A2 Site Investigation

45-54 Saffron Hill and 3 Saffron Street, London
Factual Report

April 2024

38823-A2SI-XX-XX-RP-X-0001-01

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Abbreviations

Abbreviation	Full name	Abbreviation	Full name
ACM	Asbestos-containing Material	PL	Plastic Limit
BGS	British Geological Survey	PI	Plasticity Index
BH	Borehole	PSD	Particle Size Distribution
BRE	Building Research Establishment	SGV	Soil Guideline Value
BSI	British Standards Institution	SOM	Soil Organic Matter
BS	British Standard	SPT	Standard Penetration Test
CIRIA	Construction Industry Research and Information Association	SPZ	Source Protection Zone
GAC	Generic Assessment Criteria	SVOC	Semi-volatile Organic Compounds
LL	Liquid Limit	TPH	Total Petroleum Hydrocarbon
m bgl	Metres Below Ground Level	UST	Underground Storage Tank
m OD	Metres Ordnance Datum	UXO	Unexploded Ordnance
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compound
PCB	Polychlorinated Biphenyl	WAC	Waste Acceptance Criteria
PID	Photo Ionisation Detector		

1. Introduction

A2 Site Investigation (A2SI) were appointed to undertake a ground investigation at 14 St Cross St, London EC1M 3JY. The ground investigation was specified by Heyne Tillett Steel, who also acted as Investigation Supervisor.

A desk study has been completed for the site (report ref 38823-A2SI-XX-XX-RP-Y-0001-00, dated October 2023), and should be read in conjunction with this report.

2. Site Location

The site is situated at 45-54 Saffron Hill and 3 Saffron Street, London as presented in Figure 2.1. The site is located at National Grid Reference 531430, 181950 and falls within the administrative boundaries of the London Borough of Camden. The site currently includes a multi-storey car park and office space comprised of eight stories with a lower ground floor. The top two floors are used as office spaces while the bottom six are used as a car park. The site is bounded to the north by Safron Street, St Cross Street to the south, Saffron Hill to the west and mid-rise commercial buildings (currently utilised as office buildings) at 75-79 Farringdon Road to the east.

Figure 2.1 Site location and extent shown in red

3. Proposed Development

The scheme for the proposed development consists of the demolition of the existing structure and the construction of a new 9-storey commercial office building with a lower ground floor and a basement. The basement is proposed to take a rectangular shape located at the centre of the site footprint. The existing piles are to be cut down to allow for the proposed development of the new basement and raft solution. To account for areas of high loading, new piles may be incorporated into the design.

Proposed plans of the basement, the lower ground floor, and the ground floor are presented as Figure 3.1, Figure 3.2, and Figure 3.3, respectively. The proposed development plans are valid at the time of writing this report.

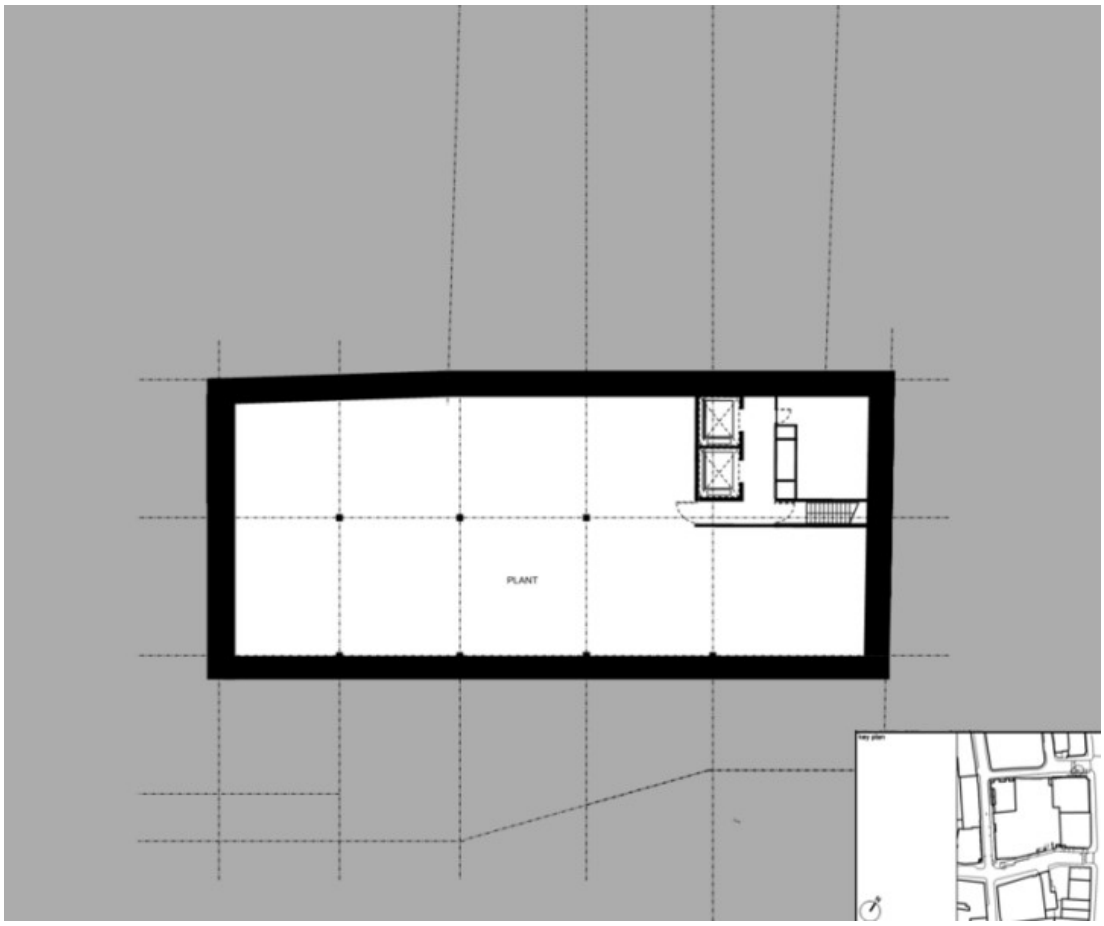


Figure 3.1 Proposed Basement Plan

Figure 3.2 Proposed Lower Ground Floor Plan

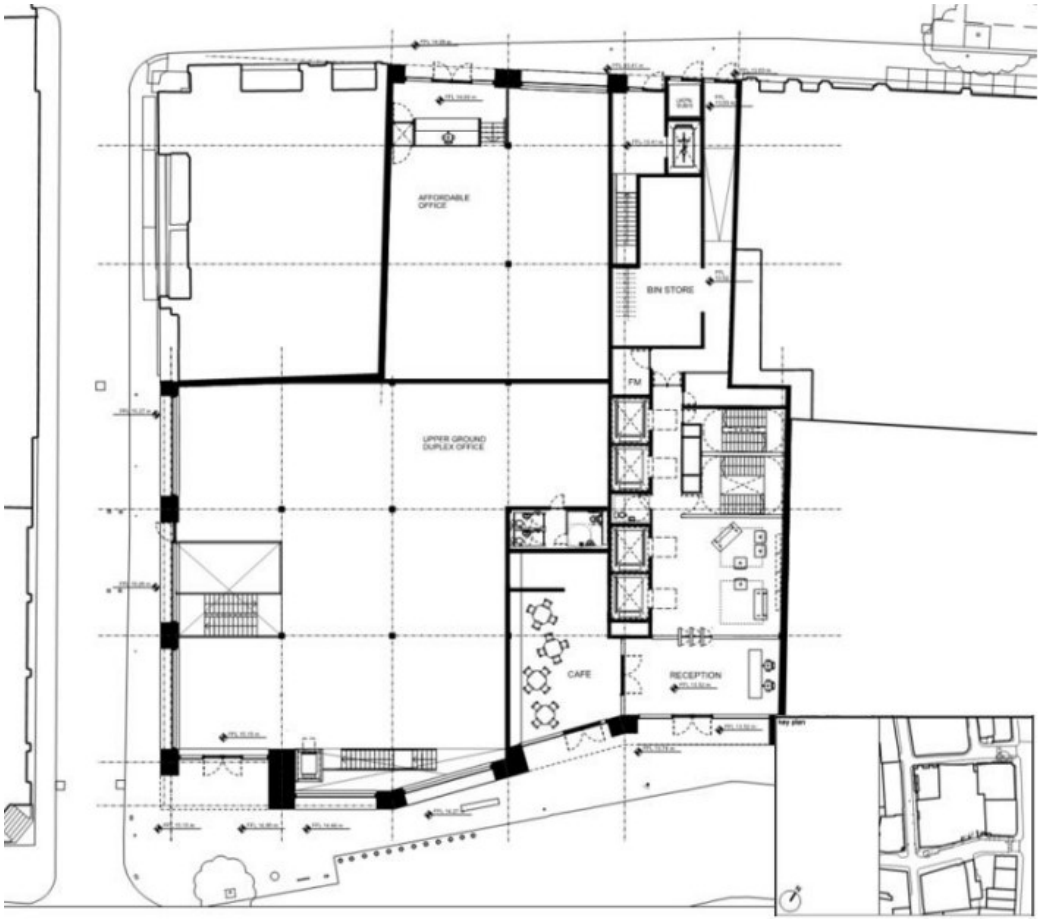


Figure 3.3 Proposed Ground Floor Plan

4. Scope and Purpose of the Investigation

A2SI have been commissioned to undertake a site investigation at the site comprising:

- 4 No. modular cable percussion boreholes up to 30.00m bgl.
    - 2 No. boreholes are located proximal to pile locations to identify pile underreams.
    - 2 No. boreholes are for the purpose of geotechnical testing and sampling, geo-environmental sampling and well installation.
- 4 No. dynamic sampling boreholes up to 3.00m bgl.
- 2 No. combined machine excavated and hand-dug trial pits to investigate pile cap and pile dimensions.
- 2 No. pile core samples.
- 6 No. standpipe installations within the boreholes for ground gas and groundwater monitoring.
- 2 No. geophysical installations for the purpose of parallel seismic testing.
- Appropriate soil sampling.
- Geotechnical in situ testing.
- Geotechnical, geoenvironmental and material laboratory testing.
- Geophysical testing in the form of parallel seismic to investigate existing pile depths.
- Monitoring of groundwater levels and ground gas concentrations (3 No. visits over three weeks).

4.1. Investigation Strategy

Table 4.1 summarises the strategy for the phases of the intrusive investigation.

Table 4.1 Summary of investigation strategy

Location ID	Method	Purpose/Comments
WS01-WS04	Dynamic sampling boreholes to depth of 3.00m bgl.	To determine the shallow ground conditions across the site and obtain geo-environmental samples.
BH01A, BH01B, BH02A, BH02B	Cable percussion boreholes to 30.00m depth.	To determine the deeper ground conditions in order to facilitate geotechnical design and parallel seismic testing.
TP01 & TP02	Trial pitting using a combination of machine excavation and hand digging to a maximum depth of 2.5m bgl. Core sample to be obtained from pile via angled coring.	To determine depth and dimensions of existing pile cap, pile diameters and obtain core sample of existing pile.

5. Anticipated Ground Conditions

Table 5.1 presents a review of available geological maps and memoirs, including the online British Geological Survey (BGS) "Geology Viewer", previous site investigations and other relevant data.

According to the BGS, the majority of the site is indicated to be underlain by superficial deposits of the Hackney Gravel Member consisting predominantly of sand and gravel, locally with lenses of clay. The bedrock geology is indicated to be the London Clay Formation, comprising of clay, silt, and sand of the Palaeogene Period. Underlying this formation, the Lambeth Group is anticipated, which is dated to the Palaeogene Period. According to the BGS, this strata is comprised of vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignite's and occasional sandstone and conglomerate.

Table 5.1 Anticipated geological sequence

Unit	Elevation[1] (m OD)	Depth[1] (m bgl)	Thickness (m)	Description
Made Ground	+13.0	0.00	1.00	Variable anthropogenic deposits
Hackney Gravel Member	+12.0	1.00	2.00	Medium dense brown sandy to very sandy medium to coarse with occasional fine to coarse subangular to subrounded flint.
London Clay Formation	+10.0	3.00	15.00	Firm fissured brownish grey silty clay with occasional lenses of silt and locally sandy
Lambeth Group	-5.0	18.00	14.00	Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones/calcrete and lignites and occasional sandstone and conglomerate
Thanet Formation	-19.0	32.00	5.00	Very dense grey locally green grey at upper interface slightly silty mainly fine and medium sand.
Chalk Group	-24.0	37.00	>2.5 (base unproven)	Very weak low density white chalk with fractures. The Chalk is friable blocky and readily breaks. Fractures are very closely spaces horizontal and sub-horizontal planar and slightly undulating.

1. Depths refer to top of stratum.

6. Limitations of Report

This report has been prepared in accordance with the specification provided by the client. The data reported relates to the specific locations where each exploratory hole was formed and may not represent the ground and groundwater conditions of the site as a whole. Furthermore, it should be considered that groundwater levels may vary throughout the year due to seasonal conditions and other influences such as flooding, leaking mains, storm drainage and foul water systems.

7. Standards

The site investigation, soil descriptions and laboratory testing were undertaken in accordance with following standards:

- AGS Assessment and Control of Asbestos Risk in Soil – Part 1: Protection of Personnel working on Ground Investigations, May 2021.
- BGS Geology Viewer: 2022. https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/. British Geological Survey.
- BGS GeoIndex: 2022. https://www.bgs.ac.uk/map-viewers/geoindex-onshore/. British Geological Survey.
- British Standards Institution BS 10175:2011+A2:2017, Investigation of potentially contaminated sites – code of practice.
- British Standards Institution BS 5930:2015+A1:2020, Code of practice for site investigations.
- British Standards Institution BS 1377-2:2022, Methods of test for soils for civil engineering purposes – Part 2: Classification tests and determination of geotechnical properties.
- British Standards Institution BS 1377-9:1990, Methods for test for soils for civil engineering purposes - In-situ tests.
- British Standards Institution BS 8576:2013 Guidance on investigations for ground gas - permanent gases and volatile organic compounds (VOCs).
- British Standards Institution BS EN ISO 14688-1:2018, Geotechnical investigation and testing – identification and classification of soil. Identification and description.
- British Standards Institution BS EN ISO 22475-1: 2021 : Geotechnical investigation and testing – Sampling methods and groundwater measurements - Part 1 Technical principles for execution.
- British Standards Institution BS EN ISO 5667-1:2023 Water quality. Sampling - Guidance on the design of sampling programmes and sampling techniques.
- Building Research Establishment (2005), BRE Special Digest 1: Concrete in aggressive ground.
- Norbury, D. (2010), Soil and Rock Description in Engineering Practice (Caithness: Whittles).
- UK Specification for Ground Investigation 3rd Edition, published by ICE Publishing (2022).

8. Ground Investigation Summary

8.1. Fieldwork Overview

The fieldwork was carried out between 10th October 2023 and 1st November 2023. A site walkover was conducted prior to the first day of the ground investigation and confirmed the anticipated layout of the site.

Up to date utility drawings were procured prior to the site work and can be downloaded using the following link - Statutory Utility Drawings.

A preliminary Unexploded Ordnance (UXO) Risk Assessment for the site was carried out by Brimstone Ltd in accordance with CIRIA C681 Guidelines: 'Unexploded Ordnance, a Guide for the construction Industry' (published in 2009) and is included in the Phase I Desk Study, report ref: 38823-A2SI-XX-XX-RP-Y-0001-00. The report's findings have concluded there to be a potential risk from buried Second World War UXOs on site, and that further research and possibly on site UXO mitigation supervision was required. A

UXO specialist was in attendance during drilling of all exploratory locations. Mitigations included the use of downhole magnetometer testing and a watching brief.

The preliminary UXO risk assessment is presented in Appendix J.

After reviewing all available service information and site reconnaissance, all locations were scanned using Ground Penetrating Radar (GPR) & Electromagnetic (CAT & Genny) techniques, to check for services within proximity to exploratory hole locations.

The exploratory hole locations are located across the lower ground floor and the basement of the site. All exploratory hole depths are presented in metres below ground level (m bgl) however levels m OD are presented in Table 9.1 and the detailed logs presented in Appendix C.

The specific details of the investigation undertaken are discussed throughout Section 8 and the completed scope comprised:

- 2 No. modular cable percussion boreholes; 1 No. to 25.00 m bgl and 1 No. to 3.10m bgl due to refusal in mass concrete.
    - 2 No. boreholes located proximal to pile locations to identify pile underreams.
- 3 No. dynamic sampling boreholes up to 3.00m bgl.
- 3 No. combined machine excavated and hand-dug trial pits to investigate pile cap and pile dimensions, and pile sample.
- 3 No. standpipe installations within the boreholes for ground gas and groundwater monitoring.
- 1 No. geophysical installations for the purpose of parallel seismic testing.
- Appropriate soil sampling.
- Geotechnical in situ testing.
- Geotechnical, geoenvironmental and material laboratory testing.
- Geophysical testing in the form of parallel seismic testing to investigate existing pile depths.
- Monitoring of groundwater levels and ground gas concentrations (3 No. visits over three weeks).

All works were supervised by an experienced ground engineer.

An exploratory hole location plan and detailed exploratory hole logs are presented in Appendices B and C, respectively. The Ordnance Datum levels, which are presented on the exploratory logs have been interpreted from the topographic survey of the site provided by HTS.

8.2. Modular Cable Percussion Boreholes

2 No. cable percussion boreholes (BH01A and BH02) were advanced to a maximum depth of 25.00m below slab level.

The original scope of works included the drilling of 4 No. boreholes, 2 No. of which were for the purpose of determining the depth of potential underream of targeted piles, and a further 2 No. for geotechnical testing and sampling to 30.00m depth and gas and groundwater well installation.

At the location of BH02, the borehole was drilled to 25.00m bgl. The borehole effectively refused at this depth due to encountering challenging ground conditions when progressing the modular drilling rig in granular soils of the Lambeth Group. No underream was encountered during the advancement of BH02 therefore the drilling of a further borehole was not required.

BH01a was progressed until refusal via cable percussion drilling to a maximum depth of 3.10m, and further progressed by diamond coring to a depth of 3.90m below slab level. This was due to limited positioning options on account of two drainage services either side of the pile location and the presence of more than 2.50m of mass concrete around the pile cap. BH01a was positioned in the base of TP01a after other options were attempted. The borehole was chiselled from a depth of 2.50m before refusing at a depth of 3.10m. In an attempt to progress the hole further, a coring methodology was implemented through the centre of the 200mm diameter casing setup at BH01a, which progressed to a maximum depth of 3.90m before refusing. The operator noted a ‘drop’ in the barrel

from 3.70m – 3.90m depth, indicating a potential void or softer (non-concrete) material – this could not be fully identified due to no recovery of the core from 3.10m to 3.90m depth.

UT100 sampling and SPT/CPT testing were undertaken at alternate 1.00m intervals in cohesive and granular soils until the base of the hole. All soils encountered were logged on site and sub-sampled accordingly for geotechnical and geoenvironmental laboratory analysis.

A 90mm diameter PVC pipe was installed to the base of BH02 for the purpose of parallel seismic testing. The anulus of the pipe was grouted from the base of the hole using a tremeing technique.

BH01 was backfilled using arisings and reinstated to the original condition.

8.3. Modular Dynamic Sampling Boreholes

The dynamic sampling boreholes were progressed using a modular tracked dynamic sampling rig and were advanced to a maximum depth of 4.00m bgl. All of the exploratory hole locations were positioned in the carpark and required diamond coring enabling works using a coring rig. The boreholes were advanced for geotechnical, geoenvironmental and well installation purposes.

At the location of WS01, concrete was encountered to 0.70m bgl and consequently effectively refused. Concrete was similarly encountered to 0.70m bgl at the location of WS01A. A further relocation was undertaken at the location of WS01B, which effectively refused on concrete at 0.70m bgl.

The dynamic sampling borehole was successfully advanced to the scheduled depth of 3.00m bgl at the location of WS02.

WS03 refused at 1.50 bgl due to encountering a potential concrete obstruction. The starter pit was expanded, and a relocation undertaken at WS03A, however refused at 1.50m bgl due to encountering an obstruction.

The location of WS04 was successfully advanced to 1.00m beyond the schedule depth, 4.00m bgl, to determine the depth of natural soil.

Standard Penetration Tests (SPTs) were carried out in the borehole. All soils encountered were logged on site and samples recovered for geotechnical and geoenvironmental laboratory analysis.

A standpipe piezometer was installed in all the successful dynamic sampling hole locations for monitoring of ground gas and groundwater levels.

8.4. Trial Pits

A total of 3 No. combined machine and hand excavated trial pits (TP01a, TP02 and TP02A) were completed to a maximum depth of 2.50m bgl to determine the dimensions of existing pile caps and piles at targeted locations, and also for geoenvironmental sampling. A summary of the findings is presented in Table 8.1.

A probing methodology was implemented using a handheld Hilti drill prior to breaking ground to determine the extent of the pile cap and to inform on the optimum position for the trial pit and borehole.

TP01a was progressed using a combination of concrete coring, machine breaking, hand breaking and insulated hand digging techniques. The lower ground floor slab was encountered to be 190mm thick. Due to encountering mass concrete underlying the slab, a machine excavator and breaker was utilised to break up and excavate the concrete, which was encountered to the base of the trial pit at 2.50m depth. The pile cap was encountered to extend 450mm west of the column, and project 750mm to the south. The base of the pile cap was not established due to mass concrete obscuring the structural concrete. A brick service chamber was encountered at 1.10m bgl with no inspection cover visible at slab level.

As described in Section 8.2, BH02 was positioned in the base of the pit due to the extensive concrete encountered in the vicinity of the target pile. The trial pit log for TP01a presented in Appendix C details the strata encountered to the maximum excavated depth of 2.50m below slab level. The trial pit sketch, also presented in Appendix C, includes the drilling of the borehole for diagrammatic purposes; therefore, includes the maximum drilled depth of 3.90m below slab level. The detailed log for BH01a includes the strata descriptions encountered between 2.50m and 3.90m depth below slab level.

At the location of TP02, a potential service was encountered at 0.50m bgl (leads to the drainage down pipe adjacent to column C38) and was relocated to column C38 – the column immediately north of the original location.

TP02A was excavated to a maximum depth of 2.67m bgl using a combination of machine excavation and hand pitting. The pile cap was encountered to project 220mm in the southern direction, and 260mm in the western direction. A concrete projection, potentially overpour concrete, was encountered at 1.05m depth to 2.30m depth. The pile was encountered at 2.30m bgl and was identified to be approximately 600mm in diameter. A 100mm diameter core sample was obtained from the pile using an angled Hilti coring machine.

No groundwater was encountered during the excavation of each trial pit.

All soils encountered were logged on site. Detailed logs and hand sketches are presented in Appendix C.

Table 8.4 Trial Pit locations

Exploratory Hole Reference	General Findings	Formation encountered	Notes
TP01a	Pile cap projects 450mm westwards from column edge. Pile cap projects 750mm southwards from column edge. Concrete beam encountered at 1.45m depth spanning north to south. Probing indicates concrete extended greater than 3.00m depth.	Concrete to base of trial pit	Underside of pile cap not established due to mass concrete. Pile not established due to mass concrete.
TP02	Concrete encapsulated service encountered at 0.50m bgl.	Made Ground	Relocated to Column TP02A (column C38)
TP02A	Pile cap projects 220mm south from column edge. Pile cap projects 260mm eastwards from column edge. Concrete projection (potentially overspill) at 1.10m depth projecting 700mm west of column edge. Pile encountered at 2.30m depth and is approximately 600mm in diameter. 100mm diameter pile core sample undertaken.	Made Ground (principally granular becoming cohesive)	

8.5. Reinstatement

At the locations of the trial pits, the excavations were backfilled using arisings and reinstated as per the original condition, including adding ballast beneath concrete. The surface wearing course of Asphalt was reinstated as per the original condition by a specialist contractor.

8.6. Gas and Groundwater Monitoring Installations

3 No. combined gas and groundwater monitoring pipes were installed (WS02, WS03 and WS04). The monitoring installations comprise of a 50mm internal diameter HDPE casing and well screen. Details are presented in Table 8.6.

Table 8.6 Gas and groundwater monitoring installations

Location Ref	Base of Borehole (m bgl)	Installation Diameter (mm)	Type of Installation	Top of Response Zone (m bgl)	Bottom of Response Zone (m bgl)	Target Strata
WS02	1.30	50	SP/G	1.00	1.30	Made Ground
WS03A	1.45	50	SP/G	1.00	1.45	Made Ground
WS04	4.00	50	SP/G	1.00	3.30	Made Ground

Key

SP – Standpipe

SP/G – Standpipe with Gas monitoring valve

PS – Parallel Seismic

9. Ground Conditions

The ground conditions indicate that Made Ground is generally deeper than anticipated and, in the exploratory locations investigated, directly overlies the bedrock geology. As anticipated, the site was encountered to be overlain by hardstanding in the form of asphalt parking bays and concrete floor slabs. Made ground was encountered in all investigation locations, to a maximum depth of 3.70m. The shallow geology encountered adjacent to pile locations was identified to be disturbed/reworked (BH02) or infilled with concrete (BH01a). Between the depths of 3.10m to 4.00m bgl in BH02, reworked River Terrace Deposits and London Clay was encountered, and concrete was encountered to a minimum of 3.70m bgl at BH01a.

The investigation corroborates with published geological records regarding the bedrock geology consisting of the London Clay Formation, underlain by the Lambeth Group. The London Clay Formation was identified to include a thin layer of Weathered London Clay with a maximum thickness of 1.70m overlying brownish grey London Clay. The Upper Mottled Beds of the Lambeth group were encountered to underly the London Clay Formation in BH02 at a depth of 12.95m and consist of mottled sandy silty clay. The underlying beds of the Lambeth Group encountered include the Upper Mottled Beds, Laminated Beds, Upper Shelly Beds and Lower Mottled Beds. The extent of the Lambeth Group was unproven to a maximum depth of 25.00m bgl.

The full set of exploratory hole logs are presented in Appendix C.

Encountered ground conditions are presented in Table 9.1.

9.1. Encountered Geology

The following ground conditions were encountered at the site. Detailed exploratory hole logs are presented in Appendix C. A photographic record is presented in Appendix D.

Table 9.1 Ground conditions encountered

Unit	Depth (m bgl)	Elevation (m OD)	Strata Thickness (m)	Description
	min – max[1]	min – max[1]		
Made Ground	0.00 – 4.00	9.35 – 13.67	1.30 – 4.00	CONCRETE SLAB over firm dark brown gravelly sandy CLAY with low cobble content. Gravel is angular to sub-angular fine to coarse of flint, brick, concrete, white fragments and occasional clinker. Cobbles are angular to sub-angular of brick fragments. Brown locally clayey gravelly fine to coarse SAND with medium cobble content and low boulder content. Gravel is angular to sub-rounded fine to coarse of flint, brick concrete, old wires, and rare carbonaceous fragments. Cobbles are angular to sub-angular of brick and concrete fragments. Boulders are angular to sub-angular of concrete fragments. Mass CONCRETE. Medium dense orangish brown slightly clayey sandy angular to sub-rounded fine to coarse GRAVEL with occasional pockets (<40mm) of brown slightly sandy clay. Sand is fine to coarse. (REWORKED RIVER TERRACE DEPOSITS) Clinker encountered in BH02.

Unit	Depth (m bgl)	Elevation (m OD)	Strata Thickness (m)	Description
	min – max(1)	min – max(1)		
Weathered London Clay Formation	1.30 – 5.00	8.70 – 11.08	0.70 – 1.70 (unproven)	Firm brown and grey mottled sandy silty CLAY with frequent pockets of orangish brown fine and medium sand. Sand is fine and medium.
London Clay Formation [2]	5.00 – 12.95	0.75 – 8.70	7.95	Firm extremely closely fissured brownish grey sandy silty CLAY with rare light grey bioturbations (generally <5mm). Soft becoming firm brown mottled grey and orangish brown slightly sandy silty CLAY with rare pockets (<5mm) of soft black organic. Sand is fine.
Lambeth Group: Upper Mottled Beds (2)	12.95 – 20.00	0.75 - -6.30	7.05	Stiff light bluish grey and brown mottled sandy silty CLAY. Sand is fine and medium.
Lambeth Group: Laminated Beds (2)	20.00 – 21.00	-6.30 - -7.30	1.00	Stiff extremely closely to closely fissured dark grey slightly sandy silty CLAY with frequent light grey partings of silt.
Lambeth Group: Upper Shelly Beds(2)	21.00 – 22.00	-7.30 - -8.30	1.00	Stiff bluish grey mottled yellowish brown slightly sandy silty CLAY with occasional pockets (<20 mm) of soft calcrete.
Lambeth Group: Lower Mottled Beds [2]	22.00 – 25.00	-8.30 - -11.30	3.00	Stiff bluish grey mottled yellowish brown slightly sandy silty CLAY with occasional pockets (<20 mm) of soft calcrete Very dense light bluish grey mottled yellowish brown silty SAND

(1) Depth / elevation refers to top of stratum.

(2) Only encountered in BH02

9.2. Groundwater

Groundwater was encountered in a single location during the investigation, BH02, and constituted two seepages at 9.30m and 10.30m bgl, and one strike at 13.30m bgl. Details are presented in Table 9.2 and also in Appendix C.

Table 9.2 Groundwater details

Location Ref	Depth of inflow (m bgl)	Strata / Remarks
BH02	9.30	London Clay Formation / Seepage
BH02	10.30	London Clay Formation / Seepage
BH02	13.30	Lambeth Group / Strike

10. In Situ Testing

10.1. Standard Penetration Testing

Standard Penetration Tests were completed in all cable percussion and dynamic sampling boreholes. The tests were completed in accordance with BS EN ISO 22476-3.

Detailed SPT results are presented in Appendix C.

10.2. Parallel Seismic Testing

The parallel seismic technique operates by directing an elastic wave through a foundation from the surface and recording its arrival time at different depths below the surface. To perform the test a hydrophone is lowered down through a plastic pipe installed next to a pile in increments of 500mm and 1000mm. At each step, the top of the cap above the pile is struck, and the hydrophone records the resultant signal from the moment of impact. As the hydrophone descends, the signal will resolve itself, and the arrival time will gradually increase linearly with the depth. A constant velocity is expected within a concrete pile; typically, this is faster than the velocity of the surrounding sedimentary deposits.

When the hydrophone reaches the base of the pile, the additional signal path is through soil, not steel or concrete, and the first arrival time (FAT) will increase at a greater rate (i.e. the signal takes longer to arrive). The depth of the foundation is determined by the depth at which the rate of first arrival changes, and analysis of the data allows determination of this inflection point and hence the depth to the toe of the pile.

The original scope of works included Parallel Seismic (PS) testing in 2 No. boreholes. Due to encountering concrete to 3.10m depth below slab level during cable percussion drilling of BH01a, and further concrete encountered to 3.70m depth with diamond coring in this location; Parallel Seismic testing was omitted in BH01a. Consequently, 1 No. Parallel Seismic test was conducted to estimate the depth to the pile toe at BH02. The borehole was positioned within 1.00m of the target pile and a sealed HDPE 90mm ID pipe was installed to the base at 25.00m bgl. The pipe was filled with water and the volume surrounding the pipe backfilled with grout, which was introduced to the base of the borehole using a tremie pipe and grout pump.

Testing was carried out on the smooth flat surface of the pile cap directly above the pile with a trial pit adjacent to the borehole. A vibration was induced by striking the top of pile cap with the hammer whilst the hydrophone was lowered in metre increments for the first test and half-metre increments for the second test.

The test data recovered from site and subsequent interpretation present a good correlation of V1 and V2 response speeds and subsequent intersection point showing pile toe depth.

The parallel seismic testing was repeated at the borehole position. The results of the parallel seismic test are summarised in Table 10.3, with the full report presented in Appendix C.

Table 10.3 Parallel Seismic Survey

Pile Reference	BH02
Estimated Intersection (pile toe level (m OD))	-2.60
Estimated Pile Length (m)	16.30

10.3. Magnetometer Testing

Magnetometer testing was undertaken in 1 no. borehole location, BH02, to indicate the depth of rebar at the target pile. The original scope of works included magnetometer testing in 2 No. locations; however, due to encountering concrete to a maximum depth of 3.70m in BH01a, geophysical installation and magnetometer testing was not undertaken in this location.

Magnetometer testing was undertaken using a magnetometer probe, lowered at a steady rate down a 90mm diameter PVC installation pipe with measurements taken continuously to the base of the installation.

In the location of BH02, the magnetometer probe detected a strong signal to a depth of 9.80m, thereafter with the signal decreasing in strength. At a depth of 10.70m depth below slab level, no reading was detected. A total of 2 No. tests were undertaken with the same result.

11. Laboratory Testing

11.1. Geotechnical Laboratory Testing

Geotechnical laboratory testing was undertaken by GSTL Limited, a United Kingdom Accreditation Service (UKAS) accredited laboratory, in accordance with relevant standards.

The following type and number of tests scheduled are presented in Table 11.1. The results are presented in Table 11.2 and detailed results are presented in Appendix E.

Table 11.1 Geotechnical laboratory testing summary

Test description	Number of tests
Natural moisture content *BS 1377:1990 - Part 2 : 3.2*	10
4 Point Liquid and Plastic Limit *BS 1377:1990 - Part 2: 4.3 and 5.3*	10
Suite D (brownfield, pyrite present)(1)	3
Quick Undrained Triaxial – 100mm or 38mm single stage *BS 1377:1990 - Part 7 : 8*	10

(1) Includes *pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate*

(2) Includes *pH, water soluble sulphate, total sulphur, acid soluble sulphate*

Table 11.2 Summary of the geotechnical laboratory test results

Strata	Parameter	Value (min -max)
Made Ground	Water Soluble Sulphate (mg/L)	249 - 5420
	pH	7.5 – 9.8
Weathered London Clay Formation	Moisture Content	30 - 40
	Plasticity Index	52

Strata	Parameter	Value (min -max)
London Clay Formation	Moisture Content (%)	25 - 37
	Plasticity Index (%)	39 - 59
	Undrained Shear Strength (kPa)	32 - 106
	Water Soluble Sulphate (g/L)	47 - 1150
	pH	7.7 – 9.0
Lambeth Group: Upper Mottled Beds	Moisture Content (%)	18 - 29
	Plasticity Index (%)	27 - 39
	Undrained Shear Strength (kPa)	64 - 150
Lambeth Group: Laminated Beds	Moisture Content (%)	31
	Plasticity Index (%)	67
Lambeth Group: Upper Shelly Beds	Moisture Content (%)	12
	Undrained Shear Strength (kPa)	142
Lambeth Group: Lower Mottled Beds	Moisture Content (%)	22
	Plasticity Index (%)	33 - 42

11.2. Geoenvironmental Laboratory Testing

Selected soil and groundwater samples were sent for geoenvironmental laboratory testing which was undertaken by Derwentside Environmental Testing Services (DETS), a United Kingdom Accreditation Service (UKAS) accredited laboratory. The following type and number of tests scheduled is presented in Tables 11.3 and the results are presented in Appendix F.

Table 11.3 Geoenvironmental testing - soil

Test description	Number of tests
A2SI RA Suite [(1)]	5
Volatile Organic Compounds	1
Full Waste Acceptance Criteria	2
PCB WHO12	1

(1) A2SI Risk Assessment Suite includes: *Asbestos Identification, Metals, Anions. Inorganics, Fraction of Organic Carbon, pH, Soil Organic Matter, Total Organic Carbon, Polyaromatic Hydrocarbons (PAH16-MS), VPH/EPH (TPH CWG incl BTEX); Speciated Phenols by HPLC or GCMS, Total Cyanide, Sulphide (acid soluble), Sulphate (water soluble)*

11.3. Concrete Core Testing

A 100mm diameter concrete core sample was obtained from the pile exposed in TP02A. The original scope of works included the sampling of 2 no. cores, however, due to encountering mass concrete at the location of TP01a, core sampling was omitted at this location.

Results of the compressive strength, density and depth of carbonation testing for the core sample of the pile located at TP02A, are presented in Appendix G.

12. Gas and Groundwater Monitoring

3 No. rounds of gas and groundwater monitoring visits were undertaken between 8th and 21st November 2023. A summary is presented in Tables 12.1 & 12.2 The results are presented in Appendix H.

12.1. Ground Gas Monitoring

Gas monitoring was undertaken using a calibrated Gas Data GFM436 hand-held gas analyser and a calibrated MiniRae Lite ATEX Photo Ionisation Detector (PID) with a 10.6eV lamp and a summary is presented in Table 12.1.

Table 12.1 Summarised ground gas monitoring results

Exploratory hole reference	Minimum steady O_2 (%)	Maximum steady CO_2 (%)	Maximum steady CH_4 (%)	Maximum steady LEL (%)	H_2S (ppm)	CO (ppm)	Maximum PID (ppmv)
WS02	20.00	0.10	0.00	0.00	0	0	0.00
WS03	19.70	0.10	0.00	0.00	0	0	0.00
WS04	19.80	0.10	0.00	0.00	0	0	0.00

The monitoring programme includes 2 No. rounds during falling atmospheric pressure conditions. The atmospheric pressure recorded during each visit is presented in Table 12.2.

Table 12.2 Atmospheric pressure trends

Date (dd/mm/yyyy)	Time (hh:mm)	Atmospheric pressure reading
08/11/2023	09:14	1000
08/11/2023	10:32	999
15/11/2023	09:42	1000
15/11/2023	12:10	1003
21/11/2023	09:18	1005

Date (dd/mm/yyyy)	Time (hh:mm)	Atmospheric pressure reading
21/11/2023	13:52	1000

12.2. Groundwater Monitoring

The groundwater levels and any free phase liquids were measured using a calibrated Geotech Oil/Water Interface meter. Groundwater levels were recorded in the monitoring wells during the monitoring visits and the results are presented in Table 12.3.

Table 12.3 Groundwater monitoring results

Exploratory hole reference	Depth of monitoring well (m bgl)	Round 1 08/11/2023 (m bgl)	Round 2 15/11/2023 (m bgl)	Round 3 21/11/2023 (m bgl)	Notes
WS02	3.00	Dry	Dry	Dry	No free phase product detected
WS03	1.45	Dry	Dry	Dry	No free phase product detected
WS04	4.00	Dry	Dry	Dry	No free phase product detected

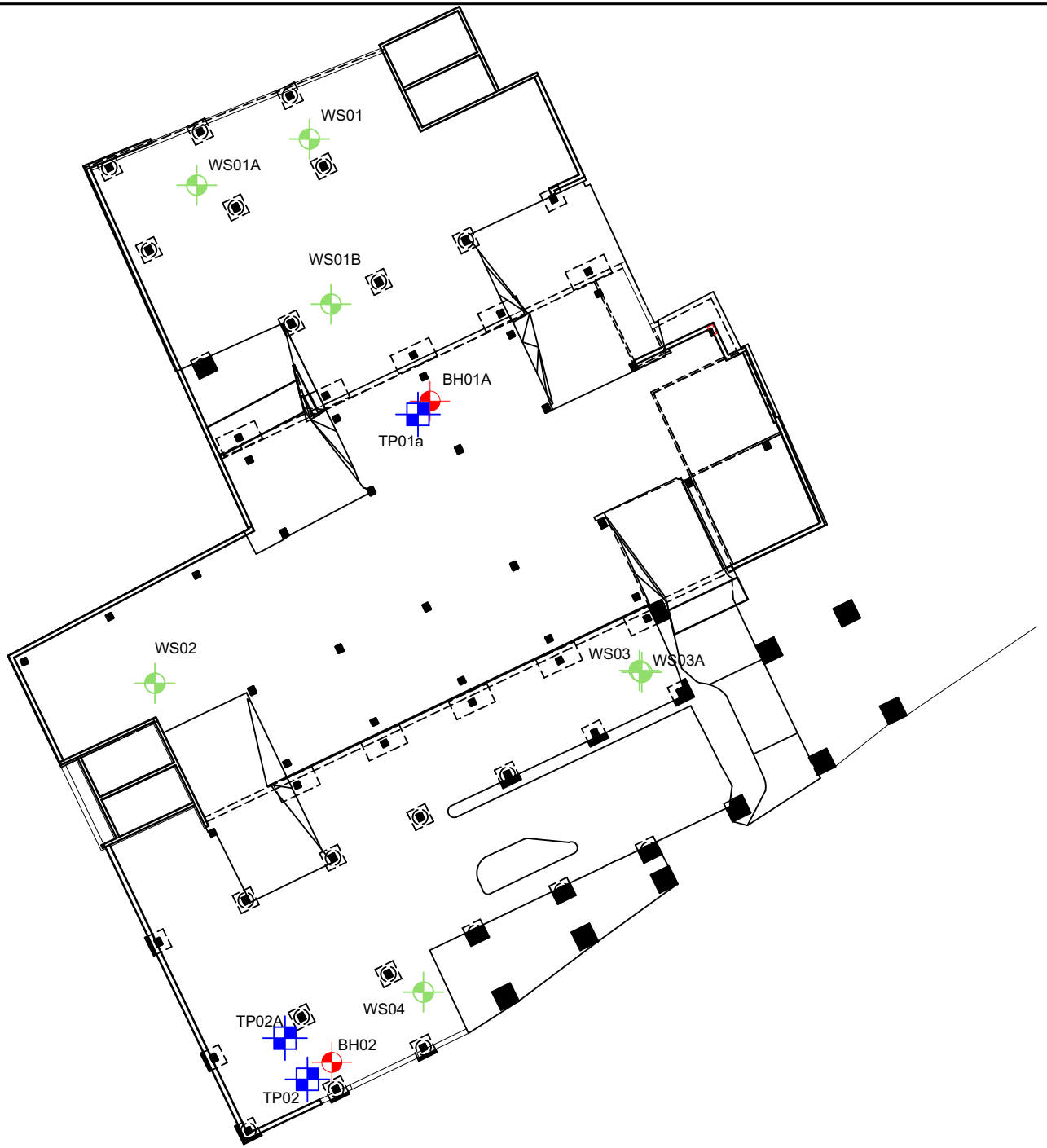
12.3. Groundwater Sampling

All sampling locations were reported as ‘dry’ during monitoring rounds; therefore, no water was sampled for geo-environmental analysis.

Appendix A: Summary of Exploratory Holes

Location ID	Type	Final Depth (m bgl)	Level (mOD)	Installation Depth (m)	Installation Response Zone (m)
BH01a	Cable Percussion	3.90	12.45	N/A	N/A
BH02	Cable Percussion	25.00	13.70	25.00	N/A
WS01	Dynamic Sampling	0.70	13.73	N/A	N/A
WS01A	Dynamic Sampling	0.70	13.75	N/A	N/A
WS01B	Dynamic Sampling	0.70	13.58	N/A	N/A
WS02	Dynamic Sampling	3.00	12.38	1.30	1.00 – 1.30
WS03	Dynamic Sampling	1.50	13.52	N/A	N/A
WS03A	Dynamic Sampling	1.45	13.52	1.45	1.00 – 1.45
WS04	Dynamic Sampling	4.00	13.69	3.00	1.00 – 3.30
TP01a	Trial Pit	2.50	12.45	N/A	N/A
TP02	Trial Pit	1.00	13.70	N/A	N/A
TP02A	Trial Pit	2.67	13.70	N/A	N/A

Appendix B: Exploratory Hole Location Plan



Key:

- Borehole
- Trial Pit - 1.2m
- Window Sample Borehole

Rev	Date	By	Chkd	Appd
00	2/11/2023	JAS	WM	DS

A2 Site Investigation

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London SE1 7XW
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www.a2-si.com

Client
Saffron Hill Investment Holdings Ltd

Project Title
Saffron Hill

Drawing Title
Exploratory Hole Location Plan

A2SI Project Number	Rev
38823	00

Drawing Number
38823-A2SI-XX-XX-DR-Y-0002-00

Appendix C: Exploratory Hole Logs, Trial Pit Sketches and In Situ Testing Results

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				BH01a
Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 20/10/2023 End 21/10/2023	12.45	E 531434.00 N 181956.00	3.90
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	Penetration Total	N60 Value	N Value	Reported Result

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks

Chiselling

Depth (m)	Duration

Water Added

From	To

Boring Progress and Backfill

Drilling Progress			Water	Casing		Backfill	
Date	Time	Depth (m)	Depth (m)	Depth (m)	Dia (mm)	Depth (m)	Backfill
10/20/2023	08:30	2.40		3.10	200	0.00 - 0.03	Asphalt
10/20/2023	02:00	3.10				0.03 - 0.22	Concrete
						0.22 - 0.32	ballast
						0.32 - 3.90	Arisings

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole positioned in base of trial pit with a starting depth of 2.40m bbl.
4. Borehole terminated at 3.10m depth on concrete. Coring methodology undertaken from 3.10m to 3.90m depth (core unable to be retrieved).
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB - Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP - Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM - Inclinometer
Hole Type
IP - Inspection Pit, TP-Trial Pit TT - Trial Trench
CP - Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS - Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Cable Percussion	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				BH01a
Job No: 38823	Start: 20/10/2023 End: 21/10/2023	Ground Level (mOD): 12.45	Co-Ordinates (Local Grid): E 531434.00 N 181956.00	Depth (m): 3.90
Client: Saffron Hill Investment Holdings Ltd		SPT Energy Ratio %:	Sheet: Sheet 1 of 1	Status: FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (BASEMENT SLAB)	0.00 (0.19) 0.19	12.26			
			Extremely weak light grey CONCRETE. 50-70% aggregate of sub-angular to well rounded fine to coarse predominantly of flint and type-1 material. Matrix is fine to coarse sand size. (MASS CONCRETE)	(2.91)				
			CONCRETE.	3.10 (0.60)	9.35			
			Potentially VOID or SOIL (core barrel dropped during coring 200mm, core/sample not recovered).	3.70 (0.20)	8.75 8.55			
			End of Borehole at 3.90m					

All dimensions in metres Scale 1:50	Contractor: A2 Site Investigation	Method: Cable Percussion	Logged By: JAS	Approved by: JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				BH02
Job No	Start 12/10/2023 End 18/10/2023	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823		13.70	E 531427.00 N 181927.00	25.00
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	Penetration Total	N60 Value	N Value	Reported Result
S	1.50				9	8	N=8 (1,2/2,2,2,2)
C	2.50				8	7	N=7 (1,2/1,2,2,2)
S	3.50				10	9	N=9 (1,2/2,2,2,3)
S	5.50				11	10	N=10 (2,2/2,2,2,4)
S	7.50				17	15	N=15 (2,3/3,4,4,4)
S	9.50				15	13	N=13 (2,2/3,3,4,3)
S	11.50				19	17	N=17 (2,3/4,4,4,5)
S	12.50				34	30	N=30 (3,4/5,8,8,9)
S	14.50				37	33	N=33 (5,7/8,8,8,9)
S	16.50				38	34	N=34 (5,6/8,8,9,9)
S	18.50				42	38	N=38 (6,9/8,9,10,11)
S	20.50				48	43	N=43 (10,15/10,10,11,12)
S	22.50						N=50 (10,12/50 for 265mm)
S	24.50						0 (75 for 60mm/0 for 0mm)

Boring Progress and Backfill

Drilling Progress			Water	Casing		Backfill	
Date	Time	Depth (m)	Depth (m)	Depth (m)	Dia (mm)	Depth (m)	Backfill
10/12/2023	01:00	1.50	3.2	4.50	200	0.00 - 0.30	Concrete
10/12/2023	03:00	2.50	17.3			0.30 - 1.00	Arisings
10/12/2023	04:00	3.00	18.4			1.00 - 25.00	Grout
10/13/2023	08:30	3.50	19.3				
10/13/2023	04:00	12.00	20				
10/16/2023	10:30	12.50	23.1				
10/16/2023	02:50	17.50	23.5				
10/16/2023	03:30	18.50					
10/16/2023	04:00	19.50					
10/17/2023	10:45	20.50					
10/17/2023	04:00	23.50					
10/18/2023	10:30	24.50					

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)
	9.30			4.50	
	10.30			4.50	
	13.30			4.50	

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks
12/10/2023	SP			

Chiselling

Depth (m)	Duration

Water Added

From	To
3.50	3.20

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole terminated at 25.00m blgfl due to encountering very dense sand.
4. Groundwater seepages encountered at 9.30m and 10.30m depth, and groundwater strike encountered at 13.30m depth .
5. Borehole backilled with arisings and reinstated as per original condition.

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB - Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP - Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM - Inclinometer
Hole Type
IP - Inspection Pit, TP-Trial Pit TT - Trial Trench
CP - Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS - Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor A2 Site Investigation	Method Cable Percussion	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				BH02
Job No	Start / End	Ground Level (mOD)	Co-Ordinates (Local Grid)	Depth (m)
38823	12/10/2023 / 18/10/2023	13.70	E 531427.00 N 181927.00	25.00
Client		SPT Energy Ratio %	Sheet	Status
Saffron Hill Investment Holdings Ltd		67	Sheet 1 of 3	FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (LOWER GROUND FLOOR SLAB)	0.00 (0.20)	13.50			
0.30 - 0.60	PID	VOC 0ppm		0.20 (0.10)	13.40			
0.30	B 1	VOC 0ppm		0.30				
0.40	PID		BALLAST. (MADE GROUND)					
0.40	ES 2	VOC 0ppm						
0.80 - 1.20	PID		Firm dark brown gravelly sandy CLAY with low cobble content. Gravel is angular to sub-angular fine to coarse of flint, brick, concrete, white fragments and occasional clinker. Cobbles are angular to sub-angular of brick. (MADE GROUND)					
0.80	B 3							
1.20	PID	VOC 0ppm						
1.20 - 1.50	B 4							
1.20	ES 5	N=8 (1,2/2,2,2,2)		(2.40)				
1.50 - 1.95	SPT		*0.80 to 1.20m - … with increasing sand content*					
1.50	SPT (D) 6		*1.20 to 3.10m - … becoming brown with decreasing sand content*					
2.00	PID	VOC 0ppm						
2.00 - 2.50	B 7							
2.00	ES 8							
2.50 - 2.95	SPT	N=7 (1,2/1,2,2,2)						
2.50	SPT (D) 9		*2.50 to 3.10m - … with increased flint gravel content*					
			Red BRICK recovered as angular to sub-angular sandy brick GRAVEL and COBBLES. (MADE GROUND)	2.70 (0.40)	11.00			
			Medium dense orangish brown sandy slightly clayey angular to sub-rounded fine to coarse GRAVEL with occasional pockets (<40mm) of brown slightly sandy clay. Sand is fine to coarse. (REWORKED HACKNEY GRAVEL MEMBER)	3.10 (0.30)	10.60			
3.50 - 3.95	SPT	N=9 (1,2/2,2,2,3)		3.40 (0.60)	10.30			
3.50	SPT (D) 10							
4.00	D 11		Firm brown slightly sandy silty CLAY with frequent partings of orange fine sand, and occasional angular to sub-angular fine to coarse flint gravel. Sand is fine to coarse. (REWORKED WEATHERED LONDON CLAY)	4.00	9.70			
4.50	UT 12		Firm brown and grey mottled sandy silty CLAY with frequent pockets of orangish brown fine and medium sand. Sand is fine and medium. (WEATHERED LONDON CLAY FORMATION)	(1.00)				
5.00	D 13		Firm extremely closely fissured brownish grey sandy silty CLAY with rare light grey bioturbations (generally <5mm). Sand is fine. (LONDON CLAY FORMATION)	5.00	8.70			
5.50 - 5.95	SPT	N=10						
5.50	SPT (D) 14	(2,2/2,2,2,4)	*5.50 to 12.95m - … becoming stiff micaceous*					
6.00	PID	VOC 0ppm						
6.00	ES 15							
6.50 - 6.95	UT 16	Ublow= 39						
7.00	D 17		*7.00 to 8.00m - … with occasional angular to sub-angular fine gravel size disarticulated white shells*					
7.50 - 7.95	SPT	N=15						
7.50	SPT (D) 18	(2,3/3,4,4,4)						
8.00	D 19		*8.00 to 9.00m - … with occasional pockets (<10mm) of brown silt*					
8.50 - 8.95	UT 20	Ublow= 42						
9.00	PID	VOC 0ppm		(7.95)				
9.00	D 21		*9.00 to 12.95m - … fissures becoming extremely closely to very closely spaced with partings of orangish brown fine sand*					
9.00	ES 22							
9.50 - 9.95	SPT	N=13						
9.50	SPT (D) 23	(2,2/3,3,4,3)	*9.50 to 12.95m - … with occasional pockets (<30mm) of very sandy silty clay.*					
10.00	D 24							

All dimensions in metres Scale 1:50	Contractor	Method	Logged By	Approved by
	A2 Site Investigation	Cable Percussion	JAS	JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				BH02
Job No	Start / End	Ground Level (mOD)	Co-Ordinates (Local Grid)	Depth (m)
38823	Start 12/10/2023 End 18/10/2023	13.70	E 531427.00 N 181927.00	25.00
Client		SPT Energy Ratio %	Sheet	Status
Saffron Hill Investment Holdings Ltd		67	Sheet 2 of 3	FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Firm extremely closely fissured brownish grey sandy silty CLAY with rare light grey bioturbations (generally <5mm). Sand is fine. (LONDON CLAY FORMATION)					
10.50 - 10.95	UT 25	Ublow= 58						
11.00	D 26							
11.50	SPT	N=17						
11.50	SPT (D) 27	(2,3/4,4,4,5)						
12.00	PID	VOC 0ppm						
12.00	D 29							
12.00	ES 28							
12.45 - 12.90	SPT (D) 30	N=30						
12.50	SPT	(3,4/5,8,8,9)						
13.00	D 31		Stiff light bluish grey and brown mottled sandy silty CLAY. Sand is fine and medium. (LAMBETH GROUP: UPPER MOTTLED BEDS)	12.95	0.75			
13.50	UT 32	Ublow= 41						
14.00	D 33		*14.00 to 15.00m - … becoming light bluish grey mottled brown*					
14.50	SPT	N=33						
14.50	SPT (D) 34	(5,7/8,8,8,9)						
15.00	D 36		*15.00 to 16.00m - … becoming brown mottled light grey and reddish brown slightly sandy with frequent pockets (<15 mm) of reddish brown silt.*					
15.00	ES 35							
15.50 - 15.95	UT 37	Ublow= 62						
16.00	D 38		*16.00 to 20.00m - … becoming sandy*					
16.50 - 16.95	SPT	N=34		(7.05)				
16.50	S 39	(5,6/8,8,9,9)						
17.00	D 40							
17.50 - 17.95	UT 41	Ublow= 81						
18.00	D 43		*18.00 to 18.50m - … with frequent pockets (<40mm) of reddish brown sandy silty clay*					
18.00	ES 42							
18.50 - 18.95	SPT	N=38						
18.50	S 44	(6,9/8,9,10,11)						
19.00	D 45		*19.00 to 20.00m - … with pockets (<50 mm) of light bluish grey silty clay/clayey silt*					
19.50 - 19.95	UT 46	Ublow= 100						
20.00	D 47			20.00	-6.30			

All dimensions in metres Scale 1:50	Contractor	Method	Logged By	Approved by
	A2 Site Investigation	Cable Percussion	JAS	JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				BH02
Job No	Start / End	Ground Level (mOD)	Co-Ordinates (Local Grid)	Depth (m)
38823	Start 12/10/2023 End 18/10/2023	13.70	E 531427.00 N 181927.00	25.00
Client		SPT Energy Ratio %	Sheet	Status
Saffron Hill Investment Holdings Ltd		67	Sheet 3 of 3	FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Stiff extremely closely to closely fissured dark grey slightly sandy silty CLAY with frequent light grey partings of silt. (LAMBETH GROUP: LAMINATED BEDS)	(0.20) 20.20	-6.50			
20.50 - 20.95 20.50	SPT S 48	N=43 (10,15/10,10,11,12)	Dense dark grey sandy locally clayey SILT. Sand is fine. (LAMBETH GROUP: LAMINATED BEDS)	(0.80)				
21.00 21.00	D 50 ES 49		Stiff dark grey locally greyish black sandy clayey SILT with occasional angular to sub-angular fine to coarse gravel size shell fragments. Sand is fine.	21.00	-7.30			
21.50 - 21.95	UT 51	Ublow= 100	(LAMBETH GROUP: UPPER SHELLY BEDS)	(1.00)				
			21.20 to 22.00m - … shells becoming abundant					
22.00	D 52		Stiff bluish grey mottled yellowish brown slightly sandy silty CLAY with occasional pockets (<20 mm) of soft calcrete. (LAMETH GROUP: LOWER MOTTLED BEDS)	22.00	-8.30			
22.50 - 22.95 22.50	SPT S 53	N=50 (10,12/50 for 265mm)						
23.00	D 54							
23.50 - 23.70	UT 55	Ublow= 100		(2.70)				
23.75	D 56							
24.00	D 57							
24.50	SPT	0 (75 for 60mm/0 for 0mm)						
			Very dense light bluish grey mottled yellowish brown silty fine and medium SAND (LAMBETH GROUP LOWER MOTTLED BEDS)	24.70 (0.30)	-11.00 -11.30			
			End of Borehole at 25.00m					

All dimensions in metres Scale 1:50	Contractor	Method	Logged By	Approved by
	A2 Site Investigation	Cable Percussion	JAS	JE

A2 Site Investigation

Borehole Log

Project	Borehole No
Saffron Hill	WS01

Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.73	E 531423.00 N 181973.00	0.70

Client	Status
Saffron Hill Investment Holdings Ltd	FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
							0.00 - 0.70	Concrete

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole terminated at 0.70m blgfl due to encountering extensive concrete.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS01
Job No: 38823	Start: 23/10/2023 End: 23/10/2023	Ground Level (mOD): 13.73	Co-Ordinates (Local Grid): E 531423.00 N 181973.00	Depth (m): 0.70
Client: Saffron Hill Investment Holdings Ltd		SPT Energy Ratio %:	Sheet: Sheet 1 of 1	Status: FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. Clasts are angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (LOWER GROUND FLOOR CONCRETE SLAB)	0.00 (0.19)				
			CONCRETE. (MASS CONCRETE)	0.19 (0.51)	13.54			
			End of Borehole at 0.70m		13.03			

All dimensions in metres Scale 1:50	Contractor: A2 Site Investigation	Method: Dynamic Sampling	Logged By: JAS	Approved by: JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS01A
Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.75	E 531419.00 N 181972.00	0.70
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
							0.00 - 0.70	Concrete

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole terminated at 0.70m blgfl due to encountering extensive concrete.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS01A
Job No: 38823	Start: 23/10/2023 End: 23/10/2023	Ground Level (mOD): 13.75	Co-Ordinates (Local Grid): E 531419.00 N 181972.00	Depth (m): 0.70
Client: Saffron Hill Investment Holdings Ltd		SPT Energy Ratio %:	Sheet: Sheet 1 of 1	Status: FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (LOWER GROUND FLOOR SLAB)	0.00 (0.19)				
			CONCRETE. (MASS CONCRETE)	0.19 (0.51)	13.56			
			End of Borehole at 0.70m		13.05			

All dimensions in metres Scale 1:50	Contractor: A2 Site Investigation	Method: Dynamic Sampling	Logged By: JAS	Approved by: JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS01B
Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.58	E 531422.00 N 181969.00	0.70
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result
C	0.70				0 (20 for 0mm/0 for 0mm)

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
							0.00 - 0.70	Concrete

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole terminated at 0.70m blgfl due to encountering extensive concrete.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project: Saffron Hill				Borehole No: WS01B
Job No: 38823	Start: 23/10/2023 End: 23/10/2023	Ground Level (mOD): 13.58	Co-Ordinates (Local Grid): E 531422.00 N 181969.00	Depth (m): 0.70
Client: Saffron Hill Investment Holdings Ltd		SPT Energy Ratio %: 78	Sheet: Sheet 1 of 1	Status: FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (BASEMENT SLAB)	0.00 (0.19)				
			CONCRETE. (MASS CONCRETE)	0.19 (0.51)	13.39			
0.70	SPT	0 (20 for 0mm/0 for 0mm)	End of Borehole at 0.70m		12.88			

All dimensions in metres Scale 1:50	Contractor: A2 Site Investigation	Method: Dynamic Sampling	Logged By: JAS	Approved by: JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS02
Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	12.38	E 531422.00 N 181940.00	3.00
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result
C	1.20			7	N=7 (1,1/1,2,2,2)
S	2.00			10	N=10 (2,2/2,2,3,3)
S	3.00			13	N=13 (3,3/3,3,3,4)

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks
23/10/2023	SP	1.30	1.00-1.30	

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks
1.20	87	100	
2.00	77	100	

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
10/23/2023	02:00	1.20					0.00 - 0.20	Concrete
10/23/2023	03:00	3.00					0.20 - 1.00	Bentonite
							1.00 - 1.30	Gravel
							1.30 - 3.00	Arisings

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole advanced to scheduled depth.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer, MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS02
Job No	Start / End	Ground Level (mOD)	Co-Ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	12.38	E 531422.00 N 181940.00	3.00
Client		SPT Energy Ratio %	Sheet	Status
Saffron Hill Investment Holdings Ltd		78	Sheet 1 of 1	FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (LOWER GROUND FLOOR SLAB)	0.00 (0.19) 0.19	12.19			
0.30 0.30	PID ES 1	VOC 0ppm	Medium dense dark brown clayey fine to coarse SAND and angular to sub-rounded fine to coarse GRAVEL with high cobble content. Gravel is angular to sub-rounded fine to coarse of flint, brick, concrete and glass fragments. Cobbles are sub-angular of brick. (MADE GROUND)	(0.26) 0.45	11.93			
1.10 1.10 1.20	PID ES 2 SPT	VOC 0ppm N=7 (1,1/1,2,2,2)	Firm dark brown sandy gravelly CLAY with medium cobble content. Gravel is angular to sub-rounded fine to coarse of flint, brick, concrete and carbonaceous fragments. Sand is fine to coarse. Cobbles are angular to sub-angular of brick. (MADE GROUND)	(0.85) 1.30	11.08			
2.00	SPT	N=10 (2,2/2,2,3,3)	Soft becoming firm brown mottled grey and orangish brown slightly sandy silty CLAY with rare pockets (<5mm) of soft black organic. Sand is fine. (WEATHERED LONDON CLAY FORMATION)	(1.70)				
3.00	SPT	N=13 (3,3/3,3,3,4)	End of Borehole at 3.00m		9.38			

All dimensions in metres Scale 1:50	Contractor	Method	Logged By	Approved by
	A2 Site Investigation	Dynamic Sampling	JAS	JE

A2 Site Investigation

Borehole Log

Project	Borehole No
Saffron Hill	WS03

Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.52	E 531447.00 N 181945.00	1.50

Client	Status
Saffron Hill Investment Holdings Ltd	FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result
S	1.20			16	N=16 (4,4/4,4,4,4)
S	1.50			16	N=16 (3,3/3,4,4,5)

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks
1.20	87	38	

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
10/23/2023	12:00	1.20					0.00 - 0.20	Concrete
10/23/2023	12:30	1.50					0.20 - 1.50	Arisings

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole effectively refused at 1.50m blgfl due to encountering an obstruction. Starter pit widened and new borehole advanced at WS03A.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS03
Job No: 38823	Start: 23/10/2023 End: 23/10/2023	Ground Level (mOD): 13.52	Co-Ordinates (Local Grid): E 531447.00 N 181945.00	Depth (m): 1.50
Client: Saffron Hill Investment Holdings Ltd		SPT Energy Ratio %: 78	Sheet: Sheet 1 of 1	Status: FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (LOWER GROUND FLOOR SLAB)	0.00 (0.19)				
			Loose dark brown clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to sub-rounded fine to coarse of flint, brick and concrete. Cobbles are angular to sub-angular of brick. (MADE GROUND)	0.19 (0.84)	13.33			
0.40 0.40	PID ES 1	VOC 1ppm						
			Soft dark brown gravelly sandy CLAY. Gravel is angular to sub-rounded fine to coarse of flint, brick and concrete fragments. Sand is fine to coarse. (MADE GROUND)	1.03 (0.47)	12.49			
1.10 1.10	PID ES 2	VOC 0ppm						
1.20	SPT	N=16 (4,4/4,4,4,4)						
1.50	SPT	N=16 (3,3/3,4,4,5)	End of Borehole at 1.50m		12.02			

All dimensions in metres Scale 1:50	Contractor: A2 Site Investigation	Method: Dynamic Sampling	Logged By: JAS	Approved by: JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS03A
Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.52	E 531447.00 N 181945.00	1.45
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks
23/10/2023	SP	1.45	1.00-1.45	

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
10/23/2023	01:00	1.20					0.00 - 0.20	Concrete
10/23/2023	01:15	1.50					0.20 - 1.00	Bentonite
							1.00 - 1.45	Gravel

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole effectively refused at 1.45m blgfl due to encountering an obstruction.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer,
MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS03A
Job No: 38823	Start: 23/10/2023 End: 23/10/2023	Ground Level (mOD): 13.52	Co-Ordinates (Local Grid): E 531447.00 N 181945.00	Depth (m): 1.45
Client: Saffron Hill Investment Holdings Ltd		SPT Energy Ratio %:	Sheet: Sheet 1 of 1	Status: FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (LOWER GROUND FLOOR SLAB)	0.00 (0.19)				
			Loose dark brown clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to sub-rounded fine to coarse of flint, brick and concrete. Cobbles are angular to sub-angular of brick. (MADE GROUND)	0.19 (0.84)	13.33			
			Soft dark brown gravelly sandy CLAY. Gravel is angular to sub-rounded fine to coarse of flint, brick and concrete fragments. Sand is fine to coarse. (MADE GROUND)	1.03 (0.42)	12.49			
			End of Borehole at 1.45m		12.07			

All dimensions in metres Scale 1:50	Contractor: A2 Site Investigation	Method: Dynamic Sampling	Logged By: JAS	Approved by: JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS04
Job No	Start / End	Ground Level (mOD)	Co-ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.69	E 531434.00 N 181931.00	4.00
Client				Status
Saffron Hill Investment Holdings Ltd				FINAL

Standard Penetration Test Summary

Test Type	Depth Top	Depth Casing	Depth Water	N Value	Reported Result
C	1.20			4	N=4 (2,1/1,1,1,1)
C	2.00			7	N=7 (1,1/2,2,2,1)
S	3.00			11	N=11 (2,2/2,3,3,3)
S	4.00			8	N=8 (2,2/2,2,2,2)

Installation / Instrument Details

Date	Instr. Type	To (m)	Response Zone (m)	Remarks
23/10/2023	SP	3.30	1.00-3.30	

Dynamic Sampling Runs

Depth Top	Dia. (mm)	Rec. %	Remarks
1.20	87	100	
2.00	77	100	
3.00	67	100	

Boring Progress and Backfill

Drilling Progress			Hole Diamater		Casing		Backfill	
Date	Time	Depth(m)	Depth(m)	Dia.(mm)	Depth (m)	Dia(mm)	Depth (m)	Backfill
10/23/2023	09:00	1.20					0.00 - 0.20	Concrete
10/23/2023	10:15	4.00					0.20 - 1.00	Bentonite
							1.00 - 3.30	Gravel
							3.30 - 4.00	Arisings

General Remarks

1. Borehole scanned with GPR, CAT & Genny prior to drilling.
2. UXO Engineer in attendance.
3. Borehole drilled beyond scheduled depth to prove natural boundary.
4. No groundwater encountered.
5. Borehole backilled with arisings and reinstated as per original condition.

Water Observations

Date/Time	Depth Strike (m)	Depth Casing (m)	Time Elapsed (min)	Depth Sealed (m)	Rose To (m)

Keys

SAMPLES
ES - Environmental Sample (Tub, Vial, Jar)
AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample,
LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

TESTS
S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer, MP-Mackintosh Probe, VOC-Volatile Organic Compound

INSTALLATION DETAILS
SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM – Inclinometer
Hole Type
IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling / Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

All dimensions in metres Scale 1:50	Contractor	A2 Site Investigation	Method	Dynamic Sampling	Logged by JAS	Approved by JE

A2 Site Investigation

Borehole Log

Project				Borehole No
Saffron Hill				WS04
Job No	Start / End	Ground Level (mOD)	Co-Ordinates (Local Grid)	Depth (m)
38823	Start 23/10/2023 End 23/10/2023	13.69	E 531434.00 N 181931.00	4.00
Client		SPT Energy Ratio %	Sheet	Status
Saffron Hill Investment Holdings Ltd		78	Sheet 1 of 1	FINAL

SAMPLES & TESTS			Stratum Description	Depth (thickness)	Reduced Level	Water	Legend	Instrument / Backfill
Depth (m)	Type No	Test Result						
			Light grey CONCRETE. 55-65% aggregate of angular to rounded fine to coarse of flint and type-1 material. Matrix is fine and medium sand. With occasional voids <4mm diameter. (BASEMENT SLAB)	0.00 (0.19) 0.19	13.50			
0.40 0.40	PID ES 1	VOC 0ppm	Loose to medium dense gravelly dark brown locally clayey fine to coarse SAND with medium cobble content. Cobbles are angular to sub-angular fine to coarse of flint, brick and occasional black carbonaceous fragments. Cobbles are angular to sub-angular fine to coarse of brick. (MADE GROUND)					
1.20	SPT	N=4 (2,1/1,1,1,1)						
1.40 1.40	PID ES 2	VOC 0ppm		(2.26)				
2.00	SPT	N=7 (1,1/2,2,2,1)						
2.50 2.50	PID ES 3	VOC 0ppm	Soft brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to sub-rounded fine to coarse of flint and brick fragments. Sand is fine and medium. (MADE GROUND)	2.45	11.24			
3.00	SPT	N=11 (2,2/2,3,3,3)		(0.85)				
			Firm brown slightly sandy silty CLAY with occasional partings of orange fine sand. (WEATHERED LONDON CLAY FORMATION)	3.30	10.39			
4.00	SPT	N=8 (2,2/2,2,2,2)		(0.70)				
			End of Borehole at 4.00m		9.69			

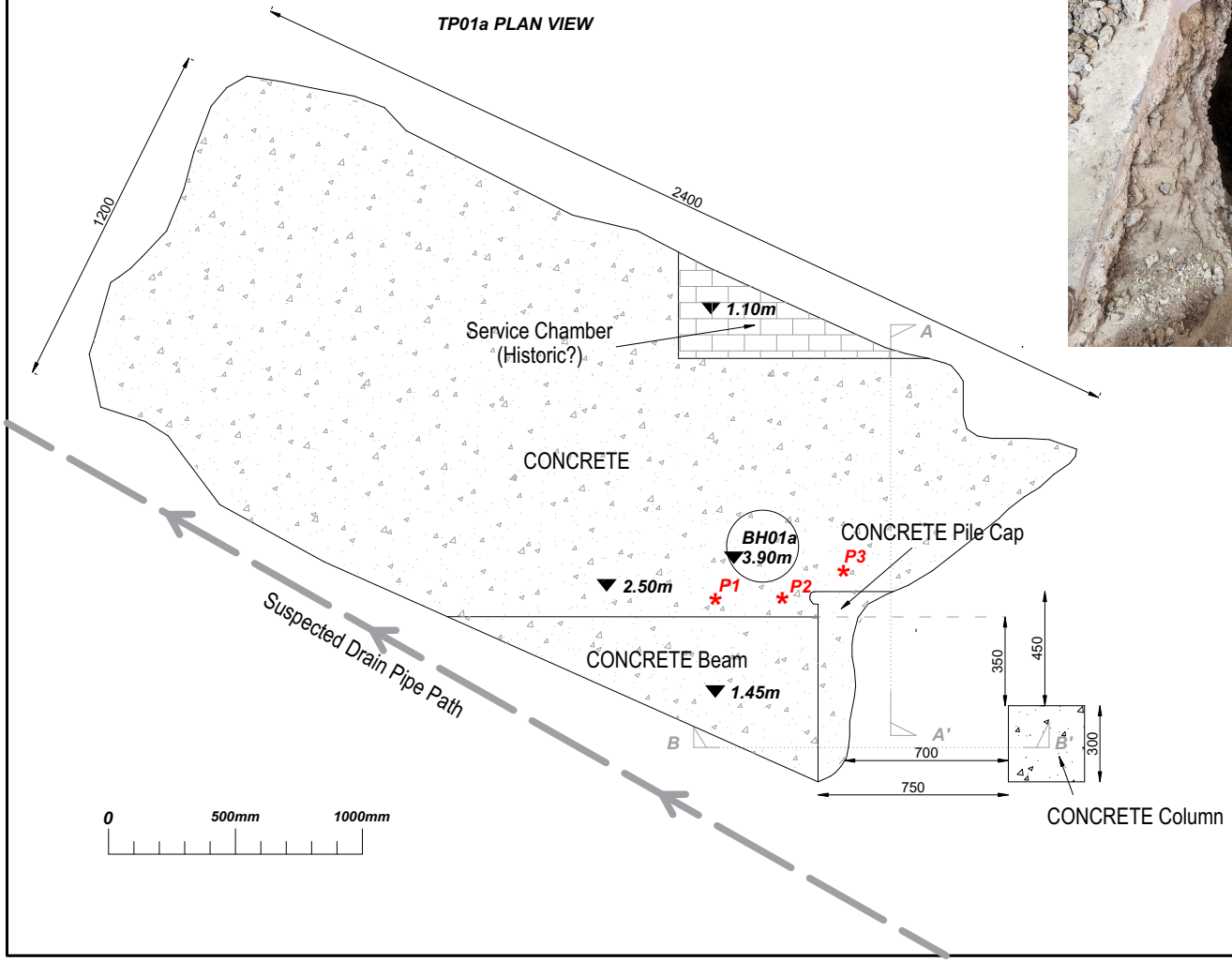
All dimensions in metres Scale 1:50	Contractor	Method	Logged By	Approved by
	A2 Site Investigation	Dynamic Sampling	JAS	JE

P3 * Probe Hole 1: Indicates CONCRETE to >500mm depth

P2 * Probe Hole 2: Indicates CONCRETE to >400mm depth

P1 * Probe Hole 1: Indicates CONCRETE to >500mm depth

TP01a PLAN VIEW



TP01a PHOTOGRAPH

Rev	Date	By	Chkd	Appd
00	3/11/2023	JAS	WM	DS

A2 Site Investigation

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Client
Saffron Hill Investments Holdings Ltd

Project Title
Saffron Hill

Drawing Title
TP01a Plan View Sketch

A2SI Project Number	Rev
38823	00

Drawing Number
38823-A2SI-XX-XX-DR-Y-0001-00