Our Ref: 16-384.06L

FAO Jeremy Roberts
Strategic Team Group Ltd
Strategic Business Centre
Blue Ridge Park
Thunderhead Ridge
Glasshoughton
Castleford
WF10 4UA

Arc Environmental Ltd
Solum House
Unit 1 Elliott Court
St. Johns Road
Meadowfield
Durham
DH7 8PN

29th March 2018

Dear Jeremy,

Re: Plots 14 & 28 to 34, Lairds Way, Penistone

As requested by Strategic Team Group Ltd, and in accordance with The Remediation Strategy dated 20th October 2016, a representative from Arc Environmental Ltd visited site on 20th March 2018 to recover representative samples of the imported materials used as a clean cover system. Samples were recovered to check the suitability for use within the private gardens of Plots 14 and Plots 28 to 34. A total of 4 no. trial pits were excavated for a visual inspection across the 8 no. plots.

The depth of the clean cover was confirmed as being a minimum of 600mm, which comprised of a minimum 150mm topsoil and a minimum 450mm of sub-soil (see photographic evidence attached). As part of the validation works, a visual and olfactory inspection of the emplaced clean cover was undertaken during the site visit to ensure these materials were absent of obvious contamination i.e. staining, obvious fuel odours, fragments of asbestos containing materials and the like. The 8 no. representative samples were recovered for confirmatory screening and dispatched to Chemtech Environmental Limited for laboratory analysis. To ascertain the suitability of the materials, the soils were screened for the following range of analytes;

- Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Sulphur, Cyanide and Total Organic Carbon.
- Asbestos fibres (presence).
- Speciated Polycyclic Aromatic Hydrocarbons (PAH's), based on the current USEPA 16 PAH's + Benzo(j)fluoranthene.

We understand the source of the imported materials has purportedly been a 'greenfield site' in Otley, West Yorkshire, with chemical screening results provided to Arc Environmental for approval prior to importation.

A summary of the results can be seen in Table 1 on the following page. The results can also be seen in the Chemtech Environmental Limited analytical test report (Report No: 70745) attached to this report. The results have been assessed against the most up to date and appropriate guidelines.

The Clean Cover Validation Record Sheet showing the positions from where representative samples of emplaced materials were recovered is attached.

Re: Plots 14 & 28 to 34, Lairds Way, Penistone (Cont'd)

Table 1

Analyte	Critical Concentration (C_C)	Concentrations (C_M) recorded
Arsenic	37[1]	1.3
Cadmium	11[1]	0.2
Chromium III	910[1]	139
Chromium VI	6[1]	<1
Copper	2400[1]	51
Lead	200[2]	53
Mercury	40[1]	<0.5
Nickel	180[1]	45
Selenium	250[1]	1.3
Zinc	3700[1]	95
Cyanide	34[3]	<1
Asbestos	Presence	None detected
Acenaphthene	510[1]	0.08
Acenaphthylene	420[1]	<0.01
Anthracene	5400[1]	0.29
Benzo(a)anthracene	11[1]	0.28
Benzo(a)pyrene	2.7[1]	0.30
Benzo(b)fluoranthene	3.3[1]	0.28
Benzo(ghi)perylene	340[1]	0.15
Benzo(k)fluoranthene	93[1]	0.19
Chrysene	22[1]	0.29
Dibenz(ah)anthracene	0.28[1]	<0.02
Fluoranthene	560[1]	0.85
Fluorene	400[1]	0.08
Indeno(123cd)pyrene	36[1]	0.12
Naphthalene	5.6[1]	0.03
Phenanthrene	220[1]	0.82
Pyrene	1200[1]	0.73

[1] = The LQM / CIEH Suitable 4 Use Levels – Residential with home-grown produce (2.5% SOM), [2] = CL:AIRE Category 4 Screening Levels – Residential with home-grown produce, [3] = ATRISK^{SOIL} Soil Screening Values (2015).

The ground contamination screening has identified that none of the maximum concentration (C_M) values for the contaminants displayed in Table 1 exceed the critical concentration (C_C) values associated with the current designated end-use of Residential with home-grown produce. It has therefore been determined that the soils which have been imported to the site and used within the areas of soft landscaping are appropriate for use.

From the validation works undertaken it is the opinion of Arc Environmental Limited that the clean cover provided meets the requirements of the remediation strategy and is suitable for use.

We trust the contents of this report are to your satisfaction, and if you require any further information or clarification, please do not hesitate to contact us.

Yours Sincerely

.....

For and on behalf of Arc Environmental Ltd
Geoff Heron
Senior Field Technician

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Constructionline Part of Capita plc
CHAS
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SSIP

Laboratory Results

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ANALYTICAL TEST REPORT

Contract no: 70745

Contract name: Plots 14 & 28-34 Lairds Way, Penistone

Client reference: 16-384

Clients name: ARC Environmental

Clients address: Solum House, Unit 1 Elliott Court
St Johns Road
Meadowfield
DH7 8PN

Samples received: 20 March 2018

Analysis started: 20 March 2018

Analysis completed: 27 March 2018

Report issued: 27 March 2018

Notes:
Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key:
U UKAS accredited test
M MCERTS & UKAS accredited test
$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by:

Dave Bowerbank
Customer Services Co-ordinator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
70745-1	Plot 14 Topsoil Clean Cover	-	Sandy Clay with Gravel & Roots	-	-	21.2
70745-2	Plot 14 Sub-soil Clean Cover	-	Clay with Gravel	-	-	16.1
70745-3	Plot 28 Topsoil Clean Cover	-	Sandy Clay with Gravel & Roots	-	-	19.3
70745-4	Plot 28 Sub-soil Clean Cover	-	Clay with Gravel	-	-	3.7
70745-5	Plot 30 Topsoil Clean Cover	-	Sandy Clay with Gravel & Roots	-	-	20.4
70745-6	Plot 30 Sub-soil Clean Cover	-	Clay with Gravel	-	-	13.4
70745-7	Plot 32 Topsoil Clean Cover	-	Sandy Clay with Gravel & Roots	-	-	21.0
70745-8	Plot 32 Sub-soil Clean Cover	-	Clay with Gravel	-	-	15.6

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SOILS

Lab number			70745-1	70745-2	70745-3	70745-4	70745-5	70745-6
Sample id			Plot 14 Topsoil Clean Cover	Plot 14 Sub-soil Clean Cover	Plot 28 Topsoil Clean Cover	Plot 28 Sub-soil Clean Cover	Plot 30 Topsoil Clean Cover	Plot 30 Sub-soil Clean Cover
Depth (m)			-	-	-	-	-	-
Date sampled			20/03/2018	20/03/2018	20/03/2018	20/03/2018	20/03/2018	20/03/2018
Test	**Method**	**Units**						
Arsenic (total)	CE127 M	mg/kg As	13	10	13	3.5	13	12
Cadmium (total)	CE127 M	mg/kg Cd	0.2	<0.2	0.2	<0.2	0.2	<0.2
Chromium (total)	CE127 M	mg/kg Cr	118	53	105	139	112	80
Chromium (III)	-	mg/kg CrIII	118	53	105	139	112	80
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 M	mg/kg Cu	24	41	21	15	23	51
Lead (total)	CE127 M	mg/kg Pb	53	27	41	16	52	34
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 M	mg/kg Ni	23	45	22	12	21	41
Selenium (total)	CE127 M	mg/kg Se	0.7	1.0	0.6	0.3	0.7	1.3
Zinc (total)	CE127 M	mg/kg Zn	84	92	63	23	60	95
pH	CE004 M	units	6.5	6.6	6.4	8.1	7.1	7.2
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	1706	573	194	226	59	80
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1	<1	<1
Total Organic Carbon (TOC)	CE072 M	% w/w C	2.09	0.40	2.01	4.45	2.72	1.08
PAH								
Naphthalene	CE087 M	mg/kg	<0.01	<0.01	<0.01	0.03	<0.01	<0.01
Acenaphthylene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	CE087 M	mg/kg	<0.01	<0.01	0.01	0.08	<0.01	<0.01
Fluorene	CE087 U	mg/kg	<0.01	<0.01	<0.01	0.08	<0.01	<0.01
Phenanthrene	CE087 M	mg/kg	<0.02	<0.02	0.08	0.82	<0.02	<0.02
Anthracene	CE087 U	mg/kg	<0.02	<0.02	0.03	0.29	<0.02	<0.02
Fluoranthene	CE087 M	mg/kg	<0.02	<0.02	0.09	0.85	<0.02	<0.02
Pyrene	CE087 M	mg/kg	<0.02	<0.02	0.12	0.73	<0.02	<0.02
Benzo(a)anthracene	CE087 U	mg/kg	<0.02	<0.02	0.02	0.28	<0.02	<0.02
Chrysene	CE087 M	mg/kg	<0.01	<0.01	0.06	0.29	<0.01	<0.01
Benzo(b)fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	0.28	<0.02	<0.02
Benzo(k)fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	0.19	<0.02	<0.02
Benzo(a)pyrene	CE087 U	mg/kg	<0.02	<0.02	<0.02	0.30	<0.02	<0.02
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	<0.02	<0.02	0.12	<0.02	<0.02
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	<0.02	<0.02	0.15	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.27	<0.27	0.42	4.49	<0.27	<0.27
Benzo(j)fluoranthene	CE087	mg/kg	<0.02	<0.02	<0.02	0.06	<0.02	<0.02
PAH (total of OIL 8)	CE087	mg/kg	<0.15	<0.15	<0.15	1.53	<0.15	<0.15
Subcontracted analysis								
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			70745-7	70745-8
Sample id			Plot 32 Topsoil Clean Cover	Plot 32 Sub-soil Clean Cover
Depth (m)			-	-
Date sampled			20/03/2018	20/03/2018
Test	**Method**	**Units**		
Arsenic (total)	CE127 M	mg/kg As	11	7.9
Cadmium (total)	CE127 M	mg/kg Cd	<0.2	<0.2
Chromium (total)	CE127 M	mg/kg Cr	112	46
Chromium (III)	-	mg/kg CrIII	112	46
Chromium (VI)	CE146	mg/kg CrVI	<1	<1
Copper (total)	CE127 M	mg/kg Cu	21	44
Lead (total)	CE127 M	mg/kg Pb	39	23
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5
Nickel (total)	CE127 M	mg/kg Ni	20	44
Selenium (total)	CE127 M	mg/kg Se	0.6	0.9
Zinc (total)	CE127 M	mg/kg Zn	55	89
pH	CE004 M	units	6.6	6.4
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	34	62
Cyanide (free)	CE077	mg/kg CN	<1	<1
Total Organic Carbon (TOC)	CE072 M	% w/w C	1.96	0.45
PAH				
Naphthalene	CE087 M	mg/kg	<0.01	<0.01
Acenaphthylene	CE087 M	mg/kg	<0.01	<0.01
Acenaphthene	CE087 M	mg/kg	<0.01	<0.01
Fluorene	CE087 U	mg/kg	<0.01	<0.01
Phenanthrene	CE087 M	mg/kg	<0.02	<0.02
Anthracene	CE087 U	mg/kg	<0.02	<0.02
Fluoranthene	CE087 M	mg/kg	<0.02	<0.02
Pyrene	CE087 M	mg/kg	<0.02	<0.02
Benzo(a)anthracene	CE087 U	mg/kg	<0.02	<0.02
Chrysene	CE087 M	mg/kg	<0.01	<0.01
Benzo(b)fluoranthene	CE087 M	mg/kg	<0.02	<0.02
Benzo(k)fluoranthene	CE087 M	mg/kg	<0.02	<0.02
Benzo(a)pyrene	CE087 U	mg/kg	<0.02	<0.02
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	<0.02
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.27	<0.27
Benzo(j)fluoranthene	CE087	mg/kg	<0.02	<0.02
PAH (total of OIL 8)	CE087	mg/kg	<0.15	<0.15
Subcontracted analysis				
Asbestos (qualitative)	$	-	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
-	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	Wet	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO_4
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	Wet		1	mg/kg CN
CE072	Total Organic Carbon (TOC)	Removal of IC by acidification, Carbon Analyser	Dry	M	0.1	% w/w C
CE087	Acenaphthene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	Wet	U	0.01	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Naphthalene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	Wet		0.27	mg/kg
CE087	Benzo(j)fluoranthene	Solvent extraction, GC-MS	Wet		0.02	mg/kg
CE087	PAH (total of OIL 8)	Solvent extraction, GC-MS	Wet		0.15	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
70745-1	Plot 14 Topsoil Clean Cover	-	N	
70745-2	Plot 14 Sub-soil Clean	-	N	
70745-3	Plot 28 Topsoil Clean Cover	-	N	
70745-4	Plot 28 Sub-soil Clean	-	N	
70745-5	Plot 30 Topsoil Clean Cover	-	N	
70745-6	Plot 30 Sub-soil Clean	-	N	
70745-7	Plot 32 Topsoil Clean Cover	-	N	
70745-8	Plot 32 Sub-soil Clean	-	N	

Clean Cover Validation Record Sheet

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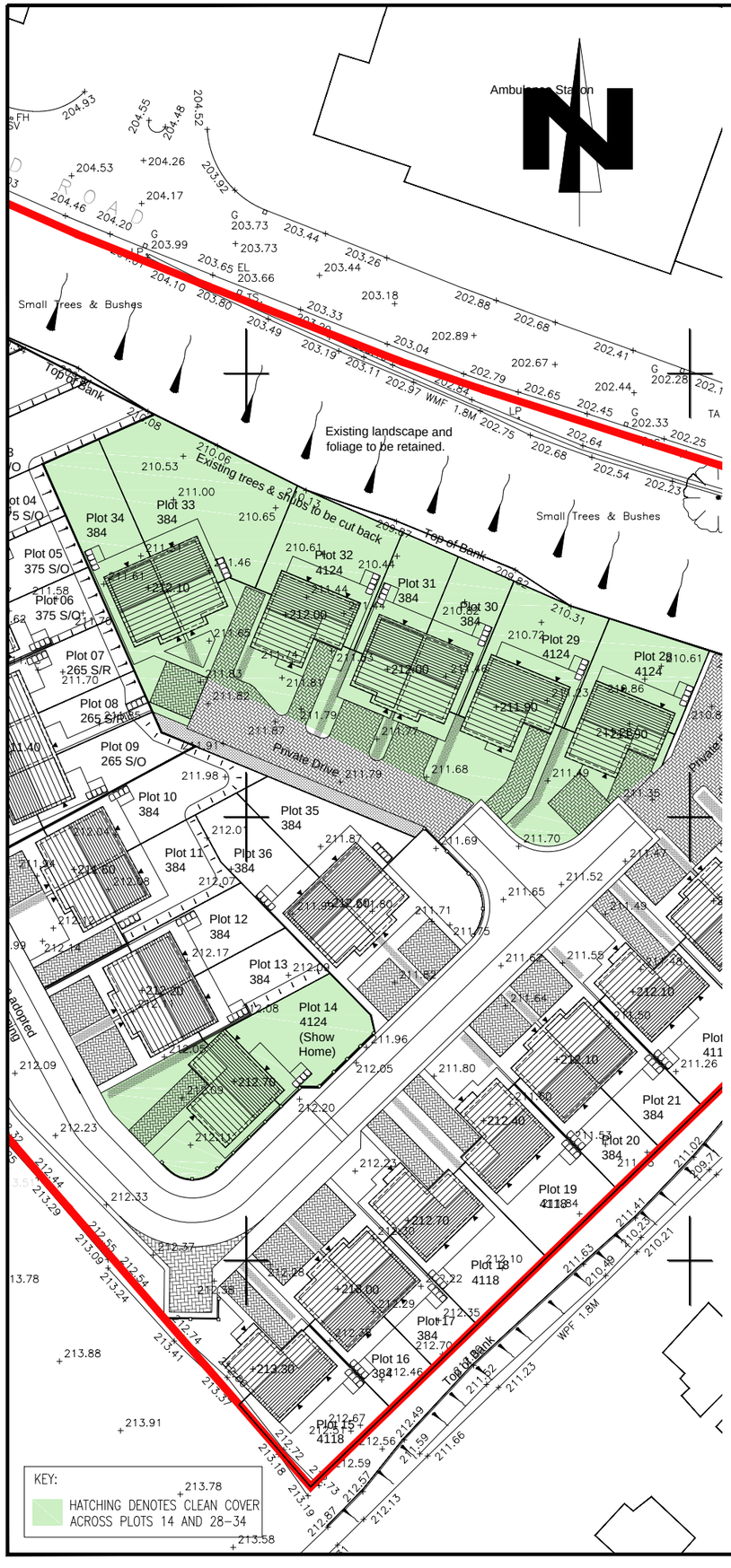


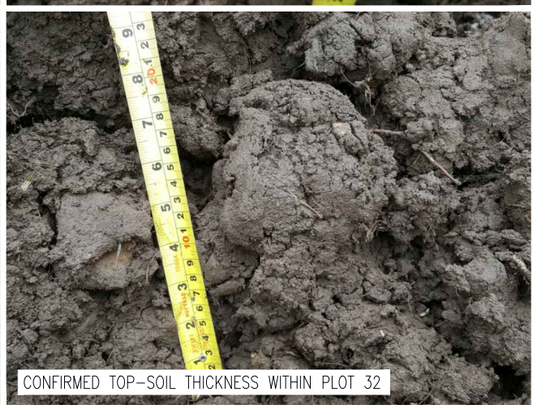

CONFIRMED SUB–SOIL THICKNESS WITHIN PLOT 28


CONFIRMED TOP–SOIL THICKNESS WITHIN PLOT 28


CONFIRMED SUB–SOIL THICKNESS WITHIN PLOT 30


CONFIRMED TOP–SOIL THICKNESS WITHIN PLOT 30


CONFIRMED SUB–SOIL THICKNESS WITHIN PLOT 32


CONFIRMED TOP–SOIL THICKNESS WITHIN PLOT 32

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rev.	date	amendments	drawn	chckd

Client:
STRATEGIC TEAM GROUP

Project Title:
Proposed Residential Development
Lairds Way
Penistone, South Yorkshire

Drawing Title:
Clean Cover Validation
Record Sheet Plots 14 and 28–34

Scale at A3:	Date:	Drawn by:	Approved by:
NTS @ A3	29.03.18	P.D	G.H

Job Ref:	Drg no:	Rev:
16–384	–	–