





REMEDIATE

TECHNICAL REPORT

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GROUND INVESTIGATION
AT
LOGISTICS SITE, BAE SAMLESBURY,
BALDERSTONE, LANCASHIRE
FOR
AEW ARCHITECTS & DESIGNERS LIMITED

REPORT NO.6019 JUNE 2015



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CONTENTS

1. INTRODUCTION	1.1 1.2	Site Location and Description Proposed Development and Purpose of the Ground Investigation
2. INVESTIGATION	2.1 2.2	Investigation Details Sub Surface Detail
3. SAMPLING, TESTING AND MONITORING	3.1 3.2 3.3 3.4	Installations and Monitoring
4. APPRAISAL AND RECOMMENDATIONS	4.8 4.9 4.10	Floor Slab Construction Excavations and Groundwater Buried Concrete
APPENDICES	Labo Con Bore	u Test results pratory Test results tamination Analysis results chole Record sheets I Pit Record sheets lres

GROUND INVESTIGATION AT LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

1

CLIENT: AEW ARCHITECTS AND DESIGNERS LIMITED

ENGINEER: TRP CONSULTING

1. INTRODUCTION

This report has been prepared in accordance with an email, dated 23rd March 2015 from the Engineer on behalf of the Client.

The brief was set out in our estimate, dated 23rd March 2015, with amendments as the investigation proceeded and includes:

- 5 No. cable percussive boreholes
- 8 No. trial pits
- 2 No. soakaway tests
- 7 No. in-situ CBR tests
- 6 No. modulus of subgrade reaction tests.
- Geotechnical laboratory testing
- Contamination analysis
- Installation of standpipes followed by groundwater and ground gas monitoring
- Provision of an interpretative report on the above.

1.1 Site Location and Description

The site is located in the north eastern quadrant of the BAE Samlesbury complex, as indicated on the appended Figure 2. The approximate National Grid Reference of the centre of the site is SD628314.

As shown on Figure 3, the site comprises an approximately rectangular shaped grassed area measuring some 200m by 235m and is bound to the north by the perimeter road, to the east and west by existing aerospace buildings and to the south by undeveloped land then the former runway.

The site is generally flat though an earth mound is present at the southern extent.

1.2 Proposed Development and Purpose of the Ground Investigation

We understand that it is proposed to construct a new warehouse, access road, car parks and landscaping on the site.

The purpose of the investigation was to obtain an indication of the ground conditions, at the positions of the boreholes and trial pits, 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.

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

2. INVESTIGATION

2.1 Investigation Details

Five 150mm diameter boreholes were put down by cable percussive boring techniques at the positions determined by the Client's Engineer and set out by Sub Surface North West Limited, as shown on Figure 3. The boreholes were put down to depths of between 10.45m and 15.45m, samples taken were logged in accordance with BS. EN. 14688 and 14689: 2002-2004 and the resulting Borehole Records are appended.

Eight trial pits were taken out by a mechanical excavator at the positions determined by the Client's Engineer and set out by Sub Surface North West Limited, as shown on Figure 3. The trial pits were excavated to depths of between 1.80m and 4.50m, representative samples were taken and the materials were logged in accordance with BS. EN. 14688 and 14689: 2002-2004. The resulting Trial Pit Records are appended.

2.2 Sub Surface Detail

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

2.2.1 Made Ground

In the boreholes and trial pits TP5, TP6 and TP7 made ground was encountered to depths of between 0.20m and 0.70m and comprised dark brown and dark grey brown slightly gravelly slightly sandy clay with some roots and rootlets (topsoil) The gravel sized fragments were mainly fine to medium stone and localised coal and brick.

TP1 to TP4 were taken out in the area of the mound at the southern end of the site and in this area the made ground was encountered to depths of between 3.50m and in excess of 4.50m measured from the highest part of the mound. The made ground in this area comprised mainly dark brown slightly gravelly silty clay with rootlets with localised low brick and stone cobble and boulder content. The gravel sized fragments comprised brick and stone with localised burnt timber, slag, bituminous macadam, ceramics, glass, fabric and slate. TP4 was terminated in the made ground at a depth of 4.50m.

TP8 was taken out in the area of an infilled pond and in this area the made ground was encountered to a depth of 3.20m and comprised a zone of dark grey ashy slightly clayey gravel sized fragments of slag, then zones of brown, light grey and grey brown mottled slightly sandy slightly gravelly clay with low stone cobble content and with some rootlets, and zones of dark grey slightly clayey peat with low stone cobbles content. The gravel sized fragments comprised mainly stone and brick with localised ceramics and timber.

2.2.2 Drift Deposits

Drift deposits were encountered in all of the exploratory holes except TP4 and comprised mainly firm low strength becoming firm and stiff medium and high strength dark brown occasionally light grey and brown mottled locally gravelly silty clay. The gravel comprised mainly fine to coarse quartz, sandstone and siltstone. In TP3, TP5, TP6 and TP8 some plant remains and peat deposits were encountered within the shallow clay strata.

2.2.3 Groundwater

A summary of groundwater entries and levels are tabulated below:

TABLE 1

GROUNDWATER

Expl. Hole No.	Water Entry Depth (m)	Rate of Inflow	Depth to Standing Water Level* (m)
BH1	NR	NR	15.00
BH2	0.80	Seepage	DRY
внз	NR	NR	15.00
BH4	NR	NR	15.45
ВН5	NR	NR	10.45
TP1	2.00	Seepage	NR
TP2	1.80	Seepage	NR
TP3	1.80	Seepage	NR
TP3	2.30	Slow	NR
TP4	2.60	Seepage	NR
TP8	0.40	Seepage	NR

^{*} on completion NR = None 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 BH1, BH2 and BH5 found groundwater levels of between 0.20m and 5.80m.

3. SAMPLING, TESTING AND MONITORING

3.1 Sampling

Twenty five 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. 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

Fourteen hand shear vane tests were undertaken in the trial pits and the results are given on the appended Trial Pit Records.

Twenty six Standard Penetration Tests (SPTs) were performed in natural cohesive 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 appended Borehole Records.

Seven insitu California Bearing Ratio (CBR) tests and six modulus of subgrade reaction tests were carried out at the positions shown on Figure 2 and the results are appended.

On completion of TP5 and TP7 soakaway tests were undertaken in the natural cohesive strata. Water was added to the pits from a bowser and water levels were subsequently monitored over a period of 330 minutes to 375 minutes. The details of the soakaway tests are appended.

3.3 Installations and Monitoring

On completion of BH1, BH2 and BH5 hdpe standpipes were installed to depths of 6.00m, 6.00m and 6.00m 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 Records.

Monitoring of the standpipes for ground gas and groundwater has been undertaken on three 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
- Oedometer consolidation tests
- Compaction tests using a 4.5kg rammer
- Soluble sulphate content and pH value tests

Contamination analyses have been performed on nineteen soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. In addition the soil samples were subjected to the Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG) suite of analysis and fourteen samples were subjected to an asbestos screen.

Waste Acceptance Criteria (WAC) analysis has been undertaken on four soil samples.

Contamination analyses have been performed on three water samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. In addition the water samples were subjected to the Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG) suite of analysis.

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.

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 and Trial Pit Records and a summary of the ground conditions is given in Section 2.2.

4.2 Foundations

We understand that it is proposed to construct a new warehouse on the site as depicted on Figure 3. However, at the time of writing this report no specific details regarding 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 4.10m then mainly firm low strength becoming firm and stiff medium and high strength locally gravelly silty clay with localised plant remains and peat deposits within the shallow clay strata. The deeper made ground was encountered mainly at the southern extent of the site where the ground is mounded and in the area of an infilled pond at the northern end of the site.

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 we recommend that the proposed building is founded on strip footings for wall loads and pad foundations for column loads in the natural firm to stiff medium to high strength clays.

Atterberg limit tests on the cohesive strata indicate clays of low to high plasticity which are considered to have a low to 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.

In any areas where the natural strata is at a depth of in excess of 0.90m 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 2

SAFE BEARING CAPACITY

Expl Hole No.	Depth SPT Shear 'N' Strength Value			Safe Beari (kl	Recommended Minimum Foundation	
(m)	(kN/m²)	Strip Footing	Square Pad	Depth (m)		
BH1	1.35	8	32	60	70	2.00
	2.00	-	91	170*	205*	
Ì	3.15	9	36	65	80	
BH2	1.20	1/50	110	205*	250*	0.90
	2.15	15	60	110	135	
į	3.15	-	130	245	295	
внз	1.35	14	56	105	125	0.90
	2.00	-	167	315*	380*	
Ì	3.15	13	52	95	115	
BH4	1.20	7.5	180	340*	410*	0.90
	2.15	14	56	105	125	
į	3.15	-	114	215	255	
BH5	1.20	-	169	320	385	0.90
	2.15	13	52	95	115	
Î	3.15	_	150	285	340	

 Consideration must be given to weaker underlying strata which might be overstressed if loading is not reduced. 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 105 kN/m² for strip footings and 125 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 softer 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. Mv values are given on the appended oedometer consolidation test results sheets.

In strata similar to that found in BH2 the oedometer consolidation tests indicate that, for a strip footing 1.0m wide at a depth of 0.90m and exerting a ground bearing pressure of 105 kN/m², consolidation settlement in the order of 10 mm might be expected. Similarly oedometer consolidation tests indicate that, for a pad foundation 1.5m square at a depth of 0.90m exerting a ground bearing pressure of 125 kN/m², consolidation settlement in the order of 15 mm might be expected. We recommend that detailed settlement calculations are carried out for the final design scheme.

If a greater safe bearing pressure is required than that determined above then piled foundations would need to be considered.

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 predetermined 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 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 15.45m long pile taking into consideration the ground conditions at BH1, as follows:

Preliminary Pile Design based on strata in BH1

Bored Cast In-sit Dia. = 0.30m, Pe	u or CFA Pile rimeter = 0.94m, Cross Se	Factor of Safety: 2.5 (shaction Area = 0.07m², Leng	
0.00 to 0.20m	MADE GROUND		- ignore
0.20 to 2.00m	Low strength CLAY Allowable Shaft Friction Allowable Shaft Friction Lo	pad	c = 32 kN/m ² = 10.2 kN/m ² = <u>17 kN</u>
2.00 to 15.45m	Medium locally high streng Allowable Shaft Friction Allowable Shaft Friction Lo		c = 75 kN/m ² = 24.0 kN/m ² = 303 kN
15.45m	High strength CLAY Allowable End Bearing Allowable End Bearing Lo	ad	c = 92 kN/m ² = 276 kN/m ² = <u>19 kN</u>

Total Allowable Working Load = 17 + 303 + 19 = 339 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 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.

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.

The trial pit sides were found to remain vertical and stable for the relatively short period that they were left open and unsupported.

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.

Seepages and slow inflows were recorded in BH2 and TPs 1, 2, 3 and 8 at depths of between 0.40m and 2.60m. No groundwater entries were recorded encountered in the remainder of the exploratory holes although standing water levels of between 5.50 and 15.45m were recorded on completion of BHs 1, 3, 4 and 5. It should be noted that the exploratory holes 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 BH1, BH2 and BH5 found groundwater levels of between 0.20m and 5.80m.

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 (September 2005 revision), "Concrete in Aggressive Ground", should be followed.

Determination of pH on the soil and groundwater samples gave values in the range of 6.9 to 8.4.

Soluble sulphate concentrations were also determined for the soil and groundwater samples and the results ranged from <0.01 to 1.70 g/l and 0.064 to 0.068 g/l respectively.

The results indicate that the Design Sulphate Class for the site should be DS-1, except for any concrete in the area of the backfilled pond (TP8) where it should be DS-3.

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, except in the area of the backfilled pond (TP8) where an ACEC classification of AC-3 should be used.

4.6 Roads, Hardstandings and Car Parks

Six insitu Modulus of Subgrade Reaction (MSR) tests were carried out using a 600mm diameter steel plate at a depth of 0.60m in the area of the proposed warehouse building at the positions shown on Figure 2. The results of the MSR tests are appended and a summary is as follows:

TABLE 3

MSR TEST RESULTS

Expl. Hole No.	Depth (m)	Moisture Content (%)	MSR Value K ₇₅₂ (MN/m²/m)	Approx. CBR Value (%)	Description of Test Strata
PL1	0.60	20	36.2	4.9	Firm brown, orangish brown, grey, dark brown and greyish brown mottled siightly gravelly sandy silty CLAY with low siltstone and sandstone cobble content
PL2	0.60	12	27.3	3.0	Firm brown and grey mottied slightly gravelly sandy silty slightly friable CLAY.
PL3	0.60	21	21.8	2.0	Firm brown, grey and orangish brown slightly gravelly sandy silty CLAY with many lenses and bands of sand and with low siltstone cobble content.
PL4	0.60	21	29.7	3.4	Firm brown and grey mottled sandy silty CLAY.
PL5	0.60	26	19.4	1.6	Firm brown and grey mottled slightly gravelly slightly sandy slity CLAY with low siltstone and sandstone cobble content.
PL6	0.60	19	34.4	4.4	Firm brown, orangish brown and grey mottled sandy slity CLAY.

Given the above it would be advisable to design on a MSR value (k_{762}) of 19.4 MN/m²/m and a CBR value of 1.6% for the ground bearing floor slabs and hardstanding within the proposed warehouse.

Seven insitu California Bearing Ratio (CBR) tests have been undertaken at a depth of 0.60m in the area of the proposed car parks and hardstanding, at the positions shown on Figure 2 and the results of the tests are appended. A summary of the insitu CBR test results is as follows:

TABLE 4

INSITU CBR RESULTS

Expl. Hole No.	Depth (m)	Moisture Content (%)	CBR Value (%)	Strata
CBR1	0.60	18	9.0	Firm brown slightly gravelly slightly sandy silty CLAY with some lenses of sand.
CBR2	0.60	21	4.8	Firm brown and occasionally grey mottled slightly gravelly slightly sandy sitty CLAY.
CBR3	0.60	18	3.6	Firm brown and occasionally grey mottled slightly gravelly sity CLAY with occasional lenses of sand.
CBR4	0.60	22	2.9	Firm brown and occasionally orangish brown, grey, and dark brown mottled slightly gravelly slightly sandy sity CLAY.
CBR5	0.60	24	9.5	Firm brown and occasionally grey mottled slightly gravelly silty CLAY.
CBR6	0.60	27	3.0	Firm brown and greyish brown mottled slightly gravelly slightly sandy silty CLAY
CBR7	0.60	28	3.7	Firm brown and greyish brown slightly sandy silty friable CLAY.

It should be noted that the above values are generally moisture dependent and it is possible that the CBR values would reduce with increased moisture content; this being particularly so for cohesive strata.

Given the above it would be advisable to design on a CBR value of 2.9% for the proposed car parks and external hard standing. If there is to be a delay before construction, to prevent water softening, loosening and disturbance, the formation strata should not be exposed.

4.7 Contamination Considerations

At the outset it should be noted that this contamination investigation has been undertaken in order to provide an initial risk assessment on the level of contamination present. Based upon the findings of this investigation additional sampling, analysis and assessment may be required.

It should be appreciated that the suite of determinants consist of a range of common contaminants and the analysis is restricted to these in the absence of historical evidence of the source of the made ground. However, the absence of other specific contaminants cannot be guaranteed.

4.7.1 Assessment (Soil)

In order to provide an assessment of the presence of contamination nineteen soil samples have been analysed for a suite of determinants and the results are appended.

Levels of the determinants has been compared against published guideline values. 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. In July 2009 Generic Assessment Criteria (GACs) were published by Land Quality Management Limited (LQM) in conjunction with the Chartered Institute of Environmental Health (CIEH). 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 which superseded the GACs. The guideline values (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 warehouse and associated car parking, hardstanding and landscaping, 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 of contaminants 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.

An asbestos screen was undertaken on fourteen soil samples and no asbestos was detected.

6019 BAE Logistics Site

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

4.7.2 Assessment (Groundwater)

Three samples of groundwater have been taken from the standpipes installed in BH1, BH2 and BH5 and analysed for a suite of determinants.

The groundwater analyses determined one slightly elevated level of selenium (11µg/l) in the sample taken from BH5 when compared with the United Kingdom Drinking Water Standards (10µg/l). None of the contaminants tested for exceeded the Environment Agency's Environmental Quality Standards (EA EQS).

The United Kingdom Drinking Water Standard is a post treatment standard and as such is very stringent. Given the significant thickness of relatively impermeable cohesive deposits between the site and the underlying aquifer, in our opinion the very slightly elevated level of selenium does not warrant any further consideration.

4.7.3 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;
- (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.

6019 BAE Logistics Site

Our assessment, based on the results of the analyses undertaken only, indicates that there are no contaminants requiring remediation and/or precautions to be taken for the proposed development.

Should it be necessary to remove on-site materials from the site, classification of the waste should be undertaken before submitting the appended Waste Acceptance Criteria (WAC) analyses to appropriate waste carriers and/ or waste disposal site operators to determine the most appropriate tip to use and the associated costs.

SGVs, S4ULs, CL:AIRE and C4SLs 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.

4.8 Ground Gas Considerations

Ground gas monitoring has been undertaken on three 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 5 GROUND GAS CONCENTRATIONS AND FLOW RATE

Methane	Carbon Dioxide	Oxygen	Gas Flow Rate	
(% vol. in air)	(% vol. in air)	(% vol. in air)	(litres/ hour)	
0.0	0.0 - 2.7	14.1 – 20.6	<0.1 – 3.1	

It can be seen from the monitoring that no elevated levels of methane and only slightly elevated levels of carbon dioxide and depleted levels of associated oxygen in BH5, have 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 characterisation and remediation from ground gas in affected developments", published in October 2007 (BS.8485:2007).

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 $Q_{hgs} = 2.7/100 \times 3.1 = 0.084$ l/hr.

BS.8485:2007, Table 1, indicates that the site falls into Characteristic Situation CS2 (Low).

BS.8485:2007. Table 2, indicates that for a CS2 and the type of development proposed, protection and remedial measures giving a minimum score of 1.0 are required. BS.8485:2007 Table 3 indicates that the following combinations of protection and remedial measures could be considered:

- Reinforced concrete ground bearing floor slab. (Score 0.5)
- Taped and sealed membrane to reasonable levels of workmanship in line with current good practice with validation. (Score 0.5)

OR

 Reinforced concrete ground bearing foundation raft with limited service penetrations that are cast into the slab. (Score 1.5)

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.

4.9 Soakaways

On completion of TP5 and TP7 soakaway tests were undertaken in the natural cohesive strata. Water was added to the pits from a bowser and water levels were subsequently monitored over a period of 330 to 375 minutes . Details of the soakaway tests are appended.

The soil infiltration rate was unable to be determined in either test due to the relative impermeability of the test strata in both trial pits and the influx of perched groundwater in TP7. Consequently in our opinion a soakaway drainage solution is unlikely to be viable on this site.

4.10 Earthworks

We understand it is proposed to undertake cut and fill earthworks as indicated on the appended Figure 4.

Trial pits TP5. TP6. PL4 and PL6 were in taken out in the area of cut and four compaction tests have been carried out using a 4.5kg rammer in order to determine the dry density/moisture content relationship of the material to be reworked. The results of the compaction tests are appended and a summary is given in Table 6 below:

TABLE 6 DRY DENSITY/MOISTURE CONTENT RELATIONSHIP

Location	Depth (m)	Natural M.C. (%)	Optimum M.C. (%)	Max Dry Density (Mg/m³)	Sample Description
TP5	0.60	23	15	1.77	Orange brown, brown and light grey mottled sandy CLAY with lenses of light grey silty sand.
TP6 .	0.70	29	11	1.54	Orange brown and greyish brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
PL4	0.40	18	14	1.79	Orange brown , brown and yellow mottled slightly gravelly sandy CLAY. Gravel is fine to medium stone.
PL6	0.30	17	12	1.66	Dark greyish brown and brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium stone.

The above table indicates the following ranges were obtained:

- Natural Moisture Content 17% to 29%
- Optimum Moisture Content 11% to 15%
- Maximum Dry Density 1.54 to 1.79Mg/m³

The materials sampled and tested should be compacted in accordance with BS6031:2009 Code of Practice for Earthworks and the Department of Transport Specification for Highway Works.

- 1. Prior to the placement of any fill the surface should be scraped clear of any vegetation, topsoil, other deleterious material and any slurried or soft layers.
- 2. The material used for compaction should also have any vegetation, topsoil and other deleterious material removed from it.
- 3. The material should be compacted at a moisture content of \pm 2% of the optimum moisture content to give a maximum of 5% air voids at the field moisture content.
- 4. It should be noted that the natural moisture content of the material tested is generally significantly greater than the optimum moisture content. Consequently, the earthworks should be carried out in drier weather which will allow for reducing the moisture content or alternatively quick lime can be mixed into the fill material.
- 5. Great care should be taken during earthworks to ensure that compaction does not take place during wet weather or the clays are over compacted as the material may be susceptible to slurrying.
- 6. If any materials of differing nature and characteristics are to be considered for use, then additional testing will be required to confirm their suitability.

4.11 General

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 Miss Anna Marsden at our Preston office.

SUB SURFACE CONSULTANTS LIMITED REPORT No. 6019 JUNE 2015

D. B. Jones Cert. Nat. Sci., B.Sc.(Hons.), C.Env., MSEE., AIEMA., MIEnvSc. Senior Geoenvironmental Engineer For and on behalf of Sub Surface Consultants Limited

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. Tei. (01772) 561135 Fax (01772) 204907

Standard Penetration Test Results

: LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE Site

Job Number 6019

Client : AEW ARCHITECTS & DESIGNERS LTD

Sheet

Engineer: TRP CONSULTING LTD

1/1

Numper 3H1 3H1	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive	Test Type	Account to the second	Blows 5mm			11	1	Result	COOMENTS
		(m)	(m)		1 1	2	1	2	3	4		Comments
H1	1.20	1.35	1.65	SPT	1	1	2	2	2	2	N=8	
	3,00	3.15	3.45	SPT	2	2	2	2	2	3	· N=9	
Н1	5.00	5.15	5.45	SPT	2	2	3	3	3	4	N=13	
H1	7.50	7.65	7.95	SPT	2	2	3	3	4	34	N=14	
Hí	10.50	10.65	10.95	SPT	2	2	3	4	14	4	N=15	No Recovery
BH1	13.50	13.65	13.95	SPT	2	3	4	4	5	ē	N=18	
3H1	15,00	15.15	15.45	SPT	3	4	5	5	6	X	N=23	
H2	2.00	2.15	2.45	SPT	2	2	3	3	4	5	N=15	
H2	4.00	4.15	4.45	SPT	2	2	3	3	-4	4	N=14	
3H2	7.00	7.15	7.45	SPT	2	2	3	3	3	3	N=12	
3H2	10.00	10.15	10.45	SPT	2	3	5	5	â	6	N=22	
H3	1.20	1.35	1.65	SPT	2	2	3	3	4	4	N=14	
3H3	3.00	3.15	3.45	SPT	2	2	3	3	3	4	N=13	
IH3	5.00	5.15	5.45	SPT	2	2	3	3	-3	3	N=12	
1H3	7,50	7.65	7.95	SPT	3	3	3	4	4	4	N=15	
3H3	10.50	10.65	10.95	SPT	3	4	4	4	5	ă	N=18	
iH3	15.00	15.15	15.45	SPI	4	5	e	7	7	8	N=28	
- H4	2.00	2.15	2.45	SPT	3	3	3	3	4	4	N=14	
H4	4.00	4.15	4.45	SPT	2	3	4	4	ā	5	N=18	
3H4	6.00	6.15	6.45	SPT	2	2	3	3	3	3	N=12	
3H4	9,00	9.15	9.45	SPT	3	3	4	4	4	4	N=16	
3H4	12.00	12.15	12.45	SPT	3	4	5	6	6	6	N=23	
3H4	15.00	15.15	15.45	SPT	4	5	6	6	7	7	N=28	
iH5	2.60	2.15	2.45	SPT	2	3	3	3:	3	4	N=13	
3H5	4.00	4.15	4.45	SPT	i	2	2	3	3	3	N=11	
3H5	7.00	7.15	7.45	SPT	2	3	4	4	5	5	N=18	
H5	10.00	10.15	10.45	SPT	3	4	4	5	5	5	N=19	
							1	W.				
		· .						 				
								Q.				
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SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Insitu Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTON, LANCS

6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Job Number

Engineer:

TRP CONSULTING

1/1

	Ground Gas and Groundwater Monitoring Results Sheet						
	1	li dina das			i ling Result		Donth to
Date	Hole No.	Methane (% Volume)	Carbon Dioxide (% Volume)	Oxygen (% Volume)	Gas Flow Rate (l/hr)	Atmospheric Pressure (m bars)	Depth to Groundwater (m)
23/04/2015	BH1	0.0	0.0	20.6	<0.1	1010	0.60
	BH2	0.0	0.8	19.5	<0.1	1010	1.00
·	BH5	0.0	0.9	19.2	<0.1	1010	5.80
12/05/2015	BH1*			!			0.20
	BH2	0.0	0.7	19.4	<0.1	1001	0.95
	BH5	0.0	1.8	16.3	<0.1	1002	4.35
28/05/2015	BH1	0.0	0.0	20.4	<0.1	1000	0.45
	BH2	0.0	0.7	19.2	3.1	1001	0.95
· · · · · ·	BH5	0.0	2.7	14.1	<0.1	1001	3.85
		·					
-							

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

The standpipes were purged of water during the monitoring visit on 20/05/15

^{*}Water Level too high to allow readings to be taken.

SUB SURFACE SITE INVESTIGATION AND

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Insitu Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Engineer: TRP CONSULTING

1/1

Soakaway Test

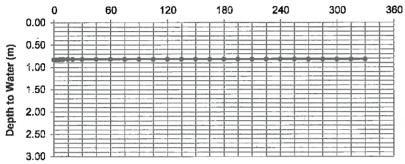
Hole No: TP5

TEST NO:

1

DATE: 07/04/15

Time (mins)



			1 1 1 1
Length of pit:	L =	1.50	m
Width of pit:	W =	0.47	m
Depth of pit	D =	1.80	m
Base area of pit:	A =	0.71	m²
100% effective depth	D100 =	0.83	m
75% effective depth	D75 =	1.07	m
50% effective depth	D50 =	1.32	m
25% effective depth	D25 =	1.56	m
time to D75	T75 =	_	sec
time to D25	T25 =	-	sec
time from D75 to D25	t _{p75-25} =	-	sec
(T25 - T75)	•		
volume between D75 & D25	$V_{p75-25} =$	0.34	m^{s}
(A x (D25 - D75))			
surface area to D50 inc. base	a _{p50} =	2.62	m^2
((2x(D-D50)x(W+L)) + A)	·		
SOIL INFILTRATION RATE	f =	v	, p75-25
			x t _{p75-25}
	_		_

Time	Depth
(min)_	(m)
0	0.83
0.5	0.83
1	0.83
2	0.83
3	0.83
4	0.83
5 7	0.83
	0.82
10	0.82
15	0.82
20	0.82
30	0.82
45	0.82
60	0.82
75	0.82
90	0.82
105	0.82
120	0.82
135	0.82
150	0.82
165	0.82
180	0.82
195	0.82
210	0.82
225	0.82
240	0.82
255	0.82
270	0.82
285	0.82
300	0.82
315	0.82
330	0.82

Test Strata: (see Trial Pit)

Remarks: *Unable to determine soil infiltration rate due to relative impermeability of tests strata.

f=

N/A*

m/sec

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Insitu Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Job Number

Engineer: TRP CONSULTING 1/1

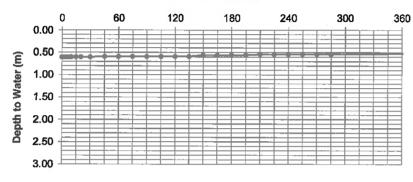
Soakaway Test

Hole No: TP7

TEST NO:

1 DATE: 07/04/15

Time (mins)



Length of pit:	L =	1.20	m
Width of pit:	W =	0.47	m
Depth of pit	D =	1.80	m
Base area of pit:	A =	0.56	m^2
100% effective depth	D100 =	0.61	m
75% effective depth	D75 =	0.91	m
50% effective depth	D50 =	1.21	m
25% effective depth	D25 =	1.50	m
time to D75	T 7 5 =	_	sec
time to D25	T25 =	-	sec
time from D75 to D25	t _{p75-25} =		sec
(T25 - T75)	p10-20		
volume between D75 & D25	V _{p75-25} =	0.34	m^3
(A x (D25 - D75))			
surface area to D50 inc. base	a _{p50} =	2.55	m^2
((2x(D-D50)x(W+L)) + A)			

SOIL INFILTRATION RATE

Time	Depth
(min)	(m)
0	0.61
0.5	0.61
1	0.61
2	0.61
3	0.61
4	0.61
5	0.61
7	0.61
10	0.60
15	0.60
20	0.60
30	0.60
45	0.59
60	0.59
75	0.59
90	0.59
105	0.59
120	0.59
135	0.59
150	0.56
165	0.56
180	0.56
195	0.56
210	0.54
225	0.54
240	0.54
255	0.54
270	0.54
285	0.54
375	0.52
	-::-

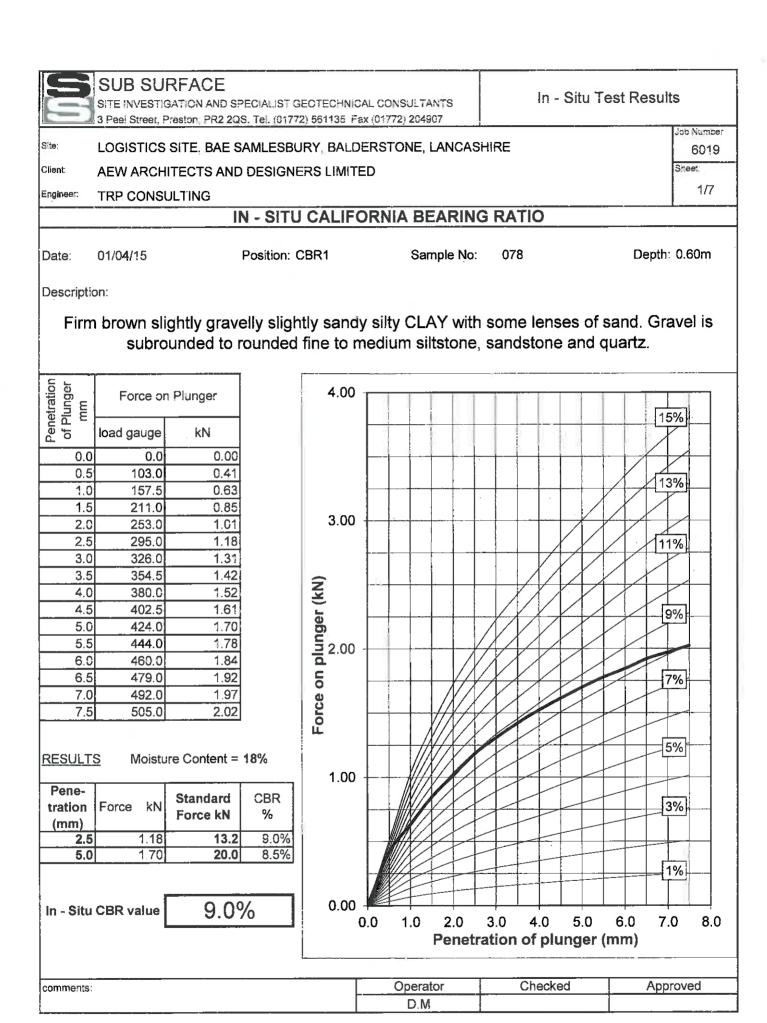
Test Strata: (see Trial Pit)

Remarks: *Unable to determine soil infiltration rate due to influx of groundwater

f =

N/A*

m/sec





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In - Situ Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Engineer:

TRP CONSULTING

2/7

IN - SITU CALIFORNIA BEARING RATIO

Date:

01/04/15

Position: CBR2

Sample No: 079

Depth: 0.60m

Description:

Firm brown and occasionally grey mottled slightly gravelly slightly sandy silty CLAY with many lenses of sand. Gravel is subangular to rounded fine to medium siltstone, sandstone and quartz.

Penetration of Plunger mm	Force on Plunger		
Peno of P	load gauge	kN	
0.0	0.0	0.00	
0.5	64.0	0.26	
1.0	94.0	0.38	
1.5	117.5	0.47	
2.0	138.0	0.55	
2.5	156.5	0.63	
3.0	173.0	0.69	
3.5	188.0	0.75	
4.0	202.0	0.81	
4.5	214.0	0.86	
5.0	225.5	0.90	
_5.5	236.0	0.95	
6.0	247.0	0.99	
6.5	254.5	1.02	
7.0	262.5	1.05	
7.5	271.0	1.09	

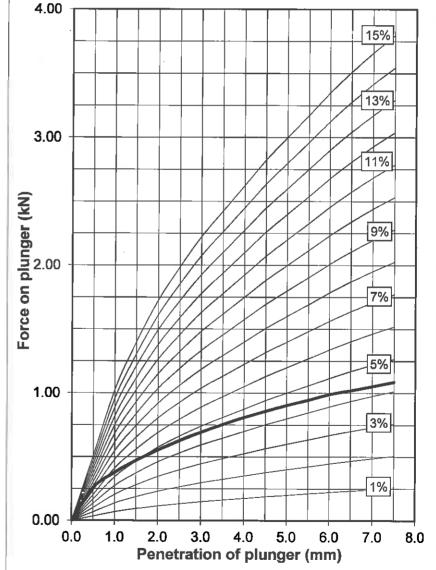


Moisture Content = 21%

Pene- tration (mm)	Force	kN	Standard Force kN	CBR %
2.5		0.63	13.2	4.8%
5.0		0.90	20.0	4.5%

In - Situ CBR value

4.8%



comments:	Operator	Checked	Approved
	D.M		



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In - Situ Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Ctient:

AEW ARCHITECTS AND DESIGNERS LIMITED

6019 Sheet:

Engineer

TRP CONSULTING

3/7

IN - SITU CALIFORNIA BEARING RATIO

Date:

01/04/15

Position: CBR3

Sample No: 080

Depth: 0.60m

Description:

Firm brown and occasionally grey mottled slightly gravelly silty CLAY with occasional lenses of sand. Gravel is subrounded to rounded fine to medium siltstone, sandstone and quartz.

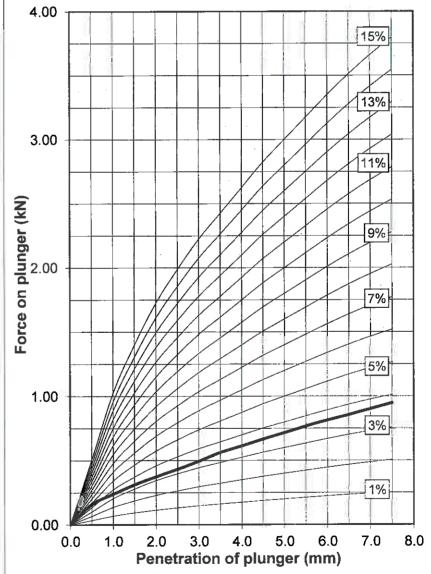
Penetration of Plunger mm	Force on Plunger load gauge kN		
0.0	0.0	0.00	
0.5	39.5	0.16	
1.0	59.5	0.24	
1.5	78.0	0.31	
2.0	93.5	0.37	
2.5	108.0	0.43	
3.0	123.5	0.49	
3.5	140.5	0.56	
4.0	153.0	0.61	
4.5	166.5	0.67	
5.0	178.5	0.72	
5.5	191.5	0.77	
6.0	203.0	0.81	
6.5	213.5	0.86	
7.0	225.0	0.90	
7.5	236.5	0.95	

RESULTS Moisture Content = 18%

Pene- tration (mm)	Force	kN	Standard Force kN	CBR %
2.5		0.43	13.2	3.3%
5.0		0.72	20.0	3.6%

In - Situ CBR value

3.6%



comments: Operator Checked Approved
D.M Approved



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In - Situ Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Client: AF

AEW ARCHITECTS AND DESIGNERS LIMITED

5019 Sheet:

Engineer:

TRP CONSULTING

4/7

IN - SITU CALIFORNIA BEARING RATIO

Date:

01/04/15

Position: CBR4

Sample No: 081

Depth: 0.60m

Description:

Firm brown and occasionally orangish brown, grey and dark brown mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse siltstone, sandstone and quartz.

Penetration of Plunger mm	Force on Plunger		
Pene of P	load gauge	kN	
0.0	0.0	0.00	
0.5	42.5	0.17	
1.0	62.0	0.25	
1.5	74.5	0.30	
2.0	86.5	0.35	
2.5	94.0	0.38	
3.0	104.5	0.42	
3.5	113.5	0.45	
4.0	120.5	0.48	
4.5	127.0	0.51	
5.0	134.0	0.54	
5.5	138.5	0.55	
6.0	143.5	0.58	
6.5	147.5	0.59	
7.0	152.0	0.61	
7.5	156.5	0.63	

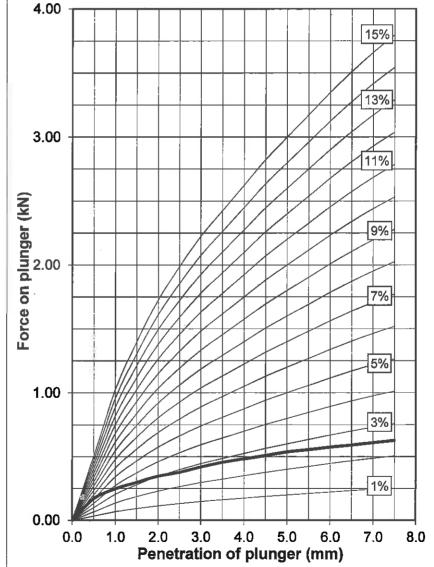
RESULTS

Moisture Content = 22%

Pene- tration (mm)	Force	kN	Standard Force kN	CBR %
2.5		0.38	13.2	2.9%
5.0		0.54	20.0	2.7%

In - Situ CBR value

2.9%



comments:	Operator	Checked	Approved
	D.M		



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In - Situ Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Engineer:

TRP CONSULTING

5/7

IN - SITU CALIFORNIA BEARING RATIO

Date:

01/04/15

Position: CBR5

Sample No: 082

Depth: 0.60m

Description:

Firm brown and occasionally grey mottled slightly gravelly silty CLAY. Gravel is subrounded fine to medium siltstone, sandstone and quartz.

Penetration of Plunger mm	Force on Plunger		
Pe	load gauge	kN	
0.0	0.0	0.00	
0.5	111.0	0.44	
1.0	170.0	0.68	
1.5	223.0	0.89	
2.0	262.0	1.05	
2.5	311.0	1.25	
3.0	356.0	1.43	
3.5	384.0	1.54	
4.0	420.0	1.68	
4.5	449.0	1.80	
5.0	473.0	1.90	
5.5	496.0	1.99	
6.0	518.0	2.08	
6.5	535.0	2.14	
7.0	557.0	2.23	
7.5	569.0	2.28	

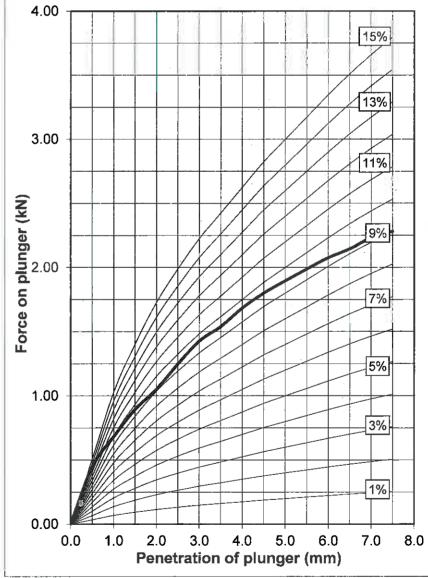
RESULTS

Moisture Content = 24%

Pene- tration (mm)	Force	kN	Standard Force kN	CBR %
2.5		1.25	13.2	9.4%
5.0		1.90	20.0	9.5%

In - Situ CBR value

9.5%



omments:	Operator	Checked	Approved
	D.M		



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

In - Situ Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

6019 Sheet:

Engineer:

TRP CONSULTING

6/7

IN - SITU CALIFORNIA BEARING RATIO

Date:

01/04/15

Position: CBR6

Sample No: 083

Depth: 0.60m

Description:

Firm brown and greyish brown mottled slightly gravelly slightly sandy silty CLAY with occasional roots and rootlets. Gravel is subangular to subrounded fine to medium siltstone, sandstone and quartz.

Penetration of Plunger mm	Force o	n Plunger
Pen of P	load gauge	kN
0.0	0.0	0.00
0.5	37.5	0.15
1.0	54.0	0.22
1.5	72.0	0.29
2.0	85.5	0.34
2.5	98.0	0.39
3.0	110.0	0.44
3.5	118.5	0.47
4.0	131.0	0.52
4.5	142.5	0.57
5.0	151.0	0.61
5.5	160.0	0.64
6.0	167.5	0.67
6.5	174.0	0.70
7.0	180.5	0.72
7.5	187.0	0.75

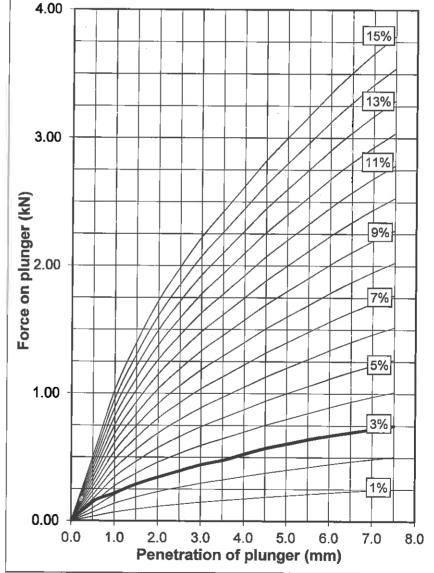


Moisture Content = 27%

Pene- tration (mm)	Force	kN	Standard Force kN	CBR %
2.5		0.39	13.2	3.0%
5.0		0.61	20.0	3.0%

In - Situ CBR value

3.0%



comments;	Operator	Checked	Approved
	D.M		



SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 2G4907

In - Situ Test Results

Site:

LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE

Job Number 6019

Client.

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Engineer,

TRP CONSULTING

7/7

IN - SITU CALIFORNIA BEARING RATIO

Date:

01/04/15

Position: CBR7

Sample No: 084

Depth: 0.60m

Description:

Firm brown and greyish brown slightly sandy silty friable CLAY.

Penetration of Plunger	E		n Plunger
P. O		load gauge	kN
0	0.0	0.0	0.00
0	.5	60.5	0.24
1	.0	80.5	0.32
1	.5	98.5	0.39
2	2.0	111.0	0.44
2	5	121.5	0.49
3	3.0	130.5	0.52
3	3.5	139.5	0.56
4	.0	147.0	0.59
4	.5	155.0	0.62
5	5.0	161.0	0.65
. 5	5.5	167.0	0.67
E	3.0	171.0	0.69
(3.5	176.5	0.71
7	7.0	182.0	0.73
7	7.5	187.0	0.75

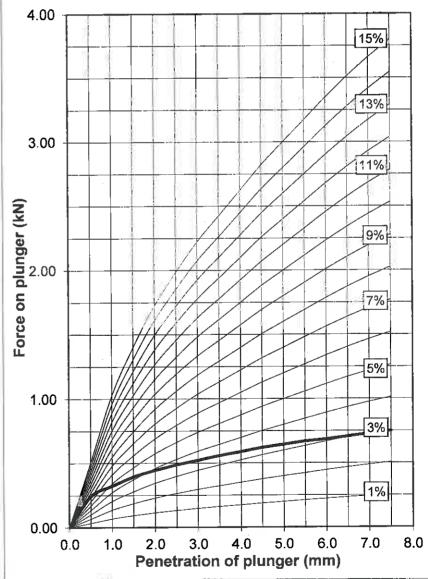
RESULTS

Moisture Content = 28%

Pene- tration (mm)	Force	kN	Standard Force kN	CBR %
2.5		0.49	13.2	3.7%
5.0		0.65	20.0	3.2%

In - Situ CBR value

3.7%



comments:	Operator	Checked	Approved
	D.M		

	SUB SURFAC SITE INVESTIGA 3 Peel Street, Pre	E LIMITED ATION AND SPECIA eston, PR2 2QS Te	ALIST GEOT	TECHNICAL COI	NSULTANTS	In-Situ	Test
Site:					E, LANCASHIRE		Job Number: 6019
Client:	AEW ARCHITE	ECTS AND DESI	GNERS L	IMITED			Sheet:
ngineer.	TRP CONSUL	TING					1/6
			Modulu	s of Subgrade	Reaction Test	<u>-</u>	
osition:	PL1	Sample No:	85	Depth:	0.60m	Date:	08-Apr-15
late Size	e: 600mn	п					
	Description:						
	Firm brown, ora silty CLAY wi	th low siltstone a	nd sandst	rown and greyi one cobble cor stone, sandsto	sh brown mottled slig tent. Gravel is suban ne and quartz.	htly gravelly sand gular to rounded	у
ummary	y of Results:			<u> </u>			
			Time S	ettlement Rel	ationship.		
0.0 +-	10 kN/m²	5		10	15	20	25
0.5	20 kN	30 kN/m²				0 k	l/m²
Settlement (mm)			40 kN/m²	50 kN/m²			
2.5 Left					60 kN/m ²		
2.0				Elapsed Time (mi	1)		
			Lo	ad Settlement	Curve		· · · · · ·
				Mean Bearing	Pressure (kN/m²)		
, William		10	20	30	40	50 55.2kWm²	60 70
Mean Disto Sofflement Imm)			9				· ·
14						100	
å	1 1.25mm	MALI BERNIT MATALAN					The state of the s
<u> </u>	<u> </u>						
260	2						
	2						
[i	Pressure (kN/m²)	Deflection (mm)				
ſ	0	0.000	\neg				
	10	0.062					
	20	0,262 0,530			initial Seating Load:		: Lat2
	30				occurry Load.		kNm ⁻²
	30 40	0.820			Moisture Content:	20	%
	40 50	0.820 1.082			Load @ 1.25mm Penetra	tion 55.2	% kNm ⁻²
	40	0.820				tion 55.2	

Operator:

DM

Checked:

CAM

Approved:

CAM

Comments:

9	SITE INVE	RFACE LIN	AND SPECIAL!	ST GEOTECHNICA	AL CONSULTANTS		In-Situ Te	st					
Site:	'			01772) 561135 Fa	STONE, LANCASH	IRE		lob Number: 6019					
Cilenti	AEW AR	CHITECTS	S AND DESIG	NERS LIMITED			1	Sheet:					
Engineer:	meer: TRP CONSULTING Modulus of Subgrade Reaction Test												
	1111 001			Modulus of Sul	grade Reaction T	est							
Position:	P12	Sa	ample No:	86 Dept	n: 0.60m		Date:	07-Apr-15					
Plate Siz	.e: 6	300mm						8					
ļ	Descripti	on:											
	Firm	brown and subangu	d grey mottled ular to subrour	slightly gravelly anded fine to coars	sandy silty slightly f se siltstone, sandst	riable CLAY. G one and quartz	ravel is						
Summar	ry of Resu	ılts:		11.00									
				Time Settleme	nt Relationship.								
0.0	0	5	10 .	15 2	25	30	35	40 46					
0.0		10 k/V/m²	2	D kN/m²				0 kN/m²					
Ē	8 6 6		2	30 k	Utm²								
<u>E</u> <u>E</u> 1.0				2 1	401011114								
Scittement (mm)		}		1 1 1		50 Jovim	12						
] 2.0													
				Elapsed	Time (min)								
				Load Sett	ement Curve								
				Mean	Bearing Pressure (ki								
	(E E		10	Zu Zu	30	40 41.8kA	¥m² 50	6C					
	Mean Plate Settlement (mm)												
	#Hem												
	9 1.25mm	and any reason we so don't do the bear		notes a second contract of the first terms.			part server of the state of the	Comment of the street of the s					
	Plat			NE									
	2 1					1							
		1,00											
	Pressure		Deflection (mm 0.000)									
	1		0.297	1									
	2		0.527	Į	Initial Caption	a Load:	5	kNm ⁻²					
	l l	0	0.825 1.190	1	Initial Seating Moisture Cor	="	12	%					
	_ 5	0	1.567			mm Penetration		kNm ⁻² MN/m ² /m					
)	0.527			Subgrade React e CBR Value =	3.0						
					• •								
Comi	ments:	.			Op	erator:	Checked:	Approved:					
1						DM:	CAM	CAM					

	RFACE LIMITED ESTIGATION AND SPECIALI	ST GEOTECHNICAL	CONSULTANTS	In-Situ Test					
	eet, Preston, PR2 2QS Tel (I ICS SITE, BAE SAMLES!			Job Number: 6019					
Client: AEW ARCHITECTS AND DESIGNERS LIMITED									
Engineer: TRP CO	3/6								
Position: PL3	Sample No:	87 Depth:	0.60m	Date: 07-May-15					
Plate Size:	600mm	•							
Descripti	on:								
Firm br bands	of sand and low siltstone	rown slightly gravel cobble content. Gr e siltstone, sandsto	ly sandy silty CLAY with m avel is subangular to subrence ne and quartz.	any lenses and ounded fine to					
Summary of Resu	its:								
		Time Settlement	Relationship.						
0	5 10	15	20 25	30 35 40					
0.0		15	20 25						
	10 kN/m²	thum²		0 kN/m²					
Settlement (mm)									
1.0		 	30 kN/m²						
Settl				40 kN/m²					
2.0									
2.0		Elapsed Time	(min)						
		Load Settleme	ent Curve	-					
		Mean Bea	ring Pressure (kN/m²)						
Mean Plate Settlement (mm)	10	20	30 33.3leV/m	12 40 50					
neut .									
the state of									
ගී 1 <u>ම</u> 1.25mm		44		The state of the s					
- Pa									
2			1111						
Pressure (LAL(-2) Deflection (mm)	¬	·						
Pressure (kN/m²) Deflection (mm) 0.000	1							
10	0.370								
20 30	0.755 1.148		Initial Seating Load:	5 kNm²					
40			Moisture Content:	21 %					
0	0.308		Load @ 1.25mm Penetratio						
			Modulus of Subgrade Re Approximate CBR Value						
Comments:			Onerator:	Checked: Annoved					

DM

CAM

CAM

	SUB SURFACE SITE INVESTIGAT	ION AND SPECIAL					in-Situ T	est			
e	3 Peel Street Preston PR2 2QS Tel (01772) 561135 Fax (01772) 204907 LOGISTICS SITE, BAE SAMLESBURY, BLADERSTONE, LANCASHIRE										
ent:	AEW ARCHITEC	CTS AND DESIG	NERS LI	MITED				Sheet:			
gineer:	TRP CONSULTI	NG						4/6			
					Reaction Tes	<u>. </u>					
sition:	PL4	Sample No:	88	Depth.	0.60m		Date:	08-Apr-15			
ite Size	e: 600mm										
	Description:										
		Firm bro	wn and di	ev mottled sa	indy silty CLAY						
			J.	- ,							
nmar	y of Results:							-			
			Time S	ettlement Rel	ationship.						
0,0		10	15	2	25		30	35 40			
	10	KN/m²	20 KN T2	1077							
Settlement (mm)			1 1 1 1	30 kN/m²							
1.0				10 10	40 kN/m²	111		\times			
E E		10/22				50 ki\l/m²	i0 kNm²				
•							++/				
2.0		1980		Elapsed Time (m	in)	1 1	<u> </u>				
			1 00	ad Settlemen	Curve						
			LOC			-21					
	Ê û	10	20	wean Bearing	g Pressure (kN/n 40	1 -) 46.2₹₩÷≗ 5 0	ı	60 .7			
	ment (mm)						<u> </u>				
			[]					Ni d			
	Mean Plate Settle		100								
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	4		- 1		1000			-			
	2							1			
	Pressure (kN/m²)	Deflection (mm	1) [4]								
	0	0.000									
	10	0.397	8								
	20 30	0.630 0.857	İ		Initial Seating L	oad:	5	kNm²			
	40	1.098			Moisture Conte			%			
	50 60	1.393 1.627	6		Load @ 1.25mm Modulus of Su			kNm ⁻² MN/m ² /m			
	0	0.562			Approximate C			· %			
					. Ab. evillare		3.7	· •=			
Comm	nents:				Oper	ator:	Checked:	Approved:			
					ום ו		CAM	CAM			

5	SUB SURFAC		INT GEOTEOU	NIOAL OC							City 1	Toot	
		TION AND SPECIAL eston, PR2 2QS Tel					1				-Situ		
Site:	190001100 OTTE, BILL OF WILLESDOTT, BEIDERO TOTAL, BRITOROTTINE												mber: 6019
Client: AEW ARCHITECTS AND DESIGNERS LIMITED												Sheet:	
Engineer:	TRP CONSULT	TING											5/6
			Modulus of	Subgrad	de Rea	action	1 Test						
Position: Plate Size		Sample No:	89 D	epth:	ı	0.60m	1			Da	ite:	08-A	pr-15
1210 0121		•											
		ind grey mottled s oble content. Grav	el is subangula										
Summan	y of Results:												
- carring	y or results.												
			Time Settle	ment Re	lation	ship.							
0		5			en.				4	-			
0.0	10 kN/m²	5			10			1 1	1	5			20
Ē		20 kN/m²											D kN/m²
Settlement (mm)													O KIWIII-
Jeme			30	0 kN/m²									
Sett					1						_		
							40 kN/	m²					
2.0 1	<u> </u>		Elaps	sed Time (n	nin)								
				441	4.0								
				ettlemen		_							
	÷ .		Mea	an Bearin	g Pres)					
	O D D D D D D D D D D D D D D D D D D D	10		20		29.5	kN/m30				40		50
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1	හු 1.25mm		" " " " " " " " " " " " " " " " " " "		MIMIN				-	HANGHAN BIRDS		Mic Michigan Mc Michigan o McCont of T	to 1 MATTARE
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	ĕ 2 <u> </u>										-		
- 1	Pressure (kN/m²)		<u> </u>										
	0 10	0.000 0.153	!										
ĺ	20	0.707											
	30	1.280			Initia	l Seati	ng Loa	d:			5	kNm ⁻²	
	40	1.898					ontent:					%	
	0	0,855			-	_		enetrati grade R		on		kNm ⁻² MN/m ² /	m
								R Value		-11		%	···
L	<u> </u>												
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SUB SURFACE
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 581135 Fex (01772) 204907

Laboratory Test Results

Site

: LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE

Job Number 6019

Client : AEW ARCHITECTS & DESIGNERS LTD

Sheet

Engineer: TRP CONSULTING LTD

1/2

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

Boreholei :	Depth		Natural Moisture	Sample 425µm	Passing Sieve	Liquid Limit	quid Plastic		Liquidity	Group	Labouston Doggrinfion	
Trial Pit	(m)	Sample	Content %	Percentage	Moisture Content	Limit .%	Limit %	Index %	Index	Group Symbol	Laboratory Description	
BH1	2,50	U	18	89	18	34	15	19	0,16	CL	Brown slightly gravelly sandy silty CLAY. Gravel is fine to medium stone.	
BH1	4.00	υ	21	92	23	45	19	26	0.15	CI	Dark brown slightly gravelly silty CLAY. Gravel is fine to medium stone.	
BH2	1.20	U	17	99	17	36	17	19	0.00	CI	Dark greyish brown slightly gravelly silty CLAY. Gravel is fine to medium stone.	
BH3	1.20	D.	17	97	18	42	20	22	-0.09	CI	Dark brown and occasional grey mottled silty CLAY.	
внз	2.00	1911	16	99	16	38	17	21	-0.05	CI	Brown gravelly silty CLAY. Gravel is fine to medium stone.	
BH4	1,20	U	18	91	20	40	20	20	0.00	CI	Dark brown and occasional grey slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to medium quartz and sandstone.	
Вн4	3.00	u	19	97	20	44	20	24	0.00	CI	Brown slightly gravelly silty CLAY. Gravel is fine to coarse stone.	
вн5	1.20	U	(17)	97	18	40	18	22	0.00	Cl	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.	
BH5	3.00	บ	18	S8	19	40	18	22	0,05	CI	Dark brown slightly gravelly silty CLAY. Gravel is fine to medium stone.	
∖T₽5	0.40	8	15	97	15	30	17	13	-0.15	CL	Brown, orange brown, light grey, red brown, greenish brown and yellow brown mottled sandy gravelly silty CLAY. Gravel is subangular fine to coarse quartz, sandstone and siltstone.	
TP8	0.70	8	24	92	28	50	23	27	0.11	CI/CH	MADE GROUND: dark brown slightly sandy gravelly clay (subsoil) with some rootlets. Gravel sized fragments are fine to coarse stone.	
TP7	1,20	۵	25	94	27	55	24	31	0.10	СН	Brown, light brown, light grey and greenish brown slightly sandy slightly gravelly CLAY with occasional rootlets and lenses of silty fine to medium sand. Gravel is subangular to subrounded fine to coarse quartz, sandstone and siltstone.	
TP8	3.60	D	22	92	24	43	19	24	0.21	CI	Brown and light grey mottled slightly sandy slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz, sandstone and siltstone.	
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				g								
					,							

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



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

Laboratory Test Results

Site

: LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE

Job Number 6019

Client : AEW ARCHITECTS & DESIGNERS LTD

6019

Engineer: TRP CONSULTING LTD

1/2

Sheet

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

Borehole/ Trial Pit	Depth (m)	Sample	Molsture Content %	Bulk Density (Mg/m²)	Dry Density (Mg/m³)	Cell Pressure (kN/m²)	Deviator Stress (kN/m²)	Apparent Cohesion (kN/m²)	Angle of Shearing Resistance (degrees)	Laboratory Description
BH1	2.00	U	18	2.11	1.79	50 100 150	182 0 0	91	0.0	Brown slightly gravelly sandy slity CLAY. Gravel is fine to medium stone.
BH1	4.00	U	21	2.21	1.84	100 150 200	137 138 138	69	0.0	Dark brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
BH1	6.00	υ	31	2.23	1.71	125 175 225	160 161 162	81	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
BH1	9.00	U	17	2.21	1.88	200 250 300	184 184 186	92	0.0	Brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to medium stone.
BH1	12.00	U	18	2.23	1.89	250 300 350	254 259 264	130	0.0	Dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to medium quartz and mudstone.
BH2	1,20	U	17	2,09	1.79	25 75 125	219 0 0	110	0.0	Dark greyish brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
BH2	3.00	U	20	2.13	1.77	75 125 175	259 262 0	130	0.0	Brown slightly gravelly sitty CLAY. Gravel is fine to medium stone.
BH2	8.50	u	16	1.92	1.65	175 225 275	125 0 0	63	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
внз	2.00	U	16	2.13	1.83	50 100 150	334 0 0	167	0.0	Brown gravelly sitty CLAY. Gravel is fine to medium stone.
внз	4.00	U	18	2.18	1.84	100 150 200	184 193 198	96	0.0	Brown slightly gravelly silty CLAY. Gravel is fine stone.
внз	6.00	U	17	2.17	1.86	125 175 225	181 156 160	78	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
внз	9.00	U	15	2.22	1.93	200 250 300	218 226 233	113	0.0	Dark brown gravelly silty CLAY. Gravel is fine to medium stone.
внз	12.00	U	18	2.13	1.81	250 300 350	211 213 217	107	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
внз	13.50	U	20	2.18	1.82	275 325 375	245 255 260	127	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
BH4	1.20	U	18	2.19	1.86	25 75 125	354 355 370	180	0.0	Dark brown and occasional grey slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to medium quartz and sandstone.
BH4	3.00	U	19	2.11	1.78	75 125 175	227 229 229	114	0,0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse stone.
BH4	5.00	U	19	2.17	1.83	100 150 200	188 197 201	98	0.0	Dark brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to coarse quartz and sandstone.
BH4	7.50	U	30	1.88	1.44	150 200 250	83 0 0	42	0.0	Dark brown silty CLAY.
,										

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

:



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

Laboratory Test Results

: LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE Site

Job Number 6019

Client : AEW ARCHITECTS & DESIGNERS LTD

Sheet

Engineer: TRP CONSULTING LTD

2/2

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

Borenole/ Trlai Pit	Depth (m)	Sample	Moisture Content	Bulk Density (Mg/m²)	Dry Density (Mg/m²)	Cell Pressure (kN/m²)	Ceviator Stress (KN/m²)	Apparent Cohesion (kN/m²)	Angle of Shearing Resistance (degrees)	Laboratory Description
BH4	10.50	U	18	2.18	1,63	225 275 325	180 185 189	92	0.0	Dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to medium quartz and sandstone.
BH4	13.50	υ	17	2.20	1.88	275 325 375	254 257 283	129	0.0	Brown slightly gravelly silty CLAY. Gravel is fine stone.
SH5	1.20	'n	17	2.11	1,81	25 75 125	338 0 0	189	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
BH5	3.00	U	18	2.07	1.76	7ā 125 175	289 301 311	150	G.0	Dark brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
BH5	5,5G	u	18	2.20	1.87	125 175 225	139 140 142	70	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to medium stone.
3H5	8.50	u	19	2.11	1,77	175 225 275	190 191 194	96	0.0	Brown slightly gravelly silty CLAY. Gravel is fine to coarse stone.
				0	2.					
						3				
									3	
		1								

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

EBS 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

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Laboratory Test Results

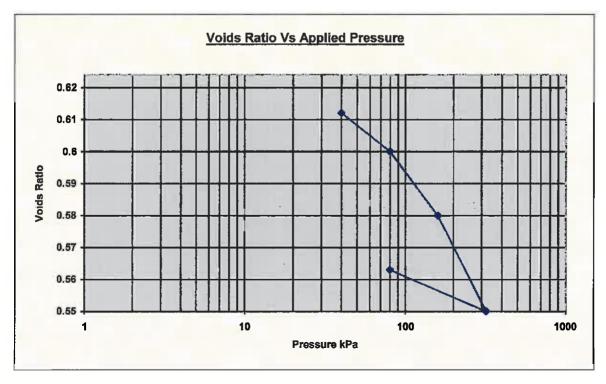
One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	190 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		
Borehole	BH1	Sample	190

Test Details						
Standard	BS 1377: Part 5 : 1990 : Clause 3	Particle Density	2.65 Mg/m3			
Sample Type	Undisturbed sample - open drive	21.0 deg.C				
Sample Depth	2.00 m					
Sample Description	Dark brown and occasional grey mottled slightly gravelly silty CLAY with occasional plant remains. Gravel is subrounded to rounded fine to medium siltstone.					
Variations from Procedure	None					

Specimen Details						
Specimen Reference	Α	Description	As Above			
Depth within Sample	0.00mm	Orientation within Sample	None			
Specimen Mass	174.03 g	Condition	Natural Moisture			
Specimen Height	20.00 mm	Preparation	Natural Undisturbed			
Comments						

Test Apparatus						
Ring Number	1	Ring Diameter	75.00 mm			
Ring Height	20.00 mm	Ring Weight	114.82 g			
Lever Ratio	9.00 : 1					



Height of Solid Particles	12.32 mm	Swelling Pressure	0.0 kPa	

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Laboratory Test Results

One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	190 (WAC)
Project	Logistics Site, BAE, Samlesbury, Lancashire	Job	6019
Borehole	BH1	Sample	190

Initial Moisture Content*	20.7 %	Final Moisture Content	19.7 %
Initial Bulk Density	1.97 Mg/m3	Final Bulk Density	2.03 Mg/m3
Initial Dry Density	1.63 Mg/m3	Final Dry Density	1.69 Mg/m3
Initial Void Ratio	0.6239	Final Void Ratio	0.5635
Initial Degree of Saturation	87.90%	Final Degree of Saturation	92.60 %

• Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	Coefficient of Volume Compressibility (m _v)	Coefficient of Consolidation (c _v)
0.00		
40.0 kPa	0.18 m2/MN	1.97 m2/yr
80.0 kPa	0.19 m2/MN	1.30 m2/yr
160.0 kPa	0.15 m2/MN	1.79 m2/yr
320.0 kPa	0.12 m2/MN	1.11 m2/yr
80.0 kPa	0.04 m2/MN	

Method of Time Fitting Used	Square Root Time

Tested By and Date:	WAC	07 May 15
Checked By and Date:		
Approved By and Date:		

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Laboratory Test Results

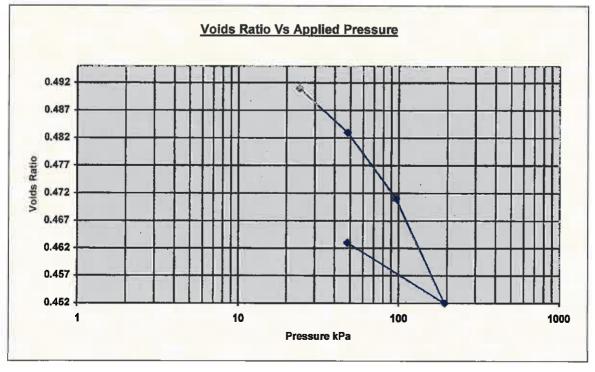
One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	124 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		
Borehole	BH2	Sample	124

Test Details			
Standard	BS 1377: Part 5 : 1990 : Clause 3	Particle Density	2.65 Mg/m3
Sample Type	Undisturbed sample - open drive	Lab Temperature	21.0 deg.C
Sample Depth	1.20 m		
Sample Description	Dark brown and occasional grey mottled remains.	silty CLAY with occasion	al plant
Variations from Procedure	None		

Specimen Details			
Specimen Reference	Α	Description	As Above
Depth within Sample	0.00mm	Orientation within Sample	None
Specimen Mass	181.69 g	Condition	Natural Moisture
Specimen Height	20.00 mm	Preparation	Natural Undisturbed
Comments			

Test Apparatus			
Ring Number	2	Ring Diameter	75.00 mm
Ring Height	20.00 mm	Ring Weight	115.01 g
Lever Ratio	9.00 : 1		



Height of Solid Particles	13.38 mm	Swelling Pressure	0.0 kPa

Laboratory Test Results

One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	124 (WAC)
Project	Logistics Site, BAE, Samlesbury, Lancashire	Job	6019
Borehole	BH2	Sample	124

Initial Moisture Content*	16.0 %	Final Moisture Content	16.5 %
Initial Bulk Density	2.06 Mg/m3	Final Bulk Density	2.11 Mg/m3
Initial Dry Density	1.77 Mg/m3	Final Dry Density	1.81 Mg/m3
Initial Void Ratio	0.4951	Final Void Ratio	0.4633
Initial Degree of Saturation	85.72%	Final Degree of Saturation	94.30 %

Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	Coefficient of Volume Compressibility (m _v)	Coefficient of Consolidation (c _v)
0.00		
24.0 kPa	0.13 m2/MN	3.27 m2/yr
48.0 kPa	0.21 m2/MN	2.93 m2/yr
96.0 kPa	0.18 m2/MN	3.20 m2/yr
192.0 kPa	0.13 m2/MN	1.19 m2/yr
48.0 kPa	0.05 m2/MN	
ļ <u></u>		

Method of Time Fitting Used Square Root Time	
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Tested By and Date:	WAC	07 May 15
Checked By and Date:		
Approved By and Date:		

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Laboratory Test Results

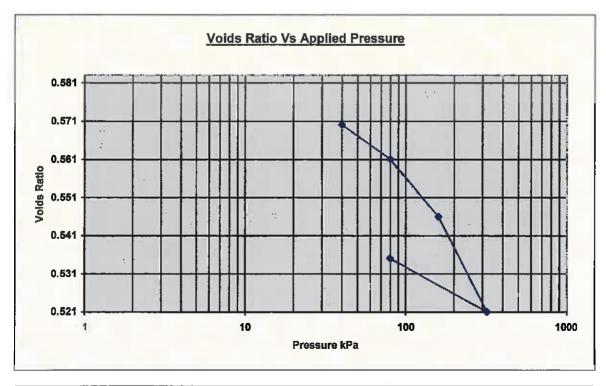
One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	217 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		·
Borehole	BH3	Sample	217

Test Details				
Standard	BS 1377: Part 5 : 1990 : Clause 3	Particle Density	2.65 Mg/m3	
Sample Type	Undisturbed sample - open drive	Lab Temperature	21.0 deg.C	
Sample Depth	2.00 m			
Sample Description	Dark brown and occasional grey mottled slightly gravelly silty CLAY with occasional plant remains. Gravel is subrounded to rounded fine to medium siltstone.			
Variations from Procedure	None			

Specimen Details				
Specimen Reference	Α	Description	As Above	
Depth within Sample	0.00mm	Orientation within Sample	None	
Specimen Mass	175.08 g	Condition	Natural Moisture	
Specimen Height	20.00 mm	Preparation	Natural Undisturbed	
Comments				

Test Apparatus			
Ring Number 3 Ring Diameter 75.00 mm			
Ring Height	20.00 mm	Ring Weight	112.42 g
Lever Ratio	9.00 : 1		



Height of Solid Particles	12.64 mm	Swelling Pressure	0.0 kPa

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Laboratory Test Results

One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	217 (WAC)
Project	Logistics Site, BAE, Samlesbury, Lancashire	Job	6019
Borehole	BH3	Sample	217

Initial Moisture Content*	18.3 %	Final Moisture Content	18.3 %
Initial Bulk Density	1.98 Mg/m3	Final Bulk Density	2.04 Mg/m3
Initial Dry Density	1,67 Mg/m3	Final Dry Density	4.73 Mg/m3
Initial Void Ratio	9.5825	Final Void Ratio	0.5354
Initial Degree of Saturation	83.39%	Final Degree of Saturation	90.52 %

Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	Coefficient of Volume Compressibility (m _v)	Coefficient of Consolidation (c _v)
0.00		
40.0 kPa	0.20 m2/MN	4.36 m2/yr
80.0 kPa	0.14 m2/MN	2.38 m2/yr
160.0 kPa	0.12 m2/MN	1.81 m2/yr
320.0 kPa	0.10 m2/MN	1.22 m2/yr
80.0 kPa	0.04 m2/MN	Section 1
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Method of Time Fitting Used	Square Root Time

Tested By and Date:	WAC	07 May 15	
Checked By and Date:			
Approved By and Date:			

Laboratory Test Results

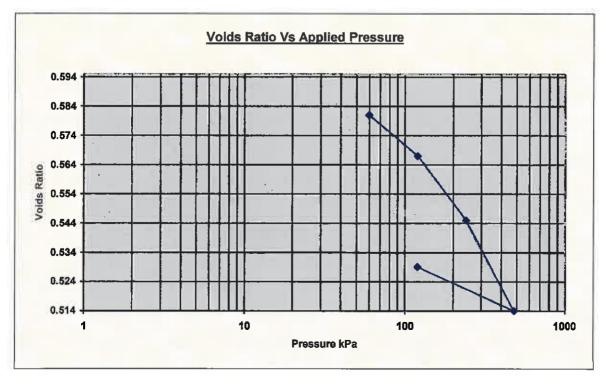
One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	147 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		
Borehole	BH4	Sample	147

Test Details				
Standard BS 1377: Part 5 : 1990 : Clause 3 Particle Density 2.65 Mg/				
Sample Type	Undisturbed sample - open drive	Lab Temperature	21.0 deg.C	
Sample Depth	3.00 m			
Sample Description	Dark brown and occasional grey mottled silty CLAY with occasional plant remains.			
Variations from Procedure	None			

Specimen Details				
Specimen Reference	Α	Description	As Above	
Depth within Sample	0.00mm	Orientation within Sample	None	
Specimen Mass	174.95 g	Condition	Natural Moisture	
Specimen Height	20.00 mm	Preparation	Natural Undisturbed	
Comments		-		

Test Apparatus			
Ring Number	4	Ring Diameter	75.00 mm
Ring Height	20.00 mm	Ring Weight	112.73 g
Lever Ratio	9.00 : 1		



Height of Solid Particles	12.54 mm	Swelling Pressure	0.0 kPa
• •			

Laboratory Test Results

One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	147 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		
Borehole	BH4	Sample	147

Initial Moisture Content*	19.2 %	Final Moisture Content	18.1 %
Initial Bulk Density	4.98 Mg/m3	Final Bulk Density	2.05 Mg/m3
Initial Dry Density	4.66 Mg/m3	Final Dry Density	1.73 Mg/m3
Initial Void Ratio	0.5949	Final Void Ratio	0.5292
Initial Degree of Saturation	85.38%	Final Degree of Saturation	90.70 %

· Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	Coefficient of Volume Compressibility (m _v)	Coefficient of Consolidation (c _v)
0.00		
60.0 kPa	0.14 m2/MN	2.98 m2/yr
120.0 kPa	0.15 m2/MN	2.22 m2/yr
240.0 kPa	0.12 m2/MN	1.80 m2/yr
480.0 kPa	0.08 m2/MN	1.38 m2/yr
120.0 kPa	0.03 m2/MN	(255.00000)

Method of Time Fitting Used	Square Root Time

171		
Tested By and Date:	WAC	07 May 15
Checked By and Date:		
Approved By and Date:		

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SITE INVESTIGATION SPECIALISTS AND CONSULTANTS 3 Peel Street, Preston, Lancashire, PR2 2QS Tel. 01772 561135 Fex. 01772 204907 info@subsurface.co.uk

Laboratory Test Results

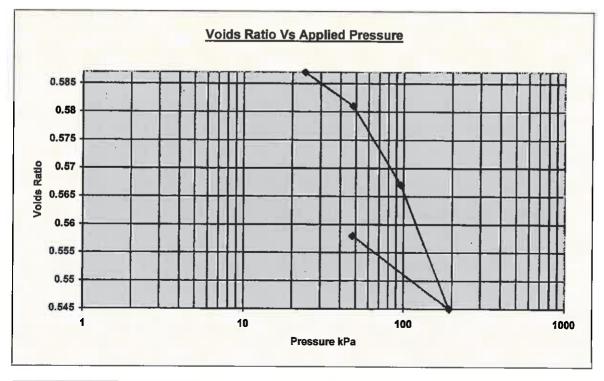
One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	170 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		
Borehole	BH5	Sample	170

	Test Details		· · · ·
Standard	BS 1377: Part 5 : 1990 : Clause 3	Particle Density	2.65 Mg/m3
Sample Type	Undisturbed sample - open drive	Lab Temperature	21.0 deg.C
Sample Depth	1.20 m		
Sample Description Dark brown and occasional grey mottled slightly gravelly silty CLAY with occasional plant remains. Gravel is subrounded to rounded fine to medium siltstone.			
Variations from Procedure	None	·	

Specimen Details				
Specimen Reference	Α	Description	As Above	
Depth within Sample	0.00mm	Orientation within Sample	None	
Specimen Mass	175.72 g	Condition	Natural Moisture	
Specimen Height	20.00 mm	Preparation	Natural Undisturbed	
Comments				

Test Apparatus				
Ring Number	5	Ring Diameter	75.00 mm	
Ring Height	20.00 mm	Ring Weight	114.79 g	
Lever Ratio	9.00 : 1			



Height of Solid Particles	12.61 mm	Swelling Pressure	0.0 kPa

Laboratory Test Results

One Dimensional Consolidation Properties (Oedometer)

Client	TRP Consulting	Lab Ref	170 (WAC)
Project	Logistics Site, BAE,	Job	6019
	Samlesbury, Lancashire		
Borehole	BH5	Sample	170

Initial Moisture Content*	19.0 %	Final Moisture Content	19.3 %
Initial Bulk Density	1.99 Mg/m3	Final Bulk Density	2.03 Mg/m3
initial Dry Density	1.67 Mg/m3	Final Dry Density	1.70 Mg/m3
Initial Void Ratio	0.5855	Final Void Ratio	0.5578
Initial Degree of Saturation	85.94%	Final Degree of Saturation	91.62 %

Calculated from initial and dry weights of whole specimen

Pressure (Loading Stages)	Coefficient of Volume Compressibility (m _v)	Coefficient of Consolidation (c _v)
0.00		
24.0 kPa	-0.05 m2/MN	
48.0 kPa	0.16 m2/MN	0.90 m2/yr
96.0 kPa	0.18 m2/MN	1.96 m2/yr
192.0 kPa	0.15 m2/MN	1_42 m2/yr
48.0 kPa	0.06 m2/MN	
<u> </u>		
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Method of Time Fitting Used	Square Root Time

Tested By and Date:	WAC	07 May 15
Checked By and Date:		
Approved By and Date:		



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Laboratory Test Results

LOGISTICS SITE, BAE, SAMLESBURY, LANCASHIRE

Job Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Engineer: TRP CONSULTING

Sheet; 1/4

Dry Density/Moisture Content Relationship

Position: TP5

Sample No:

206 Depth: 0.60 m

Mould: 1 litre

Rammer: 4.5 kg

Description:

Orangey brown, brown and light grey mottled sandy CLAY with lenses of light grey silty sand.

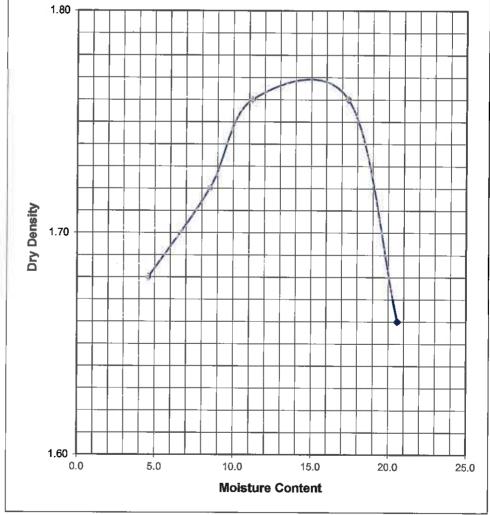
Increment	Moisture Content	Dry Density
	(%)	(Mg/m ³)
1	4.6	1.68
2	8.5	1.72
_ 3	11.2	1.76
4	17.4	1.76
5	20.6	1.66

Natural M.C:	23%

Passing	20mm :	100%

Optimum M.C:	15%

Max Dry Density:	1.77 Mg/m ³



Remarks:	Operator	Checked	Approved
	WAC		



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Laboratory Test Results

Site:

LOGISTICS SITE, BAE, SAMLESBURY, LANCASHIRE

Jab Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Sheet:

Engineer: TRP CONSULTING

2/4

Dry Density/Moisture Content Relationship

Position: TP6

Sample No:

202 Depth:

0.70 m

Mould: 1 litre

Rammer: 4.5 kg

Description:

Orangey brown and greyish brown slightly gravelly silty CLAY. Gravel is fine to medium stone.

Increment	Moisture Content	Dry Density	
	(%)	(Mg/m³)	
1	5.3	1.46	
2	8.3	1.53	
3	14.3	1.53	
4	20.3	1.41	
5	22.1	1.34	

Natural M.C:	29%	

Passing 20mm: 98%

Optimum M.C: 11.5%

Max Dry Density: 1.54 Mg/m³

	1.60 -											
nsity	1.50 -											
Dry Density	1.40 -											
	1.30 - 0	.0	5.0		0.0	ure Co	15.0		20.0		25.0	

Remarks:	Operator	Checked	Approved
	SJG		



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Laboratory Test Results

Site:

LOGISTICS SITE, BAE, SAMLESBURY, LANCASHIRE

Job Number 6019

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

6019 Sheet:

Engineer: TRP CONSULTING

3/4

Dry Density/Moisture Content Relationship

Position: PL4

Sample No:

258 Depth:

0.40 m

Mould: 1 litre

Rammer: 4.5 kg

Description:

Orangey brown, brown and yellow mottled slightly gravelly sandy CLAY. Gravel is fine to medium stone.

Increment	Moisture Content	Dry Density
	(%)	(Mg/m ³)
1	4.3	1.68
2	8.9	1.70
3	14.1	1.79
4	17.3	1.76
5	22.4	1.57

Natural M.C:	18%

Passing 20mm : 96%

Optimum M.C: 14.4%

Max Dry Density: 1.79 Mg/m³

1.90						
1.80						
Dry Density						
1.60						
1.50 - 0	.0	5.0	10.0 Moisture	15.0	20.0	25

Remarks:	Operator	Checked	Approved
	SJG		



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Laboratory Test Results

Job Number

6019

Sheet

4/4

Site:

LOGISTICS SITE, BAE, SAMLESBURY, LANCASHIRE

Client:

AEW ARCHITECTS AND DESIGNERS LIMITED

Engineer: TRP CONSULTING

Dry Density/Moisture Content Relationship

Position: PL6 Sample No: 259

0.30 m Depth:

Mould: 1 litre

Rammer: 4.5 kg

Description:

Dark greyish brown and brown slightly gravelly slightly sandy CLAY. Gravel is fine to medium stone.

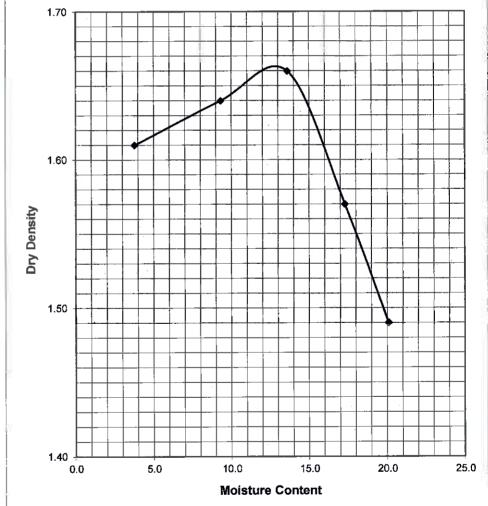
Increment	Moisture Content	Dry Density
	(%)	(Mg/m³)
1	3.8	1.61
2	9.3	1.64
3	13.6	1.66
4	17.3	1.57
5	20.1	1.49

Natural M.C: 17%

98% Passing 20mm:

Optimum M.C: 12.7%

Max Dry Density: 1.66 Mg/m³



Remarks:	Operator	Checked	Approved
	SJG		



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Laboratory Test Results

Site : LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE

Job Number 6019

Client : AEW ARCHITECTS & DESIGNERS LTD

6019

Engineer: TRP CONSULTING LTD

1/1

Sheet

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

				ration of Solubi	e Sulphate	Percentage of sample			, <u>" </u>
Borehole/ Trial Pit	Depth (m)	Sample	Total S03	S04 in 2:1 water:soll g /l	Groundwater g /l	of sample passing 2mm Sieve %	рН	Classification	Laboratory Description
BH1	0.20	W		_	0.06		7.9	DS-1	GROUNDWATER
BH1	1.20	D		<0.01 ·			8.3	DS-1	Dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to medium quartz and siltstone.
BH2	0.60	В		<0.01			7.7	DS-1	Brown and occasional grey and orangish slightly gravelly slightly sandy sitty CLAY. Gravel is subangular to rounded fine to coarse quartz, siltstone and sandstone.
BH2	0.95	w			0.04		7.7	DS-1	GROUNDWATER
ВН3	0.30	D	į	<0.01			7.6	DS-1	Dark brown and occasional grey and light grey slightly gravelly slity CLAY with occasional lenses of fine to medium sand. Gravel is subangular to rounded fine to medium quartz and siltstone.
внз	1.20	В		<0.01			8.1	DS-1	Dark brown and occasional grey mottled silty CLAY.
BH4	0.30	D		<0.01			8,0	DS-1	Brown and orange grey and light brown slightly gravelly silty CLAY with occasional lenses of silt. Gravel is subrounded to rounded fine to medium quartz.
BH4	1.70	D	i	<0.01			8.4	DS-1	DArk brown and occasional slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to coarse quartz.
BH5	0,30	D		0.02			7.6	DS-1	Brown andoccasional grey and light brown slightly gravelly silty CLAY with occasional lenses of silt. Gravel is subrounded to rounded fine to medium quartz.
BH5	0.90	D	İ	<0.01			8.2	DS-1	Dark brown and occasional grey slightly gravelly slity CLAY. Gravel is subrounded to rounded fine to medium quartz and siltstone.
BH5	4.35	w			0.07		7.7	DS-1	GROUNDWATER
TP5	0.40	В		<0.01		ì	7.2	DS-1	Brown, orange brown, light grey, red brown, greenish brown and yellow brown mottled sandy gravelly slity CLAY. Gravel is subangular fine to coarse quartz, sandstone and siltstone.
TP6	0.70	В		<0.01			6,9	DS-1	MADE GROUND: dark brown slightly sandy gravelly day (subsoil) with some rootlets. Gravel sized fragments are fine to coarse stone.
TP7	1,20	D		<0.01		ļ	8.2	DS-1	Brown, light brown, light grey and greenish brown slightly sandy slightly gravelly CLAY with occasional rootlets and lenses of silty fine to medium sand. Gravel is subangular to subrounded fine to coarse quartz, sandstone and siltstone.
TP8	1,70	D		1.70			7,5	DS-3	MADE GROUND: brown and grey brown slightly sandy slightly gravelly day with some plant, root and peat remains. Gravel sized fragments are fine to coarse stone, slag and clinker.
						1			

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

: Laboratory in-house methods based on BS1377: Part 3 for contents of water soluble sulphate, total sulphate and pH.

Remarks

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

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (31772) 56:135 Fax (01772) 204807

AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION

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 (SO₄ mg/l)	4 (SO₄ %)	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
		244-		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 classifled 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.

Sulfate						Groundwater		_
Design Sulfate Class for Location	2:1 water/soil	extract ^b	Groundwater		Total potential sulfate ³		Mobile water	ACEC Class for location
1	2 (SO ₄ mg/l)	3 (Mg mg/l)	4 (SO₂ 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
50 1	1000						>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
002							>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
550							>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
50 4	0100	7/1-55	- 23				>6.5	AC-4
						2.5 5.5		AC-4s
							2.5 - 6.5	AC-5
DS-4m	3100 - 6000	>1200°	3100 - 6000	>1000°	1.3 - 2.4	>5.5		AC-3s
00 4111	0.00						>6.5	AC-4m
						2.5 - 5.5		AC-4ms
							2.5 - 5.5	AC-5m
DS-5	>6000	≤1200	>6000	≤1006	>2.4	>5.5		AC-4s
55.5	, 2000	3.200				2.5 - 5.5	≤1000	AC-5
DS-5m	>6000	>1200°	>6000	>1000°	>2.4	>5.5		AC-4ms
20.00	-5000		,,,,,,,	>1000		2.5 - 5.5	≥2.5	AC-5m

Notes

- 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 exidation of sulfides (eg pyrite) following ground disjurcance (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 lable.

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 48.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

CHEMICAL CONTAMINATION ANALYSIS RESULTS





Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Email: info@chemtest.co.uk

Final Report

Report Number:

15-08615 Issue-1

Initial Date of Issue:

21-Apr-2015

Client:

Sub Surface

3 Peel Street

Client Address:

Preston Lancashire

PR2 2QS

Contact(s):

Simon Gabbatt

Project:

6019 Logistics Site, Bae Samlesbury

Quotation No.:

Date Received:

16-Apr-2015

Order No.:

6019

Date Instructed:

15-Apr-2015

No. of Samples:

29

5

Turnaround: (Wkdays)

Results Due Date:

21-Apr-2015

Date Approved:

(CTD Even

21-Apr-2015

Approved By:

Details:

Keith Jones, Technical Manager

Client- Sub Surface			A. Walter	A P. P. P. P. P. P. P. P. P. P. P. P. P.										
Oustation No .			Cilemest Jon Ro.	. ON OO	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615
Cuotatuon No.:		Chembe	Chemtest Sample ID.:	ple ID.:	128523	128524	128525	128526	128527	128528	128529	128530	128531	128532
Order No.: 6019		Cie	Client Sample Ref.:	e Ref	185	188	120	123	211	213	216	140	147	144
		흥	Client Sample ID.:	음 음 음	BH1	BH1	BH2	BHZ	BH3	BH3	BH3	BH4	BHA	PHA
			Sampl	Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	IIOS:	
			Top Depth (m):	oth (m):	0.0	1.20	0.0	0.60	0.0	0.30	1.20	00	030	1 70
		8	Bottom Depth(m):	pth(m):									2000	2
				mpled:	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Anr-15	00 Apr. 15	00 Apr 45
Determinand	Accred.	SOP	Units	COD	THE PERSON NAMED IN	The second second	THE REAL PROPERTY.	PORTE STATES	STREET, STREET, SQUARE,	CHICAGO CONTRACTOR			2	01-104-60
ACM Type	n	2182			1		•							
Asbestos Identification	n	2192	%	0.001	No Asbestos		No Asbestos		No Asbestos			No Asbestos		
Moisture	z	2030	76	0.00	Detected	45	Detected	ļ	Detected			Detected		
HO	=	2040	ę	70.0	27	2	7,	2	15	18	15	22	17	15
Boron (Hot Water Solutie)	- -	_	marke.	Š	1.7	6.3	6, 6	7.7	8.1	7.6	8.1	7.1	8.0	8.4
Sulphate (2:1 Water Soluble) as SO4	=		2	1 20	\ 0.40	0,00	< 0.40		< 0.40			0.94		
Country Country	, -	_	17/1/20	3 6	000	010.0		< 0.010		< 0.010	< 0.010		< 0.010	< 0.010
Sulphide (Escilu liberatable)	}		IIIg/kg		00:00		< 0.50		< 0.50			< 0.50		
Sulphate (Letal)		6262	mg/kg	200	8.0		15		2.2			4.0		
Culphiate (Total)	ا.		۶,	5.5	0.033		990.0		0.018			960.0		
Arsenic	ے ا	2450	mg/kg	-	18		14		9.8			11		
Cadmium	ا د	2450	mg/kg	0.7	0.11		0.17		0.14			0.36		
Chromium	٥	2450	mg/kg	-	20		59		54			20		
Copper	٦		mg/kg	0.5	25		26		20			28		
Mercury	ם	2450	mg/kg	0.1	< 0.10		< 0.10		< 0.10			× 0 10		7
Nickel	ם	2450	2450 mg/kg	0.5	55		39		42	,		20	†	
Lead	D	2450	2450 mg/kg	0.5	36		87		21			82		
Selenium	Ω	2450	mg/kg	0.2	< 0.20		< 0.20		< 0.20			200		
Zinc	U	2450	mg/kg	0.5	56		61		4			100	†	
Chromium (Hexavalent)	z	2490 mg/kg	mg/kg	0.5	< 0.50		< 0.50		< 0.50			< 0.50		
Aliphatic TPH >C5-C6	z	2675	mg/kg	0.1	< 0.10		< 0.10		< 0.10			< 0.10		T
Aliphatic FPH >C6-C8	z	2675	mg/kg	5	< 0.10		< 0.10		< 0.10			< 0.10		
Aliphadic IPH >C8-C10]	2675	mg/kg		< 0.10		< 0.10		< 0.10			< 0.10		
Auphalic IPH 2010-012	3	2675	mg/kg	-	× 1.0		× 1.0		< 1.0			× 1.0		
Allphanic IPH >C12-C16	5	2675	mg/kg	7	× 1.0		< 1.0		< 1.0			< 1.0		
Aliphatic IPH >C16-C21	5	2675	mg/kg	-	< 1.0		< 1.0		< 1.0			< 1.0		
Aliphatic TPH >C21-C35	3	2675	mg/kg	-	< 1.0		< 1.0		< 1.0			< 1.0		
Aliphatic TPH >C35-C44	3		mg/kg	-	< 1.0		< 1.0		× 1.0			× 1.0		
Total Aliphatic Hydrocarbons	5		mg/kg	5	< 5.0		< 5.0		< 5.0			< 5.0		
Aromatic IPH >C5-C7	z	2675	mg/kg	-1	< 0.10		< 0.10		< 0.10			× 0.10		
Aromatic TPH >C7-C8	Z	2675	mg/kg	0.1	< 0.10		< 0.10		< 0.10			< 0.10		
Aromatic IPH >C8-C10		2675	mg/kg	0.1	< 0.10		< 0.10		< 0.10			< 0.10		
Aromatic IPH >C10-C12	2	2675	mg/kg		< 1.0		< 1.0		< 1.0			× 1.0		



										and the second second second				
Client: Sub Surface		Chen	Chemiest Job No.:	b No.:	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615
Quotation No.:	O	hemte	Chemtest Sample ID.:	ile ID.:	128523	128524	128525	128526	128527	128528	128529	128530	128531	128532
Order No.: 6019		Clien	Client Sample Ref	e Ref.:	185	188	120	123	211	213	216	140	142	144
	ĺ	Clie	Client Sample ID.	ile ID.:	BH1	BH1	BH2	ВН2	BH3	внз	внз	BH4	BH4	BH4
			Sample Type:	Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	TIOS	SOIL	SOIL	SOIL.
	,		Top Depth (m):	th (m):	0.0	1.20	0.0	09'0	0.0	0.30	1.20	0.0	0.30	1.70
		Bot	Bottom Depth(m)	oth(m):										
			Date Sampled:	mpled:	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15
Determinand	Accred.	SOP	Units	TOD	State of the last	Same Property			101/633 TS	100000	STATE OF	To September		
Aromatic TPH >C12-C16	ח	2675	mg/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
Aromatic TPH >C16-C21	2	2675	mg/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
Aromatic TPH >C21-C35	z	2675	mg/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
Aromatic TPH >C35-C44	z	2675	mg/kg	-	< 1.0		< 1.0		< 1.0			< 1.0		
Total Aromatic Hydrocarbons	n	2675	mg/kg	5	< 5.0		< 5.0		< 5.0			< 5.0		
Total Petroleum Hydrocarbons	n	2675	mg/kg	10	< 10		< 10		< 10			< 10		
Naphthalene	n	2700	mg/kg	0.1	8.8		2.1		< 0.10			2.2		
Acenaphthylene	n	2700	mg/kg	0.1	0.86		0.21		< 0.10			0.13		
Acenaphthene	n	2700	mg/kg	0.1	0.91		0.14		< 0.10			< 0.10		
Fluorene	} n	2700	mg/kg	0.1	1.3		0.22		< 0.10			0.10		
Phenanthrene	n i	2700	mg/kg	0.1	1.9		0.77		< 0.10			0.44		
Anthracene	n l		mg/kg	0.1	0.27		< 0.10		< 0.10			0.10		
Fluoranthene	וח		mg/kg	0.1	0.72		0.93		< 0.10			1.1		
Pyrene	ח	2700	mg/kg	0.1	0.70		0.81		< 0.10			0.92		
Benzo[a]anthracene	l n	2700	mg/kg	0.1	< 0.10		0.30		< 0.10			0.49		
Chrysene]	2700	mg/kg	0.1	< 0.10		0.28		< 0.10			0.19		
Benzo[b]fluoranthene	ו יי		mg/kg	0.1	< 0.10		0.18		< 0.10			1.0		
Benzo[k]fluoranthene	_ n	2700	mg/kg	0.1	< 0.10		< 0.10	ļ	< 0.10			0.33		
Benzo[a]pyrene	n	2700	mg/kg	0.1	< 0.10		0.31		< 0.10			0.88		
Indeno(1,2,3-c,d)Pyrene	_ n	2700	mg/kg	0.1	< 0.10		< 0.10		< 0.10			1.1		
Dibenz(a,h)Anthracene	_ n [mg/kg	0.1	< 0.10		< 0.10		< 0.10			0.53		
Benzo[g,h,i]perylene	ר ה	2700	mg/kg	0.1	< 0. 10		< 0.10		< 0.10			1.1		
Total Of 16 PAH's	n		mg/kg	2	16		6.3		< 2.0			11		
Benzene	n T	2760	µg/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
Toluene	ח	2760	µg/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
Ethylbenzene	n	2760	ug/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
m & p-Xylene	n	2760	ng/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
o-Xykene	n	2760	ug/kg	-	< 1.0		< 1.0		< 1.0			< 1.0		
Methyl Tert-Butyl Ether	n		µg/kg	1	< 1.0		< 1.0		< 1.0			< 1.0		
Total Phenols		2920	mg/kg	0.3	< 0.30		< 0.30		v 0.30			0 V		



Client: Sub Surface		j k											
Oughter No.	4	5	Chemiest Job No.	ON OC	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615
Cuotation No.	3		Chemtest Sample ID.:	ple fo::	128533	128534	128535	128536	128537	128538	128539	128540	128541
Order No.: 6019		ਤੈ	Clent Sample Ref.:	le Ref.:	166	168	169	245 246 247	249 250 251	231 232 233	220 221 222	224 22E 22E	002 906 206
		ਹੋ	Client Sample ID.:	ple ID.:	BH5	BHS	BHS	TP1	TP1	TP?	TP3	TD3	EUS 200 203
			Sample	Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	NOS.) Indian	
			Top Depth (m):	(m) (g	0.0	0.30	06.0	0.60	1.20	0.50	0.50	1 50	200
		ď	Bottom Depth(m):	pth(m):								20:1	00.00
			Date Sampled:	mpled:	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Anr-15	00 Apr. 15	00 Apr 45
Deferminand	Accred.	SOP	SOP Units LOD	רסם		- 14 PRINT	Section Sectio	COMP IN THE		Regulated 1 mg		C) Indicate	21-12 20-120
ACM Type	5	2182			-					*		•	
Asbestos Identification		2182	*	0.001	No Asbestos			No Asbestos		No Asbestos		No Asbestos	
N = 1=6	7		4		Defected			Detected		Defected		Detected	
Moisture	1		%	0.05	13	14	16	19	20	18	22	23	25
PH	1	읾	_		7.8	7.6	8.2	7.9	7.6	8.1	7.8	7.6	7.7
Boron (Hor Water Soluble)	1	2120	티	4.0	< 0.40			0.50	0.55	< 0.40	0.40	0.59	0.66
Sulphate (2:1 Water Soluble) as SO4	T	2120		0.01		0.015	< 0.010						
Cyanide (Total)	1	2300		0.5	< 0.50			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	× 0.50
Sulpride (Easily Liberatable)	1	2325	ε	0.5	2.0			5.4	7.5	3.2	2.1	8.9	2.0
Suipriate (Total)	T	2430	%	0.01	0.032			0.24	0.13	0.046	060'0	0.17	0.16
Arsenic	٦	2450	mg/kg	-	8.6			10	17	13	16	1	12
Cadmium	7	2450	mg/kg	5	< 0.10			0.16	1.8	0.18	0.23	0.26	0.40
Chromium	٦	2 2	2450 mg/kg	-	67			46	2	88	69	92	50
Copper		2459 2459	2450 mg/kg	0.5	14			21	20	25	29	S	28
Mercury		2450	2450 mg/kg	-	< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	0.51	A 0 10
Nickel	7	2450	mg/kg	0.5	38			30	47	48	46	38	34
Lead	7	2450	mg/kg	0.5	21			45	100	39	74	120	á
Selenium	7	2450	2450 mg/kg	0.2	< 0.20			< 0.20	< 0.20	< 0.20	< 0.20	× 0.20	020
Zinc			mg/kg	0.5	41			45	250	54	29	98	80
Chromium (Hexavalent)		2490	mg/kg	0.5	< 0.50			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	\$ 0 SO
Alphane IPH >C5-C6	Ť	2675	mg/kg	0.1	< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Allphane PH >Co-Ca	1	2675	2675 mg/kg		< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	× 0.10
Alighette TPH >C8-C10		2675	mg/kg	-	< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	× 0.10
Auplianc FFT 2010-012	1	2675	D)/du	-	< 1.0			< 1.0	< 1.0	< 1.0	41.0	× 1.0	v 1.0
Allphane I Pri >C12-C16	1	2675	mg/kg	-	< 1.0			< 1.0	< 1.0	< 1.0	× 1.0	< 1.0	×1.0
Aliphatic IPH >C16-C21	7	2675	mg/kg	-	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphauc I PH >C21-C35	7	2675	mg/kg	-	< 1.0			< 1.0	< 1.0	× 1.0	< 1.0	× 1.0	< 1.0
Aliphatic IPH >C35-C44	7	2875	mg/kg	-	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	v 1.0	×10
total Aliphatic Hydrocarbons	7	2675	2675 mg/kg	2	< 5.0			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	A 5.0
Aromatic 7PH >C5-C7	2	2675	2675 mg/kg	<u></u>	< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic IPH >C/-C8	1	2675	2675 mg/kg	9	< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Alomatic IPH >Ca-CTU	7	5/97	2675 mg/kg	9	< 0.10			< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic IPH >C10-C12	z	2675	mg/kg	-	< 1.0			< 1.0	< 1.0	< 1.0	× 1.0	< 1.0	×1.0



Project: 6019 Logistics Site, Bae Samlesbury

Client: Sub Surface		S	Chemtest Job No.:	D No.:	15-08615	15-08615	15-08615	15-08615	15-08615	15-08615	15-08610	15-08615	15-08615
Quotation No.:		Chemt	Chemtest Sample ID.:	ole ID.:	128533	128534	128535	128536	128537	128538	128539	128540	128541
Order No.: 6019		Sign	Client Sample Ref .:	e Ret.:	166	168	169	245 246 247	249 250 251	231 232 233	220 221 222	224 225 226	207 208 209
		Ϊ́Ξ	Client Sample ID.:	ole ID.:	BH5	BHS	BHS	TP1	191	TP2	TP3	TP3	TP4
			Sample	Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):	th (m):	0.0	0.30	06.0	09.0	1.20	0.50	0.50	1.50	0:30
		B	Bottom Depth(m):	oth(m):									
			Date Sampled:	mpled:	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15
Determinand	Accred.	5	SOP Units	aon			I I III			DESCRIPTION OF THE PERSON NAMED IN	III VALVASCENIA	Butter Street	Company of the second
Aromatic TPH >C12-C16	ם	2675	2675 mg/kg	1	< 1.0			< 1.0	1.4	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21))	2675	2675 mg/kg	-	< 1.0			< 1.0	4.1	< 1.0	< 1.0	< 1.0	4.1
Aromatic TPH >C21-C35	z	2675	mg/kg	-	< 1.0			< 1.0	1.1	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	z	2675		1 1	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	_	2675	mg/kg	5	< 5.0			< 5.0	6.5	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	n	2675	2675 mg/kg	10	< 10			< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	<u> </u>	2700	2700 mg/kg	0.1	< 0.10			3.1	1.9	2.7	< 0.10	3.0	3.3
Acenaphthylene	n	2700	mg/kg	0.1	< 0.10			0.28	0.32	0.11	< 0.10	0.28	0.24
Acenaphthene	ם -	2700	mg/kg	0.1	< 0.10			0.21	0.65	0.10	< 0.10	0.21	0.19
Fluorene	Þ	2700	mg/kg	0.1	< 0,10			0.31	29'0	< 0.10	< 0.10	0.26	0:30
Phenanthrene	n	2700	mg/kg	0.1	< 0.10			1,4	5.0	0.26	< 0.10	0.68	1.0
Anthracene	n	2700	2700 mg/kg	0.1	< 0.10			0.29	1.3	< 0.10	< 0.10	0.19	0.23
Fluoranthene	n l	2700	2700 mg/kg	1.0	< 0.10			2.8	5.9	0.46	0.36	1.6	2.5
Pyrene	n	2700	mg/kg	1.0	< 0.10			2,6	5.7	0.45	0.34	1.6	2.5
Benzo[a]anthracene	Ω	2700	2700 mg/kg	0.1	< 0.10			1.3	2.1	< 0.10	0,10	0.91	1.3
Chrysene	ח	2700	mg/kg	0.1	< 0.10			1.3	2.6	< 0.10	0.29	1.1	1.8
Benzo[b]fluoranthene	<u> </u>	2700		0.1	< 0.10			1.8	2.8	< 0.10	0.14	2.3	2.2
Benzo[k]fluoranthene	n	2700	mg/kg	0.1	< 0,10			0.98	1.4	< 0.10	0.33	1.4	1.3
Berzo[a]pyrene	n	2700	mg/kg	0.1	< 0.10			1.2	2.0	< 0.10	0.17	1.7	1.6
Indeno(1,2,3-c,d)Pyrene	n	2700	2700 mg/kg	0.1	< 0.10			1.0	1.4	< 0.10	< 0.10	1.4	1.2
Dibenz(a,h)Anthracene	n	2700	mg/kg	0.1	< 0.10			0.45	0.18	< 0.10	< 0.10	0.60	0.45
Benzo[g,h,i]perylene	D.	2700	mg/kg	0.1	< 0.10			1.0	1.6	< 0.10	< 0.10	1.3	1.1
Total Of 16 PAH's	n	2700	mg/kg	2	< 2.0			20	36	4.1	< 2.0	19	21
Benzene	ņ	2760	µg/kg	1	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	n	2760	µg/kg	1	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ח ו	2760	µg/kg	1	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	n	2760	ng/kg	1	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	n	2760	μg/kg	1	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tort-Butyl Ether	'n	2760	µg/kg	-	< 1.0			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols	n l	2920	mg/kg	0.3	< 0.30			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30



Machematry to deliver results

Project: 6019 Logistics Site, Bae Samlesbury

											1		
Quotation No.:		Chemi	Cheminet Sample In	In olar	420547	420043	21000-21	G1990-G1	15-08615	15-08615	15-08615	15-08615	15-08615
Dedon Mar. 6040			180	יישון אותי	740071	128543	128544	128545	128546	128547	128548	128549	128550
Order No.: 5019		Š	Client Sample Ref.	ple Ref.:	211 212 213	216 217 218	176 177 178	180	198 199 200	202	170 171 172	174	182 194 195
		5	Client Sample ID.:	nple ID.:	TP4	TP4	TP5	775	TPR	AQT.	1	101	CO1 +O1 CO1
			Samp	Sample Type:	SOIL	SOIL	SOIL	II C		2		<u> </u>	2 2
			Top De	Top Depth (m):	120	4 20	ç	500			SOIL	SOIL	SOIL
		۳	offor D	Rottom Depth(m):		23.7	2	24.5	2	0.0	0.30	1.20	0.10
			Pate S	Date Sampled	00 Apr 4E	00 Aug 45	1, 10						
Deferminand		200	Color	all pleu.	ci-id-en	CL-IDM-RO	US-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15	09-Apr-15
CM Tues	Accred.	200		UNITS							dama de fermino		A STATE OF THE PARTY NAMED IN
AUM IYPE		2192				•	12.00		,				
Asbestos Identification	_	2182	*	0.00		No Asbestos	No Asbestos		No Asbestos		No Asbestos		No Ashestos
			┙			Detected	Detected		Detected		Detected		Defected
Moisture	z	2030	%	0.02	21	21	30	13	32	19	24	20	34
hd	٥	휞		_	8.0	7.9	7,9	7.2	6.7	6.9	7.1	8.2	2 2
Boron (Hot Water Soluble)	5	2120	듸	_	0.79	1.2	0.62		1.0		96 0		041
Sulphate (2:1 Water Soluble) as SO4	_	2120		4				< 0.010		< 0.010		< 0.010	
Cyanide (Total)	5	2300		4	< 0.50	< 0.50	< 0.50		< 0.50		< 0.50		0.50
Sulphide (Easily Liberatable)	5	2325	티	_	5.8	8.0	3.8		2.3		2.3		200
Sulphate (Total)	n	2430	%	0.01	0.10	0.21	0.14		0.16		0.14		0 43
Arsenic	ņ	2450	mg/kg		21	17	10		9.0		9		2 5
Cadmium	ח	2450	mg/kg	0.1	0.24	0.36	0.17		0.19		0.17		0 47
Chromium	n	2450	2450 mg/kg	1	42	38	94		33		43		5
Copper	<u> </u>	2450	mg/kg		20	45	22		16		23	T	2
Mercury	Ω	2450	⊞g/kg	0.1	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		V 0 10
Nickei	5	2420 7420	2450 mg/kg	0.5	29	31	28		18		24		39
Lead	n	2450	mg/kg	0.5	47	210	61		59		88		37
Selenium	3	2450	mg/kg	0.2	< 0.20	< 0.20	< 0.20		0.28		< 0.20		0.31
Zinc	D	2450	mg/kg	0.5	35	130	20		45		54		7
Chromium (Hexavalent)	2	2490	mg/kg	0.5	< 0.50	< 0.50	< 0.50		< 0.50		< 0.50		20.50
Aliphatic IPH >C5-C6	z	2675	mg/kg	0.1	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		010
Aliphatic IPH >C6-C8	z	2675	mg/kg	0.1	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
All Draft Control of the August Augus	5	2675	mg/kg	-	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Alleheit TBU CAS As	3	2875	2675 mg/kg	-	v 1.0	× 1.0	× 1.0		. < 1.0		< 1.0		× 1.0
Aliabatic TELL C 12-C 10	3	28/5	26/5 mg/kg		41.0	× 1.0	× 1.0		< 1.0		< 1.0		< 1.0
II-h-42 TRILL CO. CO.		2675	mg/kg	-	v 4:0	< 1.0	< 1.0		< 1.0		< 1.0		< 1.0
Allert de Trait : Ont Ott		28/5	2675 mg/kg	-	× 1.0	< 1.0	. < 1.0		< 1.0		< 1.0		< 1.0
inprinted Printed Scoto-C44		2675	mg/kg	-	v 1.0	< 1.0	< 1.0		< 1.0		< 1.0		< 1.0
Total Aliphatic Hydrocarbons	3	2675	2675 mg/kg	2	< 5.0	< 5.0	< 5.0		< 5.0		< 5.0		< 5.0
Aromanic IPH >Co-C/	z	2875	2875 mg/kg	6	< 0.10	< 0.10	< 0.10		< 0.10		< 0,10		< 0.10
Administration of the second o	Z	2875	2675 mg/kg	0.1	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Aromatic IPH >C8-C10	D	2675	mg/kg	0.1	< 0.10	< 0.10	< 0.10		< 0.10		A D 10		V 0 40
												_	2

0.10

<u>.</u>



183 184 185 09-Apr-15 128550 × 1.0 × 1.0 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 5.0 < 1.0 TPB < 0.10 09-Apr-15 128549 174 SOIL. 1.20 09-Apr-15 128548 170 171 17 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 5.0 < 0.10 < 0.10 < 0.10 < 1.0 < 1.0 < 1.0 ۸ 1.0 0.41 0.15 < 0.10 < 0.10 ۸ 1,0 < 1.0 ۸ 10 0.30 < 10 ۸ 2.0 TP7 SOIL 09-Apr-15 128547 202 SOIL 0.70 09-Apr-15 128546 198 199 200 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 < 0.10 × 1.0 × 1.0 × 1.0 TP6 SOIL 0.10 < 5.0 0.14 0.35 0.57 0.22 ۰1° < 1.0 < 1.0 3.7 6.7 09-Apr-15 128545 180 TP5 SOIL 0.40 128544 176 177 178 09-Apr-15 TP5 SOIL < 5.0 < 10 0.10 2.8 2.5 0.85 0.73 1.4 1.1 0.69 0.85 3.5 0.27 0.30 0.30 216 217 218 09-Apr-15 128543 < 1.0 < 1.0 < 1.0 0.1 × 1.0 0.1 < 5.0 < 10 0.23 0.50 0.49 < 1.0 < 1.0 1.5 0.80 TP4 SOIL 4.20 0.21 1.9 09-Apr-15 128542 < 1.0 < 0,10 < 5.0 < 10 × 1.0 0.90 0.76 1.20 2 12 TP4 SOIL Date Sampled: Top Depth (m): Bottom Depth(m): Chemtest Job No.: Chemtest Sample ID.: Client Sample ID.: Client Sample Ref.: Sample Type: 0.3 <u>.</u> 0.1 0. 9 0 0 <u>.</u> 0 0 2 0 0 2920 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2700 mg/kg 2675 mg/kg 2675 mg/kg 2675 mg/kg 2675 mg/kg 2675 mg/kg 2700 mg/kg 2700 mg/kg 2675 mg/kg 2700 mg/kg µg/kg 2760 µg/kg 2760 µg/kg 2760 Project: 6019 Logistics Site, Bae Samlesbury Accred. otal Petroleum Hydrocarbons Total Aromatic Hydrocarbons vomatic TPH >C12-C16 Aromatic TPH >C21-C35 Aromatic TPH >C35-C44 Aromatic TPH >C16-C21 ndeno(1,2,3-c,d)Pyrene Methyl Tert-Butyl Ethor Total Phenols Jibenz(a,h)Anthracene 3enzo[b]fluoranthene 3enzo[k]fluoranthene Benzo[g,h,i]perylene 3enzo[a]anthracene Client: Sub Surface otal Of 16 PAH's **Acenaphthylene** Order No.: 6019 3enzo[a]pyrene Acenaphthene Quotation No.: henanthrene Determinand Ethylbenzene n & p-Xylenc luoranthene Naphthalene Anthracene Chrysene -luorene 3enzene oluene Pyrene

0.18

< 2.0 ۸ 1.0 ۰ 10



Project: 6019 Logistics Site, Bae Samlesbury

Client: Sub Surface	THE STREET	Che	Chemitest Job No.:	ob No.:	15-08615
Quotation No.:		heme	Chemtest Sample ID.:	ple ID.:	128551
Order No.: 6019		Clie	Client Sample Ref.:	le Ref.:	192 193 194
		ਤੱ	Client Sample ID.:	ple ID.:	TP8
			Sampl	Sample Type:	SOIL
			Top Depth (m):	oth (m):	1.70
		B	Bottom Depth(m)	pth(m):	
			Date Sampled:	impled:	09-Apr-15
Determinand	Accred.	SOP		TOD	CHECK TO BE
ACM Type	ח	2192			
Asbestos Identification	n	2192	%	0.001	No Asbestos Detected
Moisture	z	2030	%	0.02	56
Hd	ח	2010			7.5
Boron (Hot Water Soluble)	n	2120	mg/kg	0.4	2.7
Sulphate (2:1 Water Soluble) as SO4	n	2120	ľ/g	0.01	1.7
Cyanide (Total)	U	2300	mg/kg	0.5	< 0.50
Sulphide (Easily Liberatable)	_ n	2325	mg/kg	0.5	9.5
Sulphate (Total)	Ú	2430	%	0.01	2.8
Arsenic	Ü	2450	mg/kg	-	10
Cadmium	U	2450	mg/kg	0.1	0.43
Chromium	Ú	2450	mg/kg	1	50
Copper	n	2450	mg/kg	0.5	44
Mercury	D	2450	mg/kg	0.1	< 0.10
Nickel	n	2450	mg/kg	0.5	38
Lead	Ü	2450	mg/kg	0.5	110
Selenium	ח	2450	mg/kg	0.2	0.24
Zinc	0	2450	mg/kg	0.5	110
Chromium (Hexavalent)	Z	2490	mg/kg	0.5	< 0.50
Aliphatic TPH >C5-C6	2	2675	mg/kg	0.1	< 0.10
Aliphatic TPH >C6-C8	Z	2675	mg/kg	0.1	< 0.10
Aliphatic TPH >C8-C10	n	2675	mg/kg	0.1	< 0.10
Aliphatic TPH >C10-C12	n	2675	mg/kg	-	< 1.0
Aliphatic TPH >C12-C16	n	2675	mg/kg	1	41.0
Aliphatic TPH >C16-C21	n	2675	mg/kg	-	< 1.0
Aliphatic TPH >C21-C35	n	2675	mg/kg	F	< 1.0
Aliphafic TPH >C35-C44	n I	2675	mg/kg	-	< 1.0
Total Aliphatic Hydrocarbons	n	2675	mg/kg	2	< 5.0
Aromatic TPH >C5-C7	N	2875	mg/kg	0.1	< 0,10
Aromatic TPH >C7-C8	z	2675	mg/kg	0.1	< 0.10
Aromatic TPH >C8-C10	ם	2675	mg/kg	0.1	< 0.10
Aromatic TPH >C10-C12	z	2675	mg/kg	-	< 1.0



Project: 6019 Logistics Site, Bae Samlesbury

Client: Sub Surface	S 18 18 18	Che	Chemtest Job No.:	b No.:	15-08615
Quotation No.:		Chemte	Chemtest Sample ID.:	ple ID.:	128551
Order No.: 6019		Clie	Client Sample Ref .:	le Ref.:	192 193 194
		CHB	Client Sample ID.:	ple ID.:	8dI
			Sampl	Sample Type:	SOIL
			Top Depth (m):	oth (m):	1.70
		Bo	Bottom Depth(m):	pth(m):	
			Date Sa	Date Sampled:	09-Apr-15
Determinand	Accred.	SOF	Units	001	10 0 MARIO 11 11 11 11 11 11 11 11 11 11 11 11 11
Aromatic TPH >C12-C16	n	2675	mg/kg		< 1.0
Aromatic TPH >C16-C21	n	2675	mg/kg	1	< 1.0
Aromatic TPH >C21-C35	z	2675	mg/kg	1	< 1.0
Aromatic TPH >C35-C44	z	2675	_	1	< 1.0
Total Aromatic Hydrocarbons	n	2675		9	< 5.0
Total Petroleum Hydrocarbons	n	2675	mg/kg	10	< 10
Naphthalene	Ω	2700	mg/kg	0.1	< 0.10
Acenaphthylene	כ	2700	mg/kg	0.1	< 0.10
Acenaphthene	n	2700	mg/kg	0.1	< 0.10
Fluorene	ם	2700	mg/kg	0.1	< 0.10
Phenanthrene	n	2700	mg/kg	0,1	< 0.10
Anthracene	Ω	2700	mg/kg	0,1	< 0.10
Fluoranthene	Ω	2700	mg/kg	0.1	0.67
Pyrene	ם	2700	mg/kg	0.1	0.53
Benzo[a]anthracene	n	2700	mg/kg	0.1	2.7
Chrysene	D	2700		0.1	2.0
Benzo[b]fluoranthene	n	2700	mg/kg	0.1	< 0.10
Benzo[k]fluoranthene	n	2700	mg/kg	0.1	< 0,10
Benzo[a]pyrene	n	2700	mg/kg	0.1	< 0.10
Indeno(1,2,3-c,d)Pyrene	ח	2700	mg/kg	0.1	< 0.10
Diberz(a,h)Anthracene	ח	2700	mg/kg	0.1	< 0.10
Benzo[g,h,i]perylene	n	2700	mg/kg	0.1	< 0.10
Total Of 16 PAH's	ח	2700	mg/kg	2	11
Benzene	ב	2760	ug/kg	1	< 1.0
Toluene	n	2760	ug/kg	1	< 1.0
Ethylbenzene	n	2760	µg/kg	1	< 1.0
m & p-Xylene	n	2760	j µg∕kg	1	< 1.0
o-Xylene	<u>∩</u>	2760	µg/kg	1	< 1.0
Methyl Tert-Butyl Ether	ם	2760	ug/kg	Ψ.	< 1.0
(Total Phenois	<u> </u>	2920	mg/kg	0.3	< 0.30

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Report Information

Keγ

- 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, SVCOs, PCBs, Phenols

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

All Asbestos testing is performed at our Coventry 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

Sample Retention and Disposal

All soil samples will be retained for a period of 60 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





Chemtest Ltd. Depot Road Newmarket CB8 0AL

Tel: 01638 606070 Email: Info@chemtest.co.uk

Final Report

Report Number:

15-09695 Issue-1

Initial Date of Issue:

07-May-2015

Client:

Sub Surface

3 Peel Street

Client Address:

Preston Lancashire

PR2 2QS

Contact(s):

Simon Gabbatt

Project:

6019 Logistics Site, BAE Samlesbury

Quotation No.:

Date Received:

28-Apr-2015

Order No.:

Date instructed:

Results Due Date:

30-Apr-2015

07-May-2015

No. of Samples:

1

Turnaround: (Wkdays)

/s) 5

Date Approved:

07-May-2015

Approved By:

Details:

Robert Monk, Technical Development

Chemist

amlesbury	
BAE S	
Site	
Logistics	
6019	
roject:	

Circili. Out out ace	TO SHAPE TO	Chen	Chemiest Job No.	b No.	55960-91
Quotation No.:	ပ	hemte	Chemtest Sample ID.:	le ID:	133913
Order No.:		Clien	Client Sample Ref.:	e Ref.:	TP1
		Clie	Client Sample ID.:	le ID.:	253 254 255
			Sample Type:	Type:	SOIL
			Top Depth (m):	th (m):	3.20
		Bat	Bottom Depth(m):	oth(m):	
			Date Sampled:	mpled:	09-Apr-15
Determinand	Accred.	SOP	Units Lob	LOD	
Moisture	z	2030	%	0.02	18
ЬН	n	2010			L'L
Boron (Hot Water Soluble)	ñ	2120	mg/kg	0.4	0,91
Cyanide (Total)	n	2300	mg/kg	0.5	< 0.50
Sulphide (Easily Liberatable)	n	2325	mg/kg	0.5	10
Sulphate (Total)	n	2430	%	0.01	0.14
Arsenic	n	2450	mg/kg	1	16
Cadmium	n	2450	mg/kg	0.1	0.18
Chromium	n	2450	mg/kg	1	26
Copper	n	2450	mg/kg	0.5	30
Mercury	n n	2450	mg/kg	0.1	0.22
Nickel	L u	2450	mg/kg	9.0	27
Lead	U	2450	mg/kg	0.5	88
Selenium	D	2450	mg/kg	0.2	< 0.20
Zinc	U	2450	mg/kg	0.5	51
Chromium (Hexavalent)	z	2490		0.5	< 0.50
Aliphatic TPH > C5-C6	Z	2675	mg/kg	0.1	B < 0.10
Aliphatic TPH > C6-C8	Z	2675	mg/kg	0.1	B < 0.10
Aliphatic TPH > C8-C10	U	2675	mg/kg	0.1	B < 0.10
Aliphatic TPH >C10-C12	n	2675	mg/kg	1	B 9.9
Aliphatic TPH >C12-C16	Û	2675	mg/kg	1	B 170
Aliphatic TPH >C16-C21	n	2875	mg/kg	1	B 170
Aliphatic TPH >C21-C35	n	2675	mg/kg	-	B 21
Allphatic TPH >C35-C44	D	2675	mg/kg	-	B < 1.0
Total Aliphatic Hydrocarbons	D	2675	mg/kg	2	B 370
Aromatic TPH >C5-C7	z	2675	mg/kg	0.1	B < 0.10
Aromatic TPH >C7-C8	z	2675	mg/kg	0.1	B < 0.10
Aromatic TPH >C8-C10	Û	2675	mg/kg	0.1	B < 0.10
Aromatic TPH >C10-C12	z	2675	mg/kg.	-	B < 1.0
Aromatic TPH >C12-C16	n	2875	mg/kg	-	B 34
뒴	3	2875	mg/kg	-	B 93
	Z	2675	mg/kg	-	B 92
Aromatic TPH >C35-C44	Z	2675	mg/kg	-	B 4.6

Schemtest The right chemistry to deliver results

Results Summary - Soil

Project: 6019 Logistics Site, BAE Samlesbury

Client: Sub Surface Quotation No.: Order No.:	O.	Cherr	Chemitest Job No.:	D No.:	20960-21
Quotation No.: Order No.:					
Order No.:	Ö	hemte	Chemtost Sample ID.:	le ID.:	133913
		Clien	Client Sample Ref.:	e Ref	TP1
		Clier	Client Sample 1D.:	le 10.:	253 254 255
			Sample Type:	Type:	SOIL
		_	Top Depth (m):	th (m):	3.20
		Bot	Bottom Depth(m)	th(m):	
		1	Date Sampled:	mpled:	09-Apr-15
Determinand	Accred	SOP	Units	00 7	
Total Aromatic Hydrocarbons	n	2675	mg/kg	5	B 220
Total Petroleum Hydrocarbons	n	2675	mg/kg	10	B 590
Naphthalene	ה	2700	mg/kg	0.1	1.1
Acenaphthylene	n .	2700	mg/kg	0.1	26.0
Acenaphthene	n	2700	mg/kg	0.1	1.1
Fluorene	n	2700	mg/kg	0.1	1.9
Phenanthrene	ח	2700	mg/kg	0.1	10
Anthracene	n	2700	mg/kg	0.1	3.6
Fluoranthene	n	2700	mg/kg	0.1	18
Pyrene	n	2700	mg/kg	0.1	18
Benzo[a]anthracene	n	2700	mg/kg	0.1	6.5
Chrysene	n	2700	mg/kg	0.1	5.4
Benzo[b]fluoranthene	n	2700	mg/kg	0.1	8.7
Benzo[k]fluoranthene	n	2700	mg/kg	0.1	3.4
Benzo[a]pyrene	n	2700	mg/kg	0.1	6.8
Indeno(1,2,3-c,d)Pyrene	n	2700	mg/kg	0.1	4.3
Dibenz(a,h)Anthracene	n	2700	mg/kg	0.1	0.60
Benzo[g,h,i]perylene	n	2700	mg/kg	0.1	4.1
Total Of 16 PAH's	n	2700	mg/kg	2	92
Benzene	n	2760	µg/kg	1	B < 1.0
Toluene	n	2760	µg/kg	+	B < 1.0
Ethylbenzene	n	2760	µg/kg	ļ	B < 1.0
m & p-Xylene	Ŋ	2760	µg/kg	1	B < 1.0
o-Xylene	n	2760	µg∕kg	-	٧I
Methyl Tert-Butyl Ether	3	2760	µg/kg	-	B < 1.0
Total Phenols	Π	2920	mg/kg	0.3	< 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, SVCOs, PCBs, Phenols

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

All Asbestos testing is performed at our Coventry 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

Sample Retention and Disposal

All soil samples will be retained for a period of 60 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





Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 506070
Email: info@chemtest.co.uk

Report Number:

15-11041 Issue-1

Initial Date of Issue:

20-May-2015

Client:

Sub Surface

3 Peel Street

Client Address:

Preston Lancashire

PR2 2QS

Contact(s):

Simon Gabbatt

Project:

6019 Logistics Site, BAE Samlesbury, Bladerston, Lancashire

Quotation No.:

Date Received:

14-May-2015

Order No.:

Date Instructed:

14-May-2015

No. of Samples:

3

5

Turnaround: (Wkdays)

Results Due Date:

20-May-2015

Date Approved:

20-May-2015

Approved By:

Details:

Keith Jones, Technical Manager



Project: 6019 Logistics Site, BAE Samlesbury, Bladerston, Lancashire

000000		Cherr	Chemiest Job No.:	B No.	15-11041	15-11041	15-11-04:
Quotation No.:	S	hemtes	Chemtest Sample ID.:	교	140278	140279	140280
Order No.:		Clien	Client Sample Ref.:	e Ref.:	203 204 205	206 207 208	209 210 211
		Clien	Client Sample ID.:	le ID.:	BH1	BH2	BHS
	_		Sample Type:	Type:	WATER	WATER	WATER
		_	Top Depth (m):	th (m):	0.20	0.95	4.35
		Bott	Bottom Depth(m):	th(m):			
			Date Sampled:	:pajdu	12-May-15	12-May-15	12-May-15
Determinand	Accred	SOP	Units Loo	001		DESCRIPTION OF THE PERSON OF T	A CHARLEST AND ADDRESS OF
ЬН	ח	1010			6.7	7.8	2.7
Sulphate	n	1220	₩ Mg/I	-	64	41	88
Cyanide (Total)	n	1300	₩g/l	0.05	< 0.050	< 0.050	< 0.050
Sulphide	n	1325	mg/I	0.05	0.051	< 0.050	< 0.050
Arsenic (Dissolved)	n	1450	l/gu	1	2.9	< 1.0	< 1.0
Boron (Dissolved)	n l	1450	l/grl	20	180	72	220
Cadmlum (Dissolved)	n	1450	μg/I	0.08	0.094	0.18	0.091
Chromium (Dissolved)	n	1450	∥⁄gπ	1	< 1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	/Br	1	4.5	3.1	3.7
Mercury (Dissolved)	n	1450	l/6rl	0.5	< 0.50	< 0.50	< 0.50
Nickel (Dissolved)	n	1450	ηg/I	-	3.2	5.7	4.3
Lead (Dissolved)	U	1450	ng/l	1	1.7	3.4	2.4
Selenium (Dissolved)	n	1450	hg/l	-	1.7	2.4	11
Zinc (Dissolved)	D	1450	l/gri	1	93	12	16
Chromium (Hexavalent)	D	1490	l/Bri	22	< 20	< 20	< 20
Total TPH >C6-C40	כ	1670	l/grl	10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	z	1675	μg/l	0.1	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	z	1675	l/gri	0.1	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	z	1675	/6rl	0,1	< 0.10	< 0.10	< 0.10
Aliphatic TPH > C10-C12	z	1675	l/gri	0.1	< 0.10	< 0,10	< 0.10
Aliphatic TPH >C12-C16	z	1675	μg/l	0.1	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	Z	1675	ηg/į	0.1	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	z	1675	l/gr	<u>:</u>	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	z	1875	<u>1</u> 61	5	< 0.10	< 0.10	< 0.10
otal Aliphatic Hydrocarbons	z	1675	ľgi	2	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	z	1675	1/61	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	z	1675	rg/l	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	z	1675	ng/I	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	z	1675	l/gr	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	z	1675	l/Bri	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	z	1675	l/gri	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	z	1675	l/gri	0.1	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	Z	1675	/bn	0.1	< 0.10	< 0.10	0,00

Results Summary - Water



Oli 4. 0. 1. 0. 1. 5		Off.	1	1. 1.1.	*****		1 000
Client: Sub Surface		CLOEITS	Chemiest Job No.:	ON 0	15 110a1	15-11041	15-11041
Quotation No.:	Ö	Chemtest Sample ID.:	t Samp	le ID.:	140278	140279	140280
Order No.:		Client	Sampl	Client Sample Ref.:	203 204 205	206 207 208	209 210 211
		Clien	t Samp	Client Sample ID.:	1H8	BH2	SHB
		,	Sample Type:	Type:	WATER	WATER	WATER
		Fe	op Depth (m):	th (m):	0.20	0.95	4.35
		Botte	Bottom Depth(m):	oth(m):			
		Ω	Date Sa	Sampled:	12-May-15	12-May-15	12-May-15
Determinand	Accred.	SOP	Units	10D	The second second	1000年の日本	
Total Aromatic Hydrocarbons	z	1675	l/6rl	5	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	_ O	1675	l/gr	10	< 10	< 10	< 10
Naphthalene	n	1700	μg/l	0.1	< 0.10	< 0.10	< 0.10
Acenaphthylene	n	1200	l/grl	0.1	< 0.10	< 0.10	< 0.10
Acenaphthene	n	1700	l/grl	0.1	< 0.10	< 0.10	< 0.10
Fluorene	n	1700	l/gu	0.1	< 0.10	< 0.10	< 0.10
Phenanthrene	n	1700	l/grl	0.1	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	l/gri	0.1	< 0.10	< 0.10	< 0.10
Fluoranthene	n	1700	l/Gri	0.1	< 0.10	< 0.10	< 0.10
Pyrene	n	1700	l/gd	0.1	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	l/gri	0.1	< 0.10	< 0.10	< 0.10
Chrysene	n	1700	l/Gd	0.1	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	l/βri	0.1	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	n	1700	l/gri	0.1	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	l/ĝr	0.1	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	l/Brl	0.1	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	Ú	1700	l/gu	0.1	< 0.10	< 0.10	< 0.10
Benza[g,h,i]perylene	U	1700	1/6/1	0.1	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	n	1700	l/Brl	2	< 2.0	< 2.0	< 2.0
Benzene	n	176D	l/gri	1	< 1.0	< 1.0	< 1.0
Toluene	U	1760	l/gri	1	< 1.0	< 1.0	< 1.0
Ethylbenzene	n	1760	l/gri	1	< 1.0	< 1.0	< 1.0
m & p-Xylene	D	1760	l/gμ	1	< 1.0	< 1.0	< 1.0
o-Xylene	O	1760 [l/gri	1	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	z	1760	ηg/l	1	< 1.0	< 1.0	< 1.0
Total Phenols	n	1900	mg/l	0.03	< 0.030	< 0.030	00:0>



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

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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

Sample Retention and Disposal

All soil samples will be retained for a period of 60 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





Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Email: Info@cnemtest.co.uk

Report Number:

15-08619 Issue-1

Initial Date of Issue:

24-Apr-2015

Client:

Sub Surface

3 Peel Street

Client Address:

Preston Lancashire

PR2 2QS

Contact(s):

Simon Gabbatt

Project:

6019 Logistics Site, Bae Samlesbury

Quotation No.:

Date Received:

16-Apr-2015

Order No.:

6019

Date Instructed:

15-Apr-2015

No. of Samples:

4

7

Turnaround: (Wkdays)

Results Due Date:

23-Apr-2015

Date Approved:

24-Apr-2015

Approved By:

Details:

Keith Jones, Technical Manager



Chemtest Job No: 15-08619							Landfill W	Landfill Waste Acceptance Criteria	ca Criteria
Chemtest Sample ID: 128567								Limits	
Sample Ref: 252								Stable Non-	
Sample ID: TP1								reactive	
Top Depth(m): 1.20							Inert Waste	Hazardous	Hazardous
Bottom Depth(m):							Landfill	waste In	Waste
Sampling Date: 09-Apr-2015				-				non-	Landfill
Determinand	SOP	Accred.	Units					hazardous	
Total Organic Carbon	2625	n	%			2.6	3	ເລ	9
Loss on Ignition	2610	Ú	%			5.7	1	1	10
Total BTEX	2760	n	mg/kg			< 0.01	9		1
Total PCBs (7 congeners)	2815	U	mg/kg			< 0.10	τ-	1	1
TPH Total WAC (Mineral Oil)	2670	ū	mg/kg			19	200	ı	
Total (of 17) PAHs	2700	Z	mg/kg			16	100	'	
pH	2010	Ú				80	ı	9<	1
Acid Neutralisation Capacity	2015	2	mol/kg			0.052	1	To evaluate	To evaluate
Fluste Analysis			2:1	8:1	2:1	Cumulative	Limit values	Limit values for compliance leaching	ce leaching
			I/Ĝu	ľgm	mg/kg	mg/kg	test using BS	lest using BS EN 12457-3 at L/S 10 l/kg	rt L/S 10 l/kg
Arsenic	1450	ñ	0.002	0.001	< 0.050	< 0.050	0.5	2	25
Barium	1450	n	0.4	0.067	0.78	1.1	20	100	300
Cadmium	1450	n	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	-	မ
Chromium	1450	Ω	0.03	0.037	0.058	0.36	0.5	10	70
Copper	1450	Ω	< 0.001	< 0.001	< 0.050	< 0.050	2	50	100
Mercury	1450	D	0.0006	< 0.0005	0.001	< 0.005	0.01	0.2	2
Molybdenum	1450	D	0.003	< 0.001	< 0.050	< 0.050	0.5	10	30
Nickel	1450	⊃	< 0.001	0.001	< 0.050	< 0.050	0,4	10	40
Lead	1450	D	< 0.001	< 0.001	< 0.010	< 0.010	0.5	10	50
Antimony	1450	n	0.003	< 0.001	< 0.010	< 0.010	90.0	0.7	5
Selenium	1450	n	0.001	< 0.001	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	ם	0.003	< 0.001	< 0.50	< 0.50	4	50	200
Chloride	1220	D	2.5	1.8	< 10	19	800	15000	25000
Fluoride	1220	ם	0.35	0.24	< 1.0	2.5	10	150	500
Sulphate	1220	ח	2	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	z	100	99	200	700	4000	00009	100000
Phenol Index	1920	٦	< 0.030	< 0.030	< 0.30	< 0.50	1	-	
Dissolved Organic Carbon	1610	Ω	< 2.5	< 2.5	< 50	< 50	009	800	1000

Dry mass or test portion/kg 0.175		1
Mojetina (%)	mass of test portion/kg	6/L'0

Leachate Test Information	
Leachant volume 1st extract/l	908.0
Leachant volume 2nd extract/	1.4
Eluant recovered from 1st extract/	0.21
Page 2 of 6	



Chemtest Sample ID: 128568									
								Limits	
Sample Ref: 234								Stable Non-	
Sample ID: TP2								reactive	,
Top Depth(m): 0.50							Inert Waste	Hazardous	Hazardous
Bottom Depth(m):							Landfill	waste in	Waste
Sampling Date: 09-Apr-2015								-11011	Landill
Determinand	SOP	Accred.	Units					hazardous	
Total Organic Carbon	2625	Ω	%			1.2	3	ιΩ	9
Loss on Ignition	2610	Π	%			4,5	ı	1	10
Total BTEX	2760	U	mg/kg			< 0.01	9	1	ı
Total PCBs (7 congeners)	2815	n	mg/kg			< 0.10	-	ì	1
TPH Total WAC (Mineral Oil)	2670	U	mg/kg			29	200	ţ	1
Total (of 17) PAHs	2700	Z	mg/kg			11	100	1	1
рН	2010	U				8.2	-	9^	1
Acid Neutralisation Capacity	2015	z	mol/kg			0.21	I	To evaluate	To evaluate
Eluate Analysis			2:1	8:1	2:1	Cumulative	Limit values	Limit values for compliance leaching	ce leaching
			mg/l	mg/l	mg/kg	mg/kg	test using BS	test using BS EN 12457-3 at L/S 10 l/kg	nt L/S 10 Vkg
Arsenic	1450	U	600'0	0.002	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.046	0.03	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	0.0058	< 0.00010	0.011	< 0.010	0.04	1	5
Chromium	1450	U	0.02	0.014	< 0.050	0.15	0.5	10	70
Copper	1450	מ	0.01	0.002	< 0.050	< 0.050	2	50	100
Mercury	1450	n	0.0011	< 0.0005	0.002	< 0.005	0.01	0.2	2
Molybdenum	1450	⊃	0.008	0.001	< 0.050	< 0.050	0.5	10	30
Nickel	1450	∩	600.0	< 0.001	< 0.050	< 0.050	0.4	10	40
Lead	1450	٦	0.007	0.001	0.013	0.017	0.5	10	50
Antimony	1450	٥	0.006	< 0.001	0.013	< 0.010	90.0	0.7	5
Selenium	1450	D	0.008	0.002	0.016	0.028	0.1	0.5	7
Zinc	1450	D	0.012	900.0	< 0.50	< 0.50	4	50	200
Chloride	1220	ם	3.1	2.3	< 10	24	800	15000	25000
Fluoride	1220	n	0.31	0.13	< 1.0	1.5	10	150	500
Sulphate	1220	ם	4.7	1.7	< 10	20	1000	20000	50000
Total Dissolved Solids	1020	z	110	99	220	710	4000	00009	100000
Phenol Index	1920	⊃	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1810	-	2	40,	C1.	Cl.	001	000	4000

Solid Information Dry mass of test portion/kg Moisture (%)
--

Leachate lest information	
Leachant volume 1st extract/l	0.312
Leachant volume 2nd extract/	1.4
Eluant recovered from 1st extract/	0.201

Page 3 of 6



Chemitest Sample ID: 12869 Sample Ref: 227 Sample ID: TP3 Top Depth(m): 1.50 Bottom Depth(m): Sample ID: TP3 SOP Acred. Units Determinand 2625 U % Medred. Units Total Organic Carbon 2625 U % % U % Medred. Medred. <td< th=""><th>Units % % mg/kg mg/kg</th><th></th><th></th><th>Limits Stable Non-</th><th></th></td<>	Units % % mg/kg mg/kg			Limits Stable Non-	
Ref: 227 ID: TP3 pth(m): 1.50 Depth(m): 3OP Accred. Units galaic Carbon 2625 U % Ignition 2610 U % Ignition 2610 U mg/kg 28 (7 congeners) 2610 U mg/kg 17) PAHS 2760 U mg/kg 17) PAHS 2700 N mg/kg 17) PAHS 2016 U 0.002 Intralisation Capacity 2015 N mg/kg Intralisation Capacity 2015 U 0.002 Intralisation Capacity 2015 U 0.002 Intralisation Capacity 1450 U 0.002 Intralisation Capacity 1450 U 0.002 Intralisation Capacity 1450 U 0.002 Intralisation Capacity 1450 U 0.002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002 Intralisation Capacity 1450 U 0.0002	Units % % mg/kg mg/kg			Stable Non-	
Discription 1.50	Units % % % mg/kg mg/kg mg/kg		_		
path(m): 1.50 Depth(m): SOP Accred. Units inand 2625 U % ganic Carbon 2610 U % lgnition 2610 U % EX 2760 U mg/kg SB (7 congeners) 2815 U mg/kg SB (7 congeners) 2815 U mg/kg Isi WAC (Mineral Oil) 2670 U mg/kg Intalisation Capacity 2015 N mg/kg Intalisation Capacity 2015 U 6.0002 Intalisation Capacity 1450 U 0.002 Intalisation Capacity 1450 U 0.0002 Intalisation Capacity 1450 U 0.0001 Intalisation Capacity 1450 U 0.0001	Units % % mg/kg mg/kg mg/kg		_	reactive	
Depth(m): og Date: 09-Apr-2015 SOP Accred. Units ganic Carbon 2625 U % ganic Carbon 2610 U % lgnition 2610 U mg/kg EX 2760 U mg/kg :Bs (7 congeners) 2815 U mg/kg :Bs (7 congeners) 2670 U mg/kg :Bs (7 congeners) 2670 U mg/kg :17) PAHs 2010 U 6.002 mn 1450 U 6.0001 mm/kg Indicated the mg/kg Indicated the mg/kg Indicated the mg/kg mm 1450 U 6.0001 mm 1450 U 6.0001 mm Indicated the mg/kg Indicated the mg/kg mm	Units % "mg/kg mg/kg mg/kg		Inert Waste	aste Hazardous	Mazardous
inand SOP Accred. Units ganic Carbon 2625 U % lgnition 2610 U % EX 2760 U mg/kg EX 2760 U mg/kg SB (7 congeners) 2815 U mg/kg SB (7 congeners) 2815 U mg/kg I 17) PAHS 2700 N mg/kg Li 17) PAHS 2010 U 0.002 Intralisation Capacity 2015 N mg/kg Intralisation Capacity 2015 U 0.002 Intralisation Capacity 1450 U 0.002 Intralisation Capacity 1450 U 0.0001 Intralisation Capacity 1450 U 0.0001 Intralisation Capacity Intralisa	Units % % mg/kg mg/kg		Landfill	fill waste in	WEATER !
Inand SOP Accred Units ganic Carbon 2625 U % Ignition 2610 U % EX 2760 U mg/kg SB (7 congeners) 2815 U mg/kg SB (7 congeners) 2815 U mg/kg Int VAC (Mineral Oil) 2670 U 0.002 Int VAC (Mineral Oil) 1450 U 0.002 Int Malysis 1450 U 0.002 Int M 1450 U 0.002 Int M 1450 U 0.001 Int M 1450 U 0.002 Int M 1450 U 0.002 Int M 1450 U 0.002	Units % % mg/kg mg/kg			-non-	Landil
ganic Carbon 2625 U % Ignition 2610 U % EX 2760 U mg/kg SB (7 congeners) 2815 U mg/kg SB (7 congeners) 2815 U mg/kg Isi VVAC (Mineral Oil) 2670 U mg/kg Isi VVAC (Mineral Oil) 2670 U mg/kg Isi VVAC (Mineral Oil) 2610 U mg/kg L17) PAHS N mg/kg mg/kg L17) PAHS L L mg/kg L1450 U 0.002 L Imalysis L L450 U 0.002 Imalysis L450 U 0.002 Inm L450	% mg/kg mg/kg			hazardous	
Ignition 2610 U % EX 2760 U mg/kg SB (7 congeners) 2815 U mg/kg In In In In In In In In In In In In In I	% mg/kg mg/kg		0.52 3	2	9
EX 2760 U mg/kg SB (7 congeners) 2815 U mg/kg Intralisation Capacity 2670 V mg/kg Intralisation Capacity 2015 N mg/kg Analysis 2015 N mol/kg Intralisation Capacity 1450 U <0.0002	mg/kg mg/kg		3.3	1	10
Lai VAC (Mineral Oil) 2815 U mg/kg f17) PAHs 2670 U mg/kg f17) PAHs 2010 U mg/kg 2010 U mg/kg varialisation Capacity 2015 N mol/kg Analysis 1450 U 0.002 m 1450 U 0.002 im 1450 U 0.002 inum 1450 U 0.002 inum 1450 U 0.002 v 1450 U 0.002 n 1450 U 0.002 n 1450 U 0.002 n 1450 U 0.002 n 0.002 U 0.002 n 0.002 U 0.002 n <td>mg/kg</td> <td>_</td> <td>< 0.01 6</td> <td>1</td> <td>ł</td>	mg/kg	_	< 0.01 6	1	ł
tal WAC (Mineral Oil) 2670 U mg/kg 117) PAHs 2010 U mg/kg utralisation Capacity 2015 N mol/kg Analysis 1450 U 0.002 m 1450 U 6.032 m 1450 U 6.003 m 1450 U 6.000 m 1450 U 6.000 m 1450 U 6.000 m 1450 U 6.000 n 6.000			< 0.10		1
Landlysis 2700 N mg/kg Analysis 2015 N mol/kg Analysis 1450 U 0.002 Imm 1450 U 0.032 Imm 1450 U 0.013 Imm 1450 U 0.002 Imm Imm 0.002 Imm Imm 0.002 Imm Imm Imm Imm Imm Imm Imm	mg/kg		< 10 500		L
utralisation Capacity 2016 U mol/kg Analysis 1450 U 0.002 Imalysis 1450 U 0.032 Imalysis 1450 U 0.002 Imalysis Imalysis Imalysis Imalysis Imalysis Imalysis	mg/kg		< 2.0 100	-	I
Analysis 2015 N mol/kg Analysis 1450 U 0.002 m 1450 U 0.032 m 1450 U 0.013 m 1450 U 0.013 m 1450 U 0.002 num 1450 U 0.002 1450 U 0.002 1450 U 0.002 n 1450 U 0.001 n 1450 U 0.001 n 1450 U 0.002 n 1450 U 0.002 n 1450 U 0.002 n 1450 U 0.002			8.3	9<	I
Analysis mg/l 1450 U 0.002 1450 U 0.032 1450 U 0.032 1150 U 0.013 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.002 1150 U 0.001 1150 U 0.002	mol/kg		0.35	To evaluate	To evaluate
mm 1450 U 0.002 mm 1450 U 0.002 mm 1450 U 0.032 mm 1450 U 0.013 mm 1450 U 0.002 mm 1450 U 0.002 mm 1450 U 0.002 mm 1450 U 0.001 mm 1450 U 0.001 mm 1450 U 0.001 mm 1450 U 0.001	2:1 8:1	2:1 Cur	НVВ	Limit values for compliance leaching	ce leaching
m 1450 U 0.002 m 1450 U 0.032 m 1450 U 0.032 m 1450 U 0.013 m 1450 U 0.013 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.001 m 1450 U 0.001 m 1450 U 0.001 m 1450 U 0.002 m 1450 U 0.002	l/bm l/bm	mg/kg	mg/kg testus	lest using BS EN 12457-3 at L/S 10 l/kg	at L/S 10 l/kg
m 1450 U 0.032 m 1450 U 0.032 m 1450 U 0.0010 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.001 m 1450 U 0.001 m 1450 U 0.001 m 1450 U 0.002 m 1450 U 0.002	0.002 0.002	< 0.050	< 0.050 0.5	2	25
m 1450 U <0.00010 m 1450 U 0.002 m 1450 U 0.013 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.001 m 1450 U <0.001 m 1450 U <0.001 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.002 m 1450 U 0.008					300
Inn 1450 U 1450	0.00010		. 0	1 1	5
1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U		-	0.12 0.5	10	70
ury 1450 U odenum 1450 U sl 1450 U nony 1450 U nium 1450 U 1450 U U	_	_		50	100
odenum 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U 1450 U	V	_	< 0.005 0.01	0.2	2
1450 U 14	0.002 0.002	< 0.050	< 0.050 0.5		30
1450 U 1450 U 1450 U 1450 U		< 0.050	< 0.050 0.4	10	40
Nony 1450 U 1450 U 1450 U 1450 U 1450 U	Н		< 0.010 0.5	10	90
ium 1450 U 1450 U 1450 U	Ì		< 0.010 0.06	3 0.7	- 2
1450 U			0.013 0.1		7
	20.00 800.0	< 0.50	< 0.50	50	200
Chloride 1220 U 3	3 1.7	< 10	19 800	15000	25000
Fluoride 0.28		< 1.0		150	200
Sulphate U 11	11 3.4	22	43 1000	20000	20000
Total Dissolved Solids 1020 N 98		190	660 4000	00009 0	100000
Phenoi Index 1920 U < 0.030	< 0.030 < 0.030	< 0.30	< 0.50	-	-
Dissolved Organic Carbon 1610 U 2.7	2.7 < 2.5	< 50	< 50 500	800	1000

Solid Information Dry mass of test portion/kg Moisture (%)
--

Leachate Test Information	
Leachant volume 1st extract/l	0.316
Leachant volume 2nd extract/	1.4
Eluant recovered from 1st extract/l	0.21
Page 4 of 6	



Chemtest Job No: 15-08619							Landfill W	Landfill Waste Acceptance Criteria	ce Criteria
Chemtest Sample ID: 128570								Limits	
Sample Ref: 219								Stable Non-	
Sample ID: TP4								reartive	
Top Depth(m): 4.20							Inort Waste	Hazardone	Hazardous
Bottom Depth(m):							1 andfill	waste in	Waste
Sampling Date: 09-Apr-2015								-000	Landfill
Determinand	SOP	Accred.	Units					hazardous	
Total Organic Carbon	2625	n	%			4	3	5	9
Loss on Ignition	2610	כ	%			8.2	1	1	10
Total BTEX	2760	ם	mg/kg			< 0.01	9	1	,
Total PCBs (7 congeners)	2815	D	mg/kg			< 0.10	-	1	
TPH Total WAC (Mineral Oil)	2670	Ω	mg/kg			20	200	1	1
Total (of 17) PAHs	2700	z	mg/kg			8.9	100	ļ	1
Ha	2010	Ŋ				7.7	1	9<	ì
Acid Neutralisation Capacity	2015	z	mol/kg			0.031		To evaluate	To evaluate
Flusta Anglysis			2:1	8:1	2:1	Cumulative	Limit values	Limit values for compliance leaching	e leaching
			I/Bw	mg/l	mg/kg	T.O.T	test using BS	test using BS EN 12457-3 at L/S 10 l/kg	t L/S 10 l/kg
Arsenic	1450	n	0.002	0.001	< 0.050	< 0.050	0.5	2	25
Barium	1450	n	0.031	0.024	< 0.50	< 0.50	20	100	300
Cadmium	1450	n	< 0.00010	< 0,00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	n	0.012	0.011	< 0.050	0.11	0.5	10	70
Copper	1450	Ω	0.002	0.001	< 0.050	< 0.050	2	50	100
Mercury	1450	ס	< 0.0005	< 0.0005	< 0.001	< 0.005	0.01	0.2	2
Molybdenum	1450	ם	0.002	< 0.001	< 0.050	< 0.050	0.5	10	30
Nickel	1450	٦	< 0.001	< 0.001	< 0.050	< 0.050	0.4	10	40
Lead	1450	٦	< 0.001	< 0.001	< 0.010	< 0.010	0.5	10	50
Antimony	1450	ח	< 0.001	< 0.001	< 0.010	< 0.010	90.0	0.7	5
Selenium	1450	ם	0.001	< 0.001	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	n	0.005	0.003	< 0.50	< 0.50	4	50	200
Chloride	1220	Ç	3.7	1.8	< 10	20	800	15000	25000
Fluoride	1220	n	0.28	0.091	< 1.0	1.1	10	150	500
Sulphate	1220	D	4	< 1.0	< 10	× 10	1000	20000	50000
Total Dissolved Solids	1020	z	90	55	180	590	4000	00009	100000
Phenol Index	1920	⊃	< 0.030	< 0.030	< 0.30	< 0.50	-1	-	1
Dissolved Organic Carbon	1610	Ω	< 2.5	< 2.5	< 50	< 50	500	800	1000

Dry mass of test portion/kg	0.175
Moisture (%)	20

Leachate Test Information	
Leachant volume 1st extract//	0.306
Leachant volume 2nd extract/l	1.4
Eluant recovered from 1st extract/	0.222

Page 5 of 6



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, SVCOs, PCBs, Phenols

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

All Asbestos testing is performed at our Coventry 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

Sample Retention and Disposal

All soil samples will be retained for a period of 60 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: <u>customerservices@chemtest.co.uk</u> **BOREHOLE RECORD SHEETS**

1.20-1.65 B 1.20-1.65 D 2.00-2.45 U c=91kPa 2.50 D 3.00-3.45 SPT N=9 3.00-3.45 B 3.00-3.45 D 4.00-4.45 U c=69kPa 4.50 D		es 08/04/2015	Client AEW ARCHITECTS & DESIGNERS LTD Engineer TRP CONSULTING LTD Description MADE GROUND: grass over dark brown slightly gravelly slity clay with occasional roctlets. Gravel sized fragments are angular to subangular fine to medium stone and coal (topsoil). Firm low strength becoming high strength brown and occasional grey motited slightly gravelly slity	Legerd	Job Numb 6019 Sheet 1/2
Depth (m) Sample / Tests Casing Depth (m) Do. 0.00-1.00 B D. 10 D D D D D D D D D D D D D D D D D D	Field Records (mO	08/04/2015 vel Depth (m) (Thickness)	Description MADE GROUND: grass over dark brown slightly gravelly slity clay with occasional rootlets. Gravel sized fragments are angular to subangular fine to medium stone and coal (topsoil).	Legerd	Mater Ins
D.00-1.00 B D.100-1.00 D D D D D D D D D D D D D D D D D D		(0.20)	MADE GROUND: grass over dark brown slightly gravelly slity clay with occasional rootlets. Gravel sized fragments are angular to subangular fine to medium stone and coal (topsoil).	Legend	\neg
1.20-1.65 SPT N=8 1.20-1.65 B D	,1 <i>1</i> 2,2,2,2	(0.20) - 0.20 - 0.20	sized fragments are angular to subangular fine to medium stone and coal (topsoil).	* -:	,,,
.20-1.65 B .20-1.65 D .00-2.45 U c=91kPa .50 D .00-3.45 SPT N=9 .00-3.45 D .00-4.45 U c=69kPa .50 D	,1/2,2,2,2		Firm low strength becoming high strength brown	* • •	
.20-1.65 B .20-1.65 D .00-2.45 U c=91kPa .50 D .00-3.45 SPT N=9 .00-3.45 B .00-3.45 D .00-4.45 U c=69kPa .50 D	,1/2,2,2,2	(2.30)	and occasional grey mortied signity gravely silly CLAY with occasional rootlets. Gravel is subangular to subrounded fine to medium siltstone, mudstone and quartz.	X - x	
.50 D .00-3.45 SPT N=9 .00-3.45 B .00-3.45 D .00-4.45 U c=69kPa .50 D .00-5.45 SPT N=13 .00-5.45 B			muqawita aya quare.	X	To the state of th
.00-3.45 SPT N=9 2 .00-3.45 B D .00-4.45 U c=69kPa .50 D .00-5.45 SPT N=13 2		2,50	below 2.00m : high strength	X X	
.00-3.45 D .00-4.45 U c=69kPa .50 D .00-5.45 SPT N=13 2	.,2/2,2,2,3		Firm low becoming medium locally high strength medium locally high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse mudstone, siltstone, sandstone and quartz.	x x x x x x x x x x x x x x x x x x x	
5.50 D 5.00-5.45 SPT N=13 2 5.00-5.45 B				7 9 0 X 7 4 X 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	
.00-5,45 B			below 4.00m : medum strength	X	
	2,2/3,3,3,4			X	
5.00-6.45 U c=81kPa			at 6.00m ; high strength	X *	
0.50 D				X	
.50-7.95 SPT N=14 .50-7.95 B .50-7.95 D	,2/3,3,4,4	(12.95)		X - 0	
.50 D				* * * * * * * * * * * * * * * * * * *	
.00-9.45 U c=92kPa		(12.95)	at 9,00m: high strength	X O X	
.50 D		المراسليل		N	
Remarks and dug inspection pit from GL to 1.20m to check for n completion backfilled with arisings and installed a 5 gravel surround to 6.00m, a Bentonite seal from 1.00	services - 1hr 50mm dia hdpe gas monif	itoring standpipe wi	th a gas valve and	Scale (approx)	Logge By
grave: surround to 6.00m, a Bentonite seal from 1.00	m to U.ZUM and a concre	eted in lockable ste	er protective bover from 0.20m to GL.	1:50 Figure N	NM/S.

and the		GEOTECHN	ICAL ANI	D ENVIRONMENTAL COI 561135 Fex (01772) 2048		'S	Site LOGISTICS SITE, BAE SAMLESBURY LANCA	:SHIRE	1	rehole imber 3H1
Boring Met	hod LE PERCUSSIVE		Diamete Omm to 1		Ground	Levei (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD			b Imber 8019
		Locatio	n PLAN		Dates 08	3/04/2015	Engineer TRP CONSULTING LTD			eet 2/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.50-10.95 10.50-10.95	SPT N=15 B			2,2/3,4,4,4			Firm medium to high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse mudstone, siltstone, sandstone and quartz.	7 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
12.00-12.45 12.50	U c=130kPa					որությունը կարությունը արդարանությունը կարարանում անույն արդարանում անույն արդարանում անույն արդարանում անույն	at 12.00m : high strength			
13.50-13.95 13.50-13.95 13.50-13.95	B			2,3/4,4,5,5	Į į					
15.00-15.45 15.00-15.40	SPT N=23 D			3,4/5,5,6,7			at 15.00m: high strength			
				08/04/2015:15.00m		15.45	Complete at 15.45m			
Remarks								Scale (approx)	Log	gged
								1:50		M/SJ
								Figure N	lo. o RH4	. 7

	SUB SURI						Site			orehole umber
1	SITE INVESTIGATION, (SEOTECH!	NICAL AND	ENVIRONMENTAL COI 561135 Fax (01772) 2048		S	LOGISTICS SITE, BAE SAMLESBURY, LANCASH	IRE		ВН2
Boring Met	thod BLE PERCUSSIVE		Diamete 0mm to 1		Ground	Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD	-	N	ob umber 6019
		Locatio	n S PLAN		Dates 02	2/04/2015	Engineer TRP CONSULTING LTD			heet 1/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legen	Water	Instr
0.00-0.60	B D					(0,60)	MADE GROUND: grass over dark brown, grey and brown mottled slightly gravelly silty clay with many rootlets. Gravel sized fragments are angular to subangular fine to medium stone.	******		
0.60 0.60-1.20 1.20-1.65	D B U c≂110kPa			Seepage(1) at 0.80m.		(1.10)	Firm high strength brown and occasional grey and orangish brown mottled slightly gravelly slightly sandy sifty CLAY. Gravel is subrounded to rounded fine to coarse quartz, siltstone and sandstone.	x	∑ 1	
1.70 2.00-2.45 2.00-2.45 2.00-2.45	D SPT N=15 B D			2,2/3,3,4,5		1.70 1.70 1.70 1.70 1.70 1.70 1.70 1.70	Stiff medium to high strength dark brown and occasional grey mottled slightly gravelly slity CLAY with occasional plant remains. Gravet is subangular to rounded fine to medium quartz, sittstone and sandstone.	X		
3.00-3.45	U c=130kPa					3.50	, at 3.00m : high strength	X		
3.50	D					3.50	Stiff medium strength dark brown slightly gravelly sitly CLAY. Gravel is subrounded to rounded fine to coarse quartz.	x		
4.00-4.45 4.00-4.45 4.00-4.45	SPT N=14 B D			2,2/3,3,4,4		المتعدا المتعددا المتعددا المتعددا المتعددات		X		
5.50-5,95 6.00	U NR					(5.50)	at 5.50m : low cobble content	X		
7.00-7.45 7.00-7.45 7.00-7.45	SPT N=12 B D			2,2/3,3,3,3		8.00 (1.00)				
8.50-8.95	U c=63kPa		!			لىلىئىلىل المالىل		X		
9.00	D					9.00	Firm poorty laminated dark brown silty CLAY with occasional dustings of silt.	X X X X X X X X X X X X X X X X X X X		
10.00-10.4	5 SPT N=22			2,3/5,5,6,6		<u> </u>		<u>x</u>	_	//
I On annola	nspection pit from GL tion backfilled with ari	IRIDAR ONA	i inetalled	a 50mm dia hana da	s monitori	ing standpipe	with a gas valve and teel protective cover from 0.20m to GL.	Scale (approx)	, E	ogged Sy
NR = No R	ecovery	a motified St	Jei IIVIII I	WHILE OF CHILD IN ST			news protested the new total 11 Mills Mill	1:50		NM/SJ
								Figure 60	No. 19.B	H2

	SUB SUR SITE INVESTIGATION. 3 Feel Street, Preston,	GEO1ECH	NICAL AN	D ENVIRONMENTAL CO 561135 Fax (01772) 204	ONSULTANT	s	Site LOGISTICS SITE, BAE SAMLESBURY, LANCAS.	HIRE		lorenole lumber BH2
Boring Me	thod BLE PERCUSSIVE	_	Diamete Omm to		Ground	Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD		J	ob lumber 6019
		Locatio	n S PLAN	***************************************	Dates 02	/04/2015	Engineer TRP CONSULTING LTD		s	heet 2/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legen	Water	Instr
10,00-10,45	5 D					10.00	Stiff high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse sandstone and siltstone.	X * x		
				02/04/2015:DRY	-	10.45	Complete at 10.45m			
										10
							5			
									3. 30	
					4			1 10	0	
						-		(8	30	
								(3)	49	
						Ē			3	
									ā	
						2			17	
									4	
								ř.	20	
10	2							E.		
]					
Remarks								Scale (approx)	4	gged
								1:50 Figure N	No.	M/SJ
									g BH	n 1

TEMPORE .		GEOTECHI	VICAL AND	DENVIRONMENTAL COI 561135 Fax (01772) 2049		S	Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	Num	ehole nber H3
Boring Meti	hod LE PERCUSSIVE	1	Diamete 0mm to 1		Ground	Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD		nber)19
		Locatio	n S PLAN		Dates 08	3/04/2015- 9/04/2015	Engineer TRP CONSULTING LTD	Shed	et 1/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Lege	nd ka
.00-1.00 .10 .30	B D D					(0,30)	MADE GROUND: grass over dark brown silty clay with occasional rootlets.		DOGGEDA
.80	D						Firm brown and occasional grey and light brown mottled slightly gravelly silty CLAY with occasional lenses of fine to medium sand. Gravel is subrounded to rounded fine to medium quartz and slitstone.		=
.20-1.65	SPT N=14			2,2/3,3,4,4	i i	0.80	Stiff medium strength locally very high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz, sandstone and siltstone.		
.20-1.65 .20-1.65	B D				:				
.00-2,45	U c=167kPa					(2.70)	at 2.00m: very high strength		-
.50	D								-
.00-3.45 .00-3.45 .00-3.45	SPT N=13 B D			2,2/3,3,3,4					-
						3.50	Stiff high strength locally medium strength dark brown silty CLAY.		
00-4.45	U c=96kPa					3.50		*	
.50	D							* — * * — *	-
.00-5.45 .00-5.45 .00-5.45	SPT N=12 B D			2,2/3,3,3,3		(3.00)			-
				08/04/2015:5.50m 09/04/2015:DRY				×	-
.00-6.45	U c=78kPa					6.50			1
.50	D						Firm medium strength dark brown silty CLAY.	× = ×	<u>-</u>
.50-7.95	SPT N=15			3,3/3,4,4,4				× = ×	1
50-7.95 50-7.95 50-7.95	B D			3,0/3,7,7,7		(2.50)		* *	
								X X	_
.00-9.45	U c=113kPa					9.00	Stiff high strength dark brown slightly gravelly silty CLAY.	× = *	
50	D					6.50 (2.50)	Gravel is subangular to rounded fine to coarse quartz, sandstone and siltstone.	x - x	
temarks							Scale	100	
and dug in ackfilled or	spection pit from GL n completion,	to 1.20m	to check	for services - 1hr			Scale (approx)		
							1:50 Figure	No.	197

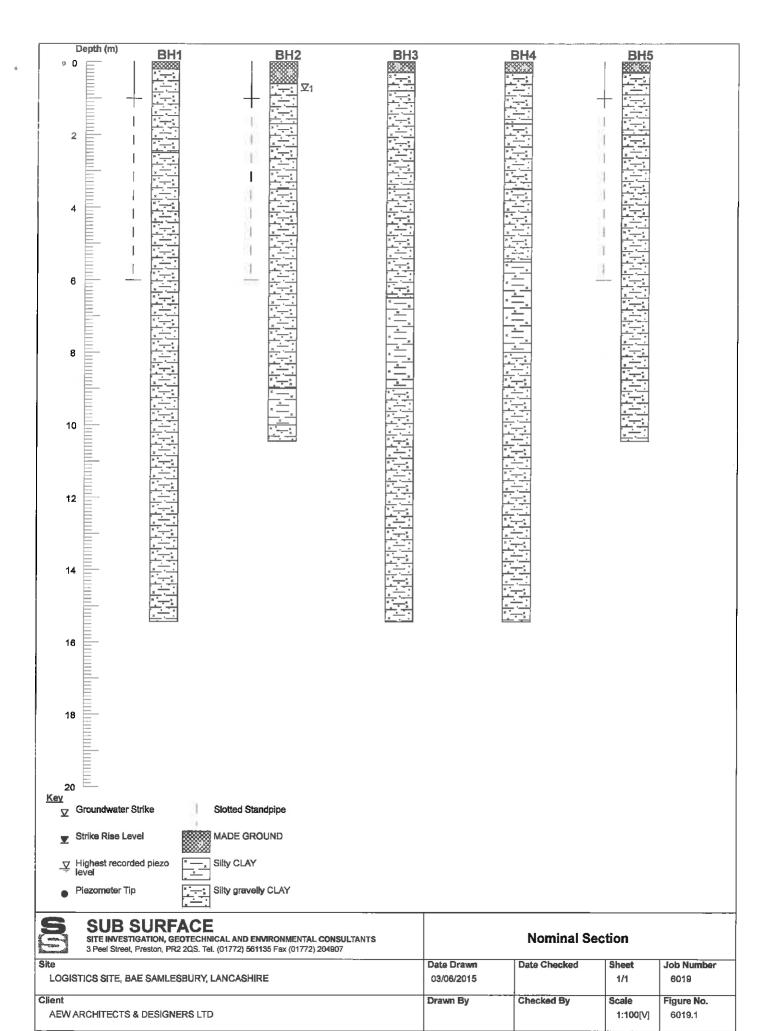
1 S	SUB SUR	GEOTECHI	ICAL AN	D ENVIRONMENTAL CO 561136 Fex (01772) 204	NSULTANT	s	Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	Borehole Number BH3
Boring Meth		Casing	Diamete 0mm to 1	r	т	Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD	Job Number 6019
		Locatio	n PLAN		Dates 08	3/04/2015- 3/04/2015	Engineer TRP CONSULTING LTD	Sheet 2/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Fedeuq Par
10.50-10.95 10.50-10.95 10.50-10.95	SPT N=18 B D			3,4/4,4,5,5	i	الماماء الماما	Stiff high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz, sandstone and siltstone.	
12.00-12.45 12.50	U c≂107kPa D					(6.45)		
13.50-13.95 14.00	U c=127kPa D			ž				
15.00-15.45 15.00-15.45	SPT N=28 D			4,5/6,7,7,8 09/04/2015:15.00m		15.45	Complete at 15.45m	
				ð				
3								
					<u></u>			
Remarks							Scale	Logged By
							1.50	NM/SJ
							Figure	No.

		GEOTECH!	VICAL AND	DENVIRONMENTAL CO 561135 Fax (01772) 204		s	Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	Boreh Numb BH4
Boring Meti	hod LE PERCUSSIVE	_	Diamete 0mm to 4		Ground	Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD	Job Numbe 6019
		Locatio	n FLAN		Dates 07	7/04/2015	Engineer TRP CONSULTING LTD	Sheet 1/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
.00-1.00 .10 .30	B D D					(0.30)	MADE GROUND: dark brown slightly gravelly slity clay with occasional rootlets. Gravel sized fragments are angular to subangular fine to medium brick and stone.	
						(1.40)	Firm becoming stiff very high strength brown and occasional grey and light brown mottled slightly gravelly sitty CLAY with occasional lenses of silt. Gravel is subrounded to rounded fine to medium quartz.	
.20-1.65	U c=180kPa					(1.40)	, at 1.20m : very high strength	
.70 .00-2,45 .00-2.45 .00-2.45	D SPT N=14 8 D			3,3/3,3,4,4		1.70	Stiff medium becoming high strength strength dark brown and occasional grey mottled slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz and sandstone.	x - v
.00-3.45	U c=114kPa					(1.80)		x - v - x - x - x - x - x - x - x - x -
.50	D					3,50	Stiff high strength dark brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to coarse siltstone and quartz.	* - *
.00-4.45 .00-4.45 .00-4.45	SPT N=18 B D			2,3/4,4,5,5	:	3.50		x
.00-5.45	U c=98kPa							XX
.50	D					5.50	Firm medium strength dark brown sifty CLAY.	xx x x
.00-6.45 .00-8.45 .00-6.45	SPT N=12 B D			2,2/3,3,3,3		2.50)		
'.50-7.95	U c=42kPa							* * * * * * * * * * * * * * * * * * *
.00	ם				1	8.00	Stiff medium to high strength dark brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse quartz, sandstone and siltstone,	X
.00-9.45 .00-9.45 .00-9.45	SPT N=16 B D			3,3/4,4,4,4		8.00		x x x x x x x x x x x x x x x x x x x
Remarks land dug in lackfilled or	spection pit from GL n completion.	to 1,20m	to check	for services - 1hr			Scale (approx)	Logge
2.	,						1:50	NM/S
							Figure I	No. 19.BH4

	SUB SUR SITE INVESTIGATION, 3 Peel Street, Preston, I	GEOTECHI	VICAL ANI	D ENVIRONMENTAL CO 561135 Fax (01772) 204	NSULTANT	rs	Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE		rehole inber 3H4
Boring Met		Casing	Diamete Omm to 4	r		i Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD		b imber 8019
		Locatio	n S PLAN		Dates	7/04/2015	Engineer TRP CONSULTING LTD	Sh	2/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Deptin (m) (Thickness)	Description	Leg	erid Mater
10.58-10.95 11.00	U c=92kPa D						Stiff medium to high strength dark brown slightly gravelly sitty CLAY. Gravel is subangular to rounded fine to coarse quartz, sandstone and siltstone.	N	
12.00-12.45 12.00-12.45 12.00-12.45	l B			3,4/5,6,6,6		1.45) (7.45)	below 12.00m : high strength	X 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	()
13.50-13.95	U c=129kPa					Line			
14.00	D								
15.00-15.45 15.00-15.45	SPT N=26 D			4,5/6,6,7,7 07/04/2015:15.45m		15:45	Complete at 15,45m	: :: :::	
Pamarke									
Remarks							Sca (appro	e Dy By	gged
							1:50 Figu	NIV	//SJ
								re No. 6019.BH4	.

	SUB SURI SITE INVESTIGATION, 0 3 Peel Street, Preston, P	GEOTECH	VICAL AND	D ENVIRONMENTAL CO: 561135 Fax (01772) 204	NSULTANT	'S		Site LOGISTICS SITE, BAE SAMLESBURY, LANCASH	IIRE	N	oreh umb	ər
Boring Met LIGHT CAB	thod LE PERCUSSIVE	-	Diamete Omm to 3		Ground	Leve	el (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD		N	ob umb 6019	
		Locatio	n PLAN		Dates 07	7/04/2	015	Engineer TRP CONSULTING LTD		S	h ee t 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	(Thi	epth (m) ckness)	Description	Legen	Water	Ins	tr
0.00-1.00 0.10 0.30	B D D					سلسنسلسل	(0.30) 0.30 (0.60)	MADE GROUND: dark brown slightly gravelly siity clay with many rootlets. Gravel sized fragments are angular to subrounded fine to coarse stone and brick.				
0.90	D					علىلىلىلىلىلىلىلىلىلىلىلىلىلىلىلىلىلىلى	0.90	Firm brown and occasional grey and light brown mottled slightly gravelly CLAY with occasional lenses of sift. Gravel is subrounded fine to medium quartz.	*			ı,
1.20-1.65	U c=169kPa						(1.10)	Stiff very high strength dark brown and occasional grey mottled slightly gravelly silty CLAY with occasional plant remains. Gravel is subrounded to rounded fine to medium siltstone and quartz.				1
1.70 2.00-2.45 2.00-2.45 2.00-2.45	SPT N=13 B D			2,3/3,3,3,4			2.00	Stiff medium to high strength dark brown slightly gravelly sitty CLAY. Gravel is subangular to subrounded fine to coarse quartz, slitstone and sandstone.	N			o New York Control
3.00-3.45	U c=150kPa							at 3.00m : high strength	× - ×			6 h 6 5 5 6 6 6
3.50	D								×			
4.00-4.45 4.00-4.45 4.00-4.45	SPT N=11 B D			1,2/2,3,3,3								
5,50-5,95	U c=70kPa								××			
6.00	D						(8.45)		X			
7.00-7.45 7.00-7.40 7.00-7.45	SPT N=18 B D			2,3/4,4,5,5					X			
8.50-8.95	U c≃96kPa	1						below 8.50m : high strength	H		/	
9.00	D								X X X X X X X X X X X X X X X X X X X			
10.00-10.45 Remarks		. 4 **		3,4/4,5,5,5					Scale		gge	
Hand dug in On completi a gravel sur	spection pit from GL to backfilled with arist round to 6.00m, a Bei	to 1,20m t sings and ntonite se	to check the character of the character	ror services - 1hr a 50mm dia hdpe gas .00m to 0.20m and a c	monitorir concreted	ng sta In loc	ndpipe w kable ste	rith a gas valve and sel protective cover from 0.20m to GL.	Scale (approx)	`	gge / M/SJ	
									Figure I			7

WWW.	SUB SUR SITE INVESTIGATION, 3 Feel Street, Presion, F	GEOTECH	IICAL AND	D ENVIRONMENTAL CO 561135 Fax (01772) 2041	NSULTANT	s	Site LOGISTICS SITE, BAE SAMLESBURY, LAN	CASHIRE		orenole umber BH5
Boring Met LIGHT CABI	hod LE PERCUSSIVE	500	Diamete Cmm to 3		Ground	Level (mOD)	Client AEW ARCHITECTS & DESIGNERS LTD		Nı	ob umber 6019
		Locatio	n FLAN		Dates 07	7/34/2015	Engineer TRP CCNSULTING LTD		Si	2/2
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45	0						Stiff medium to high strength dark brown slightly graveily slity CLAY. Gravei is subangular to subrounded fine to coarse quartz, siltstone and sandstone.	X * X		
Remarks				07/C4/2015:10.45m		անվակի և հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմակի հիմա	Complete a: 15,45m)	Scale	Lo	ogged
Remarks								Scale (approx)	i	gged /
								1:50 Figure N	_	M/SJ
									10. 19.BH	15



TRIAL PIT RECORD SHEETS

3*3	9 9	8	8 3	*	œ		s	cale (approx)	Logged By	Figure No.	
ES 9941	× ×	*0	39)		: 00		*				
a 120	v - W	211	S 3		is	•					
1940 N 39	8 T	E1	39 3	e 2 - 5	700	12	*	Measurements taken from h A = Amber glass jar sample V = Vial sample On completion backfilled wit			
Plan	* *	2	a :	÷: -	(Ga)	•		Remarks Pit sides remained stable an Seepage at 2.00m	nd vertical.		
20-3.40 20-3.40 20-3.40 20-3.40 20-3.40	A B D V					- (3.20 0.30) 3.50 0.50)	ashy slightly sandy gravell and medium cobble contrel sized fragments are fine to burnt timber and wood. MADE GROUND: brown, o slightly sandy slightly grav cobble and boulder sized f	ey and dark grey brown slighy clay with occasional rootle to the frick and stone. Grave to coarse stone, brick, slag, a dark grey and dark grey bro elly clay with some roots an fragments of brick and stone e fine to coarse stone, brick	sts sh, wn d ow	***************************************
20-1.40			Seepage(1)	at 2.00m.			2.10)	below 2,00m : with o	ccasional cobble and grave ous macadam		Z
20-1.40 20-1.40 20-1.40	A B D						1.10	li cobble and boulder sized f	dark grey and dark grey bro elly clay with some roots an fragments of brick and stone e fine to coarse stone, brick	. 1999	000000000000000000000000000000000000000
.60-0.80 .60-0.80 .60-0.80 .60-0.80	A B D V					-	0.60	sandy gravelly clay (subso and with low cobble conte	and dark grey brown slightly ill) with some roots and root nt of brick and stone. Grave o coarse stone, clay pipe, br and ceramics.	lets I Ick,	00.00000000000000000000000000000000000
.01-0.30 .01-0.30 .01-0.30	A D V						0.60)	MADE GROUND: grass or sandy gravelly clay with so Gravel sized fragments an	ver dark grey brown slightly ome roots and rootlets (tops e fine to coarse stone.	ail).	E5555555555555555555555555555555555555
Depth (m)	Sample / Tests	Water Depth (m)	Field	 I Records	Level (mOD)			TRP CONSULTING LTD	escription	Lege	1/2 end
ECHANIC	AL EXCAVATOR	Locatio			Dates	9/04/201	5	AEW ARCHITECTS & DE	SIGNERS LID	She	019 sat
xcavation		Dimens 0.70m	sions x 3.80m		Ground	d Level (ı	mOD)	Client	OIONEDO LEB	Jok Nui	nbe

	SUB S	ATION.	SEOTECH!	VICAL AN	D ENVIRO 581188 F	ONMENTAL Ex (01772)	CONSULTANT	rs	Site LOGISTICS SITE, BAE 8	SAMLESBURY, LANCASHIR	RE	Trial Pit Number TP1
	on Method ICAL EXCAVAT		Dimens				74	l Level (mOD)	Client AEW ARCHITECTS & D	ESIGNERS LTD		Job Number 6019
			Locatio AS	n PLAN			Dates 0	9/04/2015	Engineer TRP CONSULTING LTD			Sheet 2/2
Depth (m)	Sample /	Tests	Water Depth (m)		ield Re	cords	Level (mOD)	Depth (m) (Thickness)		Description		Legend Late
				09/04/2	015:			(0,10) 4,10	Stiff brown and occasion slightly gravelly slightly fi rootlets and pockets of g Gravel is subangular to r siltstone, sandstone and	al light grey mottled slightly s ssured CLAY with occasiona reenish medium to coarse so ounded fine to coarse quartz mudstone.	sandy al and. z,	K * q *
									Complete at 4.10m			
Plan	8		3	•	8	0		. F	lemarks			
(40) 5	141	23	9	¥	¥	248	32 3	+4				
900 - 10	<u> </u>	€	a	39.	*8	(96)	9 4 8					
30 S	2	55	27	17.	22	(3)	iii 2	3 89				
an a	3	200	## ##	4		020	12 S					
1917		6	2.5	180	*	(96)		s	cale (approx) 1:25	Logged By ALM/SJ	Figure 60	No. 19.TP1

	SUB SUR SITE INVESTIGATION, 3 Peel Street, Preston,	GEOTECHN	ICAL AND	ENVIRON 61135 Fe	IMENTAL (x (01772) 2	CONSULTAN 04907	TS	Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	Numbe TP2
xcavation	Method AL EXCAVATOR	Dimensi 0.70m x				Groun	d Level (mOD	Client AEW ARCHITECTS & DESIGNERS LTD	Job Numbe 6019
		Location	n PLAN			Dates	09/04/2015	Engineer TRP CONSULTING LTD	Sheet 1/2
Depth (m)	Sample / Tests	Water Depth (m)	F	ield Rec	ords	Level (mOD	Depth (m) (Thickness	Description	Legend
9.50-0.70 1.50-0.70 1.50-0.70 1.50-0.70	A B D V						- (0.30)	MADE GROUND: grass over dark grey brown slightly sandy gravelly clay (topsoil) with some roots and rootlets Gravel sized fragments are fine to coarse stone and occasional brick. MADE GROUND: brown, grey brown and grey slightly sandy gravelly clay with occasional roots and rootlets will low cobble content of stone. Gravel sized fragments are fine to coarse stone and occasional brick and glass.	
2.00-2.20	В		Seepage	e(1) at 1.	80m.		- (2.70	at 2.20m : concrete block	
3.10-3.30 3.10-3.30 3.10-3.30 3.10-3.30	A B D V						- - - - - - - - - - - - - - - - - - -		ad
3.90	D						(0.60	slightly gravelly slightly fissured CLAY with occasional rootlets and pockets of greenish medium to coarse sand Gravel is subangular to rounded fine to coarse quartz,	100
Plan	§ §	20	948	12	-		S W	Remarks Pit sides remained stable and vertical.	
8 8		*)(1660		*	¥6	э з	Seepage below 1.80m Measurements taken from high side of mound. A = Amber glass jar sample V = Vial sample On completion backfilled with arisings.	
E - 1	9 9	•	3.02	P#		<u>20</u>	95 95		
D 0	8 8	•	•	2/2	2	2 0	nan s		
	591 32	•	63			•	5063		
	(e) (f	82	55	35	95	*3	A50	Scale (approx) Logged By	Figure No.

S	SIT	UB \$1 FE INVESTIGA Posi Streat, Pre	TION, G	EOTECHA	IICAL AND	ENV!RO	NMENTAL (CONSULTAN	т s	Site LOGISTICS SITE, SAE	SAMLESBURY, LANCASHI	RE	Triel Pit Number TP2
Excavat MECHA	tion M		1	Dimens 0.70m	ions			-	t Levei (mOD	AEW ARCHITECTS &	DESIGNERS LTD		Job Number 6019
			ĺ	Location AS	n PLAN			Dates	9/04/2015	Engineer TRP CONSULTING LT	D		Sheet 2/2
Depti (m)	h	Sample / Te	ests	Water Depth (m)	F	ielc Rec	ords	Level (mOD)	Depth (m) (Thickness)	Description		Legend k
Plan					09/04/20				4.10	Stiff prown and occas sandy slightly gravely occasional rootlets ar coarse sand. Gravel coarse quartz, sands: Complete at 4.10m	ional light grey mottled slight is slightly fissured CLAY with id pockets of greenish mediu is subangular to rounced fin one and slitstone.	thy to e to	
		85 34	6	•		20		*		acinalks			
		10 O	68	•	*	•	a	SK S	2 220				
X .	5.	តា ខ		8	ži.	5	87	œ ×	(596)				
		n 8			8 2	<u>0</u>	•	8 7 E					
- 3	*	5 3		œ	ж	(*)		E F	s	cale (approx)	Logged By ALM/SJ	Figure f	Na. 9.TP2

THE PARTY.	SUB SUR SITE INVESTIGATION, 3 Peel Street, Preston,	GEOTECH	NICAL AN	ID ENVIR) 561135	ONMENTAL (Fax (01772) 2	CONSULTANT	rs	Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	Trial Num TF	ber
Excavation MECHANIC	Method AL EXCAVATOR	Dimens 0,70m	sions x 4.00m			Ground	Level (mOD) Client AEW ARCHITECTS & DESIGNERS LTD	Job Num 60	ibei
		Locatio	on S PLAN			Dates 0	9/0 4/2015	Engineer TRP CONSULTING LTD	Shee	et /1
Depth (m)	Sample / Tests	Water Depth (m)		Field Re	ecords	Level (mOD)	Depth (m) (Thickness	Description	Legen	d
.50-0.70 .50-0.70 .50-0.70 .50-0.70	A B D V						0.30	MADE GROUND: grass over dark grey brown slightly sandy slightly gravelly clay (topsoll) with many roots and rootlets. Gravel sized fragments are fine to coarse stone and occasional brick. MADE GROUND: brown and grey brown slightly sandy gravelly clay with occasional rootlets. Gravel sized fragments are fine to coarse stone and occasional brick, slag and an old piece of land drain.		
50-1.70 50-1.70 50-1.70 50-1.70	A B D V		Seepag	e(1) at 1	.80m.		1.40	MADE GROUND: brown, grey brown, dark grey brown and whiteish grey slightly sandy gravelly clay with medium cobble content of bituminous macadam and with some roots and rootlets. Gravel sized fragments are fine to coarse stone, brick, bituminous macadam, concrete and slag.		Z
50-2.70	В		Slow Int	flow(2) a	t 2.30m.		2,20	MADE GROUND: brown and grey brown and occasional yellow and red brown mottled slightly sandy gravelly CLAY with occasional rootlets. Gravel sized fragments are fine to coarse stone and occasional brick, slag and ceramics.		7
00-3.20	В						3.00	MADE GROUND: brown, grey and yellow brown sandy gravelly clay with lenses of fine to medium sand and low cobble content of stone. Gravel sized fragments are fine to coarse stone and occasional brick.		
90	D	į	09/04/20)15;			3.60	Firm to stiff brown and occasional grey mottled slightly sandy slightly gravelly CLAY with occasional rootlets, roots and plant remains. Gravel is subangular to rounded fine to coarse quartz, slitstone and mudstone.		
lan	0.002	334	00	300	- 94	SV IV	4.00	Remarks		
8	(6)	. 05	ě	F0	52	 		Pit sides remained stable and vertical. Slight seepage below 1.80m Measurements taken from high side of mound.		
	546	G)	×	48	6	8 9	Pr.	A = Amber glass jar sample V = Vial sample On completion backfilled with arisings.		
96	x es	(€	æ.	€:	300	· 8	60			
8	. §	3	Ø.)	50	93	Ti .	(8)			
85	\$8 E	8	×	i iš		¥ 4	S	cale (approx) Logged By Figure		_
	70							1:25 ALM/SJ 601	9.TP3	

S	SUB SU	RFACE	= = = = = = = = = = = = = = = = = = =	ONMENTAL	CANCIII TANT		Site LOGISTICS SITE, BAE SA	MLESBURY LANCASHIRE	Trial Pit Number
10100	3 Peel Street, Pres	ton, PR2 2QS. To	el. (01772) 561135	Fax (01772) 2	04907	3	EOGISTICS SITE, BAL SA	WIELDBOTT, EAWOAGI III.	TP4
Excavatio MECHANI	n Method CA≟EXCAVATOF	Dimens 0.70m	sions x 3,40m		Ground	Level (mOD)	Client AEW ARCHITECTS & DES	SIGNERS LTD	Job Number 6019
		Locatio	on S PLAN		Dates 09	9/04/2015	Engineer TRP CONSULTING LTD		Sheet 1/2
Depth (m)	Sample / Te	Water Depth (m)	Field R	ecords	Level (mOD)	Depth (m) (Thickness)	De	escription	Legend ze A
0.30-0.50 0.30-0.50 0.30-0.50 0.30-0.50	A B D V					(1.00)	MADE GROUND: grass ov sandy slightly gravelly clay with low cobble content of are fine to coarse stone an topsoil and subsoil).	with some roots and rootle stone. Gravel sized fragme	ts and to the
1.20-1.50 1.20-1.50 1.20-1.50 1.20-1.50	A B D V					1.00	MADE GROUND: brown, c slightly sandy gravelly clay cobble content of brick, bit Gravel sized fragments ar occasional brick, slag, bitu	uminous macadam and cor e fine to coarse stone and	icrete.
2.60-2.80	8		Seepage(1) at	2 60m		(1.60)	MADE GROUND: brown a slightly sandy very gravelly	nd occasional dark grey br	own
2.60-2.60			Geepage(1) at	2.9011.		(1.60)	stone and with occasional are fine to coarse stone ar	rootiets. Gravel sized fragi id occasional brick and slag	ments
Plan		2 8	94 12	,	800 3		Remarks		
• 0	en •	80 F.C	0± 30		(3)	× 30	Pit sides remained stable ar Seepage below 2.60m Measurements taken from h A = Amber glass jar sample V = Vial sample	igh side of mound.	
8	<u>*</u> 2	* *	e	50	7.52		On completion backfilled wit	n ananga,	
. 3	•	g 8	3 0	22	120				
82 S	¥8 94	& €	s &	×	(6)				
es to	ec 38	(i) (ii)	81 35	25	130		Scale (approx)	Logged By	Figure No.
							1:25	ALM/SJ	6019.TP4

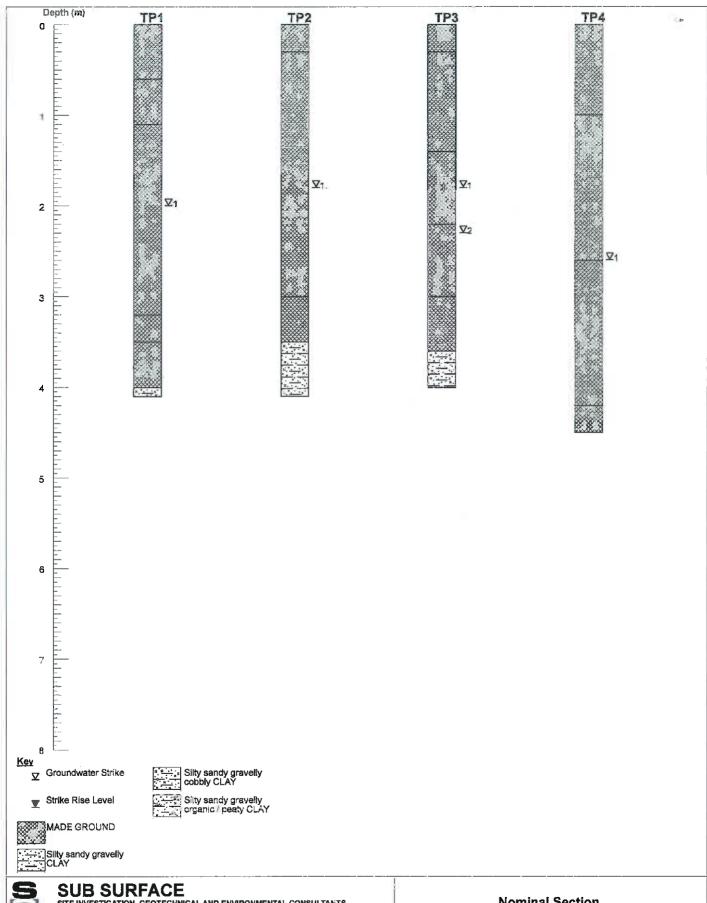
	SI	SUB S TE INVESTIG Peel Street, F	BATION, 6	EOTECH	VICAL AND	ENVIRO 561135 Fa	NMENTAL ax (01772) :	CONSULTA 204 9 07	NTS		Site LOGISTICS SITE, BAE	SAMLESBURY, LANCASHII	RE	Trial Num TF	ber
Excavati MECHAI		Method L EXCAVAT	OR	Dimens 0.70m	ilons x 3,40m			Grou	nd L	evel (mOD	Client AEW ARCHITECTS & D	ESIGNERS LTD		Job Num 60	
		_		Locatio	n S PLAN			Dates	09/0)4/2015	Engineer TRP CONSULTING LTD			Shee 2	it /2
Depth (m)		Sample /	Tests	Water Depth (m)	F	eld Rec	ords	Leve (mOI) (Depth (m) Thickness		Description		Legen	о Water
4.20-4.46 4.20-4.46 4.20-4.46		A B D V			09/04/20	15:				4.20 (0.30) 4.50	MADE GROUND: dark g sandy very gravelly clay sandstone, slate and sto Gravel sized fragments a slate, glass, ceramics ar Complete at 4.50m	rey and dark grey brown sli with medium cobble conten ne and with occasional root re fine to coarse stone, san d brick.			
Plan		×	*	:3	*	8	8.5	28	*	es 18	emarks				
14 T		(27)	122	24	Ě	***	0	-	1	80					
a 9	č	30	90	řik	50	¥)(24	(2)	ž.	"ET					
it is		•	i)t	3	m	ŧŝ	,0	iĸ	*	3.60					
. 8	3	<u>10</u>	ě	Š	Š		•	(2)	16	0.20					
S - 0	ē.	•	ā	(2)	25	23	(I	*	•	Se	cale (approx)	Logged By ALM/SJ	Fîgure	No. 9.TP4	

5	SUB SUI SITE INVESTIGATION S Peel Street, Presto	N, GEOTECH!	VICAL AND ENV			s	Site LOGISTICS SITE, BAE SA	MLESBURY LANCASHIRE	Trial Pit Number TP5
Excavation MECHANIS	n Method CAL EXCAVATOR	Dimens 0,47m	ilons x 1.50m		Ground	Level (mOD)	Client AEW ARCHITECTS & DES	SIGNERS LTD	Job Number 8019
		Locatio	n S PLAN		Dates 0	7/04/2015	Engineer TRP CONSULTING LTD		Sheet 1/1
Depth (m)	Sample / Test	Water Depth (m)	Field	Records	Level (mOD)	Depth (m) (Thickness)	De	escription	Legend kg
0.10-0.30 0.10-0.30 0.10-0.30 0.10-0.30	A B D V					(0.40)	MADE GROUND: long gra brown and brown mottled a clay (topsoil) with many ro- fragments are fine to coars	isses over dark grey and dark slightly sandy slightly gravelly ots and rootlets. Gravel sized se stone and occasional brick	
0.40-0.60	B		HV@0.60m,	c=97kPa		0.40	some rootlets and lenses of	orange brown, light grey, red d yellow brown mottled sandy oble content of quartz and with of silty fine to medium sand, o coarse quartz, sandstone a	
0.90	D		HV@0,50m.	c=102kPa		0.90	sandy slightly gravelly CLA	nd light grey mottled slightly AY with some root remains an Ind and fine gravel. Gravel is to coarse quartz, sandstone	<u> </u>
			HV @1.20m ,			(0.90)	below 1.60m : with sc	ome plant remains	
1.80	D		07/04/2015	DRY		1,80	Complete at 1.80m		
	8								
	41								
)						
Plan	m m m			100	248	900	Remarks Pit sides remained stable as	nd vertical	10
yk 99	FO . 9	¥0	9 9		: (6)	· ×	No groundwater encountered A = Amber glass jar sample V = Vial sample HV = Hand Shear Vane test	ed.	sing bookstled
#2 95	500 NS 15	1 9	81. 8		8	x x	On completion a soakaway with arisings.	test was carried out before be	ang backtiled
2 0	§ • 9		Sec. 18	40	27				
23	20 92 92	*8	540 - 59	£ 58	6	a «			
(x)	E 19 9.	X ((90) 29	39	8 1	e e	Scale (approx) 1:25	Logged By ALM/SJ	Figure No. 6019.TP5

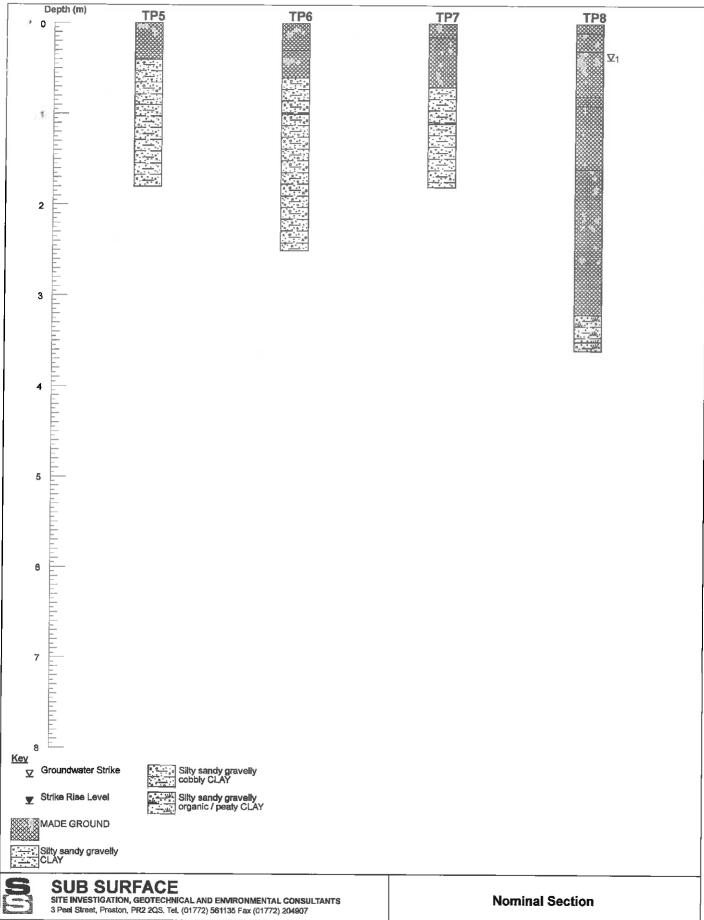
	SUB SUF SITE INVESTIGATION 3 Peel Street, Preston	, GEOTECH	NICAL AND E			rs		Site LOGISTICS SITE, BAE S	SAMLESBURY, LANCASHIR	RE	Trial Pit Number TP6
Excavatio MECHANI	n Method CAL EXCAVATOR	Dîmen: 0.70m	sions x 2,00m		Ground	Leve	el (mOD)	Client AEW ARCHITECTS & DI	ESIGNERS LTD		Job Number 6019
		Locatio	on S PLAN		Dates 08	9/04/2	2015	Engineer TRP CONSULTING LTD			Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Fie	id Records	Level (mOD)	(Thi	Depth (m) ckness)	ı	Description		Legend kate
0.10-0.30 0.10-0.30 0.10-0.30 0.10-0.30	A B D V				5 5 5		(0.30) 0.30 (0.30) 0.60	MADE GROUND: dark bi (subsoil) with some rootle fine to coarse stone.	rown slightly sandy gravelly ets. Gravel sized fragments	clay are	
0.70-0.90 1.20	D			n, c=88kPa n, c=122kPa			1.00	subangular to rounded fir siltstone. Stiff high strength brown a gravelly CLAY with some	i, orange brown, grey and gray gravelly CLAY with occa nd with some rootlets. Grav- le to coarse quartz, sandsto and grey mottled slightly sar rootlets. Gravel is subangul lartz, sandstone, mudstone	ne and ndy ar to	
2.00	D			n, c=130+kPa п, c=130+kPa			(1.50)	fissured and with occas	obble content of quartz slight ional peat/plant remains and eenish fine to coarse sand	tly	
2.50	D		HV@2.50m	1, c=130+kPa :DRY				Complete at 2,50m			
Plan	8 6	17	*	(30)			.	emarks ^o it sides remalned stable ar	nd vertical.		
9	Al 55	0.7	*	35/			11: 0	No groundwater encountere A = Amber glass jar sample / = Vial sample IV = Hand Shear Vane test	d		
1 8			*	n ar	i 1		10	On completion backfilled wit	h arisings.		
œ 18	8: (6)		*	- ac c	e e		63				
(7 (2)	51 750	(8)	®	ff 8 1	5 5		85				
. 40	20 020	©	41	P(82)	8		Sc	ale (approx)	Logged By ALM/SJ	Figure 601	No. 9.TP6

Location Dates (7,044,2018, Depth) Pieds Records (7,044,2018, Depth) (7,044,2018, Dept		SITE INVESTIGATION, 3 Pael Street, Presion,	PR2 2QS, T	el. (01772)			204907			MLESBURY LANCASHIRE	Number TP7
AS PLAN TRP CONSULTN GLTD TRP CONSULTN GLTD TRP CONSULTN GLTD Leg Trep Consultn General Consultness of Con							Ground	Level (mOD)		SIGNERS LTD	Job Numbe 6019
(m) (Introduction) (interpretation) (interpret							Dates	7/04/2015	_		Sheet 1/1
Complete at 1.80m	Deptn (m)	Sample / Tests	Water Depth (m)		Field Rec	ords	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend
MADE_GROUND: dark grow, dark grow prown and part and room plant	.05-0.15	D							sandy slightly gravelly clay Gravel sized fragments are	ver dark grey brown slightly / (topsoil) with many rootlets. e fine to coarse stone and	
HV@1.20m, c=91kPa D HV@1.20m, c=91kPa The process of the proces	30-0.50 30-0.50	D						(0.55)	MADE GROUND: dark gre slightly sandy slightly grav remains and some rootlets	elly clay with some plant and root a. Gravel sized fragments are	
Plan Remarks Pit sides remained stable and vertical, Silipit seepage at base. A *Amber Gass jars sample V= Visit seepage at base. A *Amber Gass jars sa				HV@0.	70m, c=9	3kPa		F	Stiff high strength brown, I greenish brown slightly sa	ight brown, light grey and ndy slightly gravelly CLAY with	
Plan Remarks Pt sides remained stable and vertical. Slight seepage at base. A = Amber glass jar sample V= Vial sample HV = Hand Shear Van test On completion a scakeway test was carried out bedore being back with a riskings.	.20	D		HV@1.	20m, c≂9	1kPa			Stiff high strength brown a slightly gravelly CLAY with root remains. Gravel is sul	nd grey mottled slightly sandy	X 1 2 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Plan Remarks Plan Remarks Plan taids remained stable and vertical. Slight seepage at base. A = Amber glass jar sample V = Vall sample H = Hand Shear Vane test On completion a soakaway test was carried out bedore being back with arisings.				HV@1.	60m, c=1	25kPa		1.80			
Pit sides remained stable and vertical. Slight seepage at base. A = Amber glass jar sample V = Vial sample HV = Hand Shear Vane test On completion a soakaway test was carried out bedore being back with arisings.											
Slight seepage at base. A = Amber glass jar sample V = Vall sample HV = Hand Shear Vane test On completion a soakaway test was carried out bedore being back with arisings.	Pian (2 2 2	8	1	Ţ.				Remarks		
HV = Hand Shear Vane test On completion a soakaway test was carried out bedore ceing back with arisings.			20	S	æ		(40)		Pit sides remained stable ar Slight seepage at base. A = Amber glass jar sample	nd vertical.	
Scale (approx) Logged By Figure No		e:	*8		*	8	15		HV = Hand Shear Vane test On completion a soakaway		backfilled
Scale (approx) Logged By Figure No			53	ũ	š		3	. 2			
Scale (approx) Logged By Figure No		e 4 x	•	34	32		ei .				
		E: 0		(8)	×	*	9		Scale (approx)	Logged By Figu	re No.

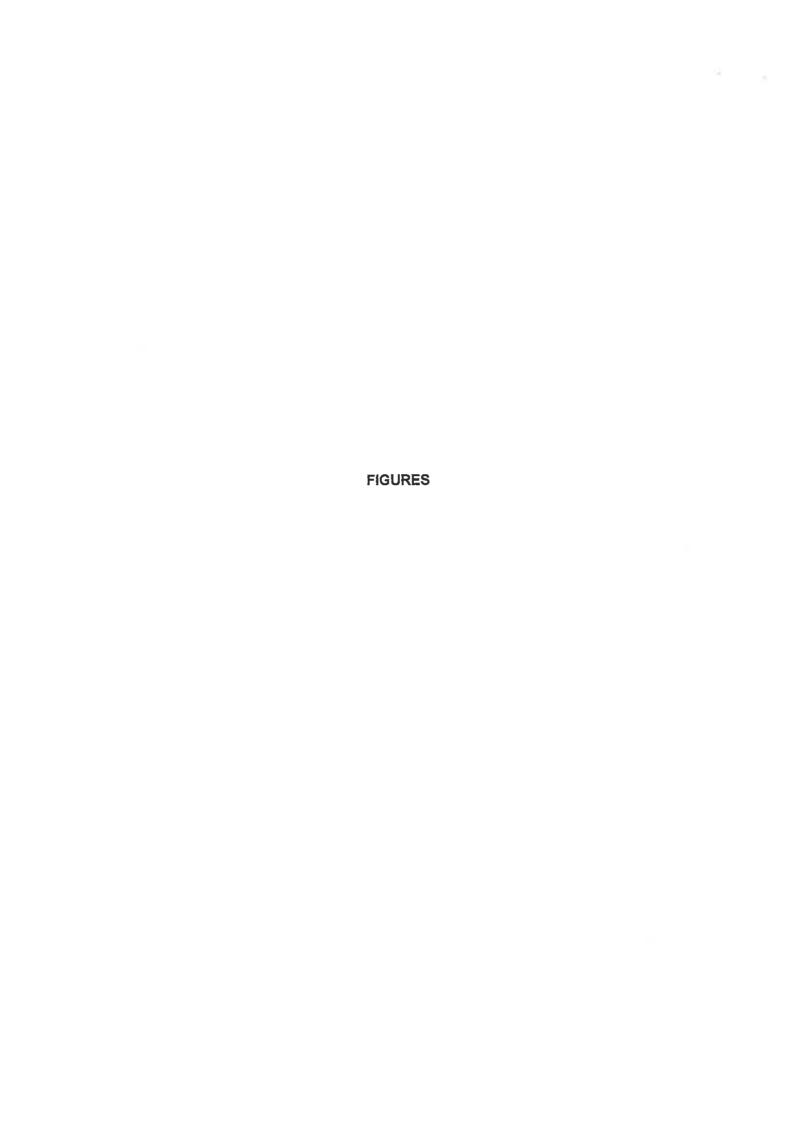
Depth (m) 10-0.30 10-0.30 10-0.30 10-0.30 30-0.50 80 80 80 80 10-1.30	Sample / Tests A B D V B	Water	S PLAN		Level (mOD)	Depth (m) (Thickness) — (0.10) — 0.10 — (0.20) — 0.30 —	MADE GROUND: grass of sandy slightly gravelly clar rootlets. Gravel sized frag	Description over dark grey brown slightly by (topsoll) with some roots and gments are fine to coarse stone ey slightly clayey slightly sandy	3.	/1
.10-0.30 .10-0.30 .10-0.30 .10-0.30 .30-0.50 .80 .80 .80 .70-1.90 .70-1.90 .70-1.90	A B D V B	Water Depth (m)	Seepage(1)	at 0,40m,	Level (mdD)	- (0,10) - 0.10 - (0,20)	MADE GROUND: grass of sandy slightly gravelly clar rootlets. Gravel sized frag	over dark grey brown slightly ly (topsoil) with some roots and gments are fine to coarse stone	3.	d
.10-0.30 .10-0.30 .10-0.30 .30-0.50 .80 .80 .80 .80 .70-1.90 .70-1.90 .70-1.90	B V B					(0.20)	sandy slightly gravelly cla rootlets. Gravel sized frag	y (topsoll) with some roots and gments are fine to coarse stone	3.	
.10-0.30 .10-0.30 .30-0.50	D V B					0.30	MADE GROUND: dark gr	ey slightly clayey slightly sandy	,	
.10-1.30 .70-1.90 .70-1.90 .70-1.90	D V		HV@0.40m,	с=/6кРа			ashy fine to coarse grave occasional stone, clinker	I sized fragments of slag with and brick.		2
.10-1.30 .70-1.90 .70-1.90 .70-1.90	D V					- (0,50) -	MADE GROUND: stiff hig brown and dark grey mott clay with some rootlets. C coarse stone.	h strength brown, light grey, gre tied slightly sandy slightly grave Gravel sized fragments are fine	ey elly to	
.70-1.90 .70-1.90 .70-1.90	В		1			- 0.80 - (0.10) - 0.90	MADE GROUND: dark gr visible plant remains and Gravel sized fragments ar occasional brick (organic	ey slightly clayey peat with mar with low cobble content of ston re fine to coarse stone and odour)	ny e.	
.70-1.90 .70-1.90							MADE GROUND: soft to f sandy slightly gravelly cla remains and low cobble c	firm brown and grey brown slig y with some plant, root and pee ontent of stone. Gravel sized rse stone, slag and timber (sligh	ıt 💮	
.70-1.80	A B D V					1,60	organic peaty clay with so	ey and dark grey brown silty me visible plant remains. Grav o coarse brick and ceramics	rel	
						(1.60)	below 2.20m : dark g odour)	grey and dark brown (organic		
20-3.40	В					3.20	bands and pockets of yell	slightly gravelly silty CLAY with ow brown peat (organic odour). ounded fine to coarse stone.	30 - 31 - 31 - 31 - 31 - 31 - 31 - 31 -	
60	D		HV@3.60m, 09/04/2015:D	c=88kPa DRY		3.50 - (0.10) - 3.60	 sandy slightly gravelly CL/ 	and light grey mottled slightly AY with occasional small pocke avel is subangular to rounded f ne and siltstone.	its ine	
Plan		.040		**		<u> </u>	Remarks			
	70 70	3.5%	10 10		-		Pit sides remained stable ar Seepage at 0.40m within the	e peat strata		
. 3	(7)		- 5	•	97	8 W	A = Àmber glass jar sample V = Vial sample HV = Hand Shear Vane test On completion backfilled wit	t		
3 3	18 .	(4)		•	84 8	2 33				
39	. ·	(⊛)		•	31 3	30				
3	27 20		(2	50	87 - 23	2.0				
14	÷ .	140			s s	S	cale (approx)	Logged By F	igure No.	_



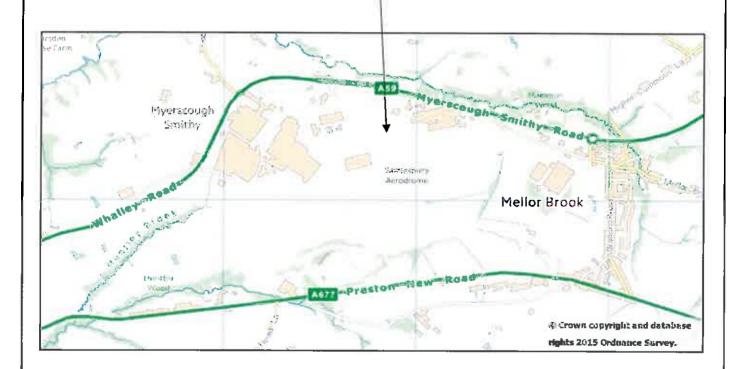
SUB SURFACE SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907		Nominal S	ection	
Site	Date Drawn	Date Checked	Sheet	Job Number
LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	03/06/2015		1/2	6019
Client	Drawn By	Checked By	Scale	Figure No.
AEW ARCHITECTS & DESIGNERS LTD			1:40[V]	6019.1
	1	1		(r)



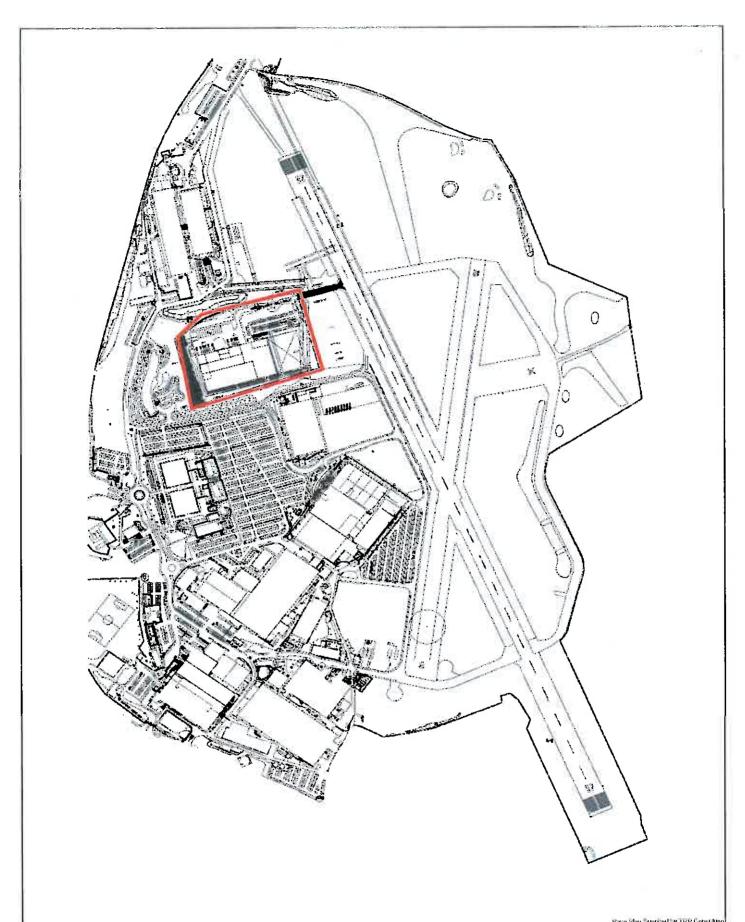
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS 3 Peel Street, Preston, PR2 2Qs. Tel. (01772) 561135 Fax (01772) 204907	Nominal Section			
Site LOGISTICS SITE, BAE SAMLESBURY, LANCASHIRE	Date Drawn 03/06/2015	Date Checked	Sheet 2/2	Job Number 6019
Client AEW ARCHITECTS & DESIGNERS LTD	Drawn By	Checked By	Scale 1:40[V]	Figure No. 6019.1







		Base F	lan Supplied by TRP Consultin		
	General Site Location				
Date Drawn	Date Checked	Onentation	JOD NO.		
01/06/2015]		6019		
	1	₹>			
Drawn By	Checked By	Scale	Figure No.		
l DJ			1		
		_	İ		
	01/06/2015 Drawn by	Date Drawn 01/06/2015 Drawn By Checked By	General Site Location Date Drawn 01/06/2015 Drawn By Checked By Scale		



SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS, Tel. (01772) 561135 Fax (01772) 264907		Site Location			
LOGISTICS SITE, BAE SAMLESBURY, BALDERSTONE, LANCASHIRE	01/06/2015	Date Checked	Onentation 245	Јор N6. 6019	
AEW ARCHITECTS AND DESIGNERS LIMITED	Drawn By DJ	Checked By	Scale —	Higure No.	

