GROUND ENGINEERING LIMITED
Newark Road Peterborough PE1 5UA
t: 01733 566566
e: admin@groundengineering.co.uk
Company Registration Number 6929574

MP Building Ltd.
Suite 3 Thrifty House
4 Bilton Road
Hitchin
Herts SG4 0SB

Date 25 April 2018
Our ref JHG/C14166B

FAO Mr Kevin Boyle

Dear Sirs,

Imported Capping Layer Soil Analysis – Walsworth Road, Hitchin

Following the construction of a residential development on Walsworth Road, Hitchin, MP Building Ltd., the client, instructed Ground Engineering Limited to recover samples from the imported soil capping layer placed within garden and landscaped areas.

Selected recovered near surface soil samples were subsequently chemically tested to screen for potential contaminants and check that the imported soil is suitable for use within residential development.

Site Work and Strata Encountered

On 17 April 2018 Ground Engineering Limited carried out nine hand auger boreholes (P1B, P2B, P2A, P3A, P5A, P5B, P4A, LA & LB) located within the gardens of Plots 1 to 5 and two landscaped areas as shown in Figure 1.

The exposed strata were sampled and logged by a geo-environmental technician, and representative disturbed samples were taken throughout the depth of each borehole. The samples were sealed in polycarbonate pots, pending possible selection for contamination testing. Borehole records are provided to the rear of this report.

The hand auger boreholes encountered two layers making up the imported capping layer. A 0.15m to 0.40m thick topsoil layer of comprised dark brown, gravelly, silty, organic sand. This was underlain by brown, dark brown and light brown, gravelly, clayey, silty sand which was present at the base of the boreholes at depths between 0.60m and 1.00m. The gravel fraction comprised angular to sub-rounded flint and quartz in both layers.

Borehole P1B was abandoned at a depth of 0.16m due to the presence of dense gravel at 0.15m depth.

Laboratory Chemical Testing

Ten near surface samples were analysed for a selection of tests which encompassed a wide range of potential contaminants outlined by the Environment Agency (EA) and National House Building Council (NHBC) document R&D 66; 2008 'Guidance for the Safe Development of Housing on Land Affected by Contamination'.

Chemical analysis carried out on the soil samples to screen for potential contaminants included: total arsenic, total cadmium, total chromium, hexavalent chromium, total lead, total mercury, total selenium, water soluble boron, total copper, total nickel, total zinc, total cyanides, free cyanides, soluble sulphate, sulphides and pH-value, phenols and polyaromatic hydrocarbons (PAH), including benzo[a]pyrene.

Comments on the Soil Chemical Testing

The results of the laboratory chemical testing on near surface soil samples have primarily been compared to soil screening values (SSVs) produced by Land Quality Management Limited (LQM) and the Chartered Institute for Environmental Health (CIEH) presented in their document 'The LQM/CIEH S4ULs for Human Health Risk Assessment: 2015 (Publication Number S4UL3608)'. The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and are transparently-derived and cautious 'trigger values' above which further assessment of the risks or remedial action may be needed. The S4ULs (Suitable for Use Levels) have been derived, in accordance with UK legislation and Environment Agency policy, using a modified version of the Environment Agency CLEA 1.06 software.

Reference has also been given to ATRISKsoil soil screening values produced by Atkins Limited and provided under licence to Ground Engineering Limited. Atkins SSVs have been derived in line with the Environment Agency 2009 guidance using the CLEA 1.04 and 1.06 software. With the absence of a S4UL for cyanide the ATRISKsoil SSV has been used as the soil screening criteria within this report.

In 2014 the Department for Environment Food and Rural Affairs (DEFRA) published, in their document SP1010, Category 4 Screening Levels (C4SL) for several contaminants including lead. The C4SL represent screening levels below which the land could be considered suitable for a specified use and definitely not contaminated land in respect of those determinands. With the absence of S4UL for lead the C4SL has been used as the soil screening criteria within this report.

For each contaminant the adopted soil screening criteria have been calculated for the following land uses:

- Residential use with home grown produce
- Residential use without home grown produce
- Commercial and industrial usage

The intended purpose of the SSVs are as "intervention values" in the regulatory framework for assessment of human health risks in relation to land use. These values are not binding standards, but are intended to inform judgements about the need for action to ensure that a new use of land does not pose any unacceptable risks to the health of the intended users. Table 1 compares the test results for the made ground with the SSVs in relation to the specified uses. The number of test results, which exceed these values, are also provided.

Table 1: Comparison of Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95th Percentile (mg/kg)	Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Commercial / Industrial		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Commercial/ Industrial (mg/kg)
Organic matter	10	<0.40%	5.3%	-	-	-	-	-	-	-	-
Arsenic	10	12	20	0	0	0	17.19	S4UL	37	40	640
Cadmium	10	<0.10	0.19	0	0	0	0.13	S4UL	11	85	190
Trivalent* Chromium	10	16	22	0	0	0	20.49	S4UL	910	910	8600
Hexavalent Chromium	10	<0.50	<0.50	0	0	0	<0.50	S4UL	6	6	33
Lead	10	11	29	0	0	0	23.23	C4SL	200	310	2330
Mercury	10	<0.10	0.12	0	0	0	0.11	S4UL	11	15	320
Selenium	10	<0.20	0.39	0	0	0	0.25	S4UL	250	430	12,000
Nickel	10	14	22	0	0	0	18.48	S4UL	130	180	980
Phenols	10	<0.30	<0.30	0	0	0	<0.30	S4UL	200	690	690
Benzo[a]pyrene	10	<0.10	0.40	0	0	0	0.20	S4UL	0.98	1.2	15
Copper	10	10	20	0	0	0	15.30	S4UL	2400	7100	68,000
Zinc	10	32	76	0	0	0	66.99	S4UL	3700	40,000	730,000
Free Cyanide	10	<0.50	<0.50	0	0	0	<0.50	ATRISK	34	34	34

Notes

*The concentration of Trivalent Chromium is assumed to be equivalent to the Total Chromium concentration. This is because most naturally occurring chromium is in the trivalent (chromic) state.

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM

LQM/CIEH S4ULs 'Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3608. All rights reserved'

ATRISKsoil SSVs produced by Atkins Limited and provided under licence to Ground Engineering Limited

Conclusions

The results of laboratory analysis on the imported capping layers indicate that all the determinand concentrations were less than the respective SSV for residential with home grown produce and residential without home grown produce.

In conclusion

- The imported capping soil layers are considered to be suitable for use within the residential gardens and landscaped areas.

GROUND ENGINEERING LIMITED

J. H. GIBB

B.Sc. (Hons.), M.Sc. (Eng.), C.Geol., F.G.S.

Senior Geo-Environmental Engineer

S. J. FLEMING

M.Sc., M.C.S.M., C.Geol., F.G.S.

Director

Exploratory Hole Location Plan

Figure 1



Project : 80-81 Walsworth Road, Hitchin **Client : M P Buildings Limited**	**GROUND ENGINEERING LIMITED** Peterborough Tel : 01733 566566	**Project No.** **C14166B**

GROUND ENGINEERING LIMITED

Tel: 01733-566566
www.groundengineering.co.uk

Site: **80 WALSWORTH ROAD, HITCHIN**

HAND AUGER P1B

Date: 17/04/18

Hole Size: 100mm dia to 0.16m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.00	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.15	
0.15	D2			MADE GROUND - 'Dense', brown GRAVEL.		0.16	
				Hole abandoned at 0.16m depth			

REMARKS 1. Pit abandoned at 0.16m in dense inpenetrable gravel

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KEY

D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
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R - Root Sample
▽ Water Strike
▼c Level on completion
MP - Mackintosh Probe
V - Vane Shear Test Cohesion ( ) kPa
ES - Environmental Sample
▼ Water Rise
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						17/04/18	0.16		dry

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Site: **80 WALSWORTH ROAD, HITCHIN**

HAND AUGER
P2A

Date: 17/04/18

Hole Size: 100mm dia to 1.00m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)			
0.30	D2						
						0.40	
0.50	D3			MADE GROUND - Brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.			
0.85	D4						
						1.00	
				Hole completed at 1.00m depth			

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Groundwater Strikes

Depth m					
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

	Depth m		
Date	Hole	Casing	Water
17/04/18	1.00		dry

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Site: 80 WALSWORTH ROAD, HITCHIN

HAND AUGER
P2B

Date: 17/04/18

Hole Size: 100mm dia to 0.50m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.15	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.22	
0.50	D2			MADE GROUND - Brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.		0.60	
				Hole completed at 0.60m depth			

REMARKS

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▼s Standpipe Level

Groundwater Strikes

Depth m					
No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

	Depth m		
Date	Hole	Casing	Water
17/04/18	0.50		dry

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Site: **80 WALSWORTH ROAD, HITCHIN**

HAND AUGER
P3A

Date: 17/04/18

Hole Size: 100mm dia to 1.00m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.00	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)			
0.20	D2					0.30	
0.50	D3			MADE GROUND - Brown, locally dark brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.			
0.90	D4					1.00	
				Hole completed at 1.00m depth			

REMARKS

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▼s Standpipe Level

Groundwater Strikes

No	Struck	Rose to	Depth m Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
17/04/18	1.00		dry

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Site: 80 WALSWORTH ROAD, HITCHIN

HAND AUGER
P4A

Date: 17/04/18

Hole Size: 100mm dia to 0.80m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.35	
0.40	D2			MADE GROUND - Brown and light brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.		0.80	
0.80	D3			Pit completed at 0.80m depth			

REMARKS

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V - Vane Shear Test Cohesion ( ) kPa
ES - Environmental Sample
▼ Water Rise
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
	Depth m						Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						17/04/18	0.80		dry

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Site: **80 WALSWORTH ROAD, HITCHIN**

HAND AUGER
P5A

Date: 17/04/18

Hole Size: 100mm dia to 1.00m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.05	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.23	
0.30	D2			MADE GROUND - Brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.			
0.80	D3					1.00	
				Hole completed at 1.00m depth			

REMARKS

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V - Vane Shear Test Cohesion ( ) kPa
ES - Environmental Sample
▼ Water Rise
▼s Standpipe Level

Groundwater Strikes						Groundwater Observations			
Depth m							Depth m		
No	Struck	Rose to	Rate	Cased	Sealed	Date	Hole	Casing	Water
						17/04/18	1.00		dry

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Site: 80 WALSWORTH ROAD, HITCHIN

HAND AUGER
P5B

Date: 17/04/18

Hole Size: 100mm dia to 1.00m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.27	
0.40	D2			MADE GROUND - Brown and dark brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.			
0.90	D3					1.00	
				Hole completed at 1.00m depth			

REMARKS

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▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
17/04/18	1.00		dry

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Site: **80 WALSWORTH ROAD, HITCHIN**

HAND AUGER
LA

Date: 17/04/18

Hole Size: 100mm dia to 0.60m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.20	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.24	
0.40	D2			MADE GROUND - Brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.		0.60	
				Hole completed at 0.60m depth			

REMARKS

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V - Vane Shear Test Cohesion ( ) kPa
ES - Environmental Sample
▼ Water Rise
▼s Standpipe Level

Groundwater Strikes

No	Depth m Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
17/04/18	0.60		dry

GROUND ENGINEERING LIMITED

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Site: 80 WALSWORTH ROAD, HITCHIN

HAND AUGER
LB

Date: 17/04/18

Hole Size: 100mm dia to 0.60m

Ground Level:

Samples and in-situ Tests			(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
Depth m	Type	Result					
0.10	D1			MADE GROUND - Dark brown, slightly gravelly, silty, organic SAND. Gravel of angular to sub-rounded flint and quartz. (TOPSOIL)		0.23	
0.50	D2			MADE GROUND - Brown, gravelly, clayey, silty SAND. Gravel of angular to rounded flint and quartz.		0.60	
				Hole completed at 0.60m depth			

REMARKS

Project No 14166B

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Groundwater Strikes

No	Struck	Rose to	Depth m Rate	Cased	Sealed

Groundwater Observations

Date	Depth m Hole	Casing	Water
17/04/18	0.60		dry

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

UKAS TESTING
2183

Final Report

Report No.:	18-10401-1
Initial Date of Issue:	23-Apr-2018
Client	Ground Engineering Limited
Client Address:	Newark Road Peterborough Cambridgeshire PE1 5UA
Contact(s):	John Gibb
Project	C14166B Hitchin

Quotation No.:		**Date Received:**	17-Apr-2018
Order No.:	C14166B	**Date Instructed:**	17-Apr-2018
No. of Samples:	10		
Turnaround (Wkdays):	5	**Results Due:**	23-Apr-2018
Date Approved:	23-Apr-2018		

Approved By:

Details: Martin Dyer, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: C14166B Hitchin

Client: Ground Engineering Limited												
			Chemtest Job No.:		18-10401	18-10401	18-10401	18-10401	18-10401	18-10401	18-10401	18-10401
Quotation No.:			**Chemtest Sample ID.:**		607878	607880	607881	607882	607883	607884	607885	607886
Order No.: C14166B			Client Sample Ref.:		P1B	P2A	P2B	P3A	P4A	P5A	P5B	LA
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.05	0.5	0.15	0.2	0.1	0.3	0.1	0.2
			Date Sampled:		17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
pH	U	2010		N/A	8.7	8.6	8.7	8.6	8.4	8.5	8.4	8.7
Moisture	N	2030	%	0.020	9.3	8.6	11	12	11	8.0	12	12
Stones and Removed Materials	N	2030	%	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.4	0.51	1.6	1.6	1.7	0.52	1.5	1.7
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.11	0.045	0.11	0.12	0.11	0.038	0.090	0.13
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.2	1.9	1.9	2.0	2.0	1.4	2.0	2.0
Arsenic	U	2450	mg/kg	1.0	12	20	13	12	13	19	13	16
Cadmium	U	2450	mg/kg	0.10	0.12	< 0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10	0.11
Chromium	U	2450	mg/kg	1.0	18	22	18	18	16	21	18	21
Copper	U	2450	mg/kg	0.50	11	11	12	14	15	11	15	16
Mercury	U	2450	mg/kg	0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	15	19	15	14	17	22	17	17
Lead	U	2450	mg/kg	0.50	16	16	17	18	29	11	23	28
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	60	33	63	64	69	35	66	76
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	4.5	0.52	2.4	3.8	4.7	0.53	5.3	3.5
Acenaphthene	U	2700	mg/kg	0.10	0.10	< 0.10	< 0.10	0.11	0.10	< 0.10	< 0.10	0.11
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	0.27	0.12	0.39	0.45	0.29	< 0.10	0.34	0.49
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.57	< 0.10	0.57	0.75	0.49	< 0.10	0.57	0.72
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	0.57	< 0.10	0.46	1.0	0.70	< 0.10	0.78	0.78
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	0.19	0.28	0.94	1.6	1.2	0.25	1.2	0.30
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.10
Phenanthrene	U	2700	mg/kg	0.10	0.45	0.13	0.13	0.63	0.11	0.11	0.13	0.21
Pyrene	U	2700	mg/kg	0.10	0.29	0.33	0.28	1.6	1.2	0.29	1.1	0.33
Total Of 16 PAH's	U	2700	mg/kg	2.0	2.4	< 2.0	2.8	6.1	4.1	< 2.0	4.1	3.0
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

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Results - Soil

Project: C14166B Hitchin

Client: Ground Engineering Limited			**Chemtest Job No.:**		18-10401	18-10401
Quotation No.:			**Chemtest Sample ID.:**		607887	608381
Order No.: C14166B			Client Sample Ref.:		LB	P2A
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.5	0.30
			Date Sampled:		17-Apr-2018	17-Apr-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
pH	U	2010		N/A	8.6	8.7
Moisture	N	2030	%	0.020	8.8	18
Stones and Removed Materials	N	2030	%	0.020	< 0.020	< 0.020
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.40	0.91
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.060	0.040
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.2	2.4
Arsenic	U	2450	mg/kg	1.0	20	15
Cadmium	U	2450	mg/kg	0.10	< 0.10	0.19
Chromium	U	2450	mg/kg	1.0	19	22
Copper	U	2450	mg/kg	0.50	10	20
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	16	19
Lead	U	2450	mg/kg	0.50	16	28
Selenium	U	2450	mg/kg	0.20	< 0.20	0.39
Zinc	U	2450	mg/kg	0.50	32	73
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	< 0.40	4.3
Acenaphthene	U	2700	mg/kg	0.10	0.12	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	0.39	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	0.40	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	0.44	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	0.51	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	0.22	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.22	< 0.10
Chrysene	U	2700	mg/kg	0.10	0.45	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	1.2	< 0.10
Fluorene	U	2700	mg/kg	0.10	0.11	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	0.31	< 0.10
Naphthalene	U	2700	mg/kg	0.10	0.24	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	1.2	< 0.10
Pyrene	U	2700	mg/kg	0.10	1.2	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	7.0	< 2.0
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30

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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
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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Report Information

Key

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

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

Sample Deviation Codes

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

Sample Retention and Disposal

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

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