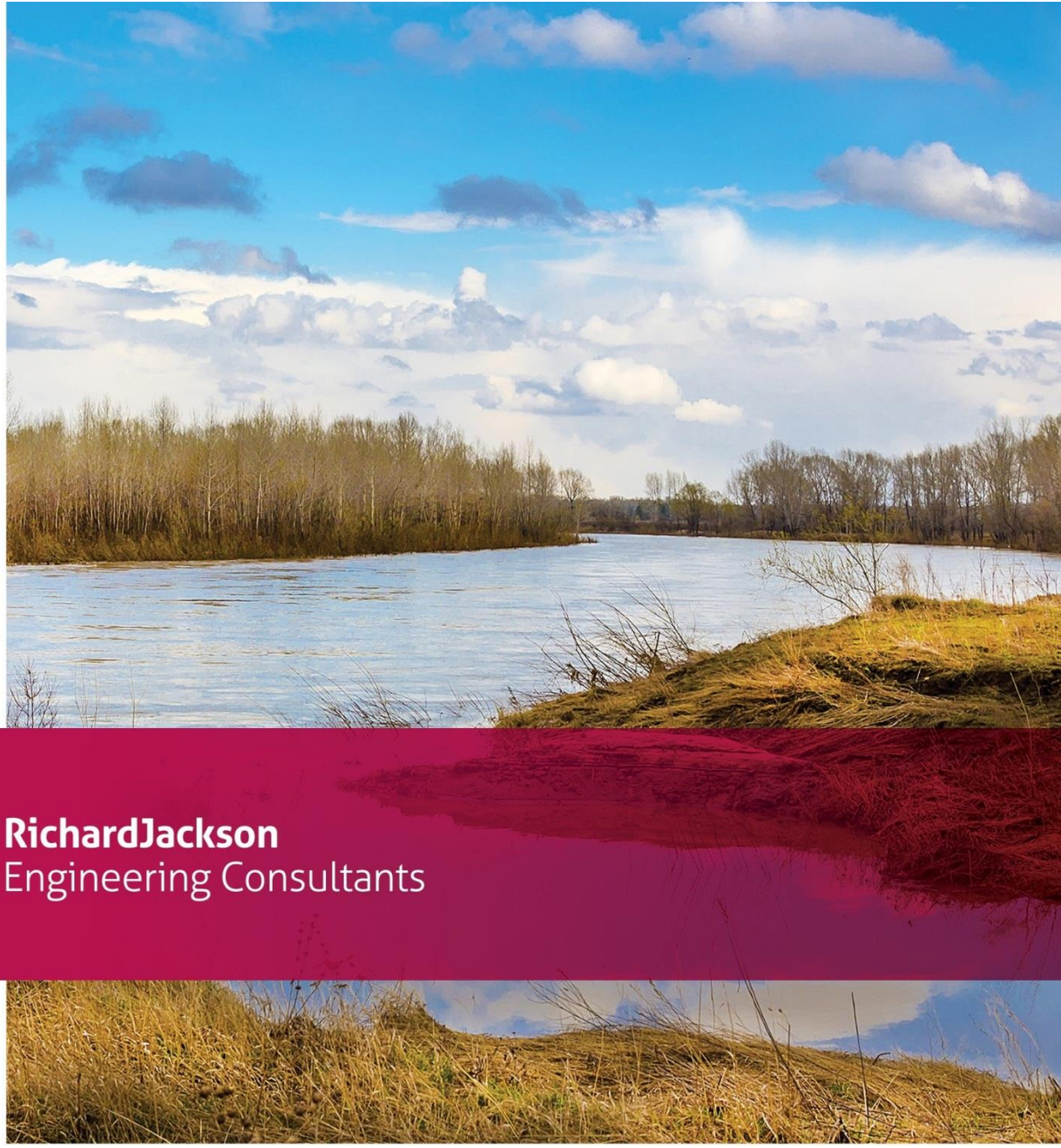

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GROUND INVESTIGATION REPORT

Land off Brick Lane, Mepal

Havebury Housing Partnership

March 2019

Project no: 49533

RichardJackson
Engineering Consultants

Document Review Sheet: -

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Contents:-

Appendix

EXECUTIVE SUMMARY

Purpose:	Intrusive ground investigation to establish the prevailing ground conditions, recover soil samples, assess the contamination status of the site and provide recommendations for use in the design and construction of the proposed scheme.
Site Status:	At the time of investigation, the site comprised an open agricultural field.
Fieldwork:	The fieldwork comprised the formation of 6no. trial pits together with soil sampling and in-situ testing.
Ground Conditions:	The following sequence of ground conditions was encountered: • Topsoil to a maximum depth of 0.50m below ground level (bgl) • Undifferentiated Kimmeridge & Ampthill Clay Formations (K&ACF) to the base of this investigation (2.40m bgl). • Groundwater seepages were encountered at 2.00m in TP1 and at 2.30m in TP5.
Soil Contamination:	Concentrations of contaminants in soils were recorded to be below their threshold values for the protection of human health in a residential setting.
Structural Foundations:	Shallow mass concrete foundations, bearing onto the K&ACF were considered appropriate for use at the site. Safe bearing pressures 120kN/m^2 at 1.00m bgl at 150kN/m^2 at 1.50m bgl have been determined for 0.45m wide strip footings.
Ground Floor Construction:	Fully suspended ground floor slabs, with a sub floor void appropriate to high-volume change potential soils are recommended for adoption on site.
Concrete Grade:	A design sulphate class of DS-2 is considered appropriate for use on site, with an aggressive chemical environment for concrete (ACEC) classification of AC-2s recommended.
Pavement Design:	A design CBR value of 2.5% is recommended where the sub-base comprises the K&ACF. In-situ CBR tests are recommended to confirm these values.

1. Introduction

Richard Jackson Ltd received an instruction to undertake ground investigation works in connection with the proposed development at Brick Lane, Mepal, Cambridgeshire, CB6 2AH.

The works were instructed by PlanSurv on behalf of the Client, Havebury Housing Partnership and were carried out in accordance with our fee proposal of 26 October 2018.

A phase one desk study report has previously been prepared for the site by Richard Jackson Ltd, report reference 49533 dated February 2019. This is briefly reviewed in this report.

The intrusive investigation, on which this report is based, comprised 6no. trial pits. In-situ testing and soil sampling were also undertaken.

This report assesses the findings of the intrusive investigation and gives recommendations for use in the design and construction of the proposed scheme.

Chemical analyses have been undertaken in order that the contamination status of the site may be determined and the need for further investigation or remediation assessed.

This report shall be read in conjunction with the limitations of investigation provided in Appendix E.

2. Site Location and Description

The site was located to the south of Brick Lane, Mepal, Cambridgeshire, CB6 2AH. The approximate Ordnance Survey grid reference for the centre of the site was TL 441 805. A site location plan is presented as Figure 1 in Appendix A.

The site was irregular in shape with maximum approximate dimensions of 180m east to west by 160m north to south. The site sloped gently downwards from an approximate elevation of 8m aOD on the southern boundary to 7m aOD on the northern boundary.

At the time of the investigation the site comprised an uncropped agricultural field.

A detailed site description is presented as Section 4 of Richard Jackson Ltd's Phase One Desk Study Report, report reference 49533, dated February 2019.

3. Proposed Development

The proposed development scheme is to comprise the construction of 55no. new residential dwellings with associated access road, driveways, gardens and infrastructure.

A proposed development plan is presented in Appendix A.

4. Review of Richard Jackson Ltd, Phase One Desk Study Report, reference 49533, dated February 2019

The site comprised an undeveloped agricultural field throughout the examined historical period. The surrounding area also remained largely undeveloped agricultural land with some small-scale residential development associated with Mepal recorded from the 1950s.

The British Geological Survey (BGS) 1:50,000 scale series mapping of the area Sheet 173, Ely, solid and drift edition (1980) indicated the southern part of the site to be underlain by the Kimmeridge Clay Formation, whilst the Ampthill Clay Formation was indicated to exist beneath the northern part of the site.

The underlying Ampthill and Kimmeridge Clay Formations were designated as unproductive strata in terms of their aquifer capabilities.

No potential on or off-site sources of contamination were identified. The risk of contamination at the site was therefore considered to be negligible.

The report recommended intrusive ground investigations to be undertaken at the site to confirm the prevailing ground conditions and the absence of soil contamination.

5. Factual Ground Investigation Information

The findings of the factual ground investigation are provided in the following sections.

5.1. Fieldwork

The fieldwork on which the report is based was undertaken on 4 February 2019 and comprised the mechanical excavation of 6no. trial pits (TP1 – TP6). Trial pits were excavated to depths of between 1.70m bgl (TP4) and 2.40m bgl (TP2) and were positioned to provide a representative coverage of the site.

An exploratory hole location plan is presented as Figure 2 in Appendix A.

Where cohesive soils were encountered, a hand shear vane was used to assess the undrained shear strength of the encountered soils.

Disturbed samples were recovered from throughout the depth of each trial pit for chemical analysis and geotechnical testing. Samples recovered for chemical analyses were stored in air tight plastic containers and amber glass jars.

All samples recovered for chemical analysis were transported to the analytical laboratory, Concept Life Sciences Ltd, in cool boxes under chain of custody protocols.

Exploratory hole logs are presented in Appendix B and give descriptions and depths of strata encountered, together with details of samples taken, in-situ tests, and other relevant information.

Where applicable, investigative techniques, sampling, logging of soils and in-situ testing complied with the requirements of British Standard BS5930:2015- 'Code of Practice for Site Investigations'.

5.2. Laboratory Testing

5.2.1. Geo-Environmental Testing

Chemical analyses were undertaken on a number of soil samples recovered from the site. Details of chemical analyses undertaken are provided in Section 6. Results of chemical analyses are presented in full in Appendix C.

5.2.2. Geotechnical Testing

Disturbed and undisturbed soil samples recovered from the exploratory holes were sent to a UKAS accredited soil testing laboratory Soil Property Testing (SPT) Ltd. The following tests were carried out in accordance with BS EN ISO: 17892-2:2014 -& BS1377:1990:

- 15no. water content determinations;
- 5no. atterberg limit tests (four-point liquid limit cone method);
- 7no. pH value and sulphate content (2:1 water soil extract) determinations*;
- 2no. BRE Pyrite suites*.

**A number of these tests were undertaken by the UKAS and MCerts accredited laboratory Concept Life Science (CLS) Ltd*

The results of these tests are presented in Appendices C and D.

5.3. Ground Conditions

The British Geological Survey (BGS) 1:50,000 scale series mapping of the area Sheet 173, Ely, solid and drift edition (1980) indicates the southern part of the site to be underlain by the Kimmeridge Clay Formation, whilst the Ampthill Clay Formation is present beneath the northern part of the site.

The deposits encountered in this investigation comprised the following sequence:

- Topsoil
- Undifferentiated Kimmeridge Clay Formation & Ampthill Clay Formation (K&ACF)

It should be noted that the Kimmeridge Clay Formation & Ampthill Clay Formation have been considered as undifferentiated in the following sections.

5.3.1. Topsoil

Topsoil was encountered from ground level in each of the 6no. trial pits, the thickness of which ranged from 0.30m bgl (TP3, TP4 & TP6) to 0.50m bgl (TP5). The topsoil typically comprised dark brown slightly gravelly clay with the gravel comprising flint.

5.3.2. Kimmeridge Clay Formation & Ampthill Clay Formation

Soils interpreted to represent the undifferentiated Kimmeridge Clay Formation & Ampthill Clay Formation (K&ACF) were encountered beneath the topsoil in each of the 6no. exploratory holes. The thickness of the K&ACF remained unproven to the maximum depth of this investigation (2.40m bgl in TP2).

The K&ACF was typically encountered as a firm to very stiff, fissured grey/brown clay with fine selenite crystals. A gravel of grey mudstone fragments was encountered in 3no. of the trial pits (TP1, TP3 & TP4).

Hand shear vane tests were undertaken throughout the depth of the K&ACF. The results of these tests ranged from 43kN/m^2 (TP2 at 0.70m) to 94kN/m^2 (TP6 at 1.90m). Full results are provided on the exploratory hole logs and summarised on the 'undrained shear strength –vs- depth' plot presented in Appendix B.

Water content determinations were undertaken on 15no. samples of the K&ACF and recorded water contents of between 15.2% (TP4 at 1.70m) and 31.9% (TP5 at 1.00m). Full results of these tests are provided in Appendix D. Full results of these tests are provided in Appendix D.

Atterberg limit tests were undertaken on 5no. samples of the K&ACF. Full results of these tests are provided in Appendix D. Plastic limits of between 24% (TP4 at 1.00m) and 26% (TP6 at 1.20m) have been reported. Plasticity indices of between 37% (TP1 at 1.50m & TP5 at 2.30m) and 47% (TP6 at 1.20m) have been recorded with liquid limits of between 62% (TP1 at 1.50m and TP5 at 2.30m) reported.

The results of the Atterberg limit tests indicated K&ACF to be of high to very high plasticity and of medium to high volume change potential.

5.3.3. Groundwater

Groundwater seepages were encountered in 2no. of the trial pits during formation., TP1 at 2.00m bgl and TP5 at 2.30m bgl.

6. Geo-Environmental Assessment

The purpose of this section is to provide an assessment of the contamination status of the site.

The analysis was undertaken by Concept Life Science (CLS) Ltd. a UKAS and MCerts accredited laboratory.

6.1. Soil Analysis

A broad suite of analyses was scheduled, including metals, organic and inorganic compounds.

5no. samples of soil have been analysed for a broad suite of contaminants as follows:

Arsenic	pH
Cadmium	Total Cyanide
Chromium	Water Soluble Sulphate
Copper	Total Phenols
Nickel	BTEX Compounds
Lead	Total Sulphur
Mercury	Speciated Polyaromatic Hydrocarbons (PAH)
Selenium	Organic Matter Content
Zinc	Total Petroleum Hydrocarbons (TPH)

An additional sample was analysed for heavy metals and speciated polyaromatic hydrocarbons (PAH).

Asbestos screening was undertaken by the analytical laboratory on 5no. samples of soil.

6.1.1. Reference Criteria

Screening values have been adopted for the site to reflect site-specific parameters, such as, intended end use and the Soil Organic Matter (SOM). Screening values have been developed on the basis of current guidance as given in The Land Quality Management / Chartered Institute of Environmental Health document, 'The LQM / CIEH S4ULS for human health assessment', (2015) publication no. S4UL3379.

It is understood that the site is to be developed for residential purpose. Therefore, screening values specific to residential land use with home-grown produce have been adopted for the site.

A conservative SOM of 1% has been adopted for organic chemicals for the purposes of the initial assessment on the basis of laboratory analysis. A SOM of 6% has been adopted for inorganic chemicals as detailed in 'The LQM / CIEH S4ULS for human health assessment', (2015).

In the absence of published S4UL for lead, the DEFRA Category 4 Screening Level (C4SL) for lead has been adopted.

Full details of the reference criteria used to derive the screening values, including the adopted values, are provided in Appendix C and summarised below.

The adopted screening values are also summarised in the following section.

6.1.2. Discussion of Analytical Results – Soils

Results of the chemical analyses undertaken on soils are presented in Appendix C and summarised in Table 1.

Table 1: Results of Chemical Analyses - Soils

Contaminant	No of Samples Tested	Screening Value (mg/kg)	Range of Concentrations (mg/kg)	No of samples exceeding screening value
Arsenic	6	37	10 – 14	0
Cadmium	6	11	0.1 – 0.2	0
Chromium	6	910	24 - 33	0
Copper	6	2,400	15 – 26	0
Nickel	6	180	22 – 27	0
Lead	6	200	20 – 55	0
Selenium	6	250	<3.0	0
Mercury	6	40	<1.0	0
Zinc	6	3,700	65 – 94	0
Benzo(a)pyrene	6	2.2	<0.1 – 0.7	0
Dibenz(a,h)anthracene	6	0.24	<0.1 – 0.21	0
Naphthalene	6	2.3	<0.1	0
Total Phenols	6	280	<1.0	0
TPH Aromatic C_5-C_7	5	70	<0.001	0
TPH Aromatic C_7-C_8	5	130	<0.001	0
TPH Aromatic C_8-C_{10}	5	34	<0.001	0
TPH Aromatic C_{10}-C_{12}	5	74	<2.0	0
TPH Aromatic C_{12}-C_{16}	5	140	<1.0	0
TPH Aromatic C_{16}-C_{21}	5	260	<1.0 – 2	0
TPH Aromatic C_{21}-C_{35}	5	1,100	<1.0 – 11	0
TPH Aliphatic C_5-C_6	5	42	<0.001	0
TPH Aliphatic C_6-C_8	5	100	<0.001	0
TPH Aliphatic C_8-C_{10}	5	27	<0.001	0
TPH Aliphatic C_{10}-C_{12}	5	130	<1.0	0

Contaminant	No of Samples Tested	Screening Value (mg/kg)	Range of Concentrations (mg/kg)	No of samples exceeding screening value
TPH Aliphatic C_{12}-C_{16}	5	1,100	<1.0	0
TPH Aliphatic C_{16}-C_{35}	5	65,000	<1.0 - 7	0
Benzene	5	0.087	<0.01	0
Toluene	5	130	<0.01	0
Ethylbenzene	5	47	<0.01	0
M & P xylene	5	56	<0.01	0
O xylene	5	60	<0.01	0

Asbestos was not detected in the 5no. samples which underwent asbestos screening.

From the above it is evident that none of the soil samples analysed presented elevated concentrations of the contaminants screened for when compared to their tier one screening values for the protection of human health.

6.2. Risk Assessment

As detailed in the preceding sections, concentrations of contaminants in soil samples analysed have been recorded to be below their tier one screening values for the protection of human health.

6.2.1. Soil Contamination and End Users

Considering initially end users of the site (i.e. future residents), exposure to contaminants would be primarily through direct contact, ingestion or inhalation of contaminated soils where soil is exposed such as in gardens or other soft landscaping areas.

There is considered to be a significantly reduced risk beneath buildings or in paved areas as in such areas there is no pathway by which the pollutant linkage may be completed.

On the basis of the results obtained to date, remediation is not considered to be necessary as no soil concentrations of contaminants have been encountered which may be considered to pose a risk to future residents at the site.

6.2.2. Soil Contamination and Construction Workers, Maintenance Workers and the Public

Although considered to be very low, risks to site workers and site neighbours during redevelopment arise primarily through dermal contact, ingestion and

inhalation of contaminants. It is considered that the degree of contamination observed poses a very low risk to site workers and the general public.

In order to reduce the risk to site workers during redevelopment, appropriate safety measures should be adopted on site.

Workers should avoid contact with the soils by the use of protective boots, overalls and gloves, and should wash before eating, drinking and using the toilet.

To prevent the inhalation of contaminants by site workers and the wind-blown transfer of contaminants off site, the generation of dust should be avoided; this can be achieved by spraying the materials with water if necessary. Measures should be taken to ensure that contaminated materials are not accidentally transferred off site, for example on vehicle tyres.

Reference should be made to CIRIA Report No.132 'A Guide for Safe Working on Contaminated Sites' (1996), and Health and Safety Guidance Document, Protection of Workers and the General Public during the Development of Contaminated Land' (1991).

6.2.3. Soil Contamination and Controlled Waters

No significant concentrations of contaminants have been recorded to date in the shallow soils at the site, with concentrations of PAH compounds and mobile TPH fractions generally below the method detection limit (MDL) for the analytical method used.

On the basis of the above, there is considered to be an insignificant risk posed by soil contamination to controlled waters adjacent to the site. Further investigation or remediation in respect to this risk is not considered to be necessary at this time

6.2.4. Soil Contamination and Flora

Concentrations of the phytotoxic contaminants, zinc, copper and nickel have been compared to the threshold values presented in Table 1 of British Standard BS3882: 'Specification for Topsoil and Requirements for Use' (2007), in order that this risk to flora may be assessed. It should be appreciated that this specification is only applicable to topsoil materials which are being placed. Topsoil which is to remain in-situ is not required to comply with the specifications of BS3882.

The screening values for phytotoxic contaminants are pH dependent and the following values have been adopted on the basis of a pH greater than 7.

- Threshold Value for Zinc –300 mg/kg
- Threshold Value for Copper –200 mg/kg
- Threshold Value for Nickel –110 mg/kg

Concentrations of the phytotoxic contaminants are below the above threshold values and thus the soils represented by the analysed samples are not considered to pose a risk to flora.

6.2.5. Soil Contamination and Structures and Services

On the basis of the results of chemical analyses on soils undertaken to date, the concentrations of contaminants are not considered to pose a risk to structures and services within the proposed development scheme.

6.2.6. Summary

On the basis of the above it is considered that the site may be developed for its intended residential end use without the need for further investigation or remediation.

6.3. Waste

Reference should be made to the EU Waste Framework Directive, Revised Directive 2008/98/EC and 'The definition of Waste: Development Industry Code of Practice (CoP) Version 2' published by CL:AIRE (2011) to establish whether soils generated from on-site works are classified as waste.

Waste will likely be generated from excavation works. There may be limited opportunities for re-use of materials on site, subject to compliance with the CoP.

There is, however, likely to be some waste to be disposed of off-site. Waste removed from the site, for disposal, must be classified according to the analytical methods and criteria recommended by the Landfill (England and Wales) (Amendment) Regulations 2004 and 2005. The regulations set new acceptance criteria for wastes to be disposed of at landfill sites with effect from 16th July 2005.

The groundworks contractor should classify the waste in accordance with the document entitled, 'Guidance on the classification and assessment of waste (1st Edition 2015), Technical Guidance WM3', to determine whether the soils to be disposed of off-site are considered to be hazardous or not.

Full and detailed records should be kept of all waste soils removed from site for future reference purposes.

6.4. General

As with any sampling exercise, the sampling process is representative and it is possible that areas of contamination may be found during the redevelopment of the site. Excavations on site should be supervised and any areas of suspected contamination should be assessed by a competent professional and subject to further analysis is necessary.

It should be noted that all remediation proposals are subject to the approval of the Local Authority. It would be prudent to involve the regulatory bodies

early in the development of the proposed scheme and before construction commences in order that all requirements are met.

7. Geotechnical Assessment

We have assumed that the proposed development will include predominantly low-rise buildings with associated roads and parking areas. We anticipate that loadings for typical one to two storey residential dwellings will be applicable.

The recommendations provided within this section are based upon the above information and our understanding of the proposed scheme as detailed in Section 3, together with the proposed development plans included in Appendix A.

7.1. Structural Foundations

7.1.1. Shallow Foundations

Conventional mass concrete foundations, bearing onto the undifferentiated Kimmeridge and Ampthill Clay Formations, are considered appropriate for adoption at the site.

Net safe bearing pressures have been determined for the site on, based on conventional strip footings. The net safe bearing pressures is the permissible increase in vertical stress at the level of the underside of the foundation, above existing overburden pressure which may be calculated on the basis of a soil bulk density of 20kN/m^3.

Groundwater seepages were recorded from 2.00m bgl in 2no. of the trial pits. For the purposes of estimating net safe bearing pressures, we have taken a conservative approach to the depth to groundwater beneath the site and assumed that the water table is at 2.00m bgl.

Table 2 provides a summary of the calculated net safe bearing pressures at a range of depths bgl. The assumed relative strength of the soil has been inferred from the 'undrained shear strength –vs- depth plot presented in Appendix B together with the soil descriptions provided by the site engineer. Elastic theory has been used to derive the stress distribution beneath the foundations.

Table 2: Net Safe Bearing Pressures

Foundation	Depth, bgl (m)	Bearing Stratum	Nett Safe Bearing Pressure (kN/m^2)
0.45m wide strip footing	1.00	Undifferentiated Kimmeridge & Ampthill Clay Formations	120
	1.50		150

At the above net safe bearing pressures, total drained settlements have been calculated to be within tolerable limits.

The total drained settlements have been calculated using modulus of elasticity values, Ev'. In over consolidated cohesive soils the Ev' values are based on the relationship; Ev' = 130 x C_u, after Stroud and Butler (1975).

Settlement in cohesive soils typically comprises a small amount of immediate settlement as loads are applied and a larger proportion of consolidation settlement which will occur over a longer period of time.

The formation should be inspected by a competent engineer prior to concreting. If very soft or loose pockets are encountered, these should be excavated until a firm to stiff or medium dense to dense deposit suitable for bearing is encountered.

It should be noted that the K&ACF is a shrinkable material and therefore, where influenced by trees, hedgerows or other vegetation, foundations will need to be designed in accordance with NHBC Standards Chapter 4.2 'Building near Trees' (2016). The K&ACF should be considered to have a high-volume change potential.

Where foundations exceed a depth of 1.5m due to the influence of trees, anti-heave precautions should be adopted.

Foundations should be excavated beyond the depth of any significant roots encountered in the excavations. Reference should be made to NHBC standards when considering any new areas of planting.

Shallow groundwater may be encountered in the K&ACF and therefore, groundwater control measures may be required to control groundwater ingress.

7.2. Ground Floor Construction

Fully suspended ground floor slabs are recommended for adoption on site and should incorporate a sub floor void appropriate to high-volume change potential.

7.3. Groundworks

The stability of any disturbed ground must not be relied upon in unsupported excavations.

Safe working conditions must be provided at all times where operatives are required to work in excavations.

Heavy plant and stockpiles of materials should not be permitted close to the edges of open excavations.

During fieldwork groundwater was not encountered in the exploratory excavations. If water seepages are encountered during excavations for foundations or services it should be possible to control water ingress by using sump pumping or similar methods.

Further reference should be made to CIRIA Report No. 97, 'Trenching Practice' (1997).

7.4. Concrete Grade

Sulphate content and pH value determinations were carried out by both the geotechnical and analytical laboratories on a total of 11no. soil samples.

The borehole records indicated the presence of selenite crystals within the K&ACF and this is typically indicative of soils which can be detrimental to concrete as a result of high sulphate content. In addition, the K&ACF can be a potential source of iron pyrites (FeS_2) which can also adversely affect buried concrete. Therefore, in addition to the above testing, BRE pyrites analysis suite was undertaken on 2no. samples. Given the observed potential presence of pyrites within the soils, the methodology detailed within Section C5.1.2 has been used to determine the required concrete grade. This methodology includes a determination of the total potential sulphate content which can be derived from the oxidation of pyrites in the K&ACF, following ground disturbance.

Values of water-soluble sulphate ranged from <10mg/l SO_4 to 1,770mg/l SO_4, pH values ranged from 7.5 to 8.2 and the concentrations of total sulphur ranged from 0.02% to 0.22%.

The above results have been compared to current guidance provided within BRE Special Digest 1, third edition 'Concrete in Aggressive Ground' (2005).

The following representative values have been adopted for the shallow soils at the site:

- Water Soluble Sulphate – 1,740mg/l SO_4;
- pH Value – 7.5;
- Total Potential Sulphate – 0.66%.

In accordance with BRE SD1 (2005) and on the basis of the above results and an assumption of mobile groundwater, the following classifications are recommended for shallow buried concrete at the site.

- Design Sulphate Class – DS-3;
- Aggressive Chemical Environment for Concrete (ACEC) – AC-3

7.5. External Works

7.5.1. Drainage

Infiltration testing was outside the scope of this investigation. Given the predominantly cohesive nature of the underlying soils, it is considered that infiltration drainage at the site is unlikely to be a viable option. Alternative methods of surface water disposal should be investigated.

7.5.2. Pavement Design

The investigation identified the likely subgrade for pavement design to comprise the K&ACF.

Reference has been made to the 'Design Guidance for Road Pavement Foundations', Interim Advice Note 73106, Revision 1 (2009), when considering the CBR value appropriate for use where K&ACF materials exists at subgrade level.

Interim advice note 73106, Revision 1 (2009) provides recommendations for design CBR values on the basis of soil plasticity. The recorded plasticity index of the K&ACF ranged from 37% to 47%. Therefore, a CBR value of 2.5% is recommended for the preliminary design of thin road pavements. Thin pavement construction is defined as a depth to subgrade of 300mm.

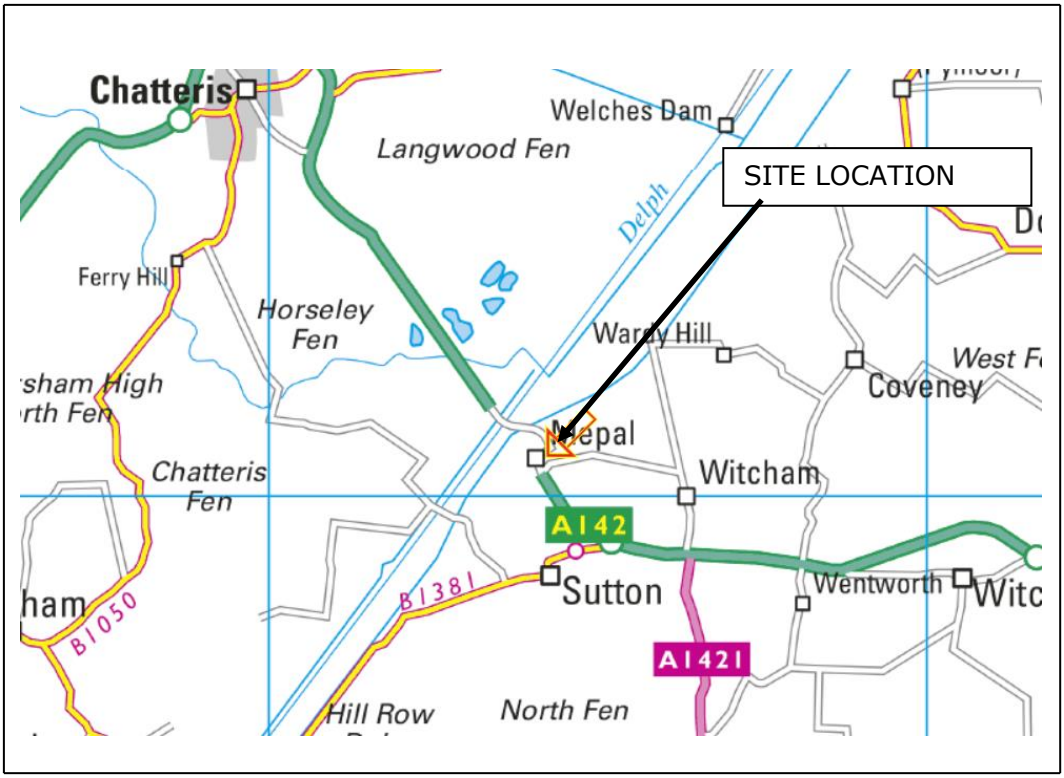
In-situ CBR tests should be carried out prior to road pavement construction to confirm the CBR values. In-situ tests should be undertaken once final levels for road construction have been determined.

Once formation level for the new road pavements has been achieved, proof rolling should be carried out using a heavy roller and any soft areas that are revealed should be excavated and a greater depth of subbase provided.

Exposed subgrades are likely to deteriorate rapidly on exposure to wet weather and should be shaped to shed water. Subbase should be placed as soon as possible to minimise the exposure of subgrade to adverse weather conditions.

Appendix A

Figures & Drawings



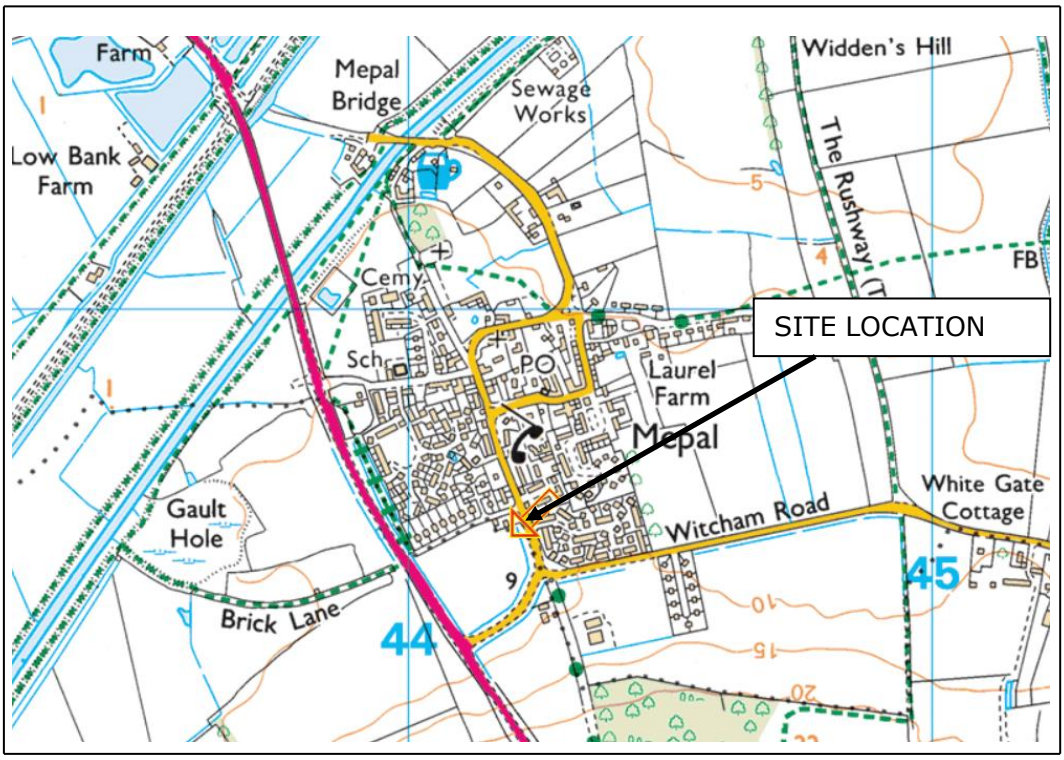


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FIGURE 1

SITE LOCATION PLAN

SCALE: N.T.S.

JOB NO: 49533

CONTRACTORS MUST CHECK ALL DIMENSIONS ON SITE, ONLY FIGURED DIMENSIONS TO BE WORKED FROM.
DISCREPANCIES MUST BE REPORTED TO THE DESIGN OFFICE BEFORE PROCEEDING.

Plot Schedule

HOUSE TYPE CODE	HOUSE TYPE	PLOT No.	Qty
1BHT/01	1 Bed House 58m2 (Semi-Detached)	29-32, 37&38	6
2BHT/01	2 Bed House 79m2 (Semi-Detached)	3,4,12-15	6
2BHT/02	2 Bed House 79m2 (Detached)	36,39,43	3
2BHT/03	2 Bed House 79m2 (Semi-Detached)	27,28	2
2BHT/05	2 Bed House 70 m2 (Semi-Detached & Terrace)	17,18,23-26	6
3BHT/01	3 Bed House 93 m2 (Semi-Detached)	5,6,10,11,33&34	6
3BHT/03	3 Bed House 94.2m2 (Detached)	9,16,35,40,46	5
3BHT/02	3 Bed House 94.9m2 (Detached)	41	1
3BHT/05	3 Bed House 88.5m2 (Semi-Detached)	19-22	4
4BHT/01	4 Bed House 113.1m2 (Detached)	45&48	2
4BHT/02	4 Bed House 112.9m2 (Detached)	42&47	2
4BHT/03	4 Bed House 109.3m2 (Detached)	44	1
5BHT/01	5 Bed House 128.9m2 (Detached)	49	1
2BBT/01	2 Bed Bugalow 61.7m2 (Semi-Detached)	7&8, 50&51	4
2BBT/02	2 Bed Bugalow 70m2 (Detached)	2	1
3BBT/01	3 Bed Bugalow 74m2 (Detached)	1,52,53,54 & 55	5
			55

KEY

- 1.2m Estate rail fence
- 1.8m closeboard fencing with concrete posts
- 1.8m brick wall
- 1.8m gate with galvanized latch and shoot bolt (or similar)
- Indicative landscaping please refer to landscape architects scheme for details
- V Visitor parking spaces
- Location of refuse bin communal collection point
- Shed — Minimum 4m2 (suggested 2.4x1.8m) SW timber shed with lockable door and window and concrete base with cycle security lock fixings
- +99.550 Indicative Proposed Ground Floor Slab Levels (To be confirmed by project engineer)
- Location of refuse bins screened by rear garden closeboard fence (each bin placed on 600x600 paving slab)
- Minimum 6m long washing line with concrete base

DRAWING REVISIONS		
Rev	Date	Details
A	21-03-19	Scheme up-dated
B	01-07-19	Scheme up-dated
C	17-07-19	Scheme up-dated
D	28-08-19	Drive hatch added to plot 2&3, sheds omitted plots 11&12, boundary adjusted between plots 10&11, additional gate omitted plot 18 and additional path from parked added to plot 50
E	29-08-19	Area of landscaping omitted adjacent to existing bungalow on brick lane
F	30-08-19	Red title line omitted from area of landscaping omitted adjacent to existing bungalow on brick lane
G	11-09-19	Up-dated to suit house type up-dates
H	07-10-19	Patio & rear paths added
J	01-11-19	Amended to suit house type up-dates
K	21-11-19	Rotary dryers added
L	25-11-19	Boundary fencing up-dated to plots 8,16,38,47&49

MWS Architectural Ltd
ARCHITECTURAL CONSULTANT
Tel/Fax: 01353 665 352
Email: mark@mwsarchitectural.co.uk

Project:
PROPOSED DEVELOPMENT AT LAND OF BRICK LANE & SUTTON ROAD MEPAL

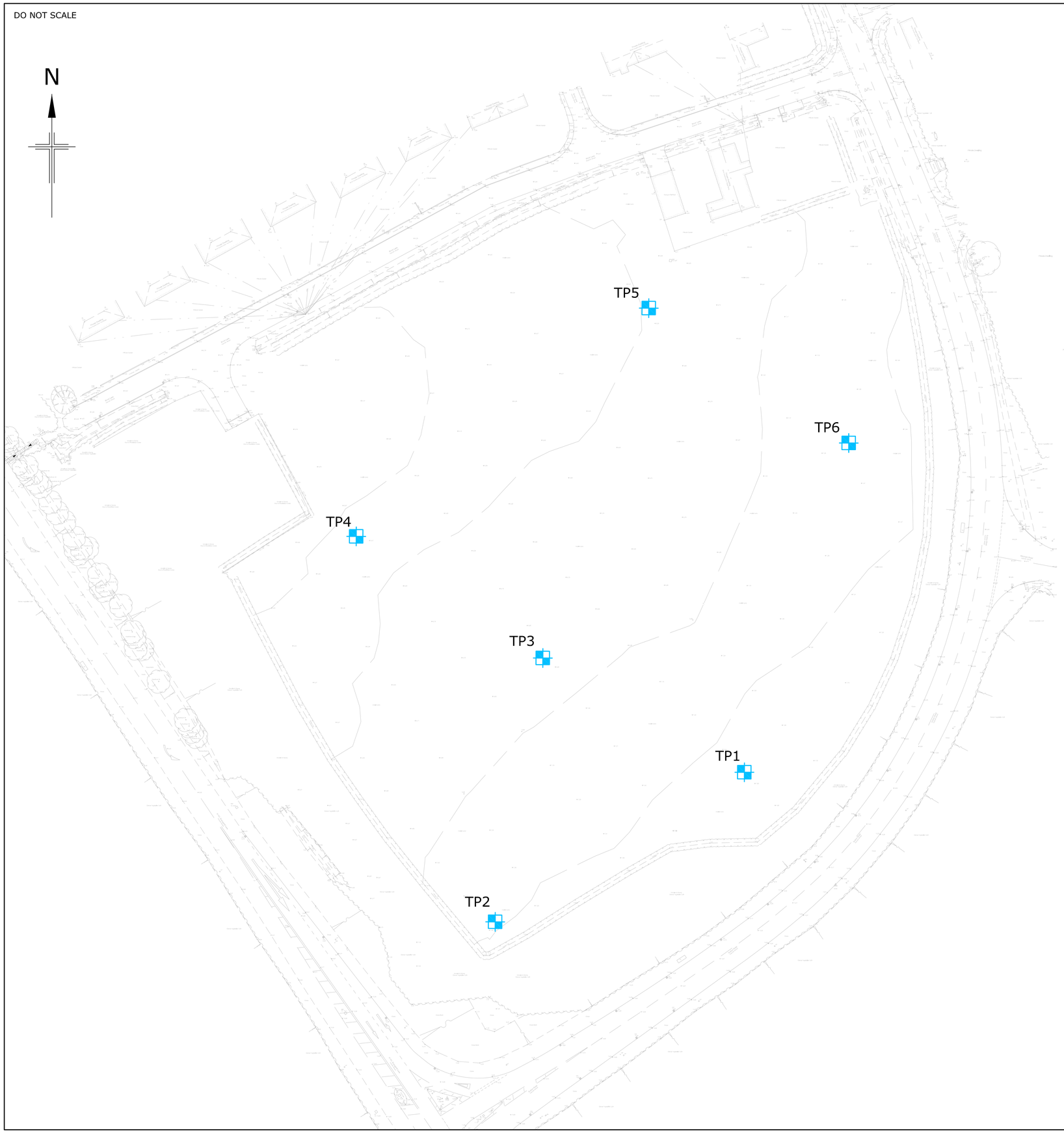
Drawing:
Proposed Site Plan

Drawing File Location:
DRAWING-FILE-LOCATION

Drawn by: MWS
Scale: 1:500@A1
Date: 07-01-19

Drawing no: 355/P/01
Revision L

DO NOT SCALE



KEY:-
:TRIAL PIT LOCATIONS (TP1-TP6)

REV	DATE	DESCRIPTION	DRAWN	CHKD

REVISIONS

This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.

Project
LAND OFF BRICK LANE
MEPAL

Title
EXPLORATORY HOLE LOCATION PLAN

Client
HAVEBURY HOUSING PARTNERSHIP

Scale	Drawn	Date
1:500 @ A1	AH	26/02/19
Job Manager	Checked	Approved
BF	KB	BF

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Drawing No.
49533-G-FIG02

Revision

Drawing Status
☒ INFORMATION ☐ APPROVAL ☐ COSTING
☐ TENDER ☐ CONSTRUCTION ☐ AS CONSTRUCTED

A1

Appendix B

Exploratory hole logs and data plots

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5 Quern House
Mill Court
Great Shelford
CB22 5LD

Trial Pit No.
TP1
Sheet 1 of 1

Project Name: Brick Lane	**Project No.** 49533	**Co-ords:**	Date **04/02/2019**
		Orientation:	**Dimensions (m)** 2.00 × 0.60
Location: Mepal, Cambridgeshire, CB6 2AH		**Level (m, aOD):**	Scale **1:20**
Client: Havebury Housing Partnership		**Depth (m):** 2.00	Logged **KB**

Ground water	Samples & In Situ Testing: Depth	Type	Results	Level (m)	Depth (m)	Legend	Stratum Description
	0.30	ES1			0.40		Dark brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint. TOPSOIL
	0.70 0.80	B1 IVN	58		1.30		Firm to stiff brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint.
	1.50 1.50	D2 IVN	78				Stiff to very stiff, fissured, grey mottled brown CLAY with frequent selenite crystals.
▼	2.00	B3			2.00		*...1.9m with angular to sub-angular gravel of grey mudstone.* End of Pit at 2.000m

1 2 3 4

Groundwater: Groundwater seepage at 2.00m bgl.

Stability: Stable sides.

Remarks:

Key

D	Disturbed	**IVN**	Hand Vane
B	Bulk	**PID**	PID Reading
ES	Environmental	**PP**	Pocket Penetrometer
▽	Groundwater strike	▼	Standing water level

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Trial Pit No.
TP2
Sheet 1 of 1

Project Name: Brick Lane	**Project No.** 49533	**Co-ords:**	Date **04/02/2019**
		Orientation:	**Dimensions (m)** 2.10 × 0.70
Location: Mepal, Cambridgeshire, CB6 2AH		**Level (m, aOD):**	Scale **1:20**
Client: Havebury Housing Partnership		**Depth (m):** 2.40	Logged **KB**

Ground water	Samples & In Situ Testing: Depth	Type	Results	Level (m)	Depth (m)	Legend	Stratum Description
	0.30	ES1			0.35		Dark brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded flint. TOPSOIL
	0.60	B1					Firm brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint.
	0.70	IVN	43				
	1.00	ES2			1.30		Stiff grey mottled brown CLAY with selenite crystals.
	1.50	D2					
	2.10	B3					
	2.10	IVN	82		2.40		End of Pit at 2.400m

1 2 3 4

Groundwater: Groundwater not encountered.

Stability: Stable sides.

Remarks:

Key

D	Disturbed	**IVN**	Hand Vane
B	Bulk	**PID**	PID Reading
ES	Environmental	**PP**	Pocket Penetrometer
	Groundwater strike		Standing water level

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Trial Pit No.
TP3
Sheet 1 of 1

Project Name: Brick Lane	**Project No.** 49533	**Co-ords:**	Date **04/02/2019**
		Orientation:	**Dimensions (m)** 2.00 × 0.70
Location: Mepal, Cambridgeshire, CB6 2AH		**Level (m, aOD):**	Scale **1:20**
Client: Havebury Housing Partnership		**Depth (m):** 2.00	Logged **KB**

Ground water	Samples & In Situ Testing: Depth	Type	Results	Level (m)	Depth (m)	Legend	Stratum Description
							Dark brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to coarse flint. TOPSOIL
	0.30	ES1			0.30		
	0.40	IVN	59				Firm brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint.
					0.50		*...0.50m land drain.*
	0.60	B1					Firm grey mottled brown CLAY.
	1.00	IVN	53				
	1.10	D2					
	1.10	ES2					
					1.50		Stiff grey gravelly CLAY. Gravel of sub-angular to angular fine to coarse grey mudstone.
	1.70	D3					
					2.00		End of Pit at 2.000m

1 2 3 4

Groundwater: Groundwater not encountered.

Stability: Stable sides.

Remarks:

Key

D	Disturbed	**IVN**	Hand Vane
B	Bulk	**PID**	PID Reading
ES	Environmental	**PP**	Pocket Penetrometer
	Groundwater strike		Standing water level

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Trial Pit No.
TP4
Sheet 1 of 1

Project Name: Brick Lane	**Project No.** 49533	**Co-ords:**	Date **04/02/2019**
		Orientation:	**Dimensions (m)** 1.80 × 0.60
Location: Mepal, Cambridgeshire, CB6 2AH		**Level (m, aOD):**	Scale **1:20**
Client: Havebury Housing Partnership		**Depth (m):** 1.70	Logged **KB**

Ground water	Samples & In Situ Testing: Depth	Type	Results	Level (m)	Depth (m)	Legend	Stratum Description
	0.20	ES1			0.30		Dark brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded flint. TOPSOIL
	1.00 1.00 1.00	D1 ES2 IVN	54		1.30		Firm brownish grey CLAY.
	1.50	D2					Stiff pale grey mottled brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to coarse grey mudstone.
	1.70	D3			1.70		*...becoming gravelly with occasional cobbles of mudstone from 1.60m*

End of Pit at 1.700m

1
2
3
4

Groundwater: Groundwater not encountered.

Stability: Stable sides.

Remarks:

Key

D	Disturbed	**IVN**	Hand Vane
B	Bulk	**PID**	PID Reading
ES	Environmental	**PP**	Pocket Penetrometer
▽	Groundwater strike	▼	Standing water level

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Trial Pit No.
TP5
Sheet 1 of 1

Project Name: Brick Lane	**Project No.** 49533	**Co-ords:**	Date **04/02/2019**
		Orientation:	**Dimensions (m)** 1.90 × 0.60
Location: Mepal, Cambridgeshire, CB6 2AH		**Level (m, aOD):**	Scale **1:20**
Client: Havebury Housing Partnership		**Depth (m):** 2.30	Logged **KB**

Ground water	Samples & In Situ Testing: Depth	Type	Results	Level (m)	Depth (m)	Legend	Stratum Description
	0.30	ES1					Dark brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint. TOPSOIL
					0.50		Firm brownish grey CLAY.
	1.00	D1					
	1.00	ES2					
	1.60	D2					
	1.60	IVN	88				*...becoming stiff and fissured with selenite crystals at 1.60m*
					2.00		Stiff, fissured, pale grey mottled brown CLAY.
	2.20	IVN	78				
▼	2.30	D3			2.30		End of Pit at 2.300m

1 2 3 4

Groundwater: Seepage

Stability: Stable sides.

Remarks:

Key

D	Disturbed	**IVN**	Hand Vane
B	Bulk	**PID**	PID Reading
ES	Environmental	**PP**	Pocket Penetrometer
▽	Groundwater strike	▼	Standing water level

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Trial Pit No.
TP6
Sheet 1 of 1

Project Name: Brick Lane	**Project No.** 49533	**Co-ords:**	Date **04/02/2019**
		Orientation:	**Dimensions (m)** 2.00 × 0.60
Location: Mepal, Cambridgeshire, CB6 2AH		**Level (m, aOD):**	Scale **1:20**
Client: Havebury Housing Partnership		**Depth (m):** 2.10	Logged **KB**

Ground water	Samples & In Situ Testing: Depth	Type	Results	Level (m)	Depth (m)	Legend	Stratum Description
	0.20	ES1			0.30		Dark brown slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint. TOPSOIL
	0.50 0.50	B1 IVN	62		0.70		Firm slightly gravelly CLAY. Gravel of sub-angular to sub-rounded fine to medium flint.
	1.20 1.20 1.20	D2 ES2 IVN	66		1.80		Firm brownish grey slightly sandy CLAY with rare gravel of fine flint. and selenite crystals.
	1.90 1.90	D3 IVN	94		2.10		Stiff pale grey mottled brown CLAY with selenite crystals.
							End of Pit at 2.100m

1 2 3 4

Groundwater: Groundwater not encountered.

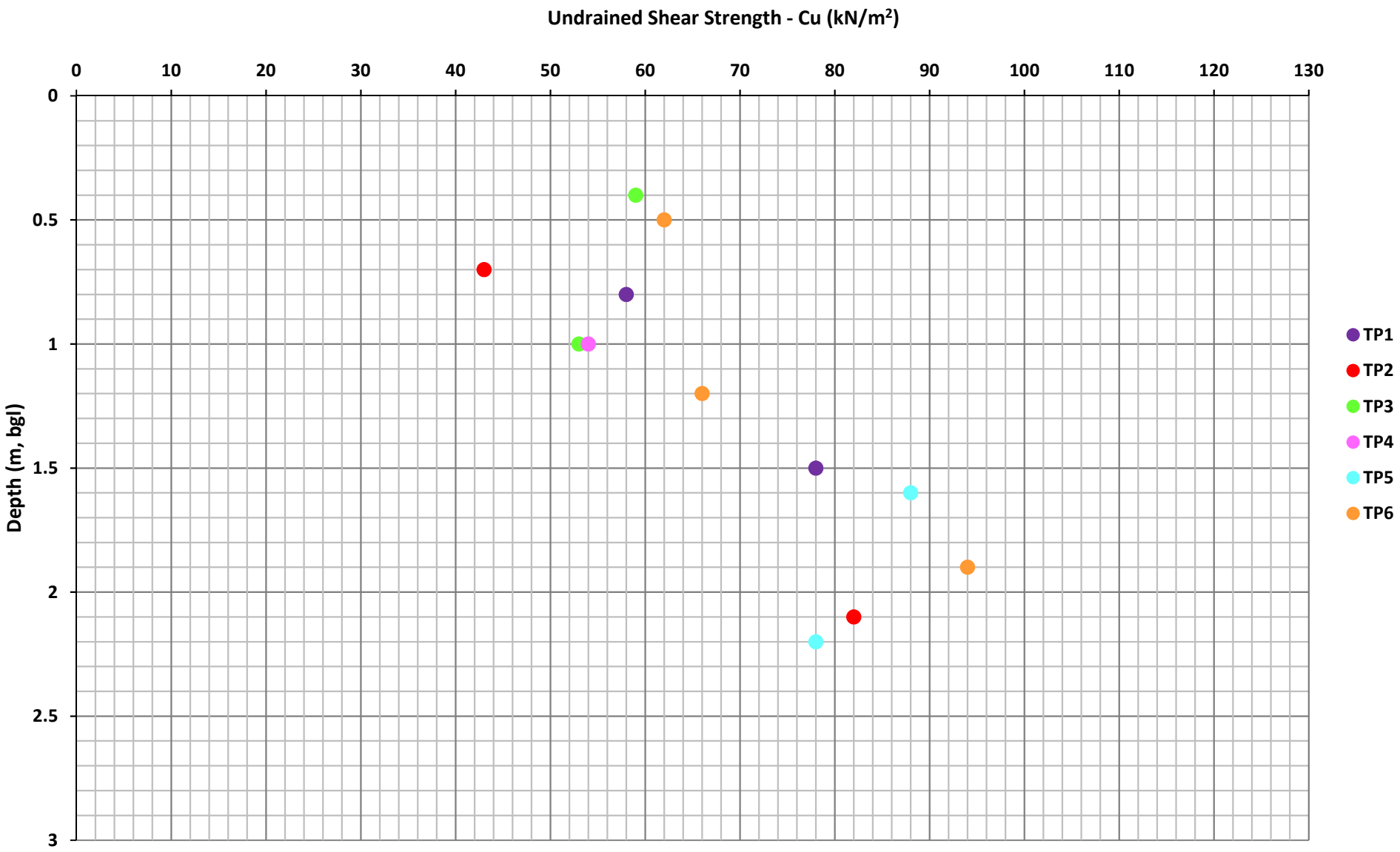
Stability: Stable sides.

Remarks:

Key

D	Disturbed	**IVN**	Hand Vane
B	Bulk	**PID**	PID Reading
ES	Environmental	**PP**	Pocket Penetrometer
	Groundwater strike		Standing water level

#49533 - Land off Brick Lane, Mepal
Undrained Shear Strength (Cu) - vs - Depth Profile



Appendix C

Results of Chemical Analyses

49533 –

Geo-environmental Assessment
Reference Criteria

Soils

In 2014 Land Quality Management Ltd (LQM) and the Chartered Institute of Environmental Health (CIEH) published 'Suitable 4 Use Levels' (S4ULs) for human health risk assessment. The S4ULs have been derived in accordance with UK legislation, national and Environment Agency policy using a modified version of the Contaminated Land Exposure Assessment (CLEA) software. The S4ULs are based on minimal or tolerable risk as described in SR2 (Environment Agency, 2009a).

The S4ULs are intended to replace the 2nd edition of the LQM/CIEH Generic Assessment Criteria (GAC). The S4ULs have also been used to replace the Environment Agency Soil Guideline Values (SGVs), which were defined in 2009 alongside updates to the CLEA methodology and software.

The parameters detailed in the LQM/CIEH S4ULs publication have been adapted using the CLEA software to reflect site specific conditions, including the Soil Organic Matter (SOM), where these are significantly different from the values used to derive the SGV.

It is understood the site is to be developed for residential purposes, therefore S4ULs for residential end use with homegrown produce have been adopted for this site. A conservative SOM of 1% has been adopted for organic chemicals for the purposes of the initial assessment on the basis of laboratory analysis. A SOM of 6% has been adopted for inorganic chemical as detailed in 'The LQM / CIEH S4ULS for human health assessment', (2015).

Only the three most hazardous PAH's, benzo(a)pyrene, dibenz(a,h)anthracene and naphthalene have been considered on this occasion.

In the absence an S4UL for lead the Category 4 Screening Level (C4SL) for lead has been adopted. In March 2014 DEFRA published C4SLs for six contaminants including lead. The C4SLs are based on a unique toxicological benchmark, 'Low Level of Toxicological Concern' rather than the 'minimal or tolerable level of risk' which forms the basis for the S4ULs.

A summary of the tier one screening values for human health is given in the Table, below.

Contaminant	Origin of Screening Value	Screening Value (mg/kg)
Arsenic	S4UL[1]	37
Cadmium	S4UL[1]	11
Chromium	S4UL[1]	910

Contaminant	Origin of Screening Value	Screening Value (mg/kg)
Copper	S4UL[1]	2,400
Nickel	S4UL[1]	180
Lead	C4SL[2]	200
Selenium	S4UL[1]	250
Mercury	S4UL[1]	40
Zinc	S4UL[1]	3,700
Benzo(a)pyrene	S4UL[3]	2.2
Dibenz(a,h)anthracene	S4UL[3]	0.24
Naphthalene	S4UL[3]	2.3
Total Phenols	S4UL[3]	280
TPH Aromatic C_5-C_7	S4UL[3]	70
TPH Aromatic C_7-C_8	S4UL[3]	130
TPH Aromatic C_8-C_{10}	S4UL[3]	34
TPH Aromatic C_{10}-C_{12}	S4UL[3]	74
TPH Aromatic C_{12}-C_{16}	S4UL[3]	1,100
TPH Aromatic C_{16}-C_{21}	S4UL[3]	260
TPH Aromatic C_{21}-C_{35}	S4UL[3]	1,100
TPH Aliphatic C_5-C_6	S4UL[3]	42
TPH Aliphatic C_6-C_8	S4UL[3]	100
TPH Aliphatic C_8-C_{10}	S4UL[3]	27
TPH Aliphatic C_{10}-C_{12}	S4UL[3]	130
TPH Aliphatic C_{12}-C_{16}	S4UL[3]	1,100
TPH Aliphatic C_{16}-C_{35}	S4UL[3]	65,000
Benzene	S4UL[3]	0.087
Toluene	S4UL[3]	130
Ethylbenzene	S4UL[3]	47
M & P Xylene	S4UL[3]	56
O Xylene	S4UL[3]	60

[1] Value derived for site specific conditions use using CLEA software, S4UL parameters, at an SOM of 6% for residential end use with homegrown produce.
[2] Category 4 Screening Level adopted based on DEFRA (2014)
[3] Value derived for site specific conditions use using CLEA software, S4UL parameters, at an SOM of 1% for residential end use with homegrown produce.
*Although soils up to this value may not be harmful to human health, it should be noted that soils would be saturated at this value and remediation may still be necessary. Results will therefore be reviewed on a case by case basis.

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Concept Life Sciences

Certificate of Analysis

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Springwood Industrial Estate
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Tel : 01376 560120
Fax : 01376 552923

Report Number: 801007-1

Date of Report: 13-Feb-2019

Customer: Richard Jackson Ltd
847 The Crescent
Colchester
Essex
CO4 9YQ

Customer Contact: Ms Katherine Brightwell

Customer Job Reference: 49533
Customer Site Reference: Brick Lane, Mepal
Date Job Received at Concept: 07-Feb-2019
Date Analysis Started: 07-Feb-2019
Date Analysis Completed: 13-Feb-2019

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Mr Simon Wicks
Organic Section Head

Issued by :
Aislinn Arthey
Customer Service Advisor

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Schedule A

Concept Reference	**801007 001**
Customer Sample Reference	**TP5 ES1 @ 0.3m**
Date Sampled	**04-FEB-2019**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T257	A40	2	mg/kg	**13**
Cadmium	T257	A40	0.1	mg/kg	**0.2**
Chromium	T257	A40	0.5	mg/kg	**30**
Copper	T257	A40	2	mg/kg	**26**
Lead	T257	A40	2	mg/kg	**32**
Mercury	T245	A40	1.0	mg/kg	<1.0
Nickel	T257	A40	0.5	mg/kg	**25**
Selenium	T257	A40	3	mg/kg	<3
Zinc	T257	A40	2	mg/kg	**94**
pH	T7	A40			**8.1**
Soil Organic Matter	T287	A40	0.1	%	**3.3**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.01**
Sulphur (total)	T6	A40	0.01	%	**0.04**
Cyanide(Total)	T921	M105	1	mg/kg	<1
Phenols(Mono)	T921	M105	1	mg/kg	<1
Naphthalene	T1086	M105	0.1	mg/kg	<0.1
Acenaphthylene	T1086	M105	0.1	mg/kg	<0.1
Acenaphthene	T1086	M105	0.1	mg/kg	<0.1
Fluorene	T1086	M105	0.1	mg/kg	<0.1
Phenanthrene	T1086	M105	0.1	mg/kg	<0.1
Anthracene	T1086	M105	0.1	mg/kg	<0.1
Fluoranthene	T1086	M105	0.1	mg/kg	<0.1
Pyrene	T1086	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T1086	M105	0.1	mg/kg	<0.1
Chrysene	T1086	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T1086	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T1086	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T1086	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T1086	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T1110	M105	0.10	mg/kg	<0.10
Benzo(ghi)Perylene	T1086	M105	0.1	mg/kg	<0.1
PAH(total)	T1086	M105	0.1	mg/kg	<0.1
Benzene	T209	M105	10	µg/kg	<10
Toluene	T209	M105	10	µg/kg	<10
EthylBenzene	T209	M105	10	µg/kg	<10
M/P Xylene	T209	M105	10	µg/kg	<10
O Xylene	T209	M105	10	µg/kg	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10
TPH (C5-C6 aliphatic)	T54	M105	0.10	mg/kg	<0.10
TPH (C6-C8 aliphatic)	T54	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aliphatic)	T54	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	<1(13)
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	<1(13)
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	<1(13)
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	<2(13)
TPH (C35-C40 aliphatic)	T909	M105	1	mg/kg	<1(13)
TPH (Aliphatic) total	T85	M105		mg/kg	<2.0(13)
TPH (C6-C7 aromatic)	T54	M105	0.10	mg/kg	<0.10
TPH (C7-C8 aromatic)	T54	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aromatic)	T54	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	<2(13)
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	<1(13)
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	<1(13)
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**1(13)**
TPH (C35-C40 aromatic)	T909	M105	1	mg/kg	<1(13)
TPH (Aromatic) total	T85	M105		mg/kg	**1.0(13)**

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Schedule A

Concept Reference	**801007 001**
Customer Sample Reference	**TP5 ES1 @ 0.3m**
Date Sampled	**04-FEB-2019**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**1.00(13)**

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Heavy Metals (9)

Concept Reference	**801007 003**
Customer Sample Reference	**TP6 ES1 @ 0.2m**
Date Sampled	**04-FEB-2019**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T257	A40	2	mg/kg	**13**
Cadmium	T257	A40	0.1	mg/kg	**0.1**
Chromium	T257	A40	0.5	mg/kg	**33**
Copper	T257	A40	2	mg/kg	**18**
Lead	T257	A40	2	mg/kg	**21**
Mercury	T245	A40	1.0	mg/kg	<1.0
Nickel	T257	A40	0.5	mg/kg	**27**
Selenium	T257	A40	3	mg/kg	<3
Zinc	T257	A40	2	mg/kg	**80**

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Pyrite BRE

Concept Reference	**801007 004**
Customer Sample Reference	**TP6 ES2 @ 1.2m**
Date Sampled	**04-FEB-2019**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Magnesium	T112	AR	1	mg/l	**4900**
pH	T7	A40			**8.1**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.38**
SO4(Total)	T102	A40	0.01	%	**0.27**
Sulphur (total)	T6	A40	0.01	%	**0.10**

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Asbestos

Concept Reference	**801007 001**	**801007 003**
Customer Sample Reference	**TP5 ES1 @ 0.3m**	**TP6 ES1 @ 0.2m**
Date Sampled	**04-FEB-2019**	**04-FEB-2019**
Matrix Class	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units		
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Total and Speciated USEPA16 PAH (SE)

Concept Reference	**801007 003**
Customer Sample Reference	**TP6 ES1 @ 0.2m**
Date Sampled	**04-FEB-2019**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Acenaphthene	T1086	M105	0.1	mg/kg	<0.1
Acenaphthylene	T1086	M105	0.1	mg/kg	<0.1
Anthracene	T1086	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T1086	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T1086	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T1086	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T1086	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T1086	M105	0.1	mg/kg	<0.1
Chrysene	T1086	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T1086	M105	0.1	mg/kg	<0.1
Fluoranthene	T1086	M105	0.1	mg/kg	<0.1
Fluorene	T1086	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T1086	M105	0.1	mg/kg	<0.1
Naphthalene	T1086	M105	0.1	mg/kg	<0.1
Phenanthrene	T1086	M105	0.1	mg/kg	<0.1
Pyrene	T1086	M105	0.1	mg/kg	<0.1
PAH(total)	T1086	M105	0.1	mg/kg	<0.1

Concept Reference: 801007
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**801007 001**	**801007 003**	**801007 004**
Customer Sample Reference	**TP5 ES1 @ 0.3m**	**TP6 ES1 @ 0.2m**	**TP6 ES2 @ 1.2m**
Date Sampled	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**
Matrix Class	**Clay**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units			
Moisture @105C	T162	AR	0.1	%	**23**	**20**	**21**
Retained on 2mm	T2	A40	0.1	%	**5.9**	**0.2**	<0.1

Index to symbols used in 801007-1

Value	Description
AR	As Received
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Limited
Retained on 2mm is removed before analysis

Method Index

Value	Description
T6	ICP/OES
T162	Grav (1 Dec) (105 C)
T1086	GC/MS (GSOP12A)
T245	ICP/OES (Aqua Regia Extraction)
T2	Grav
T7	Probe
T112	ICP/OES (SIM)(Water Extract)
T909	GCxGC
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T54	GC/MS (Headspace)
T287	Calc TOC/0.58
T1110	GC/MS (GSOP12A) (2DP)
T921	Colorimetry (CF) (MCERT)
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T27	PLM
T85	Calc
T102	ICP/OES (HCl extract)
T209	GC/MS (Head Space)(MCERTS)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Asbestos ID	T27	A40			SU	001,003
Dibenzo(ah)Anthracene	T1086	M105	0.1	mg/kg	M	003
Arsenic	T257	A40	2	mg/kg	M	001,003
Cadmium	T257	A40	0.1	mg/kg	M	001,003
Chromium	T257	A40	0.5	mg/kg	M	001,003
Copper	T257	A40	2	mg/kg	M	001,003
Lead	T257	A40	2	mg/kg	M	001,003
Mercury	T245	A40	1.0	mg/kg	U	001,003
Nickel	T257	A40	0.5	mg/kg	M	001,003
Selenium	T257	A40	3	mg/kg	U	001,003
Zinc	T257	A40	2	mg/kg	M	001,003
pH	T7	A40			M	001,004
Soil Organic Matter	T287	A40	0.1	%	N	001
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	M	001,004
Sulphur (total)	T6	A40	0.01	%	M	001,004
Cyanide(Total)	T921	M105	1	mg/kg	M	001
Phenols(Mono)	T921	M105	1	mg/kg	M	001
Naphthalene	T1086	M105	0.1	mg/kg	M	001,003
Acenaphthylene	T1086	M105	0.1	mg/kg	M	001,003
Acenaphthene	T1086	M105	0.1	mg/kg	M	001,003
Fluorene	T1086	M105	0.1	mg/kg	M	001,003
Phenanthrene	T1086	M105	0.1	mg/kg	M	001,003
Anthracene	T1086	M105	0.1	mg/kg	M	001,003
Fluoranthene	T1086	M105	0.1	mg/kg	M	001,003
Pyrene	T1086	M105	0.1	mg/kg	M	001,003
Benzo(a)Anthracene	T1086	M105	0.1	mg/kg	M	001,003
Chrysene	T1086	M105	0.1	mg/kg	M	001,003
Benzo(b)fluoranthene	T1086	M105	0.1	mg/kg	M	001,003
Benzo(k)fluoranthene	T1086	M105	0.1	mg/kg	N	001,003
Benzo(a)Pyrene	T1086	M105	0.1	mg/kg	M	001,003
Indeno(123-cd)Pyrene	T1086	M105	0.1	mg/kg	M	001,003
Dibenzo(ah)Anthracene	T1110	M105	0.10	mg/kg	M	001
Benzo(ghi)Perylene	T1086	M105	0.1	mg/kg	M	001,003
PAH(total)	T1086	M105	0.1	mg/kg	N	001,003
Benzene	T209	M105	10	µg/kg	M	001
Toluene	T209	M105	10	µg/kg	M	001
EthylBenzene	T209	M105	10	µg/kg	M	001
M/P Xylene	T209	M105	10	µg/kg	M	001
O Xylene	T209	M105	10	µg/kg	M	001
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001
TPH (C5-C6 aliphatic)	T54	M105	0.10	mg/kg	N	001
TPH (C6-C8 aliphatic)	T54	M105	0.10	mg/kg	N	001
TPH (C8-C10 aliphatic)	T54	M105	0.10	mg/kg	N	001
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	N	001

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	N	001
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	N	001
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	N	001
TPH (C35-C40 aliphatic)	T909	M105	1	mg/kg	N	001
TPH (Aliphatic) total	T85	M105		mg/kg	N	001
TPH (C6-C7 aromatic)	T54	M105	0.10	mg/kg	N	001
TPH (C7-C8 aromatic)	T54	M105	0.10	mg/kg	N	001
TPH (C8-C10 aromatic)	T54	M105	0.10	mg/kg	N	001
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	N	001
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	N	001
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	N	001
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	N	001
TPH (C35-C40 aromatic)	T909	M105	1	mg/kg	N	001
TPH (Aromatic) total	T85	M105		mg/kg	N	001
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001
Magnesium	T112	AR	1	mg/l	N	004
SO4(Total)	T102	A40	0.01	%	M	004
Moisture @105C	T162	AR	0.1	%	N	001,003-004
Retained on 2mm	T2	A40	0.1	%	N	001,003-004

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Tel : 01376 560120
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Report Number: 801004-1

Date of Report: 13-Feb-2019

Customer: Richard Jackson Ltd
847 The Crescent
Colchester
Essex
CO4 9YQ

Customer Contact: Ms Katherine Brightwell

Customer Job Reference: 49533
Customer Site Reference: Brick Lane, Mepal
Date Job Received at Concept: 07-Feb-2019
Date Analysis Started: 07-Feb-2019
Date Analysis Completed: 13-Feb-2019

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Mr Ben Wilding
Laboratory Manager

Issued by :
Aislinn Arthey
Customer Service Advisor

Concept Reference: 801004
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Schedule A

				Concept Reference	**801004 001**	**801004 003**	**801004 005**	**801004 007**
				Customer Sample Reference	**TP1 ES1 @ 0.3m**	**TP2 ES1 @ 0.3m**	**TP3 ES1 @ 0.3m**	**TP4 ES1 @ 0.2m**
				Date Sampled	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T257	A40	2	mg/kg	**10**	**11**	**11**	**14**
Cadmium	T257	A40	0.1	mg/kg	**0.1**	**0.2**	**0.2**	**0.1**
Chromium	T257	A40	0.5	mg/kg	**24**	**24**	**24**	**30**
Copper	T257	A40	2	mg/kg	**15**	**20**	**19**	**23**
Lead	T257	A40	2	mg/kg	**20**	**28**	**26**	**55**
Mercury	T245	A40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0
Nickel	T257	A40	0.5	mg/kg	**22**	**23**	**22**	**26**
Selenium	T257	A40	3	mg/kg	<3	<3	<3	<3
Zinc	T257	A40	2	mg/kg	**65**	**78**	**75**	**84**
pH	T7	A40			**8.1**	**8.0**	**8.1**	**8.2**
Soil Organic Matter	T287	A40	0.1	%	**1.2**	**2.6**	**2.9**	**2.4**
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	**0.01**	**0.01**	<0.01	**0.02**
Sulphur (total)	T6	A40	0.01	%	**0.02**	**0.03**	**0.03**	**0.03**
Cyanide(Total)	T921	M105	1	mg/kg	<1	<1	<1	<1
Phenols(Mono)	T921	M105	1	mg/kg	<1	<1	<1	<1
Naphthalene	T1086	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T1086	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T1086	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	T1086	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T1086	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1
Anthracene	T1086	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T1086	M105	0.1	mg/kg	<0.1	**1.3**	<0.1	<0.1
Pyrene	T1086	M105	0.1	mg/kg	<0.1	**1.2**	<0.1	<0.1
Benzo(a)Anthracene	T1086	M105	0.1	mg/kg	<0.1	**0.8**	<0.1	<0.1
Chrysene	T1086	M105	0.1	mg/kg	<0.1	**0.8**	<0.1	<0.1
Benzo(b)fluoranthene	T1086	M105	0.1	mg/kg	<0.1	**0.7**	<0.1	<0.1
Benzo(k)fluoranthene	T1086	M105	0.1	mg/kg	<0.1	**0.7**	<0.1	<0.1
Benzo(a)Pyrene	T1086	M105	0.1	mg/kg	<0.1	**0.7**	<0.1	<0.1
Indeno(123-cd)Pyrene	T1086	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	<0.1
Dibenzo(ah)Anthracene	T1110	M105	0.10	mg/kg	<0.10	**0.21**	<0.10	<0.10
Benzo(ghi)Perylene	T1086	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	<0.1
PAH(total)	T1086	M105	0.1	mg/kg	<0.1	**7.3**	<0.1	<0.1
Benzene	T209	M105	10	µg/kg	<10	<10	<10	<10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T54	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C6-C8 aliphatic)	T54	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T54	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	<1(13)	<1(13)	<1(13)	<1(13)
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	<1(13)	<1(13)	<1(13)	<1(13)
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	<1(13)	**1(13)**	<1(13)	<1(13)
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**7(13)**	**4(13)**	<2(13)	**3(13)**
TPH (C35-C40 aliphatic)	T909	M105	1	mg/kg	**1(13)**	<1(13)	<1(13)	**1(13)**
TPH (Aliphatic) total	T85	M105		mg/kg	**8.0(13)**	**5.0(13)**	<2.0(13)	**4.0(13)**
TPH (C6-C7 aromatic)	T54	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T54	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T54	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	<2(13)	<2(13)	<2(13)	<2(13)
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	<1(13)	<1(13)	<1(13)	<1(13)
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	<1(13)	**2(13)**	<1(13)	<1(13)
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**2(13)**	**11(13)**	**2(13)**	<1(13)
TPH (C35-C40 aromatic)	T909	M105	1	mg/kg	<1(13)	<1(13)	<1(13)	<1(13)
TPH (Aromatic) total	T85	M105		mg/kg	**2.0(13)**	**13(13)**	**2.0(13)**	<2.0(13)

Concept Reference: 801004
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Schedule A

				Concept Reference	**801004 001**	**801004 003**	**801004 005**	**801004 007**
				Customer Sample Reference	**TP1 ES1 @ 0.3m**	**TP2 ES1 @ 0.3m**	**TP3 ES1 @ 0.3m**	**TP4 ES1 @ 0.2m**
				Date Sampled	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**10.0(13)**	**18.0(13)**	**2.00(13)**	**4.00(13)**

Concept Reference: 801004
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
Asbestos

				Concept Reference	**801004 001**	**801004 003**	**801004 007**
				Customer Sample Reference	**TP1 ES1 @ 0.3m**	**TP2 ES1 @ 0.3m**	**TP4 ES1 @ 0.2m**
				Date Sampled	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**
				Matrix Class	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Asbestos ID	T27	A40			Asbestos not detected	Asbestos not detected	Asbestos not detected

Concept Reference: 801004
Project Site: Brick Lane, Mepal
Customer Reference: 49533

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**801004 001**	**801004 003**	**801004 005**	**801004 007**
				Customer Sample Reference	**TP1 ES1 @ 0.3m**	**TP2 ES1 @ 0.3m**	**TP3 ES1 @ 0.3m**	**TP4 ES1 @ 0.2m**
				Date Sampled	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**	**04-FEB-2019**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Moisture @105C	T162	AR	0.1	%	**18**	**20**	**20**	**20**
Retained on 2mm	T2	A40	0.1	%	**2.8**	**4.2**	**2.2**	**3.7**

Index to symbols used in 801004-1

Value	Description
AR	As Received
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Limited
Retained on 2mm is removed before analysis

Method Index

Value	Description
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T245	ICP/OES (Aqua Regia Extraction)
T209	GC/MS (Head Space)(MCERTS)
T1086	GC/MS (GSOP12A)
T1110	GC/MS (GSOP12A) (2DP)
T287	Calc TOC/0.58
T6	ICP/OES
T27	PLM
T85	Calc
T2	Grav
T162	Grav (1 Dec) (105 C)
T909	GCxGC
T7	Probe
T921	Colorimetry (CF) (MCERT)
T257	ICP/OES (SIM) (Aqua Regia Extraction)
T54	GC/MS (Headspace)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Asbestos ID	T27	A40			SU	001,003,007
Arsenic	T257	A40	2	mg/kg	M	001,003,005,007
Cadmium	T257	A40	0.1	mg/kg	M	001,003,005,007
Chromium	T257	A40	0.5	mg/kg	M	001,003,005,007
Copper	T257	A40	2	mg/kg	M	001,003,005,007
Lead	T257	A40	2	mg/kg	M	001,003,005,007
Mercury	T245	A40	1.0	mg/kg	U	001,003,005,007
Nickel	T257	A40	0.5	mg/kg	M	001,003,005,007
Selenium	T257	A40	3	mg/kg	U	001,003,005,007
Zinc	T257	A40	2	mg/kg	M	001,003,005,007
pH	T7	A40			M	001,003,005,007
Soil Organic Matter	T287	A40	0.1	%	N	001,003,005,007
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	M	001,003,005,007
Sulphur (total)	T6	A40	0.01	%	M	001,003,005,007
Cyanide(Total)	T921	M105	1	mg/kg	M	001,003,005,007
Phenols(Mono)	T921	M105	1	mg/kg	M	001,003,005,007
Naphthalene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Acenaphthylene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Acenaphthene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Fluorene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Phenanthrene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Anthracene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Fluoranthene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Pyrene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Benzo(a)Anthracene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Chrysene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Benzo(b)fluoranthene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Benzo(k)fluoranthene	T1086	M105	0.1	mg/kg	N	001,003,005,007
Benzo(a)Pyrene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Indeno(123-cd)Pyrene	T1086	M105	0.1	mg/kg	M	001,003,005,007
Dibenzo(ah)Anthracene	T1110	M105	0.10	mg/kg	M	001,003,005,007
Benzo(ghi)Perylene	T1086	M105	0.1	mg/kg	M	001,003,005,007
PAH(total)	T1086	M105	0.1	mg/kg	N	001,003,005,007
Benzene	T209	M105	10	µg/kg	M	001,003,005,007
Toluene	T209	M105	10	µg/kg	M	001,003,005,007
EthylBenzene	T209	M105	10	µg/kg	M	001,003,005,007
M/P Xylene	T209	M105	10	µg/kg	M	001,003,005,007
O Xylene	T209	M105	10	µg/kg	M	001,003,005,007
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001,003,005,007
TPH (C5-C6 aliphatic)	T54	M105	0.10	mg/kg	N	001,003,005,007
TPH (C6-C8 aliphatic)	T54	M105	0.10	mg/kg	N	001,003,005,007
TPH (C8-C10 aliphatic)	T54	M105	0.10	mg/kg	N	001,003,005,007
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	N	001,003,005,007
TPH (C35-C40 aliphatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (Aliphatic) total	T85	M105		mg/kg	N	001,003,005,007
TPH (C6-C7 aromatic)	T54	M105	0.10	mg/kg	N	001,003,005,007

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C7-C8 aromatic)	T54	M105	0.10	mg/kg	N	001,003,005,007
TPH (C8-C10 aromatic)	T54	M105	0.10	mg/kg	N	001,003,005,007
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	N	001,003,005,007
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (C35-C40 aromatic)	T909	M105	1	mg/kg	N	001,003,005,007
TPH (Aromatic) total	T85	M105		mg/kg	N	001,003,005,007
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001,003,005,007
Moisture @105C	T162	AR	0.1	%	N	001,003,005,007
Retained on 2mm	T2	A40	0.1	%	N	001,003,005,007

Appendix D

Geotechnical test results

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

Client:

Richard Jackson Limited

847 The Crescent
Colchester
Essex
CO4 9YQ

Soil Property Testing Ltd

15, 16, 18 Halcyon Court, St Margaret's Way, Stukeley Meadows, Huntingdon, Cambridgeshire, PE29 6DG

Tel: 01480 455579
Email: enquiries@soilpropertytesting.com
Website: www.soilpropertytesting.com

Samples Submitted By:

Richard Jackson Limited

Samples Labelled:

Brick Lane, Mepal

Approved Signatories:

- ☑ **J.C. Garner B.Eng (Hons) FGS**
  Technical Director
- ☐ **S.P. Townend FGS**
  Quality Manager
- ☐ **W. Johnstone**
  Materials Lab Manager
- ☐ **D. Sabnis**
  Operations Manager

Date Received: 15/02/2019

Samples Tested Between: 15/02/2019 **and** 25/02/2019

Remarks:

For the attention of Katherine Brightwell
Your Reference No: 49533

BRE SD1 suite of tests subcontracted to Chemtest - results to follow as a supplement to this Test Report on completion of testing

Notes:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.

2. (a) UKAS - United Kingdom Accreditation Service
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.

4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

0998

Contract	**Brick Lane, Mepal**		
Serial No.	**34620**	**Target Date**	28/02/2019
Scheduled By	Richard Jackson Limited		

SCHEDULE OF LABORATORY TESTS

Schedule Remarks

Bore Hole No.	Type	Sample Ref.	Top Depth	Water Content (BSEN)	Liquid/Plastic Limits	Sulphate Content/pH Value	BRE SD1 Suite																Sample Remarks
TP1	B	1	0.70	1																			
TP1	D	2	1.50	1	1																		
TP1	B	3	2.00	1		1																	
TP2	B	1	0.60	1																			
TP2	D	2	1.50	1	1																		
TP2	B	3	2.10	1		1																	
TP4	D	1	1.00	1	1																		
TP4	D	2	1.50	1																			
TP4	D	3	1.70	1																			
TP5	D	1	1.00	1																			
TP5	D	2	1.60	1																			
TP5	D	3	2.30	1	1		1																
TP6	B	1	0.50	1																			
TP6	D	2	1.20	1	1																		
TP6	D	3	1.90	1																			
Totals				**15**	**5**	**2**	**1**																**End of Schedule**

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

SUMMARY OF WATER CONTENT

Borehole /Pit No.	Depth (m)	Type	Ref.	Water Content (%)	Description	Remarks
TP1	0.70	B	1	**31.4**	Firm olive slightly gravelly CLAY with rare recently active roots. Gravel is fine to medium flint.	
TP1	1.50	D	2	**27.0**	Stiff fissured pale olive CLAY with frequent selenite crystals/weathered selenite, occasional bluish grey mottling, and rare recently active and decayed roots.	Dried at 80°C due to the presence of selenite.
TP1	2.00	B	3	**26.5**	Stiff light olive brown CLAY with occasional bluish grey mottling, rare recently active roots, and selenite crystals.	Dried at 80°C due to the presence of selenite.
TP2	0.60	B	1	**29.5**	Firm olive CLAY with occasional recently active roots, and rare calcareous aggregations.	
TP2	1.50	D	2	**26.4**	Stiff olive CLAY with occasional bluish grey mottling, selenite crystals, and rare recently active roots.	Dried at 80°C due to the presence of selenite.
TP2	2.10	B	3	**26.4**	Stiff slightly fissured light olive brown CLAY with occasional light bluish grey mottling, rare decayed roots, and selenite crystals.	Dried at 80°C due to the presence of selenite.
TP4	1.00	D	1	**27.7**	Stiff light olive brown CLAY with occasional bluish grey mottling, calcareous aggregations, and rare recently active and decayed roots.	
TP4	1.50	D	2	**26.7**	Stiff pale olive CLAY with occasional bluish grey mottling, rare calcareous aggregations and powder, and decayed roots.	
TP4	1.70	D	3	**15.2**	Light grey angular MUDSTONE fragments of fine to coarse gravel and cobble size in a firm calcareous clay matrix with occasional orange staining.	
TP5	1.00	D	1	**31.9**	Soft olive CLAY with rare bluish grey mottling, and rare recently active roots.	
TP5	1.60	D	2	**23.2**	Stiff fissured olive CLAY with occasional bluish grey mottling, rare recently active roots, and selenite crystals.	Dried at 80°C due to the presence of selenite.
TP5	2.30	D	3	**26.8**	Stiff slightly fissured pale olive CLAY with occasional bluish grey mottling, and decayed roots.	
TP6	0.50	B	1	**26.3**	Firm olive slightly gravelly CLAY with occasional recently active roots. Gravel is fine to medium flint and chalk.	
TP6	1.20	D	2	**29.0**	Stiff olive CLAY with occasional bluish grey mottling, rare recently active and decayed roots, selenite crystals/weathered selenite, and calcareous aggregations.	Dried at 80°C due to the presence of selenite.

Method Of Preparation: BS EN ISO: 17892-1: 2014
Method of Test: BS EN ISO: 17892-1: 2014
Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:

Remarks to Include: Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110C

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

SUMMARY OF WATER CONTENT

Borehole /Pit No.	Depth (m)	Type	Ref.	Water Content (%)	Description	Remarks
TP6	1.90	D	3	**26.1**	Stiff pale olive CLAY with occasional light grey mottling, and rare selenite crystals.	Dried at 80°C due to the presence of selenite.

Method Of Preparation: BS EN ISO: 17892-1: 2014
Method of Test: BS EN ISO: 17892-1: 2014
Type of Sample Key: U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:

Remarks to Include: Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110C

TEST REPORT

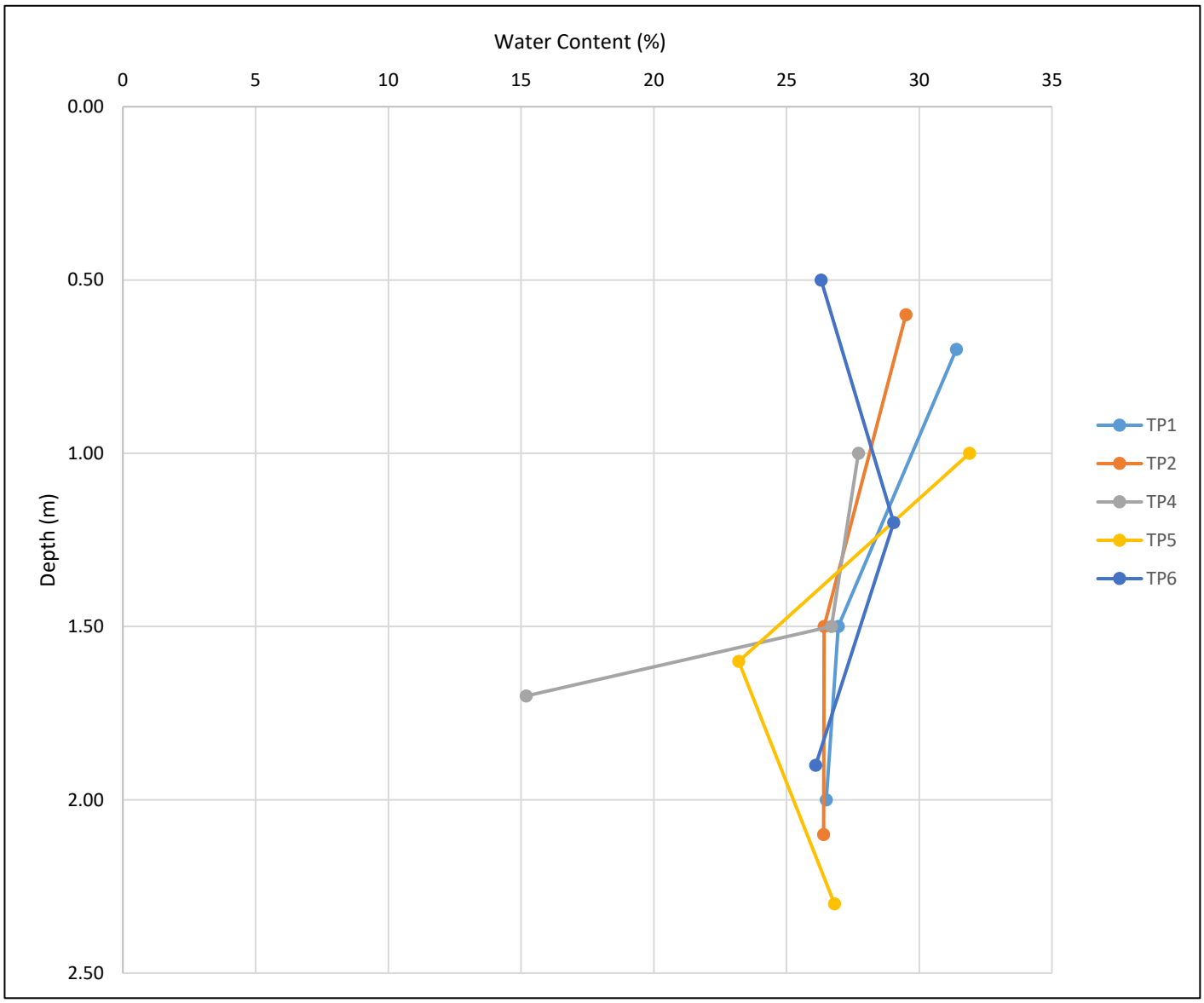
ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

WATER CONTENT VS DEPTH BELOW GROUND LEVEL



Method of Preparation:	BSEN ISO 17892-1: 2014
Method of Test:	BSEN ISO 17892-1: 2014
Type of Sample Key:	U - Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:	
Remarks to Include:	Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110°C

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

SUMMARY OF WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole /Pit No.	Depth (m)	Type	Ref.	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasti-city Index (%)	Liquid-ity Index (%)	SAMPLE PREPARATION Method	Ret'd 0.425mm (%)	Corr'd W/C <0.425mm	Curing Time (hrs)	Description	CLASS
TP1	1.50	D	2	**27.0**	62	25	37	0.05	From Natural	0 (A)		25	Stiff fissured pale olive CLAY with frequent selenite crystals/weathered selenite, occasional bluish grey mottling, and rare recently active and decayed roots.	CH
TP2	1.50	D	2	**26.4**	66	25	41	0.03	From Natural	0 (A)		24	Stiff olive CLAY with occasional bluish grey mottling, selenite crystals, and rare recently active roots.	CH
TP4	1.00	D	1	**27.7**	69	24	45	0.08	From Natural	0 (A)		24	Stiff light olive brown CLAY with occasional bluish grey mottling, calcareous aggregations, and rare recently active and decayed roots.	CH
TP5	2.30	D	3	**26.8**	62	25	37	0.05	From Natural	0 (A)		25	Stiff slightly fissured pale olive CLAY with occasional bluish grey mottling, and decayed roots.	CH
TP6	1.20	D	2	**29.0**	73	26	47	0.06	From Natural	0 (A)		24	Stiff olive CLAY with occasional bluish grey mottling, rare recently active and decayed roots, selenite crystals/weathered selenite, and calcareous aggregations.	CV

Method Of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2:1990:3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:	
Remarks to Include:	Sample disturbance, loss of water, variation from test procedure, location and origin of test specimen within original sample, oven drying temperature if not 105-110C

TEST REPORT

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DATE ISSUED: 25/02/2019

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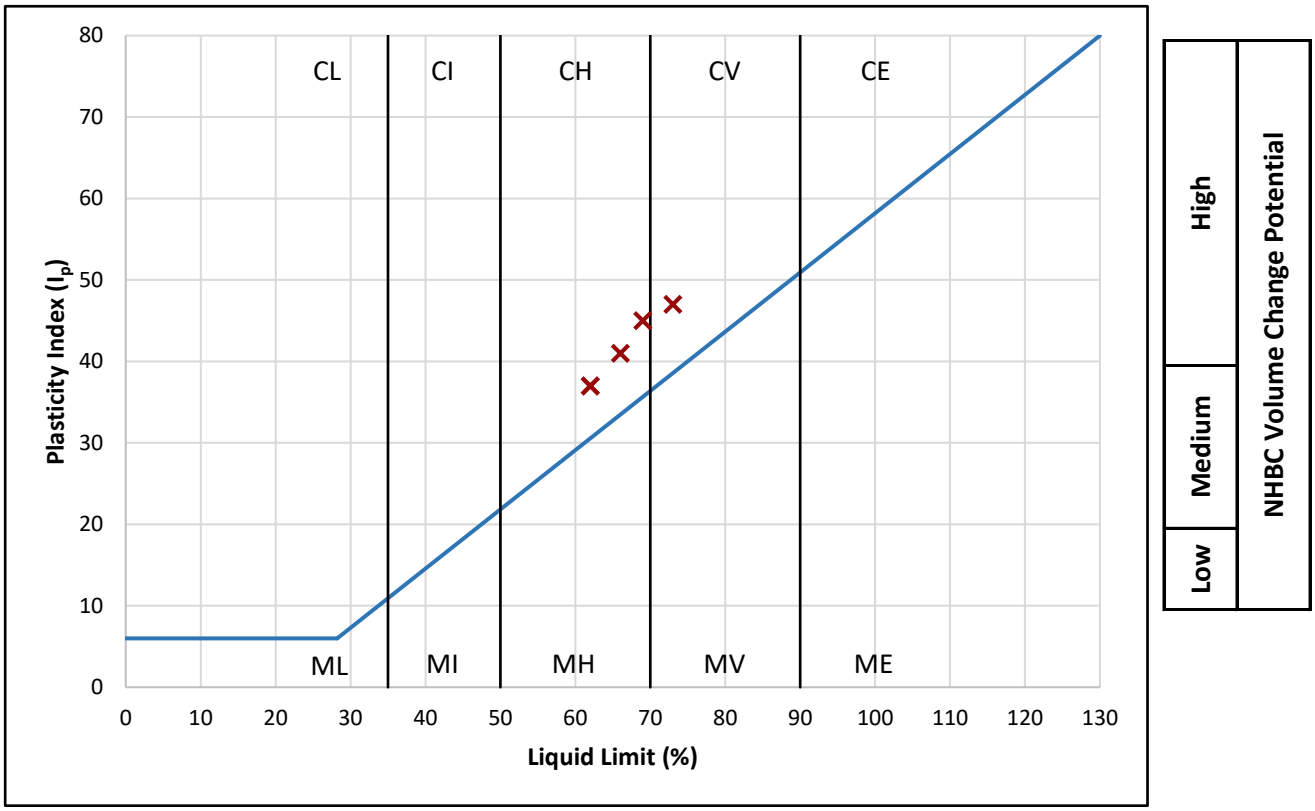
Contract	**Brick Lane, Mepal**
Serial No.	**34620**

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART

Plasticity				
Low	Medium	High	Very High	Extremely High



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS1377: Part 2: 3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter
Comments:	Volume Change Potential: NHBC Standards Chapter 4.2 Unmodified Plasticity Index

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

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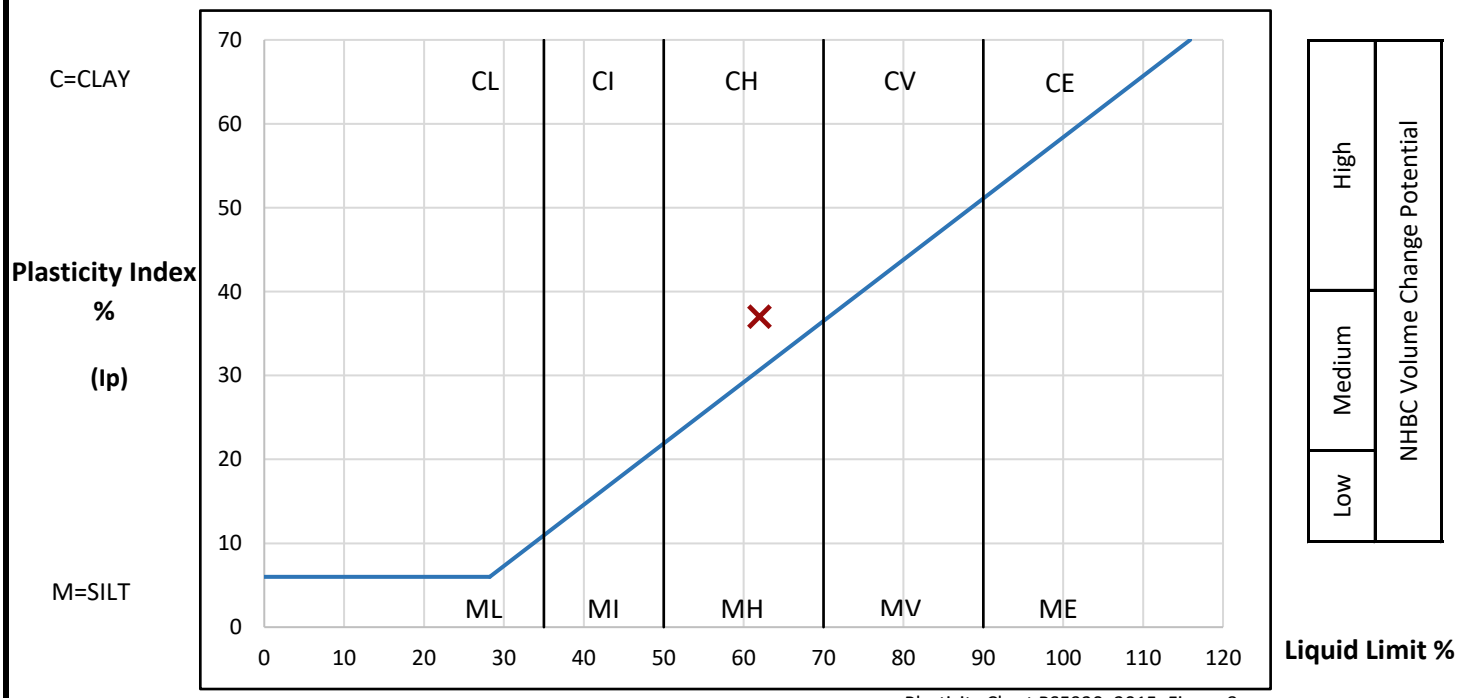
Contract	**Brick Lane, Mepal**
Serial No.	**34620**

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

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP1	1.50	D	2	27.0	Stiff fissured pale olive CLAY with frequent selenite crystals/weathered selenite, occasional bluish grey mottling, and rare recently active and decayed roots.	Specimen dried at 80°C due to the presence of selenite.

PREPARATION				Liquid Limit	62 %
Method of preparation			From natural	Plastic Limit	25 %
Sample retained 0.425mm sieve	(Assumed)		0 %	Plasticity Index	37 %
Corrected water content for material passing 0.425mm				Liquidity Index	0.05
Sample retained 2mm sieve	(Assumed)		0 %	NHBC Modified (I'p)	n/a
Curing time	25 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

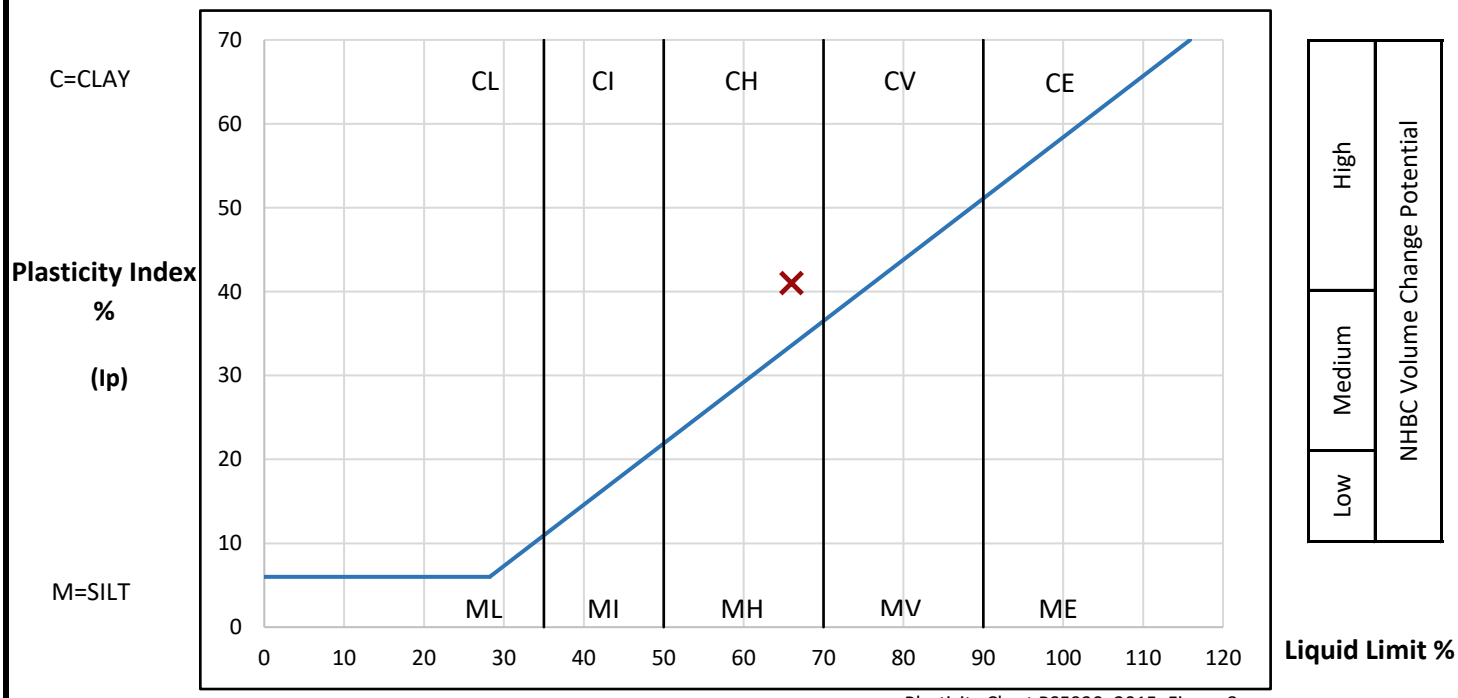
0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

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

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP2	1.50	D	2	26.4	Stiff olive CLAY with occasional bluish grey mottling, selenite crystals, and rare recently active roots.	Specimen dried at 80°C due to the presence of selenite.

PREPARATION					
				Liquid Limit	66 %
Method of preparation			From natural	Plastic Limit	25 %
Sample retained 0.425mm sieve	(Assumed)		0 %	Plasticity Index	41 %
Corrected water content for material passing 0.425mm				Liquidity Index	0.03
Sample retained 2mm sieve	(Assumed)		0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

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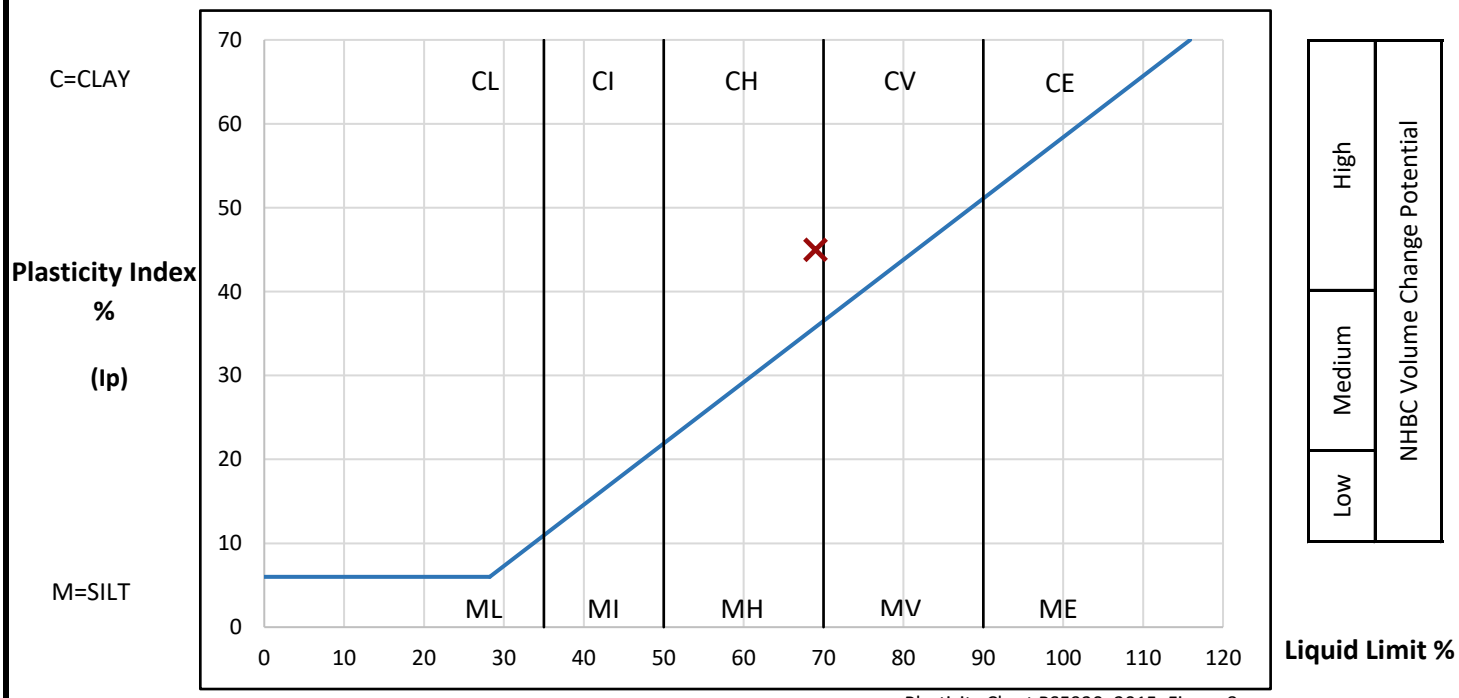
Contract	**Brick Lane, Mepal**
Serial No.	**34620**

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

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP4	1.00	D	1	27.7	Stiff light olive brown CLAY with occasional bluish grey mottling, calcareous aggregations, and rare recently active and decayed roots.	

PREPARATION				Liquid Limit	69 %
Method of preparation			From natural	Plastic Limit	24 %
Sample retained 0.425mm sieve	(Assumed)		0 %	Plasticity Index	45 %
Corrected water content for material passing 0.425mm				Liquidity Index	0.08
Sample retained 2mm sieve	(Assumed)		0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

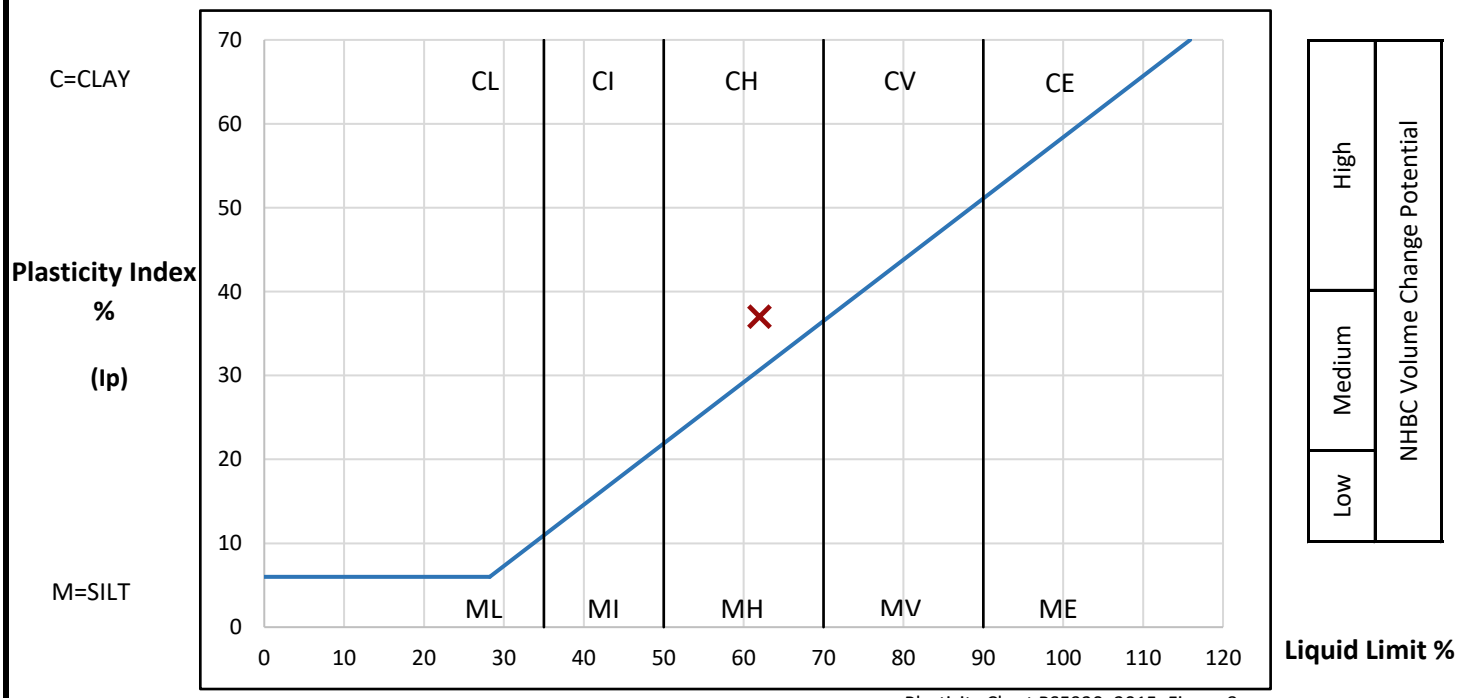
0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

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

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP5	2.30	D	3	26.8	Stiff slightly fissured pale olive CLAY with occasional bluish grey mottling, and decayed roots.	

PREPARATION				Liquid Limit	62 %
Method of preparation			From natural	Plastic Limit	25 %
Sample retained 0.425mm sieve	(Assumed)		0 %	Plasticity Index	37 %
Corrected water content for material passing 0.425mm				Liquidity Index	0.05
Sample retained 2mm sieve	(Assumed)		0 %	NHBC Modified (I'p)	n/a
Curing time	25 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

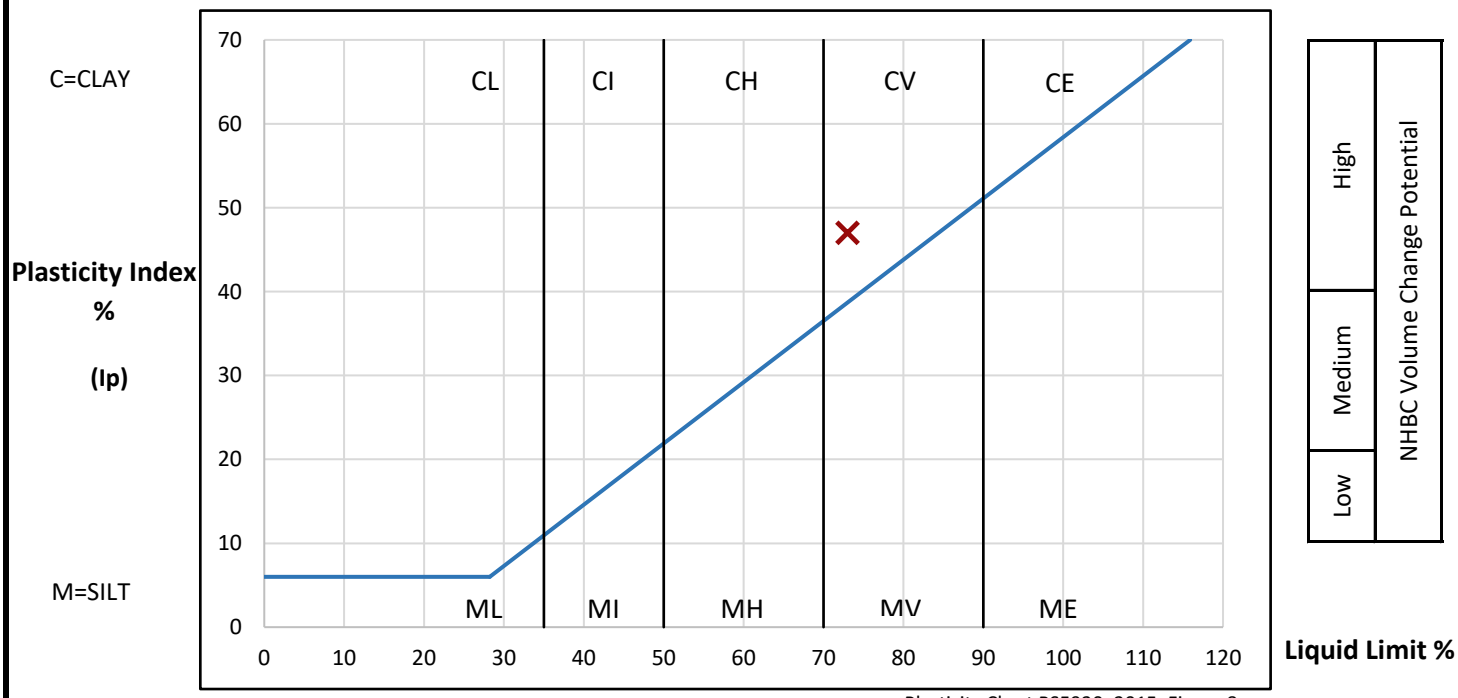
0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620**

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

Borehole / Pit No.	Depth m	Sample Type	Sample Reference	Water Content (W) %	Description	Remarks
TP6	1.20	D	2	29.0	Stiff olive CLAY with occasional bluish grey mottling, rare recently active and decayed roots, selenite crystals/weathered selenite, and calcareous aggregations.	Specimen dried at 80°C due to the presence of selenite.

PREPARATION				Liquid Limit	73 %
Method of preparation			From natural	Plastic Limit	26 %
Sample retained 0.425mm sieve	(Assumed)		0 %	Plasticity Index	47 %
Corrected water content for material passing 0.425mm				Liquidity Index	0.06
Sample retained 2mm sieve	(Assumed)		0 %	NHBC Modified (I'p)	n/a
Curing time	24 hrs	Clay Content	Not analysed	Derived Activity	Not analysed



Plasticity Chart BS5930: 2015: Figure 8

Method of Preparation:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 4.2
Method of Test:	BS EN ISO: 17892-1: 2014 & BS 1377: Part 2: 1990: 3.2, 4.3, 5.3, 5.4
Type of Sample Key:	U=Undisturbed, B=Bulk, D=Disturbed, J=Jar, W=Water, SPT=Split Spoon Sample, C=Core Cutter
Comments:	

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 25/02/2019

Contract:	**Brick Lane, Mepal**
Serial No:	**34620**

DETERMINATION OF THE SULPHATE CONTENT AND pH OF SOIL AND GROUNDWATER

Borehole / Pit No.	Depth (m)	Sample		Conc. of Soluble SO3		Calc'd Conc. Of SO4 (g/L)	pH Value	% Sample Passing 2mm Sieve	Description	Remarks
		Type	Ref.	Water Soluble 2:1 (g/L)	Ground Water (g/L)					
TP1	2.00	B	3	1.48		1.77	7.6	100	Stiff light olive brown CLAY with occasional bluish grey mottling, rare recently active roots, and selenite crystals.	
TP2	2.10	B	3	1.43		1.71	7.5	100	Stiff slightly fissured light olive brown CLAY with occasional light bluish grey mottling, rare decayed roots, and selenite crystals.	

Method of Preparation:	BS1377: Part 1: 2016: 8.5, BS1377: Part 3: 1990: 5.3 Soil/Water Extract, 5.4 Groundwater
Method of Test:	BS1377: Part 3: 1990: 5.5
Type of Sample Key:	U= Undisturbed, B= Bulk, D= Disturbed, J= Jar, W= Water, SPT= Split Spoon Sample, C= Core Cutter
Comments:	**Test not UKAS accredited**
Remarks to Include:	Sample disturbance, loss of moisture, variation from test procedure, location, and origin of test specimen within original sample. Oven drying temperature if not 105-110C.

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 07/03/2019

0998

Contract	**Brick Lane, Mepal**
Serial No.	**34620S**

Client:

Richard Jackson Limited

847 The Crescent
Colchester
Essex
CO4 9YQ

Soil Property Testing Ltd

15, 16, 18 Halcyon Court, St Margaret's Way, Stukeley Meadows, Huntingdon, Cambridgeshire, PE29 6DG

Tel: 01480 455579
Email: enquiries@soilpropertytesting.com
Website: www.soilpropertytesting.com

Samples Submitted By:

Richard Jackson Limited

Samples Labelled:

Brick Lane, Mepal

Approved Signatories:

- ☑ **J.C. Garner B.Eng (Hons) FGS** — Technical Director
- ☐ **S.P. Townend FGS** — Quality Manager
- ☐ **W. Johnstone** — Materials Lab Manager
- ☐ **D. Sabnis** — Operations Manager

Date Received: 15/02/2019 **Samples Tested Between:** 15/02/2019 **and** 07/03/2019

Remarks:

For the attention of Katherine Brightwell
Your Reference No: 49533

BRE SD1 suite subcontracted to Chemtest - results included as Appendix A to this Test Report

Notes:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.

2. (a) UKAS - United Kingdom Accreditation Service
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.

4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT

ISSUED BY SOIL PROPERTY TESTING LTD

DATE ISSUED: 07/03/2019

0998

Contract	**Brick Lane, Mepal**		
Serial No.	**34620S**	**Target Date**	07/03/2019
Scheduled By	Richard Jackson Limited		

SCHEDULE OF LABORATORY TESTS

Schedule Remarks

Bore Hole No.	Type	Sample Ref.	Top Depth	BRE SD1 Suite																			Sample Remarks
TP5	D	3	2.30	1																			
Totals				**1**																			**End of Schedule**

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING 2183

Final Report

Report No.:	19-06697-1		
Initial Date of Issue:	06-Mar-2019		
Client	Soil Property Testing		
Client Address:	18 Halycon Court St Margarets Way Stukeley Meadows Huntingdon Cambridgeshire PE29 6DG		
Contact(s):	Jon Garner		
Project	34620 Brick Lane, Mepal		
Quotation No.:		**Date Received:**	25-Feb-2019
Order No.:	34620	**Date Instructed:**	25-Feb-2019
No. of Samples:	1		
Turnaround (Wkdays):	5	**Results Due:**	01-Mar-2019
Date Approved:	06-Mar-2019		

Approved By:

Details: Martin Dyer, Laboratory Manager

Results - Soil

Project: 34620 Brick Lane, Mepal

Client: Soil Property Testing				**Chemtest Job No.:**	19-06697
Quotation No.:				**Chemtest Sample ID.:**	781069
				Client Sample ID.:	D3
				Sample Location:	TP5
				Sample Type:	SOIL
				Top Depth (m):	2.30
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Moisture	N	2030	%	0.020	20
pH	U	2010		N/A	[A] 8.2
Magnesium (Water Soluble)	N	2120	g/l	0.010	0.042
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.50
Total Sulphur	U	2175	%	0.010	[A] 0.22
Chloride (Water Soluble)	U	2220	g/l	0.010	[A] 0.072
Nitrate (Water Soluble)	N	2220	g/l	0.010	< 0.010
Ammonium (Water Soluble)	U	2120	g/l	0.01	< 0.01
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.66

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
781069		D3	TP5		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix E

Limitations of use

Limitations of Use

This report is based on the results of the exploratory boreholes, the laboratory testing carried out on samples recovered from those boreholes and on details of the scheme provided by the Client.

This report has been prepared for the benefit of Havebury Housing Partnership, and its contents should not be relied upon by others without the written authority of Richard Jackson Ltd. If any unauthorised third party makes use of this report they do so at their own risk and Richard Jackson Ltd owes them no duty of care or skill.

All information provided by others is taken as being in good faith as being accurate, but Richard Jackson Ltd cannot, and does not, accept any liability for the detailed accuracy, errors or omissions in such information.

Subsoils are by their nature hidden from view and no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may well be present beneath the site which was not evident from the investigations carried out.

Geological data, with the exception of geological maps held by Richard Jackson Ltd, Ordnance Survey maps and aerial photographs have not been inspected, nor has any other data relating to site conditions past or present, or any information regarding underground services, other than as indicated.

Groundwater levels can be subject to considerable seasonal variations, and the conditions encountered in the exploratory holes may not reflect long-term conditions.

There can be no guarantee that the samples analysed represent the highest concentrations of contamination present beneath the site. The chemical analysis results have been assessed to standards appropriate at the time of investigation.

Unless a greater period of retention of samples is agreed, it is our normal practice to discard all samples one month after submission of our final report.

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