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SUB SURFACE NORTH WEST LTD

GEOTECHNICAL & GEOENVIRONMENTAL SITE INVESTIGATION SPECIALISTS AND CONSULTANTS

Reg. Office
3 PEEL STREET
PRESTON
PR2 2QS

Telephone: 01772-561135
Fax: 01772-204907
e-mail: preston@subsurface.co.uk
www.subsurface.co.uk

Your ref:

Our ref: DJ/CAM/5047

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- 1 FEB 2008

4 February 2008

Booth King Partnership
2nd Floor
1 Grange Street
Rawtenstall
BB4 7RT

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REPLIED
RECD - 6 MAR 2008
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FOR ACTION

For the attention of Mr. Richard Carroll

Dear Sirs,

CONTAMINATION ANALYSIS ON SAMPLES FROM UNIT 51, HILTON STREET, MANCHESTER

1. INTRODUCTION

This report has been prepared in accordance with instructions dated 14th January 2008 from the Booth King Partnership.

1.1 Site Location and Description

The site is located in the centre of Manchester at National Grid Reference SJ847983 as shown in Figure 1. The site comprises an L shaped piece of land currently occupied by a two storey brick built commercial unit and associated hard standing/ car parking.

The site is bordered to the north by commercial properties fronting onto Port Street and Hilton Street to the east by Brewer Street, to the south by Tariff Street and to the west by Hilton Street.

The site is level with no trees or other vegetation present.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand it is proposed to redevelop the site as several conjoined light commercial units.

The purpose of this preliminary contamination assessment was to determine the necessary precautions and/or remedial measures required for any reuse/removal of the sampled material.

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2. SAMPLING AND TESTING

2.1 Sampling

Two bulk samples referenced as TP3 at 0.50m and TP4 at 1.20m were obtained by the Client from the locations shown in Figure 1.

The samples will be retained for a period of one month after the issue of this report, for reference purposes, and then disposed of unless otherwise instructed.

2.2 Laboratory Testing

Contamination analyses have been performed on both soil samples to determine: pH, sulphate, sulphide, cyanide, thiocyanate, arsenic, boron (soluble), cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, phenols, total polynuclear aromatic hydrocarbons (PAHs), speciated PAHs: naphthalene and benzo-a-pyrene, speciated total petroleum hydrocarbons (TPHs), speciated volatile petroleum hydrocarbons (VPHs) and benzene/ ethylbenzene/ toluene/ xylene (BTEX) concentrations. A contingency for sixteen speciated PAHs was also made for samples containing total PAH in excess of 40mg/kg.

The results of the above analyses are appended.

3. APPRAISAL AND RECOMMENDATIONS

3.1 Comments on the Sampling

At the outset it should be appreciated that only a small proportion of material has been sampled by the Client and consequently the recommendations made and opinions expressed in this report can only be applied to such conditions as were encountered in the samples provided.

3.2 Chemical Contamination Considerations

At the outset it should be noted that this assessment is for levels of contamination within each individual sample submitted for analysis and no indication of how representative the samples are of the site soils can be made.

It should be appreciated that the suite of determinants tested for consists of a range of common contaminants and the absence of any other specific contaminants cannot be guaranteed.

Assessment (Soil)

In order to provide preliminary assessment of the presence of contamination two soil samples have been analysed for a suite of contaminants. The results are given on the appended Chemical Contamination Results sheets.

The Department of Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) have published a series of papers on the assessment of risk to human health from contaminants in soil. This is known as the Contaminated Land Exposure Assessment (CLEA) model. Soil Guideline Values (SGVs) have been derived giving levels for a number of contaminants above which the contaminant may pose a significant risk to human health. The SGVs have been supplemented by Soil Screening Values (SSVs) published by Atkins and by Generic Assessment Criteria (GACs) published by Land Quality Management (LQM) in conjunction with the Chartered Institute of Environmental Health (CIEH). The SGVs, SSVs and GACs vary dependant upon the land use; residential use being the most sensitive and commercial/ industrial use being the least sensitive.

SGVs for arsenic, cadmium, chromium, lead, mercury, nickel and selenium were published in March 2002. SGVs for ethylbenzene and toluene were added in December 2004 and SGVs for phenols were added in October 2005. An extensive list of SSVs and GACs were published in 2006 and 2007 respectively. For the purposes of assessment, as the proposed development is light commercial units the contamination test results have been compared with SGVs, SSVs and GACs for a standard land use of commercial/industrial.

When compared with the SGVs, SSVs and GACs for a standard land use of commercial/industrial the contamination analysis determined elevated levels of lead sample TP4 at 1.20m. In addition copper and zinc were both present in the sample from TP4 at phytotoxic concentrations; i.e. could retard plant growth.

The Environment Agency's, "Guidance on the Disposal of Contaminated Soils, Version 3, dated April 2001", was replaced in July 2004 with Waste Acceptance Criteria (WAC). As of July 2005 landfill operators should require WAC analysis before accepting materials for land filling. We therefore recommend that WAC analysis is undertaken if on-site materials are to be removed to a landfill site.

In addition to the above, an assessment of risk to personnel who will come into contact with on-site materials throughout the site has been undertaken.

Conclusions and Recommendations

Section 78a(2) of the Environmental Protection Act: 1990, defines CONTAMINATED LAND for the purposes of Part IIA as:

"any land which appears to the LOCAL AUTHORITY in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

(a) SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused; or

(b) POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused"

Before a LOCAL AUTHORITY can make the judgement that land appears to be CONTAMINATED LAND on the basis that SIGNIFICANT HARM is being caused, or that there is a SIGNIFICANT POSSIBILITY of such harm being caused, the LOCAL AUTHORITY must identify a SIGNIFICANT POLLUTANT LINKAGE. This means that each of the following has to be identified:

(a) a CONTAMINANT;

(b) a relevant RECEPTOR (defined as living organisms, ecological systems, controlled waters or property); and

(c) a PATHWAY by means of which either:

  (i) the CONTAMINANT is causing SIGNIFICANT HARM to that RECEPTOR, or

  (ii) there is a SIGNIFICANT POSSIBILITY of such harm being caused by that CONTAMINANT to that RECEPTOR

It should be noted that the above words in capitals have a legal definition within the legislation.

Without a clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated under the regime. As we have no further information apart from the results of chemical testing on two samples we cannot comment on the contaminated land status of the site. We would have to carry out a full site investigation in order to determine the condition of the site.

Our preliminary assessment based on a limited number of soil samples only, indicates that elevated levels of lead are present in one of the samples.

Reuse on Site

If the sampled material is to be retained/reused on site then the pathway between site operatives during site works, end users of the site and any proposed planting will need to be removed by precautions and/ or remedial measures. The contamination can be dealt with by breaking the direct contact pollutant linkage.

As Trial Pit 4 is located within the footprint of the proposed building direct contact with the contaminated material would be broken by the floor slab. However if there is any proposed landscaping or planting in the area of Trial Pit 4 then a suitable thickness of clean inert topsoil (i.e. >300mm) will be required to break the pathway.

It should also be noted that if the contaminated material is excavated and stockpiled on site precautions should be taken to prevent cross contamination of the underlying soils which would otherwise also need to be treated as contaminated.

Removal from Site

Contaminated materials should, where possible, be retained on site. However, it should be appreciated that contaminated material left on site is the legal responsibility of the landowner, unless the person who created the contamination can be identified. Should it be necessary to remove contaminated materials from the site, WAC analyses should be submitted to the appropriate Waste Disposal Authority or local tip operators to determine the most appropriate tip to use and the associated costs.

All vehicles carrying contaminated material should be securely sheeted and the wheels and undercarriages cleaned before leaving site to ensure that hazardous materials are not dropped onto public roads.

SGVs and SSVs assume long term contact with contamination and assess chronic health risk. The risk of short term acute exposure to site personnel is dealt with in the remit of the Health and Safety Executive under the Health and Safety at Work Act: 1974 and Regulations made under the Act, including the Control of Substances Hazardous to Health (COSHH) Regulations. The levels of contamination and risk to site personnel should be considered under the Construction Design and Management (CDM) Regulations at the planning stage and in the development of the designers and contractors Health and Safety Plans and Method Statements.

The risk of contact with on-site soils should be minimised and the following precautions should be taken as a minimum requirement.

Site personnel involved in earthworks and excavations should be made aware of the hazards of working with contaminated materials found on the site. Strict personal hygiene should be observed and gloves, overalls, and boots should be worn. In addition smoking should be prohibited to minimise the potential for transfer of contaminants from hand to mouth.

Earthworks undertaken during dry weather might generate dust and in this instance dust should be damped down and dust masks made available to site operatives. In addition stockpiled materials should be sheeted over to prevent excessive airborne dust being formed.

4. General

As the site is located over a major aquifer (Sherwood Sandstone) we would recommend further investigation of the site including leachate analysis of the near surface soils to assess the risk of leachable contaminants to controlled waters.

We would be pleased to assist you with regard to any matters arising from this report. If you have any queries or require further assistance please do not hesitate in contacting the undersigned.

Yours faithfully

D. B. Jones BSc.(Hons.), Cert Nat Sci., FGS, MSEE
Geoenvironmental Engineer
For and on behalf of
Sub Surface Geotechnical and Environmental Consultants Limited

C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.
Director
For and on behalf of
Sub Surface Geotechnical and Environmental Consultants Limited

ALcontrol Technichem

Heron Drive,
Langley,
Slough SL3 8XP
tel: 01753 212500
fax: 01753 212501
email: langley@alcontrol.co.uk

Simon Gabbatt
Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

29 January 2008

TEST REPORT

Our Report Number: 08-44632

Your Order Reference: 5047

2 soil samples submitted for analysis on 16/01/2008

Project Name: Port Street

Laboratory analysis started on 16/01/2008
All analyses completed by 29 January 2008

Rexona Rahman
Analytical Reporting Manager
ALCONTROL TECHNICHEM

Project Co-Ordinator
ALCONTROL TECHNICHEM

Test methods are documented in house procedures or where appropriate standard methods. Non accredited tests (if applicable) are identified on each page. Procedures for sampling are outside the scope of the laboratory UKAS accreditation. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. All samples connected with this report , including any 'on hold', will be stored and disposed of according to company policy. A copy of this policy is available on request.

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ALcontrol Technichem
Sample Description

Job Number: 08-44632
Client: Sub Surface Laboratories

Matrix: Soil
Project Name: Port Street

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	Sample Description
289857	TP3	0.5	14/01/08	Brown sandy clay with gravel
289858	TP4	1.2	14/01/08	Black sandy clay with gravel and rubble

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Table Of Results

Job Number : 08-44632
Matrix : Soil

Project Name: Port Street
Client : Sub Surface Laboratories

Sample Reference	TP3	TP4				Method No.	Units	LOD
Sample Depth (m)	0.50	1.20						
Date Sampled	14/01/08	14/01/08						
Date Scheduled	16/01/08	16/01/08						
Laboratory Reference No	289857	289858						
Analysis								
Moisture Content (Wet Weight)	14.7	26.7					%	0.1
Moisture Content (Dry Weight)	17.3	36.5					%	0.1
Arsenic	12	35				069S[IM]	mg/kg	3
Boron (W/S)	0.5	1.0				016S[IM]	mg/kg	0.5
Cadmium	< 0.5	2.5				069S[IM]	mg/kg	0.5
Chromium	15	94				069S[IM]	mg/kg	10
Copper	58	1400				069S[IM]	mg/kg	5
Lead	170	1200				069S[IM]	mg/kg	10
Mercury	< 0.6	< 0.6				069S[IM]	mg/kg	0.6
Nickel	17	33				069S[IM]	mg/kg	4
Selenium	< 2.5	< 2.5				069S[IM]	mg/kg	2.5
Sulphate (Total Acid Soluble) as SO4	450	4000				025a[IM]	mg/kg	200
Zinc	43	1900				069S[IM]	mg/kg	10
Total Cyanide	< 1	9.1				061S[IM]	mg/kg	1
pH	7.9	8.2				084S[IM]	pH Units	1
Acid Soluble Sulphide	< 10	< 10				008[IM]	mg/kg	10
Thiocyanate as SCN	< 5	< 5				061S[IM]	mg/kg	5
* * VPH/BTEX SUITE								
MTBE	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
Benzene	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
Toluene	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
Ethylbenzene	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
m,p-Xylenes	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
o-Xylene	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
1,3,5-Trimethylbenzene	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
1,2,4-Trimethylbenzene	< 0.01	< 0.01				068S[IM]	mg/kg	0.01
VPH Compounds (C5-C10)	0.058	0.096				068S[IM]	mg/kg	0.01
VPH Compounds (C10-C12)	0.020	< 0.01				068S	mg/kg	0.01
VPH Compounds (C5-C12)	0.078	0.10				068S	mg/kg	0.01

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

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Table Of Results

Job Number : 08-44632
Matrix : Soil

Project Name: Port Street
Client : Sub Surface Laboratories

Sample Reference	TP3	TP4				Method No	Units	LOD
Sample Depth (m)	0.50	1.20						
Date Sampled	14/01/08	14/01/08						
Date Scheduled	16/01/08	16/01/08						
Laboratory Reference No	289857	289858						
Analysis								
**RAPID TPH SUITE								
TPH (C10-C26)	< 25	130				065	mg/kg	25
TPH (C8-C40)	47	340				065[IM]	mg/kg	25
TPH (C26-C40)	31	200				065	mg/kg	25
**RAPID PAH SUITE								
Naphthalene	< 0.5	< 0.5				022R[IM]	mg/kg	0.5
Benzo(a)pyrene	< 0.5	0.72				022R[IM]	mg/kg	0.5
Rapid PAH (Total 16)	ND	16.32				022R[I]	mg/kg	2
**PHENOLS SUITE								
Phenol	< 0.1	< 0.1				020S[IM]	mg/kg	0.1
Total Monohydric Phenols	< 1	< 1				020S[I]	mg/kg	1

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

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Table Of Results - Appendix

Job Number : 08-44632

Project Name: Port Street
Client : Sub Surface Laboratories

Summary of methods contained within report :

Method No:	Reference	Description	Wet/Dry Analysis
068S	In-house method	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) including BTEX and MTBE compounds by Headspace GC-FID (VPH).	W
061S	In-house method based on Method 4500-CN, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of cyanides and thiocyanate in soil samples by continuous flow colorimetry (Skalar)	W
022R	In-house method	Determination of PAH compounds in soil samples by hexane / acetone extraction followed by GC-MS detection [Note: this method does not separate benzo(j)fluoranthene, and this PAH will be included in the sum of benzo(b)fluoranthene & benzo(k)fluoranthene]	W
020S	In-house method based on Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of methanol/water based mobile phase extractable phenols in soil samples by HPLC with electrochemical detection	W
008	In-house method adapted from MEWAM "Sulphide in Waters and Effluents", HMSO, 1983	Determination of sulphide in soil samples by sulphuric acid addition, absorption of liberated hydrogen sulphide in sodium hydroxide / ascorbic acid buffer solution and ion selective electrode detection	W
065	In-house method	Determination of total petroleum hydrocarbons in soil samples using hexane:acetone extraction and GC-FID detection. Note: UKAS accreditation only applies to C8-C40 and excludes other carbon banding.	W
084S	In-house method referencing BS1377: Part 3: 1990 and Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of pH by addition of water followed by electrometric measurement	D
069S	In-house method based on MEWAM "Methods for the Determination of Metals in Soil", HMSO, 1986	Determination of metals in soil samples by aqua-regia digestion followed by ICP-OES detection	D
025a	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of hydrochloric acid soluble sulphate in soil samples by Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES)	D

ALcontrol Technichem
Table Of Results - Appendix

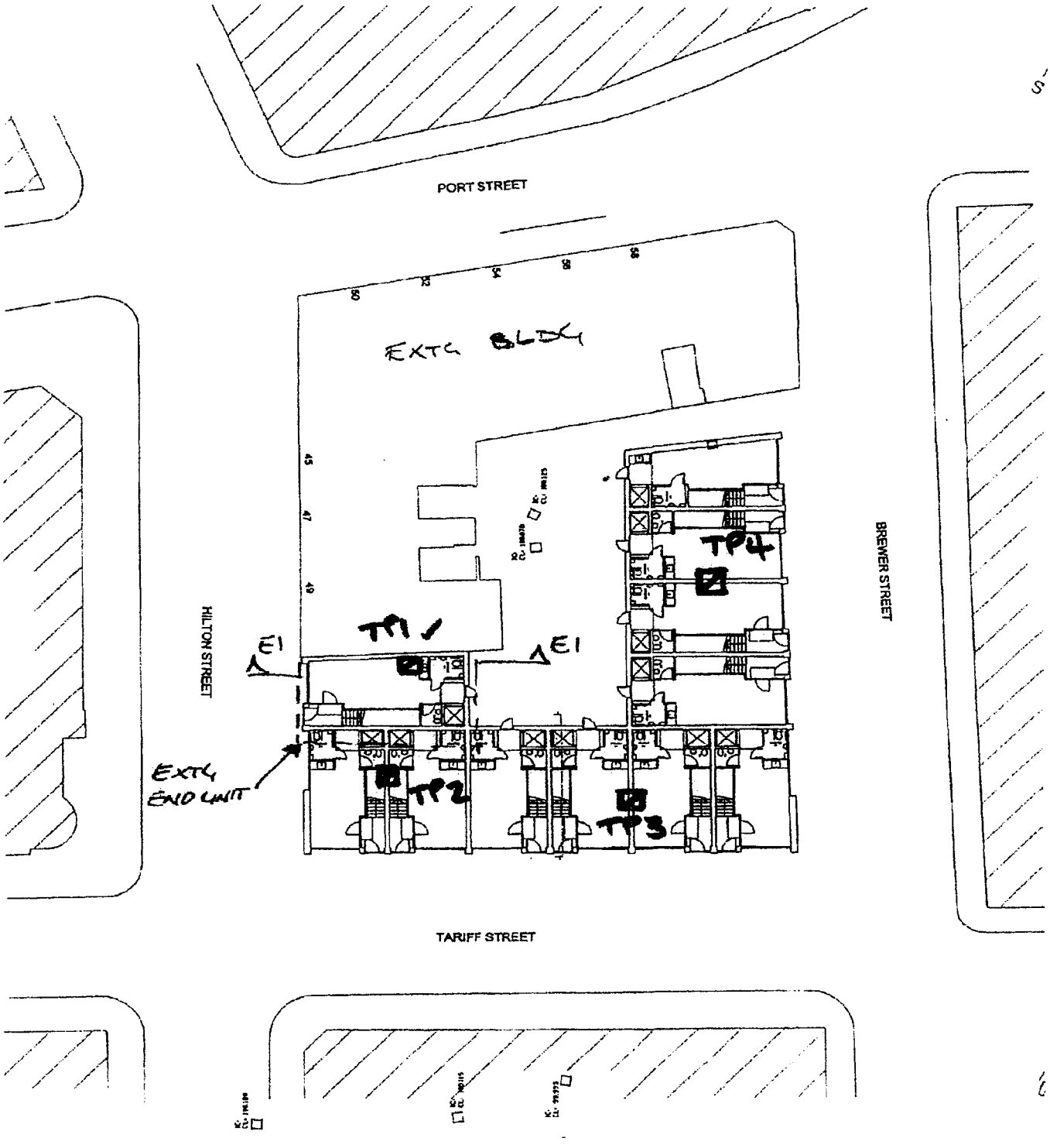
Job Number : 08-44632

Project Name: Port Street
Client : Sub Surface Laboratories

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
016S	In-house method	Determination of water soluble boron by 2:1 extraction in hot water followed by ICP-OES detection	D

Soil results are expressed on a dry weight basis. Where the test uses as-received sample, a moisture correction factor is applied to the wet weight result. This factor is determined gravimetrically using weight loss on drying at 30° (+/-5) C.



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SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site Location and Positions of Trial Pits (Client Supplied)

Site	Date Drawn	Date Checked	Orientation	Job No.
51 HILTON STREET, MANCHESTER	01-Feb-07		N	5047
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
BOOTH KING PARTNERSHIP	DJ		NTS	1