

15th November 2019

Jelson Homes Limited,
370 Loughborough Road
Leicester,
LE4 5PR

For the attention of Alan Food

Dear Alan,

Residential Development at Littleworth Drive, Deeping St Nicholas – Localised Elevated PAH.

Further to notification from South Holland District Council Environmental Protection Officer that planning condition 11 of H03-0331-16 could not be discharged due to locally occurring elevated levels of PAH's further investigative works have been undertaken at the site.

Background

Following the initial intrusive ground investigation works undertaken at the site in July 2019 and submission by Jelson of ground investigation report no. G19102-IR (dated August 2019) to South Holland District Council a response confirmed general agreement with the reports findings but declined to remove a planning condition relating to localised elevated levels of PAH's. In order to provide additional information relating to the south western corner of the site additional trial pitting and subsequent laboratory testing has been undertaken.

Site Works

Eight trial pits (TP17B and TP18-TP24 inclusive) were excavated within the area surrounding original trial pit TP5 by mechanical excavator to depths ranging from 0.60m to 0.90m on 25th October 2019. Environmental samples were taken in order for further contamination testing to be undertaken. The trial pit logs are appended. The positions of the trial pits are shown on the attached exploratory hole location plan no. G19102-IR/02B. The fieldwork was carried out in general accordance with BS 5930:2015 "Codes of Practice for Site Investigations", logged in accordance with BS EN ISO 14688-1:2015 and BS EN ISO 14688-2:2004 and the work overseen by an experienced Geotechnical Engineer.

Laboratory Testing

Nine soil samples taken at depths ranging from 0.20m to 0.50m (7 of made ground (predominantly locally sandy, ashy topsoil and brick rubble) and 2 of topsoil) have been tested at Nicholls Colton Groups laboratory, in accordance with MCERTS accreditation standards. The samples were analysed for the following determinants:-

(all values 'total' unless otherwise stated)

- Asbestos (presence of) #
- Arsenic #
- Cadmium #
- Chromium (Total) #
- Copper #
- Lead #
- Mercury #
- Nickel #
- Zinc #
- Phenols #
- pH Value #
- Polyaromatic Hydrocarbons (PAH)

Selected Samples only.

The contamination results are appended.

Contamination Assessment

The data obtained from the latest intrusive investigation work has identified locally made ground (an area of approximately 20m x 20m) comprising locally sandy, ashy topsoil and brick rubble to a maximum depth of 0.70m.

A series of soil samples taken from the site have been collected and analysed for the presence of selected potential contaminants.

Guidance published by Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) has been utilised to review the results –

Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.

The LQM/CIEH S4ULs ('Suitable For Use Level's) are derived from the Contaminated Land Exposure Assessment (CLEA) software produced the Environment Agency (version 1.06 released in October 2009).

The S4ULs supersede the previously published LQM/CIEH GACs (2009).

S4ULs are based upon the concept of either 'tolerable' risk (where the relevant health criteria value is a tolerable daily intake), or 'minimal' risk (where the health criteria is an index dose). This is consistent with the previous GACs, and also the SGVs previously published by the Environment Agency.

Where S4ULs are referred to and reproduced in this report, it is acknowledged that this is done with the permission of Land Quality Management Limited. It should be noted that Nicholls Colton Group's unique LQM/CIEH publication number is S4UL3157.

DEFRA has published a parallel set of new assessment criteria (Category 4 Screening Levels) for a very limited number of contaminants. C4SLs are based upon the concept of a 'low' risk (being a higher risk than 'tolerable' or 'minimal' risk), and on this basis, they are less stringent than the S4ULs published by LQM/CIEH. If appropriate, C4SLs may also be utilised in the assessment of the soils at the present site.

It should be noted that there is no S4UL (or former GAC) for lead; and that the SGV for lead has been withdrawn. As such, the only available authoritative published criteria for lead is the DEFRA C4SL. The C4SL for lead is considerably more conservative than the former SGV. On this basis, for lead, the C4SL is utilised in this assessment.

Exceedance of an S4UL or a C4SL implies that an unacceptable human health risk *may* be present, and therefore either further site specific risk assessment is required, or intervention (remedial) works are necessary.

S4ULs and C4SLs are set according to the proposed end use of the land. The results of the contamination test results were compared against '*residential housing with plant uptake*'. This assumes that properties will have private garden areas where vegetables may be grown and subsequently eaten.

The results of the additional contamination testing have been compared with the appropriate S4UL values and in the case of lead the C4SL and these have all been recorded below the assessment criteria for the '*residential with plant uptake*' land use scenario with the exception of the following soil sample where elevated levels of PAH's were detected:

Benzo(a,h) anthracene

Elevated Result	:	33mg/kg (1 of 9)
Location	:	TP17B (0.20m)
S4UL	:	13mg/kg
Material Type	:	Made ground; brick rubble in topsoil/sand matrix.

Benzo(a) pyrene

Elevated Results	:	3.1 to 24mg/kg (3 of 9)
Locations	:	TP17B (0.20m), TP19 (0.30m) & TP24 (0.15m)
S4UL	:	3.0mg/kg
Material Type	:	Made ground; topsoil/brick rubble in a topsoil/sand matrix.

Benzo(b) fluoranthene

Elevated Results	:	3.9 to 33mg/kg (3 of 9)
Location	:	TP17B (0.20m), TP19 (0.30m) & TP24 (0.15m)
S4UL	:	3.7mg/kg
Material Type	:	Made ground; topsoil/brick rubble in topsoil/sand matrix.

Chrysene

Elevated Result	:	31mg/kg (1 of 9)
Location	:	TP17B (0.20m)
S4UL	:	27mg/kg
Material Type	:	Made ground; brick rubble in topsoil/sand matrix

Dibenzo (a, h) anthracene

Elevated Results	:	0.44 to 3.1mg/kg (3 of 9)
Location	:	TP17B (0.20m), TP19 (0.30m) & TP24 (0.15m)
S4UL	:	0.3mg/kg
Material Type	:	Made ground; topsoil/brick rubble in topsoil/sand x matrix.

Four samples were also tested for the presence of asbestos, none was detected.

Summary and Conclusions

The additional ground investigation works recently undertaken at the site have confirmed that the made ground underlying the south western corner of the site is of relatively shallow depth with a maximum thickness of 0.70m encountered within the trial pits formed at the site.

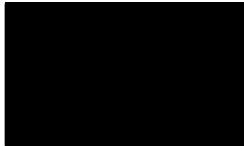
The additional contamination testing undertaken confirms that the elevated levels of contaminants are confined to a relatively small area of the site (approximately 20m x 20m) including trial pits TP5, TP17B, TP19 & TP24 and relates only to PAH elements. The topsoil tested outside of the area of made ground was found to comply with the '*residential with plant uptake*' land use.

The relatively small area of contaminated ground could have been treated as a 'hot spot' with remedial measures put in place; however it is understood that following stripping of the topsoil that the ground level over the entire site area is to be raised by approximately 1.00m with the importation of an inert fill material. The contaminated topsoil stripped from the identified 'hot spot' shall not be re-used in proposed areas of soft landscaping or gardens.

Following implementation of raising of the ground levels any remaining contaminated soils will subsequently lie below 1.00m of finished ground level. In effect this operation will provide an inert capping layer of 1.00m thickness covering any contaminated soils with elevated levels of PAH elements. It is therefore considered that this will provide sufficient remedial measures for planning condition 11 of H03-0331-16 to be lifted.

We trust the above and enclosed is satisfactory and this assessment should be forwarded to the South Holland District Council Environmental Protection Officer. Please do not hesitate to contact the writer should you wish to discuss the findings or require any further information.

Yours faithfully,



N. Birchenough
Geotechnical Engineer
NICHOLLS COLTON GROUP

Ref: G19102-LR
Enc.
Trial Pit Logs
Exploratory Hole Location Plan
Laboratory Test Results

TRIAL PIT LOG - TP17B

Site:
Residential Development on Land Off Littleworth Drive, Deeping St Nicholas.

Client: Jelson Homes Limited.	Method of Excavation: Mechanical Excavator	Dimensions: 1.50m x 0.60m	Project No.: G19102
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Logged by: NB	Ground Level:	Date: 25/10/2019	Location: -	Scale: 1:25
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Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.20				0.10	MADE GROUND - brown TOPSOIL.		
						MADE GROUND - brown and pale reddish brown whole/half bricks and fragments in a mixed topsoil and sand matrix.		
					0.40	Orangish brown silty fine SAND.		
					0.60			

Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Project No.:
G19102

Scale: 1:25

Sheet 1 of 1

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TRIAL PIT LOG - TP19

Site:
Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Client: Jelson Homes Limited.	Method of Excavation: Mechanical Excavator	Dimensions: 1.50m x 0.60m	Project No.: G19102
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Logged by: NB	Ground Level:	Date: 25/10/2019	Location: -	Scale: 1:25
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Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.20					MADE GROUND - brown TOPSOIL with occasional brick fragments.		
E2	0.50				0.40	MADE GROUND - brown buried TOPSOIL.		
					0.53	Firm pale brown locally orangish brown very silty CLAY.		
					0.70			

TRIAL PIT LOG - TP20

Site:

Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Client:
Jelson Homes Limited.

Method of Excavation:
Mechanical Excavator

Dimensions:
1.50m x 0.60m

Project No.:	G19102
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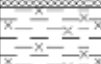
Logged by: NB

Ground Level:

Date: 25/10/2019

Location: -

Scale: 1:25

Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.20				0.22	MADE GROUND - brown and black ashy TOPSOIL with occasional brick fragments.		
						MADE GROUND - firm orangish and pale brown slightly sandy, silty CLAY with occasional brick fragments.		
					0.54	MADE GROUND - brown buried TOPSOIL.		
D2	0.80				0.70	Firm orangish brown and pale brown silty CLAY.		
					0.90			

Remarks and Water Observations	
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Sheet 1 of 1

1. No groundwater seepages were encountered during excavation of the trial pit.
2. The trial pit walls remained stable.
3. The trial pit was backfilled with the accumulated spoil arisings.

Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Project No.:
G19102

Scale: 1:25

Sheet 1 of 1

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TRIAL PIT LOG - TP22

Site:
Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Client: Jelson Homes Limited.	Method of Excavation: Mechanical Excavator	Dimensions: 1.50m x 0.60m	Project No.: G19102
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Logged by: NB	Ground Level:	Date: 25/10/2019	Location: -	Scale: 1:25
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Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.20				0.35	Brown TOPSOIL with occasional roots.		
					0.60	Firm orangish, reddish and pale brown mottled slightly silty CLAY.		

Remarks and Water Observations

- Slight groundwater seepages were encountered at 0.50m during excavation of the trial pit.
- The trial pit walls remained stable.
- The trial pit was backfilled with the accumulated spoil arisings.

Sheet 1 of 1



TRIAL PIT LOG - TP23

Site:

Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Client:
Jelson Homes Limited.

Method of Excavation:
Mechanical Excavator

Dimensions:
1.50m x 0.60m

Project No.:	G19102
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Logged by: NB

Ground Level:

Date: 25/10/2019

Location: -

Scale: 1:25

[illegible]

Remarks and Water Observations	
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Sheet 1 of 1

1. No groundwater seepages were encountered during excavation of the trial pit.
2. The trial pit walls remained stable.
3. The trial pit was backfilled with the accumulated spoil arisings.

TRIAL PIT LOG - TP24

Site:
Residential Development on Land Off Littleworth Drove, Deeping St Nicholas.

Client: Jelson Homes Limited.	Method of Excavation: Mechanical Excavator	Dimensions: 1.50m x 0.60m	Project No.: G19102
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Logged by: NB	Ground Level:	Date: 25/10/2019	Location: -	Scale: 1:25
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Samples and In situ Tests			Water	Level (mAOD)	Depth (m)	Strata Description	Legend	Backfill
Ref:	Depth (m)	Result						
E1	0.15					MADE GROUND - brown TOPSOIL with many brick fragments.		
					0.30	Firm orangish and pale brown slightly sandy CLAY/SILT.		
					0.60			



Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

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7-11 Harding Street
Leicester
LE1 4DH

Analytical Test Report: G19102-C/001

Your Project Reference:	Deeping St Nicholas	Samples Received on:	25/10/2019
Your Order Number:	G19102-C	Testing Instruction Received:	25/10/2019
Report Issue Number:	1	Sample Tested:	25/10 to 08/11/2019
Samples Analysed:	26 soil samples	Report issued:	08/11/2019

Signed



Peter Swanston
Environmental Laboratories Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with NC method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NC method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Sulphur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer, results are representative of the material provided

Asbestos

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

Deviating Samples

Samples were received in suitable containers **Yes**

A date and time of sampling was provided **Yes**

Sample holding times were exceeded prior to analysis of determinants **No**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue 24/01/2017

Drawn by Emily Blissett - Customer Services Supervisor

Authorised by James Gane - Commercial Manager

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G19102-C/001

Project Reference - Deeping St Nicholas

Analytical Test Results - NCG Soil Suite

NC Reference			59296	59297	59299	59300	59301	59303	59304
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP17	TP18	TP19	TP19	TP20	TP21	TP22
Client Sample Type			E	E	E	E	E	E	E
Client Sample Number			1	1	1	2	1	1	1
Depth - Top (m)			0.20	0.30	0.20	0.50	0.20	0.30	0.20
Depth - Bottom (m)			0.20	0.30	0.20	0.50	0.20	0.30	0.20
Date of Sampling			25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019
Time of Sampling			am	am	am	am	am	am	am
Sample Matrix			Clay	Clay	Clay	Clay	Sand	Clay	Clay
Determinant	Units	Accreditation							
Arsenic	(mg/kg)	MCERTS	12	13	-	18	17	-	-
Cadmium	(mg/kg)	MCERTS	0.5	0.6	-	0.4	0.7	-	-
Chromium (Total)	(mg/kg)	UKAS	18	17	-	20	19	-	-
Copper	(mg/kg)	MCERTS	20	24	-	21	140	-	-
Lead	(mg/kg)	MCERTS	27	72	-	35	180	-	-
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	-	< 2.5	< 2.5	-	-
Nickel	(mg/kg)	MCERTS	20	19	-	23	26	-	-
Zinc	(mg/kg)	MCERTS	200	94	-	64	77	-	-
Phenols (Total)	(mg/kg)	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0	-	-
pH	pH Units	MCERTS	8.1	8.0	-	7.8	7.9	-	-
Acenaphthene	(mg/kg)	MCERTS	7.7	< 0.20	0.04	< 0.02	< 0.20	0.08	0.06
Acenaphthylene	(mg/kg)	UKAS	< 2.00	< 0.20	0.06	0.07	< 0.20	0.08	< 0.02
Anthracene	(mg/kg)	UKAS	19	0.48	0.28	0.23	< 0.20	0.31	0.18
Benzo (a) anthracene	(mg/kg)	MCERTS	33	2.3	0.89	0.87	0.59	1.2	0.46
Benzo (a) pyrene	(mg/kg)	MCERTS	24	3.1	0.88	0.72	0.93	1.0	0.41
Benzo (b) fluoranthene	(mg/kg)	MCERTS	33	3.9	1.2	0.96	1.2	1.5	0.57
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	12	2.2	0.56	0.39	0.95	0.61	0.25
Benzo (k) fluoranthene	(mg/kg)	MCERTS	12	1.5	0.45	0.40	0.41	0.55	0.21
Chrysene	(mg/kg)	MCERTS	31	2.6	0.95	0.80	0.68	1.3	0.50
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	3.1	0.44	0.13	0.11	< 0.20	0.15	0.06
Fluoranthene	(mg/kg)	MCERTS	110	4.1	1.8	1.5	1.1	2.6	1.0
Fluorene	(mg/kg)	MCERTS	7.2	< 0.20	0.06	0.04	< 0.20	0.11	0.07
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	15	2.2	0.61	0.42	0.85	0.65	0.24
Naphthalene	(mg/kg)	MCERTS	< 2.00	< 0.20	< 0.02	< 0.02	< 0.20	0.04	< 0.02
Phenanthrene	(mg/kg)	MCERTS	84	1.6	0.74	0.48	0.59	1.5	0.80
Pyrene	(mg/kg)	MCERTS	86	4.0	1.6	1.4	1.0	2.1	0.86
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	480	29	10	8.4	9.7	14	5.7
Asbestos	-	UKAS	-	No asbestos detected	-	-	No asbestos detected	-	-

G19102-C/001

Project Reference - Deeping St Nicholas

Analytical Test Results - NCG Soil Suite

NC Reference			59305	59307
Client Sample ID			-	-
Client Sample Location			TP23	TP24
Client Sample Type			E	E
Client Sample Number			1	1
Depth - Top (m)			0.30	0.15
Depth - Bottom (m)			0.30	0.15
Date of Sampling			25/10/2019	25/10/2019
Time of Sampling			am	am
Sample Matrix			Sand	Clay
Determinant	Units	Accreditation		
Arsenic	(mg/kg)	MCERTS	18	-
Cadmium	(mg/kg)	MCERTS	0.6	-
Chromium (Total)	(mg/kg)	UKAS	17	-
Copper	(mg/kg)	MCERTS	19	-
Lead	(mg/kg)	MCERTS	48	-
Mercury	(mg/kg)	UKAS	< 2.5	-
Nickel	(mg/kg)	MCERTS	18	-
Zinc	(mg/kg)	MCERTS	81	-
Phenols (Total)	(mg/kg)	MCERTS	< 1.0	-
pH	pH Units	MCERTS	9.0	-
Acenaphthene	(mg/kg)	MCERTS	0.03	1.3
Acenaphthylene	(mg/kg)	UKAS	0.15	< 0.20
Anthracene	(mg/kg)	UKAS	0.25	3.4
Benzo (a) anthracene	(mg/kg)	MCERTS	1.0	5.7
Benzo (a) pyrene	(mg/kg)	MCERTS	1.2	4.3
Benzo (b) fluoranthene	(mg/kg)	MCERTS	1.9	5.8
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.87	2.2
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.64	2.3
Chrysene	(mg/kg)	MCERTS	1.5	6.2
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.16	0.53
Fluoranthene	(mg/kg)	MCERTS	3.0	14
Fluorene	(mg/kg)	MCERTS	0.04	1.4
Indeno (1, 2, 3-cd) pyrene	(mg/kg)	MCERTS	0.87	2.1
Naphthalene	(mg/kg)	MCERTS	0.03	< 0.20
Phenanthrene	(mg/kg)	MCERTS	1.1	13
Pyrene	(mg/kg)	MCERTS	2.8	12
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	16	76
Asbestos	-	UKAS	No asbestos detected	No asbestos detected

G19102-C/001

Project Reference - Deeping St Nicholas

Analytical Test Results - BRE Suite

NC Reference			59298	59302	59306	59308	59309	59310	59311
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP18	TP20	TP23	TP25	TP26	TP26	TP27
Client Sample Type			D	D	D	D	D	D	D
Client Sample Number			2	2	2	1	1	2	1
Depth - Top (m)			0.70	0.80	0.50	0.80	0.30	0.60	0.70
Depth - Bottom (m)			0.70	0.80	0.50	0.80	0.30	0.60	0.70
Date of Sampling			25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019
Time of Sampling			am	am	am	am	am	am	am
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	Units	Accreditation							
Water soluble sulphate	(mg/l)	u	170	30	180	42	< 10	73	63
Acid Soluble Sulphate	(%)	u	0.06	0.03	0.05	0.03	-	0.05	0.05
Total Sulphur	(%)	u	0.03	0.02	0.02	0.02	-	0.02	0.02
pH Value	pH Units	MCERTS	8.2	8.1	8.5	8.3	7.4	8.0	8.1

G19102-C/001

Project Reference - Deeping St Nicholas

Analytical Test Results - BRE Suite

NC Reference			59312	59313	59314	59315	59316	59317	59318
Client Sample ID			-	-	-	-	-	-	-
Client Sample Location			TP28	TP28	TP29	TP30	TP31	SP32	SP33
Client Sample Type			D	D	D	D	D	D	D
Client Sample Number			1	2	1	1	1	1	1
Depth - Top (m)			0.60	0.90	0.60	0.90	0.50	-	-
Depth - Bottom (m)			0.60	0.90	0.60	0.90	0.50	-	-
Date of Sampling			25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019
Time of Sampling			am	am	am	am	am	am	am
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay	Clay
Determinant	Units	Accreditation							
Water soluble sulphate	(mg/l)	u	400	530	140	610	51	130	53
Acid Soluble Sulphate	(%)	u	-	0.15	0.09	0.38	0.07	0.10	-
Total Sulphur	(%)	u	-	0.07	0.05	0.14	0.05	0.10	-
pH Value	pH Units	MCERTS	7.5	7.6	7.9	8.0	7.9	8.1	8.1

G19102-C/001

Project Reference - Deeping St Nicholas

Analytical Test Results - BRE Suite

NC Reference			59319	59320	59321
Client Sample ID			-	-	-
Client Sample Location			SP34	SP35	SP36
Client Sample Type			D	D	D
Client Sample Number			1	1	1
Depth - Top (m)			-	-	-
Depth - Bottom (m)			-	-	-
Date of Sampling			25/10/2019	25/10/2019	25/10/2019
Time of Sampling			am	am	am
Sample Matrix			Clay	Clay	Clay
Determinant	Units	Accreditation			
Water soluble sulphate	(mg/l)	u	68	180	340
Acid Soluble Sulphate	(%)	u	0.09	-	0.17
Total Sulphur	(%)	u	0.06	-	0.18
pH Value	pH Units	MCERTS	8.1	8.2	8.1

G19102-C/001

Project Reference - Deeping St Nicholas

Sample Descriptions

NC Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
59296	-	TP17	E	1	Made Ground- brown slightly sandy slightly gravelly silty clay with rare brick fragments organic matter	30	3.7	-
59297	-	TP18	E	1	Made Ground- brown slightly sandy slightly gravelly silty clay with rare brick fragments organic matter	19	35	-
59298	-	TP18	D	2	Brown slightly sandy slightly gravelly silty clay	-	-	97
59299	-	TP19	E	1	Dark brown slightly sandy gravelly silty clay with rare rootlets	22	35	-
59300	-	TP19	E	2	Dark brown slightly sandy slightly gravelly silty clay	64	4.5	-
59301	-	TP20	E	1	Made Ground- dark grey gravelly sand with rare organic matter	17	30	-
59302	-	TP20	D	2	Brown slightly sandy slightly gravelly silty clay	-	-	98
59303	-	TP21	E	1	Dark brown slightly sandy slightly gravelly silty clay with rare rootlets	36	2.2	-
59304	-	TP22	E	1	Made Ground- dark brown slightly sandy slightly gravelly silty clay with rare brick fragments	35	3.8	-
59305	-	TP23	E	1	Made Ground- brown clayey gravelly silty sand with frequent brick fragments with rare organic matter	33	11	-
59306	-	TP23	D	2	Orangish brown slightly sandy silty clay	-	-	100
59307	-	TP24	E	1	Made Ground- dark brown slightly sandy slightly gravelly silty clay with occasional brick fragments organic matter	29	27	-
59308	-	TP25	D	1	Brown slightly sandy silty clay	-	-	100
59309	-	TP26	D	1	Brown slightly sandy silty clay with rare organic matter	-	-	99
59310	-	TP26	D	2	Orangish brown slightly sandy silty clay with rare rootlets	-	-	81
59311	-	TP27	D	1	Orangish brown slightly sandy silty clay	-	-	71
59312	-	TP28	D	1	Grey brown slightly sandy silty clay	-	-	53
59313	-	TP28	D	2	Mottled brownish grey slightly sandy silty clay	-	-	65
59314	-	TP29	D	1	Mottled grey brown slightly sandy silty clay	-	-	68
59315	-	TP30	D	1	Mottled brownish grey slightly sandy silty clay	-	-	60
59316	-	TP31	D	1	Mottled brownish grey slightly sandy silty clay with rare rootlets	-	-	80
59317	-	SP32	D	1	Mottled grey brown slightly sandy silty clay	-	-	74
59318	-	SP33	D	1	Mottled grey brown slightly sandy silty clay	-	-	55
59319	-	SP34	D	1	Mottled grey brown slightly sandy silty clay	-	-	83
59320	-	SP35	D	1	Mottled brown grey slightly sandy slightly gravelly silty clay	-	-	59
59321	-	SP36	D	1	Mottled brown grey	-	-	67

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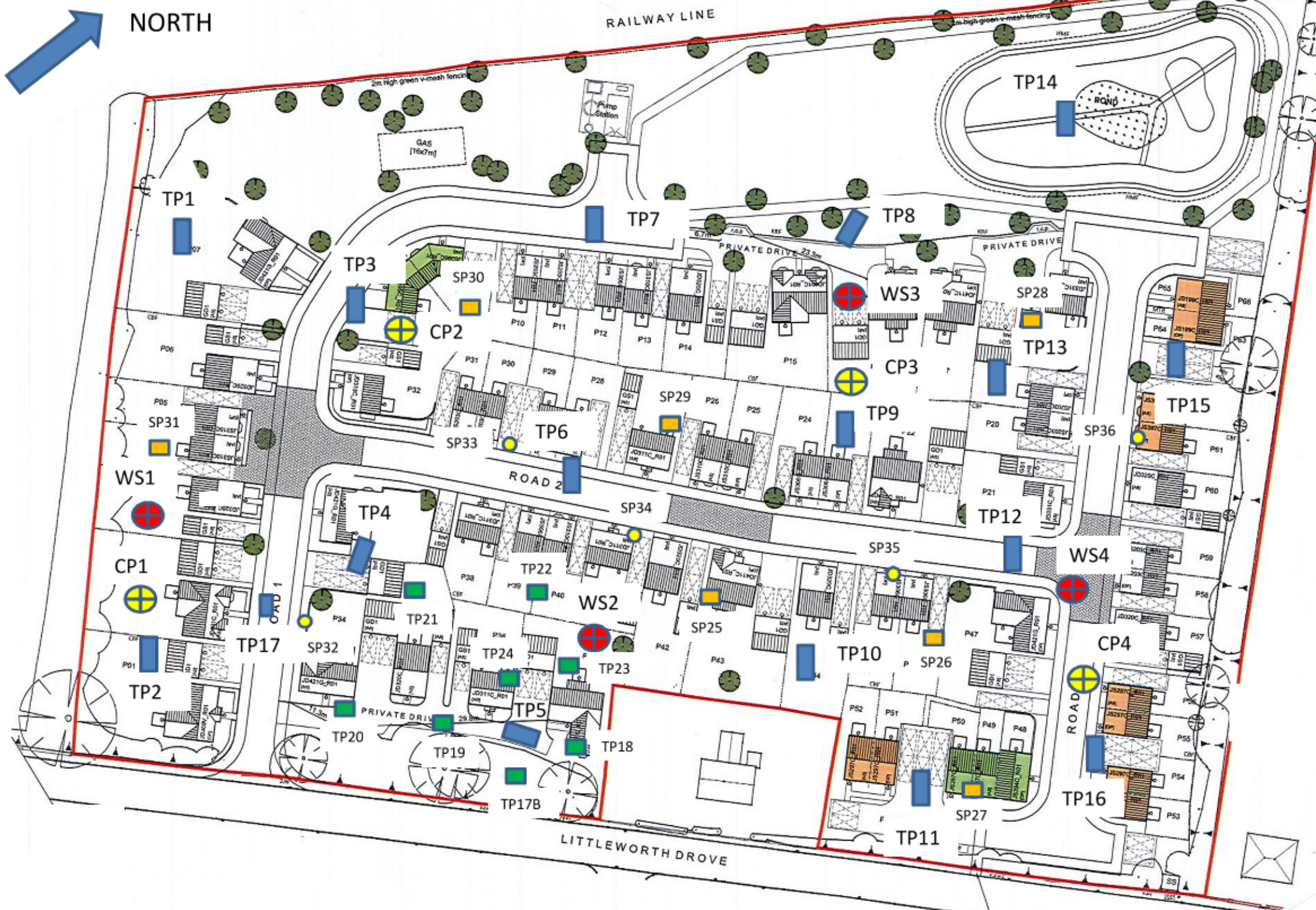
Project Reference - Deeping St Nicholas

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	Metals	Air Dried	In house method statement - MS - CL - ICP metals
Soil	PAH	As Received	In house method statement - MS - CL - PAH (As received)
Soil	Phenols	As Received	In house method statement - MS - CL - Phenols by Skalar
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - Acid Soluble Sulphate
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - Total Sulphur by ICP
Soil	Asbestos	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"



NORTH



Key:



Window Sample
borehole with gas
monitoring installation



Cable Percussion
borehole



Trial Pit Location



EHO planning condition
trial pit Location



Sulphate Investigation
trial pit location



Sample Location for
imported fill Sulphate
test

NICHOLLS COLTON
GROUP

Client:
Jelson Homes Limited

Project:
Land off Littleworth Drive, Deeping St
Nicholas, Lincolnshire.

Title:
Exploratory Hole Location Plan.

Date:
October 2019

Drawing No.
G19102-IR/02B