GROUND INVESTIGATION
AT
3, HAMPSHIRE STREET, LONDON,
NW5 2TE
FOR
HORIZON LAUNDRY

REPORT NO. SE1245A
FEBRUARY 2013

SUB SURFACE SOUTH EAST LIMITED
VICTORIA HOUSE
DESBOROUGH STREET
HIGH WYCOMBE
BUCKINGHAMSHIRE
HP11 2NF
TEL: (01494) 601013

CONTENTS

Sub Surface South East Limited
Victoria House, Desborough Street, High Wycombe, Buckinghamshire HP11 2NF
Tel: 01494 601013 Fax: 01494 601001 Email: southeast@subsurface.co.uk

GROUND INVESTIGATION AT 3, HAMPSHIRE STREET, LONDON, NW5 2TE.

CLIENT: HORIZON LAUNDRY.

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1. INTRODUCTION

This report has been prepared in accordance with an email dated 7th February 2013, from the Client.

The brief was set out in our estimate, ref. ESE1529D and dated 5th February 2013, with amendments as the investigation proceeded and includes:

- 3 No. cable percussive boreholes
- 2 No. hand excavated trial pits
- Geotechnical laboratory testing
- Contamination analysis
- Provision of an interpretative report on the above.

It should be noted that we have previously issued a Walkover Survey and Desk Study Report for this site, ref. SE1245 and dated February 2013, which should be read in conjunction with this report.

1.1 Site Location and Description

The site is located at 3 Hampshire Street, London, NW5 2TE, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is TQ 29739 84975.

The site is bounded to the north west by Hampshire Street and a commercial property, to the north east by a open area of commercial land, to the south east by a car parking area to a block of flats and to the south west by commercial and residential property.

The building comprises a derelict, three storey commercial building that had been used as a laundry since 1993. The ground surface is predominantly a concrete floor slab or other hard surfacing. Throughout the building on the ground floor were occasional piles of rubbish, old office furniture and general litter. In the upper two floors were old office furniture and stores for the old laundry including significant piles of laundry bags, materials and cloths etc. There are numerous service lines and pipes used for the old laundry equipment both overhead and along the walls.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to redevelop the site by demolishing the existing buildings and constructing a three and four storey building, with commercial use on the ground floor and residential flats on the upper floors.

The purpose of the investigation was to obtain an indication of the ground conditions, at the positions of the boreholes, to assess the likelihood of a general pattern of strata being present below the site and to establish the load bearing characteristics of the strata deriving if possible an assessment of the suitability of appropriate founding techniques.

In addition a contamination assessment was required in order to determine necessary precautions and/or remedial measures required for the proposed development and to ascertain the need for any further sampling and analysis.

2. INVESTIGATION

2.1 Investigation Details

Two No. 150mm diameter boreholes were put down by cable percussive boring techniques using a dismantleable rig due to restricted headroom and access, at the positions determined and set out by Sub Surface South East Limited, as shown on Figure 2. The boreholes were put down to depths of between 10 and 15 metres. The samples taken were logged in accordance with BS. EN. 14688 and 14689: 2002-2004 and the resulting Borehole Records are appended.

Two No. hand dug trial pits to obtain shallow soil samples for contamination testing were taken out at the positions determined and set out by Sub Surface South East Limited, as shown on Figure 2. The hand dug trial pits were excavated to depths of between 0.29 and 0.30 metres. Samples were taken for logging, in accordance with BS. EN. 14688 and 14689: 2002-2004, and testing. The resulting Hand Dug Trial Pit Records are appended.

The boreholes and trial pits were backfilled with arisings soon after completion as no installations were required.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended Borehole and Trial Pit Records. The exploratory holes found made ground to depths of between 1.10m to 1.40m overlying predominantly firm medium strength becoming stiff high to very high strength brown and grey brown silty clay with occasional selenite crystals (London Clay) to the termination of the boreholes at a maximum depth of 15.0m.

A general summary of the strata found is as follows:

2.2.1 Made Ground

Beneath an initial layer of concrete surfacing of between 0.20m to 0.30m thick, made ground was encountered in all three boreholes to depths of 1.10m, 1.30m and 1.40m in boreholes 1, 2, and 3 respectively. The made ground was predominantly comprised of dark brown gravelly slightly sandy silty clay with the gravel sized fragments comprised of angular to subrounded fine to coarse stone, brick, concrete and glass.

2.2.2 London Clay (Bedrock)

Beneath the made ground to the termination of the boreholes at a maximum depth of 15m was London Clay, which predominantly comprised a firm medium strength brown occasionally grey silty clay with occasional selenite crystals, which increased in strength with depth to become stiff very high strength at the base of the deeper boreholes.

2.2.3 Groundwater

No groundwater was encountered in any of the exploratory holes although it should be noted that they were only left open for a short period of time. Also groundwater levels and rates of inflow may be subject to seasonal and climatic variations.

3. SAMPLING AND TESTING

3.1 Sampling

Twelve 100mm diameter undisturbed samples were taken at appropriate intervals in cohesive strata, for testing in the laboratory.

Small disturbed and bulk disturbed samples were obtained for the strata encountered and were subjected to careful examination and hand penetrometer / hand shear vane tests, where appropriate.

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.

3.2 Field Testing

Twenty one Standard Penetration Tests (SPTs) were performed in made ground and natural strata, the results of which are recorded on the appended Standard Penetration Test Results Sheet with 'N' values and indicative states of compaction and consistency, where appropriate, given on the Borehole Records.

3.3 Laboratory Testing

The following laboratory tests were carried out in accordance with BS.1377: 1990, where applicable, and the results are appended.

- Moisture content, plastic limit and liquid limit tests
- Quick undrained triaxial tests
- Soluble sulphate content and pH value tests

Contamination analyses have been performed on five soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, speciated total petroleum hydrocarbons (TPH CWG) with aliphatic/aromatic split, the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. On three of the soil samples volatile organic compounds (VOC's) were also determined. In addition two soil samples were subjected to an asbestos screen.

The results of the above analyses are appended.

4. APPRAISAL AND RECOMMENDATIONS

4.1 Comments on the Profile

At the outset it should be appreciated that only a small proportion of the area to be developed has been sampled and consequently the recommendations made and opinions expressed in this report can only be applied to such conditions as were encountered in the exploratory holes.

The exploratory holes found made ground to depths of between 1.10m to 1.40m overlying predominantly firm medium strength becoming stiff high to very high strength brown and grey brown silty clay with occasional selenite crystals (London Clay) to the termination of the boreholes at a maximum depth of 15.0m. In our opinion, the exploratory holes indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions, although clearly no guarantee can be given.

Due to the nature of Made Ground localised variations in thickness and composition should be anticipated and hence interpolation or extrapolation from the exploratory holes to adjoining areas should only be undertaken with caution.

Details of the findings of the investigation are given on the appended Borehole Records and a summary of the ground conditions is given in Section 2.2.

4.2 Foundations

We understand that it is proposed to redevelop the site by demolishing the existing buildings and constructing a three and four storey building, with commercial use on the ground floor and residential flats on the upper floors. However, at the time of writing this report no specific details regarding the design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation found made ground to depths of between 1.10m to 1.40m overlying predominantly firm medium strength becoming stiff high to very high strength brown and grey brown silty clay with occasional selenite crystals (London Clay) to the termination of the boreholes at a maximum depth of 15.0m.

We would not recommend founding in the Made Ground in its present condition because of its inherent variability in consistency and compaction, and in parts the nature of its constituents.

Providing there is sufficient load bearing capability consideration could be given to founding the proposed building on strip footings for wall loads and pad foundations for column loads in the natural firm medium strength brown silty clay.

Atterberg limit tests on the cohesive strata indicate clays of very high plasticity, which are considered to have a high susceptibility to shrinkage and swelling with varying moisture content. Consequently, we recommend that any foundations are placed at a minimum depth of 1.0 metres below finished ground level to avoid the zone which is subject to seasonal moisture content variation and frost action. If buildings are to be constructed adjacent to existing trees, trees are to be removed and/or trees are to be planted then the guidelines given in the National House Building Council (NHBC) Standards Chapter 4.2, 'Building Near Trees', should be followed for clays of high shrinkage and swelling potential.

It should be noted that in parts of the site the natural strata is at a depth of in excess of 1.0 metres and in these areas foundations should be taken down to a minimum 0.10 metres below the base of the Made Ground unless the NHBC guidelines indicate a greater depth.

In view of the depth of foundations required it is anticipated that trench fill (lean mix concrete or layers of compacted graded stone) will be used to bring levels back up to the surface. We would anticipate that trench fill would normally be economically viable providing foundation depths do not exceed about 2.50 to 3.00 metres.

Taking the results of the field and laboratory tests, we have determined the safe bearing capacity of the natural strata in Table 1 below. It should be noted, that based upon the plasticity index values determined for the upper clays, to convert SPT "N" values to cohesive shear strength a factor of 4.3 would be appropriate. However, this does not appear to give a very good correlation and therefore we have used a factor of 6, which appears to be more appropriate, when compared with the triaxial test results, hand shear vane and hand penetrometer tests and visual inspection.

TABLE 1 SAFE BEARING CAPACITY

Expl Hole No.	Depth (m)	SPT 'N' Value	Shear Strength (kN/m^2)	Safe Bearing Pressure (kN/m^2)		Minimum Foundation Depth (m)
				Strip Footing	Square Pad	
BH1	2.15	7	42$	75	95	2.15
BH1	3.00	-	90#	170	205	
BH1	3.50	-	100#	190*	225*	
BH1	4.15	10	60$	110	135	
BH1	5.00	-	81	150	180	
BH2	2.15	6	36$	65	80	2.15
BH2	2.15	-	75#	140*	170*	
BH2	3.15	12	72$	135	160	
BH2	3.15	-	100#	190*	225*	
BH2	4.15	10	60$	110	135	
BH2	5.15	13	78$	145	175	
BH3	1.40	-	52#	95	115	1.50
BH3	2.00	-	60	110*	135*	
BH3	3.15	9	54$	100	120	
BH3	4.00	-	77	145	175	
BH3	5.15	13	78$	145	175	

$ To determine the cohesive shear strength a conversion factor of 6 has been used for the SPT's

* Consideration must be given to weaker underlying strata which might be overstressed if loading is not reduced.

\# Shear strength determined by hand penetrometer/ shear vane test.

Appreciable variations in safe bearing capacity are indicated in Table 1 and as a consequence of this and the need to utilise a generally applicable safe bearing pressure to enable designs to be reasonably formulated we recommend that values of 75 kN/m^2 for strip footings and 95 kN/m^2 for square pads should not be exceeded for the minimum foundation depth given.

All formation levels should be carefully inspected by an experienced and qualified Engineer to confirm the appropriateness of the design figures used with any softer/ looser zones removed and replaced with lean mix concrete. The formation should then be blinded with lean mix concrete as soon as possible after exposure, if there is to be a delay before construction, to prevent water softening or disturbance.

It should be noted that the safe bearing pressures given for the cohesive strata do not take into consideration settlement. Settlement is dependent upon loading intensity, the width of footings/pads and the coefficient of volume compressibility (Mv) of the compressible strata. When details of the foundations are formulated we recommend that total and differential settlements are assessed to ensure that they are within acceptable limits.

In view of the relatively low safe bearing pressures determined above and the anticipated high loads from a four storey structure in our opinion shallow foundations in natural ground are not likely to be feasible. Consequently, we would recommend using a piled foundation transferring the structural loads down to the more competent strata at depth.

With regard to the choice of pile type, consideration could be given to driven piles, continuous flight auger (CFA) piles or cast in-situ bored piles with the driven pile option probably being the most economical. However, in considering piles driven to a pre-determined set in the more competent strata at depth, it is essential to ensure that any vibrations set up during the driving process are not transmitted to adjacent/ nearby buildings, structures or services. This is because adjacent/ nearby buildings, structures or services could well be founded at shallow depth and already be in a highly stressed state and susceptible to structural damage as a direct result of such induced vibration. Consequently, we recommend that any Specialist Piling Contractor tendering in respect of driven piles should be asked to confirm that the process to be adopted will not affect or cause damage to adjacent/ nearby buildings, structures or services. If such confirmation cannot be given, as is likely, then we would recommend using either CFA or cast in-situ bored piles.

Care must be taken to space the piles in any group to ensure the adequate utilisation of skin friction where this has been assumed in the calculation of the load bearing capacity of an individual pile. Checks must also be undertaken to confirm that the underlying ground supporting the pile group is not overstressed.

To provide assistance for estimating purposes only, we have undertaken a preliminary pile design calculation for a 15.0 metre long pile taking into consideration the ground conditions at BH3, as follows:

Preliminary Pile Design based on strata in BH3

Bored Cast In-situ or CFA Pile Factor of Safety: 2.5 (shaft), 3.0 (end)
Dia. = 300mm, Perimeter = 0.94m, Cross Section Area = 0.07m^2, Length = 15m

0.00 to 1.40m	Made Ground	ignore
1.40 to 4.50m	Firm medium strength CLAY	($\bar{C}$ = 60kPa)
	Allowable Shaft Friction	= 10.8kN/m^2
	Allowable Shaft Friction Load	= 31kN
4.50 to 15.00m	Stiff high strength CLAY	($\bar{C}$ = 165 kPa)
	Allowable Shaft Friction	= 29.7kN/m^2
	Allowable Shaft Friction Load	= 293kN
15.00m	Stiff very high strength CLAY	(C = 212 kPa)
	Allowable End Bearing	= 508kN/m^2
	Allowable End Bearing Load	= 35kN

Total Allowable Working Load = 31 + 293 + 31 = 359kN

In order to use the load carrying capacity attributable to both shaft friction and end bearing, the final design figures should be checked to ensure that the ultimate shaft friction is greater than or equal to the allowable working load, otherwise end bearing only should be used.

To formulate the most satisfactory and economic scheme we suggest that competitive tenders and designs from Specialist Piling Contractors should be sought using the borehole information obtained.

4.3 Floor Slab Construction

With regard to the design and construction of normal ground bearing floor slabs, it must be noted at the outset, that due to the thickness of Made Ground, unless appropriate measures are taken there will be a risk of significant total and differential settlements, the extent of which will be a matter of chance rather than being assessable by calculation.

To obviate any significant damaging settlements we would recommend using a suspended floor slab with intermediate support designed on the same basis as the main foundations, where the spans are too large for economical single suspended slab design.

This is an expensive form of construction and we would recommend that careful consideration is given to the extent to which the maintenance of a very uniform level surface is essential. If some degree of tolerance is available in this respect, we would recommend consideration is given to a compromise solution, which, whilst not guaranteeing any specific limit to the degree of movement would nevertheless provide some reduction in the risks involved and at the same time be a cheaper option.

The compromise solution referred to above involves removing approximately 0.60 metres of Made Ground, placing a layer of geotextile material and then building up to the underside of the slab using a graded granular hardcore, placed and compacted in layers not exceeding 150mm followed by the construction of suitably reinforced concrete slab with shear reinforcement at all joints cast on a 50mm bed of compacted sand.

The design of the slab size and reinforcement will be controlled by the extent to which tilting of the slabs can be tolerated and the static and live loading to be supported.

4.4 Excavations and Groundwater

In our opinion, there should be no particular difficulties in excavating the strata indicated in the exploratory holes utilising an appropriate and suitably sized mechanical excavator.

It is recommended that all excavations to greater than 1.2 metres depth, or for shallower excavations where groundwater is encountered above this level, are closely supported, especially where man entry is required. Alternatively, where space permits, the excavations might be battered back to an appropriate angle.

The boreholes did not encounter groundwater, although it should be noted that they were only left open for a relatively short period of time. It should be noted that groundwater inflows and levels are likely to be subject to seasonal variations. Should groundwater seepages occur and water accumulate in excavations it should be able to be removed by pumping from a filtered sump.

4.5 Buried Concrete

For the design of buried concrete the recommendations given in Building Research Establishment (BRE) Special Digest 1 (September 2005 revision), “Concrete in Aggressive Ground”, should be followed.

Determination of pH on the soil samples gave values in the range of 7.8 to 7.9 (near neutral).

Soluble sulphate concentrations were also determined for soil samples and the results ranged from 0.12 to 0.16 g/l.

The results indicate that the Design Sulphate Class for the site should be DS-1.

Our knowledge of the site and ground conditions indicates that the site is “brownfield” with potentially mobile.

Consequently, in accordance with the Design Sulphate Class for the site together with the site and groundwater conditions an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1 should be used as detailed on the appended extract.

4.6 Contamination Considerations

It should be noted that a Walkover Survey and Desk Study Report including a Conceptual Ground Model, ref. SE1245 and dated February 2013, has previously been undertaken. This investigation has been undertaken to provide a risk assessment on the level of contamination present in accordance with the Conceptual Ground Model. Based upon the findings of this investigation additional sampling, analysis and assessment may be required.

It should be appreciated that the suite of determinants analysed for consists of a range of contaminants identified in the Conceptual Ground Model. However, the absence of any other specific contaminants cannot be guaranteed.

4.6.1 Assessment (Soil)

In order to provide an assessment of the presence of contamination, analyses have been performed on five soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, speciated total petroleum hydrocarbons (TPH CWG) with aliphatic/aromatic split, the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. On three of the soil samples volatile organic compounds (VOC's) were also determined. In addition two soil samples were subjected to an asbestos screen. The results are appended.

The Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) withdrew the soil guideline values (SGVs) and replaced the old CLR 10 document covering derivation of soil guideline values in 2008. This had the effect that any values derived using the old CLR 10 assumptions and parameters were no longer valid. In response Atkins updated their soil screening values (SSVs). DEFRA and EA published new soil guideline values (SGVs) for mercury, selenium, benzene, toluene, ethylbenzene and xylene on 31 March 2009, arsenic and nickel on 12 May 2009 and cadmium and phenols in June 2009. In July 2009 a substantial number of Generic Assessment Criteria (GACs) were published by Land Quality Management (LQM), in conjunction with the Chartered Institute of Environmental Health, which supplement the SGVs and effectively supersede many, but not all, SSVs. Contaminated Land: Applications in Real Environments (CL:AIRE) guideline values were also published in December 2009 to supplement the above. The guideline values (SGVs, GACs, CL:AIRE and SSVs) vary dependant upon the land use; allotment and residential use being the most sensitive and commercial/ industrial use being the least sensitive.

For the purposes of assessment, as the proposed development is commercial/industrial on the ground floor and residential flats on the upper floors with no garden or soft landscaped areas, the contamination analyses have been compared with the guideline values for a standard land use of commercial and industrial.

The contamination analysis determined no elevated levels when compared with the guideline values for a standard land use of commercial and industrial. Guideline values for the assessment can be supplied directly to the Regulator, if requested.

Two samples of the upper made ground were tested for the presence of asbestos. The results of the analysis did not indicate the presence of asbestos fibres. It should be noted that the existing building has not been inspected to determine whether any asbestos is present within the structure, as this was outside our brief.

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.

4.6.2 Assessment (Groundwater)

No groundwater was encountered in any of the exploratory holes and the site is underlain by an “Unproductive Aquifer” due to its low permeability that has negligible significance for water supply or base river flow. Consequently, in our opinion, there is no significant risk to controlled waters.

4.6.3 Conclusions and Recommendations

Section 78a(2) of the Environmental Protection Act: 1990 as amended by the Contaminated Land (England) (Amendment) regulations 2012, and Section 86 of the Water Act 2003, 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) SIGNIFICANT 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;

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

(d) 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.

The National Planning Policy Framework states that, “after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990”. Therefore, the general principles detailed above apply to this assessment.

Our assessment, based on the testing carried out, indicates that there are no contaminants requiring remediation and/or precautions to be taken for the proposed development. As all the site will be covered by buildings and hard standings for the proposed development we consider that no other surface protection will be necessary.

Should it be necessary to remove on-site materials from the site, classification of the waste should be undertaken before submitting analysis to appropriate waste carriers and/ or waste disposal site operators to determine the most appropriate tip to use and the associated costs.

SGVs, GACs, CL:AIRE 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 wear gloves, overalls, and boots and smoking should be prohibited.

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.

Should it be necessary for groundwater to be pumped from on-site excavations the groundwater should be analysed and assessed for disposal. Disposal of groundwater is likely to be to a sewer, following receipt of a discharge consent from the appropriate authority, or to an off-site licensed discharge point.

4.7 General

We recommend that consultation should be undertaken with Local Authority Environmental Health Officer and the Local Authority Building Control Officer prior to development

We would be happy to undertake the above or alternatively the Client should undertake such consultations before proceeding.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please do not hesitate to contact us.

SUB SURFACE SOUTH EAST LIMITED
REPORT No. SE1245A
FEBRUARY 2013

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

INSITU TEST RESULTS

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

Standard Penetration Test Results

Site : 3 HAMPSHIRE STREET, LONDON

Client : HORIZON LAUNDRY

Engineer :

Job Number SE1245A

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Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
BH1	1.20	1.35	1.65	SPT	1	0	1	0	1	1	N=3	
BH1	2.00	2.15	2.45	SPT	1	2	1	2	2	2	N=7	
BH1	4.00	4.15	4.45	SPT	4	2	3	2	2	3	N=10	
BH1	6.50	6.65	6.95	SPT	3	4	3	3	3	4	N=13	
BH1	9.50	9.65	9.95	SPT	5	3	5	6	4	5	N=20	
BH1	12.50	12.65	12.95	SPT	7	6	5	7	7	6	N=25	
BH1	14.50	14.65	14.95	SPT	5	7	6	7	7	8	N=28	
BH2	1.20	1.35	1.65	SPT	1	0	1	0	1	1	N=3	
BH2	2.00	2.15	2.45	SPT	1	1	1	2	2	1	N=6	
BH2	3.00	3.15	3.45	SPT	2	2	2	3	3	4	N=12	
BH2	4.00	4.15	4.45	SPT	2	3	2	3	2	3	N=10	
BH2	5.00	5.15	5.45	SPT	3	3	3	3	3	4	N=13	
BH2	6.50	6.65	6.95	SPT	3	4	5	5	6	6	N=22	
BH2	8.00	8.15	8.45	SPT	4	5	5	6	6	7	N=24	
BH2	9.50	9.65	9.95	SPT	8	5	7	8	7	8	N=30	
BH3	1.20	1.35	1.65	CPT	1	2	1	1	2	1	N=5	
BH3	3.00	3.15	3.45	SPT	2	1	2	3	2	2	N=9	
BH3	5.00	5.15	5.45	SPT	3	2	3	4	3	3	N=13	
BH3	8.00	8.15	8.45	SPT	5	4	4	3	4	5	N=16	
BH3	11.00	11.15	11.45	SPT	5	6	5	7	7	7	N=26	
BH3	13.50	13.65	13.95	SPT	8	5	7	7	6	8	N=28	

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LABORATORY TEST RESULTS

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

Laboratory Test Results

Site : 3 HAMPSHIRE STREET, LONDON

Client : HORIZON LAUNDRY

Engineer :

Job Number SE1245A

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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole/ Trial Pit	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Description
				Percentage %	Moisture Content %						
BH1	3.00	U	29	81	36	79	27	52	0.17	CV	Brown silty CLAY.
BH3	2.00	U	28	82	34	72	29	43	0.12	CV	Brown silty CLAY.

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :

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

Laboratory Test Results

Site : 3 HAMPSHIRE STREET, LONDON

Client : HORIZON LAUNDRY

Engineer :

Job Number SE1245A

Sheet 1 / 1

DETERMINATION OF DENSITY, MOISTURE CONTENT AND UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Trial Pit	Depth (m)	Sample	Moisture Content %	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Cell Pressure (kN/m^2)	Deviator Stress (kN/m^2)	Apparent Cohesion (kN/m^2)	Angle of Shearing Resistance (degrees)	Description
BH1	3.00	U*	29	1.97	1.53			90		Brown silty CLAY.
BH1	5.00	U	29	1.94	1.51	100 150 200	158 167 0	81	0	Brown and occasional grey mottled silty CLAY.
BH1	8.00	U	26	1.95	1.54	175 225 275	221 0 0	111	0	Brown silty CLAY with occasional fine selenite crystals.
BH1	11.00	U	23	2.02	1.64	225 275 325	271 274 0	136	0	Brown silty CLAY with occasional fine selenite crystals.
BH1	13.50	U*	25					250		Dark brown silty CLAY.
BH2	6.00	U	26	1.99	1.58	125 175 225	265 273 274	135	0	Dark brown silty CLAY with occasional fine selenite crystals.
BH3	2.00	U	28	1.88	1.47	50 100 150	119 120 0	60	0	Brown silty CLAY.
BH3	4.00	U	28	1.93	1.51	100 150 200	151 154 156	77	0	Brown silty CLAY.
BH3	6.50	U	23	2.00	1.63	150 200 250	279 280 0	140	0	Brown and occasional grey mottled silty CLAY with occasional fine selenite crystals.
BH3	9.50	U	24	1.99	1.60	200 250 300	289 0 0	145	0	Dark brown silty CLAY with occasional fine selenite crystals.
BH3	12.50	U	24	1.98	1.60	250 300 350	325 0 0	163	0	Dark brown silty CLAY with occasional fine selenite crystals.
BH3	14.50	U	24	2.05	1.65	300 350 400	423 0 0	212	0	Dark brown silty CLAY with occasional fine selenite crystals.

Method of Preparation : BS 1377:PART 1:1990:7.4.2 Moisture content 1990: Preparation of undisturbed samples for testing BS 1377:PART 2:1990:7.2

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:7 Determination of density BS 1377:PART 7:1990:8 Undrained shear strength 1990:9 Multistage loading

Remarks : *Hand Shear Vane/Hand Penetrometer test

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3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Laboratory Test Results

Site : 3 HAMPSHIRE STREET, LONDON

Client : HORIZON LAUNDRY

Engineer :

Job Number SE1245A

Sheet 1 / 1

DETERMINATION OF THE pH VALUE AND THE SULPHATE CONTENT OF SOIL AND GROUNDWATER

Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Soluble Sulphate			Percentage of sample passing 2mm Sieve %	pH	Classification	Description
			Soil		Groundwater g /l				
			Total S04 %	S04 in 2:1 water:soil g /l					
BH1	1.20	D		0.12			7.8	DS-1	Brown silty CLAY.
BH2	2.00	D		0.16			7.9	DS-1	Brown silty CLAY.
BH3	1.40	D		0.13			7.8	DS-1	Brown silty CLAY.

Method of Preparation : BS 1377:PART 1:1990:7.5 Preparation of soil for chemical tests BS 1377:PART 3:1990:5.2, 5.3, 5.4 & 9.4

Method of Test : BS 1377:PART 3:1990:5 Determination of the sulphate content of soil and ground water BS 1377:PART 3:1990:9 Determination of the pH value.

Remarks : Classification relates to Design Sulphate Class of BRE Special Digest 1 (2005)

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AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION

Table C1 Aggressive Chemical Environment for Concrete (ACEC) classification for natural ground locations[a]

Sulfate				Groundwater		
Design Sulfate Class for Location	2:1 water/soil extract[b]	Groundwater	Total potential sulfate[c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (SO_4 mg/l)	4 (SO_4 %)	5 (pH)	6 (pH)	7
DS-1	<500	<400	<0.24	≥2.5		AC-1s
					>5.5d	AC-1d
					2.5 - 5.5	AC-2z
DS-2	500 - 1500	400 - 1400	0.24 - 0.6	>3.5		AC-1s
					>5.5	AC-2z
				2.5-3.5		AC-2s
					2.5 - 5.5	AC-3z
DS-3	1600-3000	1500-3000	0.7 - 1.2	>3.5		AC-2s
					>5.5	AC-3
				2.5 - 3.5		AC-3s
					2.5 - 5.5	AC-4
DS-4	3100 - 6000	3100 - 6000	1.3 - 2.4	>3.5		AC-3s
					>5.5	AC-4
				2.5 - 3.5		AC-4s
					2.5 - 5.5	AC-5
DS-5	>6000	>6000	>2.4	>3.5		AC-4s
				2.5 - 3.5	≥2.5	AC-5

Notes

a Applies to locations on sites that comprise either undisturbed ground that is in its natural state (ie not brownfield - Table C2) or clean fill derived from such ground

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).

d For flowing water that is potentially aggressive to concrete owing to high purity or an aggressive carbon dioxide level greater than 15mg/l (Section C2.2.3), increase the ACEC Class to AC-2z.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static
- Concrete placed in ACEC Classes that included the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.

Table C1 Aggressive Chemical Environment for Concrrete (ACEC) classification for brownfield locations[a]

Sulfate						Groundwater		
Design Sulfate Class for Location	2:1 water/soil extract[b]		Groundwater		Total potential sulfate[c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (Mg mg/l)	4 (SO_4 mg/l)	5 (Mg mg/l)	6 (SO_4 %)	7 (pH)[d]	8 (pH)[d]	9
DS-1	<500		<400		<0.24	≥2.5		AC-1s
							>6.5[d]	AC-1
							5.5 - 6.5	AC-2z
							4.5 - 5.5	AC-3z
							2.5 - 4.5	AC-4z
DS-2	500 - 1500		400 - 1400		0.24 - 0.6	>5.5		AC-1s
							>6.5	AC-2
						2.5 - 5.5		AC-2s
							5.5 - 6.5	AC-3z
							4.5 - 5.5	AC-4z
							2.5 - 5.5	AC-5z
DS-3	1600 - 3000		1500 - 3000		0.7 - 1.2	>5.5		AC-2s
							>6.5	AC-3
						2.5 - 5.5		AC-3s
							5.5 - 6.5	AC-4
							2.5 - 5.5	AC-5
DS-4	3100 - 6000	≤1200	3100 - 6000	≤1000	1.3 - 2.4	>5.5		AC-3s
							>6.5	AC-4
						2.5 - 5.5		AC-4s
							2.5 - 6.5	AC-5
DS-4m	3100 - 6000	>1200[e]	3100 - 6000	>1000[e]	1.3 - 2.4	>5.5		AC-3s
							>6.5	AC-4m
						2.5 - 5.5		AC-4ms
							2.5 - 6.5	AC-5m
DS-5	>6000	≤1200	>6000	≤1000	>2.4	>5.5		AC-4s
						2.5 - 5.5	≤1000	AC-5
DS-5m	>6000	>1200[e]	>6000	>1000[e]	>2.4	>5.5		AC-4ms
						2.5 - 5.5	≥2.5	AC-5m

Notes

a Brownfield sites are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).

d An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).

e The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000mg/l and 17000 mg/l). This allows 'm' to be omitted from the relevant ACEC Classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that included the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

CONTAMINATION ANALYSIS RESULTS

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Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt
22 February 2013

Dear Simon Gabbatt

Test Report Number **223884**
Your Project Reference **SE1245A - 3 Hampshire Street, London**

Please find enclosed the results of analysis for the samples received 18 February 2013.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely

Keith Jones, Technical Manager

UKAS TESTING
2183

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Notes to accompany report:

- *The sign < means 'less than'*
- *Tests marked 'U' hold UKAS accreditation*
- *Tests marked 'M' hold MCertS (and UKAS) accreditation*
- *Tests marked 'N' do not currently hold UKAS accreditation*
- *Tests marked 'S' were subcontracted to an approved laboratory*
- *n/e means 'not evaluated'*
- *i/s means 'insufficient sample'*
- *u/s means 'unsuitable sample'*
- *Comments or interpretations are beyond the scope of UKAS accreditation*
- *The results relate only to the items tested*
- *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*
- *Uncertainties of measurement for the determinands tested are available upon request*
- *None of the test results included in this report have been recovery corrected*

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Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt

LABORATORY TEST REPORT

Results of analysis of 5 samples received 18 February 2013

SE1245A - 3 Hampshire Street, London

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Report Date
22 February 2013

Login Batch No					**223884**					
Chemtest LIMS ID					AI30720	AI30721	AI30722	AI30723	AI30724	
Sample ID					BH1	BH2	BH3	TP1	TP2	
Sample No					74,75,76	77,78,79	80,81,82	83,597,598	84,601,602	
Sampling Date					11/2/2013	11/2/2013	11/2/2013	11/2/2013	11/2/2013	
Depth					0.50m	0.50m	0.50m	0.20m	0.20m	
Matrix					*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	
SOP↓	Determinand↓	CAS No↓	Units↓	*						
2010	pH			M	7.8	8.0	7.9	10.9	10.4	
2300	Cyanide (total)	57125	mg kg-¹	M	<0.5	<0.5	<0.5	5.9	7.2	
2325	Sulfide (Easily Liberatable)	18496258	mg kg-¹	M	5.5	1.8	2.0	37	54	
2120	Boron (hot water soluble)	7440428	mg kg-¹	M	2.3	2.4	2.4	1.3	1.3	
2490	Chromium (hexavalent)	18540299	mg kg-¹	N	<0.5	<0.5	<0.5	<0.5	<0.5	
2430	Sulfate (total) as SO4	14808798	%	M	0.12	0.13	0.14	0.58	0.33	
2450	Arsenic	7440382	mg kg-¹	M	17	16	20	26	17	
	Cadmium	7440439	mg kg-¹	M	0.17	0.11	<0.10	27	4.9	
	Chromium	7440473	mg kg-¹	M	54	41	48	100	89	
	Copper	7440508	mg kg-¹	M	100	130	160	220	170	
	Mercury	7439976	mg kg-¹	M	1.9	1.6	1.8	0.65	0.78	
	Nickel	7440020	mg kg-¹	M	45	34	40	81	59	
	Lead	7439921	mg kg-¹	M	470	460	550	910	750	
	Selenium	7782492	mg kg-¹	M	0.33	<0.20	0.23	<0.20	<0.20	
	Zinc	7440666	mg kg-¹	M	170	150	210	1100	1200	
2675	TPH aliphatic >C5-C6		mg kg-¹	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
	TPH aliphatic >C6-C8		mg kg-¹	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
	TPH aliphatic >C8-C10		mg kg-¹	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
	TPH aliphatic >C10-C12		mg kg-¹	M	< 1	< 1	< 1	< 1	< 1	
	TPH aliphatic >C12-C16		mg kg-¹	M	< 1	< 1	< 1	< 1	< 1	
	TPH aliphatic >C16-C21		mg kg-¹	M	< 1	< 1	< 1	< 1	< 1	
	TPH aliphatic >C21-C35		mg kg-¹	M	< 1	< 1	< 1	< 1	< 1	
	TPH aliphatic >C35-C44		mg kg-¹	N	< 1	< 1	< 1	< 1	< 1	
	TPH aromatic >C5-C7		mg kg-¹	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	

All tests undertaken between 18/02/2013 and 22/02/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt

LABORATORY TEST REPORT

Results of analysis of 5 samples received 18 February 2013

SE1245A - 3 Hampshire Street, London

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					223884				
					AI30720	AI30721	AI30722	AI30723	AI30724
					BH1	BH2	BH3	TP1	TP2
					74,75,76	77,78,79	80,81,82	83,597,598	84,601,602
					11/2/2013	11/2/2013	11/2/2013	11/2/2013	11/2/2013
					0.50m	0.50m	0.50m	0.20m	0.20m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2675	TPH aromatic >C7-C8		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	TPH aromatic >C8-C10		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	TPH aromatic >C10-C12		mg kg-1	M	< 1	< 1	< 1	< 1	< 1
	TPH aromatic >C12-C16		mg kg-1	M	< 1	< 1	< 1	< 1	< 1
	TPH aromatic >C16-C21		mg kg-1	M	< 1	< 1	< 1	< 1	< 1
	TPH aromatic >C21-C35		mg kg-1	M	< 1	< 1	< 1	< 1	< 1
	TPH aromatic >C35-C44		mg kg-1	N	< 1	< 1	< 1	< 1	< 1
	Total Petroleum Hydrocarbons		mg kg-1	N	< 10	< 10	< 10	< 10	< 10
2700	Naphthalene	91203	mg kg-1	M	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Acenaphthylene	208968	mg kg-1	M	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Acenaphthene	83329	mg kg-1	M	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Fluorene	86737	mg kg-1	M	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Phenanthrene	85018	mg kg-1	M	0.24	0.24	0.23	0.16	0.39
	Anthracene	120127	mg kg-1	M	0.16	0.1	< 0.1	0.1	0.15
	Fluoranthene	206440	mg kg-1	M	0.28	0.27	0.38	0.35	0.46
	Pyrene	129000	mg kg-1	M	0.2	0.15	0.21	0.26	0.26
	Benzo[a]anthracene	56553	mg kg-1	M	0.22	0.16	0.31	0.25	0.12
	Chrysene	218019	mg kg-1	M	0.29	0.25	0.39	0.26	0.21
	Benzo[b]fluoranthene	205992	mg kg-1	M	0.21	0.26	0.57	< 0.1	< 0.1
	Benzo[k]fluoranthene	207089	mg kg-1	M	0.17	0.18	0.42	< 0.1	< 0.1
	Benzo[a]pyrene	50328	mg kg-1	M	0.13	0.18	0.45	< 0.1	< 0.1
	Dibenzo[a,h]anthracene	53703	mg kg-1	M	< 0.1	0.17	0.25	< 0.1	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	M	< 0.1	0.4	0.61	< 0.1	< 0.1
	Benzo[g,h,i]perylene	191242	mg kg-1	M	< 0.1	0.23	0.51	< 0.1	< 0.1
	Total (of 16) PAHs		mg kg-1	M	< 2	2.6	4.3	< 2	< 2

All tests undertaken between 18/02/2013 and 22/02/2013

* Accreditation status

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Lancashire
PR2 2QS

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LABORATORY TEST REPORT

Results of analysis of 5 samples received 18 February 2013

SE1245A - 3 Hampshire Street, London

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Report Date
22 February 2013

					223884				
					AI30720	AI30721	AI30722	AI30723	AI30724
					BH1	BH2	BH3	TP1	TP2
					74,75,76	77,78,79	80,81,82	83,597,598	84,601,602
					11/2/2013	11/2/2013	11/2/2013	11/2/2013	11/2/2013
					0.50m	0.50m	0.50m	0.20m	0.20m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2760	Methyl tert-butylether	1634044	µg kg-¹	N	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Dichlorodifluoromethane	75718	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Chloromethane	74873	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	Vinyl chloride	75014	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	Bromomethane	74839	µg kg-¹	U		< 20	< 20	< 20	
	Chloroethane	75003	µg kg-¹	U		< 2.0	< 2.0	< 2.0	
	Trichlorofluoromethane	75694	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,1-Dichloroethene	75354	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Dichloromethane	75092	µg kg-¹	N		ne	ne	ne	
	trans-1,2-Dichloroethene	156605	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,1-Dichloroethane	75343	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	cis-1,2-Dichloroethene	156592	µg kg-¹	M		< 1.0	< 1.0	17	
	Bromochloromethane	74975	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Trichloromethane	67663	µg kg-¹	M		< 1.0	< 1.0	3.6	
	1,1,1-Trichloroethane	71556	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	Tetrachloromethane	56235	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	1,1-Dichloropropene	563586	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Benzene	71432	µg kg-¹	M	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	1,2-Dichloroethane	107062	µg kg-¹	U		< 2.0	< 2.0	< 2.0	
	Trichloroethene	79016	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,2-Dichloropropane	78875	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Dibromomethane	74953	µg kg-¹	U		< 10	< 10	< 10	
	Bromodichloromethane	75274	µg kg-¹	U		< 5.0	< 5.0	< 5.0	
	cis-1,3-Dichloropropene	10061015	µg kg-¹	N		< 10	< 10	< 10	
	Toluene	108883	µg kg-¹	M	< 1.0	2.0	< 1.0	< 1.0	< 1.0

All tests undertaken between 18/02/2013 and 22/02/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

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LABORATORY TEST REPORT

Results of analysis of 5 samples received 18 February 2013

SE1245A - 3 Hampshire Street, London

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22 February 2013

					223884				
					AI30720	AI30721	AI30722	AI30723	AI30724
					BH1	BH2	BH3	TP1	TP2
					74,75,76	77,78,79	80,81,82	83,597,598	84,601,602
					11/2/2013	11/2/2013	11/2/2013	11/2/2013	11/2/2013
					0.50m	0.50m	0.50m	0.20m	0.20m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2760	trans-1,3-Dichloropropene	10061026	µg kg-¹	N		< 10	< 10	< 10	
	1,1,2-Trichloroethane	79005	µg kg-¹	U		< 10	< 10	< 10	
	Tetrachloroethene	127184	µg kg-¹	M		37	65	45	
	1,3-Dichloropropane	142289	µg kg-¹	U		< 2.0	< 2.0	< 2.0	
	Dibromochloromethane	124481	µg kg-¹	U		< 10	< 10	< 10	
	1,2-Dibromoethane	106934	µg kg-¹	U		< 5.0	< 5.0	< 5.0	
	Chlorobenzene	108907	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	1,1,1,2-Tetrachloroethane	630206	µg kg-¹	M		< 2.0	< 2.0	< 2.0	
	Ethylbenzene	100414	µg kg-¹	M	5.5	11	8.6	< 1.0	< 1.0
	m- & p-Xylene	1330207	µg kg-¹	U	5.8	11	8.4	< 1.0	< 1.0
	o-Xylene	95476	µg kg-¹	U	2.8	5.2	4.2	< 1.0	< 1.0
	Styrene	100425	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Tribromomethane	75252	µg kg-¹	U		< 10	< 10	< 10	
	Isopropylbenzene	98828	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Bromobenzene	108861	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,2,3-Trichloropropane	96184	µg kg-¹	N		< 50	< 50	< 50	
	n-Propylbenzene	103651	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	2-Chlorotoluene	95498	µg kg-¹	M		< 1.0	< 1.0	< 1.0	
	1,2,4-Trimethylbenzene	95636	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	4-Chlorotoluene	106434	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	tert-Butylbenzene	98066	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,3,5-Trimethylbenzene	108678	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	sec-Butylbenzene	135988	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,3-Dichlorobenzene	541731	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	4-Isopropyltoluene	99876	µg kg-¹	U		< 1.0	< 1.0	< 1.0	

All tests undertaken between 18/02/2013 and 22/02/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt

LABORATORY TEST REPORT

Results of analysis of 5 samples received 18 February 2013

SE1245A - 3 Hampshire Street, London

Report Date 22 February 2013

					223884				
					AI30720	AI30721	AI30722	AI30723	AI30724
					BH1	BH2	BH3	TP1	TP2
					74,75,76	77,78,79	80,81,82	83,597,598	84,601,602
					11/2/2013	11/2/2013	11/2/2013	11/2/2013	11/2/2013
					0.50m	0.50m	0.50m	0.20m	0.20m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2760	1,4-Dichlorobenzene	106467	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	n-Butylbenzene	104518	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,2-Dichlorobenzene	95501	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	1,2-Dibromo-3-chloropropane	96128	µg kg-¹	U		< 50	< 50	< 50	
	1,2,4-Trichlorobenzene	120821	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
	Hexachlorobutadiene	87683	µg kg-¹	U		< 1.0	< 1.0	< 1.0	
2920	Phenols (total)		mg kg-¹	N	<0.3	<0.3	<0.3	<0.3	<0.3

All tests undertaken between 18/02/2013 and 22/02/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Chemtest
The right chemistry to deliver results

Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt
28 February 2013

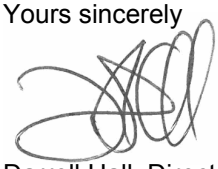
Dear Simon Gabbatt

Test Report Number **223884**
Your Project Reference **SE1245A - 3 Hampshire Street, London**

Please find enclosed the results of analysis for the samples received 18 February 2013.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely



Darrell Hall, Director

UKAS TESTING
2183

ISO 14001 Registered Company
sira CERTIFICATION SERVICE
UKAS ENVIRONMENTAL MANAGEMENT
011

Notes to accompany report:

- *The in-house procedure is employed to identify materials and fibres in soils*
- *The sample is examined by stereo-binocular and polarised light microscopy*
- *Sample size is reduced by coning and quartering to obtain a representative sub-sample if necessary*
- *The bulk identification is in accordance with the requirements of the analyst guide (HSG 248)*
- *Samples associated with asbestos are retained for six months*
- *The results relate only to the items tested as supplied by the client*
- *Comments or interpretations are beyond the scope of UKAS accreditation*

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Sub Surface Laboratories
3 Peel Street
Preston
Lancashire
PR2 2QS

FAO Simon Gabbatt

LABORATORY TEST REPORT
Asbestos in Soils

Results of analysis of 2 samples
received 18 February 2013
SE1245A - 3 Hampshire Street, London

Report Date
28 February 2013

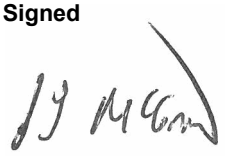
Login Batch No: 223884

Qualitative Results

				SOP 2190	
				ACM Type	Asbestos Identification
Chemtest ID	Sample ID	Sample Desc	Depth (m)		
AI30720	74,75,76	BH1	0.50	-	No Asbestos Detected
AI30724	84,601,602	TP2	0.20	-	No Asbestos Detected

The detection limit for this method is 0.001%

Signed



Steve McGrath
Asbestos Analyst

All tests undertaken between 28-Feb-2013 and 28-Feb-2013

BOREHOLE RECORD SHEETS

SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
3 HAMPSHIRE STREET, LONDON	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 1.50m		HORIZON LAUNDRY	SE1245A
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	07/02/2013-08/02/2013		1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.20	MADE GROUND: concrete surfacing (driller's description).		
0.50	D					(0.90)	MADE GROUND: dark brown gravelly slightly sandy silty clay. Gravel sized fragments are angular to subrounded fine to coarse stone and brick.		
1.10	D					1.10	Firm medium to high strength brown silty CLAY.		
1.20-1.65	SPT N=3			1,0/1,0,1,1					
1.20	D								
2.00	D			HP@2.00m, c=100kPa					
2.00-2.45	SPT N=7			1,2/1,2,2,2					
						(2.90)			
3.00-3.45	U NTP			HV@3.00m, c=90kPa					
3.50	D			HV@3.50m, c=100kPa					
4.00-4.45	SPT N=10			4,2/3,2,2,3		4.00	Stiff high strength brown and occasional grey mottled silty CLAY.		
4.00	D								
5.00-5.45	U c=81kPa								
5.50	D								
						(3.50)			
6.00	D								
6.50-6.95	SPT N=13			3,4/3,3,3,4					
6.50	D								
7.50	D					7.50	Stiff high strength brown silty CLAY with occasional fine selenite crystals.		
8.00-8.45	U c=111kPa								
8.50	D								
9.50-9.95	SPT N=20			5,3/5,6,4,5					
9.50	D								

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
NTP = No Test Possible
HV = Hand Shear Vane test
HP = Hand Penetrometer test

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. SE1245A.BH1

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
3 HAMPSHIRE STREET, LONDON	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 1.50m		HORIZON LAUNDRY	SE1245A
	Location AS PLAN	**Dates** 07/02/2013-08/02/2013	**Engineer**	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(4.80)	Stiff high to high strength brown silty CLAY with occasional fine gypsum crystals.		
10.50	D								
11.00-11.45	U c=136kPa								
11.50	D								
						12.30			
12.50-12.95 12.50	SPT N=25 D			7,6/5,7,7,6			Stiff high to very high strength dark brown silty CLAY.		
13.00	D								
13.50-13.95	U NTP			HP@13.50m, c=250+kPa		(2.70)			
14.50-14.95 14.50	SPT N=28 D			5,7/6,7,7,8			.... below 14.50m : with some pockets of silt		
				08/02/2013:DRY		15.00			
							Complete at 15.00m		

Remarks

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. SE1245A.BH1

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
3 HAMPSHIRE STREET, LONDON	BH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 1.50m		HORIZON LAUNDRY	SE1245A
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	06/02/2013-07/02/2013		1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.25) 0.25	MADE GROUND: concrete surfacing (driller's description).		
0.50	D					(1.05)	MADE GROUND: brown and grey gravelly silty clay. Gravel sized fragments are angular to subrounded fine to medium brick and stone.		
1.20-1.65 1.20 1.30	SPT N=3 D D			1,0/1,0,1,1		1.30	Firm medium strength brown silty CLAY.		
2.00 2.00-2.45	D SPT N=6			HP@2.00m, c=75kPa 1,1/1,2,2,1		(1.70)			
3.00 3.00-3.45	D SPT N=12			HP@3.00m, c=100kPa 2,2/2,3,3,4		3.00	Firm medium strength brown and occasional grey mottled silty CLAY.		
4.00-4.45 4.00	SPT N=10 D			2,3/2,3,2,3		(3.00)			
5.00-5.45 5.00	SPT N=13 D			3,3/3,3,3,4					
6.00 6.00-6.45	D U c=135kPa					6.00	Stiff high strength dark brown silty CLAY with occasional fine selenite crystals.		
6.50-6.95 6.50	SPT N=22 D			3,4/5,5,6,6					
7.00	D								
8.00-8.45 8.00	SPT N=24 D			4,5/5,6,6,7		(4.00)			
9.00	D								
9.50-9.95 9.50	SPT N=30 D			8,5/7,8,7,8 07/02/2013:DRY		10.00			

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
HP = Hand Penetrometer test

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. SE1245A.BH2

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
3 HAMPSHIRE STREET, LONDON	BH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 1.50m		HORIZON LAUNDRY	SE1245A
	Location AS PLAN	**Dates** 05/02/2013-06/02/2013	**Engineer**	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30) 0.30	MADE GROUND: concrete surfacing (driller's description).		
0.50	D					(1.10)	MADE GROUND: dark brown very gravelly sandy silty clay. Gravel sized fragments are angular to subangular fine to coarse brick, stone, concrete and glass.		
1.00	D								
1.20-1.65	CPT N=5			1,2/1,1,2,1					
1.40	D			HV@1.40m, c=52kPa		1.40	Firm medium becoming high strength brown silty CLAY.		
2.00	D								
2.00-2.45	U c=60kPa								
3.00-3.45	SPT N=9			2,1/2,3,2,2		(3.10)			
3.00	D								
4.00-4.45	U c=77kPa						.... at 4.00m : high strength		
4.50	D					4.50	Stiff high strength brown and occasional grey mottled silty CLAY with occasional fine selenite crystals.		
5.00-5.45	SPT N=13			3,2/3,4,3,3					
5.00	D								
6.00	D					(3.50)			
6.50-6.95	U c=140kPa								
7.00	D								
8.00-8.45	SPT N=16			5,4/4,3,4,5		8.00	Stiff high strength dark brown silty CLAY with occasional fine selenite crystals.		
8.00	D								
9.00	D								
9.50-9.45	U c=145kPa								

Remarks

Hand dug inspection pit from GL to 1.20m to check for services - 1hr
HV = Hand Shear Vane test

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. SE1245A.BH3

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
3 HAMPSHIRE STREET, LONDON	BH3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
LIGHT CABLE PERCUSSIVE	150mm to 1.50m		HORIZON LAUNDRY	SE1245A
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	05/02/2013-06/02/2013		2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00	D						Stiff high becoming very high strength dark brown silty CLAY with occasional fine selenite crystals.		
11.00-11.45 11.00	SPT N=26 D			5,6/5,7,7,7		(7.00)			
12.00	D								
12.50-12.95	U c=163kPa						.... below 12.50m : very high strength		
13.00	D								
13.50-13.95 13.50	SPT N=28 D			8,5/7,7,6,8					
14.50-14.95	U c=212kPa								
15.00	D			06/02/2013:DRY		15.00	Complete at 15.00m		

Remarks

Scale (approx)	Logged By
1:50	NM/SJ

Figure No. SE1245A.BH3

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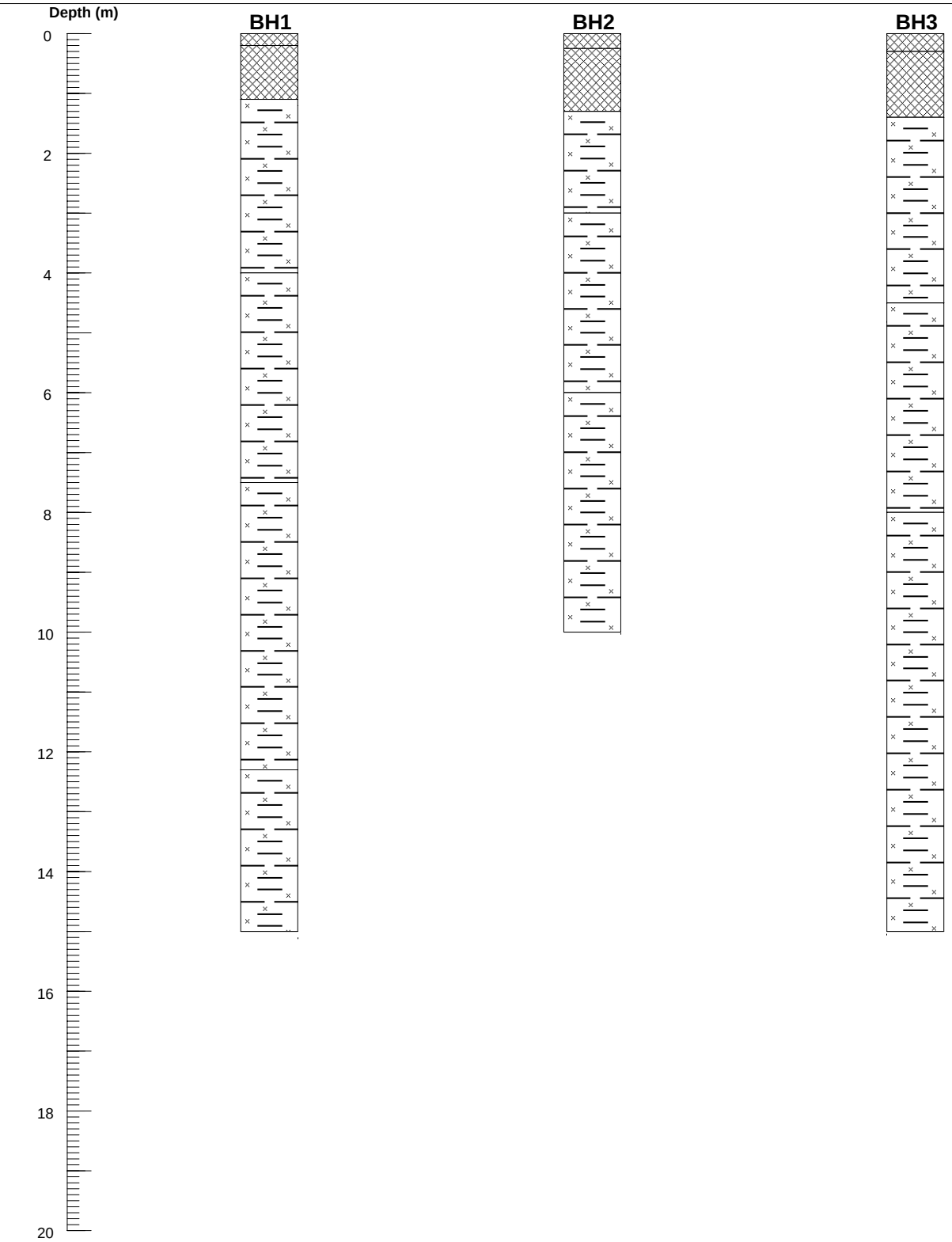

Key

Groundwater Strike

Strike Rise Level

MADE GROUND

Silty CLAY

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

Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
3 HAMPSHIRE STREET, LONDON	28/02/2013		1/1	SE1245A
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
HORIZON LAUNDRY			1:100[V]	SE1245A.1

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HAND DUG TRIAL PIT RECORD SHEETS

SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Trial Pit Number
3 HAMPSHIRE STREET, LONDON	TP1

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
HAND EXCAVATED			HORIZON LAUNDRY	SE1245A
	Location AS PLAN	**Dates** 05/02/2013	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D*		05/02/2013		(0.20) 0.20 (0.10) 0.30	MADE GROUND: concrete floor slab. MADE GROUND: moderately dense dark brown sandy gravelly clay. Gravel is angular fine to coarse brick, concrete, ash, clinker and occasional quartz and flint. Complete at 0.30m		

Plan

Remarks

D* = Amber Glass Jar sample and vial

Scale (approx)	Logged By	Figure No.
1:25	RL/SJ	SE1245A.TP1

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Trial Pit Number
3 HAMPSHIRE STREET, LONDON	TP2

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
HAND EXCAVATED			HORIZON LAUNDRY	SE1245A
	Location AS PLAN	**Dates** 05/02/2013	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D*		05/02/2013		(0.20) 0.20	MADE GROUND: concrete floor slab.		
					0.29	MADE GROUND: moderately dense dark brown sandy gravelly clay. Gravel is angular fine to coarse brick, concrete, clinker, ash and occasional quartz and flint.		
						Complete at 0.29m		

Plan

Remarks

D* = Amber Glass jar sample and vial

Scale (approx)	Logged By	Figure No.
1:25	RL/SJ	SE1245A.TP2

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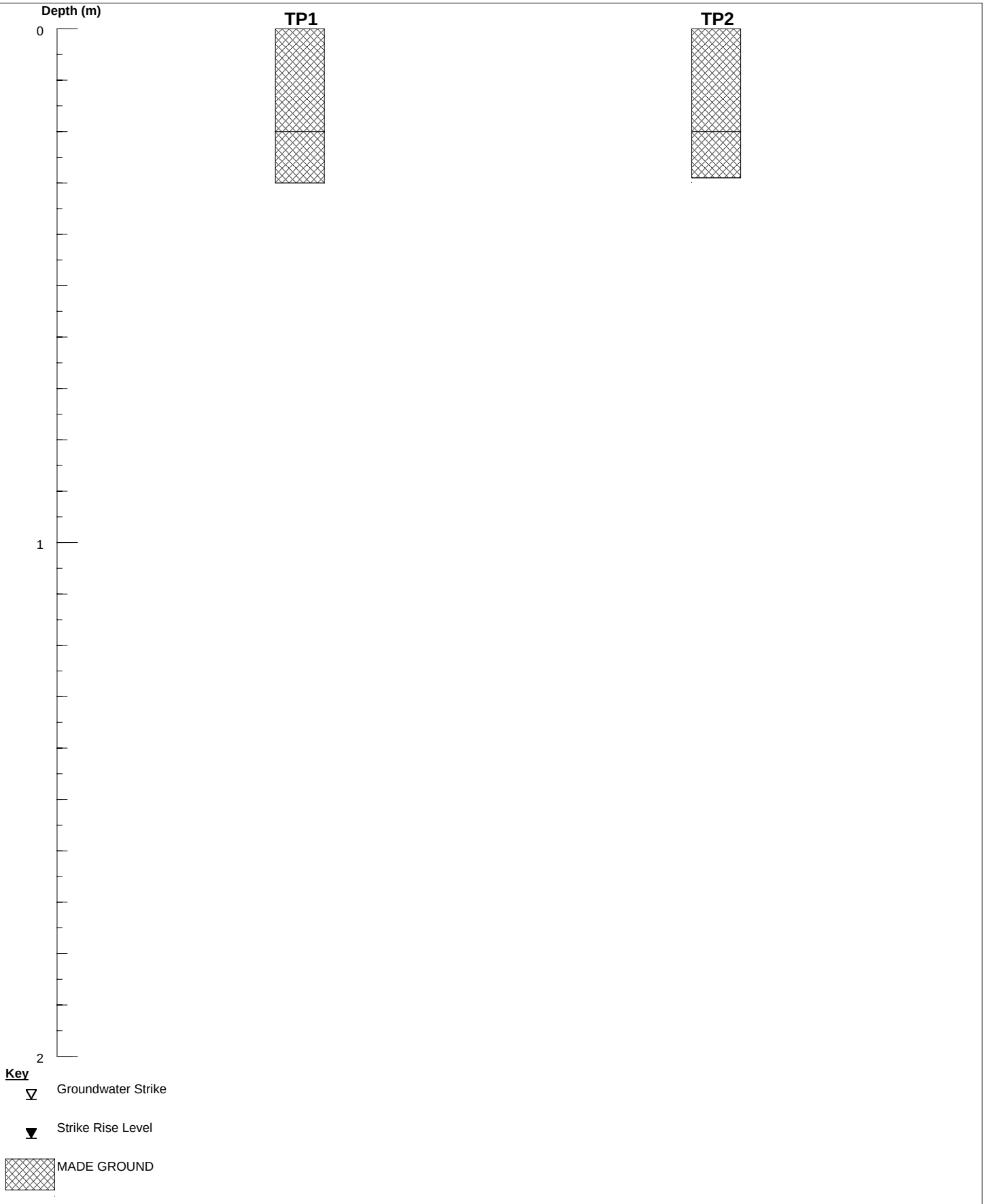

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SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
3 HAMPSHIRE STREET, LONDON	28/02/2013		1/1	SE1245A
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
HORIZON LAUNDRY			1:10[V]	SE1245A.1

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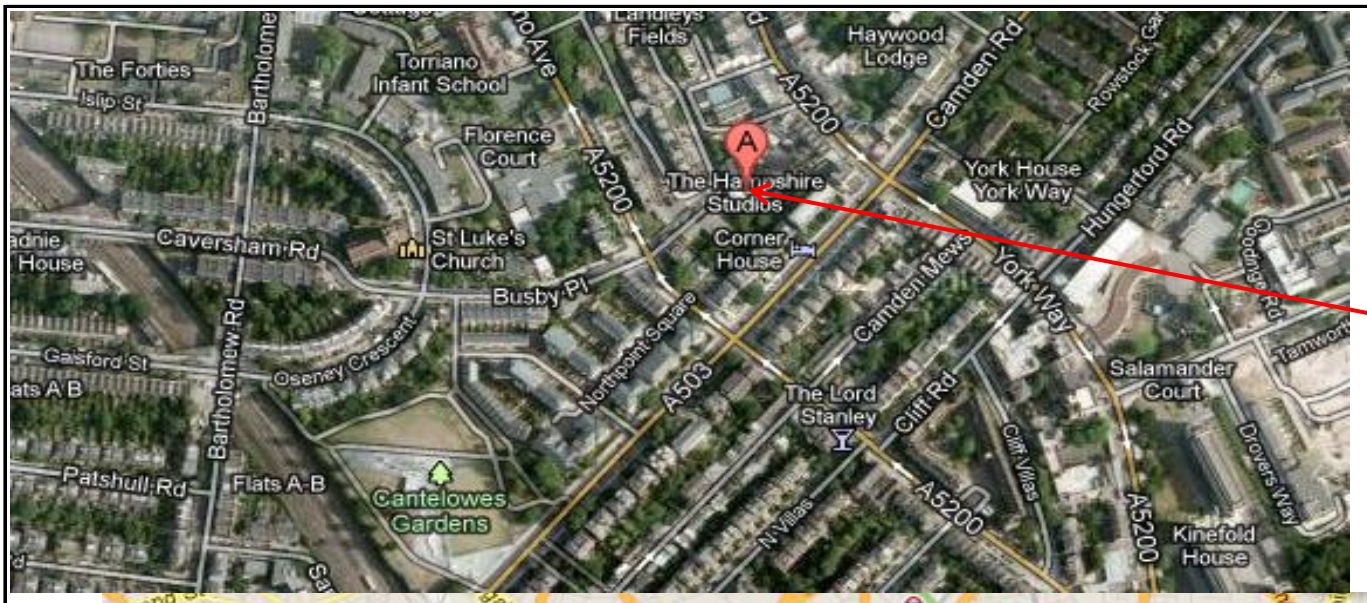
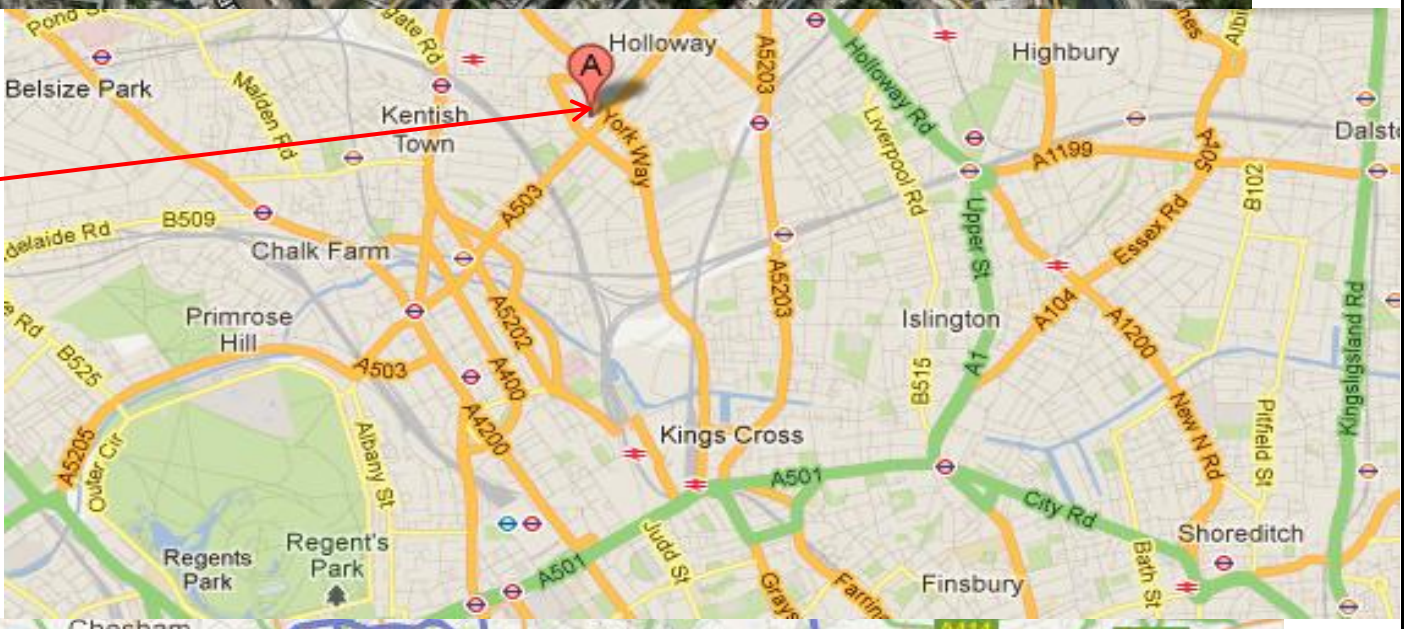
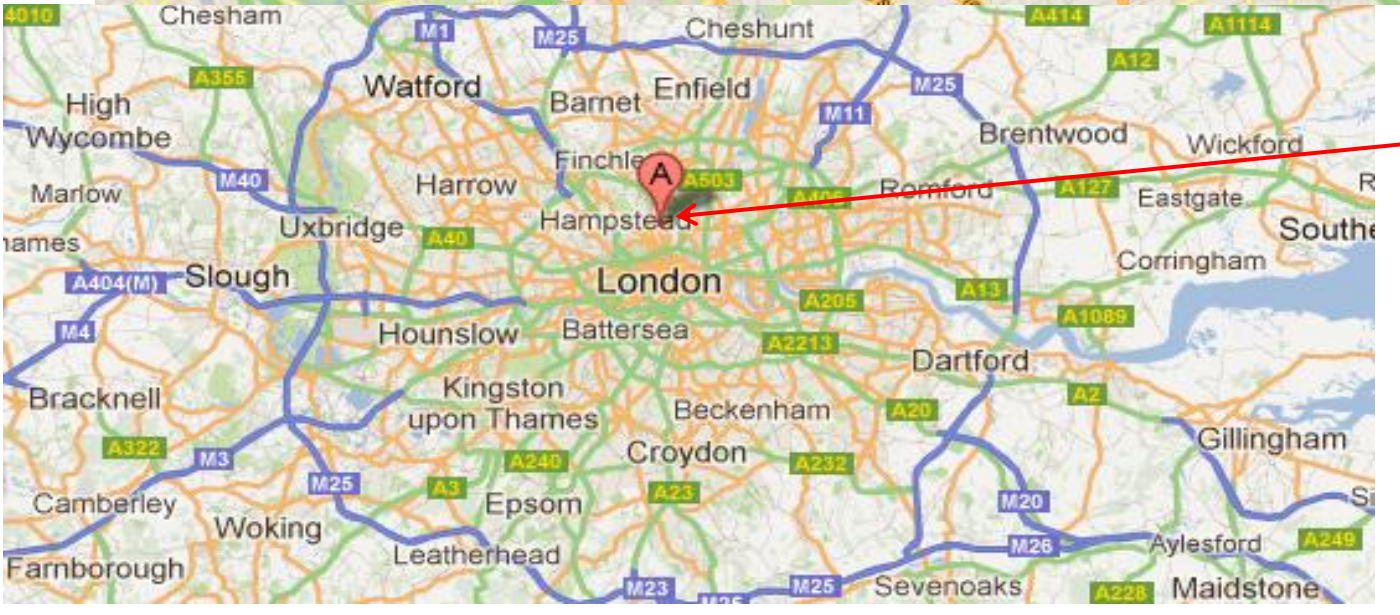
FIGURES







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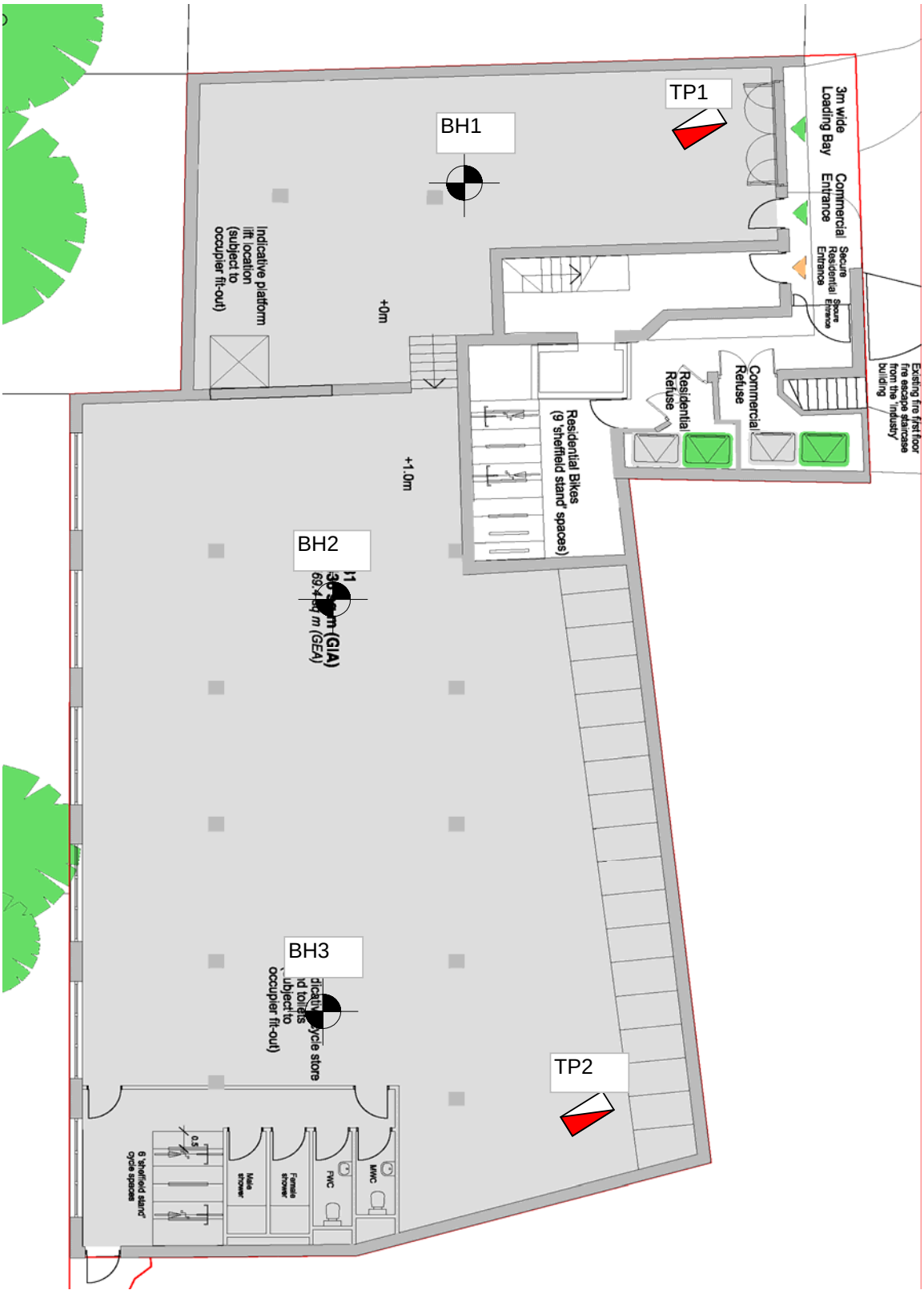
SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

SITE LOCATION PLAN

Site	Date Drawn	Date Checked	Orientation	Job No.
3 HAMPSHIRE STREET, LONDON, NW5 2TE	11-Jan-13		N	SE1245
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
HORIZON LAUNDRY	FHJ		NTS	1



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SUB SURFACE
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3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

BOREHOLE LOCATION PLAN

Site	Date Drawn	Date Checked	Orientation	Job No.
3 HAMPSHIRE STREET, LONDON, NW5 2TE	11-Jan-13		N	SE1245
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
HORIZON LAUNDRY	FHJ		NTS	2