



4 Angel Square & Primary Sub Station Validation Report

For
Bowmer & Kirkland Ltd

Report Ref: 3352-01-R02-v6
Report Date: May 2023



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0. Executive Summary

Site name	4 Angel Square & Primary Sub Station.
Location	The site is located in central Manchester at OSGR 384240, 399060. The nearest postcode is M4 4DY. Prior to development the site predominantly comprised hard standing used for car parking.
Existing use	
Site Area	0.73 Hectares
Ground Conditions	Ground conditions were broadly as expected comprising variable thickness of Made Ground underlain by Glacial Till and sandstone bedrock (Chester Formation).
Reduced Level Excavation	A reduced level dig was carried out over the footprint of the proposed lower ground floor basement and rainwater attenuation tanks. The full depth of made ground was removed over the area of the reduced level dig, exposing natural ground at formation level.
Remediation Activities	GeoEnvironmental Consulting Ltd provided visiting supervision. Bowmer & Kirkland Ltd provided full time supervision of the project and provided information relevant to remediation and validation. No significant occurrences of asbestos were encountered in made ground during the enabling works. Following the reduced level dig, no unforeseen contamination was encountered in either the Primary Sub Station area or the 4 Angel Square Area. Approximately 37,500 tonnes of non-hazardous waste arisings were derived from the basement and attenuation tank excavation at 4 Angel Square and approximately 800 tonnes of arisings were generated at the Primary Sub Station. Approximately 500m3 of subsoil and topsoil was imported for use in landscaped areas. Following sampling and testing, all of the determinands returned concentrations below the remedial target value. As such the imported soils are considered suitable for use. Validation pits were excavated at 8 representative locations in landscaped areas to provide a photographic record of the cover materials and confirm the depth of material placed. A minimum of 600mm soil cover was validated at each location. Photographic records and soil descriptions of the validation pits are included in Appendix H.
Conclusions	Based on information obtained during visiting supervision and provided to GECL by Bowmer + Kirkland, the remediation activities at 4 Angel Square and the Primary Sub Station have been carried out in general accordance with the Buro Happold remediation strategy. All pollutant linkages identified in the remediation strategy have been broken or effectively controlled.
Proposed Next Steps Recommendations	This report should be submitted to and approved by the local authority as part of the planning process.



1. Introduction

Scope of Services / Intended Purpose

Bowmer & Kirkland Ltd instructed Geoenvironmental Consulting Ltd (GECL) to provide a Validation Report for 4 Angel Square & Primary Sub Station.

The objective of this validation report is to set out what has been done to remediate the site to an acceptable standard such that it is suitable for its intended use as a commercial / office building.

This report has been produced using information provided by Bowmer & Kirkland Ltd and information gained during visiting supervision undertaken by GECL between August and December 2021.

This report has been produced by an NQMS Suitably Qualified Person. The National Quality Mark Scheme (NQMS) for Land Contamination Management has been developed by the Land Forum to provide visible identification of documents that have been checked for quality by a Suitably Qualified and experienced Person (SQP). The report bears the NQMS logo and the declaration by the SQP is included in Appendix A.

The Appointment

The scope of work is defined by and limited to "the Services" set out in the Appointment. A copy of the appointment including the agreed services and terms is included in Appendix B.

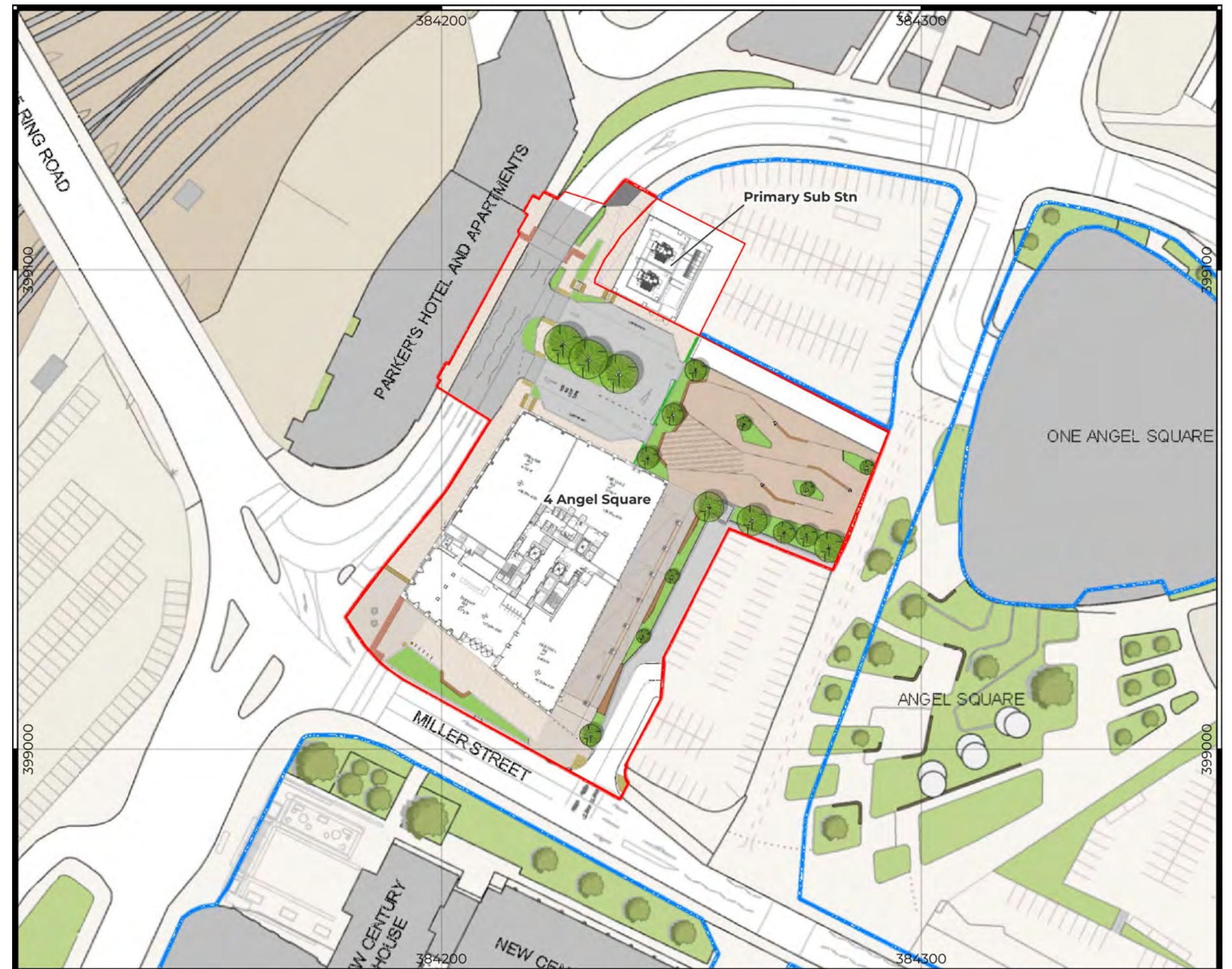
The Proposed Development

The proposed development is shown within the red line boundaries in Figure 1 and comprises:

- 4 Angel Square: an 11 storey building with external terrace to form a mixed use development comprising office use and ground floor commercial units; creation of a new public square and associated landscaping, undercroft car and cycle parking, provision of plant and servicing and related access and highways' works.
- Primary Sub Station: a single storey primary substation comprising a switch house and a transformer compound, with landscaping, access and highways' works, network connections.

Proposed development drawings are included in Appendix C. It required a reduced level dig to basement level beneath the building footprint and to the underside of proposed surface water attenuation in the east of the plot.

Figure 1 – The Proposed Development



Scale	Layout ref	Red line	Site Area	Grid system:	Base plan:
1:1000	Planit I.E. Limited Drawing 4AS-PLA-XX-XX-DR-L-02	Site Boundary	0.73 Ha	British National Grid (m)	SimpsonHagh Drawing: Site Location Plan

2. The Site

Site Description

The site is located in central Manchester at OSGR 384240, 399060. The nearest postcode is M4 4DY.

A site plan is shown in Figure 2. Prior to development the site predominantly comprised hard standing used for car parking.

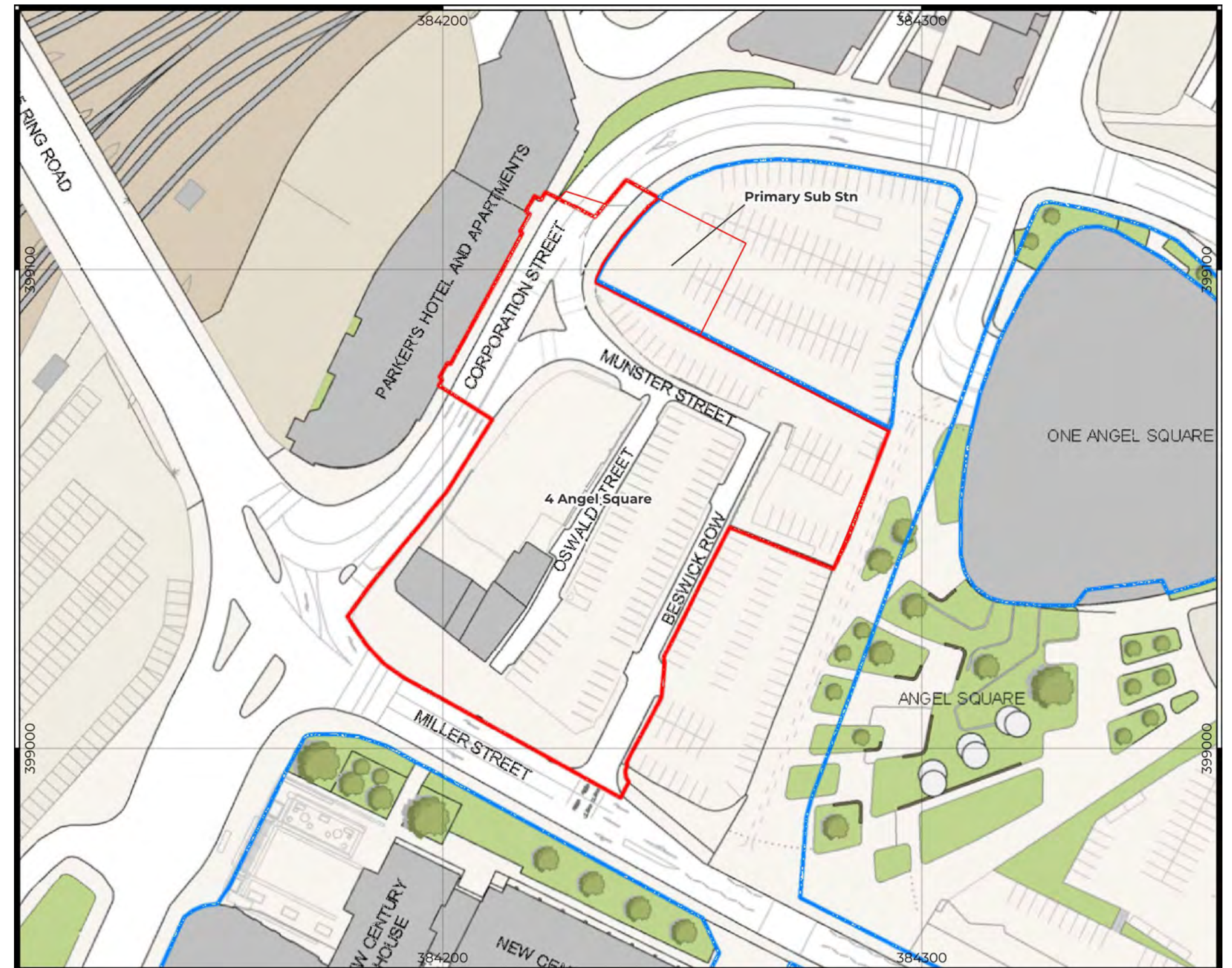
Planning Status

This report has been produced to discharge planning conditions 8a (Primary Sub) and 9b (4 Angel Square), included in the decision notices in Appendix D.

Condition 8a (Primary Sub) states: *A watching brief shall be maintained for the duration of the construction. In the event that ground contamination, groundwater contamination and/or ground gas are encountered on the site at any time before the development is occupied, then the development shall cease until a report detailing what measures, if any, are required to remediate the land (the remediation strategy) has been submitted for approval in writing by the City Council, as Local Planning Authority. Once approved, the development shall be carried out in accordance with the remediation strategy.*

Condition 9b (4 Angel Square) states: *When development commences, the development shall be carried out in accordance with the previously agreed Remediation Strategy and a Completion/Verification Report shall be submitted to and approved in writing by the City Council as local planning authority prior to the first occupation of the development.*

Figure 2 – The Site



Scale 1:1000	Red line Site Boundary	Site Area 0.73 Ha	Grid system: British National Grid (m)	Base plan: SimpsonHaugh Drawing: Site Location Plan
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3. Existing Information

The following reports and search information have been made available by the client team.

Item	Description
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- | | |
|---|---|
| 1 | Buro Happold Report: No.4 Angel Square, Manchester Ground Engineering Summary Report 042512 16 December 2019 |
| 2 | Socotec Report: PROJECT NOMA PLOT P FACTUAL REPORT ON GROUND INVESTIGATION Report No A9023-19 February 2020 |
| 3 | Buro Happold Report: NOMA 4 Angel Square and NOMA Primary Substation Remediation Strategy 047214-BHE-XX-XX-RP-GE-0002 047214 27 August 2020 |

Existing reports and information provided by others has been referred to in good faith as being accurate. GECL do not accept any liability for inaccuracies or deficiencies in third party information.

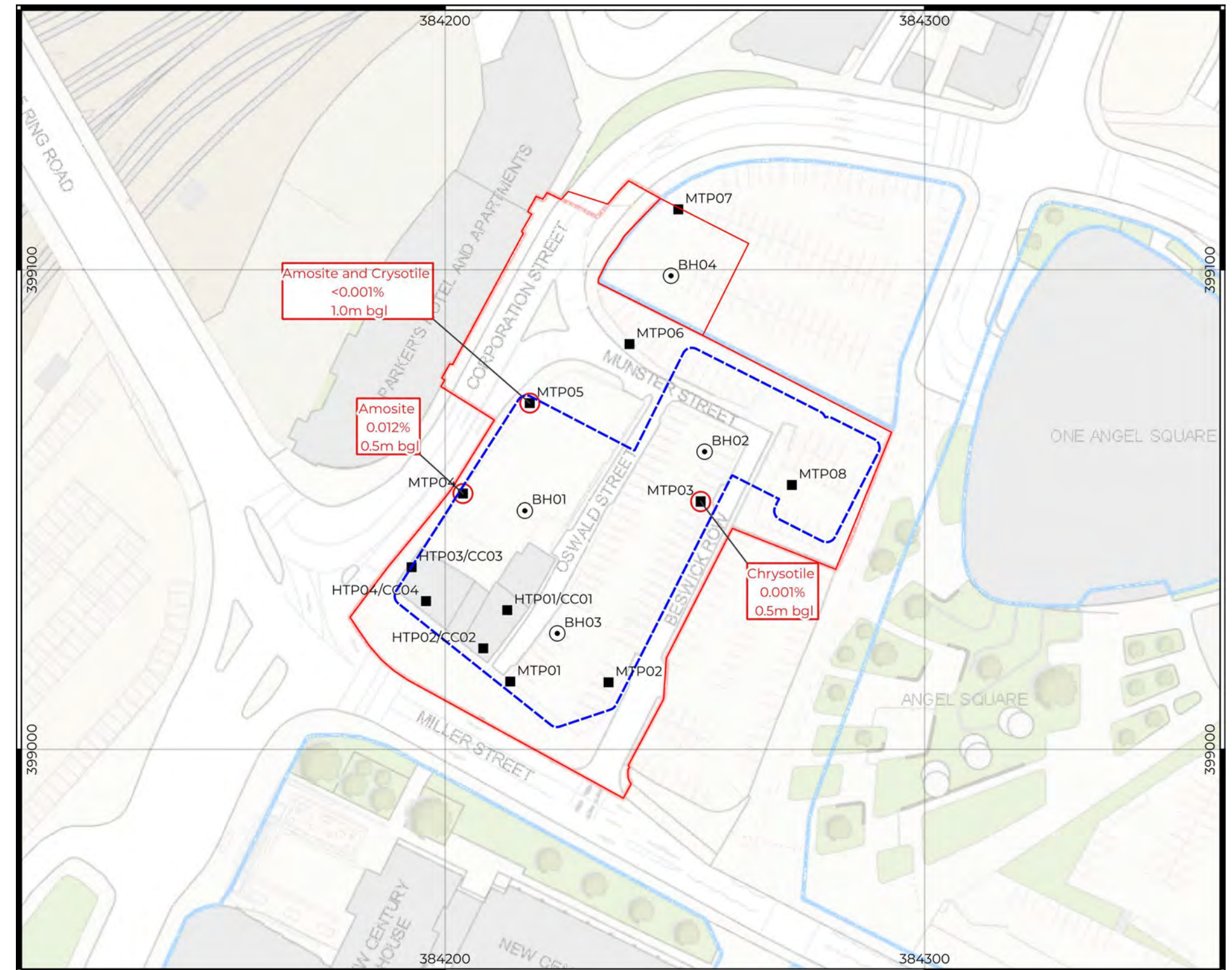
4. Findings of Previous Reports

The exploratory hole locations and the notable findings from previous reports are summarised below and referenced on Figure 3.

- Ground conditions were broadly as expected comprising variable thickness of Made Ground underlain by Glacial Till and sandstone bedrock (Chester Formation).
- 9 No. soils chemical tests were undertaken (7 No. in Made Ground and 2 No. in natural ground).
- None of the results exceeded the relevant 'commercial threshold' criteria (C4SL/S4UL).
- Of the 9 No. soil chemical tests, 7 No. tests on samples within Made Ground deposits were screened for Asbestos Containing Material (ACM). No suspect fragments or gross asbestos contamination was encountered during the intrusive ground investigations. Of these 7 No. Made Ground samples, 3 No. recorded the presence of asbestos fibres, namely, Chrysotile in MTP03 at 0.50 m bgl, Amosite in MTP04 at 0.50 m bgl and Amosite and Chrysotile in MTP05 at 1 m bgl.

The asbestos concentrations in weight % are shown labelled red in Figure 3. The extent of the basement and attenuation tank excavation is indicated with a dotted blue line.

Figure 3 – Exploratory hole locations, asbestos exceedances and basement excavation.



Scale 1:1000 Red line Site Boundary Site Area 0.73 Ha Grid system: British National Grid (m) Base plan: SimpsonHaugh Drawing: Site Location Plan

5. Reduced Level Excavation

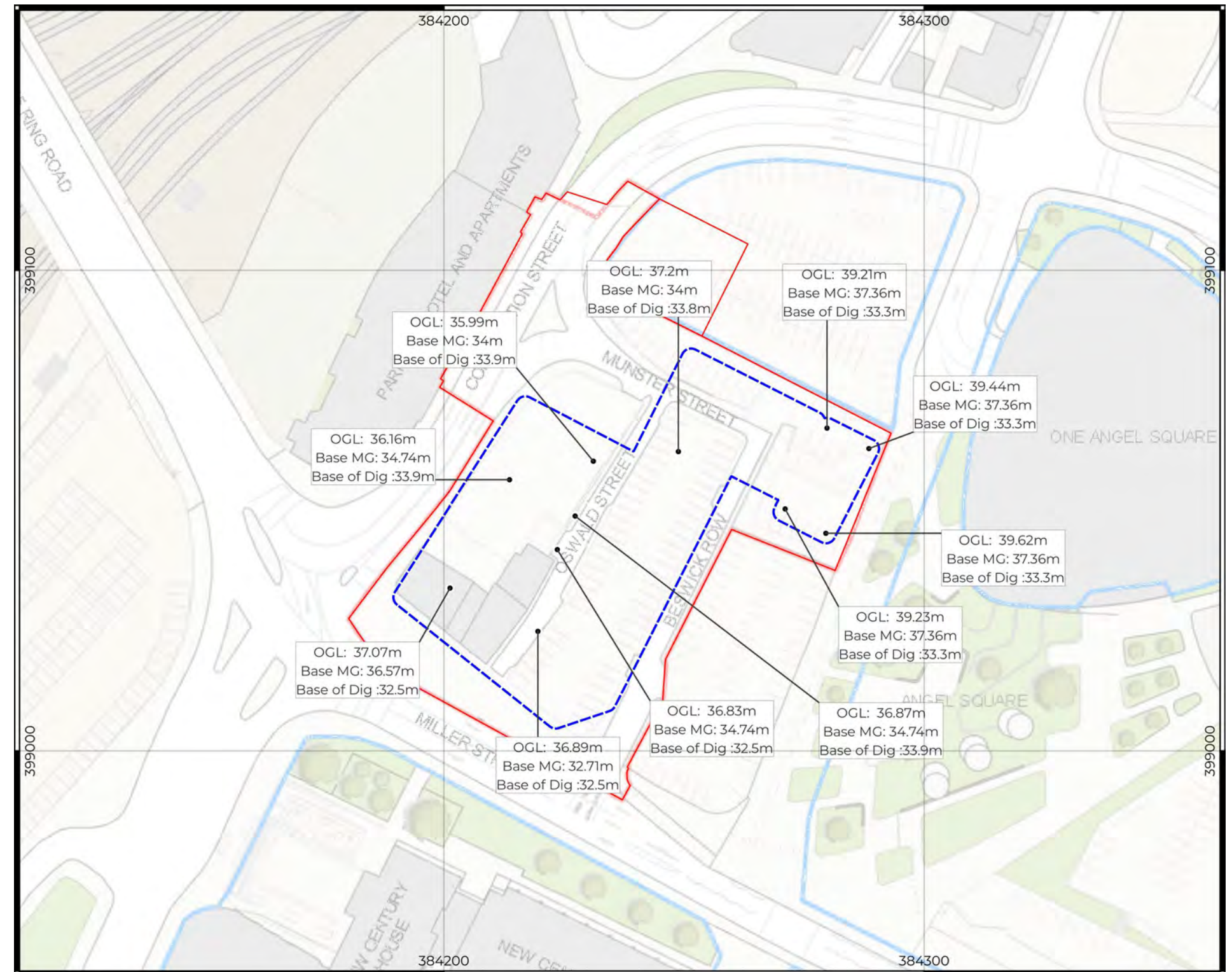
To enable the construction of the proposed basement and attenuation tanks, a reduced level dig was carried out over the footprint indicated within the dotted blue line shown in Figure 4.

The original ground levels, base of Made Ground and base of dig levels are labelled in Figure 4 as OGL, Base MG, and Base of Dig.

As can be seen from the levels plotted in Figure 4, the full depth of made ground was removed over the area of the reduced level dig, exposing natural ground at formation level.

All the arisings from the reduced level excavation were removed from site, including all the soils identified in the remediation strategy report as being impacted by asbestos.

Figure 4 – Schematic Plan on Reduced Level Dig Showing Base of Made Ground & Original Ground Level



Scale	Red line	Site Area	Grid system:	Base plan:
1: 1000	Site Boundary	0.73 Ha	British National Grid (m)	SimpsonHaugh Drawing: Site Location Plan

6. Validation

Supervision

GeoEnvironmental Consulting Ltd provided visiting supervision between August and December 2021. Bowmer & Kirkland Ltd provided full time supervision of the project and provided information relevant to remediation and validation.

Air Monitoring

No significant occurrences of asbestos were encountered in made ground during the enabling works. A copy of the Site Managers confirmation of this is included in Appendix E.

The full depth of made ground was removed from the footprint of the proposed basement and attenuation tanks as part of the reduced level dig. The soils identified in the site investigation as being impacted by very low concentrations of asbestos were removed from site during the reduced level dig.

Given the absence of any significant asbestos impacts, asbestos in air monitoring was not required.

Unforeseen Contamination

The site investigations indicated variably impacted materials with a potential to encounter contaminated materials. The potential risks related to encountering unforeseen contamination were mitigated by:

- A 'watching brief' by the Site Manager including periodic inspections and records maintained by the Contractor;
- Toolbox talks to alert construction workforce to the potential for such unforeseen contamination.

Following removal of made ground as part of the reduced level dig, no unforeseen contamination was encountered in either the Primary Sub Station area or the 4 Angel Square Area. A copy of the Site Managers confirmation of this is included in Appendix E.

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Waste Arisings

Approximately 37,500 tonnes of arisings were derived from the basement and attenuation tank excavation at 4 Angel Square and approximately 800 tonnes of arisings were generated at the Primary Sub Station.

Non-hazardous wastes were removed from site and accompanied by waste transfer notes (each load).

Waste transfer notes and returns are being kept by Bowmer and Kirkland for a minimum of 2 years. Copies of waste transfer log containing details of the waste carriers, licence numbers, receiving sites, and waste management permits are included in Appendix F. Scanned copies are available [here](#).

Landscaping

Where areas of landscaping were included by the landscape designer, clean suitable soils were imported and placed to a minimum thickness of 500mm. Written confirmation of the depth is included in Appendix E.

Testing at source (1 sample) and site based testing (2 samples) was carried out for the general suite of contaminants contained in the remediation strategy at a frequency of 1 sample per 250m³ of imported soil.

The lab data from the landscaping soils were screened against the suitability criteria and are presented in the table opposite. Assessment criteria for each determinand are listed in bold text. Soils data below the assessment criteria are highlighted green.

Of the 3 samples of imported soil, all of the determinands returned concentrations below the remedial target value and complied with British Standard BS3882. As such the imported soils are considered suitable for their intended use.

Copies of the laboratory certificates for the imported subsoils are included in Appendix G.

Imported Subsoil Suitability Summary Table

Contaminant	Units	Suitability Criteria	Sample Ref 119183-2 S02	Sample Ref 119183-3 S03	Sample Ref Crown Farm S01
Arsenic (total)	mg/kg As	37	3.32	3.08	3.0
Cadmium (total)	mg/kg Cd	26	<0.2	<0.2	<0.2
Chromium (total)	mg/kg Cr	910	26.94	24.04	9.0
Chromium (VI)	mg/kg CrVI	21	<1	<1	<4.0
Copper (total)	mg/kg Cu	2400	11.48	10.95	19.0
Lead (total)	mg/kg Pb	200	100.15	35.56	3.0
Mercury (total)	mg/kg Hg	1.2	<0.5	<0.5	<0.3
Nickel (total)	mg/kg Ni	130	7.78	7.00	9.0
Selenium (total)	mg/kg Se	250	0.59	0.60	< 1.0
Zinc (total)	mg/kg Zn	3700	33.99	31.33	12.0
pH	units	5-9	8.50	8.60	
Cyanide (total)	mg/kg CN	4.6	<1	<1	<1.0
Phenols (total)	mg/kg PhOH	380	<0.5	<0.5	<1.0
Naphthalene	mg/kg	2.3	<0.02	<0.02	< 0.05
Acenaphthylene	mg/kg	170	<0.02	<0.02	< 0.05
Acenaphthene	mg/kg	210	<0.02	<0.02	< 0.05
Fluorene	mg/kg	170	<0.02	<0.02	< 0.05
Phenanthrene	mg/kg	95	<0.02	<0.02	< 0.05
Anthracene	mg/kg	2400	<0.02	<0.02	< 0.05
Fluoranthene	mg/kg	280	0.06	0.06	< 0.05
Pyrene	mg/kg	620	0.06	0.05	< 0.05
Benzo(a)anthracene	mg/kg	7.2	0.03	0.03	< 0.05
Chrysene	mg/kg	15	0.04	0.04	< 0.05
Benzo(b)fluoranthene	mg/kg	2.6	0.06	0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	77	<0.03	<0.03	< 0.05
Benzo(a)pyrene	mg/kg	2.2	0.05	0.05	< 0.05
Indeno(123cd)pyrene	mg/kg	27	0.03	0.04	< 0.05
Dibenz(ah)anthracene	mg/kg	0.24	<0.02	<0.02	< 0.05
Benzo(ghi)perylene	mg/kg	320	0.04	0.04	< 0.05
Benzene	mg/kg	0.087	<0.01	<0.01	< 0.001
Toluene	mg/kg	130	<0.01	<0.01	< 0.001
Ethylbenzene	mg/kg	47	<0.01	<0.01	< 0.001
m & p-Xylene	mg/kg	56	<0.02	<0.02	< 0.001
o-Xylene	mg/kg	56	<0.01	<0.01	< 0.001
VPH Aromatic (>EC5-EC7)	mg/kg	70	<0.01	<0.01	< 0.001
VPH Aromatic (>EC7-EC8)	mg/kg	130	<0.01	<0.01	< 0.001
VPH Aromatic (>EC8-EC10)	mg/kg	34	<0.01	<0.01	< 0.001
EPH Aromatic (>EC10-EC12)	mg/kg	74	<10	<10	<1.0
EPH Aromatic (>EC12-EC16)	mg/kg	140	11.75	26.38	<2.0
EPH Aromatic (>EC16-EC21)	mg/kg	260	<1	110.27	<10
EPH Aromatic (>EC21-EC35)	mg/kg	1100	55.27	435.10	< 10
VPH Aliphatic (>C5-C6)	mg/kg	42	<0.1	<0.1	< 0.001
VPH Aliphatic (>C6-C8)	mg/kg	100	<0.1	<0.1	< 0.001
VPH Aliphatic (>C8-C10)	mg/kg	27	<0.1	<0.1	< 0.001
EPH Aliphatic (>C10-C12)	mg/kg	130	<6	<6	< 1.0
EPH Aliphatic (>C12-C16)	mg/kg	1100	<6	<6	<2.0
EPH Aliphatic (>C16-C35)	mg/kg	65000	15.90	37.58	< 8.0
Asbestos (qualitative)	-	NAD	NAD	NAD	NAD

Validation Pits

Following placement of subsoil and topsoil, validation pits (VP01 – VP08) were excavated at representative locations in the landscaped areas to provide a photographic record of the cover materials and confirm the depth of material placed. The location of validation pits is shown in Figure 5.

A minimum of 600mm soil cover was validated at each location.

Photographic records and soil descriptions of the validation pits are included in Appendix H.

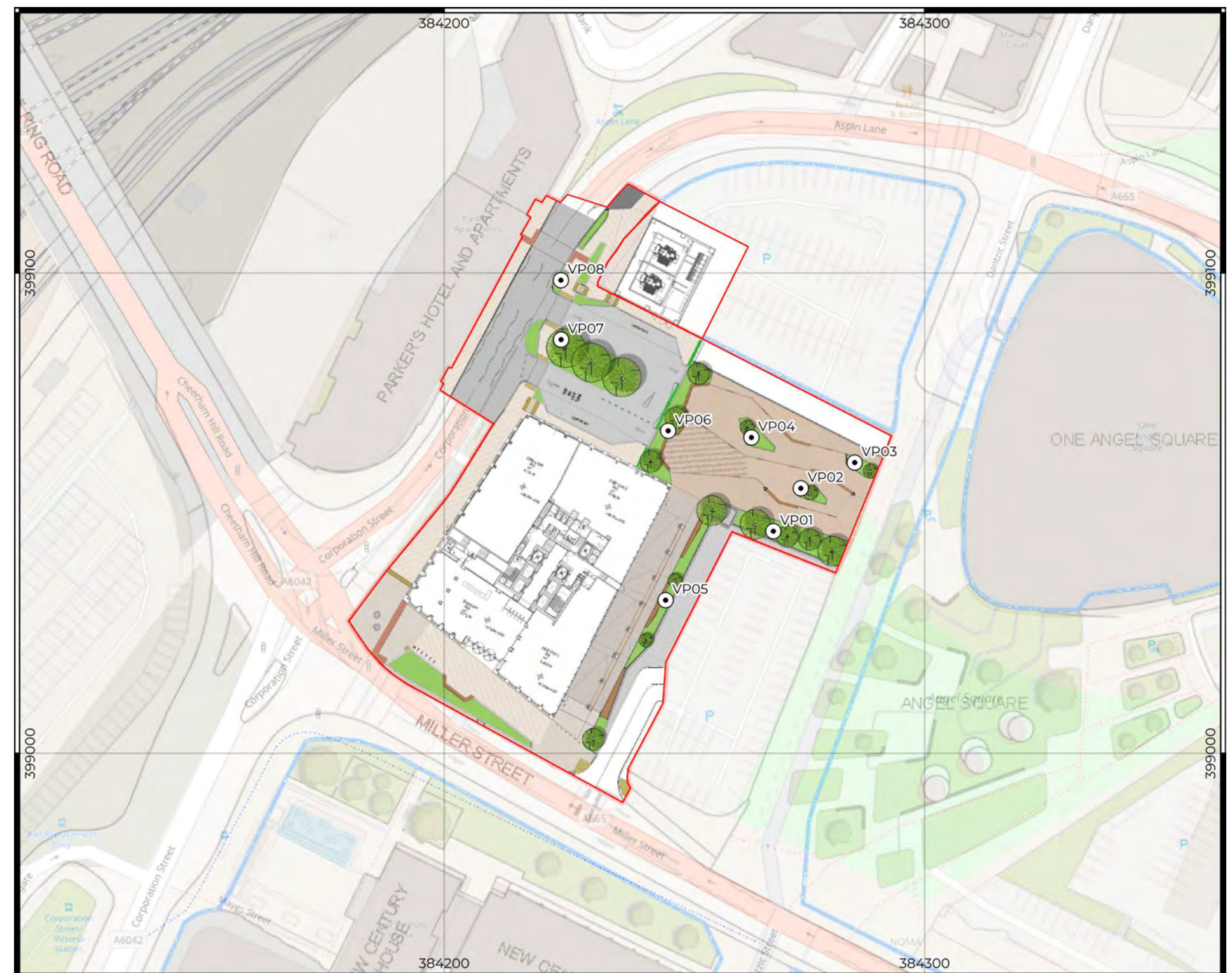
7. Conclusions

Based on information obtained during visiting supervision and provided to GECL by Bowmer + Kirkland, it is concluded that the remediation activities at 4 Angel Square and the Primary Sub Station have been carried out in general accordance with the Buro Happold remediation strategy referenced in Section 3.

All pollutant linkages identified in the remediation strategy have been broken or effectively controlled.

This report should be submitted to and approved by the local authority as part of the planning process.

Figure 5 Location of Validation Pits (VP01 – VP08) in Landscaped Areas.



Scale	Red line	Site Area	Grid system:	Base plan:
1:1000	Site Boundary	0.73 Ha	British National Grid (m)	SimpsonHough Drawing: Site Location Plan



Appendix A – NQMS Declaration



NQMS SQP Declaration of Document Adequacy

Project

Project Name	Angel Square Manchester
Project Address	M4 4DY
NQMS Declaration Reference	0323-H0330

Summary Description of Project / Proposed development

A Validation Report for remediation activities carried out at 4 Angel Square & Primary Sub Station, Manchester, updated to include validation pits.

Document

Document Title	4 Angel Square & Primary Sub Station Validation Report
Document Type	Validation Report
Document Reference	3352-01-R02-v6
Document Date	March 2023
Document Author / Publishing Organisation	GECL
Named Client	Bowmer & Kirkland



Regulator's Contact Details

Local Authority Details

Local Authority Name	N/A
Contact Name	N/A
Contact Telephone	N/A
Contact Email	N/A
Contact Role	N/A

Regulator Details

Regulator	N/A
Contact Name	N/A
Contact Telephone	N/A
Contact Email	N/A
Contact Role	N/A

SQP Details

SQP Name	Richard Meredith
SQP Registration No.	SQP0074
Telephone	N/A
Email	richard.meredith@geo-env.co.uk
Organisation	GeoEnvironmental Consulting Ltd
Address	'''
Chartered or Professional Institution	The Geological Society
Chartered or Professional Institution	
Membership Reference	



Declaration

I, Richard Meredith, confirm that I am the person described in the SQP Details section and hold current valid registration as a Suitably Qualified and Experienced Person Registration No. SQP0074 with the NQMS.

I have reviewed the document described in the Document Details section, in relation to the project and site described in the Site Details section, and I am satisfied that:

1. The work has been carried out by appropriately capable people with reference to the Brownfield Skills Framework.
2. That the work carried out is, to the best of my knowledge, undertaken with reasonable skill and care, and the information and data reported:
 - i. describe an appropriate scope and objectives and
 - ii. accord with relevant good practice guidance and standards and
 - iii. are based upon appropriately robust science and
 - iv. are factually correct and
 - v. have been appropriately reviewed.
3. That all specialist aspects have been reviewed by an appropriately qualified/competent person with relevant skills and experience in that specialist area.
4. That the interpretation and conclusions are reasonable.
5. That proposals to mitigate actual potential or residual risks are appropriate.
6. I am competent to sign this Declaration and that
 - a. I am fully aware and comply with the Code of Conduct of The Geological Society through which I hold Chartership .
 - b. The work of this review and Declaration are within the limits of my knowledge, competence and professional capacity.

Note: The document that has been reviewed was prepared by the organisation named for the benefit of the named Client who has reliance upon it. Any professional liability arising from any proven negligent act or omission by the Company carrying out the work and publishing the document rests with that Company and not with the SQP or the NQMS.

Signed:

Richard Meredith

Date:

4/5/23

Name:

RICHARD MEREDITH

[Block capitals]



0323-H0330



Appendix B – The Appointment

Mr P Neilson
Bowmer and Kirkland Ltd
Company Number: 00701982
North West Regional Office,
1st Floor,
Altitude,
Atlas Business Park,
Manchester, M22 5PR



GeoEnvironmental Consulting Ltd
Tel: 07762 751411
email: richard.meredith@geo-env.co.uk

Dear Paul

NOMA: Primary Substation and 4 Angel Square Office Development – Revised Proposals

Further to your recent request, please find outlined below our revised proposals for providing consultancy services in connection with the above sites.

The “Services”

The services will comprise: -

1. Attending Client meetings at the request of B&K (rate only)
2. 4 Angel Square:
 - a. Review previous reports and remediation strategy
 - b. Submit requests for information required by the remediation strategy.
 - c. Visiting supervision to monitor progress consistent with the requirements of the remediation strategy.
 - d. Provision of a verification report on completion of the remediation activities (based on information provided by others).
3. Primary Substation:
 - a. Visiting supervision to monitor progress consistent with the requirements of the approved remediation strategy.
 - b. Provision of a verification report on completion of the remediation activities (based on information provided by others).

The work will be overseen by an NQMS Suitably Qualified Person. The National Quality Mark Scheme (NQMS) for Land Contamination Management has been developed by the Land Forum to provide visible identification of documents that have been checked for quality by a Suitably Qualified and experienced Person (SQP). All CLR11 planning reports will carry the NQMS logo. More information on the NQMS Scheme can be found [here](#).

Please note, the scope may include commenting on asbestos in soils as a contaminant where appropriate but excludes commenting on asbestos in buildings, structures, ducts or similar.

Data and Information

Please supply any necessary / relevant data and information in good time to avoid delay to the programme. This should include all desk study, site investigation and remediation strategy reports.

Thank you for providing the following information:

- Copies of the planning trackers
- Simpson Haugh Constraints Layout: NOMA - 4 Angel Square Miller Street, Manchester

- Socotec Report Project Noma Plot P Factual Report on Ground Investigation Report No A9023-19 February 2020
- BHE Remediation Strategy Report ref 047214-BHE-XX-XX-RP-GE-0002 dated August 2020

To facilitate our review of factual data, we will request a full copy of factual data (field and lab) in AGS4 format. If the data is not available in AGS4 format it will take longer to review and process, in which case we may need to allow more time and additional fee to provide the services - we will advise you if this is the case.

For the purposes of this quotation we have taken the above information to be comprehensive and assumed that the factual data can be provided in AGS4 format. If any further information is required to carry out the services, please supply it in good time to avoid delay to the programme.

Fees and Expenses:

Our fees, expenses and travel costs for the Services are contained in the attached quotation.

Please note the scope of our services does not include any third party work such as fieldwork, surveys, lab testing or in-situ testing.

Programme:

We will start work shortly after you confirm our appointment. We will attend site or meetings at mutually convenient times, agreed in advance.

Health and Safety / CDM 2015

We have assumed that our duties under CDM 2015 will be limited to those of a Designer and only to the extent the Services described above require design input. We are not appointed as Principal Designer or Principal Contractor under CDM 2015.

We have assumed that we will be provided with safe access to working areas for survey and inspection purposes. Please confirm access and security arrangements for the site including liaison with security personnel, site caretakers etc. Any security requirements shall be made known to us prior to commencing on site and at a reasonable time to ensure site staff can comply with the requirements.

Terms of Appointment

Bowmer and Kirkland Ltd is our client for this project. This letter and the attached terms of appointment are our offer to provide the services and form the **Appointment**. Please countersign below and return a copy of this letter to confirm your acceptance of the Appointment. If you instruct us to proceed without countersigning, then you acknowledge that you have accepted the terms of the Appointment.

If you require GECL to work to B&K terms of appointment, please forward your terms for our review. We have included a rate only item for legal review of bespoke / non-standard terms.

We hope the above meets your requirements - if you have any queries regarding the content of our proposal, please do not hesitate to contact the undersigned.

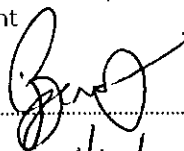
Yours sincerely



Richard Meredith
Director
GeoEnvironmental Consulting Ltd

We confirm our acceptance of the
Appointment

Signature.....



Date.....

4/10/21

For and on behalf of Bowmer and Kirkland
Ltd

B+k Order Nr. 63056/6638691

Bowmer and Kirkland Ltd appoints GeoEnvironmental Consulting Ltd to provide the Services and GeoEnvironmental Consulting Ltd accepts the appointment in accordance with these terms.

1 GeoEnvironmental Consulting Ltd's Obligations

(i) GeoEnvironmental Consulting Ltd shall provide the Services and exercise reasonable skill and care in the performance of the Services.

(ii) GeoEnvironmental Consulting Ltd shall use reasonable endeavours to perform the Services in accordance with any programme set out in the Proposal Letter.

(iii) GeoEnvironmental Consulting Ltd shall inform Bowmer and Kirkland Ltd if he considers any change or instruction from Bowmer and Kirkland Ltd is outside the scope of the Services and will cause a change to the programme and/or change to the level of fees or expenses.

2 Client's Obligations

(i) Bowmer and Kirkland Ltd shall pay GeoEnvironmental Consulting Ltd for the performance of the Services the fees and expenses set out in the Proposal Letter.

(ii) Bowmer and Kirkland Ltd shall supply GeoEnvironmental Consulting Ltd with all relevant data and information necessary for GeoEnvironmental Consulting Ltd to perform the Services, and all instructions, decisions, consents or approvals in good time to avoid delay to the performance of the Services. Bowmer and Kirkland Ltd acknowledge that any error, failure or delay in providing the same may result in additional cost being incurred by GeoEnvironmental Consulting Ltd.

(iii) Bowmer and Kirkland Ltd shall make an additional payment to GeoEnvironmental Consulting Ltd if GeoEnvironmental Consulting Ltd has to carry out additional work and/or suffers delay or disruption in the performance of the Services for reasons beyond GeoEnvironmental Consulting Ltd's control, including instructions or decisions by or on behalf of Bowmer and Kirkland Ltd. The additional payment will be calculated on the basis of GeoEnvironmental Consulting Ltd's hourly rate (£75 per hour plus VAT) together with all reasonable fees, expenses and/or disbursements. GeoEnvironmental Consulting Ltd shall if requested by Bowmer and Kirkland Ltd and where practicable give an initial estimate of the additional payment likely to be charged and how it is to be calculated, but no failure by GeoEnvironmental Consulting Ltd to provide an initial estimate shall prevent GeoEnvironmental Consulting Ltd being entitled to the additional payment.

3 Payment

Bowmer and Kirkland Ltd shall pay GeoEnvironmental Consulting Ltd in the following manner:

(i) GeoEnvironmental Consulting Ltd shall send an invoice to Bowmer and Kirkland Ltd for each instalment of the fees and other sums payable under this Appointment (the "Payment Application"). Each Payment Application shall specify the sum that GeoEnvironmental Consulting Ltd considers will become due on the payment due date under Clause 3(ii) and the basis on which that sum is calculated.

(ii) Payment shall be due on the date GeoEnvironmental Consulting Ltd submits the Payment Application. The final date for payment shall be 28 days from the due date or such shorter period as specified in the Proposal Letter.

(iii) GeoEnvironmental Consulting Ltd's Payment Application under Clause 3(i) shall be the payee's payment notice for the purposes of Section 110A of the Housing Grants, Construction and Regeneration Act 1996 (as amended).

(iv) Not later than 5 days after the due date Bowmer and Kirkland Ltd shall issue a payment notice specifying the sum that he considers to be or have been due at the due date, and the basis on which that sum is calculated (the "Payment Notice").

(v) On or before the final date for payment Bowmer and Kirkland Ltd shall pay to GeoEnvironmental Consulting Ltd either the sum stated as due in the Payment Notice ("the Notified Sum"). In the absence of a Payment Notice, the Notified Sum shall be the amount stated in the Payment Application. If Bowmer and Kirkland Ltd has served a Pay Less Notice, then on or before the final date for payment Bowmer and Kirkland Ltd shall pay the sum stated as due in the Pay Less Notice.

(vi) Not later than seven days before the final date for payment Bowmer and Kirkland Ltd may give GeoEnvironmental Consulting Ltd a Notice that it intends to pay less than the Notified Sum (a "Pay Less Notice"). Any Pay Less Notice shall specify the sum that Bowmer and Kirkland Ltd considers to be due on the date the Notice is served and the basis on which that sum is calculated.

(vii) All sums due under this Appointment are exclusive of VAT which shall be paid in addition.

4 Liability and Insurance

(i) Notwithstanding anything to the contrary contained in this Appointment but without prejudice to any of its provisions by which liability is excluded or limited to a lesser amount the total liability of GeoEnvironmental Consulting Ltd under or in connection with this Appointment whether in contract, tort, negligence, breach of statutory duty or otherwise (other than in respect of fraud, personal injury or death) shall not exceed in the aggregate:

- fifty times the fees; or
- £250,000 (two hundred and fifty thousand pounds);

whichever is the lower amount save for claims arising from, or in any way connected, to asbestos, pollution or contamination where the limit shall be £100,000.00 (one hundred thousand pounds).

(ii) Save in respect of fraud, personal injury or death GeoEnvironmental Consulting Ltd's liability in respect of terrorism, and ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radioactive, toxic, explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof (the "Excluded Matters") whether in contract, tort, negligence, breach of statutory duty or otherwise is excluded.

If GeoEnvironmental Consulting Ltd's liability in respect of any of the Excluded Matters is excluded, the relevant

Excluded Matters are outside the scope of this Appointment and GeoEnvironmental Consulting Ltd shall have no responsibility for advising or providing any Services in connection with the relevant Excluded Matters and shall not have any duty to consider the relevant Excluded Matters.

(iii) Without prejudice to clause 4(i) or 4(ii), GeoEnvironmental Consulting Ltd's liability under or in connection with this Appointment shall not exceed, the amount, if any, recoverable by GeoEnvironmental Consulting Ltd's against the claim or claims in question under the professional indemnity insurance maintained by it. The limitation on GeoEnvironmental Consulting Ltd's liability set out in this clause shall not apply in respect of fraud, death or personal injury.

(iv) No action or proceedings under or in respect of this Appointment shall be commenced against GeoEnvironmental Consulting Ltd after the expiry of six years from the date of this letter or the date that GeoEnvironmental Consulting Ltd first commenced its services (whichever is the earlier) which date shall not replace or override any earlier statutory limitation period.

(v) GeoEnvironmental Consulting Ltd shall maintain public liability insurance in the amount of £5,000,000.00 (five million pounds) and professional indemnity insurance in the amount of £2,000,000.00 (two million pounds) in the aggregate including defence costs (save for claims arising from pollution, contamination and asbestos which shall have an aggregate limit of £100,000 in the annual aggregate) and for the length of time sufficient to cover GeoEnvironmental Consulting Ltd's liabilities under this Appointment provided that in either case such insurance is available on reasonable terms and at reasonable commercial rates. If such insurance is not available on reasonable terms and/or at reasonable commercial rates, then GeoEnvironmental Consulting Ltd shall take out such lower amount of insurance as is available on reasonable terms and/or at reasonable commercial rates.

(vi) In relation to any claim brought by Bowmer and Kirkland Ltd in connection with this Appointment, GeoEnvironmental Consulting Ltd shall not be liable for any loss of profit, loss of use, loss of production or any indirect loss or consequential loss.

(vii) Nothing in this Appointment shall constitute a fitness for purpose obligation on GeoEnvironmental Consulting Ltd, and no statement made or report produced by GeoEnvironmental Consulting Ltd shall in any way be construed as GeoEnvironmental Consulting Ltd confirming or warranting the fitness for purpose of any particular site, land, development, or project. All statements, opinions, advice and other communications made and/or given by GeoEnvironmental Consulting Ltd are subject to the exercise by GeoEnvironmental Consulting Ltd of no higher obligation than the obligation to exercise reasonable skill and care.

5 Copyright, Licences and Confidentiality

(i) The copyright in all drawings and other documents (including material in electronic form) provided by GeoEnvironmental Consulting Ltd to Bowmer and Kirkland Ltd remains vested in GeoEnvironmental Consulting Ltd. Subject to all sums payable under this Appointment being paid in full, Bowmer and Kirkland Ltd shall have a licence to copy and use such material for the purposes for which they

were provided and GeoEnvironmental Consulting Ltd shall not be liable for their use by any person for any purpose other than for which they were provided. If Bowmer and Kirkland Ltd is in default of payment of any amount under this Appointment GeoEnvironmental Consulting Ltd may revoke any licence granted by giving seven days' notice.

(ii) Neither party shall disclose to any other person any private or confidential information concerning the business of the other party unless authorised by that party or if disclosed to either party's professional advisors or insurers or as required or permitted by law.

6 Termination

(i) Bowmer and Kirkland Ltd may terminate the appointment of GeoEnvironmental Consulting Ltd in the event of a breach of this Appointment or if GeoEnvironmental Consulting Ltd becomes insolvent by giving two weeks' notice and GeoEnvironmental Consulting Ltd may terminate this Appointment and in the same manner if the same circumstances arise in relation to Bowmer and Kirkland Ltd. In the event of any such termination Bowmer and Kirkland Ltd shall pay GeoEnvironmental Consulting Ltd a fair and reasonable amount on account of fees due under this Appointment commensurate with the services performed to the date of termination and any outstanding expenses.

(ii) If circumstances arise for which GeoEnvironmental Consulting Ltd is not responsible (including non payment of fees and expenses due under this Appointment) and which GeoEnvironmental Consulting Ltd considers make it irresponsible to continue to perform all or any of the Services GeoEnvironmental Consulting Ltd may terminate the appointment by giving two weeks' notice. In such event Bowmer and Kirkland Ltd shall pay GeoEnvironmental Consulting Ltd a fair and reasonable amount on account of the fees due (under the Proposal Letter) and in respect of any Services to which GeoEnvironmental Consulting Ltd is irrevocably committed together with any outstanding expenses.

(iii) Termination of GeoEnvironmental Consulting Ltd's appointment under this Appointment shall not prejudice the accrued rights or claims of either party.

7 Disputes and Differences

(i) Without prejudice to the parties' other rights and remedies, the parties shall attempt in good faith to settle any dispute by mediation.

(ii) Where this Appointment is a construction contract within the meaning of the Housing Grants Construction and Regeneration Act 1996 (as amended) any dispute arising shall be referred to adjudication in accordance with the procedure stated in the Proposal Letter or if none is so stated the CIC Model Adjudication Procedure current at the time of the referral. If either party so requests the adjudicator shall be nominated by the ACE.

8 General

(i) Neither party may assign or transfer any benefit or obligation under this Appointment without the prior written consent of the other party.

(ii) Nothing in this Appointment confers or purports to confer on any third party any benefit or any right pursuant

to the Contracts (Rights of Third Parties) Act 1999 or any other applicable law or statute to enforce any term of the Appointment.

(iii) This Appointment shall be governed by and construed in all respects in accordance with the laws of England and Wales.

(iv) In this Appointment a reference to a statute or statutory provision is a reference to it as amended, extended or re-enacted from time to time as at the date the Appointment.

9 Notices

Any notice under this Appointment shall be in writing, shall be sent to the address shown in the Proposal Letter and shall take effect when it has been received by Bowmer and Kirkland Ltd or GeoEnvironmental Consulting Ltd as the case may be. It may be in any form, including electronic, provided that a permanent record exists. Any such notice

shall be assumed to have been received within two days of issue.

10 Building Information Modelling

Bowmer and Kirkland Ltd and GeoEnvironmental Consulting Ltd shall comply with their respective obligations set out in any BIM protocol referred to in the Proposal Letter. The parties shall have the benefit of any rights granted to them in the protocol and of any limitation or exclusion of liability contained within it.

11 Entire Agreement

This Appointment represents the entire agreement between Bowmer and Kirkland Ltd and GeoEnvironmental Consulting Ltd and supersedes any previous agreement or discussions relating to the Services the subject of this Appointment.



Appendix C – Proposed Development Drawings



This drawing is copyright
Do not scale off dimensions.
All dimensions to be checked on
site by contractor.
Contractor to report any
dimensional discrepancies,
errors or omissions prior to
commencing on site.

Local Drawing No 10257-SHP-Z1-00-PL-A-B5D3-G200-001
File Path C:\Users\dingi\Documents\10257-SHP-Z1-00-M3-A-Building Model_a.dgn\1.vrt

Entrance / Reception

Retail / F&B

Office

Facilities

↑ Entrances

Back of House

NORTH

Rev

Date

Description

00

24/04/2019

Planning Application Submission

4

ANGEL SQUARE

Project Title

NOMA - 4 Angel Square
Miller Street, Manchester

Status

PLANNING

Drawing Title

GA Plan- Ground Floor

Job No

10257

Scale

1 : 250 @ A3

BSI Drawing Code

10257-SHP-Z1-00-PL -A-B5D3-G200-001

Revision

00

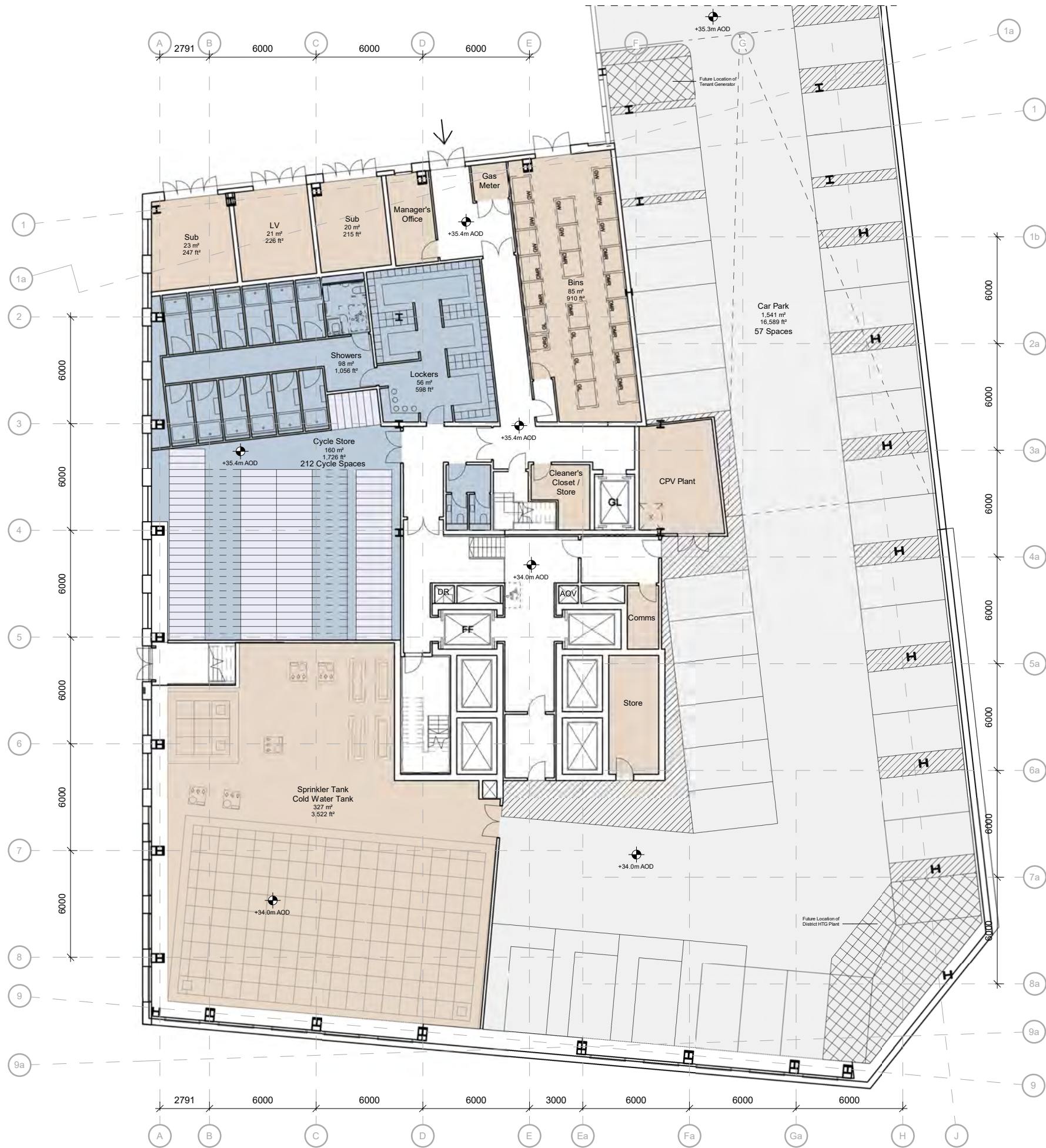
Manchester

+44 (0)161 835 2345

London

+44 (0)20 7549 4000

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This drawing is copyright
Do not scale off dimensions.
All dimensions to be checked on
site by contractor.
Contractor to report any
dimensional discrepancies,
errors or omissions prior to
commencing on site.

Local Drawing No 10257-SHP-Z1-LG-PL-A-B5D3-G200-001
File Path C:\Users\dingit\Documents\10257-SHP-Z1-JX-M3-A-Building Model_a.dingit.rvt

Car Park

Facilities

Back of House / Plant

Entrances

DMR

Dry Mixed Recycling Bin

ORG

Organic Waste Bin

GL

Glass Waste Bin

GW

General Waste Bin

NORTH

Rev	Date	Description
00	24/04/2019	Planning Application Submission

NOMA - 4 Angel Square

Miller Street, Manchester

Status

PLANNING

Drawing Title

GA Plan - Lower Ground Floor

Job No

10257

Scale

1 : 250 @ A3

BSI Drawing Code

10257-SHP-Z1-LG-PL-A-B5D3-G200-001

Project

Originator

Zone

Location

Type

Rev

Uniclass 1.4

Series

Revision

00

Manchester

+44 (0)161 835 2345

London

+44 (0)20 7549 4000

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S1-P06	24-04-19	Planning	AT	KR
S1-P05	24-04-19	Planning	AT	KR
S1-P04	10-04-19	Draft planning	AT	KR
S1-P03	29-03-19	Draft planning	AT	KR
S1-P02	15-03-19	For information	AT	KR
S1-P01	07-03-19	For information	AT	KR
Revision	Date	Description	Drawn	Apprvd.

Client	MEPC		
Project	NOMA, Plot P, Manchester		
Drg Title	Landscape Masterplan A1 Portrait		
Created on	05.04.19	Created by	AT
		Approved by	KR
Scale	1:250	Size	A1
		Workstage	Planning
Drg No.	2048-PLA-XX-XX-DR-L-0002	Suitability	S1
		Revision	P06



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T: 0151 705 6746



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NOTES:

1. Do not scale from this drawing.
2. Always work to noted dimensions.
3. All dimensions are in millimetres unless otherwise stated.
4. All setting out, levels and dimensions to be agreed on site.
5. The dimensions of all materials must be checked on site before being laid out.
6. This drawing must be read with the relevant specification clauses and detail drawings.
7. Order of construction and setting out to be agreed on site.



Appendix D – Planning Conditions

submitted for approval in writing by the City Council as the Local Planning Authority. This shall include:

- Maximise use of green SuDS in design
- Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event with allowance for climate change in any part of a building;
- Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site.
- Hydraulic calculation of the proposed drainage system;
- Construction details of flow control and SuDS elements.

(b) The development shall then be constructed in accordance with the approved details, within an agreed timescale.

Reason - To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution pursuant to policies SP1, EN14 and DM1 of the Manchester Core Strategy (2012).

9) Notwithstanding the ground conditions report stamped as received by the City Council, as Local Planning Authority, on the 1 May 2019, (a) before the development hereby approved commences (excluding demolition), the following information shall be submitted for approval in writing by the City Council, as Local Planning Authority:

- Submission of the site investigation and updated final risk assessment;
- Submission of a remediation strategy.

One approved, the development shall then be carried out in accordance with the approved details.

(b) When development commences, the development shall be carried out in accordance with the previously agreed Remediation Strategy and a Completion/Verification Report shall be submitted to and approved in writing by the City Council as local planning authority prior to the first occupation of the development.

In the event that ground contamination, groundwater contamination and/or ground gas, not previously identified, are found to be present on the site at any time before the development is occupied, then development shall cease and/or the development shall not be occupied until, a report outlining what measures, if any, are required to remediate the land (the Revised Remediation Strategy) is submitted to and approved in writing by the City Council as local planning authority and the development shall be carried out in accordance with the Revised Remediation Strategy, which shall take precedence over any Remediation Strategy or earlier Revised Remediation Strategy.

Reason - There is evidence of site contamination at the application site which requires further consideration and examination. In particular, details of outstanding gas monitoring is required to be submitted for consideration and an appropriate remediation strategy prepared. This is pursuant to policy EN18 of the Manchester Core Strategy (2012).

- o Routing strategy and swept path analysis;
- o Communication strategy with local residents;
- o Parking of construction vehicles and staff; and
- o Sheeting over of construction vehicles.

The development shall be carried out in accordance with the approved construction management plans for the duration of the demolition and construction parts of the development.

Reason - To safeguard the amenities of nearby residents and highway safety, pursuant to policies SP1, EN9, EN19 and DM1 of the Manchester Core Strategy (July 2012).

7) Prior to the first occupation of the development, details of the implementation, maintenance and management of the sustainable drainage scheme shall be submitted for approval in writing by the City Council, as Local Planning Authority.

For the avoidance of doubt this shall include:

- Verification reporting providing photographic evidence of construction;
- Management and maintenance plan for the lifetime of the development which shall include the arrangements adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

Reason - To manage flooding and pollution and to ensure that a managing body is in place for the sustainable drainage system and there is funding and maintenance mechanism for the lifetime of the development pursuant to policies SP1, EN14 and DM1 of the Manchester Core Strategy (2012).

8) (a) A watching brief shall be maintained for the duration of the construction. In the event that ground contamination, groundwater contamination and/or ground gas are encountered on the site at any time before the development is occupied, then the development shall cease until a report detailing what measures, if any, are required to remediate the land (the remediation strategy) has been submitted for approval in writing by the City Council, as Local Planning Authority. Once approved, the development shall be carried out in accordance with the remediation strategy.

(b) Prior to the first occupation of the development, a post completion report shall be submitted to the City Council, as Local Planning Authority, detailing whether any ground conditions were encountered and/or the verification of the previously approved remediation strategy.

Reason - If there is evidence of site contamination at the application site which requires further consideration and examination. In particular, details of outstanding gas monitoring is required to be submitted for consideration and an appropriate remediation strategy prepared. This is pursuant to policy EN18 of the Manchester Core Strategy (2012).

9) (a) Prior to the first use of the development hereby approved, details of any externally mounted ancillary plant, equipment and servicing shall be submitted for approval. For the avoidance of doubt, externally mounted plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 db (L_{aeq}) below the typical background (L_{a90}) level at the nearest noise sensitive location.

(b) The approved scheme shall be implemented and prior to the first use of the development, a verification report will be required to validate that the work undertaken



Appendix E – Site Managers Report



Richard Meredith <richard.meredith@geo-env.co.uk>

NOMA 4AS : Ground Remediation Report

Paul Neilson <p.neilson@bandk.co.uk>

14 March 2023 at 12:54

To: "richard.meredith@geo-env.co.uk" <richard.meredith@geo-env.co.uk>

Cc: "Mark Taylor (North West)" <m.taylor@bandk.co.uk>, Nicola Bent <n.bent@bandk.co.uk>

Hi Richard,

Just a note to confirm the following;

1: When completing the bulk excavation at NOMA 4AS, no asbestos was discovered during the works and therefore dust/ air monitoring wasn't required to monitor Asbestos fibres.

2: No unforeseen contamination was encountered during the bulk excavation works on site.

Should you require any further information, please let me know.

Regards

Paul

Paul Neilson
Senior Contracts Manager

Tel: +44 (0)161 493 1880(x4258) | Mob: 07500 761856

North West Regional Office, 1st Floor, Altitude, Atlas Business Park, Manchester, M22 5PR

Email | Website



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Appendix F – Waste Log

Project Name:	Noma	Project Number	63056	
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Record details of each waste carrier used on a job, and where the waste is being taken to

[Click here to check Waste Carrier Licences - Environment Agency](#)

[Click here to Check Waste Disposal Site Licences - Environment Agency](#)

[illegible][illegible]

Carriers Licence Expiry Key
Green - expire's over 2 weeks
Orange - expire's within 2 weeks
Red - expired

PLEASE DO NOT CUT TEXT FROM THE TABLES

% required if green box shown

Waste Producer	Waste Carrier	Date taken from site DD/MM/YY	Waste From: Construction Demolition Excavation	Waste Category / EWC Code	Disposal Site	Category of Disposal Site	Total Waste Generated	Unit of Waste measure	Waste Transfer Note Number	Recycled by Transfer station (%)
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN175196	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179743	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN175197	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179744	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN175198	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179745	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179741	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN175195	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179742	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN175194	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN175193	
Bandk	W. Maher and Sons LTD	05/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179740	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179749	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN188404	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN188403	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN188402	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN188401	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179746	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN182490	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179747	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179748	
Bandk	W. Maher and Sons LTD	06/11/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN197748	
Bandk	W. Maher and Sons LTD	06/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN179750	
Bandk	W. Maher and Sons LTD	09/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN194864	
Bandk	W. Maher and Sons LTD	09/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN194863	
Bandk	W. Maher and Sons LTD	09/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN188420	
Bandk	W. Maher and Sons LTD	09/11/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN188415	

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Waste Producer	Waste Carrier	Date taken from site DD/MM/YY	Waste From: Construction Demolition Excavation	Waste Category / EWC Code	Disposal Site	Category of Disposal Site	Total Waste Generated	Unit of Waste measure	Waste Transfer Note Number	Recycled by Transfer station (%)
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D649198	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D657347	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D648551	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D657342	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D658109	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D657345	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D648819	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D658106	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D649190	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D657342	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D657339	
Bandk	Chartrange Enviro Ltd	04/02/2021	Excavation	Subsoil (non-contaminated) - 17 05 04	Chartrange Enviro Ltd	Re-use	20	Tonne	D657338	

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Waste Producer	Waste Carrier	Date taken from site DD/MM/YY	Waste From: Construction Demolition Excavation	Waste Category / EWC Code	Disposal Site	Category of Disposal Site	Total Waste Generated	Unit of Waste measure	Waste Transfer Note Number	Recycled by Transfer station (%)
BandK	Kenny Waste Management LTD	25/08/2020	Construction	Mixed Waste - 17 09 04	Kenny Waste Management LTD	Transfer	2.08	Tonne	1359530	
BandK	W. Maher and Sons LTD	07/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191942	
BandK	W. Maher and Sons LTD	07/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN186650	
BandK	W. Maher and Sons LTD	07/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191338	
BandK	W. Maher and Sons LTD	07/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191946	
BandK	W. Maher and Sons LTD	07/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN186752	
BandK	Kenny Waste Management LTD	20/10/2020	Construction	Concrete / Brick / Ceramics - 17 01 07	Kenny Waste Management LTD	Transfer	4.08	Tonne	1407249	
BandK	Kenny Waste Management LTD	22/10/2020	Construction	General Office waste - 20 03 01	Kenny Waste Management LTD	Transfer	0.12	Tonne	1382565	
BandK	W. Maher and Sons LTD	07/08/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191341	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191924	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191922	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191919	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191937	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191925	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191923	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191920	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191938	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191932	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191930	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191928	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN185323	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191931	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN191929	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN194927	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN185333	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN185329	
BandK	W. Maher and Sons LTD	03/09/2020	Excavation	Subsoil (non-contaminated) - 17 05 04	W. Maher and Sons LTD	Re-use	20	Tonne	CN185327	

[illegible]



Appendix G – Lab Results



2183

Final Report

Report No.:	22-43051-1		
Initial Date of Issue:	21-Nov-2022		
Client	Huperade Ltd		
Client Address:	Bridge House Farm Brooks Drive Timperley Cheshire WA15 7DQ		
Contact(s):	Lesley Cox		
Project	Soil Analysis		
Quotation No.:		Date Received:	09-Nov-2022
Order No.:		Date Instructed:	09-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	22-Nov-2022
Date Approved:	21-Nov-2022		
Approved By:			



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: Soil Analysis

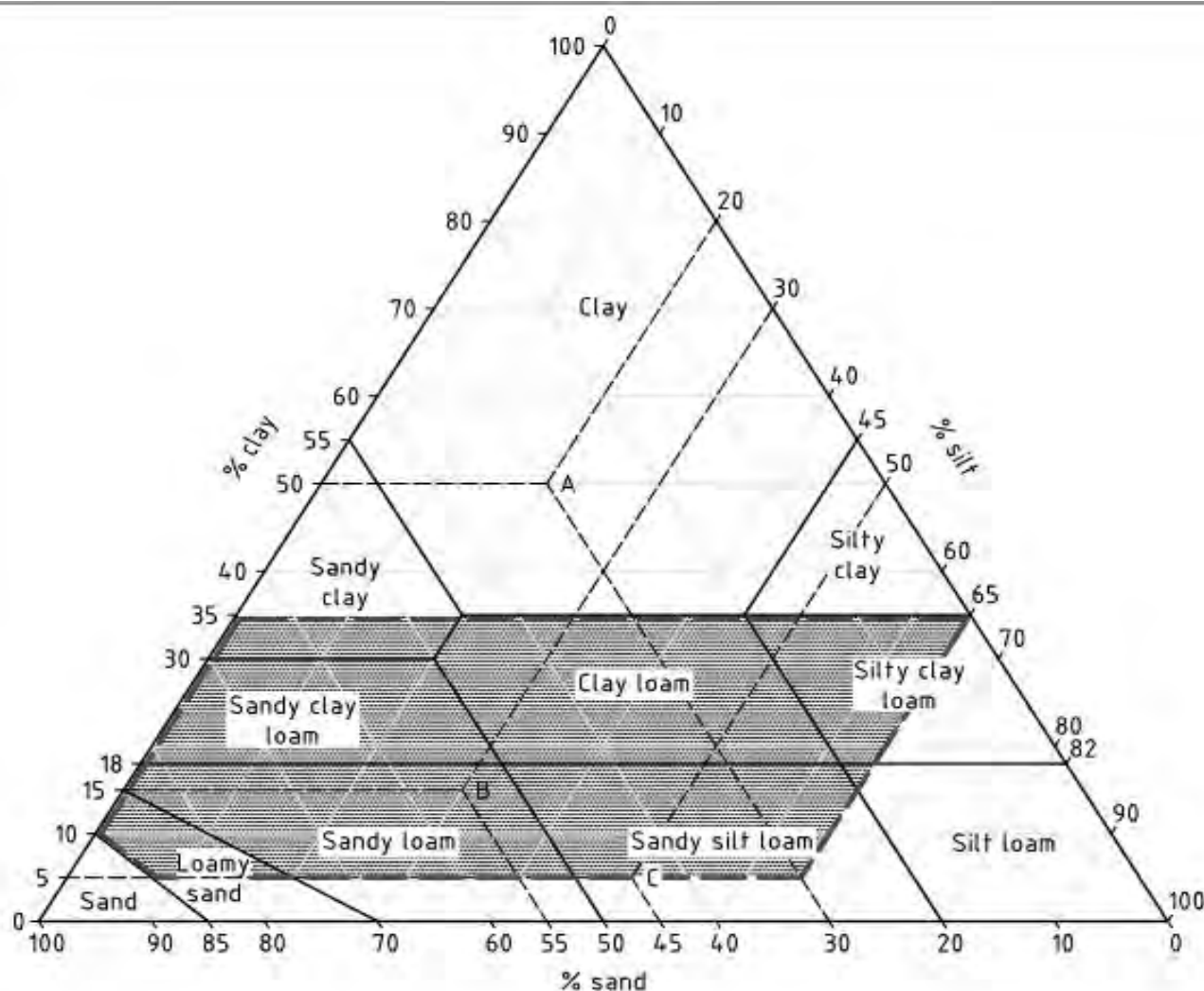
Client: Huperade Ltd	Chemtest Job No.:		22-43051		
Quotation No.:	Chemtest Sample ID.:		1542085		
	Client Sample ID.:		1		
	Sample Type:		SOIL		
	Date Sampled:		04-Oct-2022		
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	18

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 22-43051
 Chemtest Sample ID.: 1542085
 Client Sample Ref.:
 Sample Location:
 Client Sample ID.: 1
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 04-Oct-2022
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content	%		11				
Silt content	%		15				
Sand content	%		74				
Soil texture class		See Attached Chart	Sandy Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	3.7	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	21	YES			
>20mm		0-10	< 0.020	YES			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	[B] 7.8	YES	NO	YES	YES
Carbonate (Calcareous only)	%		2.2				YES
Electrical Conductivity	µS/cm	If >3300 do ESP	[B] 2300	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.090	NO	NO		NO
Extractable phosphorus	mg/l	16-140	25	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	85	NO	NO		NO
Extractable magnesium	mg/l	51-600	65	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1	24.0/1	NO	NO	YES	NO
Exchangeable sodium	%	<15	0.84				
Available Calcium	mg/l		330				
Available Sodium	mg/l		18				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0			
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	32	YES	
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	17	YES	
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	< 5.0	YES	
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Texture Classification Chart**Key**

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

- Soil A with 30% sand, 20% silt and 50% clay is in the "clay" textural class.
- Soil B with 55% sand, 30% silt and 15% clay is in the "sandy loam" textural class.
- Soil C with 45% sand, 50% silt and 5% clay is in the "sandy silt loam" textural class.

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British Standards can be obtained in PDF or hard copy formats from the BSI online shop: www.bsigroup.com/Shop or by contacting BSI Customer Services for hardcopies only: Tel: +44 (0)20 8996 9001, Email: cservices@bsigroup.com.

Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1542085		1		04-Oct-2022	B	Plastic Bag

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2260	Carbonate	Carbonate	Titration
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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

Charges may apply to extended sample storage

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

customerservices@chemtest.com



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Mr Steve Pidcock
Tarmac Trading Limited
Eaton Hall Quarry
Manchester Road
Congleton
Cheshire, CW12 2LU

11th April 2022
Our Ref: TOHA/22/7324/SS
Your Ref: PO 2002346662

Dear Sirs

Subsoil Analysis Report: Crown Farm Subsoil

We have completed the analysis of the soil sample recently submitted, referenced *Crown Farm Subsoil*, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*).

This report presents the results of analysis for the sample submitted to our office, and it should be considered 'indicative' of the subsoil source. The report and results should therefore not be used by third parties as a means of verification or validation testing or waste designation purposes, especially after the subsoil has left the Tarmac Trading Limited site.

SAMPLE EXAMINATION

The sample was described as a yellowish red (Munsell Colour 5YR 4/6), slightly moist, friable, non-calcareous LOAMY SAND with a single grain structure*. The sample was virtually stone-free and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample. Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

ANALYTICAL SCHEDULE

The sample was submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (% 5 sands, silt, clay);
- stone content (2-20mm, 20-75mm, >75mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- organic matter content;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C35 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Detailed Particle Size Analysis and Stone Content

The sample fell into the *loamy sand* texture class. Further detailed particle size analysis revealed the sample to have a relatively narrow particle size distribution and large proportion of sand falling into the *very fine sand* (0.05-0.15mm), *fine sand* (0.15-0.25mm) and *medium sand* (0.25-0.50mm) classes. This would be considered suitable for subsoil in general landscape applications.

The sample was virtually stone-free and, as such, stones should not restrict the use of the soil as subsoil in general landscape applications.

pH and Electrical Conductivity Values

The sample was strongly alkaline in reaction (pH 8.4). This pH value would be considered suitable as subsoil for general landscape purposes providing species with a wide pH tolerance or those known to prefer alkaline soils are selected for planting, turfing and seeding.

The electrical conductivity (salinity) value (water extract) was low, which indicates that soluble salts were not present at levels that would be harmful to plants.

The electrical conductivity value by CaSO₄ extract (BS8601 requirement) fell below the maximum specified value (2800 µS/cm) given in BS8601:2013 – Table 1.

Organic Matter Content

The organic matter content was low (<0.5%) and compliant with BS8601:2013 – Table 1.

Potential Contaminants

With reference to BS8601:2013 – Section 4.2: Note 2, there is a recommendation to confirm levels of potential contaminants in relation to the subsoil's proposed end use. This includes human health, environmental protection and metals considered toxic to plants. In the absence of site-specific assessment criteria, the concentrations that affect human health have been compared with the *residential with homegrown produce* land use in the Suitable For Use Levels (S4ULs) presented in *The LQM/CIEH S4ULs for Human Health Risk Assessment* (2015) and the DEFRA SP1010: *Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document* (2014).

Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS8601:2013 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the sample for use as subsoil in general landscape purposes (trees, shrubs, amenity grass). In addition, this sample has been assessed to determine its compliance with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*).

From the soil examination and subsequent laboratory analysis, the sample was described as a strongly alkaline, non-saline, non-calcareous loamy sand with a single grain structure and a very low stone content. The organic matter content was low and consistent with that of subsoil. Of the potential contaminants determined, none was found at levels that exceeded their guideline values.

To conclude, based on our findings, the soil represented by this sample would be considered suitable as subsoil for general landscape purposes (trees, shrubs and amenity grass), provided species with a wide pH tolerance or those known to prefer alkaline soils are selected and the physical condition of the soil is satisfactory.

The soil was fully compliant with the requirements of the British Standard for Subsoil (*BS8601:2013 – Specification for subsoil and requirements for use – Table 1, Multipurpose Subsoil*).

Soil Handling Recommendations

Reference should be made to Section 6.0 of *BS8601:2013* with regard to the handling and management of the subsoil:

"Soils generally lose strength and become less resistant to damage as they become wetter; therefore, it is essential that they are stripped, handled and trafficked only in the appropriate conditions of weather and soil moisture, and with suitable machinery. If sustained heavy rainfall (e.g. >10 mm in 24 h) occurs during soil stripping operations, work should be suspended and not restarted until the ground has had at least one dry day or until a suitable moisture content has been reached. A soil can be considered to have a suitable moisture content for stripping and handling if the whole thickness of the subsoil layer being stripped and/or handled is at a moisture content below the plastic limit as determined in accordance with BS 1377-2:1990 (incorporating Amendment No. 1).

Machinery should be selected and routed to minimise soil compaction."

Further guidance is provided in Clauses 6.1–6.5.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Rebecca Hollands
BSc MSc MISOilSci
Senior Soil Scientist



Ceri Spears
BSc MSc MISOilSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Client:	Tarmac Trading Limited
Project:	Crown Farm
Job:	Subsoil Analysis - B38801:2013
Date:	11/04/2022
Job Ref No:	TOHA/22/7324/83

Sample Reference		Accreditation
Clay (<0.002mm)	%	UKAS
Silt (0.002-0.063mm)	%	UKAS
Very Fine Sand (0.063-0.15mm)	%	UKAS
Fine Sand (0.15-0.25mm)	%	UKAS
Medium Sand (0.25-0.50mm)	%	UKAS
Coarse Sand (0.50-1.0mm)	%	UKAS
Very Coarse Sand (1.0-2.0mm)	%	UKAS
Total Sand (0.063-2.0mm)	%	UKAS
Texture Class (UK Classification)		UKAS
Stones (> 30mm)	% DW	GLP
Stones (20-75mm)	% DW	GLP
Stones (215mm)	% DW	GLP

Crown Farm
Subsoil
5
9
33
21
29
2
1
86
18
0
1
0

pH Value (1:2.5 water extract)	units	UKAS
Electrical Conductivity (1:2.5 water extract)	uS/cm	UKAS
Electrical Conductivity (1:2.5 CaCl ₂ extract)	uS/cm	UKAS
Organic Matter (LOI)	%	UKAS
Exchangeable Sodium Percentage	%	UKAS

8.4
125
2051
<0.5
0.4

Total Arsenic (As)	mg/kg	MCERTS
Total Cadmium (Cd)	mg/kg	MCERTS
Total Chromium (Cr)	mg/kg	MCERTS
Hexavalent Chromium (Cr VI)	mg/kg	MCERTS
Total Copper (Cu)	mg/kg	MCERTS
Total Lead (Pb)	mg/kg	MCERTS
Total Mercury (Hg)	mg/kg	MCERTS
Total Nickel (Ni)	mg/kg	MCERTS
Total Selenium (Se)	mg/kg	MCERTS
Total Zinc (Zn)	mg/kg	MCERTS
Water Soluble Boron (B)	mg/kg	MCERTS
Total Cyanide (CN)	mg/kg	MCERTS
Total Organophosphates	mg/kg	MCERTS

3
< 0.2
9
< 4.0
19
3
< 0.3
9
< 1.0
12
< 0.2
< 1.0
< 1.0

Naphthalene	mg/kg	MCERTS
Acenaphthylene	mg/kg	MCERTS
Acenaphthene	mg/kg	MCERTS
Fluorene	mg/kg	MCERTS
Phenanthrene	mg/kg	MCERTS
Anthracene	mg/kg	MCERTS
Fluoranthene	mg/kg	MCERTS
Pyrene	mg/kg	MCERTS
Benz[a]anthracene	mg/kg	MCERTS
Chrysene	mg/kg	MCERTS
Benz[b]fluoranthene	mg/kg	MCERTS
Benz[k]fluoranthene	mg/kg	MCERTS
Benz[a]pyrene	mg/kg	MCERTS
Indeno[1,2,3-cd]pyrene	mg/kg	MCERTS
Dibenzo[a,h]anthracene	mg/kg	MCERTS
Benzog[h]perylene	mg/kg	MCERTS
Total PAHs (sum USEPA16)	mg/kg	MCERTS

[illegible]

Aliphatic TPH >C5 - C6	mg/kg	MCERTS
Aliphatic TPH >C6 - C8	mg/kg	MCERTS
Aliphatic TPH >C8 - C10	mg/kg	MCERTS
Aliphatic TPH >C10 - C12	mg/kg	MCERTS
Aliphatic TPH >C12 - C16	mg/kg	MCERTS
Aliphatic TPH >C16	mg/kg	MCERTS
Aliphatic TPH >C21 - C35	mg/kg	MCERTS
Aliphatic TPH (C5 - C35)	mg/kg	MCERTS
Aromatic TPH >C5 - C7	mg/kg	MCERTS
Aromatic TPH >C7 - C8	mg/kg	MCERTS
Aromatic TPH >C8 - C10	mg/kg	MCERTS
Aromatic TPH >C10 - C12	mg/kg	MCERTS
Aromatic TPH >C12 - C16	mg/kg	MCERTS
Aromatic TPH >C16 - C21	mg/kg	MCERTS
Aromatic TPH >C21 - C35	mg/kg	MCERTS
Aromatic TPH (C5 - C35)	mg/kg	MCERTS

< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 8.0
< 8.0
< 10
< 0.001
< 0.001
< 0.001
< 1.0
< 2.0
< 10
< 10
< 10

Benzene	mg/kg	MCERTS
Toluene	mg/kg	MCERTS
Ethylbenzene	mg/kg	MCERTS
p & m-xylene	mg/kg	MCERTS
o-xylene	mg/kg	MCERTS
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	MCERTS

< 0.001
< 0.001
< 0.001
< 0.001
< 0.001
< 0.001

Asbestos	-	60 17025
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Not detected

LS - LOAMY SAND

Visual Examination

The sample was described as a yellowish red (Munsell Colour 5YR 4/6), slightly moist, friable, non-calcareous LOAMY SAND with a single grain structure. The sample was virtually stone-free and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Rebecca Hollands
BSc MSc MPhilSci
Senior Soil Scientist

Results of analysis should be read in conjunction with the report they were issued with

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Soil Contamination Test

27 February 2023

Living Landscapes Limited

Report by Mr Louis Turner BSc (Hons)
Supervised by Mr Joseph Turner

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- 1.1 Project Overview
- 1.2 Purpose of Investigation
- 1.3 Scope of Work
- 1.4 Limitations

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- 4.2 Summary of Results
- 4.3 Conclusions

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1. Introduction

The following document provides details of a Soil Contamination Test carried out by Oakshire Environmental, and includes a description of the site, proposed project, sampling methodology, testing methodology and an evaluation laboratory testing.

1.1 Project Overview

Soil contamination testing has been requested by the client, as part of a proposed project involving the identification and assessment of sampled subsoil, prior to re-use on site. Oakshire Environmental will carry out Soil Contamination Testing including delivery and collection of a soil test kit, as described below.

1.2 Purpose of Investigation

The objectives of the Soil Contamination Testing will be to:

- Identify contamination of sampled soil.
- Assess the risk to human health and the environment.
- Determine the requirement for further investigations or remediation.

1.3 Scope of Work

- Brief introductory information will be noted to provide context to the report and will include an Introduction, Project Overview, Scope of Work and Limitations.
- In order to identify contamination of sampled soil, 2 x samples will be taken by the client from soil at the site and analysed for Metals (As, Be, Cd, Cu, Pb, Hg, Ni, Se, V, Zn), Chromium (III & VI), Phenols, PAHs, BTEX & MTBE, TPH CWG (Aliphatic/ Aromatic), Cyanide, pH, Asbestos (Qualitative) and Organic Matter in a UKAS accredited laboratory.
- Results of laboratory testing will be assessed with reference to screening values, including LQM/CIEH Suitable 4 Use Levels (S4ULs), CL:AIRE Category 4 Screening Levels (C4SLs) and Generic Assessment Criteria (GAC), to assess the risk to human health and the environment.
- This information will be used to provide a clear, easy to understand and actionable summary of results, and determine the requirement for further investigations or remediation.
- Report to be carried out, by professional Environmental Consultants with BSc (Hons) in Environmental Science or above, in accordance with appropriate technical guidelines, which may include Environment Agency Land Contamination: Risk Management (LCRM) guidelines, WM3 Technical Guidance, British Standards Institute and Oakshire Environmental reporting guidelines.

1.4 Limitations

Quantum Intelligent Trading Ltd is previously and hereafter referred to as "Oakshire Environmental" or "the company". Oakshire Environmental has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant when undertaking works of this nature. This report is only valid when used in its entirety and any information or advice contained within the report should not be relied upon until considered in the context of the whole report. Oakshire Environmental disclaims any responsibility to the client, as named on the front of this report ("the client"), and others in respect of any matters outside the scope of this work. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate. This report has been prepared solely for the benefit of the client and any other party using or placing reliance upon any information contained in this report does so at their own risk. Oakshire Environmental accepts no responsibility or liability for the contents of this report being used for any purpose or project for which it was not commissioned. Oakshire Environmental accepts no liability whatsoever for any loss or damage arising from the interpretation or use of this report and in no event shall the company be liable for any punitive, exemplary or other special damages, or for any indirect, incidental or consequential damages, including with respect to the performance or non-performance of any services, whether arising under breach of contract, tort or any other legal theory, and regardless of whether the company has been advised of, knew of, or should have known of the possibility of such damages. Furthermore, Oakshire Environmental does not accept any liability for the consequences of any legislative changes or the release of subsequent guidance documentation and following delivery of the report has no obligation to advise the client or any other party of such changes or their repercussions.

This report excludes consideration of potential hazards arising from any activities at the site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities. Oakshire Environmental does not warrant or guarantee that the site is free of hazardous or potentially hazardous materials or conditions. It should be noted that this report has been produced for environmental purposes only.

Oakshire Environmental cannot be held responsible for incorrect analysis of samples as the laboratory analysis presented in this report was carried out by Chemtech Environmental Ltd. The information and conclusions provided in this report are limited to, and representative of, the samples taken and cannot be extended to apply to the whole site, in addition, Oakshire Environmental cannot guarantee the accuracy of analysis for samples not taken at the source by the company or those which deviate due to exceedance of holding time or inappropriate sampling practises. The findings and/or recommendations of this report do not take into account any conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

2. Site

The following section describes the site and outlines the details of proposed project.

2.1 Site Description and Location

Site address to be confirmed.

2.2 Proposed Project

Soil contamination testing has been requested by the client to identify contamination of sampled subsoil from Heavy Metals, Cyanide, Hydrocarbons and Asbestos, in order to assess the risk to human health and the environment from the re-use of sampled subsoil on site.

3. Methodology

3.1 Sampling Methodology

Two samples were taken by the client, on 12th February 2023, from subsoil at the site and placed into sample containers. Sample containers used for analysis of volatile contaminants were filled as much as possible without air spaces as volatile compounds can be lost into these spaces.

3.2 Health & Safety

When collecting potentially contaminated soil samples it must be assumed that the soil is contaminated in order to protect the health of the assessor, Personal Protective Equipment (PPE) was used during the sampling process to mitigate this risk. Sample containers were packed with biodegradable fill for protection and placed in a sealed container for transportation to the laboratory.

3.3 Testing Methodology

UKAS accredited laboratory testing included a comprehensive suite of contaminants, including Metals (As,Be,Cd,Cu,Pb,Hg,Ni,Se,V,Zn), Chromium (III & VI), Phenols, PAHs, BTEX & MTBE, TPH CWG (Aliphatic/ Aromatic), Cyanide, pH, Asbestos (Qualitative) and Organic Matter.

4. Evaluation of Results

4.1 Screening Values

Results of laboratory testing of soil samples were analysed by comparing them to industry standard screening values used for risk assessments. These are specific to the proposed land use and depend on the pathways present at a particular site. Exposure pathways considered include direct soil and indoor dust ingestion, skin contact with soils and dust, inhalation of vapours in indoor airspace, ingestion of homegrown produce, permeation into and/or corrosion of water pipes and leaching of contaminants through soil. It should be noted that not all of these pathways will be relevant at the site and the most appropriate screening values available have been used to assess the results. Screening values take a conservative approach to assessing potential risk and concentrations below these values can be considered to represent 'uncontaminated conditions' which pose 'LOW' risk based on the land use.

It is important to note that exceedance of a relevant screening value does not necessarily constitute evidence of either a 'significant possibility of significant harm' or the need for remediation. Rather such exceedance should usually trigger a further detailed quantitative risk assessment, where site-specific parameters are used to derive site-specific assessment criteria. Common sense tells us, and a robust risk evaluation reveals, that a gross exceedance is a good indicator that an unacceptable risk is present.

4.2 Summary of Results

- Metal concentrations in samples S02 and S03 were all below residential screening values
- pH was alkaline in all samples
- Cyanide concentration was below the laboratory limit of detection in all samples
- Phenols (total) concentration was below the laboratory limit of detection in all samples
- Total Organic Carbon value was low in samples S02 and S03
 - Soils with low organic matter content will allow hydrocarbons to leach through the soil more easily as these organic contaminants would usually adsorb to organic matter particles
- PAH concentrations were low in all samples
 - PAHs are often present in made ground deposits and coal related products such as coal tar used for the construction of roads and are also the by-products of exhaust emissions from vehicles and can, therefore, build up to high concentrations near roads
- BTEX and VPH concentrations were below the laboratory limit of detection in samples S02 and S03
- EPH concentrations were low in all samples
 - BTEX, VPH and EPH contaminants can be found in various oil and fuel products such as petrol, diesel and lubricant oils, in addition, these contaminants often impact soils near industrial sites where fuel and oils are stored such as garages and farms
- No Asbestos was detected

4.3 Conclusions

Based on the results of laboratory testing, samples S02 and S03 are considered to be uncontaminated, suggesting a low risk to human health and the environment.

It should be noted that the potential level of risk posed by a particular source is determined by assessing the potential severity of the impact of the contaminant linkage on a receptor, if it is assumed to be present, and the probability of the contaminant linkage being present.

5. References

Environment Agency *Land contamination: risk management*. [online] Available at: <gov.uk/guidance/land-contamination-how-to-manage-the-risks>.

DEFRA. *Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination*.

Nathanail, C.P.; McCaffrey, C.; Gillett, A.G.; Ogden, R.C. & Nathanail, J.F. *The LQM/CIEH S4ULs for Human Health Risk Assessment*.

USEPA. *Regional Screening Levels (RSLs)*. [online] Available at: <epa.gov/risk/regional-screening-levels-rsls>.

Oakshire Environmental Available at: <oakshireenvironmental.co.uk>

Lab number			119183-2	119183-3
Sample id			S02	S03
Depth (m)			1.50	1.50
Date sampled			12/02/2023	12/02/2023
Test	Method	Units		
Arsenic (total)	CE127 ^M	mg/kg As	3.32	3.08
Beryllium (total)	CE127 ^U	mg/kg Be	<1	<1
Cadmium (total)	CE127 ^M	mg/kg Cd	<0.2	<0.2
Chromium (total)	CE127 ^M	mg/kg Cr	26.94	24.04
Chromium (III)	CE208	mg/kg CrIII	27.00	24.00
Chromium (VI)	CE146	mg/kg CrVI	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	11.48	10.95
Lead (total)	CE127 ^M	mg/kg Pb	100.15	35.56
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	7.78	7.00
Selenium (total)	CE127 ^M	mg/kg Se	0.59	0.60
Vanadium (total)	CE127 ^M	mg/kg V	9.72	9.31
Zinc (total)	CE127 ^M	mg/kg Zn	33.99	31.33
pH	CE004 ^M	units	8.50	8.60
Cyanide (total)	CE077	mg/kg CN	<1	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5
Total Organic Carbon (TOC)	CE197	% w/w C	2.50	2.39
PAH				
Naphthalene	CE087 ^M	mg/kg	<0.02	<0.02
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	<0.02	<0.02
Fluorene	CE087 ^U	mg/kg	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	<0.02	<0.02
Anthracene	CE087 ^U	mg/kg	<0.02	<0.02
Fluoranthene	CE087 ^M	mg/kg	0.06	0.06
Pyrene	CE087 ^M	mg/kg	0.06	0.05
Benzo(a)anthracene	CE087 ^U	mg/kg	0.03	0.03
Chrysene	CE087 ^M	mg/kg	0.04	0.04
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.06	0.05
Benzo(k)fluoranthene	CE087 ^M	mg/kg	<0.03	<0.03
Benzo(a)pyrene	CE087 ^U	mg/kg	0.05	0.05
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.03	0.04
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.04	0.04
PAH (total of USEPA 16)	CE087	mg/kg	0.36	0.36
BTEX & TPH				

Benzene	CE192 ^u	mg/kg	<0.01	<0.01
Toluene	CE192 ^u	mg/kg	<0.01	<0.01
Ethylbenzene	CE192 ^u	mg/kg	<0.01	<0.01
m & p-Xylene	CE192 ^u	mg/kg	<0.02	<0.02
o-Xylene	CE192 ^u	mg/kg	<0.01	<0.01
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE250	mg/kg	<10	<10
EPH Aromatic (>EC12-EC16)	CE250	mg/kg	11.75	26.38
EPH Aromatic (>EC16-EC21)	CE250	mg/kg	<1	110.27
EPH Aromatic (>EC21-EC35)	CE250	mg/kg	55.27	435.10
EPH Aromatic (>EC35-EC44)	CE250	mg/kg	18.20	88.04
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C12-C16)	CE250	mg/kg	<6	<6
EPH Aliphatic (>C16-C35)	CE250	mg/kg	15.90	37.58
EPH Aliphatic (>C35-C44)	CE250	mg/kg	<10	<10
Asbestos				
Asbestos (qualitative)	-	-	NAD	NAD



Appendix H – Soil Cover Validation Records

Validation Pit VP01

Location of validation pit
- raised planted margin
in east of site (see sketch
plan).

Description of arisings:
brown fine sand with
some rootlets.

Depth of cover validated:
>600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of 600mm
depth



Confirmation of base of
hole



Arisings.

Validation Pit VP02

Location of validation pit raised planter in east of site (see sketch plan).

Description of arisings: bark surface treatment overlying brown silty sand with some rootlets.

Depth of cover validated: >600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of 600mm depth



Confirmation of base of hole

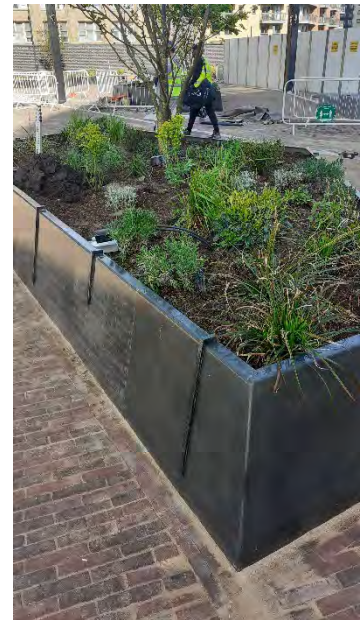


Photo of location in raised planter.

Validation Pit VP03

Location of validation pit
raised planter in east of
site (see sketch plan).

Description of arisings:
bark surface treatment
overlying brown silty
sand with some rootlets.

Depth of cover validated:
>600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of base of
hole



Confirmation of 600mm
depth



Arisings

Validation Pit VP04

Location of validation pit
raised planter in east of
site (see sketch plan).

Description of arisings:
light brown silty sand
with some rootlets.

Depth of cover validated:
>600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of base of
hole



Confirmation of 600mm
depth



Photo of location in
raised planter

Validation Pit VP05

Location of validation pit
planted margin in east of
site (see sketch plan).

Description of arisings:
grey brown silty sand.
(Note surface treatment
and planting to be
completed at time of
validation pitting).

Depth of cover validated:
>600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of 600mm
depth



Confirmation of base of
hole



Location in landscaped
margin.

Validation Pit VP06

Location of validation pit
planted margin in centre
of site (see sketch plan).

Description of arisings:
light brown silty sand

Depth of cover validated:
>600mm.

Date validated: 3/5/23.



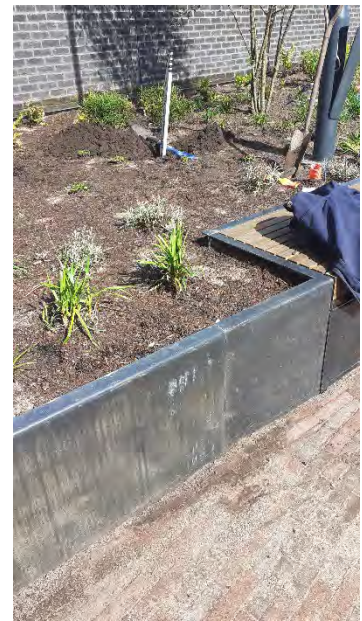
Sketch locations of validation pits.



Confirmation of 600mm
depth



Confirmation of base of
hole



Location in raised bed.

Validation Pit VP07

Location of validation pit raised planter in north west of site (see sketch plan).

Description of arisings: brown silty sand with some rootlets.

Depth of cover validated: >600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of 600mm depth



Confirmation of base of hole



Location in raised bed.

Validation Pit VP08

Location of validation pit raised planter in north west of site (see sketch plan).

Description of arisings: brown silty sand with some rootlets.

Depth of cover validated: >600mm.

Date validated: 3/5/23.



Sketch locations of validation pits.



Confirmation of 600mm depth



Confirmation of base of hole



Location of raised planter.