



Ground Gas Risk Assessment

at

30 - 48 Lawrence Road, Haringey, London N15 4EG

for

Findon Homes (UK) Ltd

Reference: 20922/GGRA/Rev1.1
October 2023

Control Document

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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.



Commission

Soils Limited was commissioned by Findon Homes (UK) Ltd to undertake a Ground Gas Risk Assessment on land at 30 - 48 Lawrence Road, Haringey, London N15 4EG. The scope of the investigation was outlined in the Soils Limited quotation reference Q27658, dated 25th April 2023 and change of request form reference 20922_1 dated 5th June 2023.

This document comprises the Ground Gas Risk Assessment (GGRA) and incorporates the results, discussion, and conclusions to this intrusive works.

This GGRA must be read in conjunction with:

- Preliminary Investigation Report (PIR) undertaken by Soils Limited, Report ref: 20922/PIR Rev1.1, dated June 2023
- Basement Impact Assessment (BIA) undertaken by Soils Limited, Report ref: 20922/BIA Rev1.1, dated July 2023

It is understood that Findon Homes (UK) Ltd is able to place full reliance on the above referenced reports which serve to inform the ground model upon which the discussions, conclusions and recommendations of this risk assessment are based.

This revised document (Rev 1.1) supersedes all previous revisions of the GGRA produced by Soils Limited.

Limitations and Disclaimers

This Ground Gas Risk Assessment relates to the site located at 30 - 48 Lawrence Road, Haringey, London, N15 4EG and was prepared for the sole benefit of Findon Homes (UK) Ltd (The “Client”). The report was prepared solely for the brief described in Section 1.1 of this report.

The contents, recommendations and advice given in the report are subject to the Terms and Conditions given in Quotation Q27658, dated 25/04/2023 accepted by the client in their Purchase Order Q27658, dated 09/05/2023.

Soils Limited disclaims any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

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The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also vary with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief. As such these do not necessarily address all aspects of ground behaviour at the site.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

If the term “competent person” is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

Within the report reference to ground level relates to the site level at the time of the investigation, unless otherwise stated.

Exploratory hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sample borehole implies the specific technique used to produce an exploratory hole.

Ownership of land brings with it onerous legal liabilities in respect of harm to the environment. “Contaminated Land” is defined in Section 57 of the Environment Act 1995 (Updated 2021) as:

“Land which is in such a condition by reason of substances in, on or under the land that significant harm is being caused or that there is a significant possibility of such harm being caused or that pollution of controlled waters is being, or is likely to be caused”.

Deleterious materials may be present in any Made Ground that pose a potential risk to site workers, end users and adjacent vulnerable receptors. These could include a range of contaminants, including asbestos, especially if the material includes large fractions of demolition derived materials.

All works are undertaken in the context of, and in compliance with, BS8485:2015+A1 2019 and LCRM (EA 2021) and all other pertinent planning, standards, documentation and guidance appropriate to the site at the time of production which may include, but are not necessarily limited to, documents provided by BS/CEN/ISO, NHBC, AGS, CIEH, CIRIA, SoBRA and CLAIRE.

The investigation, analysis or recommendations in respect of contamination are made solely in respect of the prevention of harm to vulnerable receptors, using where possible best practice at the date of preparation of the report. The investigation and report do not address, define or make recommendations in respect of environmental liabilities. A separate environmental audit and liaison with statutory authorities is required to address these issues.

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Contents

Section 1	Introduction.....	1
1.1	Objective of Investigation.....	1
1.2	Location	1
1.3	Site Description.....	1
1.4	Proposed Development	2
1.5	Anticipated Geology.....	2
1.5.1	Made Ground.....	2
1.5.2	London Clay Formation.....	2
Section 2	Site Works.....	4
2.1	Intrusive Site Works.....	4
2.2	Ground Gas Monitoring Well Installations	4
Section 3	Exploratory Hole Details.....	6
3.1	Ground Conditions	6
Section 4	Ground Model.....	7
4.1	General.....	7
4.2	Groundwater	7
Section 5	Ground Gas Monitoring.....	9
5.1	Conceptual Site Model.....	9
5.2	Methodology	9
5.3	Equipment used	9
5.4	Ground Gas Monitoring Results.....	10
Section 6	Ground Gas Risk Assessment	12
6.1	Data Quality	12
6.2	Ground Gas Risk Assessment.....	12
Section 7	Conclusion.....	14
7.1	Characteristic Gas Situation	14
7.2	Radon	14

List of Figures

Figure 1 – Site Location Map	16
Figure 2 – Aerial Photograph	17
Figure 3 – Trial Hole Plan	18

List of Tables

Table 2.1 Summary of Well Installations	4
Table 3.1 Final Depth of Exploratory Holes.....	6
Table 4.1 Ground Conditions	7
Table 4.2 Groundwater Monitoring.....	8
Table 5.1 Preliminary Conceptual Site Model	9
Table 5.2 Ground Gas Monitoring Results	11
Table 6.1 Review of Data Quality.....	12
Table 6.2 Ground Gas Data	12

List of Appendices

Appendix A Standards and Resources

Appendix B Field Work

Appendix B.1 Engineers Logs

Appendix B.2 Raw Gas Monitoring Data

Appendix C Calibration Certification

Appendix D Proposed Development

Section I Introduction

I.1 Objective of Investigation

Soils Limited was commissioned by Findon Homes (UK) Ltd to undertake a Ground Gas Risk Assessment to supply the client and their designers with information regarding the Ground Gas conditions prevalent on the site, to assist in informing the design of Ground Gas protection measures, where required.

The investigation was to be undertaken to understand the ground conditions and to the quantify the Ground Gas conditions present on site. The investigation was to be made by means of borehole well installations with subsequent monitoring visits over time to measure the insitu Ground Gas concentrations and flow rate.

Full reliance has been placed on the previously completed reports and investigations which have contributed to the forming of the ground model. These include;

- Preliminary Investigation Report (PIR) undertaken by Soils Limited, Report ref: 20922/PIR, dated June 2023
- Basement Impact Assessment (BIA) undertaken by Soils Limited, Report ref: 20922/BIA, dated July 2023

I.2 Location

The site was located at 30 - 48 Lawrence Road, Haringey, London N15 4EG and had an approximate O.S Land Ranger Grid Reference of TQ331893.

The site location plan is given in Figure 1.

I.3 Site Description

The site was located to the east of Lawrence Road, with a hardstanding car park connecting the single light industrial unit on site, with the road. Other structures on site included a two-storey office building connected to the west side (front) of the light industrial unit, and a single storey plant room on the southern site boundary. A second smaller car park with access gate to Lawrence Road existed in the southwestern corner of site. The light industrial unit, which was occupied by a dry-cleaning company, took up the majority of the site space. The site was topographically flat. Mature trees lined Lawrence Road, along the western site boundary. The site was bound to the north by residential space and a small workshop. The site was bound to the south and to the east respectively by residential flats and by residential houses with accompanying private gardens.

An aerial photograph of the site and its close environs has been included in Figure 2.

1.4 Proposed Development

The proposal alterations and extension to an existing building and erection of a residential building including ground floor commercial, cycle and car parking, hard and soft landscaping, and all other associated works.

In compiling this report reliance was placed on the following table:

Document	Reference No.	Rev.	Date	Author
Ground Floor Plan	038-BL-PL-XX-GF-DR-A-1501	P1	April 24	Boehm
First Floor Plan	038-BL-XX-SK-DR-A-1502	P2	February 23	Lynas Architekten
Second Floor Plan	038-BL-XX-SK-DR-A-1503	P2		
Third Floor Plan	038-BL-XX-SK-DR-A-1504	P2		
Fourth/Fifth Floor Plans	038-BL-XX-SK-DR-A-1505	P2		
Sixth/Seventh Floor Plans	038-BL-XX-SK-DR-A-1506	P2		
Basement	038-BL-XX-SK-DR-A-1507	P2		

The recommendations provided within this report are made exclusively in relation to the scheme outlined above and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Development plans provided by the client are presented in Appendix C.

1.5 Anticipated Geology

The 1:50,000 BGS map showed the site to be located directly upon the bedrock London Clay Formation. Made Ground was anticipated on site from the findings within the PIR.

1.5.1 Made Ground

Made Ground comprises material that has been placed by man or spread by man. It can comprise demolition material from former structures on the site or imported material placed to raise levels. Its composition can be very variable both laterally and with depth and may contain putrescible matter and voids.

1.5.2 London Clay Formation

The London Clay Formation comprises stiff grey fissured clay, weathering to brown near surface. Concretions of argillaceous limestone in nodular form (Claystones) occur throughout the formation. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay, and precautions against sulphate attack to concrete are sometimes required.

The upper boundary member of the London Clay Formation is known as the Claygate Member and marks the transition between the deep water, predominantly clay environment and succeeding shallow-water, sand environment of the Bagshot Formation.

The lower boundary is generally marked by a thin bed of well-rounded flint gravel and/or a glauconitic horizon. The formation overlies the Harwich Formation or where the Harwich Formation is absent the Lambeth Group.

In the north London area, the upper part of the London Clay Formation has been disturbed by periglacial action and may contain pockets of sand and gravel.

Section 2 Site Works

2.1 Intrusive Site Works

The intrusive project site works were designed to provide information on the ground conditions for the proposed mixed-use development. The intended investigation, as outlined within the Soils Limited quotation (Q27658, dated 25th April 2023) and subsequently documented within Soils Limited report ref: 20922/BIA, dated July 2023, comprised the following items:

- Service clearance of trial holes using Cable Avoidance Tool (CAT) and Signal Generator (Genny)
- Concrete coring crew to expedite the drilling works
- 2No. 15m cable percussion boreholes with sampling and in-situ testing (standard rig)
- 4No. 4m deep windowless sampler boreholes to take samples for contamination assessment
- 1No. 10m deep groundwater monitoring standpipe
- 6No. post site works groundwater level monitoring at monthly intervals
- Geotechnical laboratory testing
- Contamination laboratory testing.

All four windowless sampler boreholes were backfilled with gravel following completion, one borehole (BH1) was backfilled with arisings, and one borehole (BH2) was backfilled with gravel and bentonite following the installation of a monitoring well.

All exploratory hole locations have been presented in Figure 3.

Following completion of site works, soil cores were logged and sub-sampled so that samples could be sent to the laboratory for both contamination and geotechnical testing.

2.2 Ground Gas Monitoring Well Installations

On the 2nd June 2023 one cable percussive borehole was installed with a dual purpose Ground Gas and groundwater monitoring well. The well was installed to facilitate the ongoing monitoring of groundwater level, Ground Gas concentrations and flow rates.

Full details of the monitoring well installation are presented within Appendix B.1 and a summary of the well installation is presented in Table 3.1.

Table 2.1 Summary of Well Installations

Details	BH2
Cover type	Standard tamper proof flush cover
Head works	Gas tap with cone gas valve
Pipe Work	50mm OD HDPE Plain pipe for 0.00 to 1.50m then slotted to 10.00m bgl. Slotted section includes 12.1% 3mm slots with a solid end cap at base.

Details	BH2
Top seal	0.00 to 0.05 bgl (concrete) 0.05 to 1.50m bgl (bentonite pellets).
Filter pack	1.50 to 10.00m bgl 3-5mm washed gravel.
Note(s): The depths given in this table are taken from the ground level on-site at the time of investigation.	

Section 3 Exploratory Hole Details

3.1 Ground Conditions

On the 31st May and 1st June, two cable percussive boreholes were drilled using a DANDO 2000 drilling rig, to depths of 15.00m below ground level (bgl) at locations selected by Soils Limited. On 2nd June 2023 four windowless sampler boreholes (WS1 – WS4) were drilled, using a Premier Compact 110 Series drilling rig, to depths of 4.00m below ground level (bgl) at locations selected by Soils Limited. Starter pits were dug to 1.20m bgl to avoid contact with services at all exploratory hole locations.

A standpipe was installed within cable percussive borehole BH2, to allow for continued monitoring of both groundwater and ground gas.

Four super heavy dynamic probes, (DP1 – DP4) were driven prior and adjacent to their corresponding windowless sampler borehole to depths of 6.00m bgl. The maximum depths of exploratory holes have been included in Table 3.1.

All exploratory holes were scanned with a Cable Avoidance Tool (C.A.T.) and GENNY prior to excavation to ensure the health and safety of the operatives.

Table 3.1 Final Depth of Exploratory Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
BH1	15.00	BH2 ^W	15.00
WS1	4.00	DP1	6.00
WS2	4.00	DP2	6.00
WS3	4.00	DP3	6.00
WS4	4.00	DP4	6.00

Note(s): ^W - well installation. The depths given in this table are taken from the ground level on-site at the time of investigation.

The approximate exploratory hole locations are shown on Figure 3.

Section 4 Ground Model

4.1 General

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the exploratory hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots, or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference must be made to the detailed records given within Appendix B, but for the purposes of discussion, the succession of conditions encountered in the exploratory holes in descending order can be summarised as:

Made Ground (MG) Weathered London Clay Formation London Clay Formation (LCF)

The ground conditions encountered in the exploratory holes are summarised in Table 4.1.

Table 4.1 Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
MG	0.00	1.10 – 2.50	1.60	Soft greyish brown slightly sandy, slightly gravelly silty CLAY with flint, brick and concrete gravel.
wLCF	1.10 – 2.50	2.00 – 6.50	1.50	Soft greyish brown gravelly slightly sandy CLAY.
LCF ²	1.50 – 2.50	4.00 ¹ – 15.00 ¹	Not proven	Stiff thinly laminated brownish grey CLAY.

Note(s): ¹ Final depth of exploratory hole. ² Base of strata not encountered. The depths given in this table are taken from the ground level on-site at the time of investigation.

4.2 Groundwater

Groundwater was only encountered within three of the ten exploratory holes (DP2 – DP4) and was struck at depths ranging between 4.60m and 5.00m bgl. These values were inferred off of the probes when retrieving them from the ground.

The two deeper cable percussive boreholes did not record any water strikes, however this is likely due to the speed of drilling masking any strikes and/or seepages.

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigation was conducted in May/June (2023), when groundwater levels should be falling from their annual maximum (highest) which typically occurs around March to their annual minimum (lowest) elevation, which typically occurs around September.

Further groundwater monitoring was conducted within the standpipe installed on site following completion of site works and has been presented in Table 4.2.

Table 4.2 Groundwater Monitoring

Exploratory Hole	Well Depth (m bgl)	Depth to Water (m bgl)					
		06/06/23	29/06/23	12/07/23	27/07/23	02/08/23	14/08/23
BH2	10.00	6.66	1.76	1.63	1.59	1.55	1.67

Groundwater levels were found to be rising from installation in June at 6.66m bgl, to early August and a peak of 1.55m bgl. This is likely perched water in via the Made Ground and slightly more permeable weathered London Clay Formation, considering the extremely low expected permeability of the London Clay Formation.

July and August were especially wet months in comparison to expected summer weather. This may have attributed to the rise in groundwater level seen within the well.

Groundwater equilibrium conditions may only be conclusively established, if a series of observations are made via groundwater monitoring wells.

Section 5 Ground Gas Monitoring

5.1 Conceptual Site Model

The preliminary conceptual site model identified a low risk of Ground Gas due to the lack of permeable soils on site to transport ground gas. An excerpt from the revised conceptual site model included within 20922/BIA, dated July 2023, as presented within Table 5.1.

Table 5.1 Preliminary Conceptual Site Model

Potential Source (Ground Gas)	Pathway	Receptor	Risk ¹
Made Ground (Onsite)	Migration of gases through the Made	End User	Low
Jeeves of Belgravia (On site historic and current contaminative source)	Ground and weathered London Clay Formation	Site Worker	Low

Note(s): ¹= Risk is a function of probability and severity as defined fully within Soils Limited 20922/PIR, dated June 2023.

5.2 Methodology

The gas monitoring regime was designed in accordance with the principals of CIRIA:C665:2007 and BS:8576:2013 to allow the resultant data to be considered in the context of potential protective options in accordance with BS:8485+A1:2019.

The gas hazard was assessed as being low and the proposed end use, residential flats, was assessed as being moderate (see CIRIA C665 Table 4.2 and Table 5.5a).

The location and response zone of the well installation was designed to target the potential sources and pathways, in accordance with BS:8576.

The monitoring frequency and period were designed in accordance with CIRIA C665 Table 5.5a and Table 5.5b based on the classification of the potential source and of the sensitivity of the receptor. A total of six monitoring visits were conducted at fortnightly intervals, over a period of three months to give the best chance of capturing the “worst case” scenario whereby the general atmospheric conditions are low and falling pressure.

The initial monitoring visit was conducted a minimum of seven days after construction of the borehole to allow for the gas within the well to reach equilibrium.

5.3 Equipment used

The well installation was monitored using a Gas Data GFM 435 (serial number 11555) equipped with flow meter, methane, LEL, carbon dioxide, oxygen, hydrogen sulphide and carbon monoxide sensors. In addition, a Multirae lite (serial number M01C01191) photo ionising detector (PID), fitted with a 10.6ev bulb was used to screen for VOC's/SVOC's, where indicated likely in the conceptual site model.

The gas meter and PID are calibrated and serviced on an annual basis with certification available on request.

Details of the gas meter and PID used on each visit has been recorded on the raw data included within Appendix B.2.

5.4 Ground Gas Monitoring Results

Ground Gas measurements were taken of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide and volatile organic concentrations, as well as flow rates, ambient pressure, differential pressure and groundwater level.

Ambient pressure was recorded at each location prior to connecting the gas meter to the well installation. Once connected to the borehole the tap was opened and a flow reading was taken, once a steady flow reading had been recorded peak and steady Ground Gas readings were taken. In order to calculate the worst case situation the values presented in Table 5.2 and taken through into the Ground Gas risk assessment are peak readings.

A summary of the gas monitoring results is presented in Table 5.2.

Table 5.2 Ground Gas Monitoring Results

Date (Baro Trend)	Exploratory Hole	CH ₄ (%v/v)	CO ₂ (%v/v)	O ₂ (%v/v)	H ₂ S (ppm)	CO (ppm)	LEL (%)	aP (mb)	Flow (l/h)	Dp	H ₂ O (m bgl)	VOC (ppm)
06/06/2023 (Rising)	BH2	<0.1	0.8	18.3	<1	<1	<2	1023	<0.1	<1	6.66	<0.1
29/06/2023 (Falling)	BH2	<0.1	1.9	18.8	<1	<1	<2	1016	<0.1	<1	1.76	3.1
12/07/2023 (Falling)	BH2	<0.1	1.8	18.9	<1	<1	<2	1011	<0.1	<1	1.63	0.4
27/07/2023 (Falling)	BH2	<0.1	2.2	18.7	<1	<1	<2	1001	<0.1	<1	1.59	6.1
02/08/2023 (Falling)	BH2	<0.1	2.2	18.5	<1	<1	<2	986	<0.1	<1	1.55	0.6
14/08/2023 (Rising)	BH2	<0.1	2.4	18.2	<1	<1	<2	1008	<0.1	<1	1.67	1.6
Minimum		<0.1	0.8	18.2	<1	<1	<2	986	<0.1	<1	6.66	<0.1
Maximum		<0.1	2.4	18.9	<1	<1	<2	1023	<0.1	<1	1.55	6.1

Note: Published barometric pressure trend data were obtained for each monitoring visit (data from weatheronline.co.uk).

G.L. – Ground Level ¹ No readings were undertaken for WS3 and WS1 during the first and sixth site visit respectively, due to groundwater being present at ground level.

Section 6 Ground Gas Risk Assessment

6.1 Data Quality

A review was made of the quality of the available data for the site, which can be viewed in Table 2. CIRIA 665 (2007) and BS 8485:2015 + A1:2019 stress the need for risk assessments to be based on good quality data and give guidance as to best practice in this respect.

Table 6.1 Review of Data Quality

Data Type	Current Situation	UK Best Practice
Geological and hydro-geological conditions	Geology and hydrogeology are understood to be fully understood as presented in 20922/BIA, dated July 2023 and 20922/PIR, dated June 2023.	CIRA 665, Wilson and Card (2007) and BS 8485:2015 + A1:2019 recommend that geology and hydrogeology be fully understood.
Monitoring period	The monitoring has been undertaken on a total of six occasions over a ten-week period. Monitoring has been undertaken over a range of weather conditions including low and high atmospheric pressures.	CIRIA 665 recommends approximately 3-month monitoring over a range of weather conditions.
Gas data sets	Borehole flow velocity and borehole gas has been measured on each monitoring occasion.	Borehole flow velocity and borehole gas volume required to define characteristic gas saturation. Modified Wilson and Card, Table 8.5 of CIRIA 665 (2006)/Table 2 of BS 8485:2015 + A1:2019.

The data quality can be characterised as good overall, covering a range of atmospheric pressures including a low-pressure event with an ambient pressure of <1000mb. The geological and hydrological conditions have been investigated previously and are considered to be fully understood in relation to Ground Gas.

6.2 Ground Gas Risk Assessment

The minimum and maximum Ground Gas concentrations have been summarised in Table 6.2. The full set of results has been summarised in Table 5.2 and the full set of field data is presented within Appendix B.2.

Table 6.2 Ground Gas Data

Range	CH₄ (%v/v)	LEL CH₄ (%v/v)	CO₂ (%v/v)	O₂ (%v/v)	H₂S (ppm)	CO (ppm)	aP (mb)	Flow (l/hr)	VOC (ppm)
Minimum	<0.1	0.8	18.2	<1	<1	<2	986	<0.1	<1
Maximum	<0.1	2.4	18.9	<1	<1	<2	1023	<0.1	<1

Based on the documentation presented in the “BS 8485:2015+A1:2019”, Code of practice for the design of protective measures for Methane and Carbon Dioxide ground gases for new buildings” the hazardous gas flow rate (Q_{hg}) was calculated using Equation 1:

$$Q_{hg} = \left(\frac{C_{hg}}{100} \right) \times q \quad \text{Equation 1}$$

Where:

C_{hg} is the measured hazardous gas concentration in percentage volume-by-volume

q is the flow rate in litres per hour of combined gases found by direct measurement – where the flow rate is zero or below the detection level of the instrument, this must default to the detection limit, in this case 0.1 ltr/hr.

Consequently, the Q_{hg} using carbon dioxide as the maximum C_{hg} was calculated using Equation 1. The flow rate used was <0.1 l/hr (maximum flow rate recorded).

$$Q_{hg} = \left(\frac{2.4}{100} \right) \times 0.1 = 0.0024 \text{ l/h}$$

Based upon the site characteristic hazardous gas flow rate (Q_{hg}) the characteristic gas situation (CS) would be classified as CS1, as this is below the CS1/CS2 threshold of 0.07.

Therefore, as the site falls into a Characteristic Gas Situation 1 (or CS1), no gas protection measures should be emplaced in accordance with BS 8485:2015.

No signs of active generation are present (no Methane, Hydrogen Sulphide, Carbon Monoxide <1). VOC levels were consistently <10ppm. The site is liable to be subject to significant piston effects locally, as evidenced by the significant variations in water levels over time.

Section 7 Conclusion

7.1 Characteristic Gas Situation

On the basis of the Ground Gas monitoring undertaken to date, a gas risk has been confirmed as being present on-site. The gas concentrations present are typical of a low risk source and confirm the risk as hypothesised within the CSM.

Therefore it is considered that the design of the gas monitoring regime was appropriate to the sources, pathways and receptors identified. As such no further monitoring is indicated at this time and the monitoring which has been undertaken to date is in compliance with appropriate guidance and the quality of the data are considered good.

The technical results of the initial characterisation of the Ground Gas regime, accepting a low risk as having been confirmed in this case, classifies the site as **Characteristic Situation 1 (CS1)**, as no sources or evidence of active gas or vapour generation have been noted. Therefore, ground gas building protection measures are not considered necessary within the property.

7.2 Radon

Soils Limited 20922/PIR dated June 2023 detailed that the Landmark Report, attached to the PIR, indicated that the site was situated within a low probability radon area (<1% of homes are estimated to be at or above the Action Level), and where radon protection measures will not be required within the proposed new development.

List of Figures

Figure 1 – Site Location Map	16
Figure 2 – Aerial Photograph	17
Figure 3 – Trial Hole Plan	18

List of Appendices

Appendix A Standards and Resources

Appendix B Field Work

Appendix B.1 Engineers Logs

Appendix B.2 Raw Gas Monitoring Data

Appendix C Calibration Certification

Appendix D Proposed Development

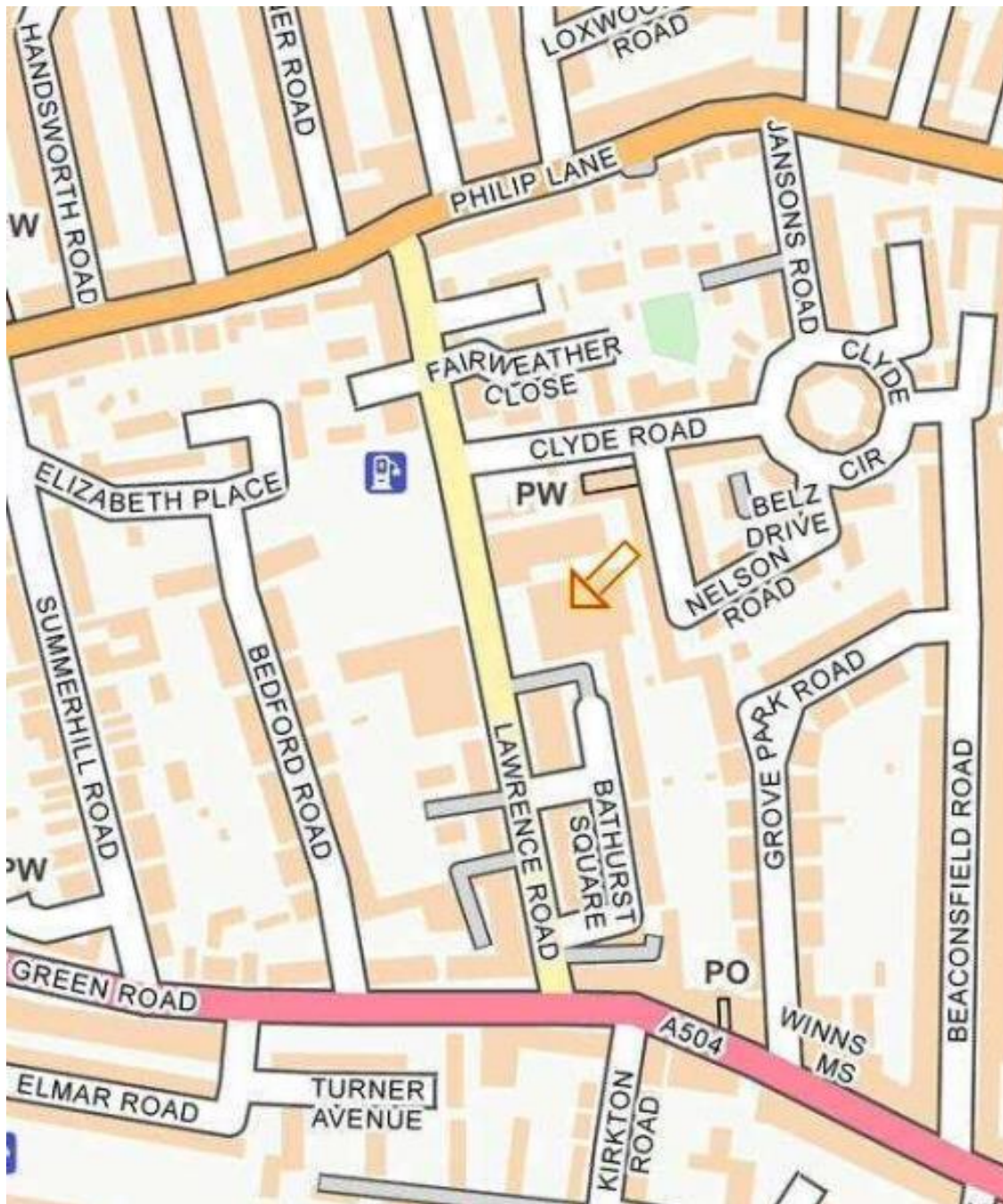


Figure 1 – Site Location Map



Job Number
20922

Project
30 - 48 Lawrence Road, Haringey, London, N15 4EG

Client
Findon Homes (UK) Ltd

Date
October 2023



Figure 2 – Aerial Photograph

Project

30 - 48 Lawrence Road, Haringey,
London, N15 4EG

Client

Findon Homes (UK) Ltd

Date

October 2023

Job Number

20922





Figure 3 – Trial Hole Plan

Project

30 - 48 Lawrence Road, Haringey,
London, N15 4EG

Client

Findon Homes (UK) Ltd

Date

October 2023

Job Number

20922



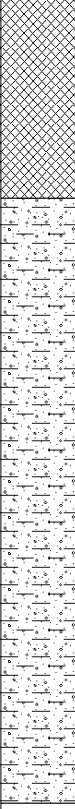
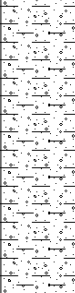
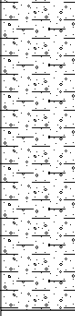
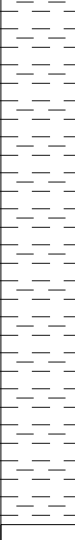
Appendix A Standards and Resources

The site works and monitoring was undertaken in accordance with the following standards where applicable:

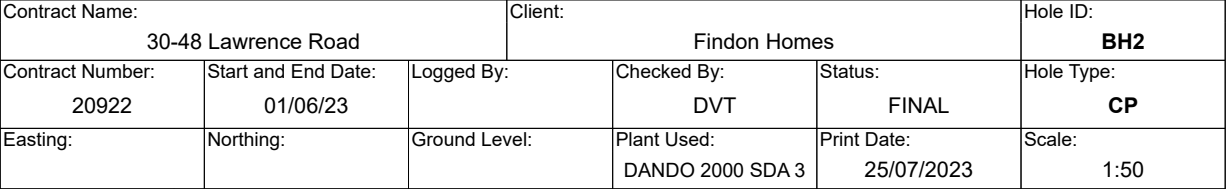
- BS 8485:2015+A1:2019
- BS 8576:2013
- BS 5930:2015+A1:2020
- NHBC Report Edition 04 2007 as updated
- CIRIA 665
- CIRIA 682
- CIRIA 735
- CLAIR RB17

Appendix B Field Work

Appendix B.1 Engineers Logs

	Contract Name: 30-48 Lawrence Road				Client: Findon Homes				Hole ID: BH1						
	Contract Number: 20922		Start and End Date: 31/05/23		Logged By:		Checked By: DVT		Status: FINAL		Hole Type: CP				
	Easting:		Northing:		Ground Level:		Plant Used: DANDO 2000 SDA 3		Print Date: 25/07/2023		Scale: 1:50				
Weather:			Termination: EoH				SPT Hammer: SDA3 Energy Ratio: 74%				Sheet 1 of 2				
Samples & In Situ Testing				Strata Details								Groundwater			
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/ Installation		
0.20 - 0.40	B			0.20		CONCRETE									
0.40 - 0.80	B			0.40		MADE GROUND									
0.80 - 1.20	B			0.60		CONCRETE									
				(0.30)		MADE GROUND									
1.50 - 1.95	U	N=8 (2,2/1,2,2,3)		0.90		Firm yellowish brown slightly sandy very gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular flint, quartz, brick and ceramic material. MADE GROUND	1								
				(1.60)			2								
2.00	D			3											
2.50	SPT			2.50			Soft becoming firm greyish brown gravelly slightly sandy CLAY. Sand was fine. Gravel is fine to coarse subangular consisting of flint. WEATHERED LONDON CLAY FORMATION	3							
2.50 - 2.95				4											
3.50 - 3.95	U			5											
4.00	D			6											
4.50	SPT			N=8 (2,1/2,2,2,2)		(4.00)		7							
4.50 - 4.95								8							
5.50	D			9											
6.00 - 6.45	U	10													
6.50	D	N=18 (3,3/4,4,5,5)		6.50		Stiff thinly laminated brownish grey CLAY. LONDON CLAY FORMATION	10								
6.50 - 7.00							10								
7.00	D	10													
7.50	SPT	N=18 (3,3/4,4,5,5)					10								
7.50 - 7.95							10								
8.00	D	10													
8.50	D	10													
9.00 - 9.45	U	10													
9.50	D	10													
10.00	D	10													
Start & End of Shift Observations				Borehole Diameter		Casing Diameter		Remarks:							
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)							Dia (mm)	
Chiselling				Installation				Water Strikes							
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	
												0	0.00	No groundwater encountered	
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.															

	Contract Name: 30-48 Lawrence Road				Client: Findon Homes				Hole ID: BH1									
	Contract Number: 20922		Start and End Date: 31/05/23		Logged By:		Checked By: DVT		Status: FINAL		Hole Type: CP							
	Easting:		Northing:		Ground Level:		Plant Used: DANDO 2000 SDA 3		Print Date: 25/07/2023		Scale: 1:50							
Weather:			Termination: EoH				SPT Hammer: SDA3 Energy Ratio: 74%				Sheet 2 of 2							
Samples & In Situ Testing				Strata Details								Groundwater						
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation					
10.50 10.50 - 10.95	SPT	N=22 (4,3/4,6,6,6)		(8.50)		Stiff thinly laminated brownish grey CLAY. LONDON CLAY FORMATION						11						
11.50	ED											12						
12.00 - 12.45	U											13						
12.50	D											14						
13.00	D											15						
13.50 13.50 - 13.95	SPT	N=25 (4,5/5,6,6,8)										16						
14.50	D											17						
15.00 - 15.45	U											18						
15.50	D			19	End of Borehole at 15.00m						20							
Start & End of Shift Observations				Borehole Diameter							Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)							Depth (m)	Dia (mm)					Depth (m)	Dia (mm)
Chiselling				Installation				Water Strikes										
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks				
												0	0.00	No groundwater encountered				
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.																		



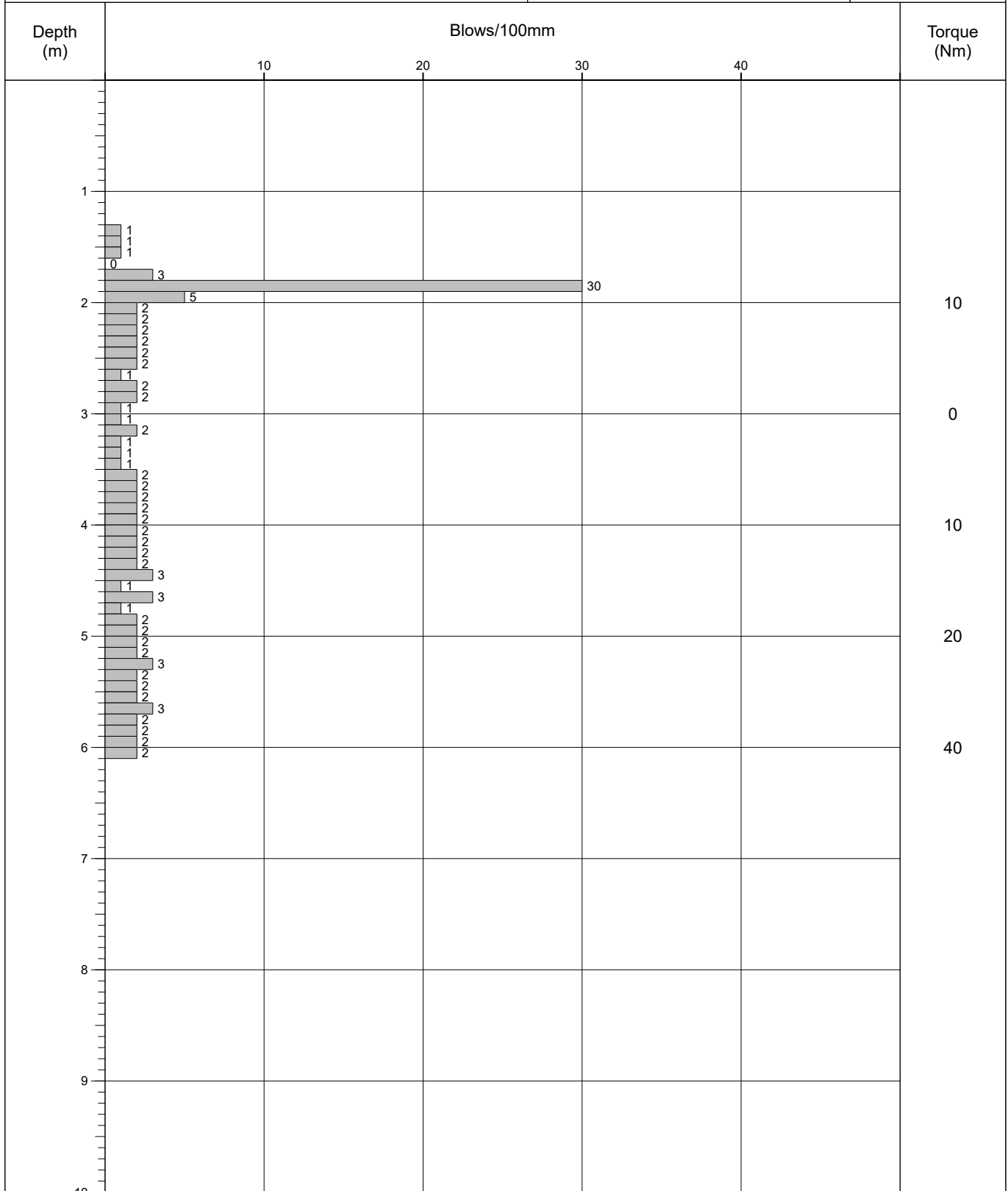
Weather:	Termination: EoH	SPT Hammer: SDA3 Energy Ratio: 74%	Sheet 1 of 2
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Samples & In Situ Testing			Strata Details							Groundwater							
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description				Water Strike	Backfill/ Installation						
0.20 - 0.40	B			0.20		TARMAC		1									
0.40 - 0.80	B			0.30		MADE GROUND											
				0.40		CONCRETE											
				(0.40)		MADE GROUND											
0.80 - 1.20	B	N=6 (1,1/2,1,2,1)		0.80		Soft brown slightly sandy gravelly REWORKED CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular flint. MADE GROUND		1									
				(0.70)													
1.50	SPT			1.50		Soft brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium flint. WEATHERED LONDON CLAY FORMATION						2					
1.50 - 1.95				(1.50)													
2.50 - 2.95	U	N=14 (2,2/3,3,4,4)		(3.50)				3									
3.00	D										3.00		Soft becoming firm greyish brown slightly sandy CLAY. Sand was fine. LONDON CLAY FORMATION				
3.50	SPT														4		
3.50 - 3.95																	
4.50 - 4.95	U	N=17 (2,3/3,4,4,6)		(3.50)				5									
5.00	D																
5.50	D														6		
6.00	SPT																
6.00 - 6.45																	
6.50 - 7.00	B	N=19 (2,3/3,4,4,6)		6.50		Stiff thinly laminated brownish grey CLAY. LONDON CLAY FORMATION		7									
																	
7.50 - 7.95	U											8					
8.00	D																
8.50	D	N=19 (3,3/4,5,5,5)						9									
9.00	SPT																
9.00 - 9.45															10		
10.00	D																

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.50	PLAIN	50				0	0.00	No groundwater encountered
					1.50	10.00	SLOTTED	50						
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.														

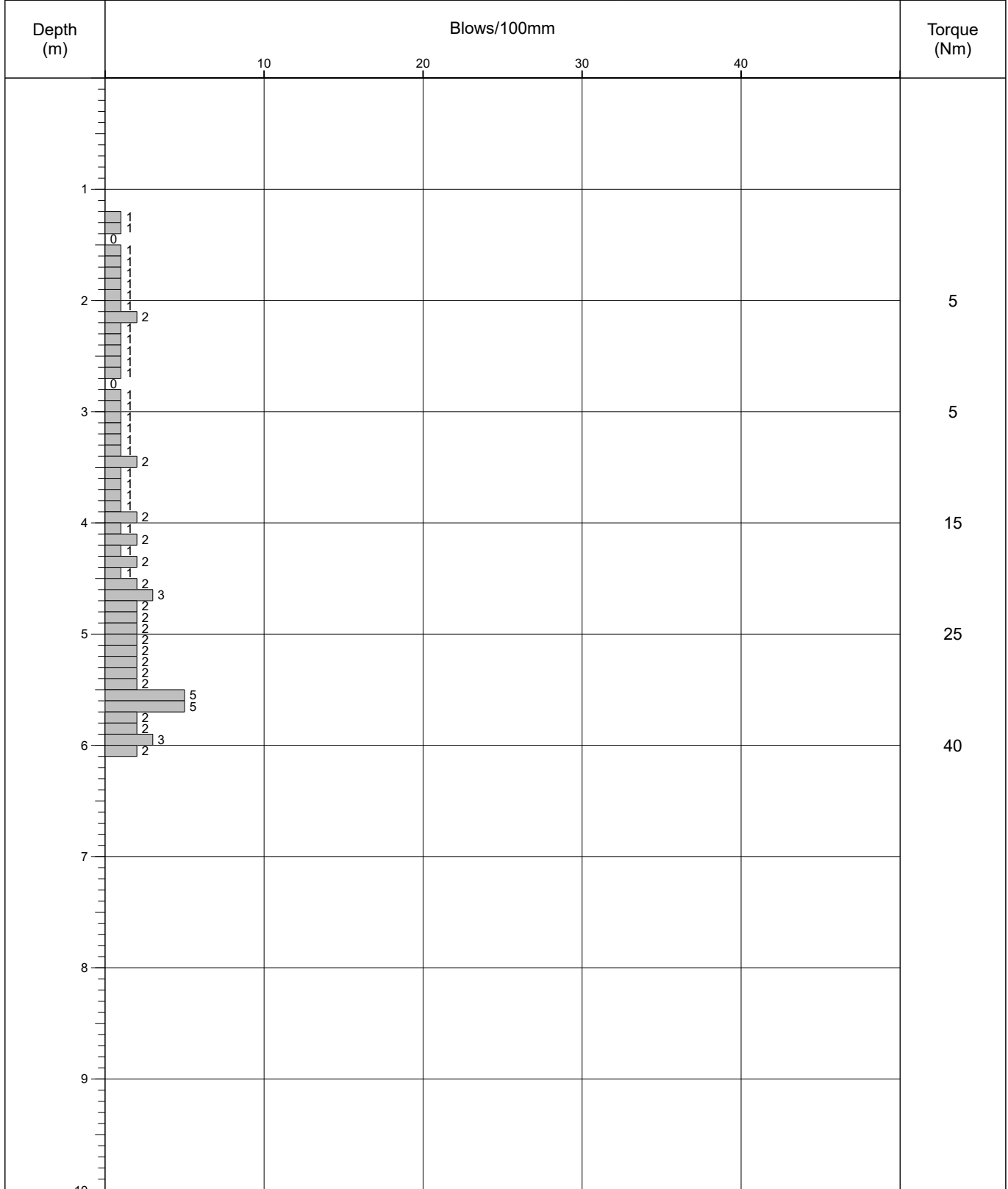
soils L I M I T E D				Contract Name: 30-48 Lawrence Road				Client: Findon Homes				Hole ID: BH2			
				Contract Number: 20922		Start and End Date: 01/06/23		Logged By:		Checked By: DVT		Status: FINAL		Hole Type: CP	
				Easting:		Northing:		Ground Level:		Plant Used: DANDO 2000 SDA 3		Print Date: 25/07/2023		Scale: 1:50	
Weather:				Termination: EoH				SPT Hammer: SDA3 Energy Ratio: 74%				Sheet 2 of 2			
Samples & In Situ Testing				Strata Details								Groundwater			
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation		
10.50 - 10.95	U	N=22 (4,3/4,5,7,6)		(8.50)		Stiff thinly laminated brownish grey CLAY. LONDON CLAY FORMATION						11			
11.00	D														
11.50	D														
12.00	SPT														
12.00 - 12.45															
13.00	D	N=27 (4,4/6,6,7,8)		15.00		End of Borehole at 15.00m						13			
13.50 - 13.95	U														
14.00	D														
14.50	D														
15.00	SPT														
15.00 - 15.45												12			
												14			
												15			
												16			
												17			
												18			
												19			
												20			
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:						
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)							
Chiselling					Installation				Water Strikes						
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	
					0.00	1.50	PLAIN	50				0	0.00	No groundwater encountered	
					1.50	10.00	SLOTTED	50							
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.															

Project Name:	30-48 Lawrence Road	Project No.	20922	Co-ords:		Hole Type	DP
Location:	Haringey, N15 4EG	Level:	m AOD			Scale	1:50
Client:	Findon Homes	Dates:	02/06/2023			Logged By	GJB



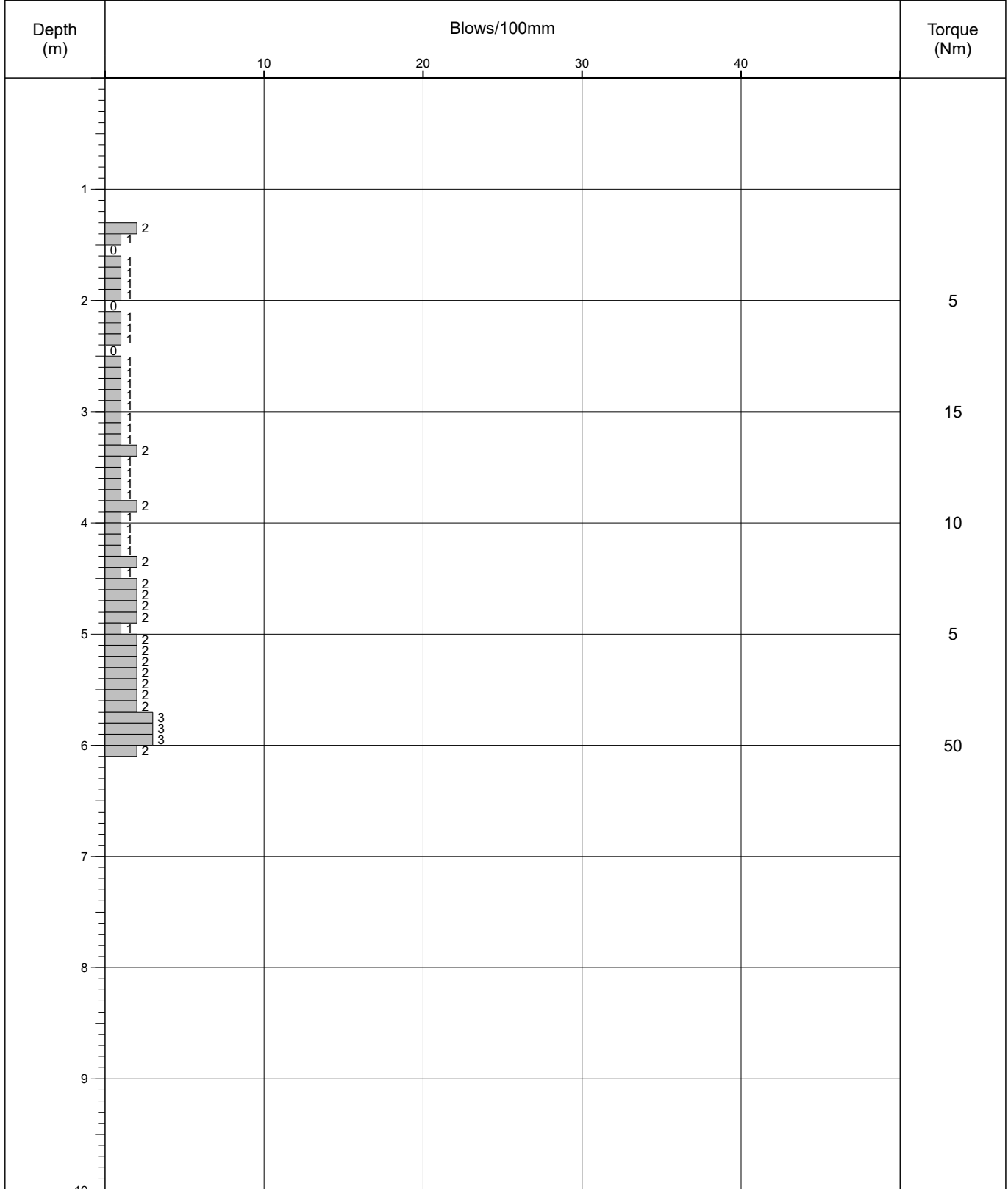
Remarks	Fall Height	760mm	Cone Base Diameter	mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

Project Name:	30-48 Lawrence Road	Project No.	20922	Co-ords:		Hole Type	DP
Location:	Haringey, N15 4EG	Level:	m AOD			Scale	1:50
Client:	Findon Homes	Dates:	02/06/2023			Logged By	GJB



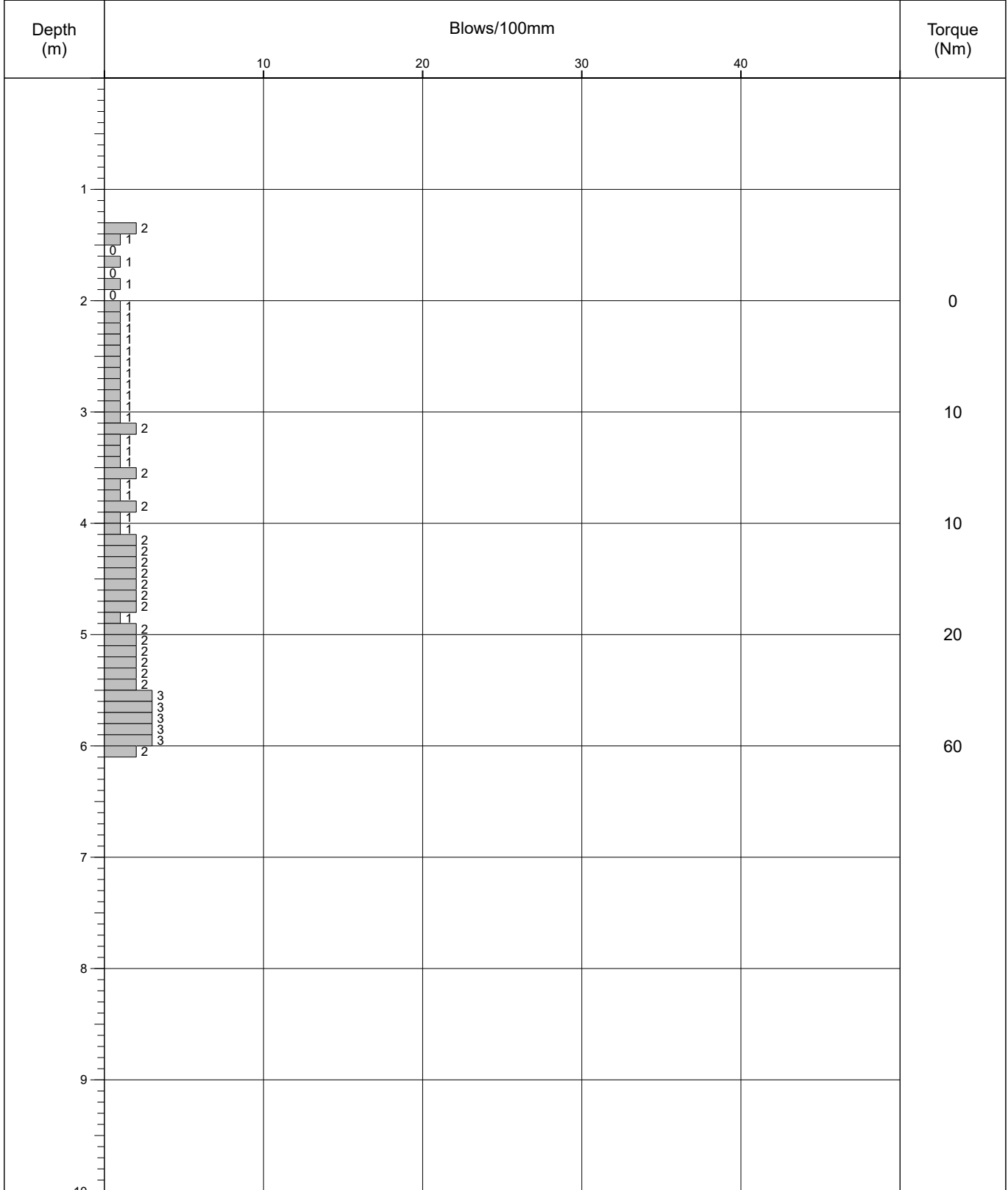
Remarks	Fall Height	760mm	Cone Base Diameter	mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

Project Name:	30-48 Lawrence Road	Project No.	20922	Co-ords:		Hole Type	DP
Location:	Haringey, N15 4EG	Level:	m AOD			Scale	1:50
Client:	Findon Homes	Dates:	02/06/2023			Logged By	GJB



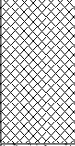
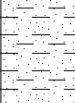
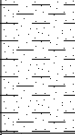
Remarks	Fall Height	760mm	Cone Base Diameter	mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

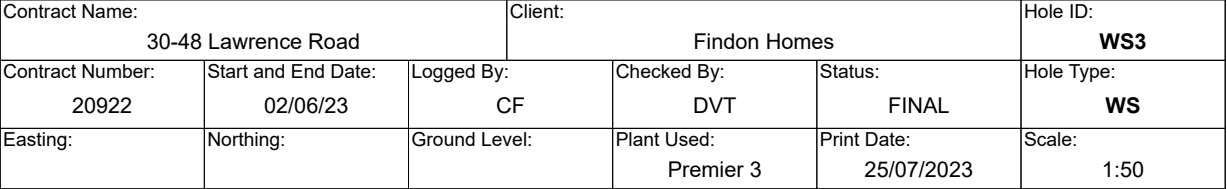
Project Name:	30-48 Lawrence Road	Project No.	20922	Co-ords:		Hole Type	DP
Location:	Haringey, N15 4EG	Level:	m AOD			Scale	1:50
Client:	Findon Homes	Dates:	02/06/2023			Logged By	GJB



Remarks	Fall Height	760mm	Cone Base Diameter	mm
	Hammer Weight	63.5kg	Final Depth	6m
	Probe Type	DPSH-B	Energy Ratio (Er)	87.45%

	Contract Name: 30-48 Lawrence Road				Client: Findon Homes				Hole ID: WS1					
	Contract Number: 20922		Start and End Date: 02/06/23		Logged By: AN		Checked By: DVT		Status: FINAL		Hole Type: WS			
	Easting:		Northing:		Ground Level:		Plant Used: Premier 3		Print Date: 25/07/2023		Scale: 1:50			
Weather:			Termination:					Sheet 1 of 1						
Samples & In Situ Testing				Strata Details								Groundwater		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation	
0.25	D			0.17		CONCRETE							1	
0.50	ES			0.40		Soft greyish brown slightly sandy, slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular, fine to coarse flint with fragments of brick and concrete. MADE GROUND								
	ES			(0.70)		Soft brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular, fine to coarse flint with fragments of brick and concrete. MADE GROUND								
1.00	D			1.10		Firm greyish brown mottled orangish brown and dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular, fine to coarse flint, concrete, brick and burnt wood .Occasional roots. MADE GROUND							2	
1.30	ES			(0.90)										
1.40	D													
1.80	ES			2.00		Stiff greyish brown mottled grey slightly sandy CLAY. Sand is fine. Frequent orangish brown sand inclusions. Rare roots. LONDON CLAY FORMATION							3	
1.90	D													
2.30	ES			(2.00)										
2.40	D												4	
2.90	D													
3.40	D													
3.90	D			4.00		End of Borehole at 4.00m							5	
														
														
													6	
														
														
													7	
														
														
													8	
														
														
													9	
														
														
													10	
														
														
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Roots observed up to 2.40m bgl					
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
												0	0.00	No groundwater encountered
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.														

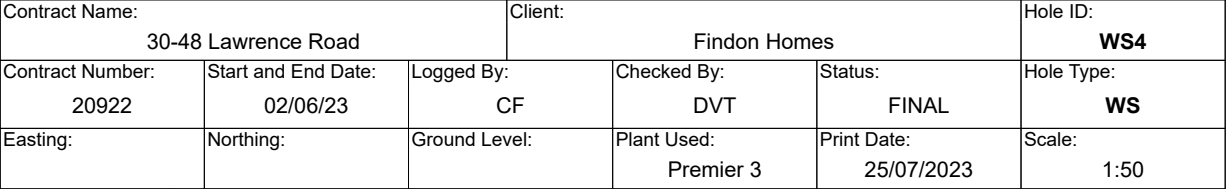
	Contract Name: 30-48 Lawrence Road				Client: Findon Homes				Hole ID: WS2				
	Contract Number: 20922		Start and End Date: 02/06/23		Logged By: AN		Checked By: DVT		Status: FINAL		Hole Type: WS		
	Easting:		Northing:		Ground Level:		Plant Used: Premier 3		Print Date: 25/07/2023		Scale: 1:50		
Weather:			Termination:					Sheet 1 of 1					
Samples & In Situ Testing					Strata Details							Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation
0.20	ES			0.18		CONCRETE						1	
0.50	ES			0.35		Yellowish brown sandy GRAVEL. Gravel is subangular, fine to coarse flint concrete and brick. Sand is fine to coarse. MADE GROUND							
				(1.05)		Soft dark brown mottled brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular, fine to coarse flint concrete and brick. Occasional rootlets. MADE GROUND.							
1.00	ES												
1.20	ES					Soft brown mottled light grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded, fine to coarse flint and calcareous nodules. WEATHERED LONDON CLAY FORMATION							
1.30	D			1.40									
1.60	ES			(0.60)		Firm yellowish brown slightly sandy gravelly CLAY. Sand is fine to medium, gravel is subrounded, fine to coarse flint.							
1.80	D			2.00									
						Firm greyish brown mottled grey slightly sandy CLAY. Sand is fine. Frequent orangish brown sand inclusions. Rare roots. LONDON CLAY FORMATION						2	
2.30	D												
												3	
2.80	D			(2.00)									
												4	
3.30	D												
												5	
3.80	D			4.00									
					End of Borehole at 4.00m						6		
											7		
											8		
											9		
											10		
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Desiccated roots observed up to 2.80m bgl				
									Water Strikes				
Chiselling					Installation		Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks	
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)					
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.													



Weather:	Termination:		Sheet 1 of 1
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Samples & In Situ Testing				Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation	
0.30	D			0.22		CONCRETE. MADE GROUND.			
	ES					Brown very gravelly SAND. Gravel is angular to rounded fine to coarse flint, concrete, fine clinker and red brick. Occasional glass fragments. MADE GROUND.			
0.60	D			0.50		Dark greyish brown and dark brown, clayey very gravelly SAND. Gravel is sub-angular to rounded fine to coarse flint, concrete, fine clinker and red brick. Occasional glass fragments. MADE GROUND.			
	ES			(0.40)					
1.00	D			0.90		Soft becoming firm, dark greyish brown, dark reddish brown and grey mottling, slightly gravelly slightly sandy silty REWORKED CLAY. Gravel is sub-angular to sub-rounded fine to medium flint. Occasional rootlets. Rare coarse sand-sized clinker and red brick. MADE GROUND.	1		
	ES			(0.40)					
1.20	ES			1.30		Firm brown and light brown mottling, slightly sandy silty CLAY. Occasional desiccated rootlets. Rare sub-angular fine to medium flint gravel. Rare sandy inclusions. WEATHERED LONDON CLAY FORMATION			
1.40	ES								
1.50	D			(0.90)					
2.00	D			2.20		Firm becoming stiff, dark brown and grey mottling, slightly sandy silty CLAY. Frequent fine to coarse sand-sized selenite crystals. Occasional desiccated rootlets. Rare sandy inclusions. LONDON CLAY FORMATION	2		
2.30	D								
2.80	D			(1.20)			3		
3.30	D			3.40		Stiff dark brown, orangish brown and grey mottling, slightly sandy silty fissured CLAY. Occasional fine to coarse sand-sized selenite crystals. Rare desiccated rootlets. Rare sandy inclusions. LONDON CLAY FORMATION			
3.50	D			(0.60)					
4.00	D			4.00		End of Borehole at 4.00m	4		
							5		
							6		
							7		
							8		
							9		
							10		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks: Rootlets observed to 1.30m bgl. Desiccated rootlets observed to 3.40m bgl. Water Strikes <table><tr><th>Strike (m)</th><th>Casing (m)</th><th>Sealed (m)</th><th>Time (mins)</th><th>Rose to (m)</th><th>Remarks</th></tr><tr><td></td><td></td><td></td><td>0</td><td>0.00</td><td>No groundwater encountered</td></tr><tr><td colspan="6">Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.</td></tr></table>	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks				0	0.00	No groundwater encountered	Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																						
			0	0.00	No groundwater encountered																						
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.																											
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)																			
Chiselling					Installation																						
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)																			



Weather:	Termination:		Sheet 1 of 1
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Samples & In Situ Testing				Strata Details					Groundwater		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description			Water Strike	Backfill/ Installation	
0.20	D			0.10		TARMAC. MADE GROUND.	1				
	ES			0.30		Brown very gravelly SAND. Gravel is angular to rounded fine to coarse flint, concrete, fine clinker and red brick. Occasional glass fragments. MADE GROUND.					
0.50	D			(0.60)		Soft dark greyish brown and dark brown, slightly gravelly slightly sandy silty CLAY. Gravel is angular to sub-rounded fine to medium flint, concrete, fine clinker and red brick. Rare rootlets. MADE GROUND.					
	ES										
1.00	D			0.90		Firm brown, dark reddish brown and yellowish brown mottling, slightly sandy gravelly silty					
	ES			1.10		REWORKED CLAY. Gravel is sub-angular to well-rounded fine to coarse flint, fine clinker and red brick. MADE GROUND.					
1.20	ES			(1.10)		Firm brown and light brown mottling, slightly sandy silty CLAY. Occasional rootlets. Rare sub-angular fine to medium flint and calcareous gravel. Rare sandy inclusions. Occasional desiccated rootlets. WEATHERED LONDON CLAY FORMATION					
1.30	D										
1.80	D			2		2.20			Firm becoming stiff, dark brown and grey mottling, slightly sandy silty CLAY. Frequent fine to coarse sand-sized selenite crystals. Occasional desiccated rootlets. Rare sandy inclusions. Rare sub-angular to sub-rounded fine to coarse calcareous gravel. WEATHERED LONDON CLAY FORMATION		
2.30	D										
2.80	D			3		(1.10)			3.30		Stiff dark brown, orangish brown and grey mottling, slightly sandy silty fissured CLAY. Occasional fine to coarse sand-sized selenite crystals. Rare desiccated rootlets. Rare sandy inclusions. LONDON CLAY FORMATION
3.20	D										
3.40	D			4		(0.70)			4.00		End of Borehole at 4.00m
3.90	D										
		5									
		6									
		7									
		8									
		9									
		10									

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks: Rootlets observed to 1.10m bgl. Desiccated rootlets observed to 3.75m bgl.	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)		
Chiselling					Installation					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Water Strikes	
									Strike (m)	Casing (m)
									Sealed (m)	Time (mins)
									0	Rose to (m)
									0.00	Remarks
									No groundwater encountered	
									Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.	

Appendix B.2 Raw Gas Monitoring Data

Job Number:	20922	Weather	* Delete as appropriate		
Site Name:	38-40 Lawrence Road	Wind		Light	
BH/WS ID:	BH2	Cloud Cover			Overcast
Date:	06/06/2023	Precipitation	Dry		
Start Time:	12:16:07 PM	Ground Conditions	Dry		

Gas Monitor:*	Gas Data GFM 435 11555	or		Step 3	
PID:*	Multirae M01C011991	or		Depth to Water (m bgl)	Base of Hole (m bgl)
Dip meter:*		or	Single Phase	6.66	9.96

Step 1			
Monitoring interval		Flow	DP
		L/hr	Pa
Atmosphere		<0.1	<1
mea	00:00:05	<0.1	<1
	00:00:30	<0.1	<1
	00:01:00	<0.1	<1
	00:02:00		
	00:03:00		
	00:04:00		
	00:05:00		
	00:06:00		
	00:07:00		
	00:08:00		
	00:09:00		
	00:10:00		

Step 2										
Monitoring interval		CH ₄	LEL CH ₄	CO ₂	O ₂	H2S	Co	aP	VOC	Temp
		% v/v	%	% v/v	% v/v	ppm	ppm	mb	(PPM)	(°C)
Atmosphere		<0.1	<2.0	<0.1	21.0	<1.0	<1.0	1023	<0.1	14
mea	00:00:05	<0.1	<2.0	0.2	20.9	<1.0	<1.0	1023	<0.1	
	00:00:30	<0.1	<2.0	0.8	18.6	<1.0	<1.0	1023	<0.1	
	00:01:00	<0.1	<2.0	0.8	18.3	<1.0	<1.0	1023	<0.1	
	00:02:00	<0.1	<2.0	0.8	18.3	<1.0	<1.0			
	00:03:00									
	00:04:00									
	00:05:00									
	00:06:00									
	00:07:00									
	00:08:00									
	00:09:00									
	00:10:00									

Samples		Notes;
1 Litre Plastic		
1 Litre Glass		
40ml Vial		
Gas sample (Tedlar bag etc)		

Job Number:	20922	Weather	* Delete as appropriate		
Site Name:	30-48 Lawrence Road	Wind		Light	
BH/WS ID:	BH2	Cloud Cover		Light	
Date:	29.6.23	Precipitation	Dry		
Start Time:	12:47pm.	Ground Conditions	Dry		

Gas Monitor:*	Gas Data GFM 435 11555	or		Step 3	
PID:*	Watchgas Poli 1	or		Depth to Water (m bgl)	Base of Hole (m bgl)
Dip meter:*	Dual phase	or		1.76m.	10.1m.

Step 1				
Monitoring interval	Flow L/hr	Dp Pa	SP mB	
mea	00:00:05	<0.1	<1	
	00:00:30	<0.1	<1	
	00:01:00	<0.1	<1	
	00:02:00	<0.1	<1	
	00:03:00	<0.1	<1	
	00:04:00	<0.1	<1	
	00:05:00	<0.1	<1	
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	LEL CH ₄ %	H ₂ S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (°C)	
Atmosphere										
mea	00:00:05	<0.1	0.8	19.7	<2.0	<1.0	<1	1016	5.4.	19*
	00:00:30	<0.1	1.8	18.9	<2.0	<1.0	<1	1016	4.7.	19*
	00:01:00	<0.1	1.8	18.9	<2.0	<1.0	<1	1016	4.5.	19*
	00:02:00	<0.1	1.8	18.9	<2.0	<1.0	<1	1016	4.0.	19*
	00:03:00	<0.1	1.8	18.8	<2.0	<1.0	<1	1016	3.8.	19*
	00:04:00	<0.1	1.8	18.8	<2.0	<1.0	<1	1016	3.4.	19*
	00:05:00	<0.1	1.9	18.8	<2.0	<1.0	<1	1016	3.1.	19*
	00:06:00								3.1	
	00:07:00								3.1	
	00:08:00									
	00:09:00									
	00:10:00									

Samples	Notes;
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag)	

Job Number:	20922	Weather	* Delete as appropriate		
Site Name:	30-48 Lawrence Road	Wind		Light	
BH/WS ID:	BH2	Cloud Cover		Light	
Date:	12.7.23	Precipitation	Dry		
Start Time:	09:09am.	Ground Conditions	Dry		

Gas Monitor:*	Gas Data GFM 435 11555	or		Step 3	
PID:*	Watchgas Poli 1	or		Depth to Water (m bgl)	Base of Hole (m bgl)
Dip meter:*	Dual phase	or		1.63	10.1

Step 1				
Monitoring interval	Flow L/hr	Dp Pa	SP mB	
00:00:05	<0.1	<1		
00:00:30	<0.1	<1		
00:01:00	<0.1	<1		
00:02:00	<0.1	<1		
00:03:00	<0.1	<1		
00:04:00	<0.1	<1		
00:05:00	<0.1	<1		
00:06:00				
00:07:00				
00:08:00				
00:09:00				
00:10:00				
00:11:00				

Step 2										
Monitoring interval	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	LEL CH ₄ %	H ₂ S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (°C)	
Atmosphere										
00:00:05	<0.1	<0.1	20.4	<2.0	<1.0	<1.0	1011	0.6.	17*	
00:00:30	<0.1	1.8	19.0	<2.0	<1.0	<1.0	1011	0.4.	17*	
00:01:00	<0.1	1.6	19.0	<2.0	<1.0	<1.0	1011	0.3.	17*	
00:02:00	<0.1	1.8	18.9	<2.0	<1.0	<1.0	1011	0.3.	17*	
00:03:00	<0.1	1.8	18.9	<2.0	<1.0	<1.0	1011	0.3.	17*	
00:04:00	<0.1	1.8	18.9	<2.0	<1.0	<1.0	1011	0.4.	17*	
00:05:00	<0.1	1.8	18.9	<2.0	<1.0	<1.0	1011	0.4.	17*	
00:06:00										
00:07:00										
00:08:00										
00:09:00										
00:10:00										

Samples		Notes;
1 Litre Plastic		
1 Litre Glass		
40ml Vial		
Gas sample (Tedlar bag)		

Job Number:	20922	Weather	* Delete as appropriate		
Site Name:	30-48 Lawrence Road	Wind		Light	
BH/WS ID:	BH2	Cloud Cover			Overcast
Date:	27.7.23	Precipitation		Light	
Start Time:	14:47pm.	Ground Conditions		Moist	

Gas Monitor:*	Gas Data GFM 435 11555	or		Step 3	
PID:*	Watchgas Poli 1	or		Depth to Water (m bgl)	Base of Hole (m bgl)
Dip meter:*	Dual phase	or		1.59	10.1

Step 1				
Monitoring interval	Flow L/hr	Dp Pa	SP mB	
mea	00:00:05	<0.1	<1	
	00:00:30	<0.1	<1	
	00:01:00	<0.1	<1	
	00:02:00	<0.1	<1	
	00:03:00	<0.1	<1	
	00:04:00	<0.1	<1	
	00:05:00	<0.1	<1	
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	LEL CH ₄ %	H ₂ S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (°C)	
Atmosphere										
mea	00:00:05	<0.1	2	19.1	<2.0	<1.0	<1.0	1001	9.2.	21*
	00:00:30	<0.1	2.2	18.8	<2.0	<1.0	<1.0	1001	10.6.	21*
	00:01:00	<0.1	2.2	18.8	<2.0	<1.0	<1.0	1001	6.3.	21*
	00:02:00	<0.1	2.2	18.7	<2.0	<1.0	<1.0	1001	9.4.	21*
	00:03:00	<0.1	2.2	18.7	<2.0	<1.0	<1.0	1001	5.4.	21*
	00:04:00	<0.1	2.2	18.7	<2.0	<1.0	<1.0	1001	4.2.	21*
	00:05:00	<0.1	2.2	18.7	<2.0	<1.0	<1.0	1001	6.3.	21*
	00:06:00								6.1	
	00:07:00								6.1	
	00:08:00									
	00:09:00									
	00:10:00									

Samples	Notes;
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag)	

Job Number:	20922	Weather	* Delete as appropriate		
Site Name:	30-48 Lawrence Road	Wind		Light	
BH/WS ID:	BH2	Cloud Cover		Cloudy	
Date:	2.8.23	Precipitation	Dry		
Start Time:	10:17am.	Ground Conditions		Moist	

Gas Monitor:*	Gas Data GFM 435 11555	or		Step 3	
PID:*	Watchgas Poli 1	or		Depth to Water (m bgl)	Base of Hole (m bgl)
Dip meter:*	Dual phase	or		1.55	10.1

Step 1				
Monitoring interval	Flow L/hr	Dp Pa	SP mB	
mea	00:00:05	<0.1	<1	
	00:00:30	<0.1	<1	
	00:01:00	<0.1	<1	
	00:02:00	<0.1	<1	
	00:03:00	<0.1	<1	
	00:04:00	<0.1	<1	
	00:05:00	<0.1	<1	
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	LEL CH ₄ %	H ₂ S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (°C)	
Atmosphere										
mea	00:00:05	<0.1	1.5	19.3	<2.0	<1.0	<1.0	986	<0.1	18*
	00:00:30	<0.1	2.2	18.7	<2.0	<1.0	<1.0	986	<0.1	18*
	00:01:00	<0.1	2.2	18.6	<2.0	<1.0	<1.0	986	0.1	18*
	00:02:00	<0.1	2.3	18.6	<2.0	<1.0	<1.0	986	0.1	18*
	00:03:00	<0.1	2.2	18.6	<2.0	<1.0	<1.0	986	0.2	18*
	00:04:00	<0.1	2.2	18.5	<2.0	<1.0	<1.0	986	0.4	18*
	00:05:00	<0.1	2.2	18.5	<2.0	<1.0	<1.0	986	0.6	18*
	00:06:00								0.6	
	00:07:00								0.6	
	00:08:00									
	00:09:00									
	00:10:00									

Samples	Notes;
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag)	

Job Number:	20922	Weather	* Delete as appropriate		
Site Name:	30-48 Lawrence Road	Wind		Light	
BH/WS ID:	BH2	Cloud Cover			Overcast
Date:	14.8.23	Precipitation	Dry		
Start Time:	10:06am.	Ground Conditions	DRY		

Gas Monitor:*	Gas Data GFM 435 11555	or		Step 3	
PID:*	Watchgas Poli 1	or		Depth to Water (m bgl)	Base of Hole (m bgl)
Dip meter:*	Dual phase	or		1.67	10.1

Step 1				
Monitoring interval	Flow L/hr	Dp Pa	SP mB	
mea	00:00:05	<0.1	<1	
	00:00:30	<0.1	<1	
	00:01:00	<0.1	<1	
	00:02:00	<0.1	<1	
	00:03:00	<0.1	<1	
	00:04:00	<0.1	<1	
	00:05:00	<0.1	<1	
	00:06:00			
	00:07:00			
	00:08:00			
	00:09:00			
	00:10:00			
	00:11:00			

Step 2										
Monitoring interval	CH ₄ % v/v	CO ₂ % v/v	O ₂ % v/v	LEL CH ₄ %	H ₂ S ppm	Co ppm	Ap mB	VOC (PPM)	Temp (°C)	
Atmosphere										
mea	00:00:05	<0.1	2.3	18.7	<2.0	<1.0	<1.0	1008	1.2.	18*
	00:00:30	<0.1	2.4	18.3	<2.0	<1.0	<1.0	1008	1.1.	18*
	00:01:00	<0.1	2.4	18.3	<2.0	<1.0	<1.0	1008	1.2.	18*
	00:02:00	<0.1	2.4	18.3	<2.0	<1.0	<1.0	1008	1.3.	18*
	00:03:00	<0.1	2.4	18.2	<2.0	<1.0	<1.0	1008	1.3.	18*
	00:04:00	<0.1	2.4	18.3	<2.0	<1.0	<1.0	1008	1.4.	18*
	00:05:00	<0.1	2.4	18.2	<2.0	<1.0	<1.0	1008	1.6.	18*
	00:06:00								1.6	
	00:07:00								1.6	
	00:08:00									
	00:09:00									
	00:10:00									

Samples	Notes;
1 Litre Plastic	
1 Litre Glass	
40ml Vial	
Gas sample (Tedlar bag)	

Appendix C Calibration Certification

TEST DATE AND CONDITIONS	
Date	23/08/23
Atmospheric pressure	1007 mb
Ambient Temp	24.1 °C
EnviroNics Serial No.	2518

GAS DATA LTD
Unit 4 Fairfield court
Seven Stars Estate
Coventry
CV3 4LJ, UK
+44 (0) 24 7630 3311



GFM435-1 (MCERTS) OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS					
SO Number	Instrument Banner	Instrument Serial Number + SW Version	Job Number(s)		
335434	Gfm435	11555 V24.04	26197	-	-

Calibration Technician *[Signature]*

DATE 21/8/23

Inspection Technician *[Signature]*

DATE 23/08/23

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable(NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All keys)	P	Leather Case		✗
	Backlight Test	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		✓
	Comms Test	P	AC Battery Charger (EURO)		✗
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		✗
	Overall Leak Test (30mb)	N/A	AC Battery Charger (AUS)		✗
	Battery Charge Test	P	Gas Sample Pipe		✗
	Service Date set to?	21/08/24	Hard Carry Case		✓
Channel Tests	Data Logging Enabled?	P	Spares Pot		✗
	Verify CH4/LEL/Hexane/PID	P	Allen Key		✗
	Verify CO2	P	Flow Sample Pipe		✗
	Verify O2	P	Temperature Probe		✗
	Verify H2S	P	Vane Anemometer		✗
	Verify CO	P	USB Cable		✗
	Verify LEL	P	USB Memory Stick		✗
	Verify 1st Option gas	N/A	SiteMan Software	Ver	✗
	Verify atmospheric pressure	P	Internal Filter Pack	Qty	✗
	Verify differential pressure	P	External Filter Pack	Qty	✗
	Verify flow	P	Field Guide		✗
	Verify temperature probe input	P	Extra Items: SERVICE SPARES.		
	Verify vane anemometer input	P			
DataBase Checks	Jobcard(s) completed and signed	P			
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	N/A			
Label Checks	No. of Calibration label fitted	12391	Comments		
	MCERTS label displayed	P			
	Warranty label fitted	P			
H2S Range	H2S Range from SO	5000 ppm			
	H2S Range from cal cert	5000 ppm			
	Over-range value correct?	P			

TEST DATE AND CONDITIONS	
Date	21/8/23
Atmospheric pressure	1000mb
Ambient Temp	24.2°C
Enviroics Serial No.	2518

GAS DATA LTD
Unit 4 Fairfield court
Seven Stars Estate
Coventry
CV3 4LJ, UK
+44 (0) 24 7630 3311



GFM435-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

INSTRUMENT DETAILS	
Serial No	Customer
11555	Soils Limited

INSTRUMENT CHECKS			
Keyboard	✓	Pump Flow	450cc/min
Display Contrast	✓	Pump Flow @ -200mB	300cc/min
Clock Set / Running	✓	S/W Version	G435.0024/0004
Labels Fitted	✓	Recalibration Date	21/8/24

GAS CHECKS							
Calibration Gas		Instrument Gas Channels Read					
Gas Type	Applied Conc.	CH4 (%)	tol. (% vol.)	CO2 (%)	tol. (% vol.)	O2 (%)	tol. (% vol.)
N2	100%	0.0	0.0	0.0	0.0	0.0	+/-0.1
CH4	5%	5.0	+/-0.3	0.0	0.0	0.0	+/-0.1
	60%	60.0	+/-3.0	0.0	0.0	0.0	+/-0.1
CO2	5%	0.0	0.0	5.0	+/-0.3	0.0	+/-0.1
	40%	0.0	0.0	39.7	+/-3.0	0.0	+/-0.1
O2	20.9%	0.0	0.0	0.1	+0.1	20.8	+/-0.5

OPTIONAL GAS CHECKS							
Calibration Gas		Instrument Gas Channels Read					
Gas Type	Applied Conc.	Label	H2S	CO		Hexane	tol. (% vol.)
		Range	5000ppm	2000ppm		2%	
N2	100%		0	0		0.000	0.0
H2S	1500ppm		1520	0			+/- 5.0
CO	1000ppm		110	996			+/- 5.0
Hexane	20000ppm					2.002	+/- 10.0

PRESSURE CHECKS							
Calibration Pressure		Instrument Pressure Channels Read					
Pressure @	Applied Pressure	Atmospheric [Ap] (mB)	tol. (mB)				
All Ports	Current Atmospheric	998	+/-2.0				
Ap Port (Internal)	+800mB(a)	800	+/-5.0				
	+1200mB(a)	1200	+/-5.0				

TEST DATE AND CONDITIONS	
Date	21/8/23
Atmospheric pressure	1000mb
Ambient Temp	24.2°C
EnviroNics Serial No.	2518

GAS DATA LTD
Unit 4 Fairfield court
Seven Stars Estate
Coventry
CV3 4LJ, UK
+44 (0) 24 7630 3311



GFM435-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

FLOW CHECKS					
Calibration Flow		Instrument Flow Channels Read			
Applied Flow (l/hour)	Applied Pressure (Pa)	Flow [Flow] (l/hour)	tol. (l/hour)	Differential Pressure [Dp] (Pa)	tol. (Pa)
-30.0	-289	-28.9	+/-3.0	-276	+/-50
-3.0	-14	-3.0	+/-1.0	-15	+/-6
0.0	0	0.0	0.0	0	0.0
+3.0	14	3.0	+/-0.5	14	+/-3
+30.0	300	29.8	+/-3.0	295	+/-50
+60.0	884	59.4	+/-6.0	873	+/-130
+90.0	1745	90.6	+/-9.0	1794	+/-250

TEMPERATURE CHECK		
Calibration Temperature	Instrument Temperature Channel Read	
Applied Equivalent Temperature (°C)	Temperature [Temp] (°C)	tol. (°C)
-10.0	-10.0	+/- 2.0
0.0	0.0	+/- 1.0
30.0	30.0	+/- 1.0
60.0	60.0	+/- 1.0
100.0	100.0	+/- 1.0

Notes:

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to: BS EN ISO 9001:2015
 BS EN ISO 14001:2015
 BS EN ISO 45001:2018



SAFETY MONITORS

Unit 2 Church House Farm, Clewers Hill,
Waltham Chase, Southampton SO32 2LN

Tel: +44(0)1489 326031

info@safetymonitors.co.uk

Calibration Certificate

Certificate Number CO23060910
Serial Number M00404001744
Calibration Date 09/06/2023
Next Calibration Due Date 09/06/2024
Last Test Result Pass

Sensor Calibration Dates

Sensor 1	Sensor 2	Sensor 3	Sensor 4	Sensor 5
08/10/2021 14:19				
07/06/2022 09:22				
09/06/2023 12:34				

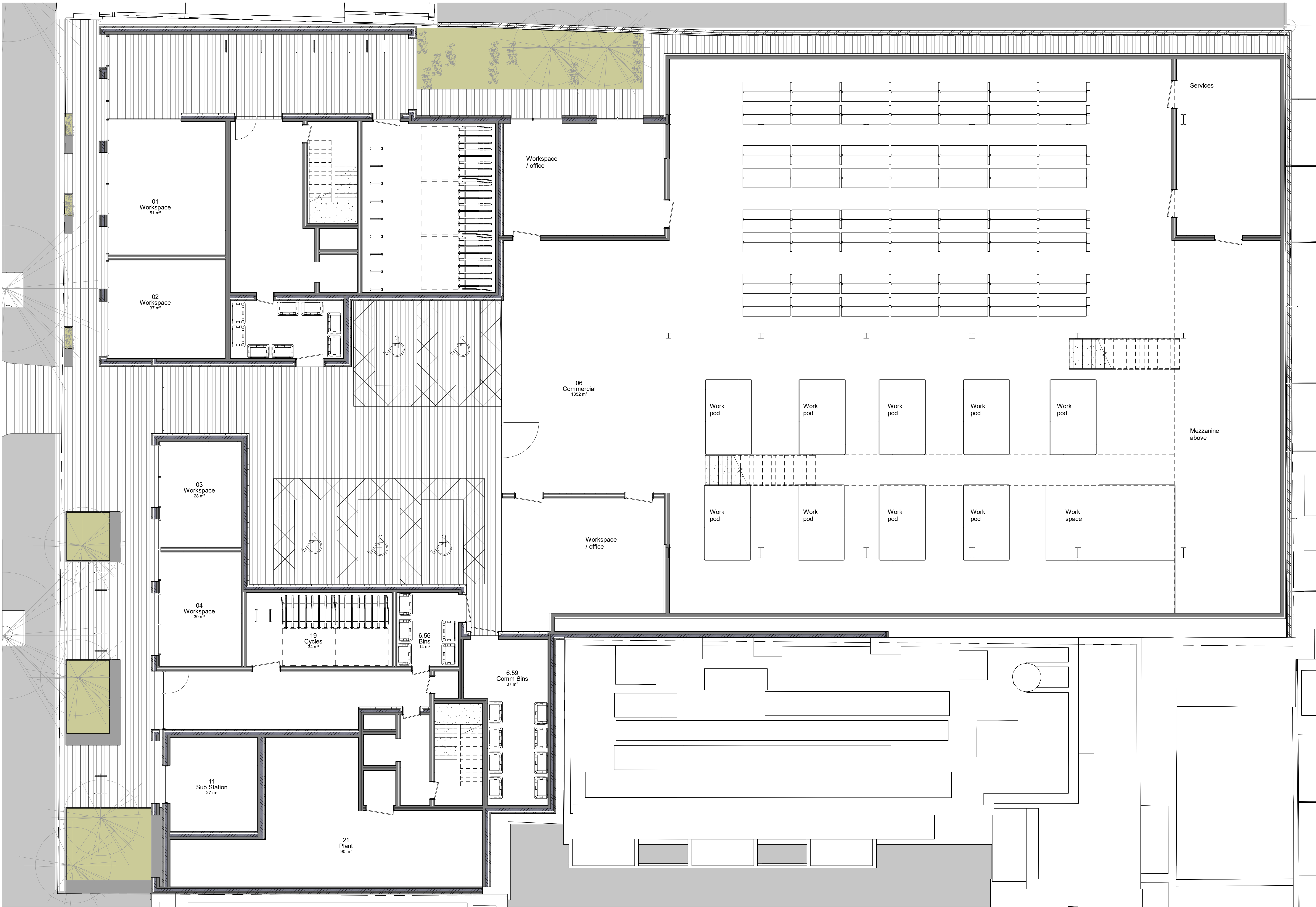
Gas Lot Number(s) WO367512-1
Gas Concentrations Isobutylene 100ppm

Notes:

Passed Inspection.
Passed Calibration. [All sensors correctly responsive to shown gas concentration]
Passed Bump Test. [All sensors correctly responsive to shown gas concentration]

If this instrument is used for Health and Safety purposes, certificate is valid for 6 months from date of calibration. If unit is used for environmental purposes certificate is valid for 12 months.

Appendix D Proposed Development



Rev.	Description	Date	By
P1	Planning Application Submission	08/04/2024	BL

Ground Floor Plan

1 : 100

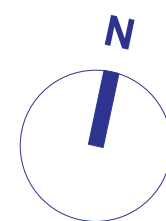
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Original drawing is A1. Do not scale from this drawing.

30-48 Lawrence Road, Tottenham
CNF Properties London Ltd



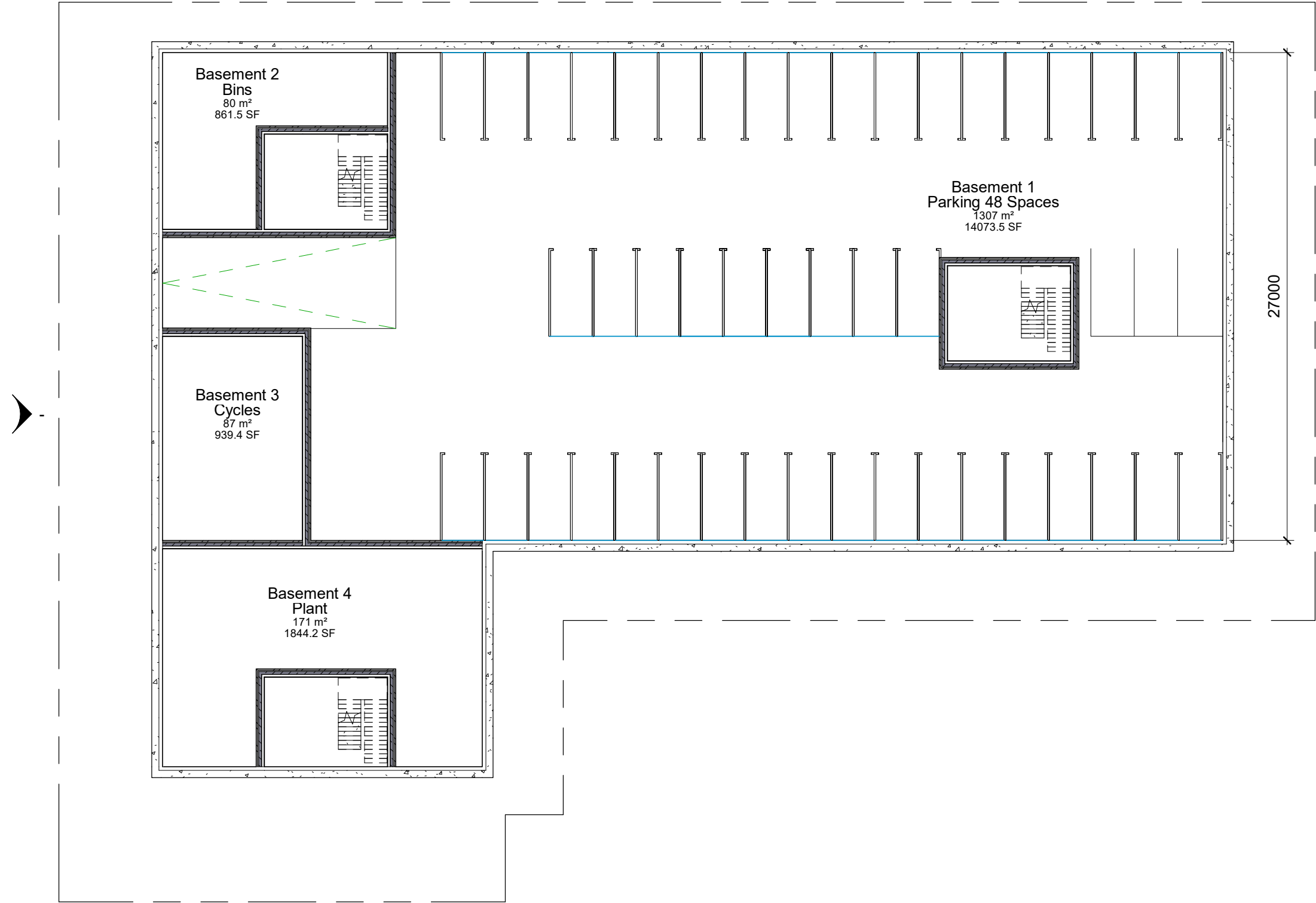
0 1 5 10 M

Plans Ground Floor

Drawn by: ML Reviewed by: BL
Project No: 038

1 : 100 @A1
038-BL-PL-XX-GF-DR-A-1501

boehm lynas



1 Basement
1 : 250



P 1 Site Study
2 Study Update

09/02/2023 BL
27/02/2023 BL

Drawn: ML
Project No: 038
27/02/2023

Lawrence Road Tottenham - Mixed Haus Scheme 04
Site Study Basement

1 : 250 @A3
038-BL-XX-SK-DR-A-1507 - P2

Original drawing is A2. Do not scale from this drawing.

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First Floor Plan
1 : 250



P	1	Site Study	09/02/2023	BL
	2	Study Update	27/02/2023	BL

Drawn: ML
Project No: 038
27/02/2023

Lawrence Road Tottenham - Mixed Haus Scheme 04
Site Study First Floor

1 : 250 @A3
038-BL-XX-SK-DR-A-1502 - P2

Original drawing is A2. Do not scale from this drawing.

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Second Floor Plan
1 : 250



P	1	Site Study	09/02/2023	BL
	2	Study Update	27/02/2023	BL

Drawn: ML
Project No: 038
27/02/2023

Lawrence Road Tottenham - Mixed Haus Scheme 04
Site Study Second Floor

1 : 250 @A3
038-BL-XX-SK-DR-A-1503 - P2
Original drawing is A2. Do not scale from this drawing.

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Third Floor Plan
1 : 250



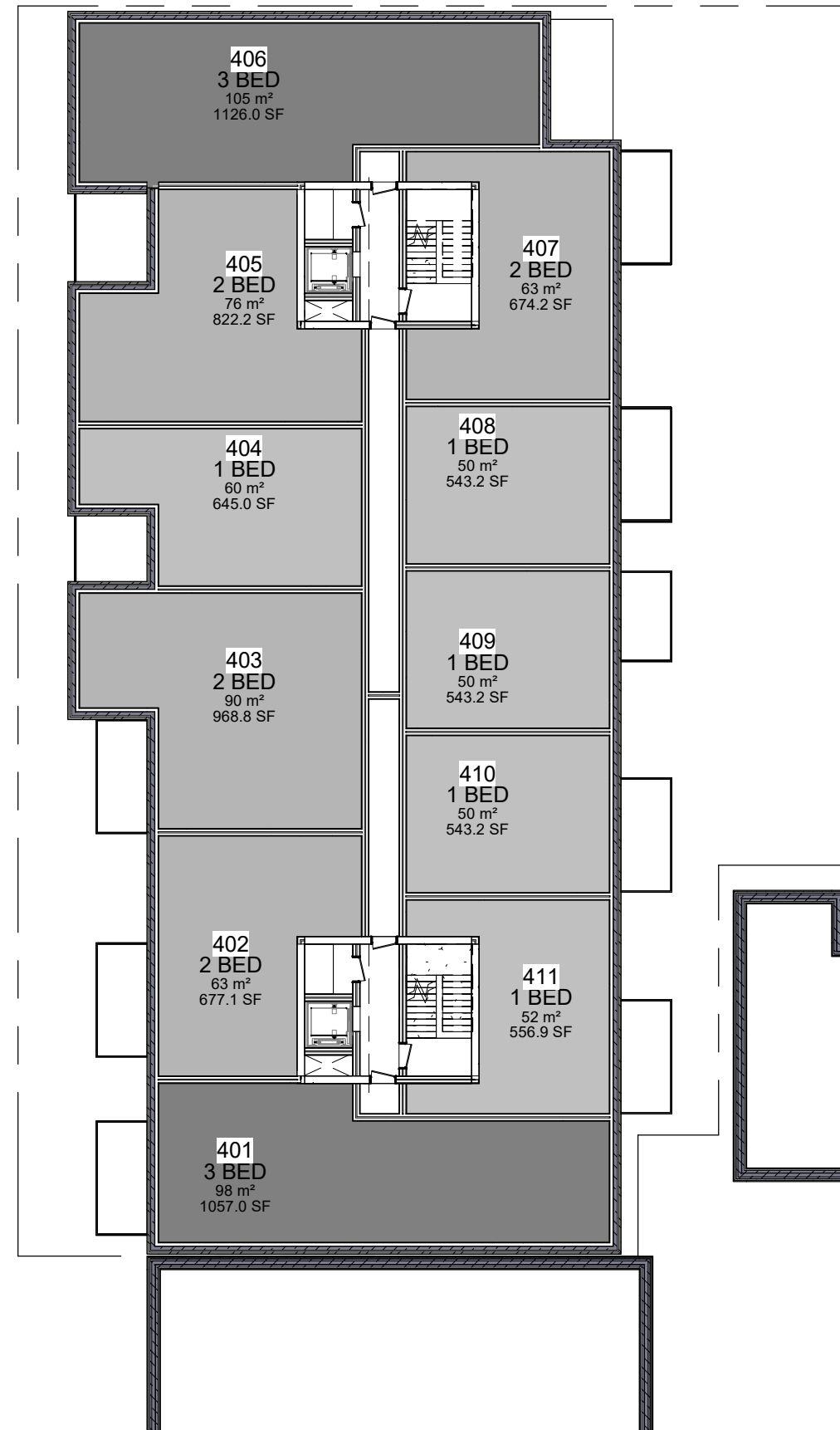
P 1 Site Study 09/02/2023 BL
2 Study Update 27/02/2023 BL

Drawn: ML
Project No: 038
27/02/2023

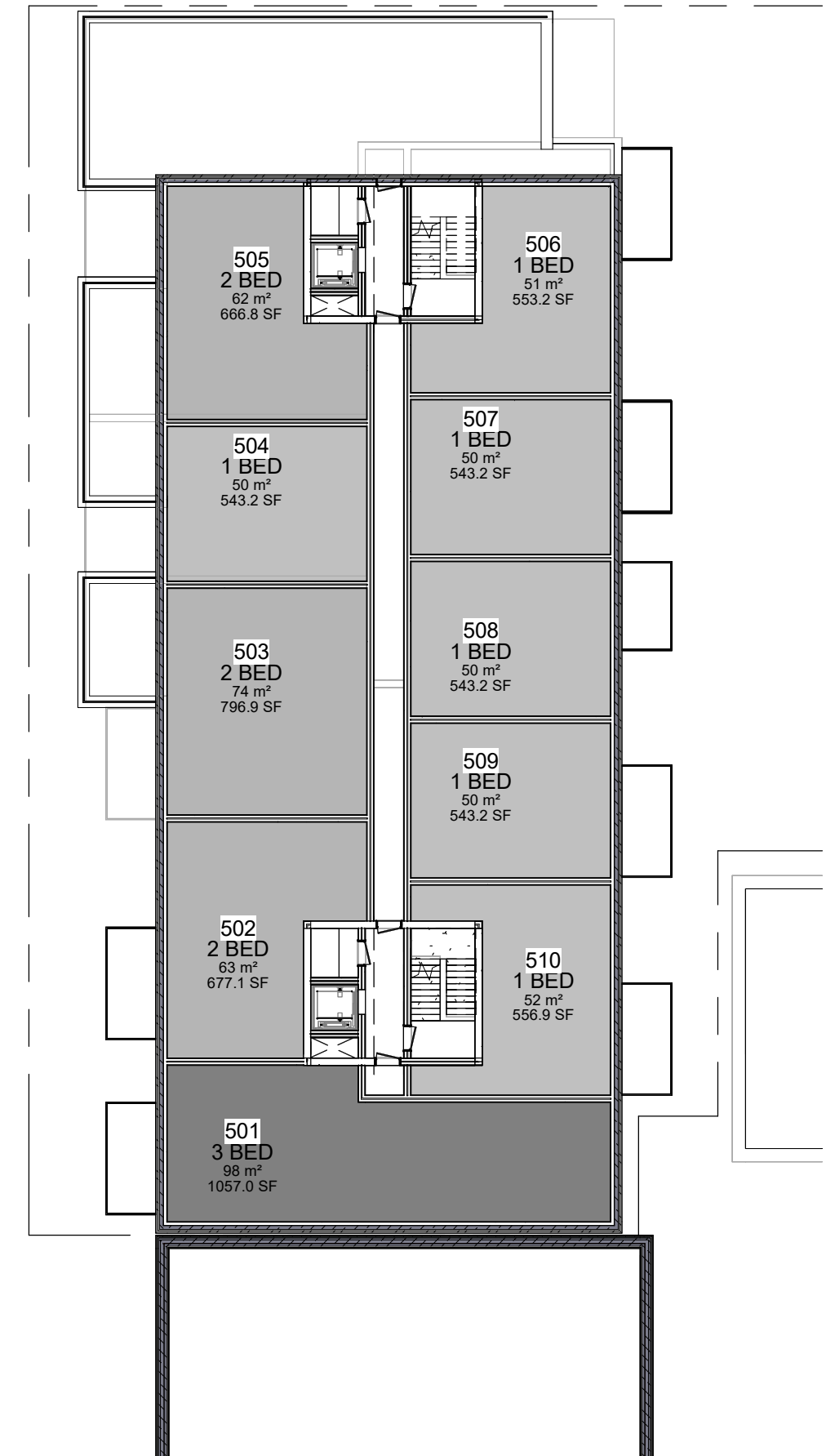
Lawrence Road Tottenham - Mixed Haus Scheme 04
Site Study Third Floor

1 : 250 @A3
038-BL-XX-SK-DR-A-1504 - P2
Original drawing is A2. Do not scale from this drawing.

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Fourth Floor Plan
1 : 250



Fifth Floor Plan
1 : 250



P 1 Site Study
2 Study Update

09/02/2023 BL
27/02/2023 BL

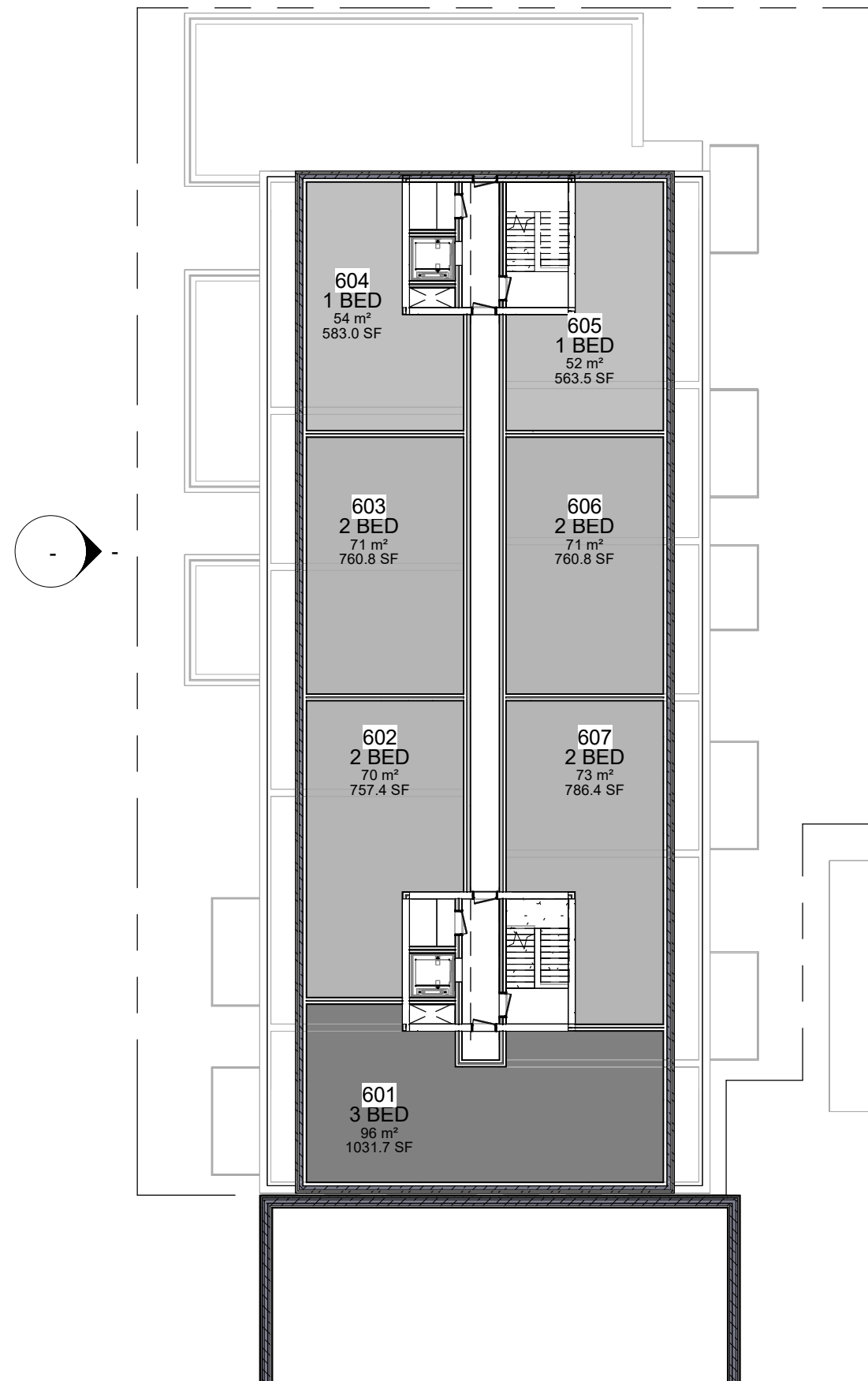
Drawn: ML
Project No: 038
27/02/2023

Lawrence Road Tottenham - Mixed Haus Scheme 04
Site Study Upper Plans

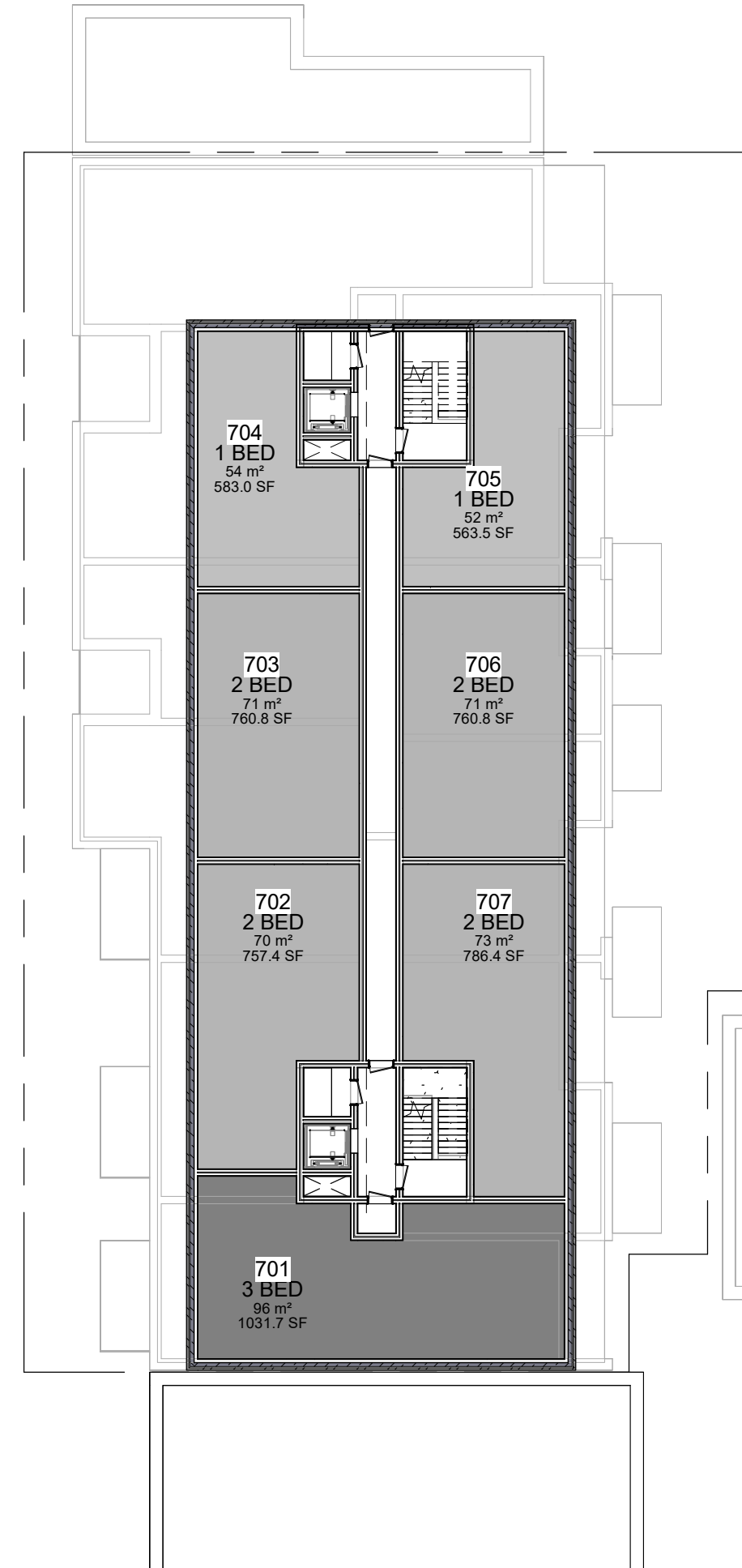
1 : 250 @A3
038-BL-XX-SK-DR-A-1505 - P2

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Sixth Floor Plan
1 : 250



Seventh Floor Plan
1 : 250



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