ROBERTS ENVIRONMENTAL LIMITED
23 Grey Street
Newcastle upon Tyne. NE1 6EE

Date:	14th November 2014
To:	Andy Hawkin
From:	Mike Hay
Subject:	The Kendray, Barnsley
Project No:	141008
Total Pages (including this page):	15

Dear Andy,

RE: Preliminary Logs and Comments for the ground investigation works carried out at The Kendray Barnsley

Further to the completion of the ground investigation works at the above mentioned site, we have pleasure in providing the attached preliminary logs along with the following comments. Please find attached the following documents;

- Investigation Position Location Plan
- Trial pit and Borehole Record Sheets (TP's 01-05 & BH's 01 – 05)

The positions of the investigation positions can be seen on the attached Investigation Position Location Plan, 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 depths of strata on the record sheets are recorded from current ground levels.

The site is currently occupied by a vacant and derelict former public house, named as The Kendray. The main structure fronts on to Birk Avenue and is surrounded by hard standing of tarmac with a small area of concrete overlain by rubber type tiles, installed on the former children's play area.

A small sandstone retaining wall was noted to the rear of the main structure, running across the width of the site from east to west, with site levels rising to the former garden area. It was necessary to remove a section of the retaining wall to create an access ramp, for the plant and machinery, to enable the site investigation works to be progressed.

CEnv Chartered Environmentalist

Ground Conditions

Made ground has been recorded within all of the investigation positions up to depths of between 0.40m and 0.60m below current ground levels (bcgl's). The near surface made ground comprises tarmac around the building and disturbed natural strata of sandy gravel soil with occasional fragments of brick, stone, ash, clinker and glass. The deeper made ground comprises a mix of disturbed sand, gravel and clay with fragments of brick and sandstone.

According to BGS records, the site is positioned on an area recorded as being free from drift and the upper natural deposits are considered to be representative of residual soils. These deposits generally comprise sand and gravel, with the gravel comprising small to 'dinner plate' sized tabular pieces of sandstone. Within two of the investigation positions, WS01 and TP04, a band of sandy gravelly clay was recorded between 1.00m and 2.30m and 1.20m to 2.10m respectively. The residual soil deposits were noted to become more competent with depth, the sandy tabular gravel representing completely or very weathered sandstone bedrock. All of the investigation positions were terminated at depths between 1.80m and 3.02m due to the refusal of the borehole sampling equipment or it becoming increasingly difficult to excavate the trial pits with the mechanical excavator.

Groundwater

No significant groundwater ingresses were encountered during these investigation works, with the boreholes and trial pits remaining open and dry on completion. A small ingress of perched water was recorded within WS02 at 0.30m, considered to be associated with trapped surface drainage as opposed to being representative of a continuous groundwater source (water table).

Foundation Options

Based upon the results of the insitu testing and the observations made during the initial ground investigation works it is considered that conventional strip foundations could be utilised across the site.

For normal shallow strip foundations a preliminary assessment of the overall allowable bearing pressure indicates that the residual soils / completely weathered bedrock comprising sand and gravel could provide a suitable homogenous bearing strata. Future foundations will need to be based at a minimum depth of 0.60m, for frost protection, and should be limited to a maximum allowable bearing pressure of 75kN/m^2.

Foundations should be kept high, within the granular deposits of sand and gravel, and care should be taken not to over excavate the foundation excavations and "straddle" any foundations between the sand/gravel and the sandy gravelly clay, as this may result in differential settlements occurring. In the event of any 'soft spots' being identified within sand and gravel deposits or if there is any uncertainty about the suitability of the deposits to be utilised as a bearing strata, it may be necessary to increase the width of the foundation runs and provide reinforcement. We would recommend that all foundation excavations are inspected by suitably experienced and qualified engineer to ensure a suitable homogenous bearing strata is utilised.

Should greater loadings be required, future foundations can be taken down through the residual soils and completely weathered bedrock and based within the more competent medium dense to dense weathered bedrock deposits. These more competent bedrock deposits were encountered at depths from approximately 2.00m below current ground level, and at this depth the loadings will need to be limited to a maximum allowable bearing pressure of 200kN/m^2.

A basement was identified below the existing the structure, the extents of which are not known at this stage, any future foundations on this part of the site, anticipated to be associated with the retail portion of the development, will need to be either stepped and extended to the natural deposits at depth or a suitable engineered fill will need to be provided along with an appropriate foundation solution. Depending on the nature of the engineered fill, this could comprise a raft or semi raft, or conventional strip foundations that have been widened and reinforced.

Contamination Comments

There was no visual or olfactory evidence of any hydrocarbon contamination noted within any of the investigation positions. However, some evidence of ash and clinker was noted within the made ground. Representative samples have been selected along with a targeted sample from adjacent to the electricity sub-station, and delivered to the laboratory for appropriate contamination screening. The results will be reported in due course.

General Comments

Bearing in mind the nature of the majority of the materials encountered on this site, it is likely that lateral trench support will be required for excavations, in order to prevent trench wall collapse or over excavation, as well as to provide a safe working environment especially below a depth of 1.20m for drainage runs and the like. In addition it is recommended that excavations remain open for as short a period as possible, since most of these materials will be susceptible to significant

deterioration, if left open to the natural elements for any significant periods of time. Reference to CIRIA 97 'Trenching Practice' would be beneficial to establish a suitable means of support or battering of excavation sides during construction.

In addition, for deeper excavations, drainage, service runs or the like that may pass close to or beneath any existing or proposed new foundations, these 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 causing settlement to occur to any new or adjacent old foundation based at a higher level.

We trust that these preliminary comments and attachments are to your satisfaction and if you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely,

Mike Hay BSc (Hons), MSc FGS
Director
For and on behalf of Roberts Environmental Ltd
Tel: 0191 2304521
Mobile: 07557 511 292

Investigation Position Location Plan: The Kendray, Birk Avenue, Barnsley S70 3AH (141008)

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BOREHOLE LOG

Project				BOREHOLE No
The Kendray, Birk Avenue, Barnsley				**WS01**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.05	Tarmac (Made ground)		
						(0.30)	Compact brown to yellow brown sandy gravel of sandstone (MADE GROUND		
						0.35			
0.40-0.50	J					0.50	Firm brown to yellow brown silty sandy gravelly clay. Gravel of sandstone and brick (MADE GROUND)		
						(0.50)	Compact dark orange brown silty gravelly SAND. Gravel of sandstone (RESIDUAL SOIL)		
						1.00			
1.00-1.30 1.00-1.45	B SPT	N=12				(1.30)	Orange brown to light brown sandy very gravelly CLAY / clayey GRAVEL, completely weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)		
2.00-2.45	SPT	N=63				2.30			
						2.45	Highly weathered orange brown light brown SANDSTONE recovered as slightly sandy GRAVEL (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)		
							Borehole terminated due to refusal of the sampling equipment.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

No water encountered during or on completion of the borehole.

All dimensions in metres Scale 1:25	Client CPD	Method/ Plant Used Windowless Sampling	Logged By MWH

AGS3 UK BH THE KENDRAY, BARNSLEY.GPJ GINT STD AGS 3_1.GDT 12/11/14

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BOREHOLE LOG

Project				BOREHOLE No
The Kendray, Birk Avenue, Barnsley				**WS02**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.05-0.30	J					(0.30) 0.30	Compact sandstone cobbles, tarmac, brick, ash, and clinker gravel (MADE GROUND)		
						0.40	Firm green brown sandy silt with gravel, possibly disturbed (MADE GROUND)		
						(0.60) 1.00	Dark orange brown silty gravelly SAND. Gravels of yellow brown sandstone (RESIDUAL SOIL)		
1.00-1.30 1.00-1.45	B SPT	N=28				(1.27) 2.27	Medium Dense becoming dense to hard, completely to highly weathered orange brown to light brown SANDSTONE, recovered as a sandy GRAVEL (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)		
1.85-2.27	SPT	100Blows							
							Borehole terminated due to refusal of the sampling equipment.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Perched water at 0.30m, borehole dry on completion.

All dimensions in metres Scale 1:25	Client CPD	Method/ Plant Used Windowless Sampling	Logged By MWH

AGS3 UK BH THE KENDRAY, BARNSLEY.GPJ GINT STD AGS 3_1.GDT 12/11/14

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BOREHOLE LOG

Project				BOREHOLE No
The Kendray, Birk Avenue, Barnsley				**WS03**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						(0.20) 0.20	Unmanaged grass, dark brownn sandy gravelly topsoil with rootlets (MADE GROUND)		
0.20-0.45	J					(0.25) 0.45	Disturbed firm brown sandy gravelly clay. Gravel of sandstone (MADE GROUND)		
1.00-1.00 1.00-1.45	B SPT	N=19				(1.62)	Medium Dense becoming dense to hard, completely to highly weathered orange brown to light brown SANDSTONE, recovered as a sandy GRAVEL (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)		
1.80-2.07	SPT	75 Blows				2.07			
							Borehole terminated due to refusal of the sampling equipment.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	No water encountered during or on completion of the borehole.

All dimensions in metres Scale 1:25	Client CPD	Method/ Plant Used Windowless Sampling	Logged By MWH

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BOREHOLE LOG

Project				BOREHOLE No
The Kendray, Birk Avenue, Barnsley				**WS04**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
						0.10	Tarmac (Made ground)		
						(0.20) 0.30	Compact rubble of brick and sandstone with occasional ash and clinker (MADE GROUND)		
0.30-0.40	J					0.40	Disturbed firm dark brown sandy silty gravelly clay. Gravel of sandstone (MADE GROUND)		
0.80-1.10	B						Dense becoming hard, completely to highly weathered orange brown to light brown SANDSTONE, recovered as a sandy GRAVEL (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)		
1.00-1.45	SPT	N=37				(1.97)			
1.95-2.37	SPT	50 Blows				2.37			
							Borehole terminated due to refusal of the sampling equipment.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

No water encountered during or on completion of the borehole.

All dimensions in metres Scale 1:25	Client CPD	Method/ Plant Used Windowless Sampling	Logged By MWH

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BOREHOLE LOG

Project				BOREHOLE No
The Kendray, Birk Avenue, Barnsley				**WS05**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION			
						0.10	Tarmac (Made ground)			
						(0.20) 0.30	Compact rubble of brick and sandstone with occasional ash and clinker (MADE GROUND)			
0.30-0.50	J					(0.20) 0.50	Disturbed firm dark brown silty gravelly sand. Gravel of sandstone (MADE GROUND)			
						(0.50) 1.00	Compact dark brown silty gravelly SAND. Gravel of sandstone (RESIDUAL SOIL)			
1.00-1.30 1.00-1.45	B SPT	N=12				(2.02) 3.02	Medium Dense becoming dense to hard, completely to highly weathered orange brown to light brown SANDSTONE, recovered as a sandy GRAVEL (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
2.00-2.45	SPT	N=34								
2.75-3.02	SPT	98 Blows								
							Borehole terminated due to refusal of the sampling equipment.			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											No water encountered during or on completion of the borehole.

All dimensions in metres Scale 1:25	Client CPD	Method/ Plant Used Windowless Sampling	Logged By MWH

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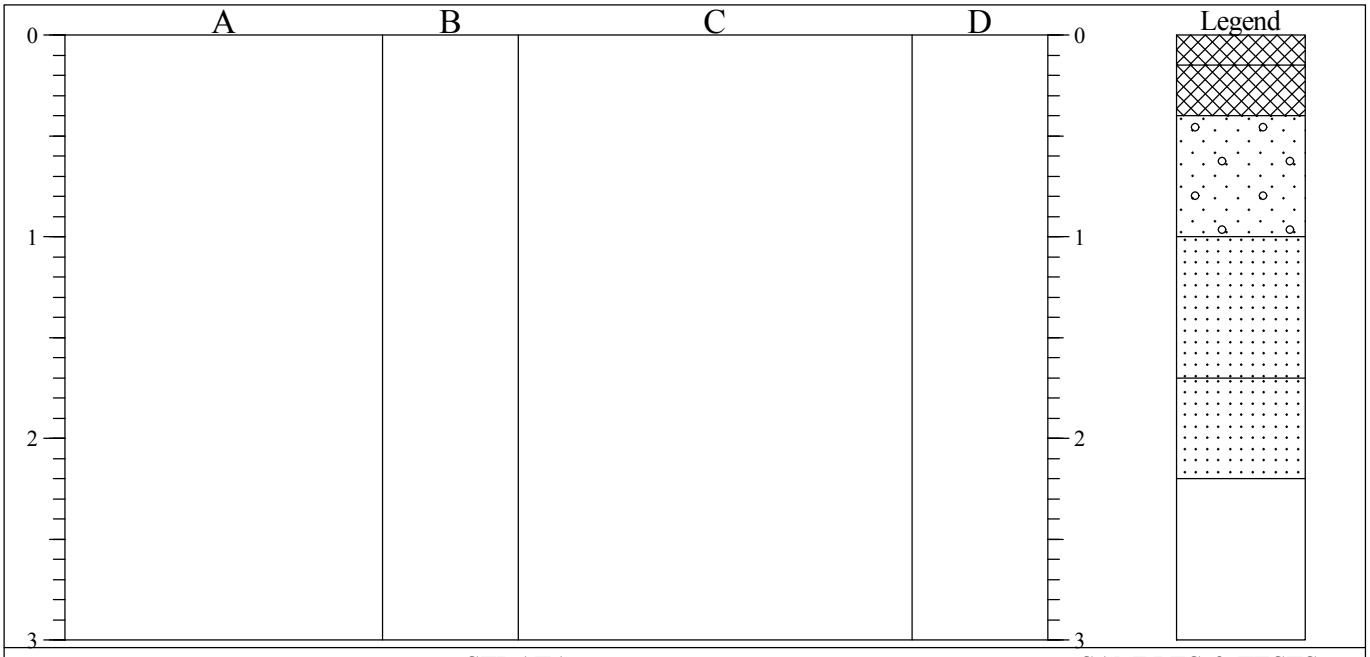
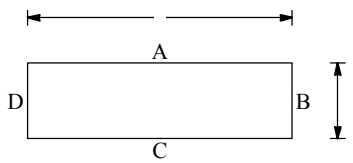
TRIAL PIT LOG

Project				TRIAL PIT No
The Kendray, Birk Avenue, Barnsley				**TP01**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		Dark grey to black sandy gravelly soil with ash gravel and frequent rootlets (MADE GROUND)			
0.15-0.40		Yellow brown sandy gravel, sub-base type materials (MADE GROUND)	0.10-0.20	J	
0.40-1.00		Yellow to orange brown gravelly SAND, noted as clayey in places. Gravel of sandstone (RESIDUAL SOIL)	0.60	CBR	3%
			0.90-1.00	B	
1.00-1.70		Yellow brown sandy GRAVEL, gravel recovered as small tabular pieces, completely weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
1.70-2.20		Orange brown weathered SANDSTONE, recovered as sandy tabular gravel (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
2.20		Trial terminated within the sandstone bedrock deposits.			

Shoring/Support:
Stability:



GENERAL REMARKS

Trial pit remained open and dry on completion.

All dimensions in metres Scale 1:37.5	Client CPD	Method/ Plant Used JCB 3CX	Logged By MWH

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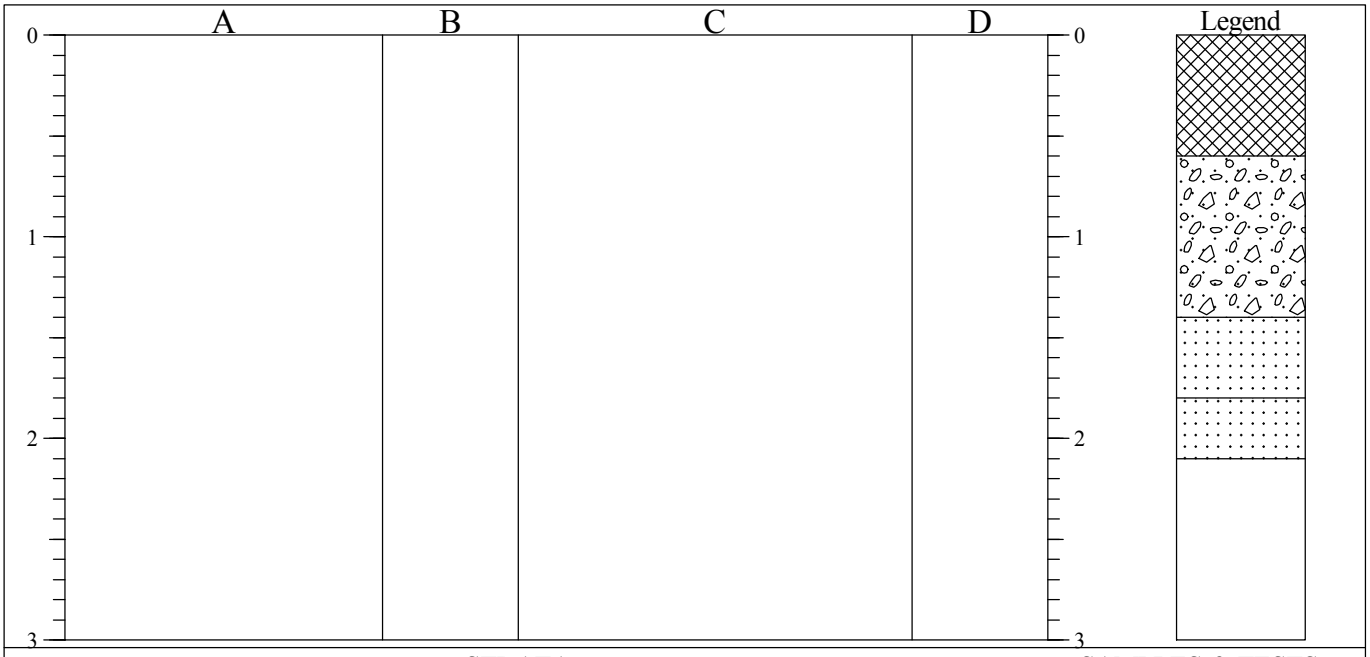
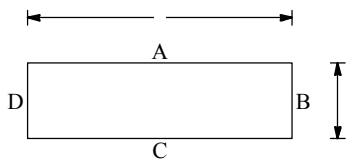
TRIAL PIT LOG

Project				TRIAL PIT No
The Kendray, Birk Avenue, Barnsley				**TP02**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60		Dark grey to brown sandy gravelly topsoil with occasional brick and stone fragments (MADE GROUND)	0.20-0.30	J	
0.60-1.40		Yellow brown SAND and GRAVEL becoming more competent with depth, completely weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)	0.60	CBR	>14%
			1.20-1.30	B	
1.40-1.80		Yellow brown very sandy GRAVEL, gravel recovered as small tabular pieces, weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
1.80-2.10		Yellow brown sandy GRAVEL, gravel recovered as plate sized tabular pieces, weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
2.10		Trial terminated within the sandstone bedrock deposits.			

Shoring/Support:
Stability:



GENERAL REMARKS

Trial pit remained open and dry on completion.

All dimensions in metres Scale 1:37.5	Client CPD	Method/ Plant Used JCB 3CX	Logged By MWH

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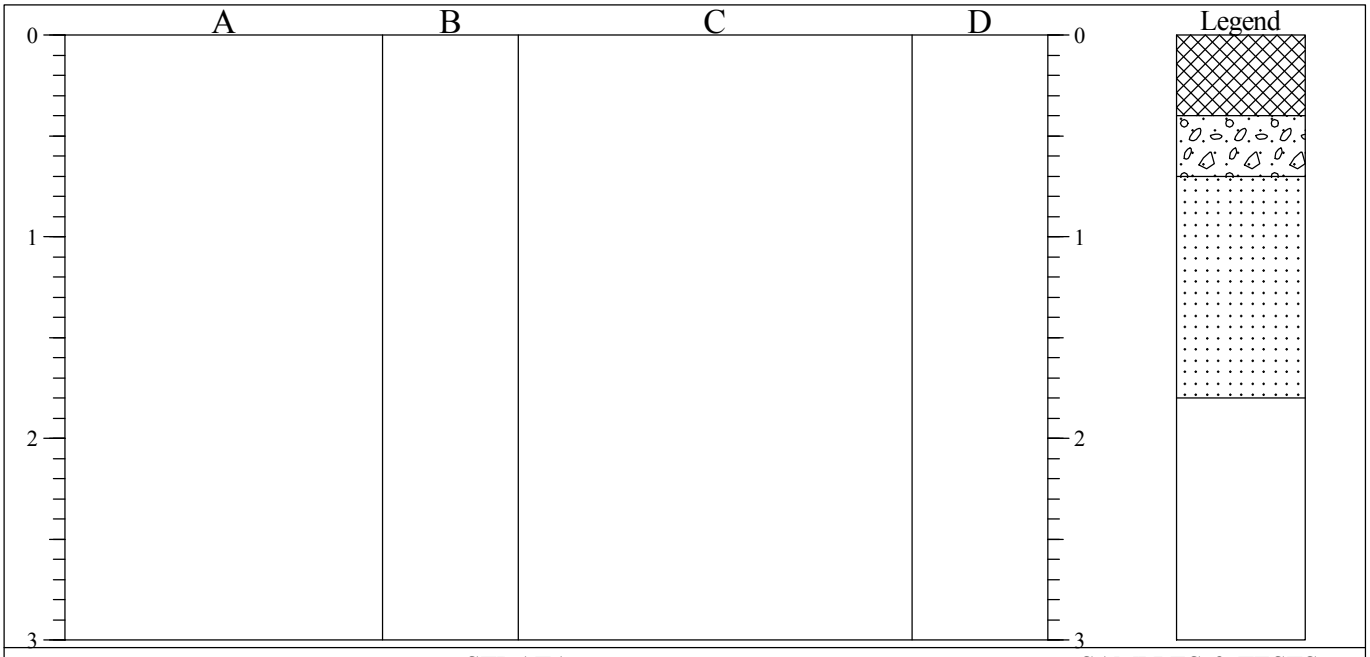
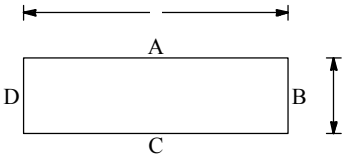
TRIAL PIT LOG

Project				TRIAL PIT No
The Kendray, Birk Avenue, Barnsley				**TP03**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Paving slabs over a sandy gravel, gravel of sandstone and brick (MADE GROUND)	0.10-0.30	J	
0.40-0.70		Yellow to orange brown slightly clayey SAND and GRAVEL, gravel recovered as small tabular pieces of SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)	0.40-0.50 0.50	B CBR	 14%
0.70-1.80		Yellow brown SAND and GRAVEL becoming more competent with depth, completely weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
1.80		Trial terminated within the sandstone bedrock deposits.			

Shoring/Support:
Stability:



GENERAL REMARKS

Trial pit remained open and dry on completion.

All dimensions in metres Scale 1:37.5	Client CPD	Method/ Plant Used JCB 3CX	Logged By MWH

AGS3 UK TP THE KENDRAY, BARNSLEY.GPJ GINT STD AGS 3_1.GDT 12/11/14

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TRIAL PIT LOG

Project				TRIAL PIT No
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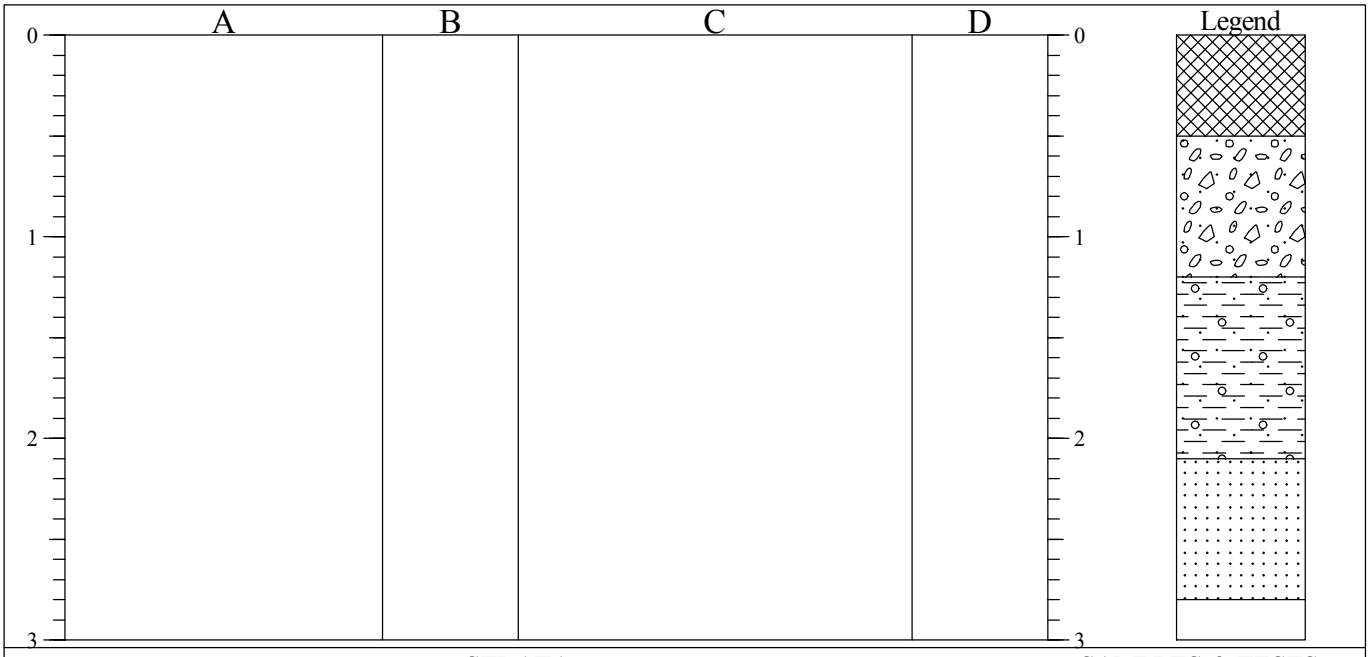
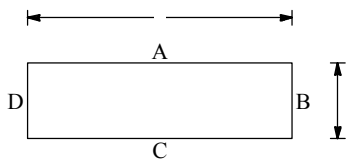
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		Dark brown to grey tospoil with gravel of stone ash, brick and slate (MADE GROUND)	0.20-0.30	J	
0.50-1.20		Yellow to orange brown sandy GRAVEL, noted as slightly clayey in places (RESIDUAL SOIL)	0.50	CBR	5%
			0.90-1.00	B	
1.20-2.10		Stiff grey mottled orange slightly sandy gravelly CLAY (RESIDUAL SOIL)	1.30	HSV	104kN/m^2
			1.40-1.50	B	
2.10-2.80		Yellow brown SAND and GRAVEL becoming more competent with depth and excavated in tabular pieces, completely weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
2.80		Trial terminated within the sandstone bedrock deposits.			

Shoring/Support:
Stability:



GENERAL REMARKS

Trial pit remained open and dry on completion.

All dimensions in metres Scale 1:37.5	Client CPD	Method/ Plant Used JCB 3CX	Logged By MWH

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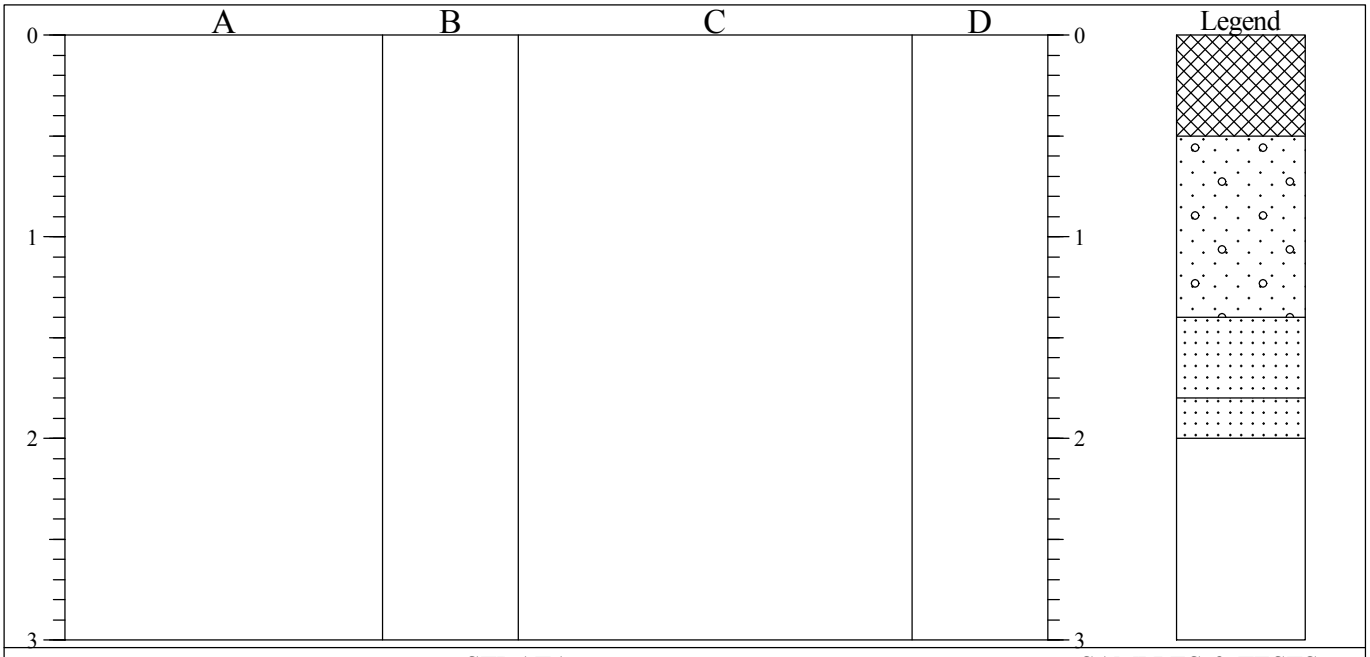
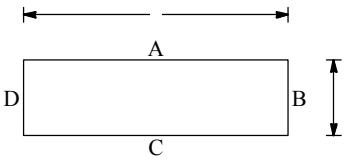
TRIAL PIT LOG

Project				TRIAL PIT No
The Kendray, Birk Avenue, Barnsley				**TP05**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
141008	09-11-14			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		Dark brown to grey tospoil with gravel of stone ash, brick and slate (MADE GROUND)			
			0.30-0.40	J	
0.50-1.40		Yellow to orange brown gravelly SAND. Gravel of sandstone (RESIDUAL SOIL)	0.50	CBR	5%
			0.70-0.80	B	
1.40-1.80		Yellow brown sandy GRAVEL, gravel recovered as small tabular pieces, completely weathered SANDSTONE (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
1.80-2.00		Orange brown weathered SANDSTONE, recovered as sandy tabular gravel (OAKS ROCK FORMATION - PENNINE MIDDLE COAL MEASURES)			
2.00		Trial terminated within the sandstone bedrock deposits.			

Shoring/Support:
Stability:



GENERAL REMARKS

Trial pit remained open and dry on completion.

All dimensions in metres Scale 1:37.5	Client CPD	Method/ Plant Used JCB 3CX	Logged By MWH

AGS3 UK TP THE KENDRAY, BARNSLEY.GPJ GINT STD AGS 3_1.GDT 12/11/14