By Email

Our ref: 20-241.01L

FAO Graham Binnington
Graham Binnington Architects
23a North Bar Within
Beverley
East Yorkshire
HU17 8DB

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

5th October 2020

Dear Graham,

Re: Conversion of Former Agricultural Barns to Residential Dwellings, Bilton Kennels, 138 Main Road, Bilton, HU11 4AA.

Following completion of the ground investigation works at the above site, we have the pleasure of providing you with our ground investigation letter report. The following documents are attached with this report:

- Trial Pit Location Plan
- Trial Pit Record Sheets
- Laboratory Testing (Ref. 88548)

1.0 Introduction: -

Following the results of the Phase 1: DTS (Ref. 20-241, dated September 2020), Arc Environmental Ltd (Arc) were commissioned by Graham Binnington Architects on behalf of JM Guthrie 1965 Settlement to undertake a ground Contamination Investigation works at Bilton Kennels, 138 Main Road, Bilton, HU11 4AA. The ground investigation was required to complete a ground contamination risk assessment for the proposed conversion of Agricultural barns to 7 no. residential dwellings and demolition of a Dutch barn.

The intrusive investigation works undertaken by Arc Environmental Limited comprised of 12 no. manually excavated trial pits labelled as TP01 – TP12. The positions within the investigation area can be seen on the Trial pit Location Plan, a copy of which is attached. This plan should be used for orientating purposes only, as the positions shown are approximate and the plan is not to a standard scale.

2.0 Investigation Rationale: -

The ground investigation works were designed to provide information on the general ground and groundwater conditions within the boundaries of the site to aid with the general contamination assessment.

3.0 Ground Conditions: -

For an accurate description of the ground conditions encountered, 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 below.

Table 1

Type of strata	Depths recorded	Description
MADE GROUND:	From c.0.00 generally up to c.0.70m and >c.0.80m bgl	Generally comprised of dark brown / brown gravelly clayey sand / gravelly sandy clay with bricks, ash, with grass overlying the initial made ground materials in TP01-TP03, TP05-TP09 and TP12. There was no visual and / or olfactory evidence of significant ground contamination (such as fuel-derived contaminants, etc.) present at any of the exploratory positions undertaken across the site. However, asbestos containing materials and burnt materials were recorded to be present on site.
DRIFT DEPOSITS: (Glacial Till Deposits)	From c.0.70m bgl	Glacial Till deposit in the form of brown sandy gravelly slightly gravelly CLAY was encountered in TP09 only.

4.0 Groundwater: -

There was no water ingress recorded within the trial pits during the investigation period. However, pockets of trapped surface water may be present within the made ground and at a greater depth. Therefore, it would be prudent to allow for the introduction of temporary groundwater control techniques, in order to deal with any ingresses of groundwater, during the construction works, especially during the wetter periods of the year.

5.0 Laboratory Testing: -

5.1 Ground Contamination Assessment: -

The testing results can be found in the Chemtech Environmental Ltd. Analytical Report (Ref. 88548), a copy of which can be seen attached.

The results have been assessed against the most up to date and appropriate guidelines for a change in end use to Residential with Home Grown Produce.

Representative 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.

5.0 Laboratory Testing (Cont'd): -

5.1 Ground Contamination Assessment (Cont'd): -

There was no significant evidence of any fuel / oil type contamination, etc. However, for completeness, representative samples were tested for Speciated PAH (Polycyclic Aromatic Hydrocarbon), Speciated TPH (Total Petroleum Hydrocarbons) & Asbestos. The testing was carried out as follows:

- 7 no. soil samples screened for a generic (metals and non-organics) soil suite which includes the following determinants: Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide and Total Organic Carbon (TOC).
- 7 no. soil samples screened for Speciated Polycyclic Aromatic Hydrocarbons (PAH's) – based on the current USEPA 16 PAH's.
- 7 no. soil samples screened for Speciated Total Petroleum Hydrocarbons (Aliphatic / Aromatic).
- 7 no. soil samples screened for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).
- 7 no. samples screened for the presence of Asbestos.

Table 2

Bold = Elevated result

Analyte	Critical Concentration (C_C) mg/kg	No. of Samples Screened	Maximum Concentrations (C_M)	No. of Samples >Cc
Arsenic	37(1)	7	34	0
Cadmium	11(1)	7	4.7	0
Chromium III	910(1)	7	64	0
Chromium VI	6(1)	7	<1	0
Copper	2400(1)	7	221	0
Lead	200(2)	7	**353**	**2**(TP01 &TP07)
Mercury	40(1)	7	<0.5	0
Nickel	130(1)	7	51	0
Selenium	250(1)	7	7.2	0
Zinc	3700(1)	7	182	0
Cyanide	34(3)	7	<1	0
Asbestos	Presence	7	NAD	0
Acenaphthene	1100(1)	7	4.0	0
Acenaphthylene	920(1)	7	1.06	0
Anthracene	110000(1)	7	11.7	0
Benzo(a)anthracene	13(1)	7	**21.92**	**1**(TP11)
Benzo(a)pyrene	3.0(1)	7	**17.2**	**2**(TP10 & TP11)
Benzo(b)fluoranthene	3.7(1)	7	**22.56**	**2**(TP10 & TP11)
Benzo(ghi)perylene	350(1)	7	10.7	0
Benzo(k)fluoranthene	100(1)	7	8.96	0
Chrysene	27(1)	7	20.88	0
Dibenz(ah)anthracene	0.3(1)	7	**2.61**	**2**(TP10 & TP11)
Fluoranthene	890(1)	7	43.55	0
Fluorene	860(1)	7	2.40	0
Indeno(123cd)pyrene	41(1)	7	11.53	0
Naphthalene	13(1)	7	0.59	0

(1) = LQM CIEH Suitable 4 Use Levels (S4UL Nov 2014 (Revised August 2015) – *Residential with home grown produce* – 6.0% SOM. Note = All units are mg/kg.

5.0 Laboratory Testing (Cont'd): -

5.1 Ground Contamination Risk Assessment (Cont'd): -

Table 2 (Cont'd)

Bold = Elevated result

Analyte	Critical Concentration (C_C) mg/kg	No. of Samples Screened	Maximum Concentrations (C_M)	No. of Samples >Cc
Phenanthrene	440(1)	7	36.99	0
Pyrene	2000(1)	7	37.12	0
Benzene	0.37(1)	7	<0.01	0
Toluene	660(1)	7	<0.01	0
Ethylbenzene	5700(1)	7	<0.01	0
m & p-Xylene	310(1)	7	<0.02	0
o-Xylene	330(1)	7	<0.01	0
VPH Aliphatic (>C5-C6)	160(1)	7	<0.1	0
VPH Aliphatic (>C6-C8)	530(1)	7	<0.1	0
VPH Aliphatic (>C8-C10)	150(1)	7	0.3	0
EPH Aliphatic (>C10-C12)	760(1)	7	<4	0
EPH Aliphatic (>C12-C16)	4300(1)	7	25	0
EPH Aliphatic (>C16-C35)	110000(1)	7	1036	0
EPH Aliphatic (>C35-C44)	110000(1)	7	624	0
VPH Aromatic (>EC5-EC7)	300(1)	7	<0.01	0
VPH Aromatic (>EC7-EC8)	660(1)	7	<0.01	0
VPH Aromatic (>EC8-EC10)	190(1)	7	<0.01	0
EPH Aromatic (>EC10-EC12)	380(1)	7	<1	0
EPH Aromatic (>EC12-EC16)	660(1)	7	5	0
EPH Aromatic (>EC16-EC21)	930(1)	7	133	0
EPH Aromatic (>EC21-EC35)	1700(1)	7	107	0
EPH Aromatic (>EC35-EC44)	1700(1)	7	19	0

(1) = LQM CIEH Suitable 4 Use Levels (S4UL Nov 2014 (Revised August 2015) – *Residential with home grown produce* – 6.0% SOM. Note = All units are mg/kg, NAD = No asbestos detected.

The ground contamination screening results have been risk assessed by comparing the maximum values (C_M) recorded for each analyte to the critical concentration (C_C) values chosen for this site.

The findings are summarised as follows:

- The C_M value for Lead exceeds the C_c value for the site.
- The C_M values for some PAHs exceed the C_c values for the site with elevated concentrations of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenz(ah)anthracene being identified.
- No asbestos fibers have been identified.
- Where garden and areas of soft landscaping are proposed, these areas will require remediation due to the levels of Lead and PAH's recorded.

6.0 Revised Conceptual Site Model (CSM): -

From the findings of the Phase 1: Desk Top Study report completed, combined with the results of the intrusive investigation works, a revised Conceptual Site Model (CSM) has been developed for the site, with Table 3 below summarising the various contaminant sources, plausible migration pathways and potentially sensitive receptors identified for the site, assuming no remediation, additional protection measures and/or removal of the sources of contamination takes place.

Table 3

* = Not included in the Human Health & Controlled Waters Risk Assessment

	Sources (S)
S1	Made ground.
S2	Cemented asbestos roofing sheet and fragments requiring hand picking.
S3	Localised contamination associated with burning.

	PATHWAYS (P)
P1	Ingestion & Dermal Contact.
P2	Air – inhalation of vapours (indoor and outdoor) and direct contact with dust.
P3	Consumption of home-grown produce and attached soil.
P4	Migration through existing services.
P5	Direct contact with building materials.
P6	Surface run-off and infiltration.

	RECEPTORS (R)
R1	Human health – Future end users (Residents and workers).
R2	Groundwater – superficial geology underlying the site: secondary undifferentiated Aquifer, solid geology underlying the site: Principal Aquifer.
R3	OS water network recorded within 250m of site boundary.
R4	Adjacent sites.
R5	Building materials & protection of water pipes.
R6	Flora and fauna.

6.1 Sources: -

The site is covered by a layer of made ground which represents a potential source of ground contamination for this site. The majority of the made ground contains some anthropogenic debris and ash, and these materials have been assessed using a standard generic soil suite, with the site considered as a single averaging area for these analytes.

There was no significant visual, olfactory or analytical evidence of significant heavy or gross contamination, such as waste oils, fuels, pesticides etc. However, due to the presence of ash within the made ground and considering previous site usage, the potential for metals and hydrocarbon-based contamination (PAH's & TPH's) for this site have been assessed. In addition, there was cemented asbestos sheet recorded on site associated with previous development and therefore the asbestos screening on the soil was also assessed.

6.2 Pathways: -

When considering the proposed end use, and without considering treatment, removal or protection measures, there are some potential plausible pathways available for direct contact, dermal contact, ingestion,

6.0 Revised Conceptual Site Model (CSM) (Cont'd): -

6.2 Pathways (Cont'd): -

inhalation, wind (dust / particulate), volatilization, and vertical and lateral transportation below the site.

Within the CLEA Risk Assessment Model for Human Health, there are 3 exposure mediums considered for onsite receptors, comprising ingestion of soil containing contaminants, inhalation of contaminated dust/vapours and dermal contact, with up to 10 no. exposure pathways considered, as shown below.

- *1. Ingestion of soil and indoor dust 2. Consumption of homegrown produce and attached soil 3. Dermal contact (indoor) 4. Dermal contact (outdoor) 5. Inhalation of dust (indoor) 6. Inhalation of dust (outdoor) 7. Inhalation of vapour (indoor) 8. Inhalation of vapour (outdoor) 9. Oral background intake 10. Inhalation background intake*

Where the future site has hard cover and below new structures, the majority of these pathways will not be available.

When considering the potential pathways for leachate migration, where either hard cover and / or future surface water drainage systems are present, the potential effects of surface infiltration or contaminated surface water runoff will be greatly reduced.

Similarly, when considering the construction work force, exposure pathways through direct contact, ingestion and dust inhalation will be available during part of the construction process, and therefore adequate PPE should be provided to protect the work force during this period.

6.3 Receptors: -

Within the CLEA Risk Assessment Model for Human Health, the potential receptors are assessed initially on site end use, followed by a delineation of age category (i.e. child or adult), with default settings for *Residential, Allotment* and *Public Open Space (Park)* end uses based on a child aged 0 to 6 years, *Public Open Space (Residential)* based on a child aged 3 to 9 and *Commercial* end uses based upon a working exposure period of up to 49 years (i.e. 16 to 65).

Key generic assumptions for *Residential* and *Public Open Space (Residential)* are based upon a typical residential property, consisting of a two-storey small terraced house, with private garden, and a *Commercial* end use based upon a typical commercial or light industrial property, consisting of a three-storey office building (pre-1970). No buildings are anticipated for *Allotment* or *Public Open Space (Park)* end uses.

6.0 Revised Conceptual Site Model (CSM) (Cont'd): -

6.3 Receptors (Cont'd): -

Within the CLEA Risk Assessment Model for Human Health there are 6 no. generic end use categories presently in use, as follows;

1) Residential - with home grown produce, 2) Residential - without home grown produce, 3) Allotments, 4) Commercial 5) Public Open Space – Residential, 6) Public Open Space – Park.

When considering the proposed end use of this site comprising residential dwellings, the Level 1 Risk Assessment has taken the best-fit end use category as:

1) Residential - with home grown produce.

For Controlled Waters, the primary receptor for this Level 1 Risk Assessment is groundwater at depth within the drift and solid geology (Secondary undifferentiated and Principle Aquifer respectively).

Elevated soils results have been identified and hence the made ground below the site represents a potential risk to the proposed end users due to the levels of PAH's & Lead. In order to negate the potential risk either treatment, removal, protection measures and / or further risk assessment will be required.

7.0 Conclusion & Recommendations: -

7.1 Ground Conditions: -

From the information gained during these intrusive ground investigation works, made ground was missed recorded to depths of at least c.0.70m to c.0.80m below current ground level, generally comprising dark brown/brown gravelly clayey sand or sandy clay with ash, bricks, and Limestone.

Underlying natural drift deposits was encountered within TP09, comprising of brown sandy slightly gravelly clay recorded at a depth of c.0.70m bcgl

7.2 Ground Contamination: -

From the results of the contamination screening carried out, elevated levels of PAH's (TP10 &TP11) & Lead (TP07) were recorded that represent a potential risk to future end users, where exposure pathways are available. As a result, it is recommended that either removal or protection measures and / or further detailed quantitative risk assessment will be required. Asbestos was not detected within the samples tested, however cemented asbestos fragments were recorded to be present on site and its recommended that any asbestos containing material should be handpicked / removed by specialist asbestos removal contractors. When considering the elevated levels of contamination recorded and ground conditions noted, where buildings and areas of hardstanding are proposed, then the source-pathway-receptor linkage will not exist and there is not considered to be a health risk to the future end users.

7.0 Conclusion & Recommendations (Cont'd): -

7.2 Ground Contamination (Cont'd): -

However, in areas of private gardens and soft landscaping, there is the potential for dermal contact, plant uptake and inhalation of dust and vapours. Therefore, within areas of proposed landscaping the emplacement of a suitably designed clean cover system is recommended.

8.0 Preliminary Remediation Statement: -

The capping layer should be a minimum of 600mm (0.60m) thick including a minimum 150mm of topsoil and should be placed in all gardens and landscaped areas.

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.

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 Authority. Where buildings and hardcover are present (i.e. footpaths, driveways, access roads) there will be no requirement to incorporate clean cover materials.

9.0 General comments: -

If during future redevelopment works, any excavated materials are to be discarded and removed from this site as a waste to landfill, these materials can be classified using HazWasteOnline™ software in accordance with the 'Guidance on the Classification and Assessment of Waste (1st Edition 2015) – Technical Guidance WM3, Version 1.1 June 2018'.

Where excavated materials need discarding to accommodate new foundations, additional analysis and screening may be required once each specific waste stream has been identified and the volume of material to be disposed of has been calculated, since the amount of screening required including any pre-disposal WAC screening, will be dependent upon the final volume of material to be disposed of.

We have sampled and tested for asbestos which has been discussed in the report. Whilst we would target any asbestos sampling and testing in accordance with a Conceptual Site Model and site findings, there is always the possibility, along with other contamination, that undiscovered asbestos exists between sample locations. There is a possibility of unknown asbestos to exist on all sites, particularly brownfield sites where previous buildings have been demolished, where there were previous features that were infilled (old hollows, pits etc) or where significant quantities of materials such as demolition and brick rubble exist.

Re: Conversion of Agricultural Barns to Residential Dwellings, Bilton Kennels, 138 Main Road, Bilton (Cont'd)

9.0 General comments (Cont'd): -

It is not uncommon for historical asbestos wastes to be deliberately buried on derelict sites or for imported old demolition rubble to contain asbestos which can be imported for use as hardstanding/hardcore. Unless otherwise stated, we have not assessed any above or below ground features such as existing buildings, service ducts, basements, culverts, partly demolished or dilapidated structures, spoil heaps, fly tipped materials, security bunds, etc.

For future site works, adequate lateral trench support will be required for excavations, in order to prevent trench wall, collapse or over excavations, as well as to create a safe working environment. Any excavations on this site should remain open for as short a period as possible, since some of these materials may be susceptible to deterioration if left open to the natural elements for any significant period of time.

It is also recommended for any new developments, that adequate surface drainage should be designed and installed by a competent contractor, in order to prevent surface water 'ponding' or collection, during and post construction, particularly where the existing surface drainage system is disrupted or damaged.

In addition, for deeper excavations, where a drainage, service runs or the like may pass close to or beneath any proposed new foundations, these excavations should be undertaken with care and completed prior to the preparation of any new foundations, so as not to allow any loose or granular material to move or 'flow', thus leading to settlement of new foundations which were initially based at higher levels.

Following the results of the Phase 1: Desk Top Study previously completed, the site is not located within an area that requires radon protective measures within proposed new developments.

An "observational technique" can be applied to the design and construction of this site, and where ground conditions seem to vary from that indicated from the conceptual ground model derived from works to date, then advice from a suitably qualified Engineer should be sought.

We trust the contents of this report is 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
Tarric Igun, Geo-environmental Engineer

Trial Pit Location Plan

T: 0191 378 6380
E: admin@arc-environmental.com
W: www.arc-environmental.com
Registered in England No. 05539784

ended & indicative surface water
n area and sloped parking/retaining wall omitted from
FFL amended, further notation added. 22.05.17
efer to FRA - 15.06.17

Flood Zone 1 Flood Zone 2

Yorkshire Water stand-off zone

New hedge planting to front & western boundaries

Existing vehicular & pedestrian access to be improved in accordance with Highway's recommendations

4.000

Proposed foul connection to existing public sewer

Path

Grass verge

Access road min. 4.8m wide fo
parking areas, with new perme

MH3

MHA

New hedge to eastern boundary with new ditch to run to existing field ditch

Hedge

MH4

r: PU 300 CO F

PU 750 CO C

MHB

8 7 6 5 4 3 2 1

Parking

Visitor parking

TP03

Yorkshire Water stand-off zone

TP01

TP02

Flood Zone 1

Path

Public sewer: PU 100 VC F

TP04

TP05

TP06

Garden

Garden

Garden

Garden

Garden

Flood Zone 1

MH2

TP08

TP07

House

Cycle compound

Public sewer: PU 100 VC F

Path

Flood Zone 1

Turning head

9
10
11

Parking

12 Visitor parking

Flood Zone 1

13 14

TP09

6 Garden

Buried MH

MH1

TP11

Communal landscaped area

TP12

7 Garden

TP10

To existing field ditch, with new (assumed 225mm Ø) SW pipe to new header

Fields

Proposed foul drainage to connect into existing system.
Invert levels, falls etc. to be checked prior to construction

Flood Zone 1

Flood Zone 2

Flood Zone 3

Allotments

ARC ENVIRONMENTAL LTD
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Durham, DH7 8PN
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Fax: (0191) 378 0494
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

LEGEND

	APPROXIMATE SITE BOUNDARY
	MANUALLY EXCAVATED TRIAL PIT POSITION

rev.	date	amendments	drawn	chckd

Client: **JM GUTHRIE**
1965 SETTLEMENT

Project Title:
Proposed Conversion of Agricultural Barns to Residential Dwellings, 138 Main Road Bilton, HU11 4AA

Drawing Title:
Trial Pit Location Plan

Scale at A3:	Date:	Drawn by:	Approved by:
NTS @ A3	24.08.20	P.D	T.I

Job Ref:	Drg no:	Rev:
20-241	–	–

Trial Pit Record Sheets

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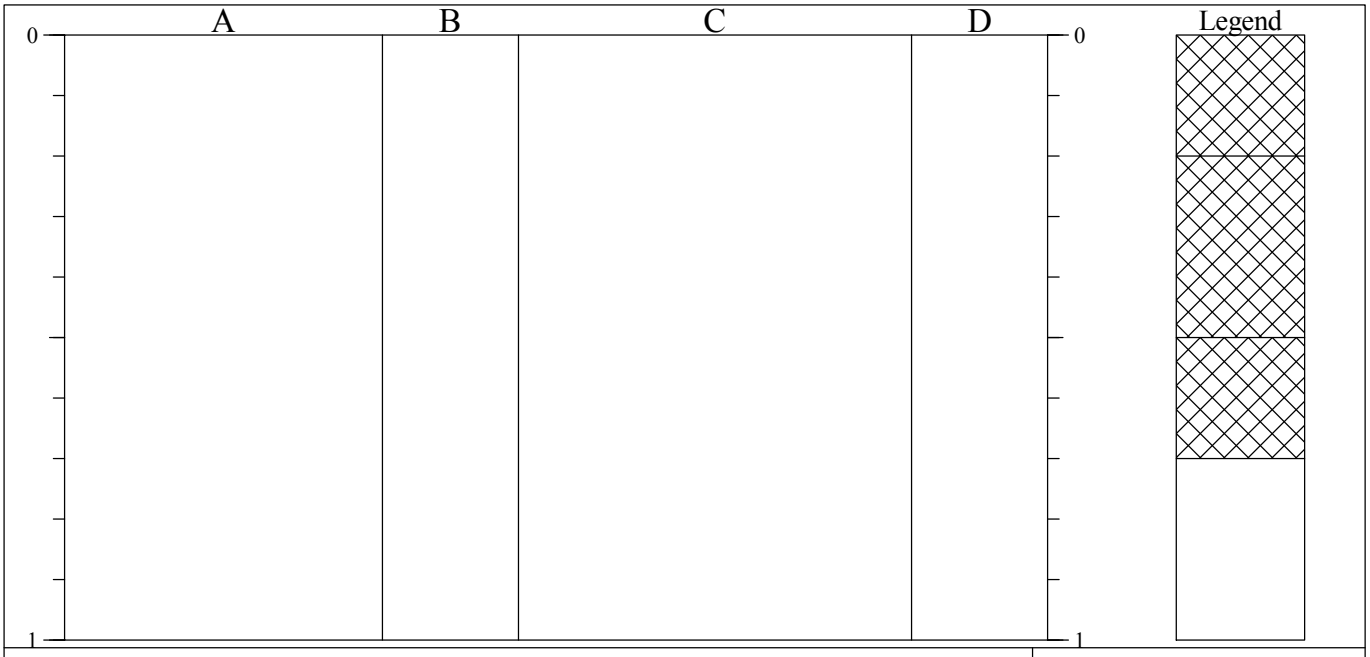
Registered in England No. 05539784

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

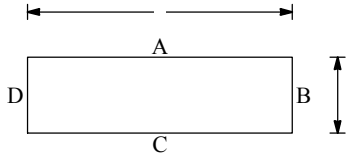
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP01
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying dark brown gravelly slightly silty sand with bricks and ash (MADE GROUND)			
0.20-0.50		Dark brown very gravelly slightly silty clayey sand with bricks and ash. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles (MADE GROUND)	0.40	J/D	
0.50-0.70		Dark brown gravelly sandy slightly silty clay with ash and occasional bricks. Gravel comprises fine to coarse subangular limestone (MADE GROUND)	0.60	J/D	
0.70		Pit terminated at c.0.70m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

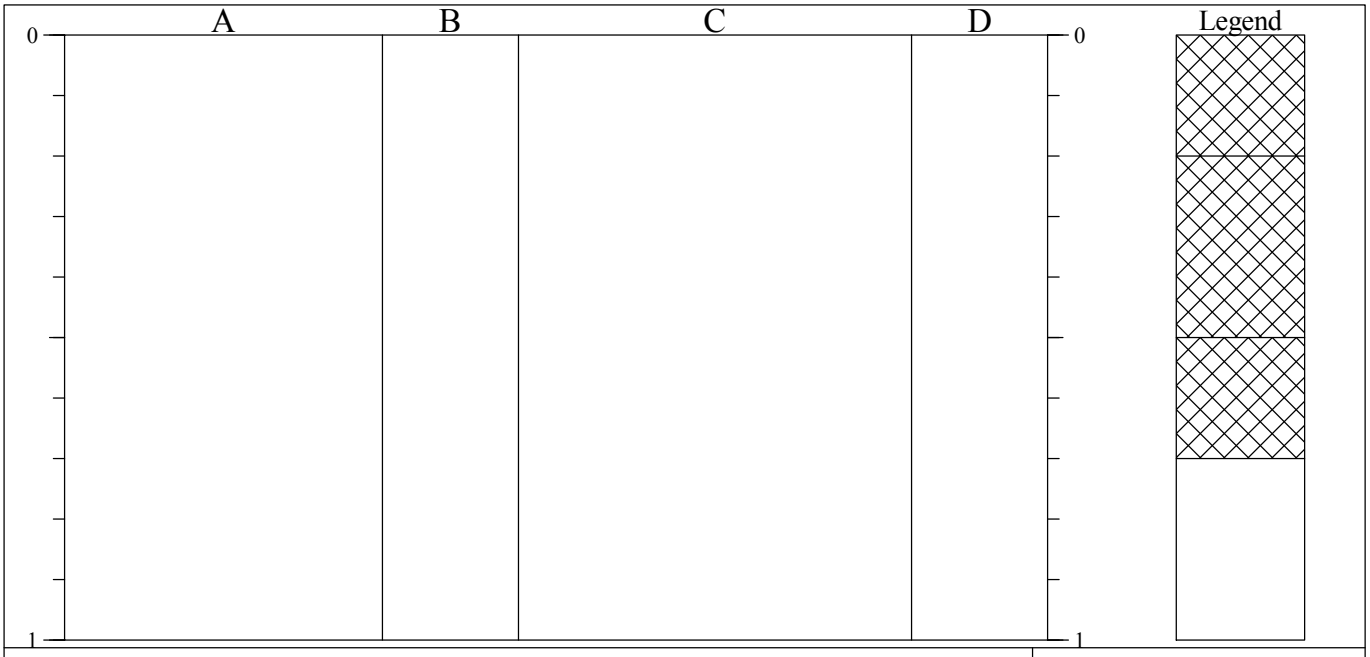
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

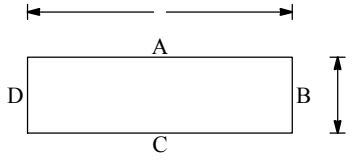
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				**TP02**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying dark brown gravelly slightly silty slightly clayey sand with bricks and concrete (MADE GROUND)			
0.20-0.50		Dark brown very gravelly slightly silty clayey sand with bricks and ash. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles (MADE GROUND)	0.30	J/D	
0.50-0.70		Dark brown clayey gravelly slightly silty sand with ash and bricks. Gravel comprises medium to coarse subangular limestone (MADE GROUND)	0.60	J/D	
0.70		Pit terminated at c.0.70m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

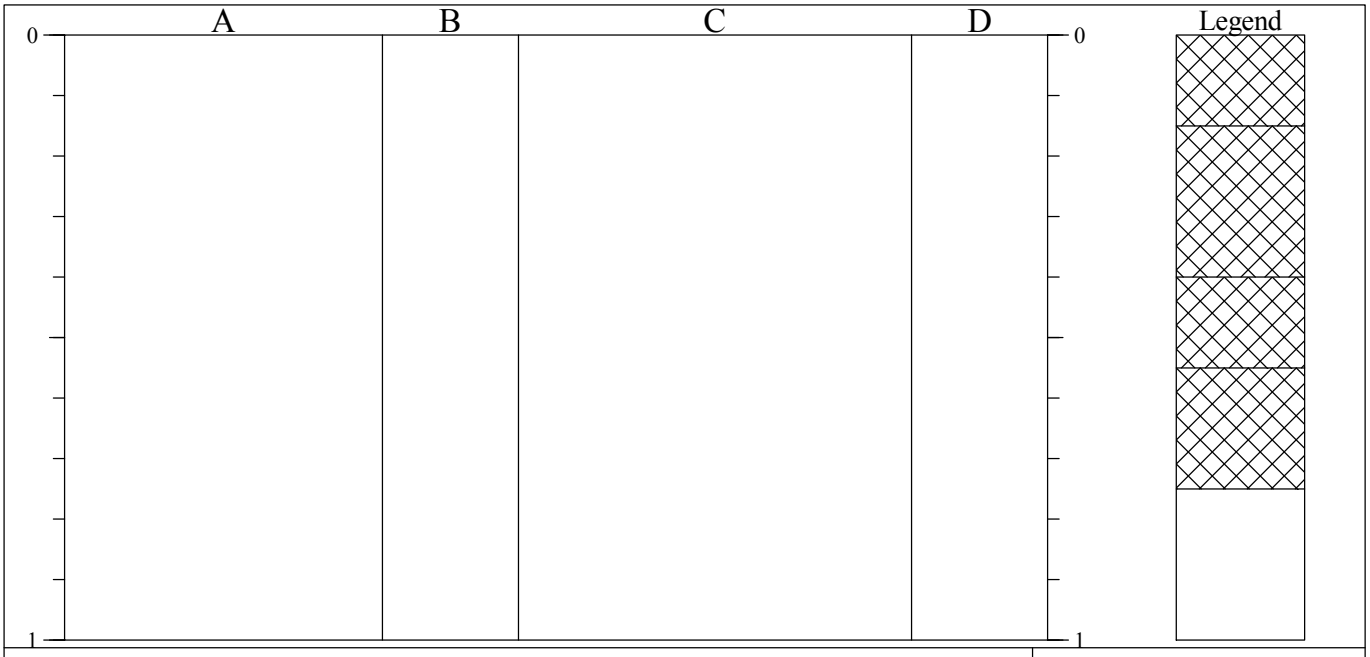
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

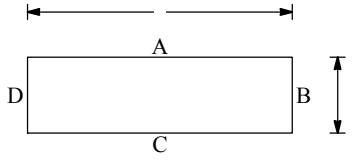
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP03
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		Grass overlying dark brown greenish mottled gravelly clayey sand with bricks and concrete (MADE GROUND)	0.10	J/D	
0.15-0.40		Dark brown very gravelly clayey sand with bricks and ash. Gravel comprises medium to coarse subangular limestone (MADE GROUND)	0.30	J/D	
0.40-0.55		Brown very gravelly slightly clayey sand with bricks. Gravel comprises medium to coarse subangular limestone (MADE GROUND)			
0.55-0.75		Dark brown gravelly sand with bricks. Gravel comprises fine to coarse subangular limestone (MADE GROUND)	0.60	J/D	
0.75		Pit terminated at c.0.75m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

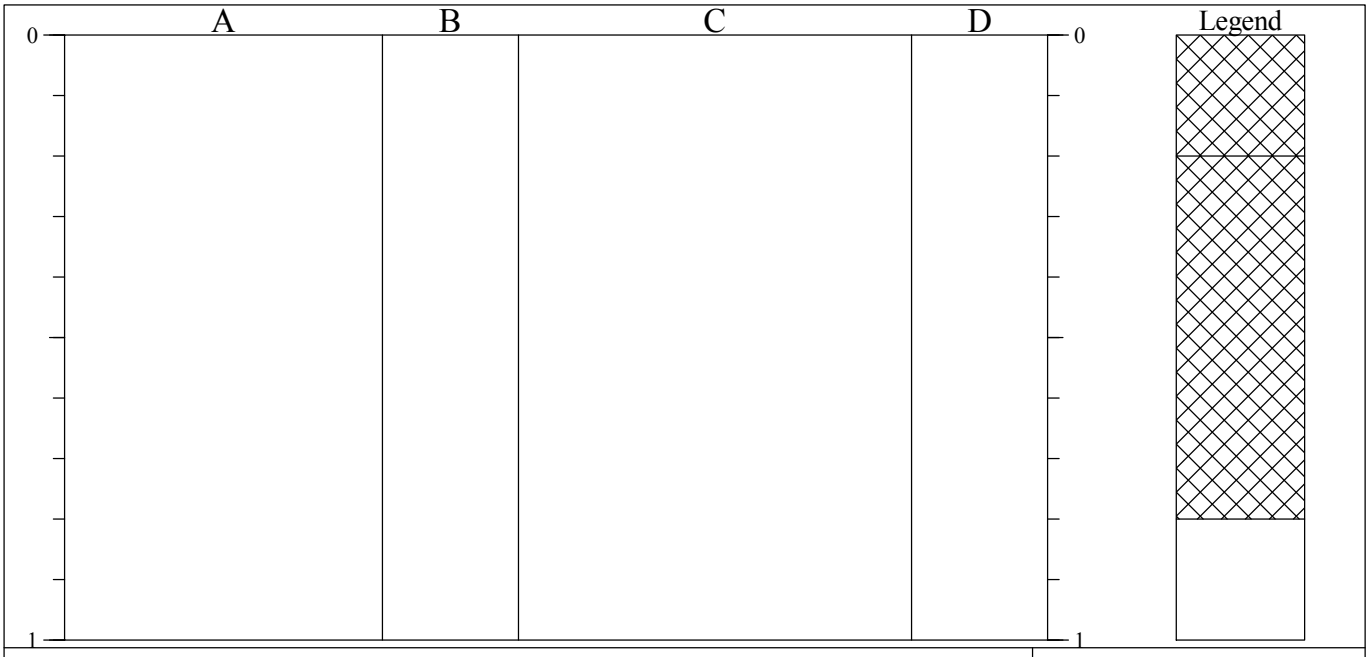
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

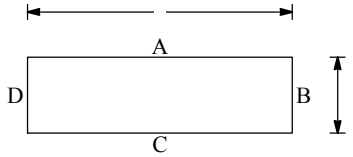
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				**TP04**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown gravelly slightly clayey sand with bricks and ash (MADE GROUND)	0.10	J/D	
0.20-0.80		Dark brown very gravelly clayey sand with bricks and ash. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles (MADE GROUND)	0.30	J/D	
0.80		Pit terminated at c.0.80m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

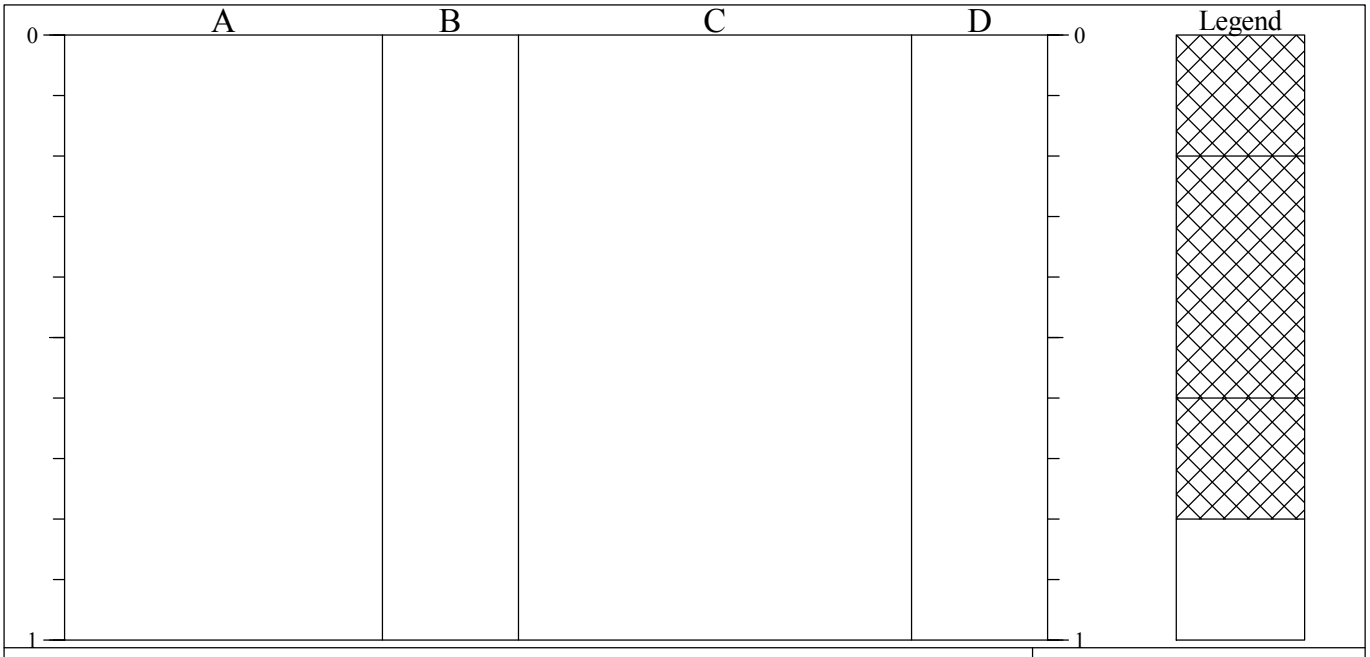
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

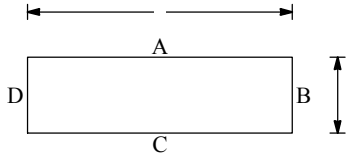
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				**TP05**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying dark brown gravelly slightly clayey sand with bricks and rootlets (MADE GROUND)			
0.20-0.60		Brown very gravelly clayey sand with bricks and concrete. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles (MADE GROUND)	0.30	J/D	
0.60-0.80		Brown orange and grey mottled slightly gravelly slighty sandy clay with occasional bricks fragments. Gravel comprises fine to coarse subangular limestone (MADE GROUND)	0.70	J/D	
0.80		Pit terminated at c.0.80m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

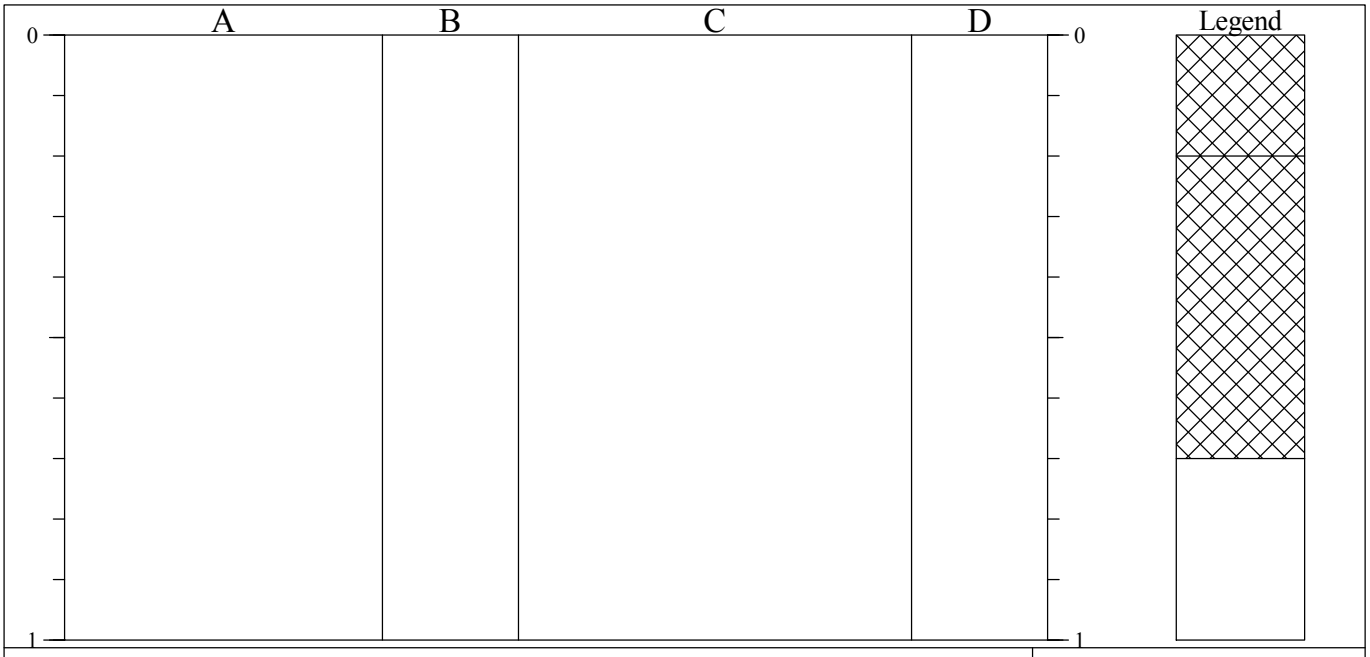
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

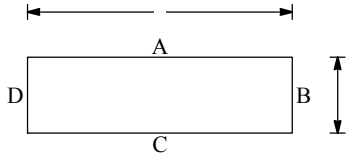
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP06
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Grass overlying dark brown gravelly slightly clayey sand with bricks and ash (MADE GROUND)	0.10	J/D	
0.20-0.70		Brown very gravelly clayey sand with bricks and concrete. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles and chalk fragments noted (MADE GROUND)	0.50	J/D	
0.70		Pit terminated at c.0.70m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

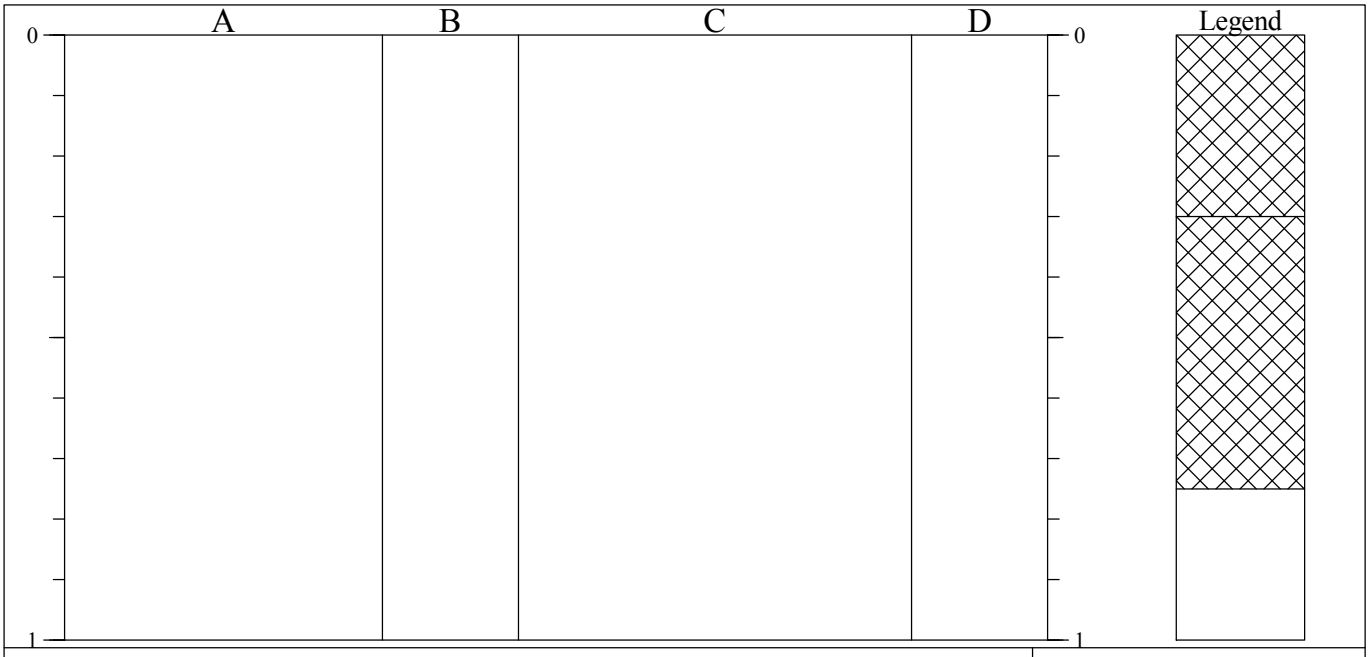
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

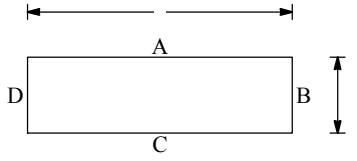
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				**TP07**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		'Grass overlying dark brown very gravelly slightly clayey sand with bricks and ash (MADE GROUND)	0.20	J/D	
0.30-0.75		Brown very gravelly clayey sand with bricks and concrete. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles (MADE GROUND)	0.50	J/D	
0.75		Pit terminated at c.0.75m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

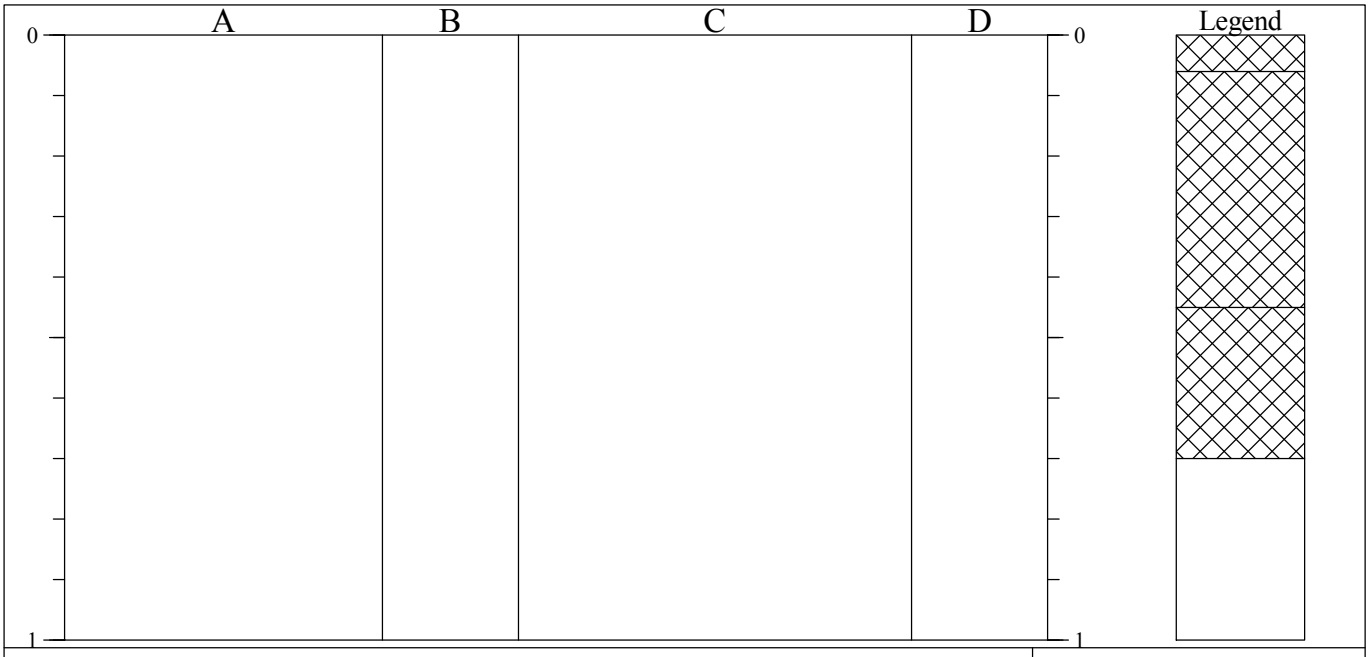
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

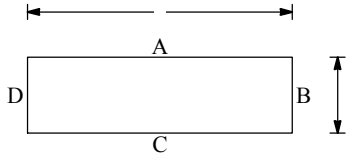
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				**TP08**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.06		Concrete (MADE GROUND)			
0.06-0.45		Dark brown gravelly clayey sand with bricks and rootlets. Gravel comprises medium to coarse subangular limestone. (MADE GROUND)	0.20-0.45	J/D	
0.45-0.70		Dark brown very gravelly sandy clay with bricks and occasional concrete fragments. Gravel comprises medium to coarse subangular limestone (MADE GROUND)	0.45-0.70	J/D	
0.70		Pit terminated at c.0.70m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

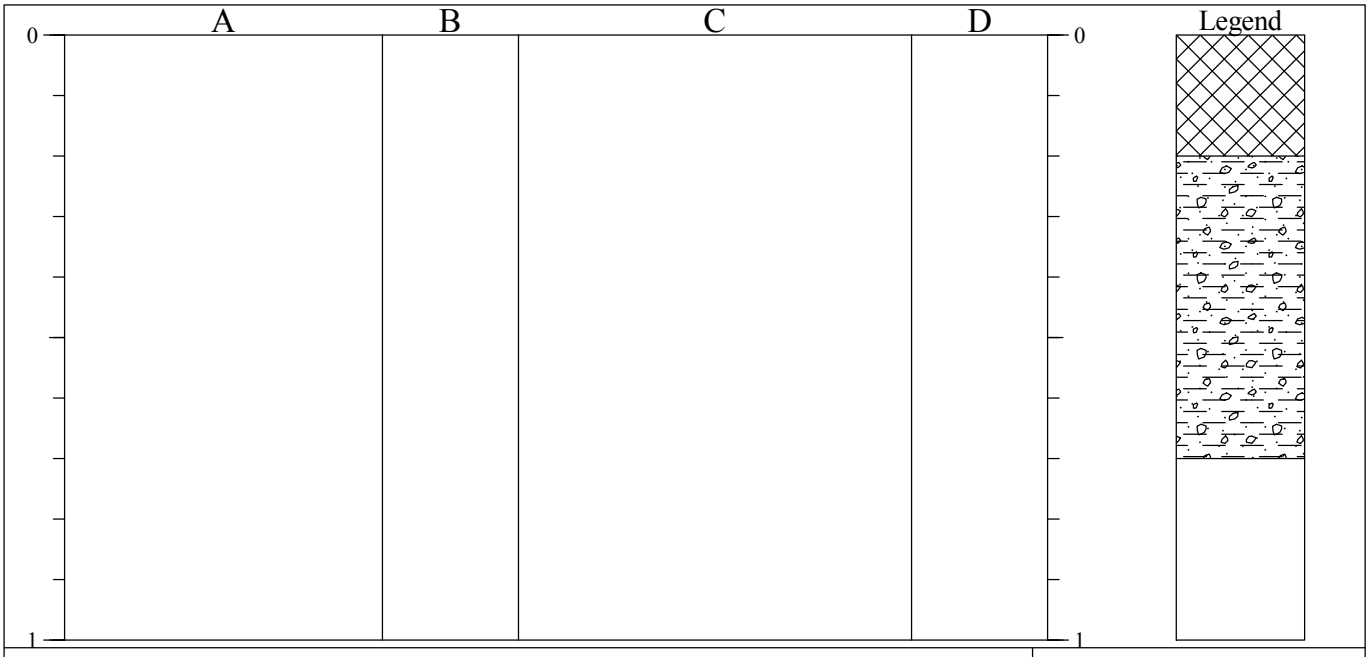
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

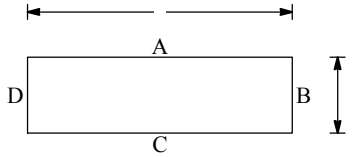
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP09
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		'Grass overlying dark brown sandy slightly gravelly clay with occassional bricks and rootlets (MADE GROUND)	0.00-0.10	J/D	
			0.10-0.70	J/D	
0.20-0.70		Brown sandy gravelly slightly gravelly CLAY. Gravel comprises medium to coarse subangular limestone.			
0.70		Pit terminated at c.0.70m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

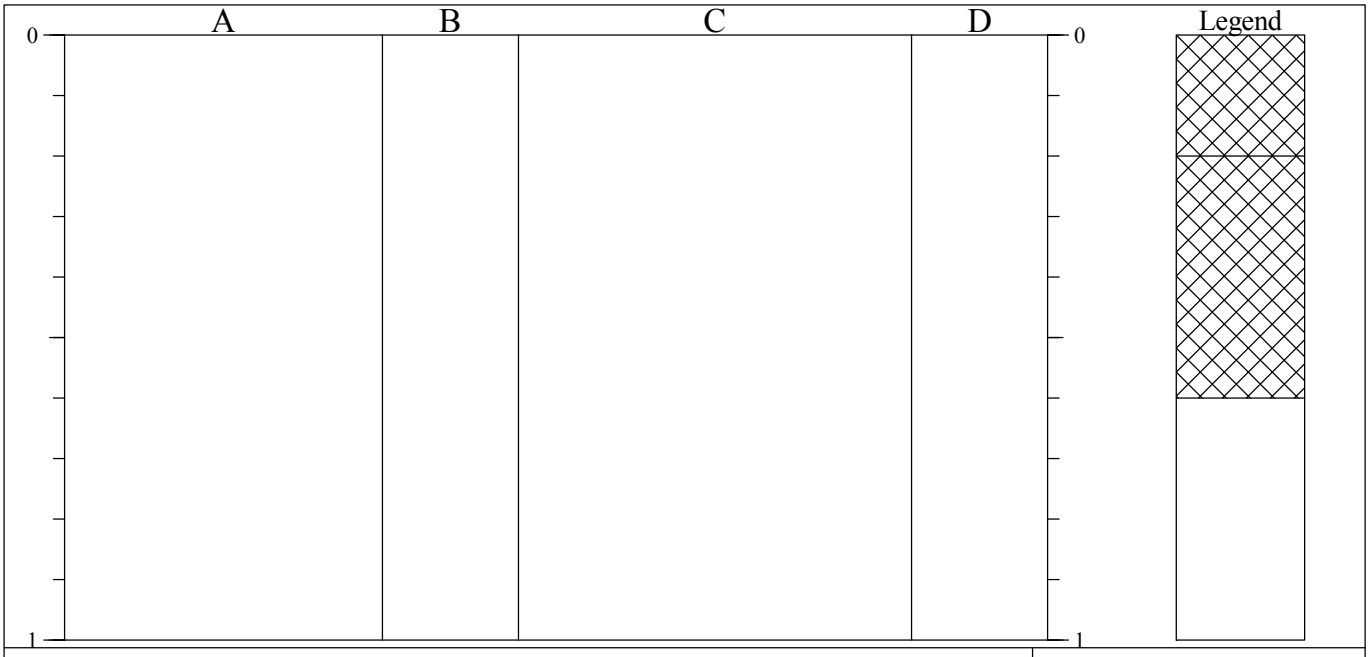
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

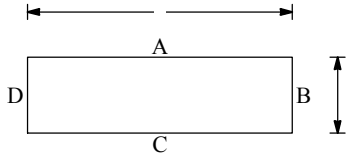
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP10
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Brown very gravelly sandy clay with bricks and ash (MADE GROUND)	0.10	J/D	
0.20-0.60		Dark brown very gravelly sandy clay with bricks and ash. Gravel comprises medium to coarse subangular limestone. Some limestone cobbles (MADE GROUND)	0.30	J/D	
0.60		Pit terminated at c.0.60m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

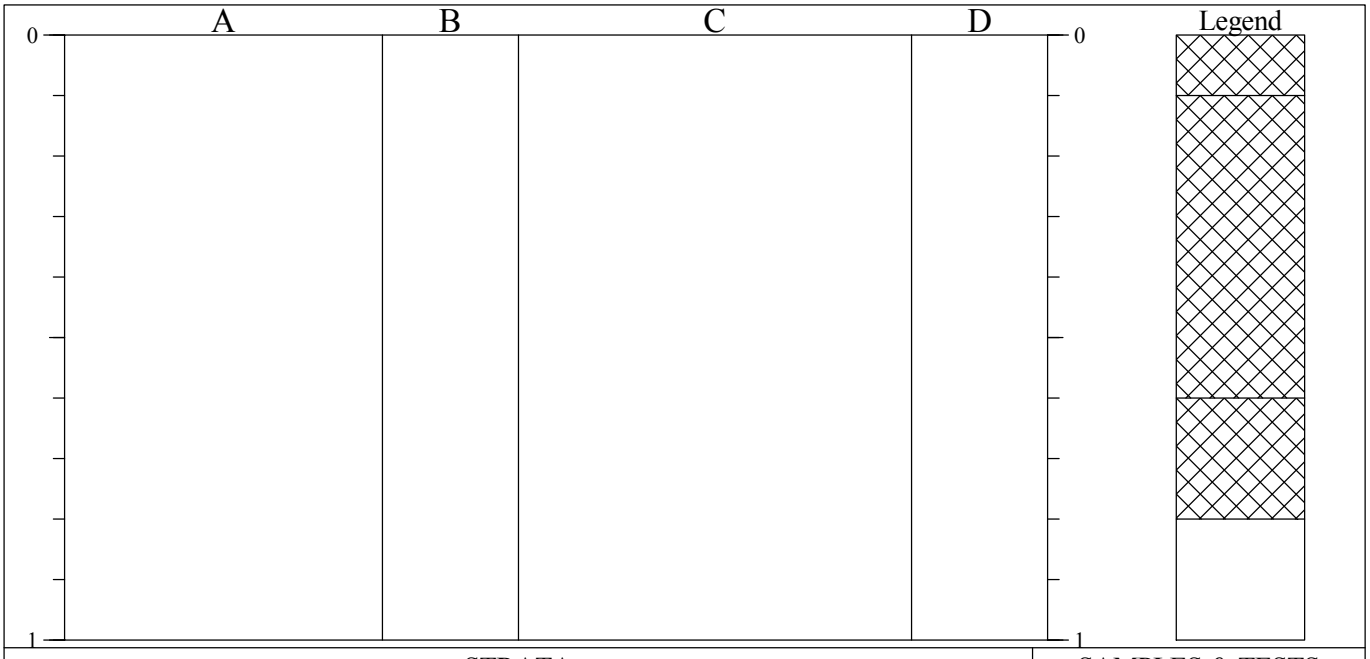
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

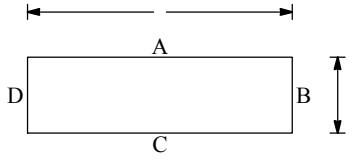
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP11
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Brown gravelly clayey sand with bricks and concrete (MADE GROUND)			
0.10-0.60		Dark brown very gravelly sandy clay with bricks and ash. Gravel comprises medium to coarse subangular limestone (MADE GROUND)	0.15	J/D	
			0.35	J/D	
0.60-0.80		Brown gravelly slighty sandy clay with occasional bricks fragments. Gravel comprises fine to coarse subangular limestone (MADE GROUND)			
0.80		Pit terminated at c.0.80m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

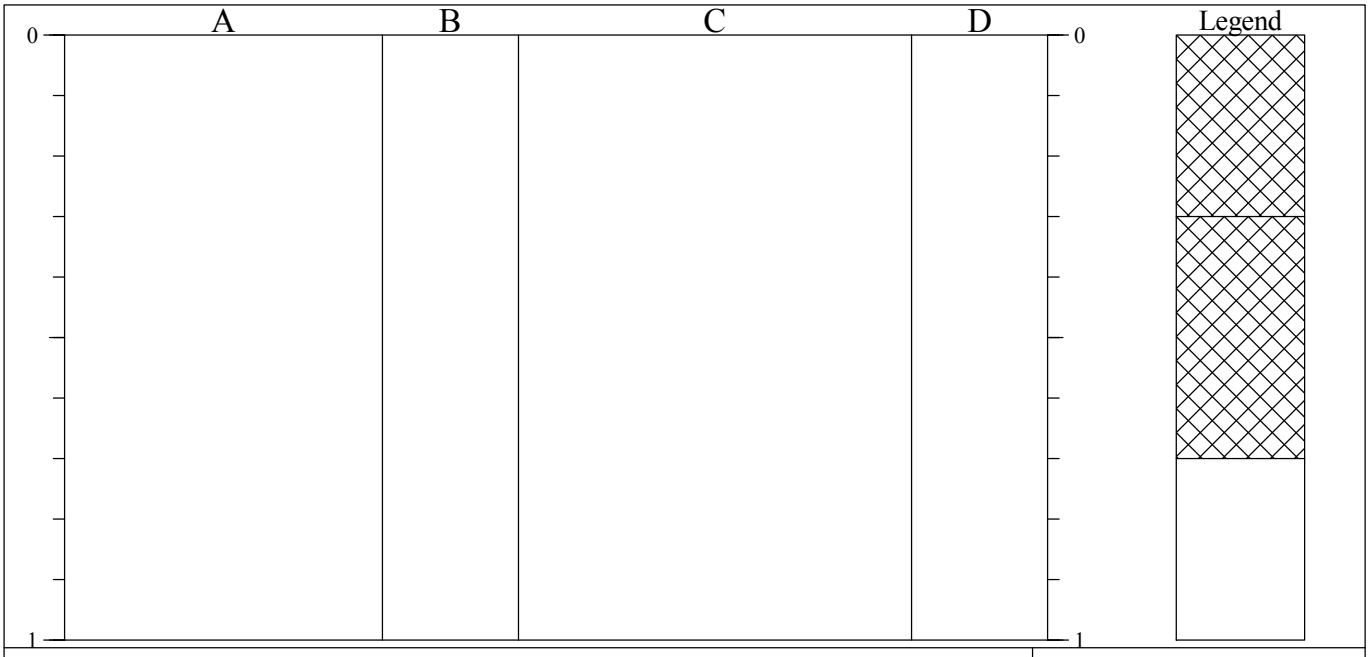
All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

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

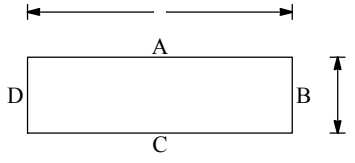
TRIAL PIT LOG

Project				TRIAL PIT No
138 Main Road, Bilton				TP12
Job No	Date	Ground Level (m)	Co-Ordinates ()	
20-241	17-08-20			
Contractor				Sheet
Arc Environmental Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass overlying brown very gravelly clayey sand with bricks and rootlets (MADE GROUND)	0.20	J/D	
0.30-0.70		Brown gravelly clayey sand with bricks and ash. Gravel comprises medium to coarse subangular limestone (MADE GROUND)	0.40	J/D	
0.70		Pit terminated at c.0.70m bgl.			

Shoring/Support:
Stability:



GENERAL REMARKS

WATER: Pit remained dry and stable during exploratory period.

All dimensions in metres Scale 1:12.5	Client Graham Binnington Architects	Method/ Plant Used Hand Excavated	Logged By TI

AGS3 UK TP 20-241.GPJ AGS3_ALL.GDT 5/10/20

Laboratory Results

2531

ANALYTICAL TEST REPORT

Contract no: 88548

Contract name: 138 Main Road, Bilton

Client reference: 20-241

Clients name: ARC Environmental

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

Samples received: 20 August 2020

Analysis started: 20 August 2020

Analysis completed: 27 August 2020

Report issued: 27 August 2020

Notes:

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
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.
BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

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 Support Hero

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
88548-1	TP01	0.40	Sandy Clay with Gravel	-	-	14.7
88548-2	TP03	0.30	Loam with Gravel	-	-	12.6
88548-3	TP04	0.30	Loam with Gravel	-	-	13.6
88548-4	TP06	0.10	Clay with Gravel	-	-	18.3
88548-5	TP07	0.20	Loam with Gravel	-	-	16.5
88548-6	TP10	0.30	Sandy Clay with Gravel	-	-	12.8
88548-7	TP11	0.35	Clay with Gravel	-	-	22.2

Chemtech Environmental Limited

SOILS

Lab number			88548-1	88548-2	88548-3	88548-4	88548-5	88548-6
Sample id			TP01	TP03	TP04	TP06	TP07	TP10
Depth (m)			0.40	0.30	0.30	0.10	0.20	0.30
Date sampled			17/08/2020	17/08/2020	17/08/2020	17/08/2020	17/08/2020	17/08/2020
Test	**Method**	**Units**						
Arsenic (total)	CE054	mg/kg As	26	14	13	13	34	<10
Cadmium (total)	CE054	mg/kg Cd	4.7	2.1	2.8	2.7	3.6	0.9
Chromium (total)	CE054	mg/kg Cr	50	39	56	56	54	23
Chromium (III)	CE208	mg/kg CrIII	50	39	56	56	54	23
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE054	mg/kg Cu	188	51	30	30	120	13
Lead (total)	CE054	mg/kg Pb	353	74	32	30	270	13
Mercury (total)	CE054	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE054	mg/kg Ni	51	23	33	33	44	8.8
Selenium (total)	CE054	mg/kg Se	<0.3	7.2	<0.3	<0.3	<0.3	3.3
Zinc (total)	CE054	mg/kg Zn	138	64	76	73	182	59
pH	CE004 M	units	8.6	8.4	8.5	8.2	8.0	8.2
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	131	46	68	257	94	85
Cyanide (free)	CE077	mg/kg CN	<1	<1	<1	<1	<1	<1
Total Organic Carbon (TOC)	CE072 M	% w/w C	18.1	7.7	7.5	1.2	12.3	1.9
Estimate of OMC (calculated from TOC)	CE072 M	% w/w	31.1	13.2	12.8	2.1	21.1	3.2
PAH								
Acenaphthene	CE087 M	mg/kg	0.18	0.03	<0.02	<0.02	<0.02	0.72
Acenaphthylene	CE087 M	mg/kg	0.04	0.04	0.05	<0.02	<0.02	1.06
Anthracene	CE087 U	mg/kg	0.53	0.10	0.06	<0.02	0.08	3.69
Benzo(a)anthracene	CE087 U	mg/kg	1.49	0.52	0.35	0.04	0.43	12.88
Benzo(a)pyrene	CE087 U	mg/kg	1.34	0.51	0.37	0.07	0.44	13.71
Benzo(b)fluoranthene	CE087 M	mg/kg	1.83	0.71	0.60	0.09	0.64	17.55
Benzo(ghi)perylene	CE087 M	mg/kg	0.95	0.37	0.26	0.04	0.33	9.14
Benzo(k)fluoranthene	CE087 M	mg/kg	0.75	0.29	0.21	0.03	0.24	6.91
Chrysene	CE087 M	mg/kg	1.48	0.52	0.43	0.05	0.50	12.59
Dibenz(ah)anthracene	CE087 M	mg/kg	0.19	0.08	0.06	<0.02	0.06	2.03
Fluoranthene	CE087 M	mg/kg	3.39	0.89	0.69	0.07	0.95	25.61
Fluorene	CE087 U	mg/kg	0.16	0.04	<0.02	<0.02	<0.02	0.97
Indeno(123cd)pyrene	CE087 M	mg/kg	1.04	0.39	0.31	0.05	0.36	10.44
Naphthalene	CE087 M	mg/kg	0.23	0.06	0.06	0.02	0.07	0.15
Phenanthrene	CE087 M	mg/kg	1.88	0.37	0.31	0.04	0.32	10.56
Pyrene	CE087 M	mg/kg	2.79	0.78	0.57	0.06	0.81	22.12
PAH (total of USEPA 16)	CE087	mg/kg	18.3	5.68	4.34	0.56	5.24	150
Benzo(j)fluoranthene	CE087	mg/kg	0.25	0.10	0.07	<0.02	0.08	2.30
PAH (total of OIL 8)	CE087	mg/kg	8.37	3.12	2.40	0.33	2.75	78.4
BTEX & TPH								
Benzene	CE192 U	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	CE192 U	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	CE192 U	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
m & p-Xylene	CE192 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

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SOILS

Lab number			88548-1	88548-2	88548-3	88548-4	88548-5	88548-6
Sample id			TP01	TP03	TP04	TP06	TP07	TP10
Depth (m)			0.40	0.30	0.30	0.10	0.20	0.30
Date sampled			17/08/2020	17/08/2020	17/08/2020	17/08/2020	17/08/2020	17/08/2020
Test	**Method**	**Units**						
o-Xylene	CE192 [U]	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4	<4	<4	<4	<4	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	7	5	5	<4	<4	25
EPH Aliphatic (>C16-C35)	CE068	mg/kg	87	107	101	20	84	942
EPH Aliphatic (>C35-C44)	CE068	mg/kg	21	23	24	<10	16	346
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1	<1	<1	<1	<1	4
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	9	3	3	<1	3	70
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	9	6	5	2	5	78
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	2	1	<1	<1	<1	14
Subcontracted analysis								
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	NAD	NAD

Chemtech Environmental Limited

SOILS

Lab number			88548-7
Sample id			TP11
Depth (m)			0.35
Date sampled			17/08/2020
Test	**Method**	**Units**	
Arsenic (total)	CE054	mg/kg As	19
Cadmium (total)	CE054	mg/kg Cd	3.1
Chromium (total)	CE054	mg/kg Cr	64
Chromium (III)	CE208	mg/kg CrIII	64
Chromium (VI)	CE146	mg/kg CrVI	<1
Copper (total)	CE054	mg/kg Cu	221
Lead (total)	CE054	mg/kg Pb	137
Mercury (total)	CE054	mg/kg Hg	<0.5
Nickel (total)	CE054	mg/kg Ni	31
Selenium (total)	CE054	mg/kg Se	0.6
Zinc (total)	CE054	mg/kg Zn	119
pH	CE004 [M]	units	8.4
Sulphate (2:1 water soluble)	CE061 [M]	mg/l SO_4	62
Cyanide (free)	CE077	mg/kg CN	<1
Total Organic Carbon (TOC)	CE072 [M]	% w/w C	9.6
Estimate of OMC (calculated from TOC)	CE072 [M]	% w/w	16.5
PAH			
Acenaphthene	CE087 [M]	mg/kg	4.04
Acenaphthylene	CE087 [M]	mg/kg	0.18
Anthracene	CE087 [U]	mg/kg	11.70
Benzo(a)anthracene	CE087 [U]	mg/kg	21.92
Benzo(a)pyrene	CE087 [U]	mg/kg	17.21
Benzo(b)fluoranthene	CE087 [M]	mg/kg	22.56
Benzo(ghi)perylene	CE087 [M]	mg/kg	10.71
Benzo(k)fluoranthene	CE087 [M]	mg/kg	8.98
Chrysene	CE087 [M]	mg/kg	20.88
Dibenz(ah)anthracene	CE087 [M]	mg/kg	2.61
Fluoranthene	CE087 [M]	mg/kg	43.55
Fluorene	CE087 [U]	mg/kg	2.40
Indeno(123cd)pyrene	CE087 [M]	mg/kg	11.53
Naphthalene	CE087 [M]	mg/kg	0.59
Phenanthrene	CE087 [M]	mg/kg	36.99
Pyrene	CE087 [M]	mg/kg	37.12
PAH (total of USEPA 16)	CE087	mg/kg	253
Benzo(j)fluoranthene	CE087	mg/kg	2.99
PAH (total of OIL 8)	CE087	mg/kg	109
BTEX & TPH			
Benzene	CE192 [U]	mg/kg	<0.01
Toluene	CE192 [U]	mg/kg	<0.01
Ethylbenzene	CE192 [U]	mg/kg	<0.01
m & p-Xylene	CE192 [U]	mg/kg	<0.02

Chemtech Environmental Limited

SOILS

Lab number			88548-7
Sample id			TP11
Depth (m)			0.35
Date sampled			17/08/2020
Test	**Method**	**Units**	
o-Xylene	CE192 [U]	mg/kg	<0.01
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	0.3
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	23
EPH Aliphatic (>C16-C35)	CE068	mg/kg	1036
EPH Aliphatic (>C35-C44)	CE068	mg/kg	624
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	5
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	133
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	107
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	19
Subcontracted analysis			
Asbestos (qualitative)	$	-	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE054	Arsenic (total)	Aqua regia digest, ICP-OES	Dry	M	1	mg/kg As
CE054	Cadmium (total)	Aqua regia digest, ICP-OES	Dry	M	0.2	mg/kg Cd
CE054	Chromium (total)	Aqua regia digest, ICP-OES	Dry	M	1	mg/kg Cr
CE208	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE054	Copper (total)	Aqua regia digest, ICP-OES	Dry	M	1	mg/kg Cu
CE054	Lead (total)	Aqua regia digest, ICP-OES	Dry	M	1	mg/kg Pb
CE054	Mercury (total)	Aqua regia digest, ICP-OES	Dry	M	0.5	mg/kg Hg
CE054	Nickel (total)	Aqua regia digest, ICP-OES	Dry	M	1	mg/kg Ni
CE054	Selenium (total)	Aqua regia digest, ICP-OES	Dry	M	0.3	mg/kg Se
CE054	Zinc (total)	Aqua regia digest, ICP-OES	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	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	As received		1	mg/kg CN
CE072	Total Organic Carbon (TOC)	Removal of IC by acidification, Carbon Analyser	Dry	M	0.1	% w/w C
CE072	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry	M	0.1	% w/w
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE087	Benzo(j)fluoranthene	Solvent extraction, GC-MS	As received		0.02	mg/kg
CE087	PAH (total of OIL 8)	Solvent extraction, GC-MS	As received		0.18	mg/kg
CE192	Benzene	Headspace GC-FID	As received	U	0.01	mg/kg
CE192	Toluene	Headspace GC-FID	As received	U	0.01	mg/kg
CE192	Ethylbenzene	Headspace GC-FID	As received	U	0.01	mg/kg
CE192	m & p-Xylene	Headspace GC-FID	As received	U	0.02	mg/kg
CE192	o-Xylene	Headspace GC-FID	As received	U	0.01	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE068	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID	As received		4	mg/kg

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE068	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID	As received		10	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE068	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID	As received		1	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

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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)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
88548-1	TP01	0.40	N	
88548-2	TP03	0.30	N	
88548-3	TP04	0.30	N	
88548-4	TP06	0.10	N	
88548-5	TP07	0.20	N	
88548-6	TP10	0.30	N	
88548-7	TP11	0.35	N	