Our Ref: 15-154.01L

Abacus Stone Sales
273 Manchester Road
Crosland Moor
Huddersfield
West Yorkshire
HD4 5AG

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

13th August 2015

Dear Sirs,

RE: Land at Station Road, Meltham

Further to our recent visit to the above mentioned site, please find enclosed the following:

- Site Location Plan
- Existing Site Layout Plan
- Proposed Development Layout Plan
- Exploratory Hole Location Plan
- Trial Pit Record Sheets
- Laboratory Test Results

1.0 Introduction:-

As requested by One17 Design, and in conjunction with the Phase 1: Desk Top Study Report (ref: 15-154, July 2015), a program of ground investigation works were carried out over an area of land adjacent to Station Road, Meltham, where it is proposed to construct 2 no. residential properties with private gardens and areas of hard standing in the near future. The intrusive investigation works undertaken by Arc Environmental Limited comprised 6 no. mechanically excavated trial pits (TP's 1 – 6). The exploratory positions can be seen on the trial pit location plan attached and this plan should be used for orientating purposes only, as the positions shown are approximate and the plan is not to a standard scale.

The information contained in this report is limited to the areas of the site as indicated on the existing and proposed layout plans attached, and to those areas accessible during the ground investigation.

2.0 Ground Conditions:-

For an accurate description of the ground conditions encountered at the exploratory positions created by Arc Environmental Limited, reference should be made to the trial pit record sheets attached. It should be noted that there is always the possibility of variation in the ground conditions around and between the trial pit locations. A summary of the soil profile can be seen in Table 1 on the following page.

2.0 Ground Conditions (Cont'd):-

Table 1

Type of strata	Depths recorded (bgl)	Description
TOPSOIL:	From 0.00m up to c.0.40m	Comprising grass overlying brown slightly clayey slightly sandy soil, recorded in TP5 only.
MADE GROUND:	From 0.00m up to c.0.80m to c.3.30m	Comprising initial site surfacing of grass overlying dark brown/black slightly clayey soil with fragments of brick, glass and pottery. Underlying these deposits, disturbed natural strata with occasional anthropogenic debris (i.e. brick, ash, glass, pottery, etc.) was recorded.
DRIFT DEPOSITS:	From c.0.80m up to c.2.50m	Comprising dark brown clayey gravely SAND, greyish brown clayey SAND and greyish brown very sandy CLAY, recorded in TP3 only.
SOLID GEOLOGY:	From c.0.40m to c.2.50m up to at least c.3.60m	Comprised brown SANDSTONE, recovered as clayey sand with many sandstone cobbles.

There was no visual evidence of significant ground contamination (i.e. fuel-derived contaminants, asbestos, etc.) present within any of the exploratory positions undertaken across the site.

3.0 Groundwater:-

A slight ingress of water was recorded within TP1 only at a depth of c.3.00m, although no standing water level was recorded on completion. This ingress is likely to be representative of trapped lenses of surface infiltration rather than that of a continuous ground water surface (i.e. water table) below the site.

Subsequently, although not anticipated to be present in large quantities, it would be prudent to allow for the introduction of groundwater control measures (i.e. pumping equipment), in order to take care of any surface water ingresses and pockets of trapped surface drainage within the made ground and natural strata, particularly during the wetter periods of the year.

4.0 Laboratory Testing:-

All laboratory testing was undertaken by a suitably experienced and qualified laboratory (UKAS and MCERTS accredited, unless otherwise stated).

4.1 Determination of pH & SO_4:-

Four representative samples of the made ground encountered in the investigation were tested in order to determine their acidic (pH) and soluble sulphate (SO_4) levels. The results are shown in Table 2 on the following page, and are also contained in the Chemtech Environmental Limited Analytical Report no. 55878, a copy of which is attached.

RE: Land at Station Road, Meltham (Cont'd)

4.0 Laboratory Testing (Cont'd)

4.1 Determination of pH & SO_4 (Cont'd):-

Table 2

Position	Depth (m)	pH	SO_4(mg/l)	Design SO_4 Class	ACEC Class
TP1	1.00	8.2	228	DS-1	AC-1
TP2	0.30	8.4	51	DS-1	AC-1
TP4	0.80	6.6	28	DS-1	AC-1
TP6	0.60	8.2	51	DS-1	AC-1

ACEC = Aggressive Chemical Environment for Concrete site classification, SS = Surface sample taken from demolition rubble mound

From these results it can be seen that the pH values for the samples tested range from 6.6 up to 8.2 and the amount of soluble sulphate present falls within the negligible range (i.e. <500mg/l). Therefore, in accordance with BRE Special Digest 1: 2005 (3rd Edition), the site can be given a classification of Class DS-1. When considering the nature of the materials tested and assuming mobile groundwater the assessment of the Aggressive Chemical Environment for Concrete (ACEC) for the site overall, is AC-1

4.2 Contamination Screening:-

Representative samples of the made ground were passed onto Chemtech Environmental of Stanley, Co. Durham, so that soil contamination screening could be carried out. The results of all the testing can be found in the Chemtech Environmental Limited Report (Ref No. 55878), a copy of which is attached.

In total 4 no. samples were screened using a standard generic contamination suite (based on the current CLEA SGV listed analytes with historical additions), which is used to assess typical made ground (disturbed natural strata mixed with anthropogenic debris), of an unknown source. These results can be used to help with a preliminary assessment for off-site disposal classification.

Although no significant evidence of any fuel /oil type contamination was noted within the exploratory positions carried out, fragments of ash were noted within the made ground. Therefore, for completeness representative samples were targeted for Speciated PAH (Polycyclic Aromatic Hydrocarbons) and Speciated TPH (Total Petroleum Hydrocarbons). In addition, representative samples were also screened for Asbestos fibres.

To ascertain the nature and degree of potential contamination, each sample was screened for the following range of contaminants;

- Generic Soil Suite, comprising: Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, pH, Soluble Sulphate, free Cyanide, and Total Organic Carbon (TOC))
- Speciated Polycyclic Aromatic Hydrocarbons (PAH's - USEPA 16)
- Speciated TPH – Split into C5 – C7, C7 – C8, C8 – C10, C10 – C12, C12 – C16, C16 – C21, C21 – C35 & C35 – C44 Carbon Bands.
- Asbestos fibres.

The results have been compared against current published Generic Assessment Criteria Values (GAC's – S4UL's & C4SL's), and where these values are not available against the published CIEM (Chartered Institute of Environmental Health)/LQM Generic Assessment Criteria (GAC), CL:AIRE and Atkins ATRISKsoil© SSV values to allow an assessment of the level of risk to be made.

4.0 Laboratory Testing (Cont'd):-

4.2 Contamination Screening (Cont'd):-

The results of the analysis undertaken are summarised within Tables 3, 4 & 5 below and continued on the following pages and have identified the following.

Table 3

Bold = Elevated result

Generic determinands including asbestos	Critical Conc. (C_C) mg/kg	No. of samples screened	Max. conc. (C_M) recorded mg/kg	Has C_M exceeded C_T	No of Samples >C_T
Arsenic	**37(1)**	**4**	**76**	**YES**	**4**
Cadmium	11(1)	4	0.6	NO	0
Chromium (III)	910(1)	4	219	NO	0
Chromium (VI)	6(1)	4	<1*	NO	0
Copper	2400(1)	4	174	NO	0
Lead	**200(2)**	**4**	**766**	**YES**	**3**
Mercury	40(1)	4	4.1	NO	0
Nickel	180(1)	4	39	NO	0
Selenium	250(1)	4	2.0	NO	0
Zinc	3700(1)	4	328	NO	0
Cyanide	34(3)	4	<2	NO	0
Asbestos	N/A	4	NAD	NO	0

(1) = LQM/CIEH S4UL's – Residential with home grown produce, (2) = CL:AIRE C4SLs – Residential with home grown produce, (3) = Atkins ATRISK SSV Residential with the consumption of home-grown produce (Mar 2011). * = Site Value (C_M) less than analytical detection limit. NAD = No Asbestos Detected.

Table 4

Bold = Elevated result

PAH determinands	Critical Conc. (C_C) mg/kg	No. of samples screened	Max. conc. (C_M) recorded mg/kg	Has C_M exceeded C_T	No of Samples >C_T
Acenaphthene	1100(1)	4	1.01	NO	0
Acenaphthylene	920(1)	4	1.31	NO	0
Anthracene	11000(1)	4	3.70	NO	0
Benzo(a)anthracene	13(1)	4	6.18	NO	0
Benzo(a)pyrene	**3.0(1)**	**4**	**5.82**	**YES**	**3**
Benzo(b)fluoranthene	**3.7(1)**	**4**	**6.10**	**YES**	**2**
Benzo(ghi)perylene	350(1)	4	3.15	NO	0
Benzo(k)fluoranthene	100(1)	4	2.68	NO	0
Chrysene	27(1)	4	4.82	NO	0
Dibenz(ah)anthracene	**0.3(1)**	**4**	**1.02**	**YES**	**3**
Fluoranthene	890(1)	4	14.30	NO	0
Fluorene	860(1)	4	2.55	NO	0
Indeno(123cd)pyrene	41(1)	4	4.18	NO	0
Naphthalene	13(1)	4	1.64	NO	0
Phenanthrene	440(1)	4	13.08	NO	0
Pyrene	2000(1)	4	10.78	NO	0

(1) = LQM/CIEH S4UL's – Residential with home grown produce (6.0% SOM).

RE: Land at Station Road, Meltham (Cont'd)

4.0 Laboratory Testing (Cont'd):-

4.2 Contamination Screening (Cont'd):-

Table 5

TPH determinands	Critical Conc. (C_C) mg/kg	No. of samples screened	Max. conc. (C_M) recorded mg/kg	Has C_M exceeded C_T	No of Samples >C_T
TPH C5-C7	160(1)*	4	<0.1*	NO	0
TPH C7-C8	530(1)*	4	<0.1*	NO	0
TPH C8-C10	150(1)*	4	<0.1*	NO	0
TPH C10-C12	380(1)*	4	3	NO	0
TPH C12-C16	660(1)*	4	18	NO	0
TPH C16-C21	930(1)*	4	54	NO	0
TPH C21-C35	1700(1)*	4	152	NO	0
TPH C35 – C44	1700(1)*	4	27	NO	0

(1) = LQM/CIEH S4UL's – Residential with home grown produce (6.0% SOM). * = Most sensitive Aliphatic/Aromatic Fraction taken. ** = Site Value (C_M) less than analytical detection limit.

- The maximum concentration (C_M) values for Arsenic, Lead, Benzo(a)pyrene, Benzo(b)fluoranthene & Dibenz(ah)anthracene exceed the Critical Concentration (C_C) values for this site.
- When considering these results, the made ground below the site represents a potential risk to the proposed end users and therefore, either treatment, removal, protection measures and / or further detailed quantitative risk assessment will be required.

5.0 Foundation Options:-

With regards to new foundations, it can be seen that in and around the area of the proposed development made ground was recorded to depths of between c.0.40m to c.1.60m below ground levels before limited natural drift and bedrock deposits were encountered. Therefore, it is felt that conventional strip or pad foundations (utilising mass trench fill where necessary) should be acceptable for the proposed development, with foundations based wholly within the natural sandstone deposits at a minimum depth of c.0.60m below finished ground levels, where a maximum allowable bearing pressure of c.150kN/m^2 is available. This will necessitate foundation depths of between c.0.60m up to c.1.60m below current ground levels.

6.0 Conclusions:-

From the results of the contamination screening carried out, it can be seen that slightly elevated levels of Arsenic, Lead and several PAH's have been recorded in the made ground that represent a potential risk to future end users, where exposure pathways are available. As a result it is recommended that treatment, removal, protection measures and / or further detailed quantitative risk assessment is required.

When considering the elevated levels of contamination recorded, where buildings and areas of hardstanding are proposed then the *source-pathway-receptor* model will not exist and there is not considered to be a health risk to the future end users. However, in areas of soft landscaping there is the potential for dermal contact, plant uptake and inhalation of dust/fibres.

Taking into account the nature of the proposed development and ground conditions recorded, it is felt that the most suitable remedial option available is the installation of a clean cover system within all areas of soft landscaping, with an estimated minimum 600mm thick cover envisaged at this stage.

RE: Land at Station Road, Meltham (Cont'd)

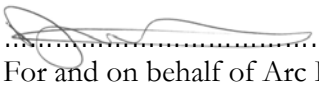
6.0 Conclusions (Cont'd):-

Where remedial works are completed across the site, confirmatory validation testing and photographic evidence of the chosen remediation strategy would be required by the Local Authorities. In addition, if made ground materials are to be removed off-site, a supplementary site visit by a suitably qualified Geo-environmental Engineer should be undertaken to confirm the removal of these materials, combined with appropriate off-site disposal consignment notes, etc. Where buildings and hardcover is present (i.e. footpaths, driveways, access roads) there will be no requirement to incorporate clean cover materials.

Prior to any remedial works being undertaken, a remediation strategy may need to be prepared, this should be agreed with the LA, and once implemented, the remediation work should be validated by a suitably qualified Geo-environmental Engineer to ensure that all works are being completed in strict accordance with the agreed Remediation Strategy.

We trust the attached information is to your satisfaction. If you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely,



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For and on behalf of Arc Environmental Ltd
Darren McGrath MIEnvSc FGS MNEIMME Tech IOSH
Associate Director

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Site Location Plan
Existing Site Layoput Plan
Proposed Development Layout Plan

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Client:

ABACUS STONE SALES

Project Title:	Drawing Title:
Land at Station Road Meltham Huddersfield	Location Plan

rev.	date	amendments	drawn	chckd

Job Reference:	Drawing Number:	Revision:
15–154	–	–

Drawn by:	Date:	Scale at A4:
P.D	15.07.15	As Shown

Checked by:	Approved by:	
A.M	A.M	The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing. © Copyright Reserved

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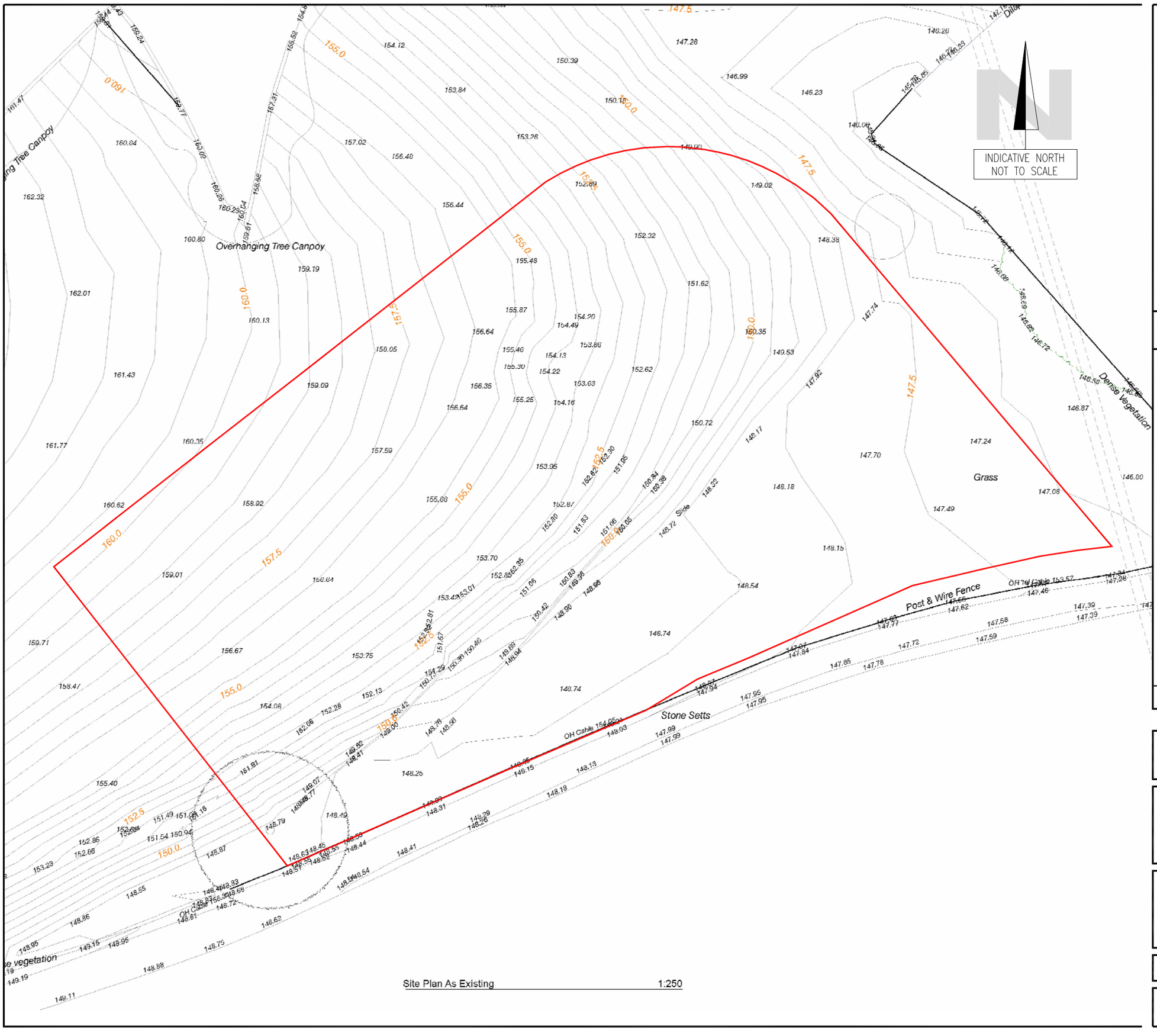

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LEGEND

	APPROXIMATE SITE BOUNDARY

rev.	date	amendments	drawn	chckd

Client:
ABACUS STONE SALES

Project Title:
Land at Station Road
Meltham
Huddersfield

Drawing Title:
Existing Site Layout Plan

Scale at A3:	Date:	Drawn by:	Approved by:
NTS @ A3	15.07.15	P.D	A.M

Job Ref:	Drg no:	Rev:
15-154	–	–



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LEGEND

	APPROXIMATE SITE BOUNDARY

rev.	date	amendments	drawn	chckd

Client:
ABACUS STONE SALES

Project Title:
Land at Station Road
Meltham
Huddersfield

Drawing Title:
Proposed Development Layout Plan

Scale at A3:	Date:	Drawn by:	Approved by:
NTS @ A3	15.07.15	P.D	A.M

Job Ref:	Drg no:	Rev:
15–154	–	–

Exploratory Hole Location Plan
Trial Pit Record Sheets

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LEGEND	
	APPROXIMATE SITE BOUNDARY
	MECHANICALLY EXCAVATED TRIAL PIT POSITION
	SOAKAWAY TEST POSITION

rev.	date	amendments	drawn	chckd

Client:
ABACUS STONE SALES

Project Title:
Land at Station Road
Meltham
Huddersfield

Drawing Title:
Exploratory Hole Location Plan

Scale at A3:	Date:	Drawn by:	Approved by:
NTS @ A3	15.07.15	P.D	A.M

Job Ref:	Drg no:	Rev:
15–154	–	–

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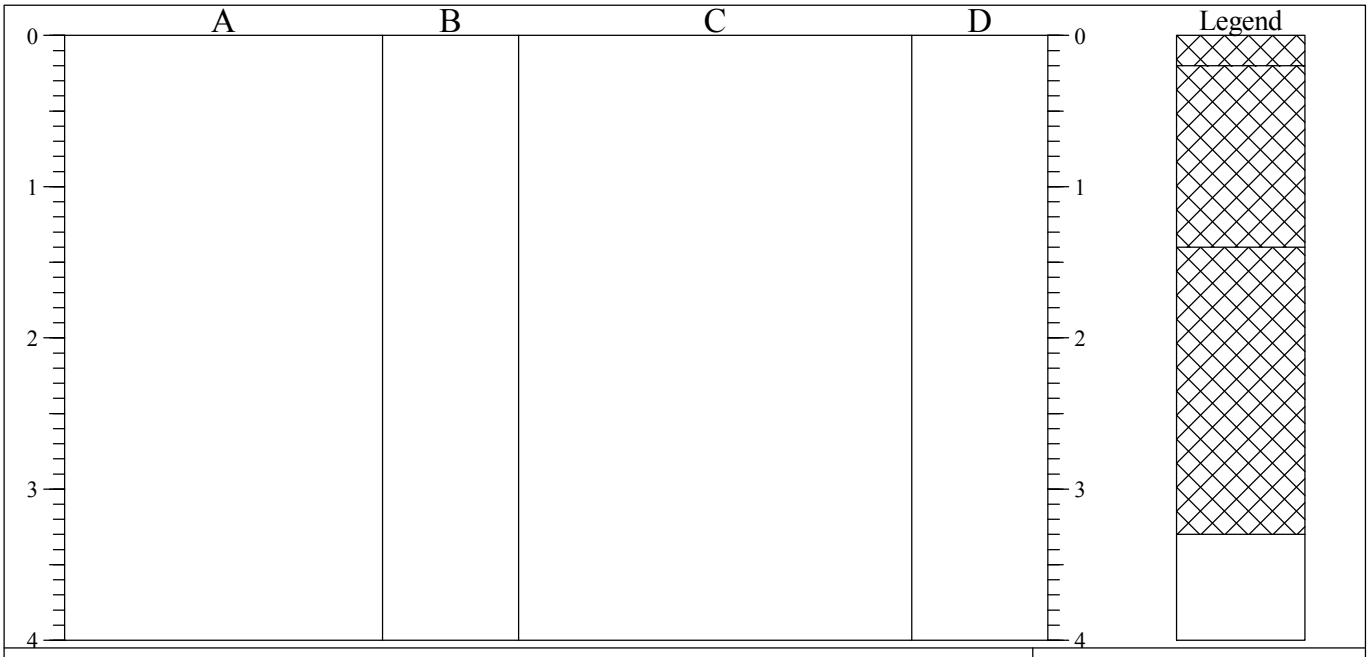
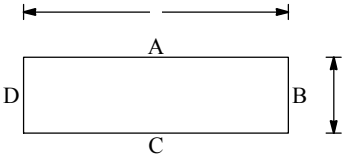
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**TP1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying black slightly sandy slightly clayey soil with brick fragments, glass and pottery (MADE GROUND).	0.10	J/D	
0.20-1.40		Black clayey sand with brick fragments, glass, pottery, ash and sandstone cobbles (MADE GROUND).	1.00	J/D	
1.40-3.30		Dark brown very clayey gravelly sand with clay bands and sandstone cobbles (MADE GROUND).	2.00	B	
3.30		Trial pit terminated at c.3.30m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Water at c.3.00m bgl.

All dimensions in metres Scale 1:50	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 13/8/15

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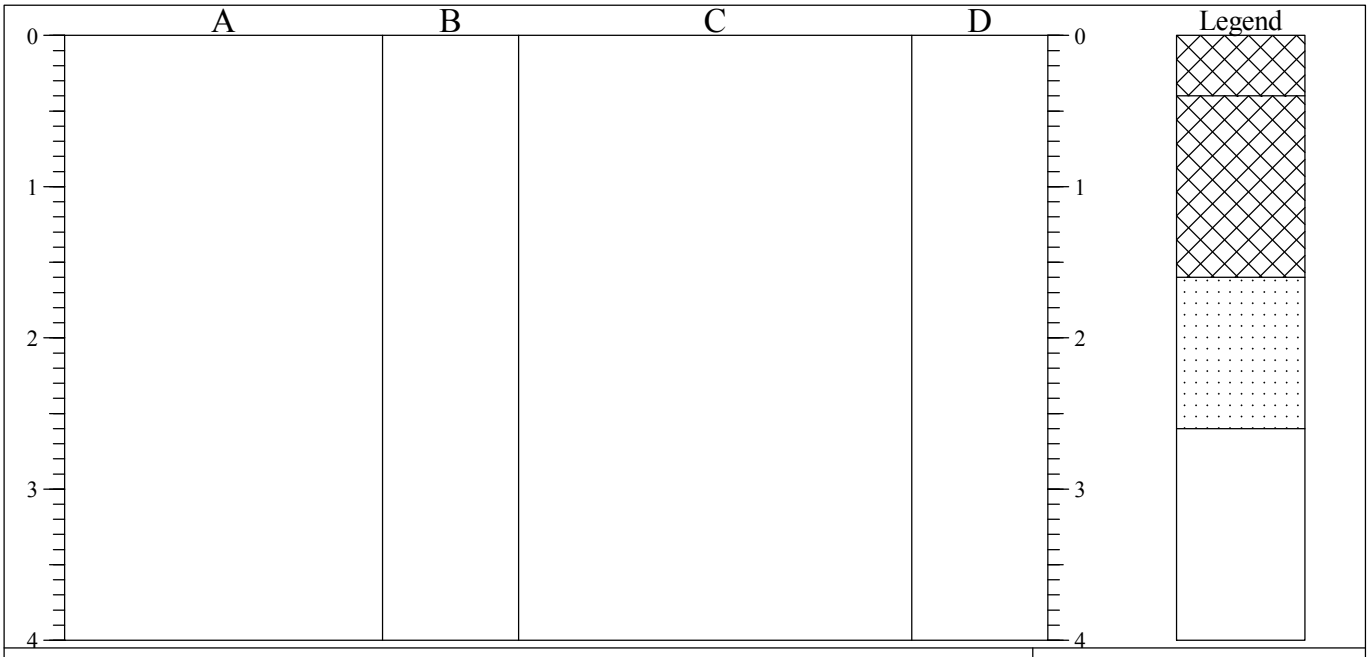
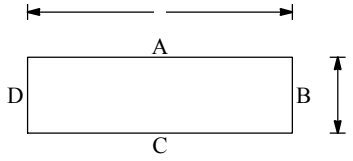
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**TP2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Grass overlying dark brownish black sandy clayey soil with glass bottles pottery and tin (MADE GROUND).	0.30	J/D	
0.40-1.60		Dark brown soft very sandy clay with many glass bottles, pottery and metal (MADE GROUND).	1.00	J/D	
1.60-2.60		Brown SANDSTONE. Recovered as very clayey sand with many sandstone cobbles.	2.00	B	
2.60		Trial pit terminated at c.2.60m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

All dimensions in metres Scale 1:50	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 13/8/15

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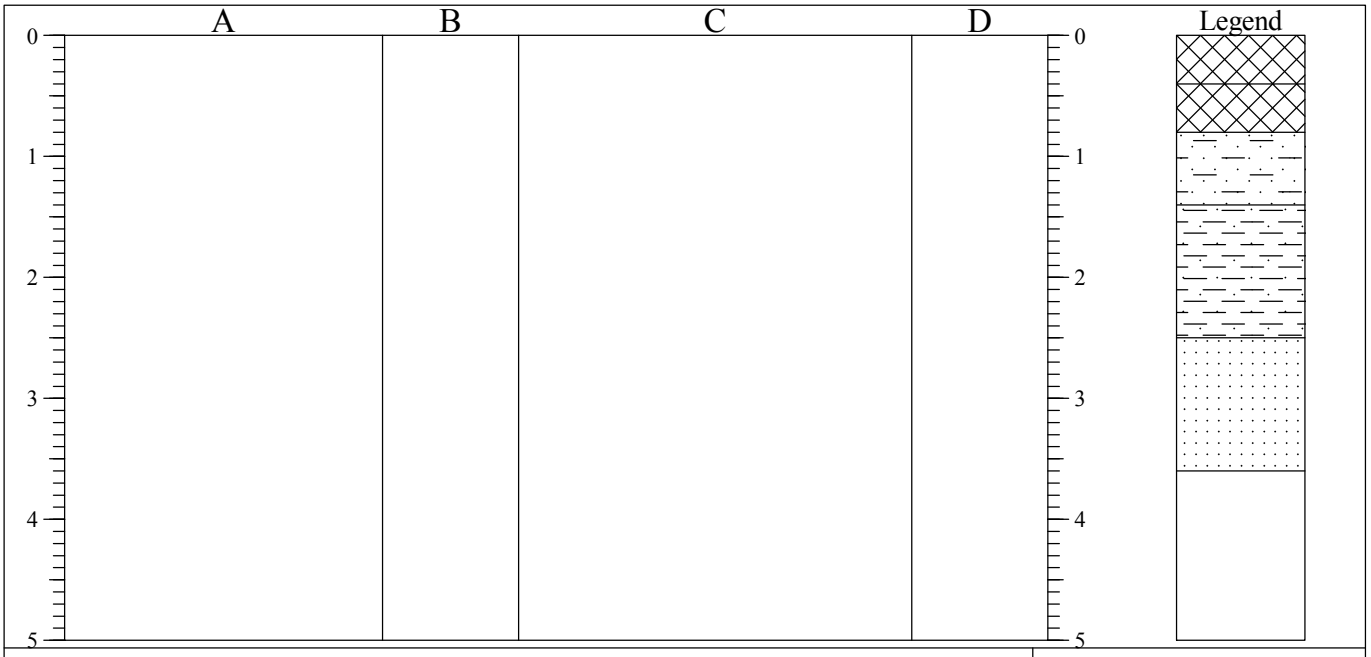
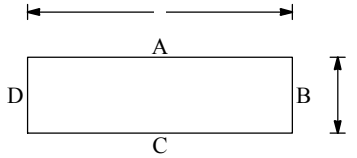
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**TP3**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Grass overlying dark brown sandy clayey soil with brick fragments, glass bottles and sandstone cobbles (MADE GROUND).	0.20	J/D	
0.40-0.80		Dark brown soft very sandy slightly silty clay (MADE GROUND).			
0.80-1.40		Greyish brown very clayey fine SAND.	1.20	B	
1.40-2.50		Soft (low strength) greyish brown very sandy CLAY.	1.90 2.00	B V	 26kN/m^2
2.50-3.60		Light brownish yellow SANDSTONE. Recovered as clayey sand with many sandstone cobbles.	2.70	B	
3.60		Trial pit terminated at c.2.50m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

All dimensions in metres Scale 1:62.5	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 13/8/15

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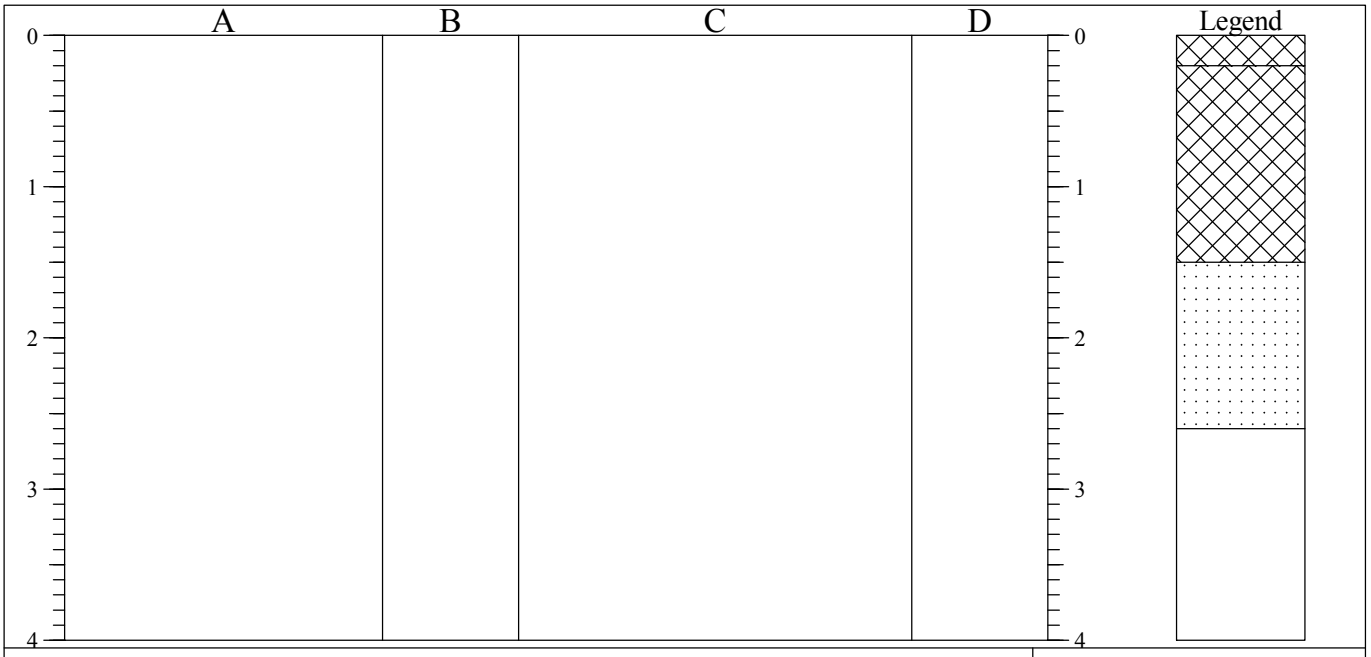
Telephone: 01913786380

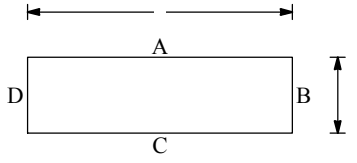
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**TP4**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying black sandy gravelly soil with pottery and glass (MADE GROUND).			
0.20-1.50		Yellowish brown and red sandy gravelly silty clay with ash, slag and metal. Slight hydrocarbon odour. (MADE GROUND).	0.20	J/D	
			0.80	B	
1.30		Sandstone cobbles from c.1.30m.			
1.50-2.60		Light brownish yellow SANDSTONE. Recovered as clayey sand with many sandstone cobbles.	1.70	B	
2.60		Trial pit terminated at c.2.60m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

All dimensions in metres Scale 1:50	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 13/8/15

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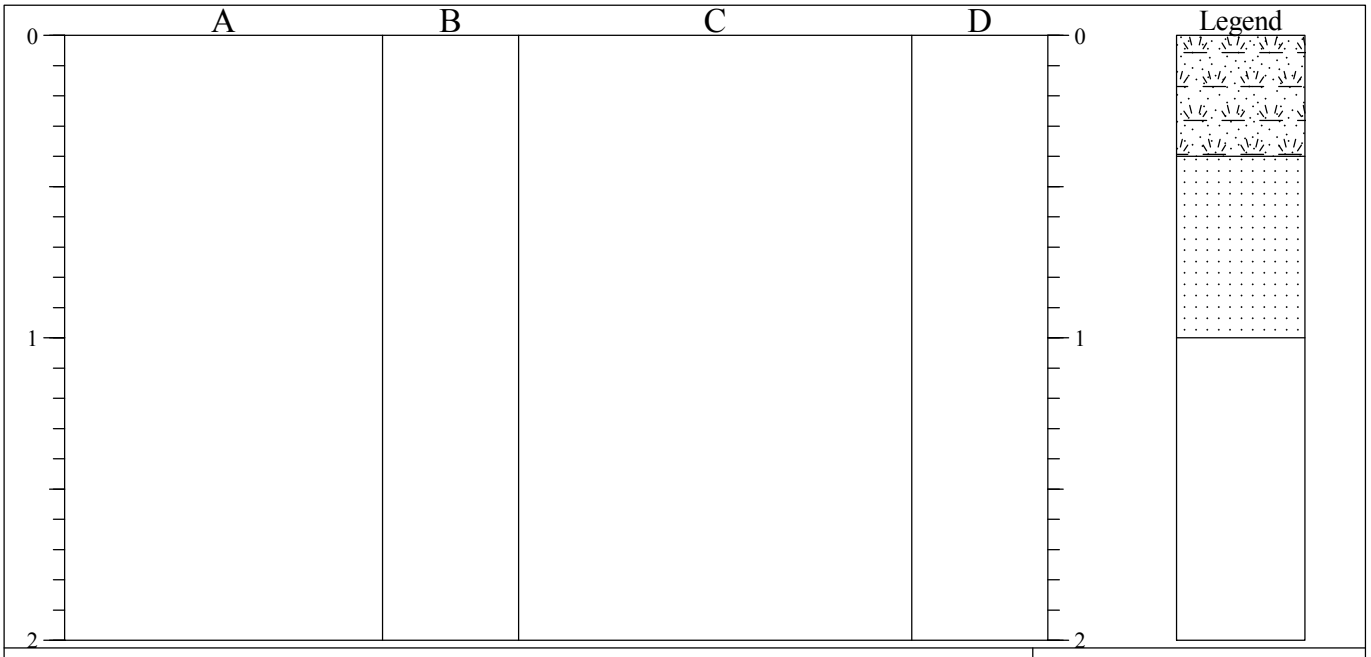
Durham, DH7 8PN
Telephone: 01913786380

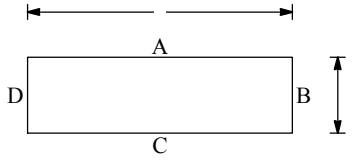
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**TP5**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Grass overlying brown slightly clayey slightly sandy SOIL.	0.10	J/D	
0.40-1.00		Light orangish brown SANDSTONE. Recovered as slightly clayey sand with many sandstone cobbles.			
1.00		Trial pit terminated at c.1.00m.	1.00	B	

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

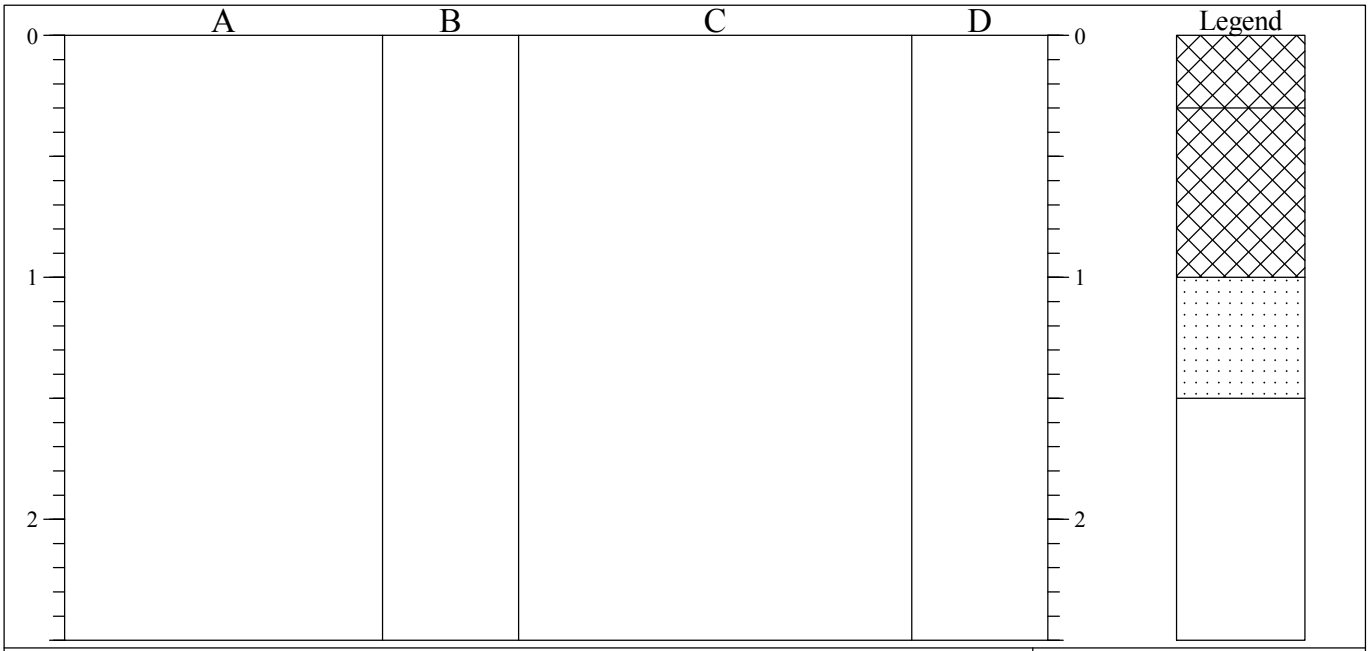
All dimensions in metres Scale 1:25	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 13/8/15

Solum House, Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham, DH7 8PN
Telephone: 01913786380

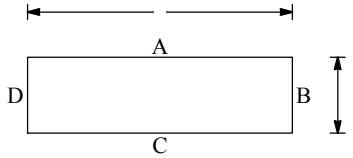
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**TP6**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass overlying dark brownish black slightly sandy slightly clayey soil with brick fragments, glass bottles and pottery (MADE GROUND).	0.20	J/D	
0.30-1.00		Black sandy clay with brick fragments, ash, glass and pottery (MADE GROUND).	0.60	J/D	
1.00-1.50		Brown SANDSTONE. Recovered as very clayey sand with many sandstone cobbles.	1.30	B	
1.50		Trial pit terminated at c.1.50m due to obstruction.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

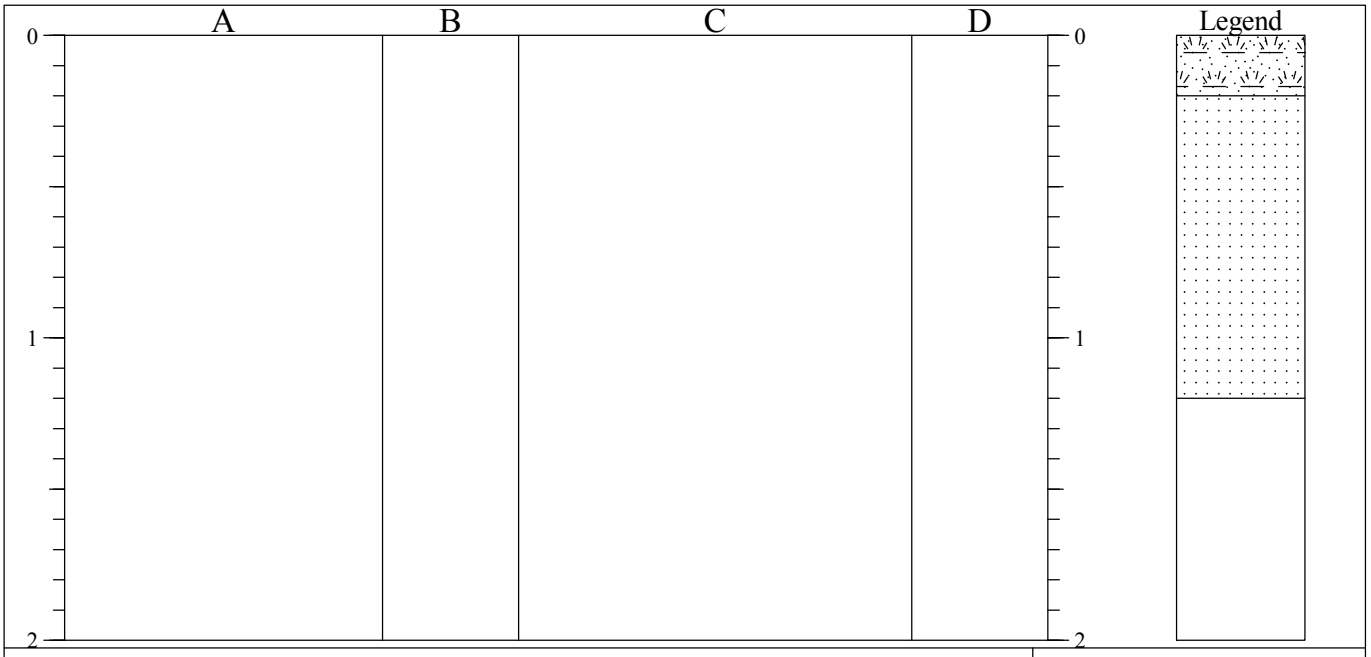
All dimensions in metres Scale 1:31.25	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 13/8/15

Solum House, Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham, DH7 8PN
Telephone: 01913786380

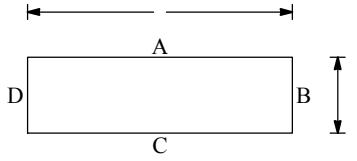
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				**S1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying dark brown sandy SOIL.			
0.20-1.20		Light brown SANDSTONE. Recovered as clayey sand with many sandstone cobbles.	0.20	J/D	
			0.80	B	
1.20		Trial pit terminated at c.1.20m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

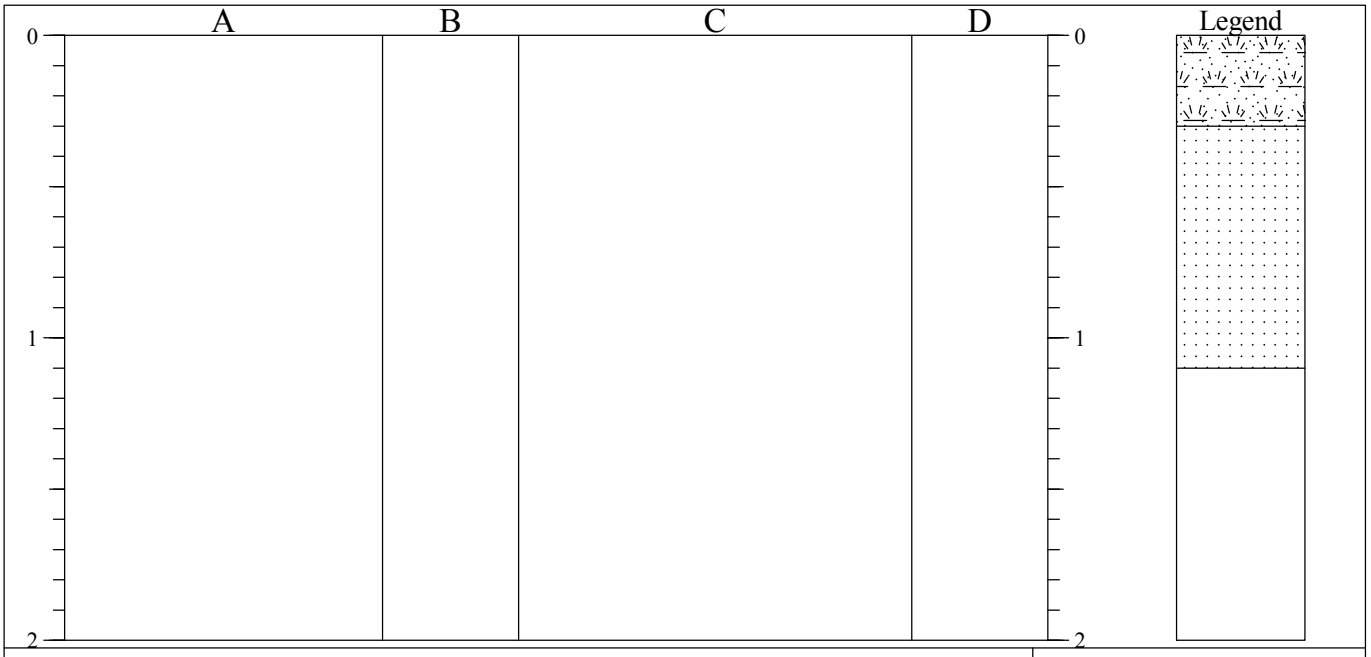
All dimensions in metres Scale 1:25	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 15/7/15

Solum House, Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham, DH7 8PN
Telephone: 01913786380

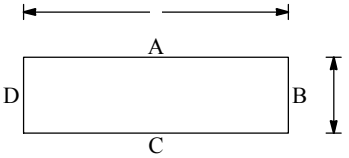
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				S2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass overlying dark brown sandy SOIL with sandstone cobbles.			
0.30-1.10		Light orangish brown SANDSTONE. Recovered as slightly clayey sand with many sandstone cobbles.	0.30	J/D	
			0.90	B	
1.10		Trial pit terminated at c.1.10m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

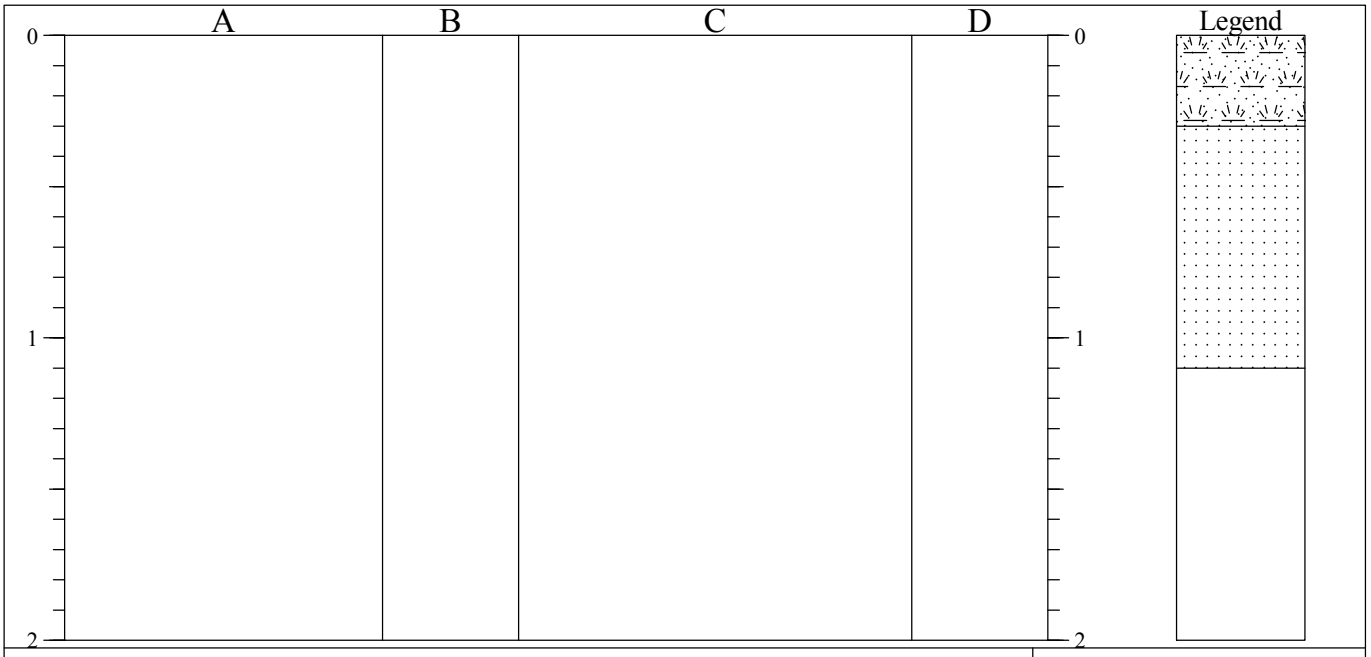
All dimensions in metres Scale 1:25	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 15/7/15

Solum House, Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham, DH7 8PN
Telephone: 01913786380

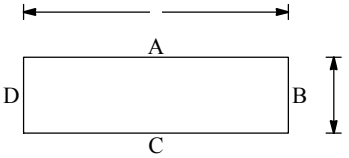
TRIAL PIT LOG

Project				TRIAL PIT No
Land at Station Road, Meltham				S3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
15-154	17-06-15			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass overlying dark brownish black sandy SOIL with occasional roots.	0.20	J/D	
0.30-1.10		Reddish orange SANDSTONE. Recovered as clayey sand with many sandstone cobbles with occasional clay pockets.	0.80	B	
1.10		Trial pit terminated at c.1.10m.			

Shoring/Support:
Stability:





GENERAL REMARKS

WATER: Trial pit remained DRY during the exploratory period.

All dimensions in metres Scale 1:25	Client One 17	Method/ Plant Used JCB 3CX	Logged By SD

AGS3 UK TP 15-154 LOGS.GPJ AGS3_ALL.GDT 15/7/15

Laboratory Results

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Registered in England No. 05539784

2531

ANALYTICAL TEST REPORT

Contract no: 55878

Contract name: Land at Station Road, Meltham

Client reference: 15-154

Clients name: ARC Environmental

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

Samples received: 25 June 2015

Analysis started: 27 July 2015

Analysis completed 30 July 2015

Report issued: 13 August 2015

This is a supplementary report to report number 55878 issued 31 July 2015.

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, withour 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:

Karan Campbell	John Campbell	Dave Bowerbank
Director	Director	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
55878-1	TP 1	1.00	Sand with Gravel & Roots	-	-	21.5
55878-2	TP 2	0.30	Sand with Gravel	-	-	18.8
55878-3	TP 4	0.80	Loamy Sand with Gravel	-	-	21.2
55878-4	TP 6	0.60	Sand with Gravel	-	-	26.4

Chemtech Environmental Limited

SOILS

Lab number			55878-1	55878-2	55878-3	55878-4
Sample id			TP 1	TP 2	TP 4	TP 6
Depth (m)			1.00	0.30	0.80	0.60
Date sampled			17/06/2015	17/06/2015	17/06/2015	17/06/2015
Test	**Method**	**Units**				
Arsenic (total)	CE127 M	mg/kg As	46	57	44	76
Cadmium (total)	CE127 M	mg/kg Cd	0.5	0.6	0.4	0.3
Chromium (total)	CE127 M	mg/kg Cr	89	112	219	93
Chromium (III)	-	mg/kg CrIII	89	112	219	93
Chromium (VI)	CE050	mg/kg CrVI	<1	<1	<1	<1
Copper (total)	CE127 M	mg/kg Cu	174	131	145	163
Lead (total)	CE127 M	mg/kg Pb	67	766	246	757
Mercury (total)	CE127 M	mg/kg Hg	0.9	0.5	<0.5	4.1
Nickel (total)	CE127 M	mg/kg Ni	38	55	37	39
Selenium (total)	CE127 M	mg/kg Se	1.8	2.0	1.9	1.9
Zinc (total)	CE127 M	mg/kg Zn	328	139	157	294
pH	CE004 M	units	8.2	8.4	6.6	8.2
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	228	51	28	51
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1
Total Organic Carbon (TOC)	CE072 M	% w/w C	13.40	11.23	7.89	14.65
PAH						
Acenaphthene	CE087 M	mg/kg	1.01	0.55	0.53	0.15
Acenaphthylene	CE087 M	mg/kg	0.09	1.31	0.06	0.04
Anthracene	CE087 U	mg/kg	2.05	3.70	1.12	0.36
Benzo(a)anthracene	CE087 U	mg/kg	5.99	6.18	3.56	0.99
Benzo(a)pyrene	CE087 U	mg/kg	5.82	4.54	3.38	0.94
Benzo(b)fluoranthene	CE087 M	mg/kg	6.10	4.88	3.69	1.14
Benzo(ghi)perylene	CE087 M	mg/kg	3.15	1.98	1.74	0.58
Benzo(k)fluoranthene	CE087 M	mg/kg	2.68	2.32	1.64	0.43
Chrysene	CE087 M	mg/kg	4.82	4.73	3.26	0.89
Dibenz(ah)anthracene	CE087 M	mg/kg	1.02	0.76	0.62	0.17
Fluoranthene	CE087 M	mg/kg	10.61	14.30	6.57	2.15
Fluorene	CE087 U	mg/kg	0.63	2.55	0.41	0.12
Indeno(123cd)pyrene	CE087 M	mg/kg	4.18	2.91	2.35	0.70
Naphthalene	CE087 M	mg/kg	0.95	1.51	1.64	0.30
Phenanthrene	CE087 M	mg/kg	6.30	13.08	4.81	1.49
Pyrene	CE087 M	mg/kg	9.37	10.78	5.85	1.81
PAH (total of USEPA 16)	CE087	mg/kg	64.8	76.1	41.2	12.3
Benzo(j)fluoranthene	CE087	mg/kg	1.89	1.69	1.01	0.19
PAH (total of OIL 8)	CE087	mg/kg	32.5	28.0	19.5	5.45
TPH						
TPH (C5-C7)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1
TPH (C7-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1
TPH (C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1
TPH (C10-C12)	CE033	mg/kg	3	2	3	3
TPH (C12-C16)	CE033	mg/kg	10	18	16	10

Chemtech Environmental Limited

SOILS

Lab number			55878-1	55878-2	55878-3	55878-4
Sample id			TP 1	TP 2	TP 4	TP 6
Depth (m)			1.00	0.30	0.80	0.60
Date sampled			17/06/2015	17/06/2015	17/06/2015	17/06/2015
Test	**Method**	**Units**				
TPH (C16-C21)	CE033	mg/kg	32	53	54	20
TPH (C21-C35)	CE033	mg/kg	136	152	138	69
TPH (C35-C44)	CE033	mg/kg	27	26	18	9
Subcontracted analysis						
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD

Chemtech Environmental Limited

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
CE050	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		2	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
CE067	TPH (C5-C10) speciation	Headspace GC-FID	Wet		0.1	mg/kg
CE033	TPH (C10-C40) speciation	Solvent extraction, GC-FID	Wet		1	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-