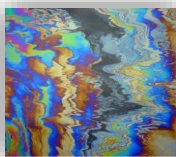




INVESTIGATE



REMEDiate



REGENERATE

TECHNICAL REPORT

**GROUND INVESTIGATION
AT
FORMER CLEAN LAUNDRY CO.
1 DARWIN CLOSE,
READING, BERKSHIRE
FOR
ELMCROFT SERVICES**

**REPORT NO. SE1443
MARCH 2018**



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**GROUND INVESTIGATION AT FORMER CLEAN LAUNDRY CO, 1 DARWIN
CLOSE, READING, BERKSHIRE**

CLIENT: ELMCROFT SERVICES

1. INTRODUCTION

This report has been prepared in accordance with Purchase Order No. 5578/GLEN dated 5th February 2018, from the Client.

The brief was set out in our estimate, ref. ESE2102A and dated 2nd February 2018, with amendments as the investigation proceeded and includes:

- 5 No. mini boreholes
- 2 No. cable percussive boreholes
- Insitu testing
- Geotechnical laboratory testing
- Contamination analysis
- Installation of standpipes followed by groundwater and ground gas monitoring
- Provision of an interpretative report on the above.

It should be noted that a Walkover Survey and Desk Study Report for this site, ref. B17041-L and dated September 2017, has been undertaken by Patrick Parsons which should be read in conjunction with this report.

1.1 Site Location and Description

The site is located at the junction of Darwin Close and Commercial Road in Reading, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is SU713704.

As shown on Figure 2, the approximately rectangular shaped site measures some 75m by 50m and comprises a vacant two storey building and hardstanding previously occupied by a laundry company. Hardstanding is present to the east and west of the building with the western part previously used primarily for car parking and the eastern part apparently used for deliveries and the storage of containers. An oil tank and bund is present adjacent to the north east corner of the buildings.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to demolish the existing building and to redevelop the site as a two storey commercial property with associated parking and hardstanding. However, at the time of writing this report no specific details regarding the building layout, proposed foundations and design loadings were available.

The purpose of the investigation was to determine the ground conditions at the positions of the exploratory holes, 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 contamination analysis and 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.

Ground gas monitoring and assessment was also required to determine necessary precautions and/or remedial measures.

2. INVESTIGATION

2.1 Investigation Details

Five mini boreholes were put down to depths of between 4.75m and 5.45m using a mini sampling rig fitted with windowless sample tubes of 83mm reducing to 56mm diameter at the positions determined and set out by Sub Surface South East Limited, as shown on Figure 2. The samples were subsequently logged in accordance with BS EN ISO 14688-1: 2002 and BS EN ISO 14689-1: 2003 and the resulting Mini Borehole Records are appended.

Two 150mm diameter boreholes were put down by cable percussive boring techniques at the positions determined and set out by Sub Surface South East Limited, as shown on Figure 2. The boreholes were put down to a depth of 15.45m, samples taken were logged in accordance with BS EN ISO 14688-1: 2002 and BS EN ISO 14689-1: 2003 and the resulting Borehole Records are appended.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended Borehole and Mini Borehole Records. The exploratory holes found made ground overlying natural predominantly cohesive strata. A general summary of the strata found is as follows:

2.2.1 Made Ground

Made ground was encountered in all of the exploratory holes to depths of between 0.20m and 0.50m in the mini boreholes and to depths of 1.65m and 1.20m in the light cable percussive boreholes.

In the mini boreholes the made ground comprised concrete surfacing to depths of between 0.20m and 0.30m locally underlain by grey and brown mottled slightly gravelly slightly sandy silty clay or light brown sandy fine to coarse gravel sized fragments of brick. In the cohesive made ground the gravel sized fragments comprised mainly fine to coarse stone and brick. In M2 and M3 the concrete appeared to be directly underlain by natural strata.

In BH1 and BH the made ground comprised bituminous macadam surfacing underlain by dark brown, brown and grey sandy fine to coarse gravel sized fragments of stone and flint to between 0.40m and 0.50m then dark brown locally clayey fine to coarse gravel sized fragments of stone and brick with localised medium brick cobble content.

2.2.2 Drift Deposits

Natural drift deposits were encountered in all of the exploratory holes at depths of between 0.20 and 1.20m and comprised mainly firm low and medium strength locally high strength brown, light brown, brownish grey and greyish brown with localised orangish brown mottling slightly sandy silty clay with silt lenses and occasional shell fragments, locally interbedded with bands of greyish brown and brown silt and greyish brown slightly gravelly sand to a depth of some 11.30m then firm to stiff high strength brown, grey, orangish brown, reddish brown and light purple mottled silty clay.

2.2.3 Groundwater

A groundwater inflow was recorded at 3.20m in M4 and 5.80m in BH2, whilst in BH1 the strata was wet below 8.70m but no water inflows were recorded. No groundwater was encountered in the remainder of the exploratory holes although it should be noted that they were only left open for a short period of time and groundwater levels and rates of inflow and may be subject to seasonal and/ or climatic variations.

Monitoring of standpipes installed in M1, BH1, BH2 found groundwater to be at depths of 3.30m, 3.30m and 2.30m respectively.

3. SAMPLING, TESTING AND MONITORING

3.1 Sampling

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

Continuous core, small disturbed and bulk disturbed samples were obtained for the strata encountered and were subjected to careful examination. 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

Forty five Standard Penetration Tests (SPTs) were performed in the natural cohesive strata, the results of which are recorded on the appended Standard Penetration Test Results Sheet with 'N' values and indicative relative density and shear strength, where appropriate, given on the appended Borehole and Mini Borehole Records.

3.3 Installations and Monitoring

On completion of BH1, BH2 and M1 hdpe standpipes were installed to depths of 5.00m, 5.00m and 4.00m respectively. The standpipes are slotted from 1.00m depth, have an internal diameter of 50mm and have removable quick release gas valves to enable both ground gas and groundwater monitoring and sampling to be undertaken. Details of the installations are given on the appended Borehole and Mini Borehole Records.

Monitoring of the standpipes for ground gas and groundwater has been undertaken on one of six scheduled occasions to date using portable equipment. A Gas Data GFM 435 was used for monitoring methane, carbon dioxide, oxygen, gas flows and atmospheric pressure. The results of the monitoring are given on the appended Ground Gas and Groundwater Monitoring Results sheet.

3.4 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 seven 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 (TPHs), the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. In addition one soil sample was subjected to the Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG) suite of analysis. The 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 investigated 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 indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions. However, 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 and Mini 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 demolish the existing building and to redevelop the site as a two storey commercial property with associated parking and hardstanding. However, at the time of writing this report no specific details regarding the building layout, proposed foundations and design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation found made ground to depths of between 0.20m and 1.65m, underlain by natural firm low and medium strength locally high strength slightly sandy silty clay with silt lenses and occasional shell fragments, locally interbedded with bands of greyish brown and brown silt and greyish brown slightly gravelly sand to a depth of some 11.30m then firm to stiff high strength silty clay.

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 cohesive strata.

Atterberg limit tests on the cohesive strata indicate clays of generally intermediate to high plasticity which are considered to have a medium susceptibility to shrinkage and swelling with varying moisture content. Given the above foundations should be taken down to a minimum 0.90m 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 medium 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 0.90m and in these areas foundations should be taken down to a minimum 0.10m below the base of the made ground unless the NHBC guidelines indicate a greater depth.

Taking the results of the field and laboratory tests we have determined the safe bearing capacity of the natural strata, as follows:

TABLE 1 SAFE BEARING CAPACITY

Expl Hole No.	Depth (m)	SPT 'N' Value	Shear Strength (kN/m ²)	Safe Bearing Pressure (kN/m ²)		Recommended Minimum Foundation Depth (m)
				Strip Footing	Square Pad	
BH1	1.35	7	28	50	60	1.75
	2.15	6	24	45	50	
	4.15	7	28	50	60	
BH2	1.35	8	32	60	70	1.30
	2.15	7	28	50	60	
	3.00	10	40	75	90	
M1	1.35	10	40	75	90	0.90
	2.15	14	56	105	125	
	3.15	17	68	125	155	
M2	1.35	11	44	80	100	0.90
	2.15	17	68	125	155	
	3.15	19	76	140	170	
M3	1.35	12	48	90	105	0.90
	2.15	14	56	105	125	
	3.15	18	72	135	160	
M4	1.35	9	36	65	80	0.90
	2.15	13	52	95	115	
	3.15	21	84	155	190	
M5	1.35	13	52	95	115	0.90
	2.15	13	52	95	115	
	3.15	27	108	205	245	

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 50 kN/m² for strip footings and 60 kN/m² for square pads should not be exceeded for the recommended 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 soft 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 the foundation 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 and the potential for high settlements shallow foundations in natural ground may not be feasible and hence alternative foundations may need to be considered. For this site we would recommend piled foundations.

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 15.0m long pile taking into consideration the ground conditions at BH2, as follows:

Preliminary Pile Design based on strata in BH2 (water at 2.30m)

Bored Cast In-situ or CFA Pile Factor of Safety: 2.5 (shaft), 3.0 (end)
Dia. = 0.30m, Perimeter = 0.94m, Cross Section Area = 0.07m², Length = 15.0m

0.00 to 1.20m	MADE GROUND	-ignore
1.20 to 3.80m	Low strength CLAY and SILT Allowable Shaft Friction Allowable Shaft Friction Load	$\bar{c} = 33 \text{ kN/m}^2$ $= 5.9 \text{ kN/m}^2$ $= \underline{14 \text{ kN}}$
3.80 to 7.50m	Medium to high strength SILT Allowable Shaft Friction Allowable Shaft Friction Load	$\bar{c} = 77 \text{ kN/m}^2$ $= 13.8 \text{ kN/m}^2$ $= \underline{48 \text{ kN}}$
7.50 to 11.60m	Medium strength CLAY Allowable Shaft Friction Allowable Shaft Friction Load	$\bar{c} = 39 \text{ kN/m}^2$ $= 9.3 \text{ kN/m}^2$ $= \underline{35 \text{ kN}}$
11.60 to 15.00m	High strength CLAY Allowable Shaft Friction Allowable Shaft Friction Load	$\bar{c} = 110 \text{ kN/m}^2$ $= 26.4 \text{ kN/m}^2$ $= \underline{84 \text{ kN}}$
15.00m	High strength CLAY Allowable End Bearing Allowable End Bearing Load	108 kN/m^2 $= 324 \text{ kN/m}^2$ $= \underline{23 \text{ kN}}$

Total Allowable Working Load = 14 + 48 + 35 + 84 + 23 = 204 kN

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 floor slabs for most of the site we would recommend the removal of any topsoil and/or made ground and the level brought up as required using a graded granular hardcore placed and compacted in layers of not greater than 150mm followed by the construction of a concrete ground bearing floor slab.

Where the thickness of made ground exceeds a depth of 1.0m, as in BH1 and BH2, 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 in these areas of deeper made ground with intermediate support designed on the same basis as the main foundations where the spans are too large for economical single suspended slab design.

4.4 Excavations and Groundwater

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 1.20m 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.

A groundwater inflow was recorded at 3.20m in M4. No groundwater was encountered in the remainder of the exploratory holes although it should be noted that they were only left open for a short period of time and groundwater levels and rates of inflow and may be subject to seasonal and/ or climatic variations.

Monitoring of standpipes installed in M1, BH1, BH2 found groundwater to be at depths of 3.30m, 3.30m and 2.30m respectively.

Given the information provided by the boreholes, groundwater seepages or inflows are not anticipated in shallow excavations. However, should groundwater seepages occur and water accumulate in the excavation 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 (February 2017 revision), "Concrete in Aggressive Ground", should be followed.

Determination of pH on the soil samples gave values in the range of 7.8 to 10.3.

Soluble sulphate concentrations were also determined for the soil samples and the results ranged from <0.01 to 0.35 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 groundwater. 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 Phase I Desk Study Report for this site, ref. B17041-L and dated September 2017, has been undertaken by Patrick Parsons. This Phase II ground investigation has been undertaken to provide an initial contamination risk assessment in accordance with the Conceptual Ground Model provided in the Phase I Report.

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 seven soil samples have been analysed for a suite of determinants and the results are appended.

The concentrations of the determinants have been compared against published generic assessment criteria. The Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency published 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. Contaminated Land: Applications in Real Environments (CL:AIRE) guideline values were also published in December 2009 to supplement the above. DEFRA published in March 2014 Category 4 Screening Levels (C4SLs) for arsenic, cadmium, lead, hexavalent chromium, benzo(a)pyrene and benzene. In November 2014 Suitable for Use Levels (S4ULs) were then published by LQM/ CIEH and updated S4ULs values for cadmium and phenols were published in July 2015 and for nickel in August 2015. The assessment criteria (SGVs, S4ULs, CL:AIRE and C4SLs) vary dependent 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 a new commercial property, the results of the contamination analyses have been compared with the generic assessment criteria for a standard land use of commercial/industrial.

When compared with the generic assessment criteria the soil contamination analyses determined no elevated contaminants.

Guideline values for the assessment can be supplied directly to the Regulator, if requested.

4.6.4 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;
- (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 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 soil samples tested, indicates that there are no contaminants requiring remediation and/or precautions to be taken for the proposed development

If waste materials are to be removed from the site, classification of the waste should be undertaken to determine the most appropriate type of landfill site to use and the associated costs. It should be noted that significant cost savings can sometimes be made on waste disposal by correct classification of the waste, a service that we can provide.

S4ULs, C4SLs and CL:AIRE 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.

4.6.6 Risk Assessment for Water Pipes

If it is intended to use standard polyethylene (PE) pipes for new water supply connections to the site, then as the site has previously been developed a risk assessment will be required by the Local Water Authority (in this case Thames Water), this is a service we can provide.

It should be noted that some Water Authorities require a pipeline risk assessment to be completed even if it is intended to use barrier pipe for new water supply connection and in this case, we would recommend contacting the Thames Water for approval prior to installation.

4.7 Ground Gas Considerations

Ground gas monitoring has been undertaken on one of six scheduled occasions to date and the results of the monitoring visits are appended.

Ground gases: methane, carbon dioxide and oxygen and flow rate have been monitored and the ranges of ground gases and flow rate during the monitoring period are as follows:

TABLE 2 GROUND GAS CONCENTRATIONS AND FLOW RATE

Methane (% vol. in air)	Carbon Dioxide (% vol. in air)	Oxygen (% vol. in air)	Gas Flow Rate (litres/ hour)
0.0	0.0 – 0.2	20.0 – 20.3	<0.1

To date, it can be seen from the monitoring that no elevated levels of methane or carbon dioxide, or depleted levels of associated oxygen, have been detected. In addition no gas flow has been detected.

Methane gas when present between 5% volume in air (Lower Explosive Limit - L.E.L.) and 15% volume in air (Upper Explosive Limit - U.E.L.) is potentially explosive and inflammable whilst carbon dioxide in conjunction with depleted oxygen is an asphyxiant. Both methane and carbon dioxide are a by-product of the anaerobic and aerobic decomposition of biodegradable materials.

The levels of gas have been assessed in accordance with British Standard 8485, "Code of practice for the design of protective measures for methane and carbon dioxide gasses for new buildings", published in June 2015 (BS.8485:2015).

The characteristic hazardous gas flow rate (Q_{hgs}) is calculated by dividing the maximum gas (methane or carbon dioxide) concentration by 100 and multiplying by the maximum flow rate in litres per hour (minimum 0.1 l/hr for Sub Surface monitoring equipment). For this site $Q_{hgs} = 0.2 / 100 \times 0.1 = 0.0002$ l/hr.

BS.8485: 2015, Table 2, indicates that the site falls into Characteristic Situation CS1 (Very Low).

BS.8485: 2015, Table 4, indicates that for a CS1 and the type of development proposed no protection or remedial measures are required.

All excavations of greater than 1.20m depth should be routinely checked for air quality prior to man entry and appropriate precautions taken.

Any manholes, inspection chambers or other void spaces formed beneath the sites ground surface are potential ground gas traps. Precautions, as per the excavations above, should be taken.

It should be noted that it is our intention to update this section of the report on completion of the ground gas monitoring.

4.8 General

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

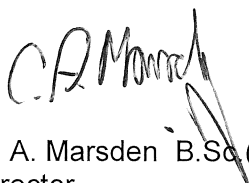
We would be happy to undertake the above or alternatively the Client should undertake such consultations before proceeding.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr Gurbinder Singh Mann at our High Wycombe office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. SE1443
MARCH 2018



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INSITU TEST RESULTS



SUB SURFACE

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Standard Penetration Test Results

Site : FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE

Client : ELMCROFT SERVICES

Engineer :

Job Number
SE1443

Sheet
1 / 1

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		
M1	1.20	1.35	1.65	SPT	2	2	2	2	3	3	N=10	
M1	2.00	2.15	2.45	SPT	2	3	3	3	4	4	N=14	
M1	3.00	3.15	3.45	SPT	4	3	4	3	4	6	N=17	
M1	4.00	4.15	4.45	SPT	6	5	6	5	8	8	N=27	
M1	5.00	5.15	5.45	SPT	6	6	7	8	8	9	N=32	
M2	1.20	1.35	1.65	SPT	2	2	2	3	3	3	N=11	
M2	2.00	2.15	2.45	SPT	3	3	4	3	5	5	N=17	
M2	3.00	3.15	3.45	SPT	4	3	4	5	5	5	N=19	
M2	4.00	4.15	4.45	SPT	4	6	8	6	8	8	N=30	
M2	4.60	4.68	4.75	CPT	25		48	2			25*/75mm 50/75mm	
M3	1.20	1.35	1.65	SPT	2	2	3	3	3	3	N=12	
M3	2.00	2.15	2.45	SPT	3	2	3	3	4	4	N=14	
M3	3.00	3.15	3.45	SPT	4	4	5	4	4	5	N=18	
M3	4.00	4.15	4.45	SPT	4	5	5	6	6	7	N=24	
M3	4.90	4.98	5.06	SPT	25		40	10			25*/75mm 50/85mm	
M4	1.20	1.35	1.65	SPT	1	2	2	2	2	3	N=9	
M4	2.00	2.15	2.45	SPT	3	3	3	3	4	3	N=13	
M4	3.00	3.15	3.45	SPT	3	3	4	5	6	6	N=21	
M4	4.00	4.15	4.45	SPT	3	3	4	5	6	8	N=23	
M4	5.00	5.15	5.45	SPT	4	4	5	7	7	7	N=26	
M5	1.20	1.35	1.65	SPT	1	2	2	3	4	4	N=13	
M5	2.00	2.15	2.45	SPT	3	3	3	3	3	4	N=13	
M5	3.00	3.15	3.45	SPT	3	3	4	5	5	6	N=20	
M5	4.00	4.15	4.45	SPT	4	5	6	6	7	8	N=27	
M5	4.70	4.78	4.78	CPT	25		50				25*/75mm 50/0mm	

Site: FORMER CLEAN LAUNDRY CO, 1 DARWIN CLOSE, READING, BERKSHIRE

Client: ELMCROFT SERVICES

Engineer:

Job Number

SE1443

Sheet:

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Ground Gas and Groundwater Monitoring Results Sheet

[illegible]

Remarks: Elevated levels of methane and carbon dioxide and depleted levels of oxygen are shown in ***bold/italics***.

LABORATORY TEST RESULTS



Site : FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE Client : ELMCROFT SERVICES Engineer :	Job Number SE1443
	Sheet 1 / 1

Borehole/ Trial Pit	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Laboratory Description
				Percentage %	Moisture Content %						
BH1	1.20	B	32	97	33	59	28	31	0.16	CH	MADE GROUND: dark brown silty clay.
BH1	3.00	B	27	98	28	56	24	32	0.13	CH	Brown and grey slightly gravelly slightly sandy silty CLAY.
BH2	5.00	U	24	87	28	39	19	20	0.45	CI	Brown and grey slightly sandy silty CLAY with bands of silt.
BH2	12.00	U	23	59	39	67	31	36	0.22	CH	Grey and orangish brown mottled silty CLAY.
M1	1.50	C	26	82	32	63	26	37	0.16	CH	Greyish brown silty CLAY.
M1	3.50	C	25	86	29	41	18	23	0.48	CI	Greyish brown silty CLAY with lenses of fine sand.
M2	2.40	C	32	83	39	56	25	31	0.45	CH	Brown slightly sandy silty CLAY.
M3	3.50	C	22	99	22	35	20	15	0.13	CL/CI	Brown slightly sandy silty CLAY.
M4	1.50	C	21	98	21	43	19	24	0.08	CI	Greyish brown slightly sandy silty CLAY with silt lenses.
M5	2.50	C	23	96	24	34	19	15	0.33	CL	Brown and grey slightly sandy silty CLAY.

Remarks :



Site : FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE Client : ELMCROFT SERVICES Engineer :	Job Number SE1443
	Sheet 1 / 1

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

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 :	



Site : FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE Client : ELMCROFT SERVICES Engineer :	Job Number
	SE1443
	Sheet
	1 / 1

[illegible]

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

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

BRE Special Digest 1

AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION

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

Sulfate Design Sulfate Class for Location	2:1 water/soil extract ^b	Groundwater	Total potential sulfate ^c	Groundwater		ACEC Class for location
				Static water	Mobile water	
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	>5.5d 2.5 - 5.5	AC-1s AC-1d AC-2z
DS-2	500 - 1500	400 - 1400	0.24 - 0.6	>3.5 2.5-3.5	>5.5 2.5 - 5.5	AC-1s AC-2 AC-2s AC-3z
DS-3	1600-3000	1500-3000	0.7 - 1.2	>3.5 2.5 - 3.5	>5.5 2.5 - 5.5	AC-2s AC-3 AC-3s AC-4
DS-4	3100 - 6000	3100 - 6000	1.3 - 2.4	>3.5 2.5 - 3.5	>5.5 2.5 - 5.5	AC-3s AC-4 AC-4s AC-5
DS-5	>6000	>6000	>2.4	>3.5 2.5 - 3.5	≥2.5	AC-4s 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 C2 Aggressive Chemical Environment for Concrete (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	>6.5 ^d 5.5 - 6.5 4.5 - 5.5 2.5 - 4.5	AC-1s AC-1 AC-2z AC-3z AC-4z
DS-2	500 - 1500		400 - 1400		0.24 - 0.6	>5.5 2.5 - 5.5	>6.5 5.5 - 6.5 4.5 - 5.5 2.5 - 5.5	AC-1s AC-2 AC-2s AC-3z AC-4z AC-5z
DS-3	1600 - 3000		1500 - 3000		0.7 - 1.2	>5.5 2.5 - 5.5	>6.5 5.5 - 6.5 2.5 - 5.5	AC-2s AC-3 AC-3s AC-4 AC-5
DS-4	3100 - 6000	≤1200	3100 - 6000	≤1000	1.3 - 2.4	>5.5 2.5 - 5.5	>6.5 2.5 - 6.5	AC-3s AC-4 AC-4s AC-5
DS-4m	3100 - 6000	>1200 ^e	3100 - 6000	>1000 ^e	1.3 - 2.4	>5.5 2.5 - 5.5	>6.5 2.5 - 6.5	AC-3s AC-4m AC-4ms AC-5m
DS-5	>6000	≤1200	>6000	≤1000	>2.4	>5.5 2.5 - 5.5	≥2.5	AC-4s AC-5
DS-5m	>6000	>1200 ^e	>6000	>1000 ^e	>2.4	>5.5 2.5 - 5.5	≥2.5	AC-4ms 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 12 000 mg/l and 17 000 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.

CHEMICAL CONTAMINATION ANALYSIS RESULTS

Final Report

Report No.: 18-05345-1

Initial Date of Issue: 01-Mar-2018

Client Sub Surface

Client Address: 3 Peel Street
Preston
Lancashire
PR2 2QS

Contact(s): Simon Gabbatt

Project SE1443 - Former Clean Laundry Co., 1
Darwin Close, Reading

Quotation No.: **Date Received:** 23-Feb-2018

Order No.: **Date Instructed:** 23-Feb-2018

No. of Samples: 11

Turnaround (Wkdays): 5 **Results Due:** 01-Mar-2018

Date Approved: 01-Mar-2018

Approved By:



Details: Martin Dyer, Laboratory Manager

Results - Soil

Project: SE1443 - Former Clean Laundry Co., 1 Darwin Close, Reading

Client: Sub Surface	Chemtest Job No.:				18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345
Quotation No.:	Chemtest Sample ID.:				583711	583712	583713	583714	583715	583716	583717	583718	583719
Order No.:	Client Sample Ref.:				BH1	BH2	M1	M2	M3	M4	M5	BH1	BH2
	Client Sample ID.:				887	862	834	805	814	823	794	890	873
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.00	0.15	0.20	0.40	0.40	0.30	0.30	1.20	5.45
	Bottom Depth (m):				0.50	0.40	0.40					1.65	
	Date Sampled:				14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY		
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-		
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		
Moisture	N	2030	%	0.020	< 0.020	< 0.020	14	17	18	10	16	23	16
pH	U	2010		N/A	8.7	8.6	8.5	7.9	8.0	10.3	8.5	8.2	7.8
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	0.81	0.43	0.64	0.98	0.55		
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010		0.092					0.011	0.35
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
Sulphide (Easily Liberatable)	U	2325	mg/kg	0.50	8.1	3.6	7.6	2.7	3.5	7.1	2.6		
Sulphate (Total)	U	2430	%	0.010	0.052	0.018	0.10	0.033	0.048	0.34	0.025		
Arsenic	U	2450	mg/kg	1.0	37	11	14	13	11	10	12		
Cadmium	U	2450	mg/kg	0.10	0.66	0.21	0.26	0.10	0.10	0.20	0.11		
Chromium	U	2450	mg/kg	1.0	9.9	15	18	25	23	24	27		
Copper	U	2450	mg/kg	0.50	13	13	16	15	17	48	17		
Mercury	U	2450	mg/kg	0.10	< 0.10	0.25	0.18	< 0.10	< 0.10	0.32	< 0.10		
Nickel	U	2450	mg/kg	0.50	9.7	6.6	12	23	25	16	26		
Lead	U	2450	mg/kg	0.50	79	15	36	11	12	190	15		
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	0.32	0.23	< 0.20	< 0.20	< 0.20		
Zinc	U	2450	mg/kg	0.50	160	31	65	55	51	100	55		
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50		
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0		
TPH >C10-C21	N	2670	mg/kg	1.0	2.9	5.6		< 1.0	< 1.0	32	< 1.0		
TPH >C21-C40	N	2670	mg/kg	1.0	660	73		< 1.0	< 1.0	890	< 1.0		
Total TPH >C6-C40	U	2670	mg/kg	10	660	79		< 10	< 10	920	< 10		
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0			< 1.0						
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0			< 1.0						
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0			< 5.0						
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0			< 1.0						
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0			< 1.0						
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0			< 1.0						

Results - Soil

Project: SE1443 - Former Clean Laundry Co., 1 Darwin Close, Reading

Client: Sub Surface		Chemtest Job No.:				18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345	18-05345
Quotation No.:	Chemtest Sample ID.:					583711	583712	583713	583714	583715	583716	583717	583718	583719	583719
Order No.:	Client Sample Ref.:					BH1	BH2	M1	M2	M3	M4	M5	BH1	BH2	BH2
	Client Sample ID.:					887	862	834	805	814	823	794	890	873	873
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.00	0.15	0.20	0.40	0.40	0.30	0.30	1.20	5.45	5.45
	Bottom Depth (m):					0.50	0.40	0.40					1.65		
	Date Sampled:					14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018	14-Feb-2018
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY		
Determinand	Accred.	SOP	Units	LOD											
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0				< 1.0							
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0				< 1.0							
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0				< 1.0							
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0				< 1.0							
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0							
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0							
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				< 10							
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.47	< 0.10			
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.52	< 0.10			
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0			
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30			

Project: SE1443 - Former Clean Laundry Co., 1 Darwin Close, Reading

Client: Sub Surface	Chemtest Job No.:				18-05345	18-05345
Quotation No.:	Chemtest Sample ID.:				583720	583721
Order No.:	Client Sample Ref.:				M2	M3
	Client Sample ID.:				809	820
	Sample Type:				SOIL	SOIL
	Top Depth (m):				2.50	3.50
	Bottom Depth (m):					
	Date Sampled:				14-Feb-2018	14-Feb-2018
	Asbestos Lab:					
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A		
Asbestos Identification	U	2192	%	0.001		
Moisture	N	2030	%	0.020	23	17
pH	U	2010		N/A	7.9	7.8
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	0.034	0.32
Cyanide (Total)	U	2300	mg/kg	0.50		
Sulphide (Easily Liberatable)	U	2325	mg/kg	0.50		
Sulphate (Total)	U	2430	%	0.010		
Arsenic	U	2450	mg/kg	1.0		
Cadmium	U	2450	mg/kg	0.10		
Chromium	U	2450	mg/kg	1.0		
Copper	U	2450	mg/kg	0.50		
Mercury	U	2450	mg/kg	0.10		
Nickel	U	2450	mg/kg	0.50		
Lead	U	2450	mg/kg	0.50		
Selenium	U	2450	mg/kg	0.20		
Zinc	U	2450	mg/kg	0.50		
Chromium (Hexavalent)	N	2490	mg/kg	0.50		
TPH >C6-C10	N	2670	mg/kg	1.0		
TPH >C10-C21	N	2670	mg/kg	1.0		
TPH >C21-C40	N	2670	mg/kg	1.0		
Total TPH >C6-C40	U	2670	mg/kg	10		
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0		
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0		
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0		
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0		
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0		
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0		

Project: SE1443 - Former Clean Laundry Co., 1 Darwin Close, Reading

Client: Sub Surface	Chemtest Job No.:				18-05345	18-05345
Quotation No.:	Chemtest Sample ID.:				583720	583721
Order No.:	Client Sample Ref.:				M2	M3
	Client Sample ID.:				809	820
	Sample Type:				SOIL	SOIL
	Top Depth (m):				2.50	3.50
	Bottom Depth (m):					
	Date Sampled:				14-Feb-2018	14-Feb-2018
	Asbestos Lab:					
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0		
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0		
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		
Naphthalene	U	2700	mg/kg	0.10		
Acenaphthylene	U	2700	mg/kg	0.10		
Acenaphthene	U	2700	mg/kg	0.10		
Fluorene	U	2700	mg/kg	0.10		
Phenanthrene	U	2700	mg/kg	0.10		
Anthracene	U	2700	mg/kg	0.10		
Fluoranthene	U	2700	mg/kg	0.10		
Pyrene	U	2700	mg/kg	0.10		
Benzo[a]anthracene	U	2700	mg/kg	0.10		
Chrysene	U	2700	mg/kg	0.10		
Benzo[b]fluoranthene	U	2700	mg/kg	0.10		
Benzo[k]fluoranthene	U	2700	mg/kg	0.10		
Benzo[a]pyrene	U	2700	mg/kg	0.10		
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10		
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10		
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10		
Total Of 16 PAH's	U	2700	mg/kg	2.0		
Benzene	U	2760	µg/kg	1.0		
Toluene	U	2760	µg/kg	1.0		
Ethylbenzene	U	2760	µg/kg	1.0		
m & p-Xylene	U	2760	µg/kg	1.0		
o-Xylene	U	2760	µg/kg	1.0		
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0		
Total Phenols	U	2920	mg/kg	0.30		

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

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

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

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

Charges may apply to extended sample storage

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

customerservices@chemtest.co.uk

MINI BOREHOLE RECORD SHEETS

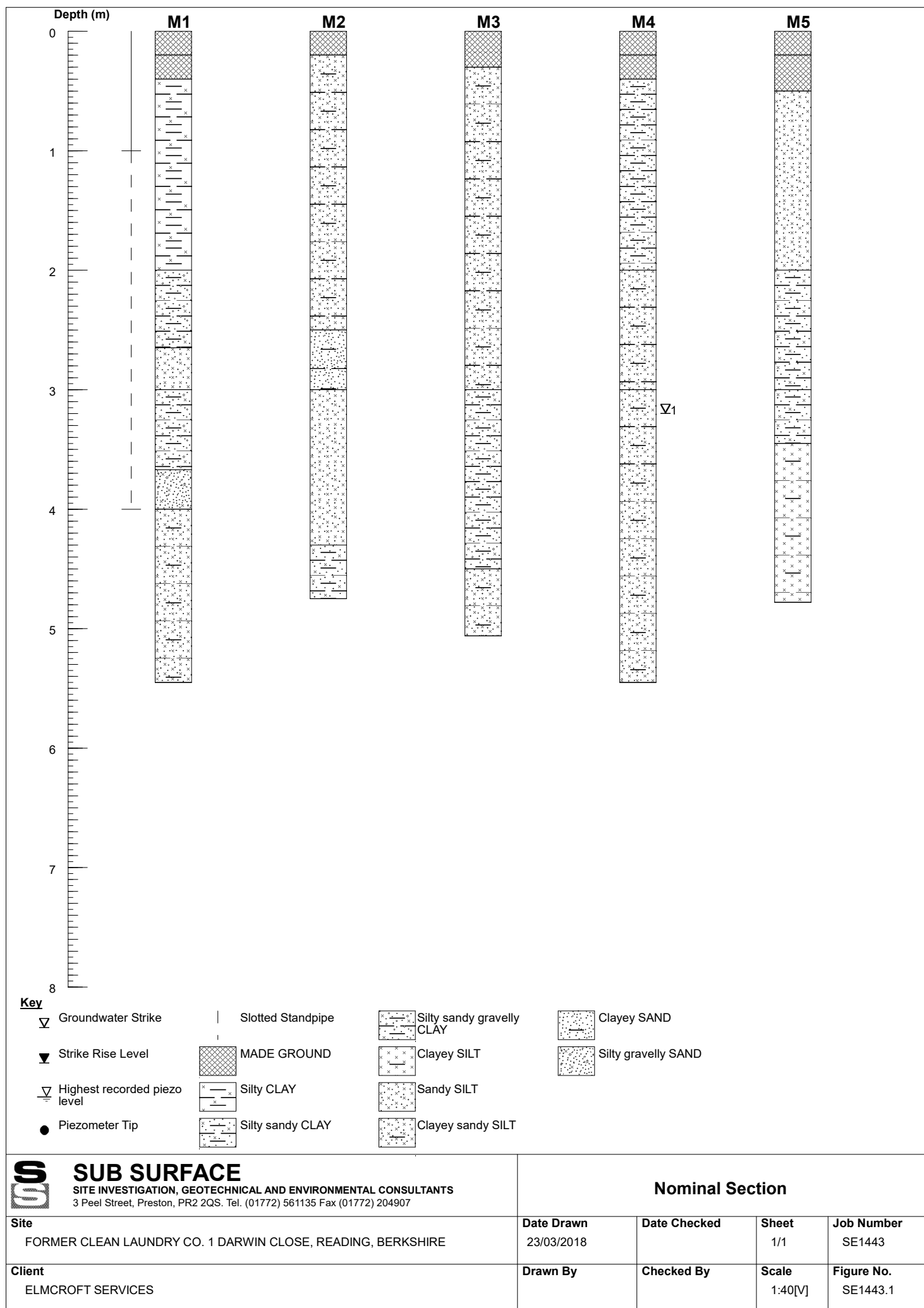
S S SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907						Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE			Borehole Number M1	
Boring Method MINI PERCUSSIVE		Casing Diameter		Ground Level (mOD)		Client ELMCROFT SERVICES			Job Number SE1443	
		Location As Shown on Figure 2.		Dates 14/02/2018		Engineer			Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20-0.40	B					(0.20)	MADE GROUND: concrete.			
0.40-1.20	B					0.20 (0.20) 0.40	MADE GROUND: grey and brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse stone and brick.			
							Firm medium strength greyish brown silty CLAY.			
1.20-1.65	SPT N=10			2,2/2,2,3,3		(1.60)				
1.20-1.65	D			1.20m to 2.00m,						
1.20-2.00	C			100% recovery.						
2.00-2.45	SPT N=14			2,3/3,3,4,4		2.00	Firm medium strength greyish brown with orange mottling slightly sandy silty CLAY with some lenses of silt and sand and with occasional shell fragments.			
2.00-2.45	D			2.00m to 3.00m,						
2.00-3.00	C			100% recovery.		(0.65)				
						2.65	Greyish brown with occasional orange mottling slightly sandy SILT with some shell fragments.			
						(0.35)				
3.00-3.45	SPT N=17			4,3/4,3,4,6		3.00	Firm medium strength greyish brown silty CLAY with many lenses of fine sand.			
3.00-3.45	D			3.00m to 4.00m,						
3.00-4.00	C			90% recovery.		(0.67)				
						3.67	Greyish brown slightly gravelly silty fine SAND. Gravel comprises fine shell fragments.			
						(0.33)				
4.00-4.45	SPT N=27			6,5/6,5,8,8		4.00	Brown with occasional grey and orangish brown slightly sandy slightly clayey SILT with occasional lenses of silty clay.			
4.00-4.45	D			4.00m to 5.00m,						
4.00-5.00	C			90% recovery.		(1.45)	...below 4.55m with occasional fine gravel sized shell fragments.			
5.00-5.45	SPT N=32			6,6/7,8,8,9		5.45	Complete at 5.45m			
5.00-5.45	D									
				14/02/2018:DRY						
Remarks Hand excavated inspection pit to 1.20m to check for services - 1hr. Core diameter - 1.20m to 2.00m - 83mm, 2.00m to 4.00m - 76mm, 4.00m to 5.00m - 56mm. On completion backfilled with bentonite to 4.00m and installed a 50mm dia. hdpe gas monitoring standpipe with a gas valve and gravel surround to 4.00m, a bentonite seal from 1.00m to 0.20m, and a concreted in lockable steel cover to ground level.								Scale (approx) 1:40	Logged By DF/DJ	
								Figure No. SE1443.M1		

SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907						Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE		Borehole Number M2		
Boring Method MINI PERCUSSIVE		Casing Diameter			Ground Level (mOD)		Client ELMCROFT SERVICES		Job Number SE1443	
		Location As Shown on Figure 2.			Dates 14/02/2018		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.40	B					(0.20) 0.20	MADE GROUND: concrete.			
1.20-1.65 1.20-1.65 1.20-2.00	D SPT N=11 C			1.20m to 2.00m, 100% recovery 2,2/2,3,3,3		(2.30)	Firm medium strength brown and occasional orange brown mottled slightly sandy silty CLAY with some bands of silt and occasional shell fragments.			
2.00-2.45 2.00-2.45 2.00-3.00	SPT N=17 D C			3,3/4,3,5,5 2.00m to 3.00m, 100% recovery.		2.50	...at 2.00m band of light greyish brown sandy subangular to subrounded fine to coarse flint and quartz gravel.			
3.00-3.45 3.00-3.45 3.00-4.00	SPT N=19 D C			4,3/4,5,5,5 3.00m to 4.00m, 100% recovery.		(0.50) 3.00	Light greyish brown slightly clayey fine SAND. ...at 2.80m band of fine to coarse gravel sized shell fragments.			
4.00-4.45 4.00-4.45 4.00-4.60	SPT N=30 D C			4,6/8,6,8,8 4.00m to 4.60m, 100% recovery.		(1.30) 4.30	Grey and greyish brown becoming dark grey slightly sandy SILT with clay lenses and occasional shell fragments ...at 3.80m band of fine to coarse gravel sized shell fragments.			
4.60-4.75	SPT(C) 25*/75 50/75			25/48,2 14/02/2018:DRY		(0.45) 4.75	Dark brownish grey slightly sandy silty CLAY with some pockets of silt and occasional shell fragments.			
							Complete at 4.75m			
Remarks Hand excavated inspection pit to 1.20m to check for services - 1hr. Core diameter - 1.20 to 2.00m - 86mm, 2.00 to 3.00m - 72mm, 3.00 to 4.00m - 66mm, 4.00 to 4.60m - 56mm.								Scale (approx) 1:40	Logged By DF/DJ	
								Figure No. SE1443.M2		

SUB SURFACE						Site		Borehole Number		
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907						FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE		M3		
Boring Method MINI PERCUSSIVE		Casing Diameter			Ground Level (mOD)		Client ELMCROFT SERVICES		Job Number SE1443	
		Location As Shown on Figure 2.			Dates 14/02/2018		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.40	B					(0.30) 0.30	MADE GROUND: concrete.			
1.20-1.65 1.20-1.65 1.20-2.00	SPT N=12 D C			2,2/3,3,3,3 1.20m to 2.00m, 100% recovery.		(2.70)	Light brown and brown slightly sandy clayey SILT interbedded with silty CLAY with shell fragments			
2.00-2.45 2.00-2.45 2.00-3.00	SPT N=14 D C			3,2/3,3,4,4 2.00m to 3.00m, 100% recovery.			...below 2.00m thinly laminated with thin bands of fine sand.			
3.00-3.45 3.00-3.45 3.00-4.00	SPT N=18 D C			4,4/5,4,4,5 3.00m to 4.00m, 100% recovery.		3.00	Firm high strength greyish brown slightly sandy silty CLAY with occasional pockets of silt and shell fragments.			
4.00-4.45 4.00-4.45 4.00-4.90	SPT N=24 D C			4,5/5,6,6,7 4.00m to 5.00m, 100% recovery.		(1.50)				
4.90-5.06 4.90-5.16	SPT 25*/75 50/85 D			25/40,10 14/02/2018: DRY		4.50 (0.56) 5.06	Brownish grey slightly sandy clayey SILT with thin bands of clay with some shell fragments.			
							Complete at 5.06m			
Remarks Hand excavated inspection pit to 1.20m to check for services - 1hr. Core diameter - 1.20m to 2.00m - 86mm, 2.00m to 3.00m - 76mm, 3.00m to 4.60m - 53mm								Scale (approx) 1:40	Logged By DF/DJ	
								Figure No. SE1443.M3		

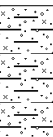
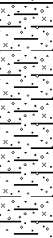
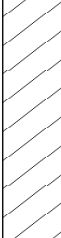
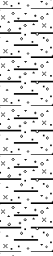
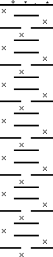
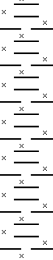
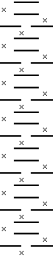
S S SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907						Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE		Borehole Number M4	
Boring Method MINI PERCUSSIVE		Casing Diameter		Ground Level (mOD)		Client ELMCROFT SERVICES		Job Number SE1443	
		Location As Shown on Figure 2.		Dates 14/02/2018		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	B					(0.20) 0.20 (0.20) 0.40	MADE GROUND: concrete.		
0.70	B						MADE GROUND: light brown sandy fine to coarse gravel sized fragments of stone and brick with low brick cobble content.		
1.20-1.65 1.20-1.65 1.20-2.00	SPT N=9 D C			1,2/2,2,2,3 1.20m to 2.00m, 100% recovery		(1.60)	Firm greyish brown slightly sandy silty clay with lenses of silt.		
2.00-2.45 2.00-2.45 2.00-3.00	SPT N=13 D C			3,3/3,3,4,3 2.00m to 3.00m, 100% recovery		2.00	 at 1.35m : low strength		
							...at 1.90m band of shell fragments.		
3.00-3.45 3.00-3.45 3.00-4.00	SPT N=21 D C			3,3/3,3,4,3 2.00m to 3.00m, 100% recovery		2.00	Firm medium strength brown with occasional orangish brown mottling slightly sandy clayey SILT with some bands of clay.		
						(1.00)	...at 2.85m band of shell fragments.		
4.00-4.45 4.00-4.45 4.00-5.00	SPT N=23 D C			3,3/4,5,6,6 3.00m to 4.00m, 90% recovery Water Inflow(1) at 3.20m.		3.00	Firm high strength brown slightly sandy silty CLAY with some lenses of silt and with some shell fragments.		▽1
							...below 3.60m interbedded with bands of silt.		
5.00-5.45 5.00-5.45	SPT N=26 D			4,4/5,7,7,7					
				14/02/2018:		5.45	Complete at 5.45m		
Remarks Hand excavated inspection pit to 1.20m to check for services - 1hr. Core diameters: 1.20m to 2.00m - 82mm, 2.00m to 3.00m - 76mm, 3.00m to 5.00m - 56mm.								Scale (approx) 1:40	Logged By DS/DJ
								Figure No. SE1443.M4	

 SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907							Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE		Borehole Number M5
Boring Method MINI PERCUSSIVE		Casing Diameter		Ground Level (mOD)		Client ELMCROFT SERVICES		Job Number SE1443	
		Location As Shown on Figure 2		Dates 14/02/2018		Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	B					(0.20) 0.20 (0.30) 0.50	MADE GROUND: concrete. MADE GROUND: firm brown with occasional grey mottling slightly gravelly silty clay. Gravel sized fragments comprise fine to coarse flint.		
0.70	B						Brown slightly sandy SILT with some shell fragments.		
1.20-1.65 1.20-1.65 1.20-2.00	SPT N=13 S C			1,2/2,3,4,4 1.20m to 2.00m, 100% recovery.		(1.50)			
2.00-2.45 2.00-2.45 2.00-3.00	SPT N=13 S C			3,3/3,3,3,4 2.00m to 3.00m, 96% recovery.		2.00	Firm medium strength brown and grey mottled slightly sandy silty CLAY with bands of silt.		
3.00-3.45 3.00-4.00	S C			HV@2.80m, c=56kPa 3.00m to 4.00m, 88% recovery. 3,3/4,5,5,6		3.00	Firm high strength brown, light brown and grey mottled slightly sandy silty CLAY with some lenses of silt.		
3.00-3.45	SPT N=20					(0.45) 3.45	Medium dense grey and occasional reddish brown mottled clayey SILT with lenses of silty clay and occasional shell fragments.		
4.00-4.45 4.00-4.45 4.00-4.70	SPT N=27 D C			4,5/6,6,7,8 4.00m to 4.70m, 60% recovery.		(1.33)	...below 4.40m interbedded with bands of clay.		
4.70-4.78 4.70-4.78	SPT(C) 25*/75 50/0 D			25/50 14/02/2018: DRY		4.78	...sampler bouncing at 4.70m. Complete at 4.78m		
Remarks Hand excavated inspection pit to 1.20m to check for services - 1hr. Core diameter - 1.20m to 2.00m - 86mm, 2.00m to 3.00m - 72mm, 3.00m to 4.00m - 66mm, 4.00m to 4.70m - 56mm. HV = Hand Shear Vane test								Scale (approx) 1:40	Logged By DF/DJ
								Figure No. SE1443.M5	



BOREHOLE RECORD SHEETS

 SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907							Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE			Borehole Number BH1
Boring Method LIGHT CABLE PERCUSSIVE		Casing Diameter 150mm cased to 15.00m		Ground Level (mOD)		Client ELMCROFT SERVICES			Job Number SE1443	
		Location As Shown on Figure 2		Dates 15/02/2018		Engineer			Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.50	B					(0.15) 0.15	MADE GROUND: bituminous macadam surfacing.			
0.50-1.00	B					(0.35) 0.50	MADE GROUND: dark brown and dark grey sandy fine to coarse gravel sized fragments of stone.			
1.20-1.65 1.20-1.65 1.20-1.65	SPT N=7 B D			1,1/2,1,2,2		(1.15)	MADE GROUND: dark brown clayey sandy fine to coarse gravel sized fragments of stone and brick with medium brick cobble content with zones of dark brown silty clay.			
2.00-2.45 2.00-2.45 2.00-2.45	SPT N=6 B D			1,1/2,1,2,1		1.65	Firm low strength brown with orange and grey mottling slightly gravelly slightly sandy silty CLAY. Gravel comprises subround fine to medium quartz. ...below 1.90m with occasional sand lenses			
3.00-3.45 3.00-3.45	B U NR					(3.65)	...at 3.45m occasional plant remains			
3.45	D									
4.00-4.45 4.00-4.45 4.00-4.45	SPT N=7 B D			1,2/1,2,2,2						
5.50-5.95 5.50-5.80 5.50-5.95 5.50-5.95	SPT N=16 B B D			2,2/3,4,4,5		5.30	Firm medium strength brown with occasional orange and grey mottling slightly sandy silty CLAY with some lenses of sand and silt.			
						(1.80)				
7.50-7.95 7.50-7.95 7.50-7.95	SPT N=7 B D			1,1/1,2,2,2		7.10	Firm low strength grey and brown very sandy silty CLAY with many silt lenses.			
						(1.60)				
Remarks Hand excavated inspection pit to 1.20m to check for services - 1hr NR = No Recovery Strata wet at 8.70m but no inflows observed. On completion backfilled with arisings to 6.00m and bentonite to 5.00m, then installed a 50mm dia. hdpe gas monitoring standpipe with a gas valve and gravel surround to 5.00m, a bentonite seal from 1.00m to 0.20m and a concrete in steel protective cover from 0.20m to ground level.								Scale (approx) 1:40	Logged By DF/DJ	Figure No. SE1443.BH1

S S SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907						Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE			Borehole Number BH1		
Boring Method LIGHT CABLE PERCUSSIVE		Casing Diameter 150mm cased to 15.00m			Ground Level (mOD)		Client ELMCROFT SERVICES			Job Number SE1443	
		Location As Shown on Figure 2			Dates 15/02/2018		Engineer			Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
9.00-9.45 9.00-9.45 9.00-9.45	SPT N=8 B D			1,1/2,1,2,3		8.70	Firm low strength grey very sandy silty CLAY. Firm low becoming medium strength brown and grey mottled slightly sandy silty CLAY with bands of clayey silt.	 		 	
10.50-10.95 10.50-10.95 10.50-10.95	SPT N=12 B D			1,2/3,3,3,3		(2.60)	 at 10.50m : medium strength				
12.00-12.45 12.00-12.45 12.00-12.45	SPT N=21 B D			2,2/3,4,6,8		11.30	Firm to stiff becoming stiff high strength brown, grey , orangish brown, reddish brown and light purple mottled silty CLAY.				
13.50-13.95 13.50-13.95 13.50-13.95	SPT N=29 B D			3,5/5,7,8,9		(4.15)					
15.00-15.45 15.00-15.45	SPT N=31 D			3,5/5,8,8,10		15.45	Complete at 15.45m				
Remarks								Scale (approx) 1:40	Logged By DF/DJ	Figure No. SE1443.BH1	



FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE,
READING. BERKSHIRE

Borehole
Number
BH2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.15-0.40	B					(0.15) 0.15	MADE GROUND: bituminous macadam surfacing.			
0.40-1.00	B					(0.25) 0.40	MADE GROUND: brown and grey sand and fine to coarse gravel sized fragments of stone and flint.			
						(0.80)	MADE GROUND: brown silty sandy fine to coarse gravel sized fragments of stone and brick.			
1.20-1.65	SPT N=8			1,1/2,2,2,2		1.20	Firm low strength dark grey slightly gravelly slightly sandy slightly clayey SILT. Gravel comprises fine to medium shell fragments.			
1.20-1.65	B					(0.70)				
1.20-1.65	D					1.90	Firm low becoming medium strength brown and greyish brown slightly sandy silty CLAY with some clayey silt lenses.			
2.00-2.45	SPT N=7			1,2/1,2,2,2						
2.00-2.45	B									
2.00-2.45	D									
3.00-3.45	SPT N=10			1,2/2,3,2,3		(1.90)	...below 3.00m medium strength.			
3.00-3.45	B									
3.00-3.45	D					3.80	Firm high strength locally low strength brownish grey very sandy silty CLAY with bands of grey silty fine sand and brownish grey sandy silt.			
4.00-4.45	SPT N=19			2,3/4,4,5,6						
4.00-4.45	B									
4.00-4.45	D									
5.00-5.45	U c=78kPa									
5.45	D									
6.00-6.36	D			Water Inflow(1) at 5.80m, no rise after 20 mins. 5,8/10,18,22		(4.30)				
6.00-6.36	SPT 50/210									
6.00-6.45	B									
7.50-7.95	SPT N=8			1,2/2,2,1,3						
7.50-7.95	B									
							 at 7.95m : low strength			

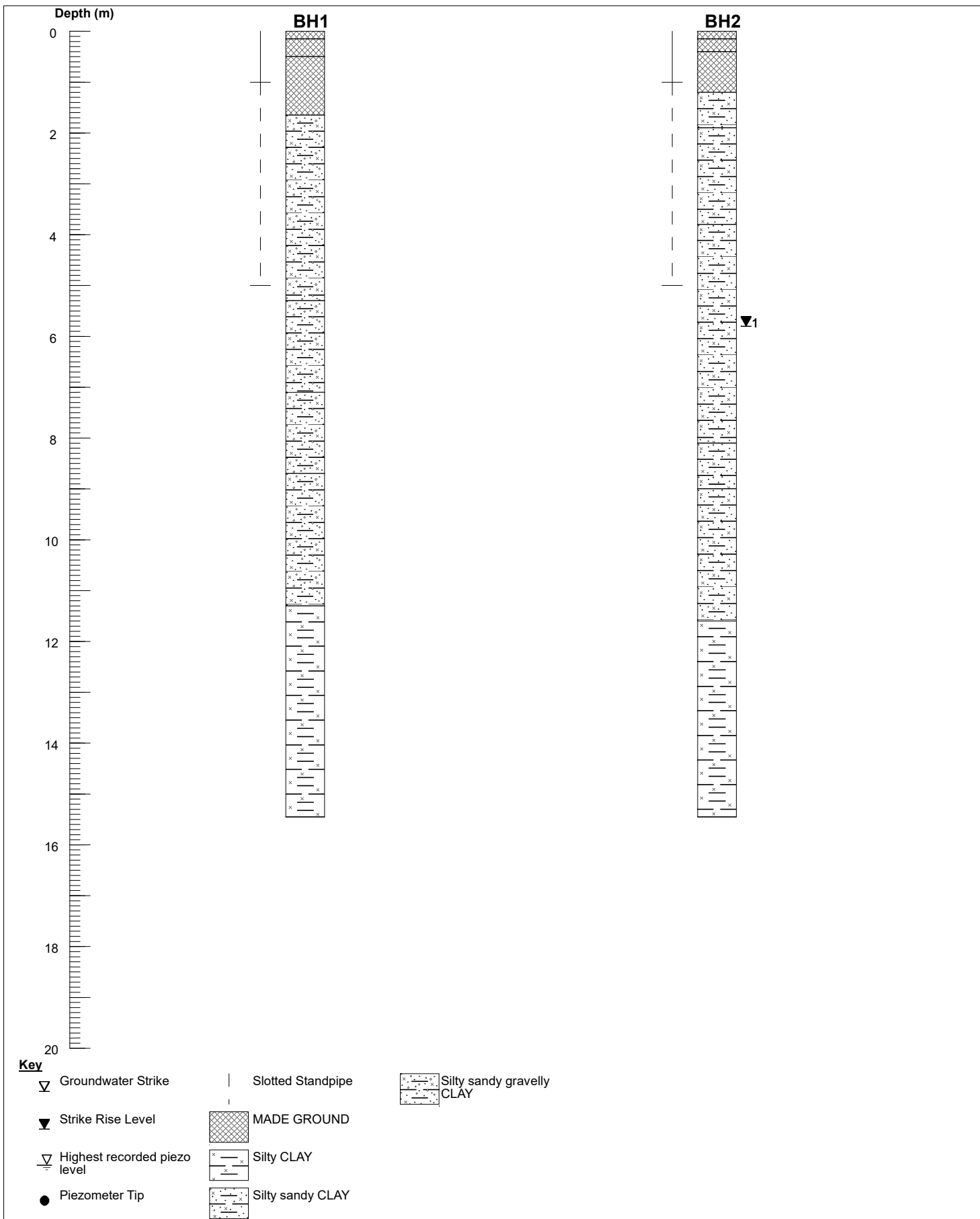
On completion backfilled with arisings to 6.00m and bentonite to 5.00m then installed a 50mm dia. hdpe gas monitoring standpipe with a gas valve and gravel surround to 5.00m, a bentonite seal from 1.00m to 0.20m and a concrete in steel protective cover from 0.20m to ground level.

1:40

DF/DJ

SF1443 BH2

 SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907						Site FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE		Borehole Number BH2					
Boring Method LIGHT CABLE PERCUSSIVE		Casing Diameter 150mm cased to 15.00m		Ground Level (mOD)		Client ELMCROFT SERVICES		Job Number SE1443					
		Location As Shown on Figure 2.		Dates 14/02/2018		Engineer		Sheet 2/2					
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr			
9.00-9.45 9.00-9.45 9.00-9.45	SPT N=9 B D			1,2/1,2,3,3		8.10	Brownish grey very sandy silty CLAY with bands of grey silty fine sand and brownish grey sandy silt.						
						(0.90)	Grey sand with clay bands (driller's description).						
						9.00	Firm medium strength brown and grey mottled sandy silty CLAY with silt bands.						
10.50-10.95 10.50-10.95 10.50-10.95	SPT N=12 B D			1,2/2,3,4,3		(2.60)							
12.00-12.45 12.45	U c=129kPa D					11.60	Stiff high strength grey, brown, orangish brown and reddish brown mottled silty CLAY.						
13.50-13.95 13.50-13.95 13.50-13.95	SPT N=23 B D			3,4/4,5,7,7		(3.85)							
15.00-15.45 15.00-15.45	SPT N=27 D			3,4/5,6,7,9									
						15.45	Complete at 15.45m						
Remarks								Scale (approx) 1:40	Logged By DF/DJ				
								Figure No. SE1443.BH2					

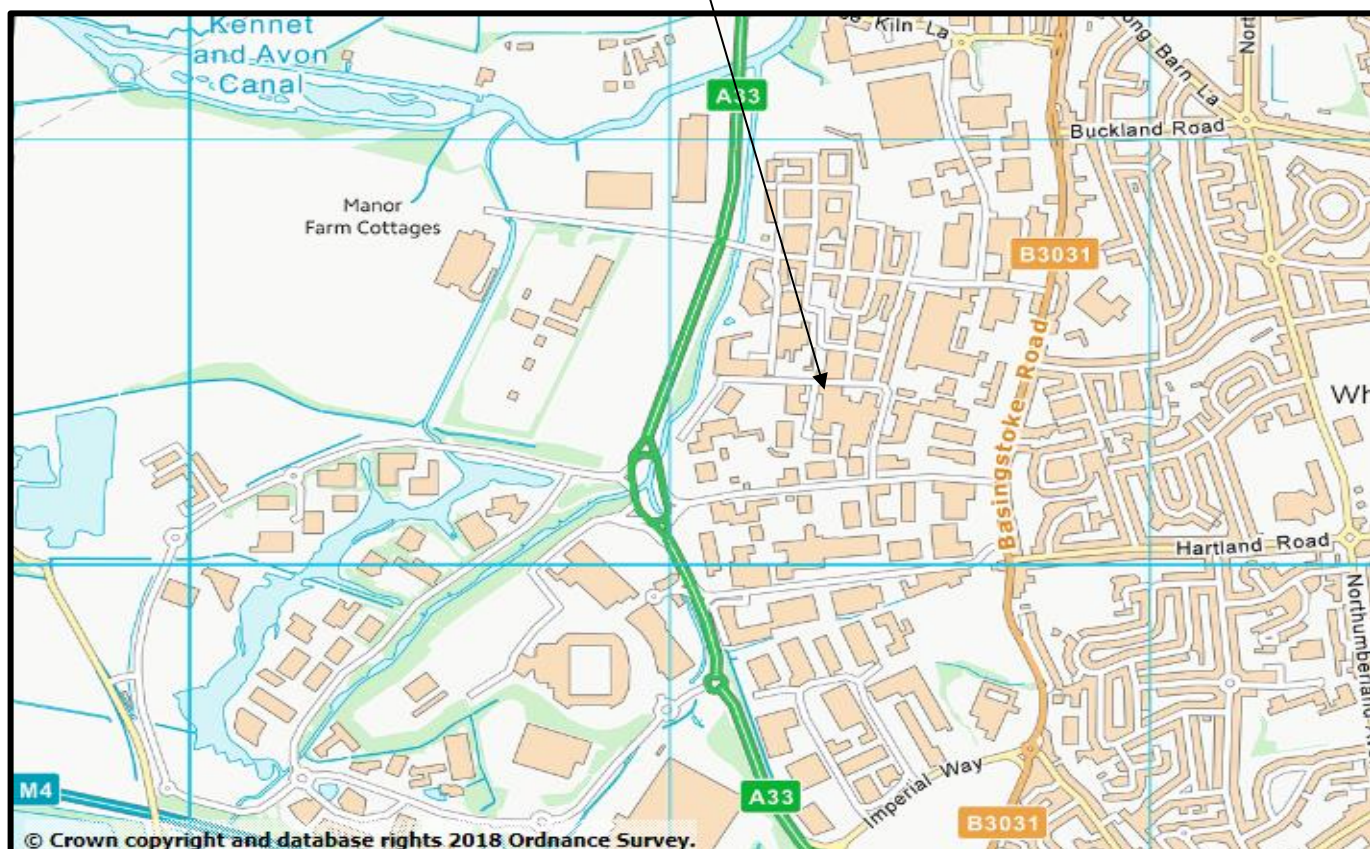
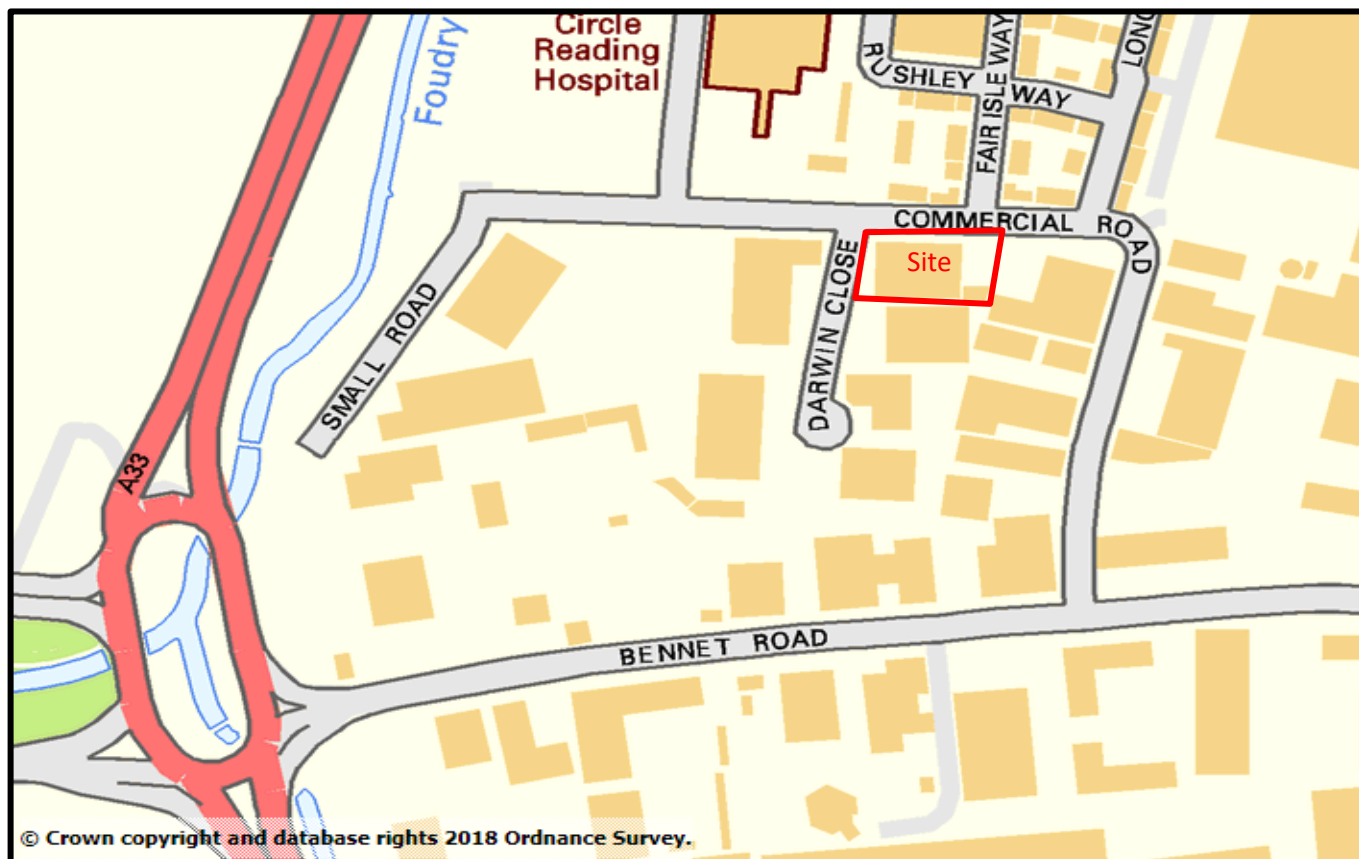


SUB SURFACE

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

Site		Nominal Section		
FORMER CLEAN LAUNDRY CO. 1 DARWIN CLOSE, READING, BERKSHIRE		Date Drawn 23/03/2018	Date Checked	Sheet 1/1
Client ELMCROFT SERVICES		Drawn By	Checked By	Job Number SE1443
				Scale 1:100[V]
				Figure No. SE1443.1

FIGURES



SUB SURFACE

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

Site

FORMER CLEAN LAUNDRY CO, 1 DARWIN CLOSE,
READING

Client

ELMCROFT SERVICES

Site Location

Date Drawn

20/03/2018

Date Checked

Orientation



Job No.

SE1443

Drawn By

DJ

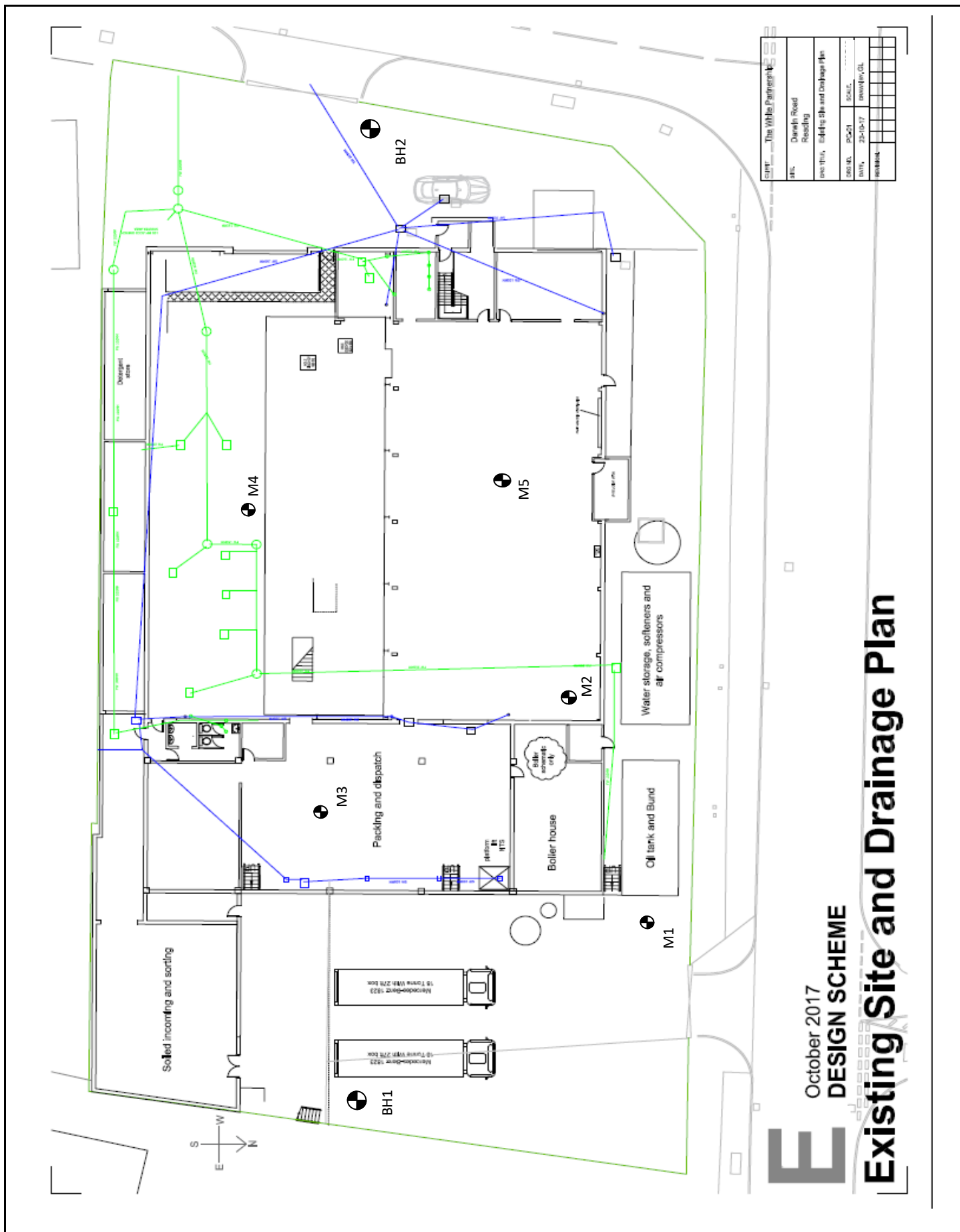
Checked By

Scale

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Figure No.

1



	SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Locations of Exploratory Holes			
Site FORMER CLEAN LAUNDRY CO, 1 DARWIN CLOSE, READING	Date Drawn 20-Mar-18	Date Checked	Orientation 	Job No. SE1443	
Client ELMCROFT SERVICES	Drawn By DJ	Checked By	Scale -	Figure No. 2	