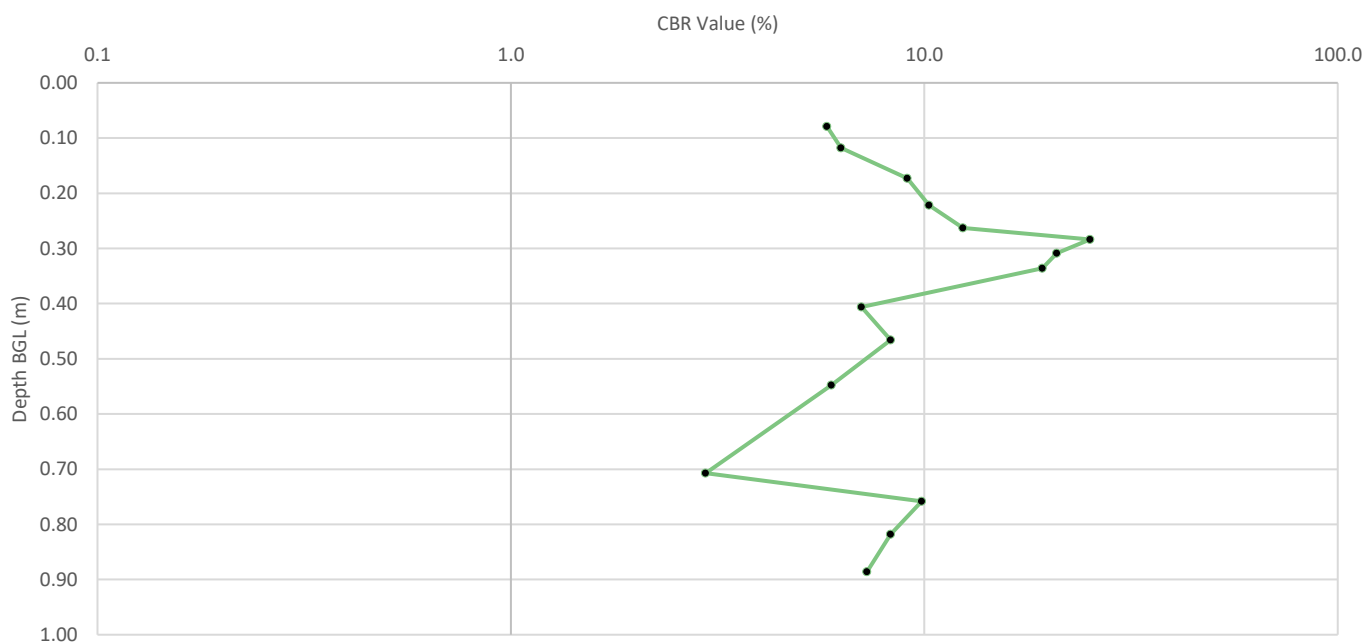
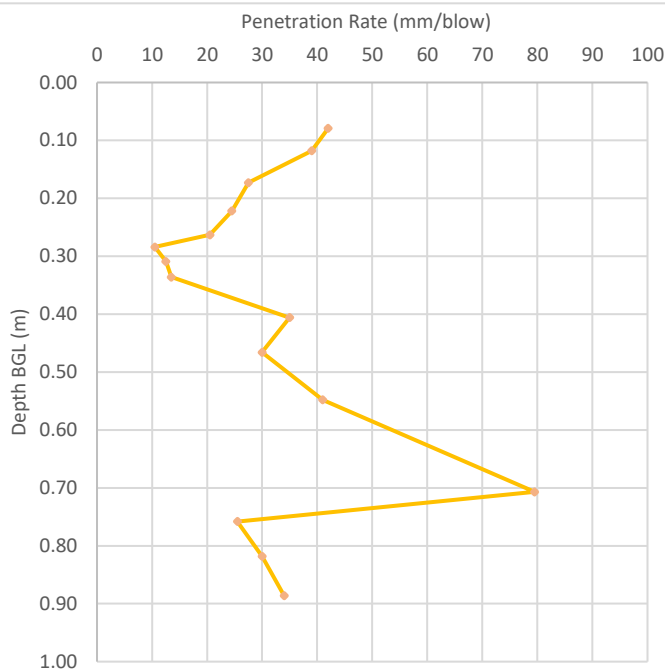
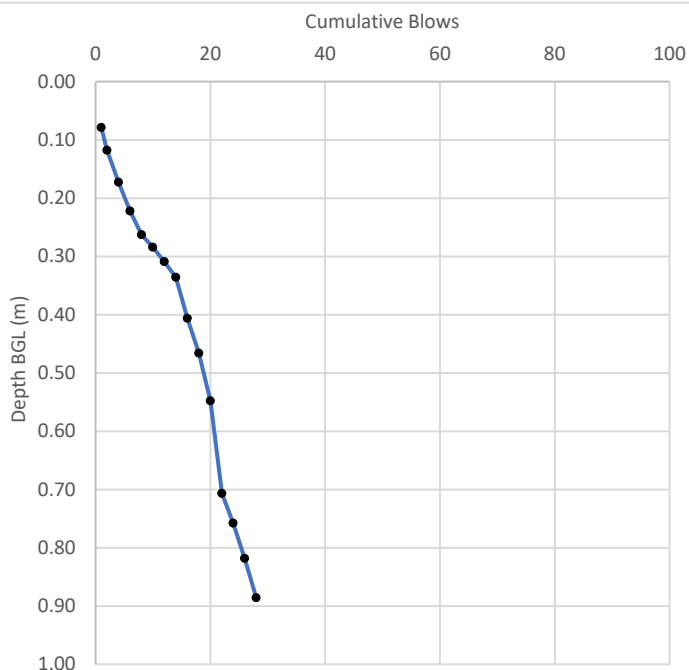
|                                    |                                                       |                  |                  |               |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|---------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location: | <b>DCP4</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:         | <b>27/07/2023</b> |
| Surface Conditions & Observations: |                                                       | Zero Error (mm): | Approx AOD (m):  |               |                   |
| <b>Rough ground</b>                |                                                       | <b>35</b>        |                  |               |                   |

[illegible]



# Dynamic Cone Penetrometer

|                                    |                                                       |                  |                  |                 |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|-----------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location:   | <b>DCP4</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:           | <b>27/07/2023</b> |
| Surface Conditions & Observations: | <b>Rough ground</b>                                   | Zero Error (mm): | <b>35</b>        | Approx AOD (m): |                   |





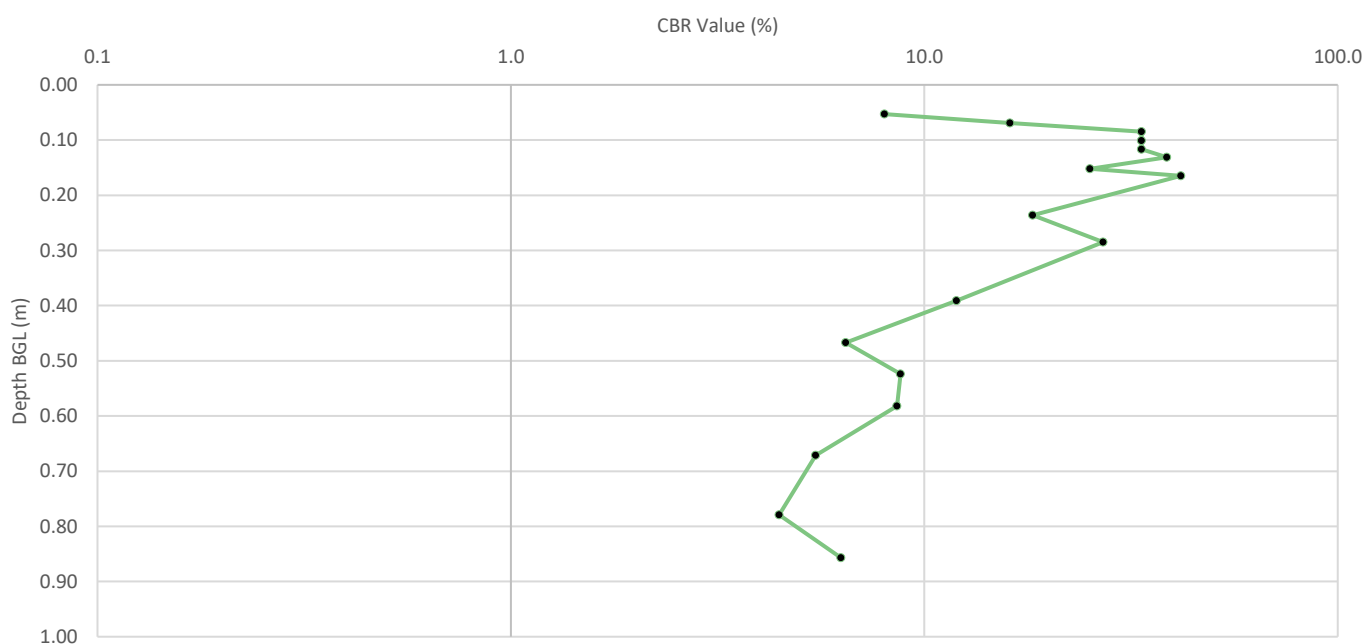
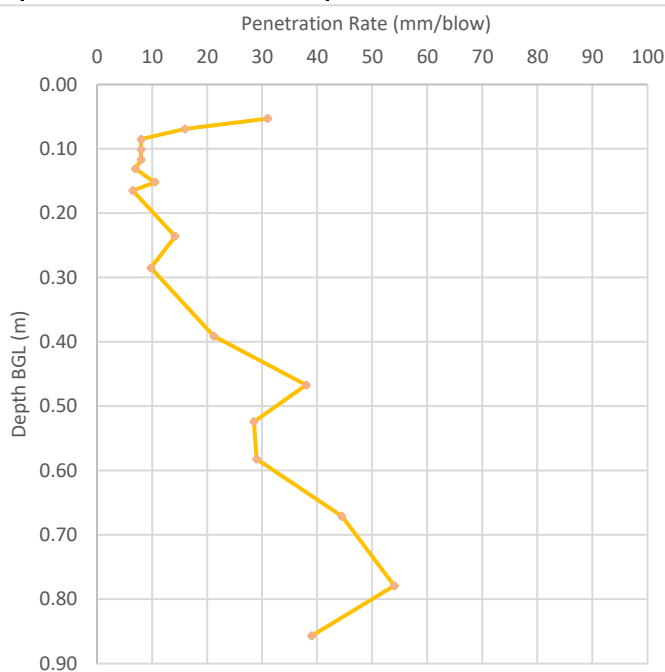
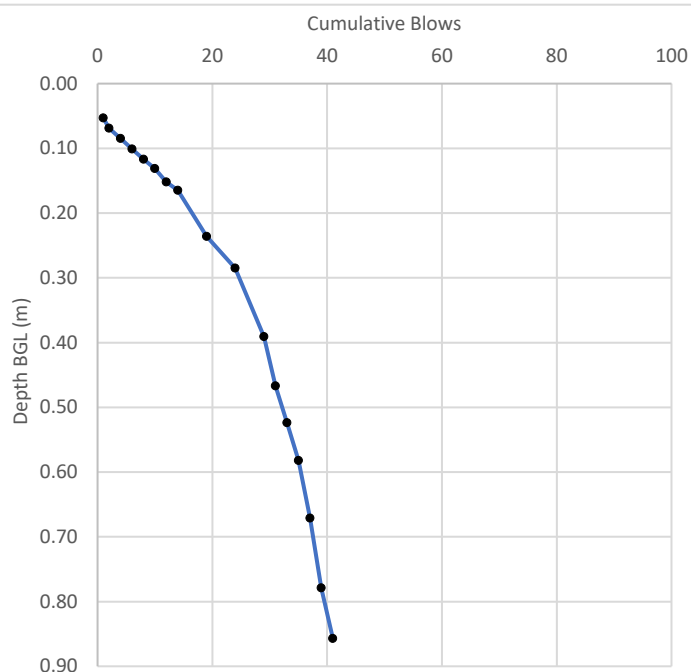
|                                    |                                                       |                  |                  |               |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|---------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location: | <b>DCP5</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:         | <b>27/07/2023</b> |
| Surface Conditions & Observations: |                                                       | Zero Error (mm): | Approx AOD (m):  |               |                   |
| <b>Rough ground</b>                |                                                       | <b>35</b>        |                  |               |                   |

[illegible]



# Dynamic Cone Penetrometer

|                                                                |                              |                           |
|----------------------------------------------------------------|------------------------------|---------------------------|
| Project: <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No: <b>23-176.01</b> | DCP Location: <b>DCP5</b> |
| Client: <b>Palatine Homes Limited</b>                          | Operator: <b>AC / DN</b>     | Date: <b>27/07/2023</b>   |
| Surface Conditions & Observations: <b>Rough ground</b>         | Zero Error (mm): <b>35</b>   | Approx AOD (m):           |





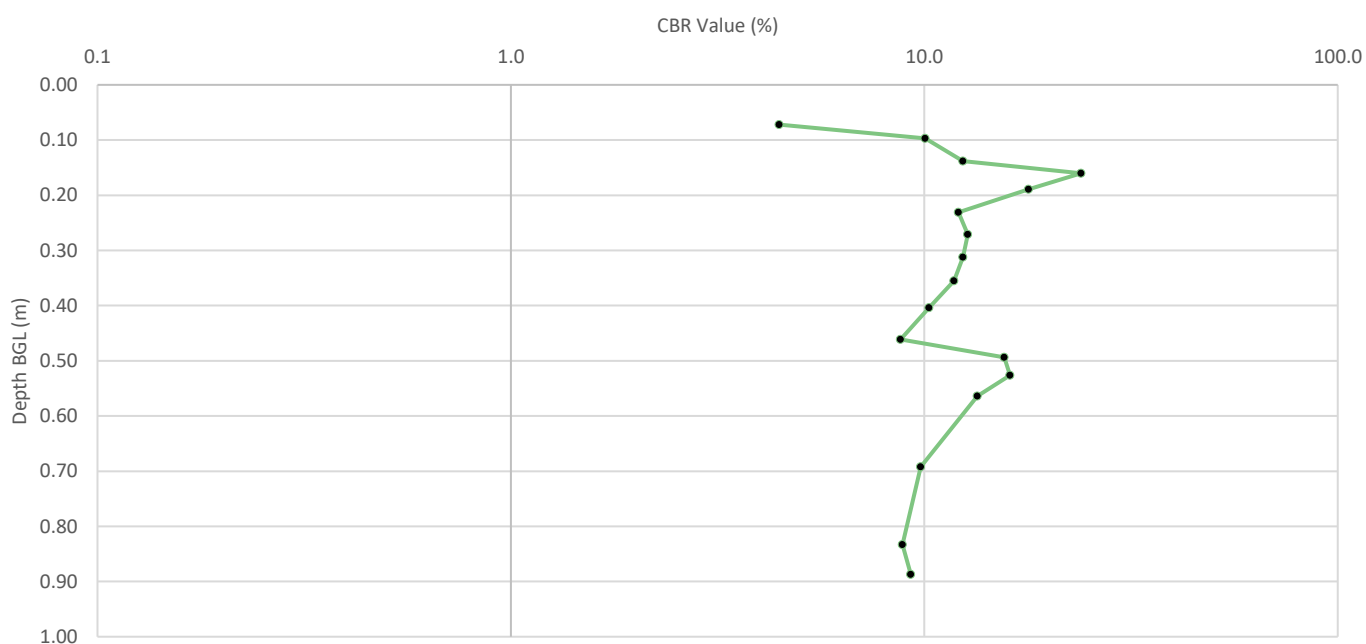
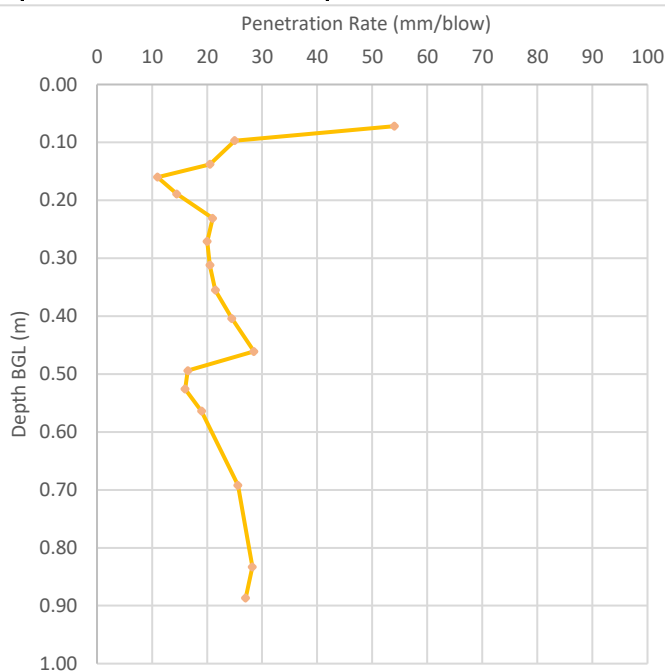
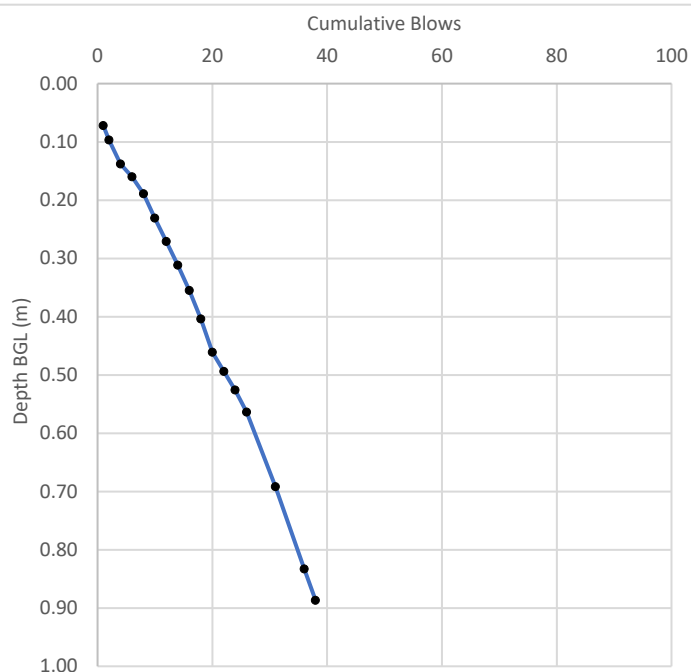
|                                    |                                                       |                  |                  |               |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|---------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location: | <b>DCP6</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:         | <b>27/07/2023</b> |
| Surface Conditions & Observations: |                                                       | Zero Error (mm): | Approx AOD (m):  |               |                   |
| <b>Rough ground</b>                |                                                       | <b>35</b>        |                  |               |                   |

[illegible]



# Dynamic Cone Penetrometer

|                                    |                                                       |                  |                  |                 |                   |
|------------------------------------|-------------------------------------------------------|------------------|------------------|-----------------|-------------------|
| Project:                           | <b>Land at Johnson Drive, Finchampstead, RG40 3NW</b> | Project No:      | <b>23-176.01</b> | DCP Location:   | <b>DCP6</b>       |
| Client:                            | <b>Palatine Homes Limited</b>                         | Operator:        | <b>AC / DN</b>   | Date:           | <b>27/07/2023</b> |
| Surface Conditions & Observations: | <b>Rough ground</b>                                   | Zero Error (mm): | <b>35</b>        | Approx AOD (m): |                   |



## **AVIRON ASSOCIATES LIMITED**

**is a dynamic company of Chartered Environmental Surveyors and Geotechnical Engineers.**

We continuously work hard to ensure our services are the most technically competent, efficient and viable in our market place. Our years of experience of vastly varied sites and projects compliment our ability to deliver assured and effective Ground Investigations and Risk Assessments of both Brownfield, Greenfield and Currently Developed Land.

Our clients choose Aviron to plan, design and manage their Ground Investigations and Land Remediation Schemes assisting in land procurement to deliver engineering requirements, discharge planning and ensure their sites are suitable, developable and sustainable.

Our tenaciously committed team ensure regardless of project value we will always deliver quickly, effectively and exceed expectations.



### **AVIRON ASSOCIATES LIMITED**

Badgemore House  
Badgemore Park  
Gravel Hill  
Henley on Thames  
Oxfordshire  
RG9 4NR

**TELEPHONE:** 07787 771 686 / 01491 413 722

**FAX :** 01491 413 722

**ENQUIRIES:** james@aviron.co.uk

**WEB:** www.aviron.co.uk