



REPORTS 4 PLANNING

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Shallow Soil Assessment

PROPOSED RESIDENTIAL DEVELOPMENT AT
NO. 6 NORFOLK ROAD,
READING,
RG30 2EE

Consultant:
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Consultant in Contaminated Land

Report Ref: 21SI4615CW

Report Date: February 2021



Executive Summary

Reports 4 Planning have been commissioned by Manish Parmar to undertake a shallow soil assessment of a parcel of land located at 6 Norfolk Road, Reading, RG30 2EE.

A Preliminary Risk Assessment (Phase I) was previously prepared for the site by Reports4Planning which identified a small number of possible contaminative risks associated with historical use of the site. This is in relation to the observation of an inspection pit located within the garage/store at the site. It is possible that the garage was therefore used for vehicle maintenance on a small residential scale and the possibility that oils, fuels or other was deposited in this area cannot be discounted.

In considering the suitability of the site for development the Local Planning Authority has to determine 'whether, as a result of the proposed change of use, taking into account any proposed mitigation, the site will be contaminated land as described in Part 2A of the Environmental Protection Act 1990, and in doing so have regard to the Contaminated Land Statutory Guidance issued by the Secretary of State for the Environment, Food and Rural Affairs in April 2012. The client should also take note and abide by the requirements of the new LCRM regulations which is the latest guidelines issued by Government Environment Agency Published on 08/10/2020.

The aim of this shallow site assessment is to identify and assess any potential contamination affecting the site to ensure that should any be identified above acceptable concentrations that this can be remediated before the land is brought into use for residential purposes.

The aim is to update the conceptual model of the site from the Phase I Assessment and establish whether or not there are potentially unacceptable risks posed by contaminative sources, particularly from use of the inspection pit at the site.

A **Ground Assessment** included the drilling of four shallow window sampler boreholes to investigate the shallow soils around the inspection pit. Locations were chosen where access was possible, but all sides of the pit were adequately inspected. The recovered soils consisted of a soft and slightly gravelly sand located beneath concrete and gravelly sub base. Shallow and deeper soil samples were collected and analysed at the laboratory. All returned laboratory data confirmed that concentrations are reported below the recommended concentrations for a residential site with plant uptake. No further assessment is required.

A **Controlled Waters Assessment** has shown that site is not located within a Source Protection Zone. Given the geology of the site and detected concentrations of contaminants at the site they are not deemed to be sufficiently elevated to have a detrimental impact to groundwater's at the site. No piling of the soils or other significant disturbance of the ground shall take place and thus no new significant pathways shall be

created. There is no further recommendation for any further assessment in relation to controlled waters.

A Ground Gas Assessment has reported that there are no concentrations of contaminants above the recommended guidelines in the shallow soils at the site. No organic materials were observed. No further assessment is required to assess ground gas risk at the site.

The report is based on the assumption by the author that the Local Planning Authority will follow guidance detailed in the NPPF where for all development involving disturbance to land, the LPA would impose a Condition requiring the reporting of all other instances of contamination currently unreported found during the course of development. Should instances of previously unreported contamination be found then the submission for approval of an assessment of the risks and proposed remediation scheme will be submitted to the Local Planning Authority.

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1.0 INTRODUCTION

Reports 4 Planning have been commissioned by Mr Manish Parmar to undertake a shallow soil assessment of a parcel of land located at 6 Norfolk Road, Reading, RG30 2EE.

A Preliminary Risk Assessment (Phase I) was previously prepared for the site by Reports4Planning which identified a small number of possible contaminative risks associated with historical use of the site. This is in relation to the observation of an inspection pit located within the garage/store at the site. It is possible that the garage was therefore used for vehicle maintenance on a small residential scale and the possibility that oils, fuels or other was deposited in this area cannot be discounted.

In considering the suitability of the site for development the Local Planning Authority has to determine 'whether, as a result of the proposed change of use, taking into account any proposed mitigation, the site will be contaminated land as described in Part 2A of the Environmental Protection Act 1990 , and in doing so have regard to the Contaminated Land Statutory Guidance issued by the Secretary of State for the Environment, Food and Rural Affairs in April 2012. The client should also take note and abide by the requirements of the new LCRM regulations which is the latest guidelines issued by Government Environment Agency Published on 08/10/2020.

This report provides detail on the aims and methodology of the investigation and provides interpretive discussion on the findings with recommendations for further assessment as appropriate. The consultant who has prepared this report is a Contaminated Land Consultant with twenty years experience in Brownfield Development, Contaminated Land, Risk Assessment, and Land Condition Surveys. The consultant is a member of the Institute of Environmental Management and Assessment.

This report has been prepared for the use of Mr. Manish Parmar in connection with the proposed redevelopment of the site located at 6 Norfolk Road, Reading, RG30 2EE. It is not intended for and should not be relied upon by any third party without the expressed permission of both Lucy Head and Reports 4 Planning.

Reasonable skill and care has been exercised in preparation of this report in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking this contamination assessment, it is possible that ground conditions other than that potentially indicated by this report may exist at the site. Should these be encountered then professional advice should be sought immediately.

2.0 AIMS

The aim of the investigation is to provide sufficient information on ground conditions across the site to determine whether site soils present are suitable for the proposed residential land use.

Particular attention was made to the soils surrounding the shallow inspection pit located in the garage / store building.

3.0 METHODOLOGY

Ground Assessment

The ground assessment was designed to investigate the area across the site around the inspection pit located within the garage / store building. Access around the pit meant that the drilling rig was able to set up on the each of the four corners.

At each location a shallow borehole was excavated to a depth of 2.5m bgl using a percussive window sampler drilling rig.

The cores from the borehole were retrieved in one meter intervals and opened up for inspection. The recovered soil was inspected for material type and any evidence of contamination. The boreholes were advanced until the required depth of 2.5m was achieved.

Disposable gloves were used during all sampling activities and replaced between locations. Soil samples were placed in special containers supplied by the laboratory which comprised of 1-litre plastic tubs for metals and inorganic analyses, 500ml glass jars, and 40ml glass vials for general organic analyses which were supplied by Derwentside Environmental Testing Services (DETS) located Consett, County Durham, England. Samples were stored in cool boxes with ice packs for transportation to the laboratory. DETS are accredited by the United Kingdom Accreditation Service (UKAS). Each soil sample container was labelled with the date, site reference, project code, and sample identification prior to dispatch to the laboratory, with appropriate chain of custody documentation.

Samples of the recovered soil were analysed for the following parameters:

- Metals and other inorganics;
- Cyanide;
- pH;
- phenol;
- Extractable Petroleum Hydrocarbons;
- Polycyclic Aromatic Hydrocarbons;
- Asbestos

Controlled Waters Assessment

It was noted from the findings of the Phase I Report and the on-site topographical gradients that groundwater was not likely to be encountered at such shallow depth.

Once the nature of the soils (and potential contaminative sources) at the site were determined then a decision to proceed to a groundwater assessment would be made if necessary.

Ground Gas Assessment

From the Deskstudy information collected the presence of gas vapours at the site was not deemed a significant risk, providing that no significant source material was present in the soils from historical activity e.g oils etc. Therefore, once the nature of the soils (and potential contaminative sources) at the site were determined then a decision to proceed to a ground gas assessment would be made.

4.0 FIELD OBSERVATIONS

It was observed that in all locations the ground surface consisted of a thin layer of concrete, beneath which a layer of 10cm coarse 'Type 1' gravel was laid. A shallow depth of medium brown sand was present beneath which the remaining core reported a soft light brown sand. This was consistent with the geological records of the area. The sand became softer and with increased clay content with depth. The predominant material was however sand throughout.

No foreign material was observed and no visual or olfactory evidence of contamination.

5.0 RESULTS

5.1 Soils

The human health risk assessment has been undertaken using the guidance provided in the Environment Agency's publication CLR11, Model Procedures for the Management of Contaminated Land, published in September 2004. Human health assessment criteria used are based upon the proposed final land use of the site. In this case and to be conservative, 'Residential with homegrown produce' have been used.

Currently in the UK, no statutory limits for the presence of contaminants in soils or groundwater exist. Therefore, the results of the soil samples tested are compared to the following environmental quality standards:

Category 4 Screening Levels (C4SLs)

Published in March 2014 by DEFRA, C4SLs were primarily produced to support the revised Statutory Guidance to support Part 2A of the Environmental Protection Act 1990, which was published in April 2012.

This Guidance introduced a new four-category system for classifying land under Part 2A for cases of a Significant Possibility of Significant Harm to human health, where Category 1 includes land where the level of risk is clearly unacceptable and Category 4 includes land where the level of risk posed is acceptably low.

With regards to using the C4SLs for planning purposes the DEFRA letter of 3rd September 2014 from Lord de Mauley established that they are also meant for use in planning situations, as does the DCLGs 'Planning Portal' document 2014.

Suitable 4 Use Levels (S4ULs)

As well as limited number of C4SLs (and where C4SLs are not available), the set of S4ULs produced by Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) in 2015 using the CLEA software, are used as a screening tool.

The CLEA software was released in October 2009 and is a deterministic exposure model with altered exposure data to the original model. The model allows the creation of a generic assessment criteria database with which to screen laboratory testing results. These generic assessment criteria are conservative and based upon common assumptions.

Detailed Quantitative Risk Assessment (DQRA)

Should any results exceed the C4SLs or S4ULs, then a DQRA is undertaken to establish site specific assessment criteria. This final stage uses specific information regarding the contamination and its potential receptors and pathways. The CLEA software was updated to version 1.071 in November 2015 to enable both site specific C4SLs and S4ULs to be determined, which produces less conservative, more accurate, site specific soil assessment criteria (SACs).

The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment

Where the Environment Agency has not officially released toxicological data to enable assessment criteria to be developed, data has been used as derived from a well-respected research project undertaken jointly by the Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM).

Since the initial implementation of Part2A in 2000 very little guidance had been released in the following few years to assist practitioners in applying the Act on a practical level. Across the industry a reliable, transparent, and consistent approach was sought which was slow to emerge. Through the use of the first trial CLEA Models a set of Soil Guidelines were introduced which were limited in number and total agreement could not be achieved with regards to toxicological accuracy. In 2004 the government introduced a task force to move the process forward so that

more sites could be investigated appropriately under the Part2A regime. The original SGVs were embraced by practitioners and many more equivalent Generic Assessment Criteria (GAC) values were generated similarly by a whole host of consultancies of which some are judged to be inappropriate or of uncertain derivation.

In order to derive as an authoritative set of guideline number as possible the Chartered Institute of Environmental Health in partnership with Land Quality Management (LQM) sponsored a workshop in 2006 to derive a set of GACs for 31 contaminants. This led to the 1st Edition of the Report.

In the following three years this data became obsolete as the old 'probabilistic' model has been replaced with a fully deterministic CLEA model. Following this change the previous workshop was repeated and new GACs derived in a second edition using CLEA v1.04 in July 2009.

The 2nd Edition represents to many 'relevant, appropriate, authoritative, and scientifically-based' guideline criteria if used appropriately and the assumptions made in deriving this data applies to the site in which it is used against. Mr Tim Everett, Director of Policy at CIEH in 2009 stated that "the new LQM/CIEH GAC for 82 substances will play a welcome role in the risk assessment process which is at the heart of the regulation of and contamination and necessary for public peace of mind".

In the absence of any other form of publically released data it is viewed that the research project of CIEH/LQM and the GACs derived from the study can be used with the required degree of appropriateness. The assumptions behind the study have been reviewed and are judged to be representative of the site.

There is currently some uncertainty in the UK regarding the assessment of human health risks from lead in soils. Assessing the risks from lead in soil is currently hindered due to the withdrawal of the 'old' SGV and the absence of any appropriate 'new' guidance. How risks to health from lead should be assessed in the UK is currently being considered by the Environment Agency. The 'old' SGV for lead was based on a blood lead concentration. The SGV was calculated to ensure that uptake of lead from soil, taking into account sources of lead other than soil and dust, in the general population, will not result in a blood level concentration of above 10 ug dL⁻¹. This applied regardless of the origins of lead whether natural or man-made. At this time the UK Government considered this a minimum standard of health protection for all individuals. For comparative purposes only and in the absence of any other form of authoritative data this value has been used in this assessment.

A copy of the Soil Analysis Results with comparison against CIEH/LQM guidelines are provided in Appendix B with a copy of the laboratory certificates provided in Appendix C. A brief comparison of the data is provided below.

Analysis of Results

Metals

Concentrations of metals were detected in each of the eight samples collected. In general concentrations were noted to be very low and below the respective guideline value for a residential site with plant uptake. The detected concentrations were consistent throughout the sample set, with the exception of lead and zinc at shallow depth at BH1. All detected concentrations were reported below the respective guideline criteria for a residential land use with plant uptake.

Inorganics

It is noted that concentrations of inorganics are generally low and either at, or marginally above, the method detection level in each case. Organic matter ranged from 0.7 – 4.2% which indicates the organic matter is low which was expected given the stony nature of the deposits.

No asbestos materials were confirmed in the laboratory testing.

pH ranged from 7.4 – 9.2 consistent across the site.

Hydrocarbons (Polycyclic Aromatic Hydrocarbons and Extractable Petroleum Hydrocarbons)

Extractable Petroleum Hydrocarbons were not detected above the method detection limits in any of the samples, except BH1 where a concentration of 130mg/kg was detected at shallow depth. No hydrocarbon concentrations were detected at this same location at greater depth. This concentration is not viewed as particularly elevated and may be a result of general made ground in this area. No visual or olfactory evidence of contamination was noted in this area during the site works.

5.2 Groundwater

As no groundwater was detected in any of boreholes no samples were collected for analysis.

5.3 Ground Gas

As no material was encountered which was likely to contain organic materials, no installations were placed for the purposes of Ground Gas Monitoring as it is not required.

6.0 QUALITY ASSURANCE

The quality assurance/quality control (QA/QC) program was designed to ensure that the quality of the samples submitted for analyses are representative of the field conditions without interferences from other sources.

Sampling protocols included the use of uncontaminated sampling material and equipment and a minimum of handling. Disposable nitrile gloves were worn during all the sampling work and replaced between monitoring wells. Samples were placed in laboratory supplied 1-litre plastic tubs for metals and inorganic analyses, 2 x 500ml glass bottles for general organic analyses, and 40ml glass vials for VOCs. The samples were stored in cool boxes for transport to DETS Lt, located in Consett, England. The laboratory is accredited by the United Kingdom Accreditation Service (UKAS). Each sample container was labelled with the date, site reference, project code and sample identification prior to dispatch to the laboratory with appropriate chain of custody documentation. All samples were analysed within the holding time limits established by the laboratory.

7.0 UPDATED CONCEPTUAL SITE MODEL (POST PHASE II INVESTIGATION)

This UPDATED model is based on risk assessment for a redevelopment of the site for Residential use based on information gained firstly through the preparation of the Phase I and further Phase II report on the site.

Table 1: Updated Conceptual Site Model

Conceptual Site Model			
Receptor	Linkage	Source	Risk
Demolition / Ground workers	Inhalation	Organic vapours arising from on-site sources	Negligible risk – However PPE should be worn for any new trenches as standard
		Asbestos	Negligible Risk –None observed.
	Ingestion and dermal contact	Shallow soil contamination from potential on-site and/or migratory off-site sources.	Low risk – no significantly elevated concentration of contamination recorded across the data set. Hotspot in shallow ground at BH1 not sufficiently elevated to result in an acute risk. No further mitigation required.
Future site users	Inhalation	Organic vapours arising from on-site sources and off-site sources	Negligible risk – However PPE should be worn for any new trenches as standard Negligible Risk –None observed.
	Ingestion and dermal contact	Shallow soil contamination from potential on-site and/or migratory off-site.	Low risk – no significantly elevated concentration of contamination recorded across the data set. Hotspot in shallow ground at BH1 not sufficiently

			elevated to result in an acute risk. Soils to be removed in any case to allow for a soakaway to be placed. No further mitigation required.
	Direct	Radon	No further assessment required.
Neighbouring Residents	Inhalation	Disturbed vapours arising from on-site development	Negligible risk – No further assessment required.
	Ingestion and dermal contact	Shallow soil contamination from on-site sources being disturbed through development and transposed off-site through air.	Negligible risk – No further assessment required.
Groundwater resources	Infiltration and leaching of potential oil contaminants	Downward and lateral migration of mobile contaminants and possible disturbance and creation of new fractures result of development adversely affecting flow to other receptors	Low risk No significant source material with viable pathway to deep aquifer. No further assessment required.
Surface waters	Possible mobilisation of shallow soil contaminants from site to offsite watercourse to west	Shallow soil contamination from off site and on site sources being mobilised through surface waters off site.	No significant source material with viable pathway to surface water feature to west.

Local flora and fauna	Uptake from soil and Ingestion	Shallow soil contamination from off site and on site sources	No risk – Low concentrations detected posing no long-term risk. No flora or fauna proposed. No further assessment required.
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Following the completion of the Phase II Assessment at the site it has been shown that no infill or significant made ground is present on site. Concentrations of contaminations are reported to be below the respective residential with plant uptake criteria. No further assessment is required.

8.0 CONCLUSION

The aim of the investigation was to investigate the shallow soils across the site around an observed inspection pit within the garage / store. Four shallow boreholes were excavated using a percussive window sampler rig to a depth not exceeding 2.0m bgl. At these depths a shallow layer of made ground consisting of concrete over gravel was observed with a semi soft sand beneath.

Samples of soil were collected from each of the four boreholes at shallow and deeper depths and analysed for the presence of contamination to include a variety of common contaminants.

Ground Assessment

In general, the contamination concentrations were recorded low and no exceedances to the respective guidelines are present in any of the locations.

Recommendations:

As all detected concentrations are reported below the respective guidelines for a residential site with plant uptake, then NO further assessment is deemed necessary.

Should any imported topsoils be brought onto site as part of the development then these should be tested to ensure compliance with the appropriate criteria for a residential site with plant uptake.

Controlled Waters

Information collated from the Phase I Desk Study has shown that the site is not located within a Source Protection Zone.

No waters were encountered as part of the investigation.

As detected concentrations of contaminants are below the respective guidelines are not viewed as significant, then the impact to any underlying aquifer and the nearby surface water feature is viewed as negligible.

Ground Gas Assessment

No source of potential gas risk has been observed beyond the boundaries of the site. No organic materials was recorded in any of the boreholes and there are no known off-site sources of ground gas.

Therefore, there are no recommendations to further assess potential gas risk at the site.

The report is based on the assumption by the author that the Local Planning Authority will follow guidance detailed in the NPPF where for all development involving disturbance to land, the LPA would impose a Condition requiring the reporting of all other instances of contamination currently unreported found during the course of development. Should instances of previously unreported contamination be found then the submission for approval of an assessment of the risks and proposed remediation scheme will be submitted to the Local Planning Authority.

The report is supplied subject to our standard terms and conditions and these should be read alongside the report.

FIGURES



FIGURE 1

SITE LOCATION PLAN
SMALL SCALE

6 NORFOLK ROAD
READING
RG30 2EE



FIGURE 2

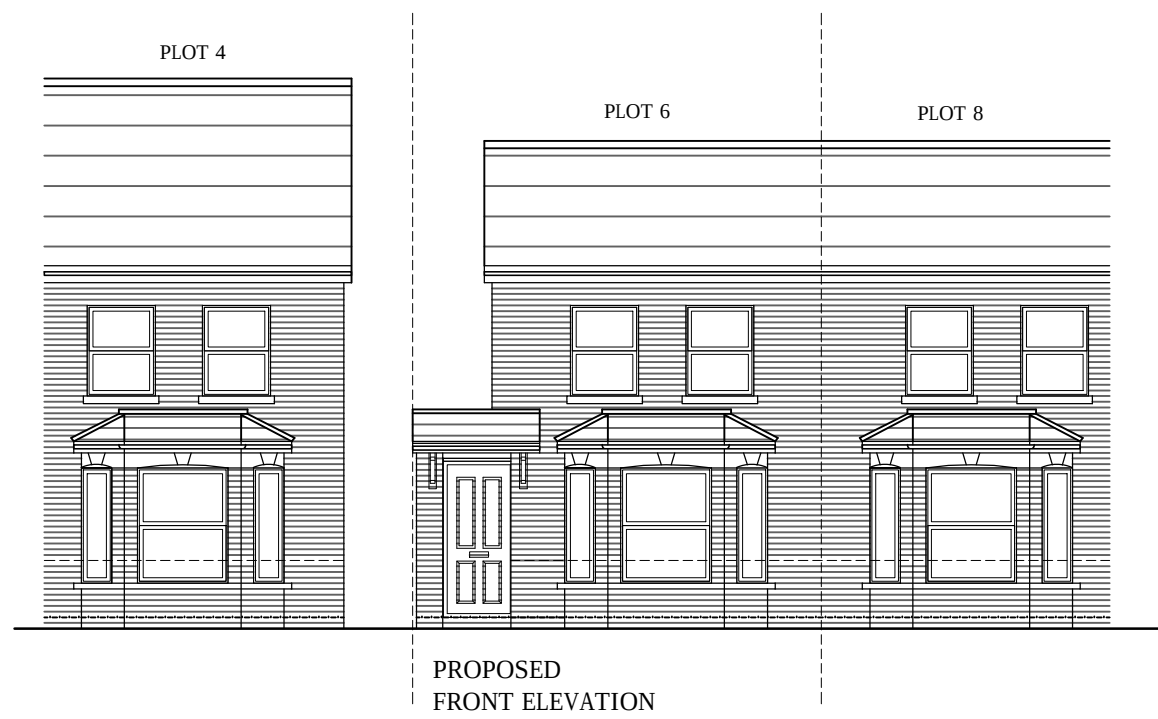
SITE AERIAL PHOTOGRAPH

6 NORFOLK ROAD
READING
RG30 2EE

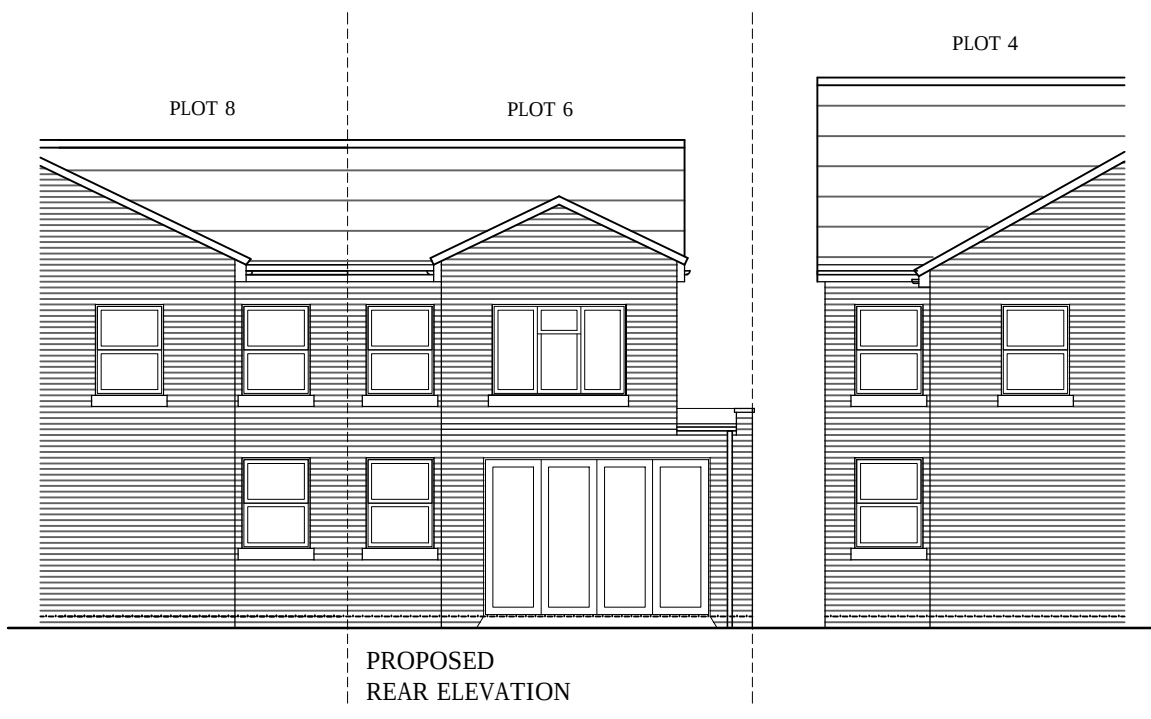
FIGURE 3

PROPOSED SITE LAYOUT PLAN

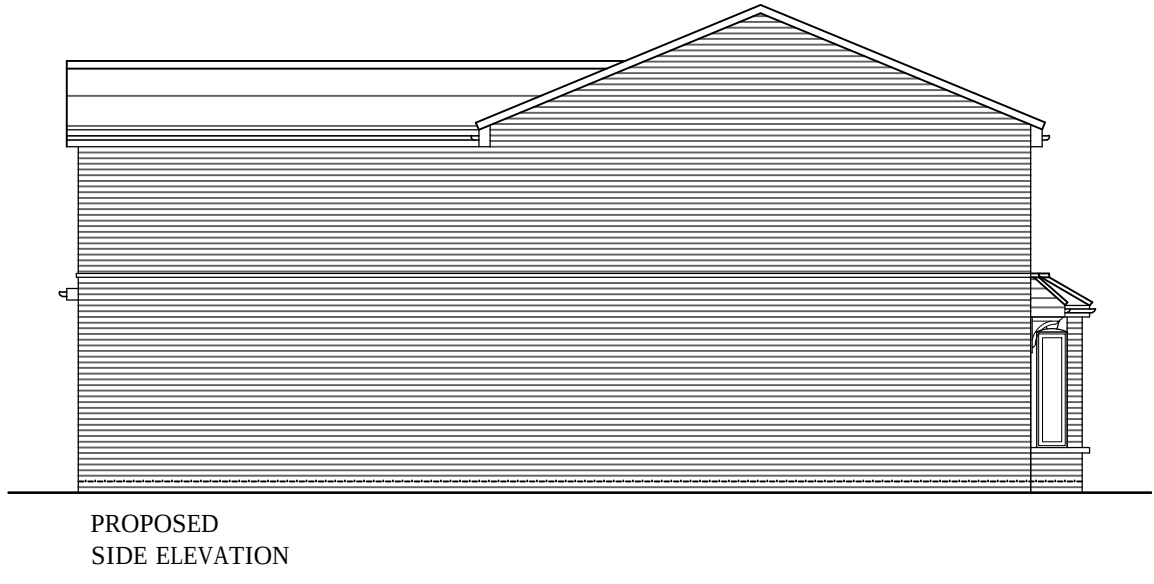
6 NORFOLK ROAD
READING
RG30 2EE



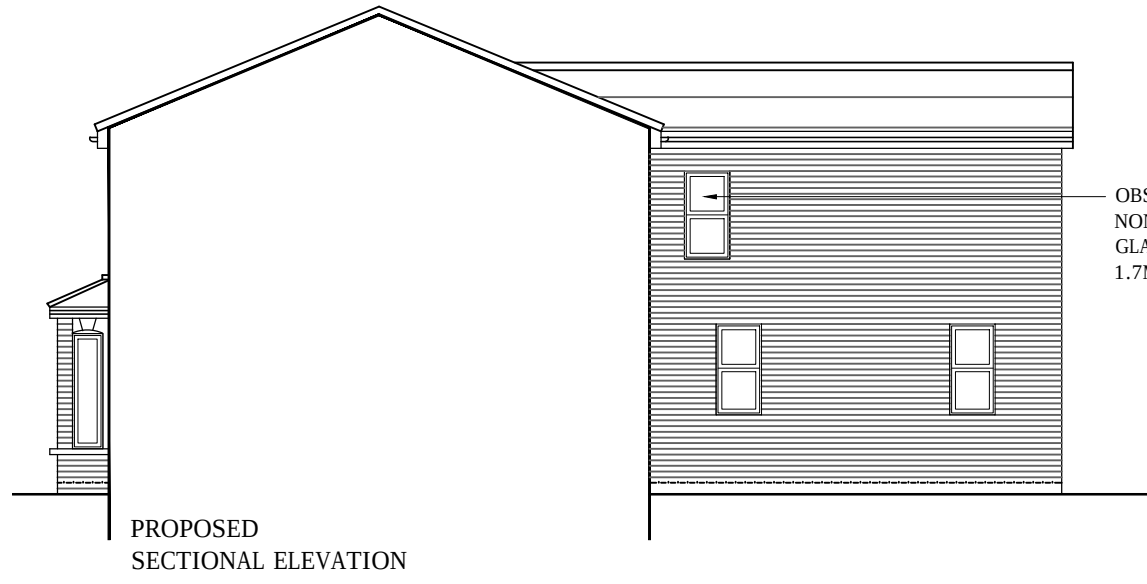
PROPOSED
FRONT ELEVATION



PROPOSED
REAR ELEVATION

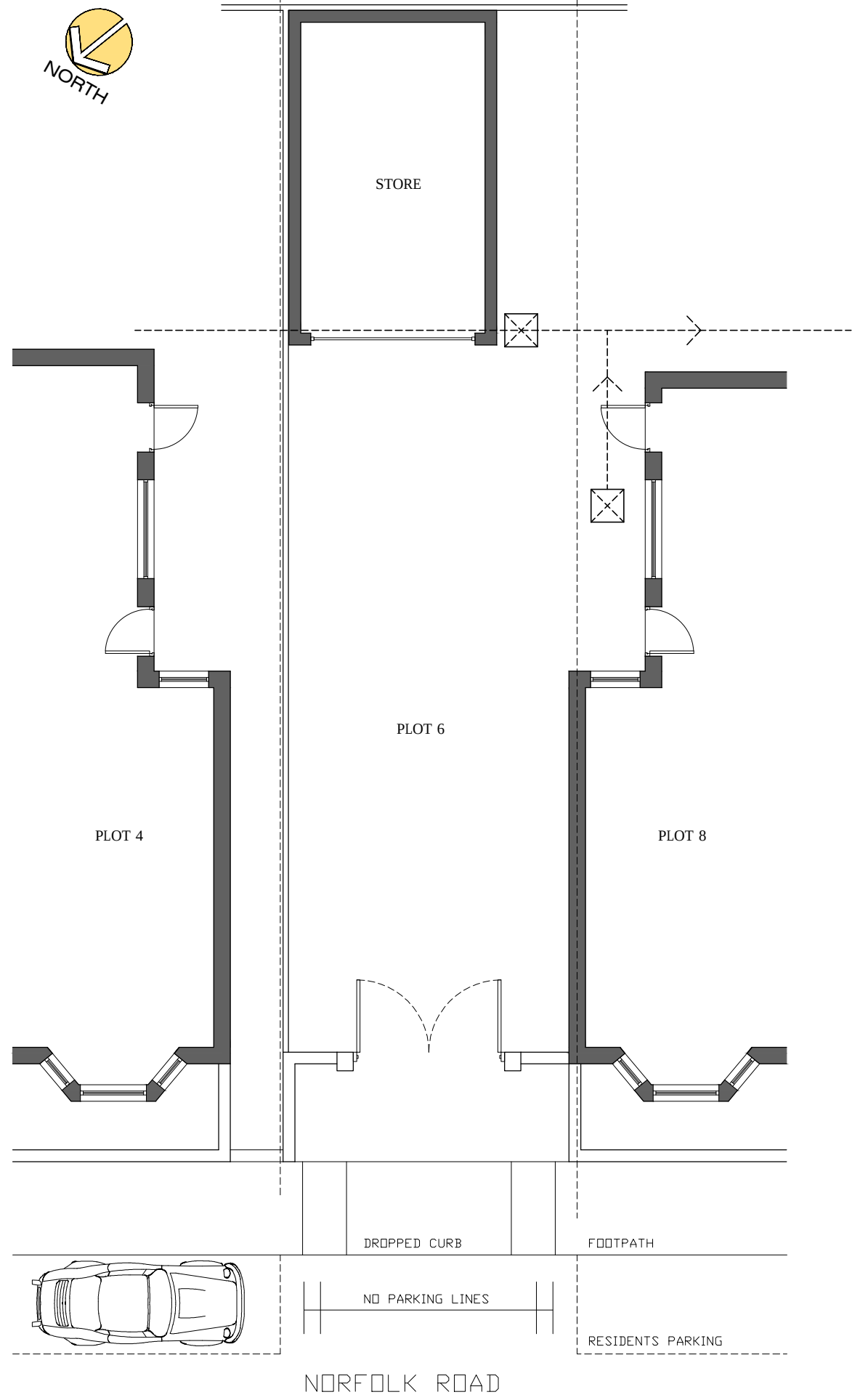


PROPOSED
SIDE ELEVATION

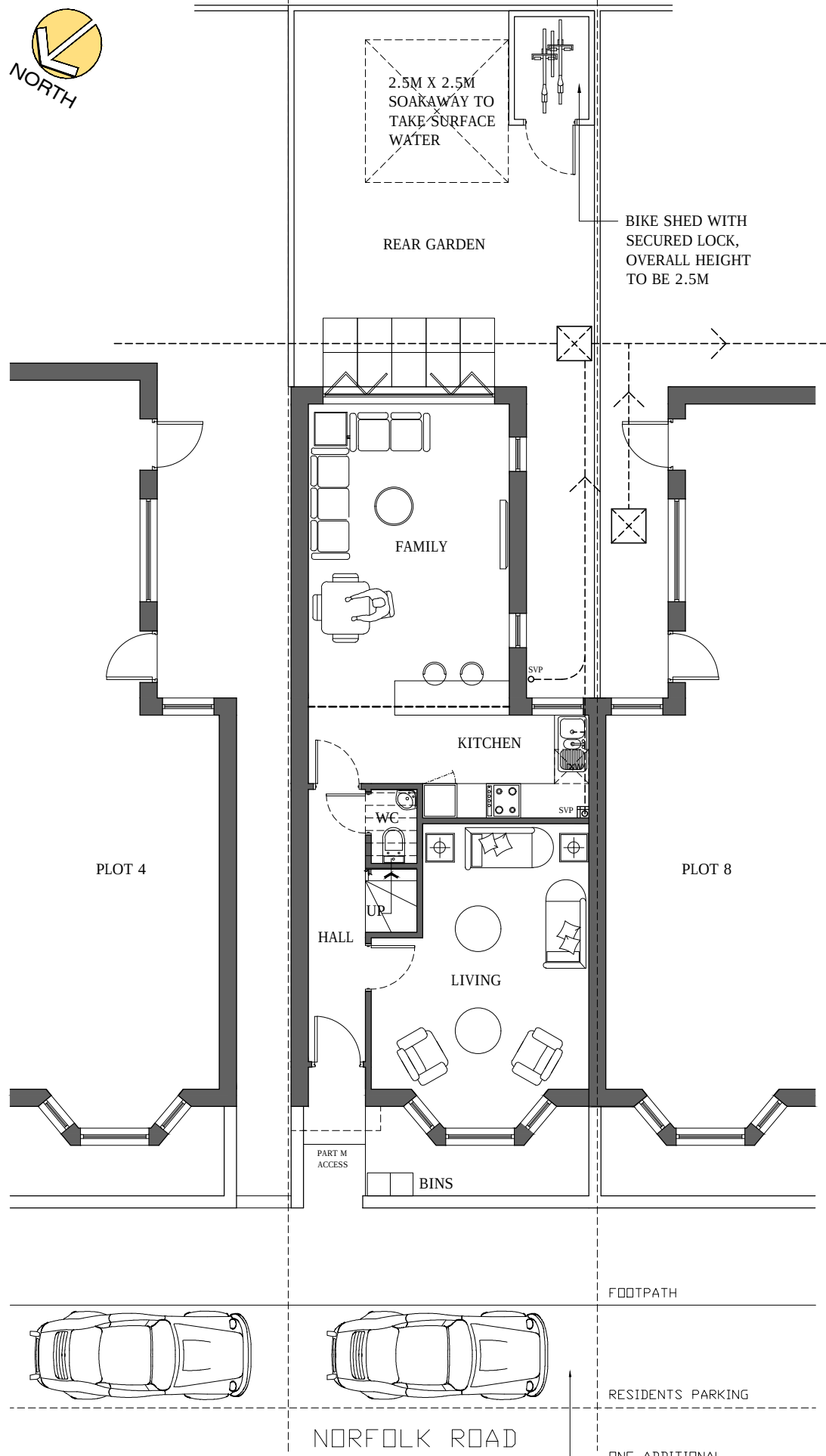


PROPOSED
SECTIONAL ELEVATION

OBSURED AND
NON OPENABLE
GLAZING UP TO
1.7M FROM FFL



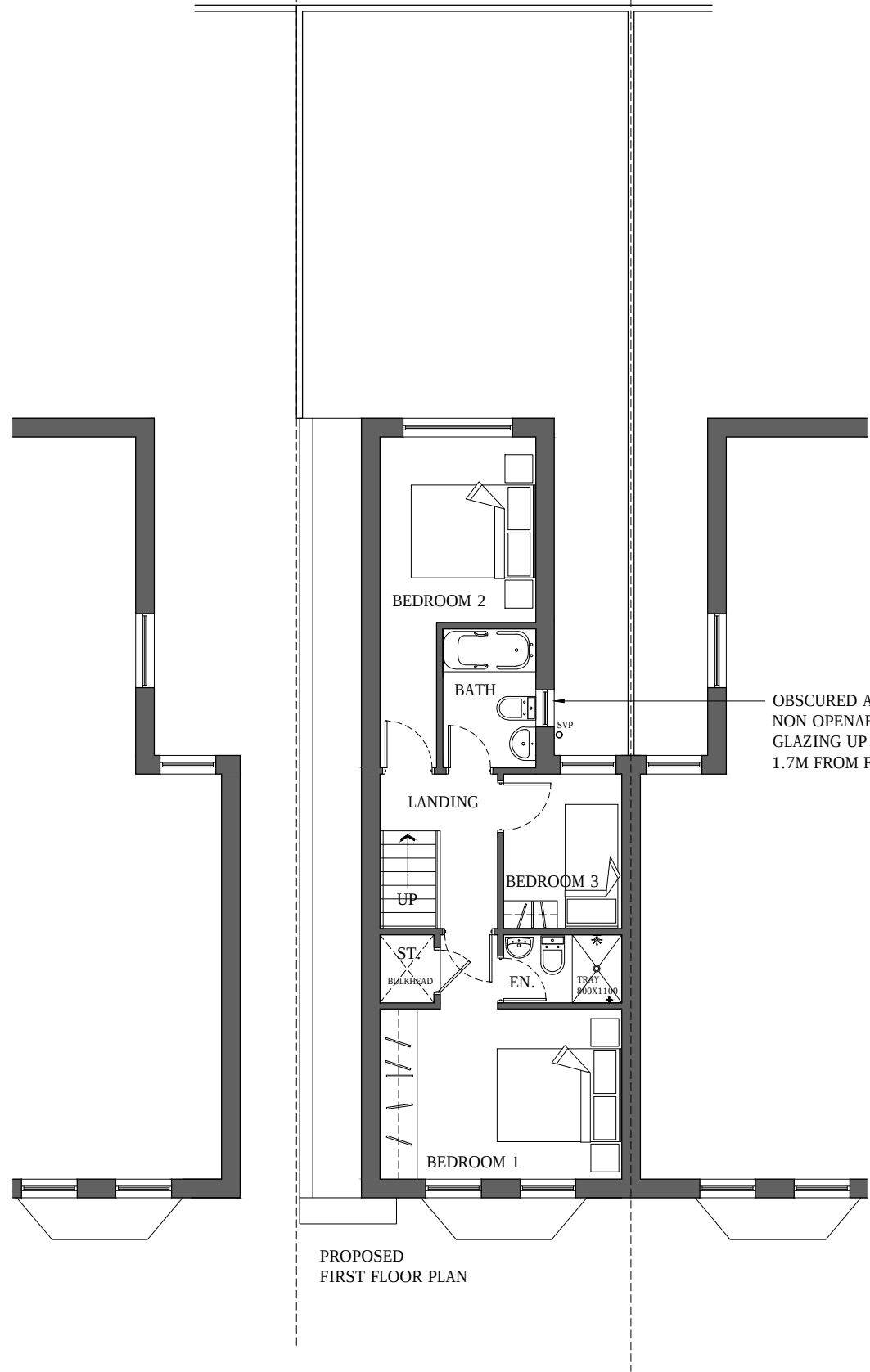
EXISTING
GROUND FLOOR PLAN



PROPOSED
GROUND FLOOR PLAN

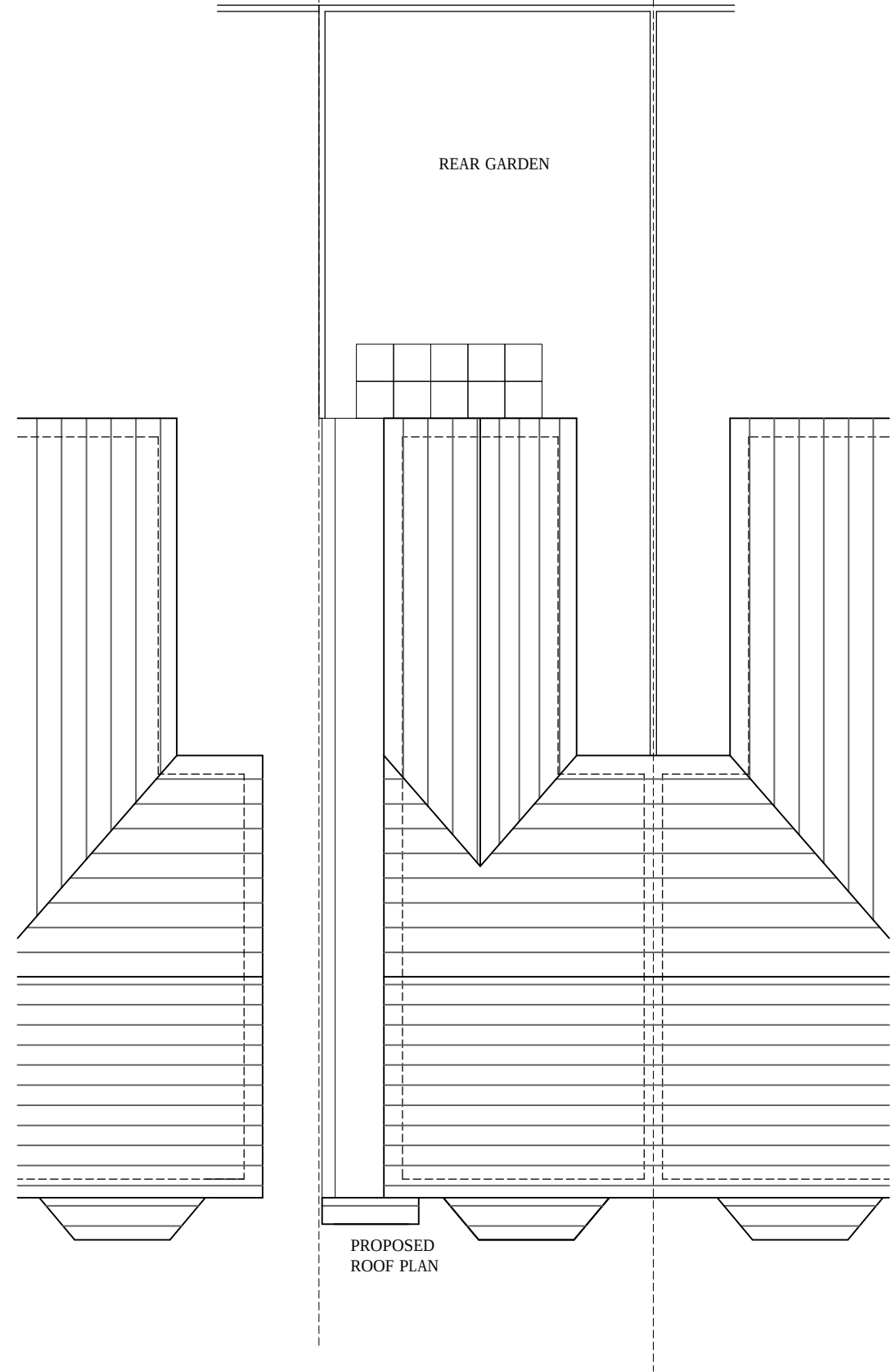
ONE ADDITIONAL
PARKING SPACE
WILL BE CREATED
ON ROAD SIDE

NOTE: EXISTING DROPPED
CURB TO BE REINSTITATED
AND REALIGNED WITH THE
FOOTWAY



PROPOSED
FIRST FLOOR PLAN

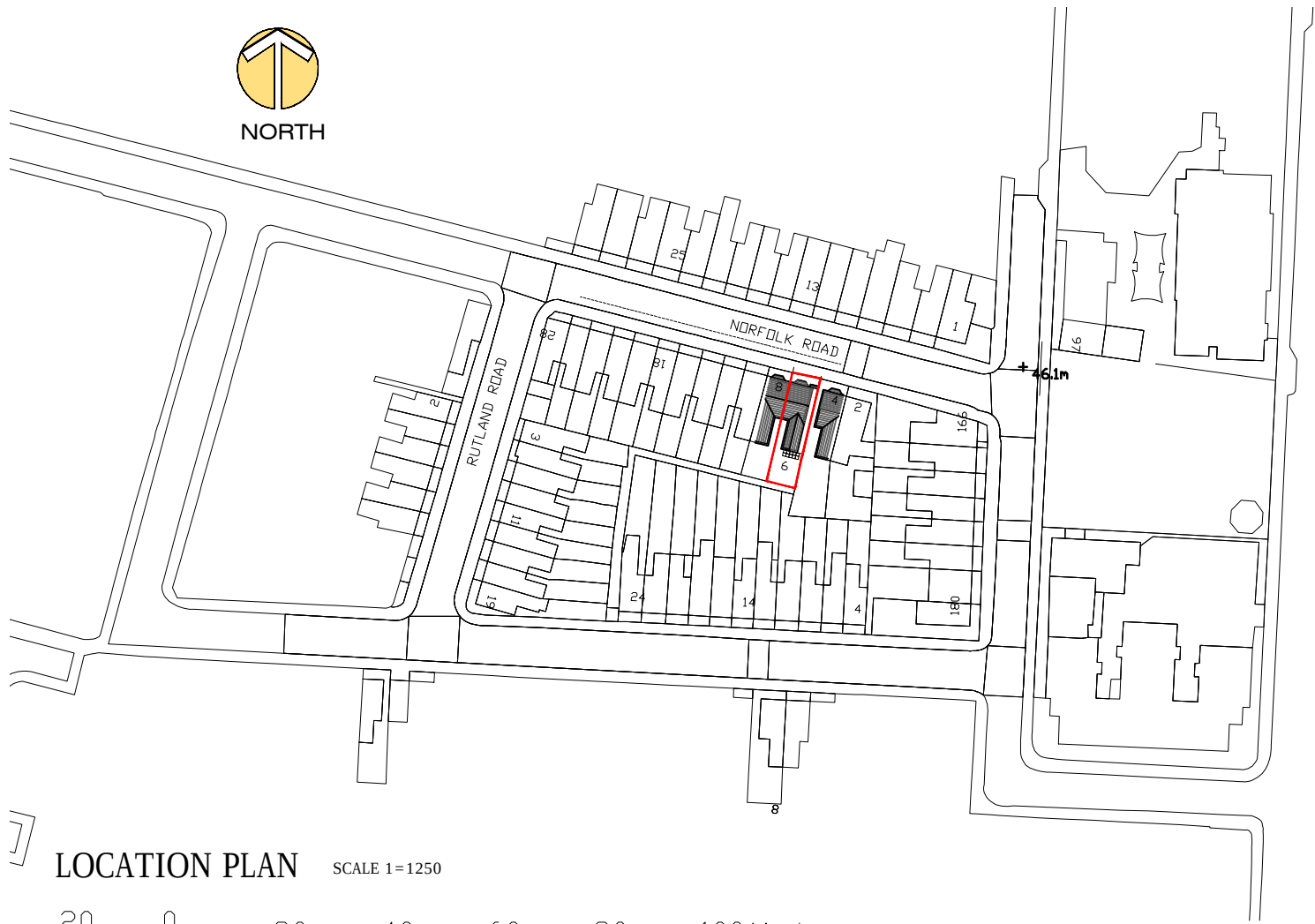
OBSURED AND
NON OPENABLE
GLAZING UP TO
1.7M FROM FFL



PROPOSED
ROOF PLAN

HATCH KEY

BOUNDARY OUTLINE

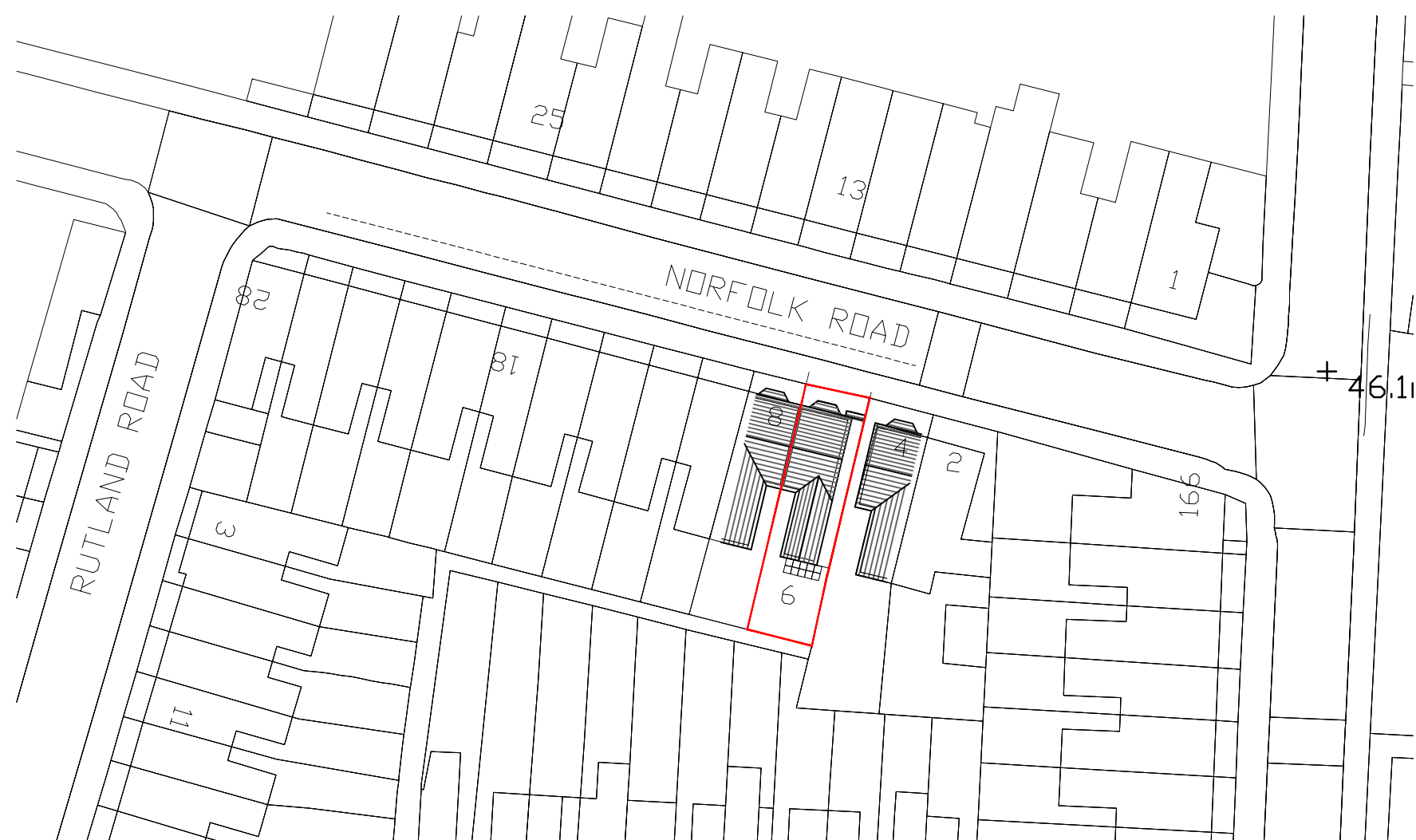


LOCATION PLAN SCALE 1:1250

20 0 20 40 60 80 100Metres

ADDRESS: 6 NORFOLK ROAD, READING, RG30 2EE

THIS DRAWING HAS BEEN PRODUCED FROM EMAPSITE ORDNANCE SURVEY MASTER MAP
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BLOCK PLAN SCALE 1:500

5 0 5 10 20 40Metres

The scaling of this drawing cannot be assured

Revision	Date	Initial
P1 PRELIMINARY ISSUE FOR COMMENTS	11.07.17	EH
P2 DRAWING REVISED	22.09.17	EH
P3 DRAWING REVISED	27.09.17	EH

Status PLANNING DRAWINGS

Project

DEMOLITION OF AN EXISTING STORE AND
CONSTRUCTION OF A NEW 3 BEDROOMS
DWELLING AT THE SIDE OF 6 NORFOLK
ROAD, READING, RG30 2EE

Client MR MANISH PARMER

ARCHIGRACE

Architectural Design, Planning & Building Regulations
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www.archigrace.co.uk, Registration no. 08642485

Registered LABC Partner with

SLOUGH BOROUGH COUNCIL



Project No
268
Drawing No
PL-01
Rev
P3
Scale @ A1
100,500,1250
Drawn by
EU

FIGURE 4
SITE SAMPLING LOCATION PLAN

6 NORFOLK ROAD
READING
RG30 2EE

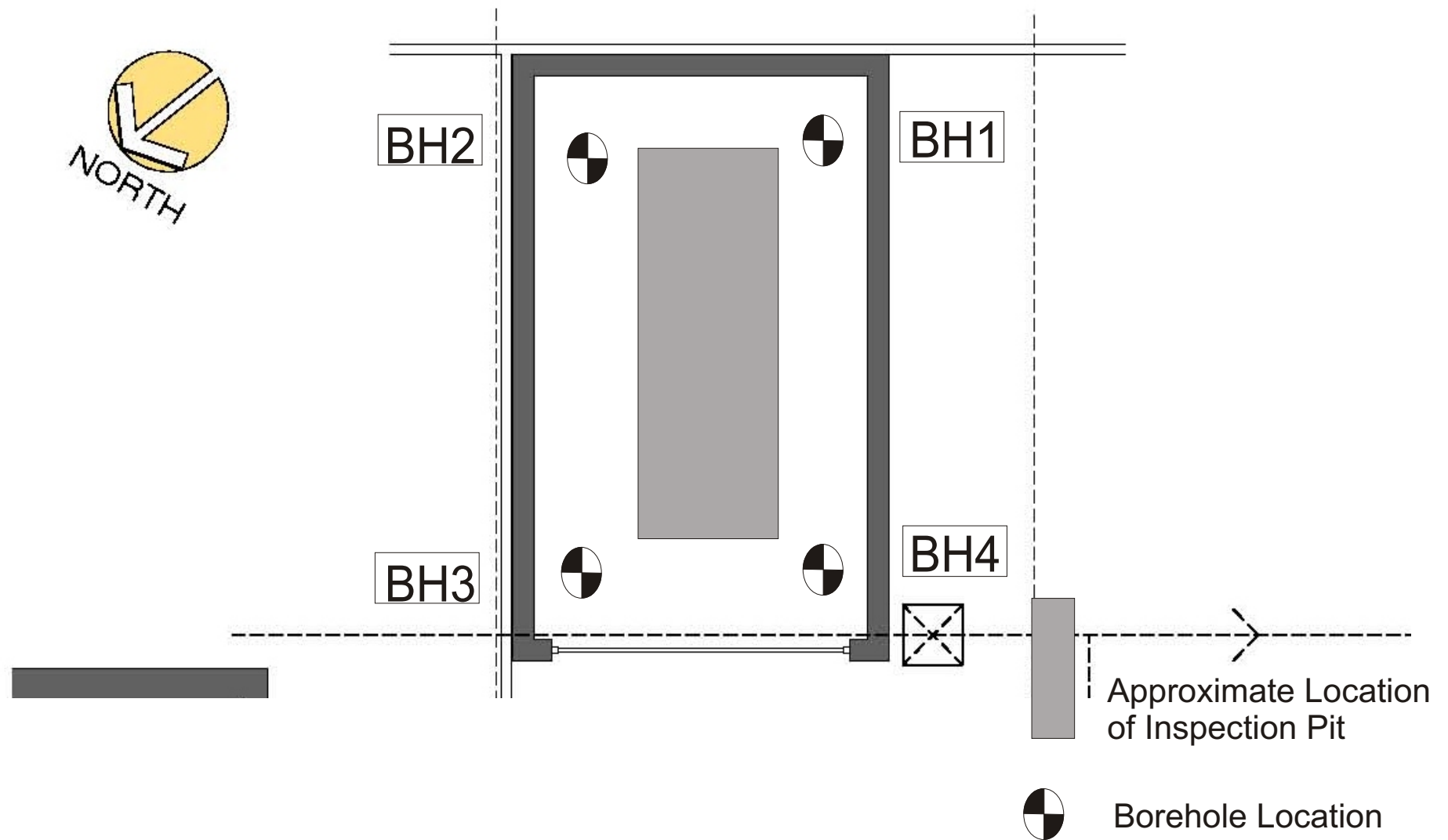


Figure 4 - Borehole Location Plan
6 Norfolk Road, Reading

APPENDICES

APPENDIX A

SITE INVESTIGATION PHOTOGRAPHS



Photograph 1: A view showing the drilling rig set up at BH1 located to the rear of the garage



Photograph 2: A view showing the recovered soil profile from BH1 showing darker topsoils and underlying coarse sands and sandy clays.



Photograph 3: A closer view of the topsoil from BH1



Photograph 4: A view of the semi soft clays located at depth



Photograph 5: A view of the end profile at 1 metre showing sands with gravel



Photograph 6: Setting up the drilling rig at BH2



Photograph 7: A view showing the thickness of concrete, gravel sub base and sands beneath



Photograph 8: Recovered soils from BH2



Photograph 9: Soft clean sand from Bh2 at 0.8m bgl.



Photograph 10: Setting up at BH3.



Photograph 11: Recovered soil profile from BH3.



Photograph 12: Clean sands at shallow depth at BH3.



Photograph 13: Clean sands observed at base at BH3.



Photograph 14: Pearly gravels fractured at 1.4m bgl.



Photograph 15: View of recovered soil profile from BH4.

APPENDIX B

BOREHOLE LOGS

APPENDIX C

ANALYTICAL RESULTS COMPARATIVE DATA

6 Norfolk Road, Reading
Comparative Residential Values

6 Norfolk Road, Reading Comparative Residential Values				Lab No			1799698	1799699	1799700	1799701
				Sample ID			BH1	BH1	BH2	BH2
				Depth			0.30-0.40	1.3 - 1.4	0.6 - 0.8	1.30-1.40
				Sample Type			SOIL	SOIL	SOIL	SOIL
				Sampling Date			29/01/2021	29/01/2021	29/01/2021	29/01/2021
				Sampling Time			1015	1015	1050	1050
Test	Method	LOD	Units	C4SL	CIEH/LQM Criteria	Other				
				Residential with home-grown produce	2.5% SOM Other) Residential					
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	37			16	14	26	33
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg		291		1.3	1.1	1.2	0.5
Cadmium	DETSC 2301#	0.1	mg/kg	22	3		0.4	0.1	0.1	0.1
Chromium	DETSC 2301#	0.15	mg/kg	26	3000		18	22	18	24
Copper	DETSC 2301#	0.2	mg/kg				29	12	12	14
Lead	DETSC 2301#	0.3	mg/kg	86-210		450*	94	16	10	11
Mercury	DETSC 2325#	0.05	mg/kg				0.17	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg				20	25	25	25
Selenium	DETSC 2301#	0.5	mg/kg				< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg		3750		600	82	62	46
Inorganics										
pH	DETSC 2008#		pH				9.2	7.4	7.5	7.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg				0.6	< 0.1	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg				0.1	< 0.1	< 0.1	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg				0.7	< 0.6	< 0.6	< 0.6
Organic matter	DETSC 2002#	0.1	%				0.7	0.9	4.2	3.1
Sulphide	DETSC 2024*	10	mg/kg				< 10	< 10	< 10	< 10
Sulphur (free)	DETSC 3049#	0.75	mg/kg				< 0.75	< 0.75	< 0.75	< 0.75
Sulphate as SO4, Total	DETSC 2321#	0.01	%				0.09	< 0.01	< 0.01	< 0.01
Asbestos Screen							NAD	NAD	NAD	NAD
Petroleum Hydrocarbons										
EPH (C5-C10)	DETSC 3321*	0.1	mg/kg				< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C40)	DETSC 3311#	10	mg/kg				130	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	0.87			< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg				< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg				< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg				< 0.01	< 0.01	< 0.01	< 0.01

6 Norfolk Road, Reading
Comparative Residential Values

6 Norfolk Road, Reading							Lab No	1799698	1799699	1799700	1799701	
Comparative Residential Values							Sample ID	BH1	BH1	BH2	BH2	
							Depth	0.30-0.40	1.3 - 1.4	0.6 - 0.8	1.30-1.40	
							Sample Type	SOIL	SOIL	SOIL	SOIL	
							Sampling Date	29/01/2021	29/01/2021	29/01/2021	29/01/2021	
							Sampling Time	1015	1015	1050	1050	
							C4SL					
							Residential with home-grown produce	CIEH/LQM Criteria 2.5% SOM Other)				
							Residential					
Test	Method	LOD	Units									
PAHs												
Naphthalene	DETSC 3301	0.1	mg/kg				< 0.1	< 0.1	< 0.1	< 0.1		
Acenaphthylene	DETSC 3301	0.1	mg/kg				0.2	< 0.1	< 0.1	< 0.1		
Acenaphthene	DETSC 3301	0.1	mg/kg				< 0.1	< 0.1	< 0.1	< 0.1		
Fluorene	DETSC 3301	0.1	mg/kg				< 0.1	< 0.1	< 0.1	< 0.1		
Phenanthrene	DETSC 3301	0.1	mg/kg				0.7	< 0.1	< 0.1	< 0.1		
Anthracene	DETSC 3301	0.1	mg/kg				0.3	< 0.1	< 0.1	< 0.1		
Fluoranthene	DETSC 3301	0.1	mg/kg				2.0	< 0.1	< 0.1	< 0.1		
Pyrene	DETSC 3301	0.1	mg/kg				1.8	< 0.1	< 0.1	< 0.1		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg				1.0	< 0.1	< 0.1	< 0.1		
Chrysene	DETSC 3301	0.1	mg/kg				1.2	< 0.1	< 0.1	< 0.1		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg				0.8	< 0.1	< 0.1	< 0.1		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg				0.4	< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	5.0			1.2	< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg				1.0	< 0.1	< 0.1	< 0.1		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg				0.2	< 0.1	< 0.1	< 0.1		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg				0.9	< 0.1	< 0.1	< 0.1		
PAH Total	DETSC 3301	1.6	mg/kg				12	< 1.6	< 1.6	< 1.6		
Phenols												
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				< 0.3	< 0.3	< 0.3	< 0.3		

APPENDIX D

LABORATORY CERTIFICATES



Certificate of Analysis

Certificate Number 21-02803

Issued: 16-Feb-21

Client Brown Fisher Consulting
Barley House
Cedar Drive
Snitterfled
Stratford upon Avon
CV37 0LJ

Our Reference 21-02803

Client Reference 4615B

Order No (not supplied)

Contract Title Norfolk Road

Description 8 Soil samples.

Date Received 02-Feb-21

Date Started 03-Feb-21

Date Completed 16-Feb-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 21-02803
Client Ref 4615B
Contract Title Norfolk Road

Lab No	1799698	1799699	1799700	1799701	1799702	1799703
Sample ID	BH1	BH1	BH2	BH2	BH3	BH3
Depth	0.30-0.40	1.3 - 1.4	0.6 - 0.8	1.30-1.40	0.30-0.40	1.4 - 1.5
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Sampling Time	1015	1015	1050	1050	1115	1115

Test	Method	LOD	Units						
Metals									
Arsenic	DETS 2301#	0.2	mg/kg	16	14	26	33	12	14
Boron, Water Soluble	DETS 2311#	0.2	mg/kg	1.3	1.1	1.2	0.5	1.4	1.1
Cadmium	DETS 2301#	0.1	mg/kg	0.4	0.1	0.1	0.1	< 0.1	0.1
Chromium	DETS 2301#	0.15	mg/kg	18	22	18	24	18	22
Copper	DETS 2301#	0.2	mg/kg	29	12	12	14	9.0	12
Lead	DETS 2301#	0.3	mg/kg	94	16	10	11	11	16
Mercury	DETS 2325#	0.05	mg/kg	0.17	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETS 2301#	1	mg/kg	20	25	25	25	14	25
Selenium	DETS 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETS 2301#	1	mg/kg	600	82	62	46	68	82
Inorganics									
pH	DETS 2008#		pH	9.2	7.4	7.5	7.4	8.0	7.5
Cyanide, Total	DETS 2130#	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cyanide, Free	DETS 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Thiocyanate	DETS 2130#	0.6	mg/kg	0.7	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Organic matter	DETS 2002#	0.1	%	0.7	0.9	4.2	3.1	5.2	3.2
Sulphide	DETS 2024*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Sulphur (free)	DETS 3049#	0.75	mg/kg	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Sulphate as SO ₄ , Total	DETS 2321#	0.01	%	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Petroleum Hydrocarbons									
EPH (C5-C10)	DETS 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C40)	DETS 3311#	10	mg/kg	130	< 10	< 10	< 10	< 10	< 10
Benzene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETS 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETS 3301	0.1	mg/kg	0.7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETS 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETS 3301	0.1	mg/kg	2.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETS 3301	0.1	mg/kg	1.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETS 3301	0.1	mg/kg	1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETS 3301	0.1	mg/kg	1.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETS 3301	0.1	mg/kg	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETS 3301	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETS 3301	0.1	mg/kg	1.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETS 3301	0.1	mg/kg	1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETS 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 21-02803
 Client Ref 4615B
 Contract Title Norfolk Road

Lab No	1799698	1799699	1799700	1799701	1799702	1799703
Sample ID	BH1	BH1	BH2	BH2	BH3	BH3
Depth	0.30-0.40	1.3 - 1.4	0.6 - 0.8	1.30-1.40	0.30-0.40	1.4 - 1.5
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021	29/01/2021
Sampling Time	1015	1015	1050	1050	1115	1115

Test	Method	LOD	Units						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	12	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-02803
Client Ref 4615B
Contract Title Norfolk Road

Lab No	1799704	1799705
Sample ID	BH4	BH4
Depth	0.5 - 0.6	1.50-1.60
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	29/01/2021	29/01/2021
Sampling Time	1220	1220

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	16	28
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.1	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	24	18
Copper	DETSC 2301#	0.2	mg/kg	16	10
Lead	DETSC 2301#	0.3	mg/kg	11	10
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	24	20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	67	52
Inorganics					
pH	DETSC 2008#		pH	7.5	7.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	< 0.6
Organic matter	DETSC 2002#	0.1	%	0.8	1.5
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10
Sulphur (free)	DETSC 3049#	0.75	mg/kg	< 0.75	< 0.75
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.01	0.01
Petroleum Hydrocarbons					
EPH (C5-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 21-02803
 Client Ref 4615B
 Contract Title Norfolk Road

Lab No	1799704	1799705
Sample ID	BH4	BH4
Depth	0.5 - 0.6	1.50-1.60
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	29/01/2021	29/01/2021
Sampling Time	1220	1220

Test	Method	LOD	Units		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-02803

Client Ref 4615B

Contract Title Norfolk Road

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1799698	BH1 0.30-0.40	SOIL	NAD	none	A Christodoulou
1799702	BH3 0.30-0.40	SOIL	NAD	none	A Christodoulou

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-02803
 Client Ref 4615B
 Contract Norfolk Road

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1799698	BH1 0.30-0.40 SOIL	29/01/21	GJ 250ml, GJ 60ml, PT 1L		
1799699	BH2 1.30-1.40 SOIL	29/01/21	GJ 250ml, GJ 60ml, PT 1L		
1799700	BH3 0.30-0.40 SOIL	29/01/21	GJ 250ml, GJ 60ml, PT 1L		
1799701	BH4 1.50-1.60 SOIL	29/01/21	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report