APPENDIX V

Soil Mechanics Factual Reports for Stage 1 and Stage 2 Ground Investigations

Soil Mechanics

The UK's leading geotechnical specialists

Report No A7088

BARNSLEY MARKET

FACTUAL REPORT ON GROUND INVESTIGATION

Carried out for :	White Young Green Consulting Ltd
Engineer :	Wardell Armstrong LLP
Date :	November 2007

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BARNSLEY MARKET

FACTUAL REPORT ON GROUND INVESTIGATION

Report No: A7088

Date: November 2007

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1	November 2007	Report as submitted

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1 INTRODUCTION

During July 2007 Soil Mechanics (SM) were commissioned by Wardell Armstrong (WA), on behalf of White Young Green Consulting Limited, to carry out a ground investigation at Barnsley, South Yorkshire. The investigation was required to obtain geotechnical information for a proposed redevelopment.

The scope of the investigation, which was specified by WA, comprised cable percussion and rotary drilled boreholes, windowless sampling and laboratory testing. The investigation was carried out in accordance with the contract specification and relevant standards (see References). The fieldwork was carried out between 30 July 2007 and 24 August 2007.

This report presents the factual records of the fieldwork and laboratory testing with respect to the proposed redevelopment.

2 THE SITE AND GEOLOGY

2.1 The Site

Barnsley Market is situated within the town centre of Barnsley, see Site Location Plan in Enclosure E. The site is at National Grid reference SK 348 063

2.2 Published Geology

The published geological map covering the site, BGS Sheet 87 (1978) shows the underlying geology to be Middle Coal Measures of Upper Carboniferous age. BGS Sheet 87 does not indicate the presence of drift deposits suggesting that they are absent or, if present, very thin.

3 FIELDWORK

3.1 General

The fieldwork was carried out in general accordance with BS 5930 (1999) and Part 9 of BS 1377 (1990).

The exploratory hole locations were selected by WA. The locations were set out from local features. The co-ordinates and reduced levels, to National Grid and Ordnance Datum, were supplied by WA.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

SUMMARY OF EXPLORATORY HOLES

TYPE	QUANTITY	MAXIMUM DEPTH (m)	REMARKS
Cable Percussion Boring	3	6.32	
Cable Percussion Boring extended by Rotary Core Drilling/Open Hole Drilling	11	30.20	
Windowless Sampling	15	6.20	

The exploratory hole records are presented in Enclosure A and should be read in conjunction with the Key included therein. The records provide descriptions, in accordance with BS 5930 (1999), of the materials encountered and details of the samples taken, together with observations made during boring, drilling, and windowless sampling. The descriptions given for the recovered core were provided by WA. Photographs of the recovered cores are presented in Enclosure D.

On completion of the fieldwork all geotechnical samples were transported to the Doncaster laboratory of Soil Mechanics for temporary retention and testing. Geoenvironmental samples were retained by WA.

3.3 Instrumentation and Monitoring

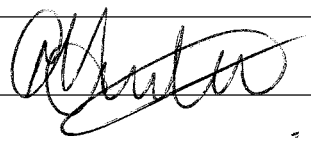
The instruments installed in the exploratory holes are shown on the logs and detailed in Enclosure B. No groundwater or gas monitoring was requested by WA.

4 LABORATORY TESTING

The testing was scheduled by WA and was carried out in accordance with BS 1377 (1990), ISRM (1981 and 1985). The testing is summarised below and the results are presented in Enclosure C.

SUMMARY OF GEOTECHNICAL LABORATORY TESTING

TYPE	REMARKS
Moisture Content Determination	
Atterberg Limit Determination	
Particle Size Distribution Analysis	
Consolidated Undrained Triaxial Compression Testing	
Unconsolidated Undrained Triaxial Compression Testing	
One Dimensional Oedometer Consolidation Testing	
Dry Density/Moisture Content Relationship	
Moisture Condition Value	
Point Load Index Test of Rock	
Uniaxial Compressive Strength of Rock	

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Approved for Issue By	

REFERENCES

AGS : 2005 : Electronic transfer of geotechnical and geoenvironmental data (Edition 3.1 including addendum May 2005). Association of Geotechnical and Geoenvironmental Specialists.

BGS England and Wales Sheet 87 : 1978 : Bradford. 1:50000 geological map (solid and drift). British Geological Survey

BS 1377 : 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930 : 1999 : Code of practice for site investigations. British Standards Institution.

ISRM : 1981 : Rock Characterisation, Testing and Monitoring - ISRM Suggested Methods (Ed E T Brown). Commission on Testing Methods, International Society for Rock Mechanics, Pergamon Press.

ISRM : 1985 : Suggested method for determining point load strength. Commission on Testing Methods, International Society for Rock Mechanics, International Journal of Rock Mechanics, Mining Sciences and Geomechanics Abstracts, Vol 22.

ENCLOSURE A
EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records	Key
Borehole Logs	BH101,102, 102A, 104,106, 106A, 108, 111, 112, and 114 to 118
Window Sampler Hole Logs	WS103,103A, 105, 105A, 107, 109, 110, 113, 119 to123, 123A, 124 and 125

Key to Exploratory Hole Records

Soil Mechanics

SAMPLES

Undisturbed

U	Driven tube sample
TW	Pushed thin wall tube sample } nominally 100 mm diameter and full recovery unless otherwise stated
P	Pushed piston sample
L	Liner sample (from Windowless or similar sampler), full recovery unless otherwise stated
CBR	CBR mould sample
BLK	Block sample
CS	Core sample (from rotary core) taken for laboratory testing
AMAL	Amalgamated sample

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample
	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

Comments Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that attempt was made to take a tube sample, however, there was no recovery.

Monitoring samples taken after completion of hole construction are not shown on the exploratory hole logs.

TESTS

SPT S or SPT C Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS 1377 : Part 9 (1990). The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 (either in total or for a single increment) the total blow count beyond the seating drive is given (without the N = prefix).

IV	*in situ* Vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Variable head permeability tests (KFH = falling head test, KRH = rising head test, KPI = packer test), permeability value
	Test results provided in Field Records column

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930 (1999)

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacings are presented. The term non-intact (NI) is used where the core is fragmented.

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss
NR	Not recovered

GROUNDWATER

▼	Groundwater strike
▽	Groundwater level after standing period

Key to Exploratory Hole Records

Soil Mechanics

INSTALLATION

Standpipe/ piezometer

Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:



SP Standpipe
SPIE Standpipe piezometer
PPIE Pneumatic piezometer
EPIE Electronic piezometer

Inclinometer or Slip Indicator

The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column at the base of the tubing:



ICE Biaxial inclinometer
ICM Inclinometer tubing for use with probe
SLIP Slip indicator

Settlement Points or Pressure Cells

The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.

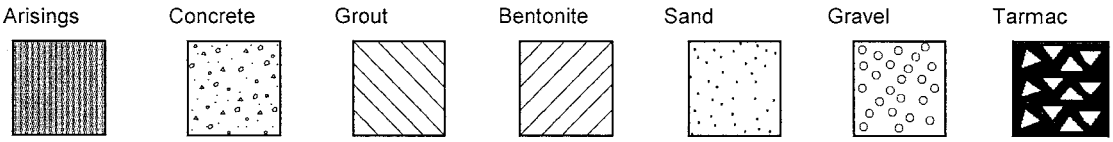
The type of instrument installed is indicated by a code in the Legend column:



ESET Electronic settlement cell/gauge
ETM Magnetic extensometer settlement point
EPCE Electronic embedment pressure cell
PPCE Electronic push in pressure cell

INSTALLATION LEGENDS

A legend describing the installation is shown in the rightmost column. Legends additional to BS5930 are used to describe the backfill materials as indicated below.



NOTES

1 Strata legends are in accordance with BS 5930 (1999).

2 Water level observations of discernible entries during the advancing of the exploratory hole are given at the foot of the log and in the Legend column. The term "none observed" is used where no discrete entries are identified although this does not necessarily indicate that the hole has not been advanced below groundwater level. Under certain conditions groundwater cannot be observed, for instance, drilling with water flush or overwater, or boring at a rate much faster than water can make its way into the borehole (ref BS5930 : 1999, Clause 47.2.7). In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

3 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs, however, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

4 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

5 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

6 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures

REFERENCES

BS 1377 : 1990 : British Standard Methods of test for soils for civil engineering purposes. British Standards Institution
BS 5930 : 1999 : Code of Practice for site investigations. British Standards Institution

Updated February 2007

Borehole Log

Soil Mechanics

Drilled PB/CS **Logged** CH **Checked** JH	**Start** 03/08/2007 **End** 24/08/2007	**Equipment, Methods and Remarks** Dando 150, Mobile Cable percussion boring. Rotary open hole drilling. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 2.00m / 150mm / 2.30m 2.00m / 26.60m / 121mm / 4.30m	**Ground Level** +94.17 mOD **Coordinates** E 434791.16 **National Grid** N 406209.48 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.10	ES 4			
0.50	ES 5			
1.00-1.45	SPT S	N=12 (1,2/2,3,3,4)		
1.00-1.45	D 1			
1.00	ES 6			
1.50-2.00	B 2			
2.00-2.30	SPT S	35 (2,6/15,20)		
2.00-2.30	D 3		03/08/2007 2.00	
			22/08/2007 2.00	0800
3.20-5.25	83 0 0			
5.25-9.75	60 0 0			
			22/08/2007 4.30	
			23/08/2007 4.30	0800

Strata

Description	Depth, *Level* / (Thickness)
TOPSOIL. (Foreman's description)	(0.30) 0.30 *+93.87*
Firm orange and grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone and brick. (MADE GROUND)	(2.00)
1.50 m becoming sandy	
Firm to stiff brown gravelly CLAY. Gravel is angular fine to coarse of brick, coal, sandstone, mudstone and timber. (MADE GROUND)	2.30 *+91.87* (2.95)
Very weak brown to grey shaley MUDSTONE recovered as gravelly clay.	5.25 *+88.92* (1.50)
Weak grey to orange MUDSTONE recovered as gravelly clay.	6.75 *+87.42* (1.50)
No recovery.	8.25 *+85.92*
Weak grey MUDSTONE recovered as gravelly clay.	(0.30) 8.55 *+85.62* (1.20)
	9.75 *+84.42*
Stratum continues to 10.28 m	

Legend | Backfill/ Instruments

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
2.30	3.20	Open Hole Drilling
2.30		Cable percussion refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
2.00 -2.10	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH101

Borehole Log

Soil Mechanics

Drilled PB/CS **Logged** CH **Checked** JH	**Start** 03/08/2007 **End** 24/08/2007	**Equipment, Methods and Remarks** Dando 150, Mobile Cable percussion boring. Rotary open hole drilling. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 2.00m / 150mm / 2.30m 2.00m / 26.60m / 121mm / 4.30m	**Ground Level** +94.17 mOD **Coordinates** E 434791.16 **National Grid** N 406209.48 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.75-14.15	72 26 11				
12.93-13.05			CS 7		
14.95-15.12			Flush: 3.20-26.60 , 100 % CS 8		
14.15-17.25	97 54 39				
16.63-16.73			CS 9		
18.35-18.75			CS 10		
17.25-20.05	101 61 54				
19.50-19.72			CS 11		
19.95-20.10			CS 12		

Strata

Description (Continued from Sheet 1)		Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Very weak grey MUDSTONE recovered as gravelly clay.		(0.53)		
		10.28 *+83.89*		
Weak to moderately weak black shaley COAL recovered as gravel.		(1.17)		
		11.45 *+82.72*		
Moderately weak grey MUDSTONE with organic remains.	13.32 m subhorizontally fractured 13.63-13.72 m 35 deg subhorizontally fractured 13.95-14.02 m gravelly clay	(2.70)		
		14.15 *+80.02*		
Weak grey to black interbedded (thinly laminated) MUDSTONE/COAL recovered as stiff gravelly clay.	14.10-14.21 m subvertically fractured (drilling induced?)	(0.45)		
		14.60 *+79.57*		
Weak grey MUDSTONE. Contains organic remains.	15.35-16.15 m fractured subhorizontally 16.30-16.49 m fractured subvertically	(2.65)		SP
	17.15-17.25 m fractured subvertically (drilling induced?)	17.25 *+76.92*		
Very weak to weak grey MUDSTONE.		(0.79)		
	17.98-18.04 m gravelly clay with a shaley mudstone horizon	18.04 *+76.13*		
Moderately weak to moderately strong pale grey to black (thickly laminated) interbedded MUDSTONE/SILTSTONE.		(2.01)		
	19.18-19.45 m moderately spaced subhorizontal undulating smooth discontinuities			
Stratum continues to 20.05 m				

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH101

Borehole Log

Soil Mechanics

Drilled PB/CS **Logged** CH **Checked** JH	**Start** 03/08/2007 **End** 24/08/2007	**Equipment, Methods and Remarks** Dando 150, Mobile Cable percussion boring. Rotary open hole drilling. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 2.00m / 150mm / 2.30m 2.00m / 26.60m / 121mm / 4.30m	**Ground Level** +94.17 mOD **Coordinates** E 434791.16 **National Grid** N 406209.48 **Chainage**			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
20.47-20.58			CS 13		
20.05-22.75	89 46 31			23/08/2007 4.30	
21.63-21.75			CS 14	24/08/2007 4.30	0800
23.24-23.36			CS 15		
22.75-25.10	110 19 0				
25.61-25.77			CS 16		
25.10-26.60 25.93-26.30	100 93 63		CS 17		
				24/08/2007 4.30	

Strata

Description (Continued from Sheet 2)		Depth, *Level* / (Thickness)
Moderately weak to moderately strong pale grey to black (thickly laminated) interbedded MUDSTONE/SILTSTONE.		20.05 *+74.12*
Moderately weak pale grey interbedded MUDSTONE/SILTSTONE. Medium spaced, subhorizontal, planar smooth black discontinuities.	20.68-20.75 m subvertical concave smooth fracture (drilling induced?)	(1.50)
Weak to moderately weak dark grey to black MUDSTONE.		21.55 *+72.62*
	22.43-22.52 m silty gravelly clay	(2.05)
	23.00-23.10 m subvertically fractured at approximately 80 deg	
Weak dark grey shaley MUDSTONE.		23.60 *+70.57*
	23.80-23.90 m gravelly silty clay	(0.35)
Moderately weak to moderately strong black COAL.	24.05-24.20 m occasional closely spaced subhorizontal planar vitreous discontinuities recovered as gravel	23.95 *+70.22* (0.31) 24.26 *+69.91*
Very weak to weak shaley MUDSTONE recovered as gravelly silty clay. Contains organic matter possible seat earth.		24.50 *+69.67* 24.70 *+69.47* 24.80 *+69.37*
Moderately weak grey MUDSTONE.		24.90 *+69.27*
Weak black shaley COAL recovered as gravelly clay with some vitreous fragments.		25.10 *+69.07*
Moderately weak to moderately strong dark grey MUDSTONE.		(1.50)
Weak to moderately weak black COAL recovered as gravel and cobbles.		
Moderately weak to moderately strong grey to black MUDSTONE.	26.40-26.60 m silty gravelly clay	26.60 *+67.57*
EXPLORATORY HOLE ENDS AT 26.60 m		

Legend / Backfill/Instruments

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH101

Borehole Log

Soil Mechanics

Drilled PB **Logged** CH **Checked** JH	**Start** 03/08/2007 **End** 03/08/2007	**Equipment, Methods and Remarks** Cable percussion boring	**Depth from to Diameter Casing Depth**	**Ground Level** +94.99 mOD **Coordinates** E 434743.36 **National Grid** N 406240.53 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			03/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Monoblock Paving. (MADE GROUND)	0.05 *+94.94*		
CONCRETE AND BRICK. (MADE GROUND) (Foreman's description)	(0.65)		
EXPLORATORY HOLE ENDS AT 0.70 m	0.70 *+94.29*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.40	Hand excavated inspection pit.
0.40		Inspection pit terminated due to refusal at hard stratum.
0.70		Hole terminated due to refusal at hard stratum (concrete)

Chiselling

Depths (m)	Time	Tools used
0.40 -0.70	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH102

Sheet 1 of 1

Borehole Log

Soil Mechanics

Drilled PC/CS **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 20/08/2007	**Equipment, Methods and Remarks** Dando 2000 Cable percussion boring. Rotary core drilling (PWF size) using water flush. Rotary open hole drilling. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 1.75m / 150mm / 1.50m 1.75m / 30.00m / 121mm / 3.20m	**Ground Level** +94.99 mOD **Coordinates** E 434743.48 **National Grid** N 406242.59 **Chainage**	

Samples and Tests

Depth	Type & No	If	Records	Date Casing	Time Water
0.00-1.50	B 4				
0.20	D 1				
0.50	D 2				
0.50	ES 2A				
1.00	D 3				
1.00	ES 3A				
				13/08/2007 1.50	
				16/08/2007 1.50	0800 1.60
3.20-5.50	96 0 0				
5.50-8.50	103 3 0				
9.60-9.80			CS 5		

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Monoblock Paving. (MADE GROUND) (Foreman's description)	0.05 *+94.94*		
Yellow and cream angular fine to coarse GRAVEL of limestone. (MADE GROUND)	0.20 *+94.79*		
	(1.20)		
Brown sandy subangular fine to medium GRAVEL of brick, mudstone and sandstone. (MADE GROUND)	1.40 *+93.59*		
Wood sleeper. (MADE GROUND) (Foreman's description)	1.60 *+93.39*		
CONCRETE. (Foreman's description)	1.75 *+93.24*		
Firm brown to red silty gravelly CLAY. Gravel of brick and sandstone. (MADE GROUND)	(1.91)		
Firm to stiff brown to grey SILTY CLAY.	3.66 *+91.33*		
	(0.54)		
Firm to stiff brown to orange SILTY CLAY. Gravel of iron stained weak sandstone. 4.20-4.35 m gravelly clay band; 4.54-4.58 m gravelly clay band; 4.66-4.74 m gravelly clay band; 4.83-4.88 m gravelly clay band	4.20 *+90.79*		
	(1.22)		
Soft to firm grey to black silty gravelly CLAY. 5.14-5.20 m gravelly clay band; 5.76-5.85 m recovered as subrounded cobbles; 5.96-6.04 m shaley coal; 6.12-6.19 m shaley coal; 6.28-6.33 m shaley coal	5.42 *+89.57*		
	(1.30)		
Weak to moderately strong grey brown MUDSTONE. 7.98-8.06 m approximately 45 deg fracture (drilling induced?)	6.72 *+88.27*		
	(1.78)		
Moderately weak grey interbedded (thickly laminated) MUDSTONE/SILTSTONE. 8.76-8.81 m recovered as gravelly clay; 9.21-9.49 m recovered as gravelly clay	8.50 *+86.49*		
	(1.13)		
Weak to moderately weak grey to black weak black shaley coal; 9.57-9.63 m	9.63 *+85.36*		
Stratum continues to 11.50 m			

Depth | **TCR SCR RQD** | **If** | **Records/Samples** | **Date Casing** | **Time Water**

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
1.65	3.20	Rotary open hole drilling
1.75		Cable percussion refusal at hard stratum (concrete)

Chiselling

Depths (m)	Time	Tools used
1.40 -1.50	60 mins	
1.60 -1.70	60 mins	
1.70 -1.75	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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408.24 20/11/2007 16:39:15

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH102A

Borehole Log

Soil Mechanics

Drilled PC/CS **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 20/08/2007	**Equipment, Methods and Remarks** Dando 2000 Cable percussion boring. Rotary core drilling (PWF size) using water flush. Rotary open hole drilling. Environmental soil samples recovered by Wardell Armstrong.	**Depth from / to / Diameter / Casing Depth** 0.00m / 1.75m / 150mm / 1.50m 1.75m / 30.00m / 121mm / 3.20m	**Ground Level** +94.99 mOD **Coordinates** E 434743.48 **National Grid** N 406242.59 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
8.50-11.50 10.15-10.38	100 49 44		CS 6	16/08/2007 3.20	 2.40
11.60-11.96			CS 7	17/08/2007 3.20	0800 2.40
11.50-14.50	97 50 37				
14.50-18.20	76 5 0		Flush: 3.20-30.00 , 100 %		
18.81-18.93			CS 8		
18.20-20.50	120 51 38				
19.96-20.10			CS 9		

Strata

Description (Continued from Sheet 1)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
MUDSTONE. Widely spaced black subhorizontal smooth undulating discontinuities. 10.45-10.52 m closely spaced subhorizontal fractures (drilling induced?) 10.73-10.78 m recovered as gravelly clay 11.30-11.35 m recovered as gravelly clay	(1.87)		
Moderately strong grey interbedded (thinly laminated) MUDSTONE/SILTSTONE.	11.50 *+83.49* (0.94)		
Weak dark grey MUDSTONE. 12.80-12.97 m recovered as gravelly clay 13.48-13.62 m recovered as gravelly clay with black organic laminations 13.67-13.76 m recovered as gravelly clay with black organic laminations	12.44 *+82.55* (2.06)		
Weak grey MUDSTONE recovered as gravelly clay. 14.95-15.09 m Black organic rich laminations	14.50 *+80.49* (1.34)		SP
Moderately strong pale grey to black interbedded (thickly laminated) MUDSTONE and COAL recovered as gravel.	15.84 *+79.15* (0.86)		
Weak black to dark grey shaley MUDSTONE recovered as gravel. 17.37-17.44 m with intact core	16.70 *+78.29* (1.15)		
Very weak grey to brown interbedded MUDSTONE/SILTSTONE. 18.05-18.16 m subvertical fracture (drilling induced?)	17.85 *+77.14* (0.35)		
Moderately weak to moderately strong grey to dark grey very thinly interbedded MUDSTONE/SILTSTONE. 19.27-19.40 m recovered as gravelly clay 19.60-19.67 m recovered as gravelly clay	18.20 *+76.79* (2.30)		
Stratum continues to 20.50 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:39:16

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH102A

Borehole Log

Soil Mechanics

Drilled PC/CS **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 20/08/2007	**Equipment, Methods and Remarks** Dando 2000 Cable percussion boring. Rotary core drilling (PWF size) using water flush. Rotary open hole drilling. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 1.75m / 150mm / 1.50m 1.75m / 30.00m / 121mm / 3.20m	**Ground Level** +94.99 mOD **Coordinates** E 434743.48 **National Grid** N 406242.59 **Chainage**			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				17/08/2007 3.20	4.00
				20/08/2007 3.20	0800 4.00
20.50-23.50	97 40 8				
24.21-24.31			CS 10		
23.50-26.55	102 14 4				
26.55-28.60 27.65-27.82	109 30 12		CS 11		
28.93-29.24			CS 12		
28.60-30.00	69 67 56				
				20/08/2007 3.20	3.90

Strata

Description (Continued from Sheet 2)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Moderately weak to moderately strong grey to dark grey very thinly interbedded MUDSTONE/SILTSTONE.			
20.33-20.42 m subvertical fracture (drilling induced?)			
Weak dark grey MUDSTONE.	20.50 *+74.49*		
20.50-20.91 m recovered as gravelly clay 21.15-21.20 m recovered as gravelly clay 21.60-21.72 m closely spaced subhorizontal planar smooth discontinuities 21.80-21.83 m recovered as gravelly clay 22.20-22.38 m loss of core 22.84-22.90 m recovered as gravelly clay	(3.00)		
Weak to moderately weak dark grey to black interbedded SILTSTONE/MUDSTONE.	23.50 *+71.49*		
23.50-23.97 m recovered as gravelly clay 24.01-24.11 m subvertical fractures 24.29-24.52 m subvertical fractures 24.69-24.97 m recovered as gravelly clay 25.22-25.29 m subvertical fractures 26.00-26.05 m recovered as gravelly clay 26.24-26.60 m recovered as gravelly clay	(3.10)		
Weak to moderately weak black shaley COAL recovered as gravelly clay.	26.60 *+68.39*		
	(0.87)		
Very weak grey MUDSTONE recovered as gravelly clay.	27.47 *+67.52*		
Weak to moderately weak grey MUDSTONE.	27.67 *+67.32*		
27.82-28.09 m recovered as gravelly clay			
	(2.33)		
EXPLORATORY HOLE ENDS AT 30.00 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH102A

Borehole Log

Soil Mechanics

Drilled PC/CJ **Logged** CH **Checked** JH	**Start** 14/08/2007 **End** 22/08/2007	**Equipment, Methods and Remarks** Dando 2000. Berretta T44. Cable percussion boring. Rotary core drilling (PWF size) using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 5.00m / 150mm / 5.00m 5.00m / 30.00m / 121mm / 5.00m	**Ground Level** +95.29 mOD **Coordinates** E 434730.57 **National Grid** N 406287.81 **Chainage**			

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 4			
0.20	D 1			
0.50	D 2			
0.50	ES 2A			
1.00	D 3			
1.20-1.65	SPT S	N=15 (4,3/3,5,4,3)		
1.20-1.65	D 5			
1.20-1.70	B 6			
1.40	ES 6A			
2.00-2.45	SPT S	N=9 (2,2/2,2,2,3)		
2.00-2.45	D 7			
2.00-2.50	B 8			
3.00-3.45	U 9	67 blows		
3.20	ES 9A			
3.50	D 10			
4.00-4.45	D 11			
4.00-4.50	B 12			
4.60	D 13			
4.70-5.00	D 14		14/08/2007 5.00	
6.40 5.00-8.00	97 11 0	ES 15	21/08/2007 5.00	0800 3.10
8.00-11.00 9.70	100 7 0	ES 16		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, *Level* (Thickness)
FLAGSTONE. (MADE GROUND)	0.05 *+95.24* 0.20 *+95.09*
CONCRETE. (Foreman's description)	(0.90)
Brown very sandy (ash) GRAVEL. Gravel is angular to subangular fine to coarse of brick. (MADE GROUND)	1.10 *+94.19*
Medium dense becoming loose black and brown very silty very gravelly SAND (ash). Gravel is subangular fine to coarse of brick and sandstone. (MADE GROUND)	(1.60)
Soft brown and grey slightly sandy SILT/CLAY. Slight hydrocarbon odour.	2.70 *+92.59* (0.50)
Stiff grey and green gravelly CLAY. Gravel is subangular fine to medium of mudstone. (Weathered MUDSTONE)	3.20 *+92.09* (1.80)
Weak orange to grey interbedded (thickly laminated) medium grained SANDSTONE/MUDSTONE recovered as gravelly clay.	5.00 *+90.29* (1.23)
6.11-6.15 m shaley coal horizon	
Weak to moderately weak grey to orange MUDSTONE. Medium spaced, subhorizontal, black planar smooth discontinuities. Strong hydrocarbon odour. 6.50-7.06 m recovered as gravelly clay 7.60-8.00 m recovered as gravelly clay	6.23 *+89.06* (1.77)
Weak grey MUDSTONE. Strong hydrocarbon odour.	8.00 *+87.29* (2.02)
9.75-9.86 m recovered as	
Stratum continues to 10.02 m	

Legend: SP

Backfill/Instruments

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
5.00		Cable percussion refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
4.60 -4.70	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH104

Borehole Log

Soil Mechanics

Drilled PC/CJ **Logged** CH **Checked** JH	**Start** 14/08/2007 **End** 22/08/2007	**Equipment, Methods and Remarks** Dando 2000. Berretta T44. Cable percussion boring. Rotary core drilling (PWF size) using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 5.00m / 150mm / 5.00m 5.00m / 30.00m / 121mm / 5.00m	**Ground Level** +95.29 mOD **Coordinates** E 434730.57 **National Grid** N 406287.81 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
11.40			ES 17		
11.00-14.00	83 0 0				
14.00-17.00 15.69-15.96	90 28 0		CS 18		
17.20-17.70			CS 19 Flush: 5.00-30.00 water, 100 %		
17.00-20.00 18.71-18.93	100 55 48		CS 20		

Strata

Description (Continued from Sheet 1)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Weak grey MUDSTONE. Strong hydrocarbon odour. :: 9.75m - gravelly clay	10.02 *+85.27*		
Weak to moderately weak grey MUDSTONE. 10.50-10.75 m interbedded with moderately strong sandy mudstone	(1.10)		
11.00-11.70 m recovered as soft silty clay Weak grey MUDSTONE recovered as gravelly clay.	11.12 *+84.17*		
	(1.38)		
Very weak to weak dark grey to black shaley MUDSTONE.	12.50 *+82.79*		
	(0.70)		
Weak to moderately weak black COAL with medium spaced subhorizontal steeped striated vitreous discontinuities.	13.20 *+82.09*		
	(0.60)		
Weak grey shaley MUDSTONE. 13.80-14.30 m gravelly clay 14.50-16.65 m gravelly clay 15.10-15.20 m gravelly clay 15.40-15.50 m gravelly clay 15.90-16.00 m subvertically fractured (drilling induced?) 15.95-16.15 m gravelly clay	13.80 *+81.49*		
	(3.20)		
Moderately weak grey to brown interbedded (thinly laminated) fine grained SANDSTONE/SILTSTONE/MUDSTONE subhorizontal undulating, smooth, discontinuities. 17.70-17.80 m fractured approximately 30 deg (drilling induced?) 18.40-18.50 m recovered as cobbles	17.00 *+78.29*		
	(2.00)		
Weak grey MUDSTONE. 19.15-19.20 m shaley mudstone band 19.30-19.38 m shaley mudstone band 19.46-19.54 m shaley mudstone	19.00 *+76.29*		
Stratum continues to 22.40 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:39:23

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH104

Borehole Log

Soil Mechanics

Drilled PC/CJ **Logged** CH **Checked** JH	**Start** 14/08/2007 **End** 22/08/2007	**Equipment, Methods and Remarks** Dando 2000. Berretta T44. Cable percussion boring. Rotary core drilling (PWF size) using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 5.00m / 150mm / 5.00m 5.00m / 30.00m / 121mm / 5.00m	**Ground Level** +95.29 mOD **Coordinates** E 434730.57 **National Grid** N 406287.81 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
20.00-23.00	100 16 0			21/08/2007 5.00	0.00
				22/08/2007 5.00	0800 3.95
24.05-24.37			CS 21		
23.00-26.00	93 34 30				
25.10-25.32			CS 22		
26.28-26.45			CS 23		
26.00-29.00 27.50-27.85	89 40 39		CS 24		
28.80-29.00			CS 25		
29.46-29.69 29.00-30.00	95 73 45		CS 26		
				22/08/2007 5.00	0.00

Strata

Description (Continued from Sheet 2)	Depth, *Level* (Thickness)
Weak grey MUDSTONE. band 20.00-20.40 m shaley mudstone band 20.80-20.90 m shaley mudstone band 22.30-22.40 m gravel	(3.40)
Weak to moderately weak black COAL recovered as gravel.	22.40 *+72.89* (0.35)
Moderately weak pale grey SEAT EARTH of firm silty clay with occasional gravel of coal and organic matter.	22.75 *+72.54*
Weak grey shaley MUDSTONE recovered as gravelly clay.	23.00 *+72.29* (0.76)
Moderately weak to moderately strong MUDSTONE. 24.90-25.00 m gravelly clay 25.00-25.20 m subvertical fracture 25.45-25.60 m subvertical fracture 25.75-25.80 m shaley mudstone	23.76 *+71.53* (2.24)
Weak to moderately weak dark grey MUDSTONE. 26.94-27.00 m gravelly clay 27.05-27.20 m gravelly clay 28.10-28.20 m gravelly clay 28.30-30.00 m closely spaced subhorizontal black smooth planar discontinuities	26.00 *+69.29* (4.00)
EXPLORATORY HOLE ENDS AT 30.00 m	

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH104

Borehole Log

Soil Mechanics

Drilled PB **Logged** CH **Checked** JH	**Start** 01/08/2007 **End** 06/08/2007	**Equipment, Methods and Remarks** Dando 150 Cable percussion boring. Rotary open hole drilling.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 1.50m / 150mm / 1.50m 1.50m / 2.60m / 121mm / 2.60m	**Ground Level** +96.14 mOD **Coordinates** E 434711.02 **National Grid** N 406246.10 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.30-0.70	D 1			
			01/08/2007 2.60	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
MONOBLOCK PAVING. (MADE GROUND)	0.05 *+96.09* 0.20 *+95.94*		
Hardcore. (Foreman's description) (MADE GROUND)	(0.50) 0.70 *+95.44*		
Brick and clay FILL. (MADE GROUND) (Foreman's description)	(0.90) 1.60 *+94.54*		
CONCRETE. (MADE GROUND) (Foreman's description)			
Brick and rubble. (MADE GROUND) (Foreman's description)	(1.00) 2.60 *+93.54*		
EXPLORATORY HOLE ENDS AT 2.60 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)	
0.00	0.70	Hand excavated inspection pit.
0.70		Inspection pit terminated due to refusal at hard stratum.
1.70		Cable percussion refusal due to hard stratum
2.60		Hole terminated due to possible service strike

Chiselling

Depths (m)	Time	Tools used
0.70 -1.10	120 mins	
1.10 -1.50	120 mins	
1.55 -1.60	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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408.24 20/11/2007 16:39:29

Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH106

Sheet 1 of 1

Borehole Log

Soil Mechanics

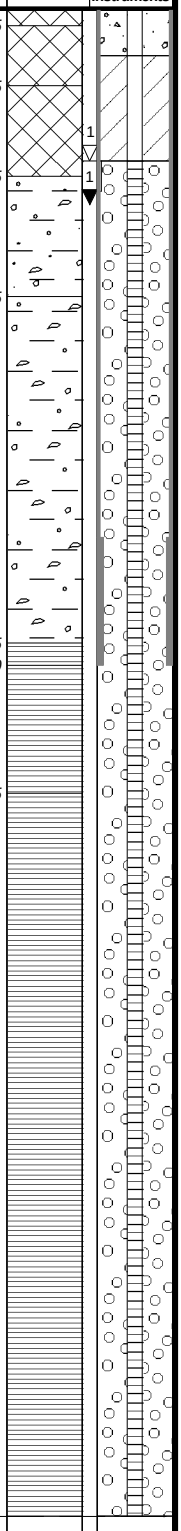
Drilled PC/CJ **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 23/08/2007	**Equipment, Methods and Remarks** Dando 2000. Mobile Cable percussion boring. Rotary open hole drilling using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 4.35m / 150mm / 3.50m 4.35m / 30.00m / 115mm / 4.35m	**Ground Level** +96.15 mOD **Coordinates** E 434708.70 **National Grid** N 406253.10 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 4			
0.20	D 1			
0.50	D 2			
0.50	ES 2A			
1.00	D 3			
1.00	ES 3A			
1.20-1.65	SPT S	N=6 (1,1/1,2,1,2)		
1.20-1.65	D 5			
1.20-1.70	B 6			
2.00-2.45	SPT S	N=16 (3,4/3,3,5,5)		
2.00-2.45	D 7			
2.00-2.50	B 8			
3.00-3.45	U 9	98 blows		
3.50	D 10			
3.90-4.35	SPT S	N=50 (9,15/14,16,18,2)		
3.90-4.10	D 12			
4.20-4.35	SPT S	50 (10,15 for 20mm/ 50 for 50mm)	13/08/2007 3.50	
4.20	D 11			
4.20-4.35	D 13		23/08/2007 3.50	0800

Strata

Description	Depth, *Level* (Thickness)
Monoblock Paving. (MADE GROUND)	0.10 *+96.05*
	(0.40)
Brick rubble FILL. (Foreman's description) (MADE GROUND)	0.50 *+95.65*
	(0.60)
Brown sandy GRAVEL. Gravel is angular to subangular fine to medium of brick, concrete and sandstone. Slight hydrocarbon odour. (MADE GROUND)	1.10 *+95.05*
	(0.80)
Soft to firm brown slightly sandy gravelly CLAY, locally silt. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.	1.90 *+94.25*
Soft becoming firm to stiff grey and green very gravelly CLAY. Gravel is subangular fine to medium of mudstone. (Weathered MUDSTONE)	
	(2.30)
Very weak grey and green thinly laminated MUDSTONE. Recovered as angular to subangular fine to medium gravel. (Weathered MUDSTONE)	4.20 *+91.95*
Brown grey MUDSTONE (Foreman's description)	4.35 *+91.80*
	(0.85)
Weak light grey MUDSTONE (Foreman's description)	5.20 *+90.95*
	(6.90)
Stratum continues to 12.10 m	



Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.20	Rose to 1.00 m after 20 minutes.	-

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
3.50	30.00	Open Hole Drilling
4.35		Cable percussion refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
2.80 -3.00	30 mins	
3.90 -4.20	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:39:31

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH106A

Borehole Log

Soil Mechanics

Drilled PC/CJ **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 23/08/2007	**Equipment, Methods and Remarks** Dando 2000. Mobile Cable percussion boring. Rotary open hole drilling using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 4.35m / 150mm / 3.50m 4.35m / 30.00m / 115mm / 4.35m	**Ground Level** +96.15 mOD **Coordinates** E 434708.70 **National Grid** N 406253.10 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water

Strata

Description (Continued from Sheet 1)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Weak light grey MUDSTONE (Foreman's description)			
	12.10 *+84.05*		
COAL (Foreman's description)	(0.30)		
	12.40 *+83.75*		
Grey MUDSTONE (Foreman's description)	(0.80)		
	13.20 *+82.95*		
COAL (Foreman's description)	(0.80)		
	14.00 *+82.15*		
Weak light grey MUDSTONE (Foreman's description)	(1.50)		
	15.50 *+80.65*		
Hard grey SILTSTONE with some soft bands. (Foreman's description)			SP
Stratum continues to 30.00 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH106A

Borehole Log

Soil Mechanics

Drilled PC/CJ **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 23/08/2007	**Equipment, Methods and Remarks** Dando 2000. Mobile Cable percussion boring. Rotary open hole drilling using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 4.35m / 150mm / 3.50m 4.35m / 30.00m / 115mm / 4.35m	**Ground Level** +96.15 mOD **Coordinates** E 434708.70 **National Grid** N 406253.10 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			23/08/2007	3.50

Strata

Description (Continued from Sheet 2)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Hard grey SILTSTONE with some soft bands. (Foreman's description)	(14.50)		
EXPLORATORY HOLE ENDS AT 30.00 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH106A

Borehole Log

Soil Mechanics

Drilled PB/DS **Logged** CH **Checked** JH	**Start** 17/08/2007 **End** 20/08/2007	**Equipment, Methods and Remarks** Dando 150/Comachio Cable percussion boring. Rotary open hole drilling. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 1.30m / 150mm / 1.30m 1.30m / 29.60m / 121mm / 2.00m	**Ground Level** +91.14 mOD **Coordinates** E 434676.95 **National Grid** N 406300.03 **Chainage**	

Samples and Tests / Strata

Depth	Type & No	Records	Date Casing	Time Water	Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
					CONCRETE. (Foreman's description)	(0.50)		
0.40	ES 3					0.50 *+90.64*		
					COAL. (Foreman's description)	0.70 *+90.44*		
						(0.30)		
1.00-1.30	SPT S	50 (10,20/25,25)			Very weak dark grey angular to subangular fine to medium GRAVEL of mudstone. (Weathered MUDSTONE)	1.00 *+90.14*		
1.00-1.30	D 1		02/08/2007			(0.30)		
1.00-1.30	B 2					1.30 *+89.84*		
			17/08/2007	0800 dry	Very weak vitreous COAL recovered as angular fine to medium gravel.			
					Weak grey to orange interbedded (thickly laminated) MUDSTONE/SILTSTONE recovered as gravelly clay. Iron staining on close, subhorizontal, smooth planar discontinuities.	(1.81)		
2.00-4.25	87 21 6				Very weak to weak grey MUDSTONE. 3.17-3.21 m medium spaced shaley mudstone lamination	3.11 *+88.03*		
						(0.51)		
					Weak grey to black MUDSTONE.	3.62 *+87.52*		
					3.92-3.98 m medium spaced shaley mudstone lamination	(0.63)		
					Weak to moderately weak interbedded (thickly laminated) IRONSTONE/MUDSTONE.	4.25 *+86.89*		
4.69-4.88		CS 4						
					5.01-5.15 m cobbles	(1.50)		
5.34-5.55		Flush: 2.00-8.60 water, 100 % CS 5						
4.25-6.90	85 41 25					5.75 *+85.39*		
					No recovery.	(0.85)		
					Weak to moderately weak grey MUDSTONE. 6.60-6.90 m gravelly clay	6.60 *+84.54*		
						(0.30)		
					Moderately weak dark grey MUDSTONE.	6.90 *+84.24*		
			17/08/2007 2.00	0.60				
					7.34-7.49 m gravelly clay			
			18/08/2007 2.00	0800 1.90				
6.90-8.60	129 87 9				7.95-8.19 m gravelly clay	(2.47)		
					Moderately strong black shaley MUDSTONE.	9.37 *+81.77*		
					Moderately weak to moderately strong	9.57 *+81.57*		
					Stratum continues to 11.45 m			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)	
0.00	0.50	9' concrete coring
1.30	2.00	Rotary open hole drilling
1.30		Cable percussion refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
1.00 -1.30	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH108

Borehole Log

Soil Mechanics

Drilled PB/DS **Logged** CH **Checked** JH	**Start** 17/08/2007 **End** 20/08/2007	**Equipment, Methods and Remarks** Dando 150/Comachio Cable percussion boring. Rotary open hole drilling. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 1.30m / 150mm / 1.30m 1.30m / 29.60m / 121mm / 2.00m	**Ground Level** +91.14 mOD **Coordinates** E 434676.95 **National Grid** N 406300.03 **Chainage**			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
8.60-12.50	79 27 18				
12.00-12.15			CS 6		
12.84-13.21			CS 7		
12.50-15.30	100 68 45			18/08/2007 2.00	1.05
				19/08/2007 2.00	0800 1.95
15.20-15.34	48		CS 8		
12.30-18.35	42 14				
			Flush: 8.60-23.75 water, 90 %		
16.48-16.75			CS 9		
16.86-17.04			CS 10		
18.35-21.40	79 56 35				

Strata

Description (Continued from Sheet 1)

grey to black shaley MUDSTONE recovered as gravelly clay.

(1.88)

11.45 +79.69

11.45-11.87 m gravelly clay

Moderately weak to moderately strong pale grey to grey sandy MUDSTONE contains organic remains

(1.05)

12.50 +78.64

Moderately strong pale grey MUDSTONE.

14.40-14.54 m subvertically fractured

15.00-15.10 m gravelly clay

(5.85)

15.99-16.09 m gravelly clay

16.33-16.48 m gravelly clay

18.35 +72.79

No recovery.

(1.50)

19.85 +71.29

Stratum continues to 29.60 m

Depth, *Level* / (Thickness)	Legend	Backfill/ Instruments
		SP

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH108

Borehole Log

Soil Mechanics

Drilled PB/DS **Logged** CH **Checked** JH	**Start** 17/08/2007 **End** 20/08/2007	**Equipment, Methods and Remarks** Dando 150/Comachio Cable percussion boring. Rotary open hole drilling. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 1.30m / 150mm / 1.30m 1.30m / 29.60m / 121mm / 2.00m	**Ground Level** +91.14 mOD **Coordinates** E 434676.95 **National Grid** N 406300.03 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
20.75-20.90			CS 11		
				19/08/2007 2.00	
				20/08/2007 2.00	0800 1.90
21.40-23.75	106 67 36				
23.15-23.35			CS 12		
23.75-26.75	66 57 46				
26.50-26.75			CS 13 Flush: 23.75-29.60 water, 70 %		
26.75-29.60 28.28-28.72	105 79 76		CS 14		
				20/08/2007 2.00	1.00

Strata

Description (Continued from Sheet 2)

Moderately strong to strong pale brown to grey fine to medium grained SANDSTONE. Widely to closely spaced black, subhorizontal planar smooth discontinuities.

20.39 m fractured subhorizontally
20.45 m fractured subhorizontally
20.76 m fractured subhorizontally
22.01 m fractured subhorizontally
22.16 m fractured subhorizontally
22.23 m fractured subhorizontally
22.30 m fractured subhorizontally
22.85 m fractured subhorizontally
25.64-25.74 m subvertical fractures
27.28 m fractured subhorizontally
28.05-28.25 m subvertical fractures
28.74 m fractured subhorizontally
29.10 m fractured subhorizontally

EXPLORATORY HOLE ENDS AT 29.60 m

Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
(9.75)		
29.60 *+61.54*		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Project BARNSLEY MARKET
Project No. A7088
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Borehole
BH108
Sheet 3 of 3

Borehole Log

Soil Mechanics

Drilled PC **Logged** CH **Checked** JH	**Start** 08/08/2007 **End** 08/08/2007	**Equipment, Methods and Remarks** Dando 2000 Cable percussion boring Environmental soil samples recovered by Wardell Armstrong.	**Depth from** 0.00m	**to** 6.32m	**Diameter** 150mm	**Casing Depth** 6.32m

Ground Level +96.11 mOD
Coordinates E 434573.55
National Grid N 406322.70
Chainage

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 5			
0.20	D 1			
0.50	D 2			
0.50	ES 2A			
0.70	D 3			
1.00	D 4			
1.00	ES 4A			
1.20-1.65	SPT S	N=24 (4,3/3,6,8,7)		
1.20-1.65	D 6			
1.20-1.70	B 7			
2.00-2.45	U 8	67 blows		
2.50	D 9			
2.70	D 10			
3.00-3.45	SPT S	N=26 (4,6/6,6,7,7)		
3.00-3.45	D 11			
3.00-3.50	B 12			
3.50	ES 12A			
4.00-4.50	B 13			
4.00-4.45	U NR	69 blows No recovery		
5.50-5.95	U 14	76 blows		
6.00	D 15			
6.20-6.32	SPT S	50 (25 for 50mm/50 for 70mm)	08/08/2007	6.32
6.20-6.32	D 16			

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Monoblock Paving. (MADE GROUND)	0.05 *+96.06* 0.10 *+96.01*		
TARMACADAM. (MADE GROUND) (Foreman's description)	(1.00)		
Dense brown clayey very sandy (ash) GRAVEL with occasional cobbles. Gravel is angular to subangular fine to coarse of brick and sandstone. Hydrocarbon odour. (MADE GROUND)	1.10 *+95.01*		
Medium dense yellow and brown slightly silty gravelly SAND. Gravel is subangular fine to coarse of sandstone.	(1.50)		
Firm to stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coasre of sandstone.	2.60 *+93.51*		
4.00-4.50 m sandstone boulder	(2.90)		
Very stiff dark brown very gravelly CLAY. Gravel is angular to subangular fine to medium locally coarse of mudstone, coal and sandstone.	5.50 *+90.61* (0.50) 6.00 *+90.11*		
Very dense light grey and green GRAVEL of siltstone. (Weathered SILTSTONE)	(0.32) 6.32 *+89.79*		
EXPLORATORY HOLE ENDS AT 6.32 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit using pneumatic breaker
6.32		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
2.60 -2.70	30 mins	
3.70 -3.90	30 mins	
4.00 -4.50	60 mins	
6.00 -6.20	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project BARNSLEY MARKET
Project No. A7088
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Borehole
BH111
Sheet 1 of 1

Borehole Log

Soil Mechanics

Drilled AN/DS **Logged** CH **Checked** JH	**Start** 09/08/2007 **End** 23/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.20m / 150mm / 6.20m 6.20m / 29.75m / 121mm / 8.00m	**Ground Level** +96.19 mOD **Coordinates** E 434593.97 **National Grid** N 406352.64 **Chainage**			

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 5			
0.20	D 1			
0.50	D 2			
0.50	ES 2A			
0.70	D 3			
1.00	D 4			
1.00	ES 4A			
1.20-1.65	U 6	35 blows		
1.20	ES 6A			
1.70	D 7			
2.00-2.45	SPT S	N=18 (3,4/4,5,4,5)		
2.00-2.45	D 8			
2.00-2.50	B 9			
3.00-3.45	U 10	39 blows		
3.50	D 11			
4.00-4.45	SPT S	N=13 (2,3/3,4,3,3)		
4.50	B 12			
5.50-5.95	U NR	150 blows No recovery		
			09/08/2007	
6.20	D 13		6.20	
			21/08/2007	0800
			6.20	
		Flush: 6.20-7.10 water, 100 %		
		Flush: 7.10-8.10 water, 80 %		
6.20-9.60	TCR 77 SCR 26 RQD 0			
8.45-8.50		CS 14		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Monoblock Paving. (MADE GROUND) (Foreman's description)	0.10 *+96.09*		
	(0.30)		
TARMACADAM AND CONCRETE. (MADE GROUND) (Foreman's description)	0.40 *+95.79*		
	(0.80)		
Dense black and grey sandy (ash) angular to subangular fine to coarse GRAVEL of clinker. Strong hydrocarbon odour. (MADE GROUND)	1.20 *+94.99*		
Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of sandstone, mudstone and occasional coal.			
	(2.70)		
Medium dense brown very sandy GRAVEL. Gravel is subangular to rounded fine to medium of mudstone and sandstone.	3.90 *+92.29*		
	(1.90)		
Very weak light brown and yellow angular fine to medium of GRAVEL of mudstone. (Weathered MUDSTONE)	5.80 *+90.39*		
	(0.40)		
Weak orange to brown very thinly interbedded SILTSTONE/MUDSTONE.	6.20 *+89.99*		
	(0.90)		
Weak to moderately weak grey to orange interbedded (thinly laminated SILTSTONE/MUDSTONE with widely spaced subhorizontal, smooth planar discontinuities.	7.10 *+89.09*		
	(3.30)		
Stratum continues to 10.40 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	3.90	Rose to 3.70 m after 20 minutes.	-

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit using pneumatic breaker
6.20		Cable percussion refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
6.00 -6.20	30 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH112

Borehole Log

Soil Mechanics

Drilled AN/DS **Logged** CH **Checked** JH	**Start** 09/08/2007 **End** 23/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.20m / 150mm / 6.20m 6.20m / 29.75m / 121mm / 8.00m	**Ground Level** +96.19 mOD **Coordinates** E 434593.97 **National Grid** N 406352.64 **Chainage**			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.60-12.50	91 18 11				
11.27-11.59			CS 15		
			Flush: 8.10-18.90 water, 100 %		
12.50-15.50	85 42 14				
14.74-14.90			CS 16		
				21/08/2007 8.00	
				22/08/2007 8.00	0800 2.10
15.50-19.90	90 63 40				
18.86-19.10			CS 18		
19.03-19.35			CS 17		
19.13-19.50			CS 19		
			Flush: 18.90-19.90 water, 90 %		

Strata

Description (Continued from Sheet 1)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Weak to moderately weak grey to orange interbedded (thinly laminated SILTSTONE/MUDSTONE with widely spaced subhorizontal, smooth planar discontinuities. 10.50-10.75 m fracture at approximately 80 deg	10.40 *+85.79*		
Moderately weak pale grey to orange medium to find grained SANDSTONE.	(1.35)		
11.60-11.70 m fracture at approximately 80 deg, iron staining present on fracture surfaces (drilling induced?)	11.75 *+84.44*		
Moderately weak pale grey to black MUDSTONE. 11.78-11.90 m subvertically fractured 12.00-12.25 m subvertically fractured	(1.21)		
Moderately weak to moderately strong dark grey interbedded (thickly laminated) SILTSTONE/MUDSTONE. Contains organic remains. 12.25-12.40 m medium spaced subhorizontal black smooth undulating discontinuities 12.30-12.96 m cobbles (drilling induced?) 13.80-14.00 m gravelly clay 14.00-14.30 m cobbles	12.96 *+83.23*		SP
	(2.96)		
Moderately strong to strong pale grey to orange/brown fine grained SANDSTONE.	15.92 *+80.27*		
	(1.23)		
No recovery.	17.15 *+79.04*		
	(1.75)		
Moderately weak to moderately strong pale grey to brown fine grained SANDSTONE. 19.53-19.80 m fractured (drilling induced?)	18.90 *+77.29*		
Stratum continues to 24.35 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH112

Borehole Log

Soil Mechanics

Drilled AN/DS **Logged** CH **Checked** JH	**Start** 09/08/2007 **End** 23/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.20m / 150mm / 6.20m 6.20m / 29.75m / 121mm / 8.00m	**Ground Level** +96.19 mOD **Coordinates** E 434593.97 **National Grid** N 406352.64 **Chainage**			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
19.90-22.40	57 40 19				
22.29-22.40			CS 20		
22.90-24.35	52 24 0				
24.50-24.80			CS 21		
24.35-25.60	92 76 58		Flush: 19.90-29.75 water, 80 %		
25.84-26.26			CS 22	22/08/2007 8.00	4.50
				23/08/2007 8.00	0800 4.20
25.60-28.25 27.00-27.08	96 67 57		CS 23		
27.79-27.98			CS 24		
28.31-28.45			CS 25		
28.25-29.25	144 97 82				
29.08-29.25			CS 26		
				23/08/2007 8.00	3.60

Strata

Description (Continued from Sheet 2)	Depth, *Level* / (Thickness)	Legend	Backfill/ Instruments
Moderately weak to moderately strong pale grey to brown fine grained SANDSTONE. 20.54-24.35 m cobbles 23.10-24.35 m contains organic remains	(5.45)		
Moderately weak to moderately strong grey MUDSTONE.	24.35 *+71.84* (0.70)		
No recovery - driller reported coal fragments in the returned flush. 25.10-25.30 m closely spaced subhorizontal ~~black smooth~~ wavy discontinuities	25.05 *+71.14* (0.40)		
Very weak to weak grey shaley MUDSTONE recovered as gravelly clay with organic matter, possible seat clay.	25.45 *+70.74* 25.60 *+70.59*		
Moderately weak to moderately strong interbedded (thinly laminated) fine grained SANDSTONE/MUDSTONE. 26.27-26.75 m closely spaced subhorizontal black smooth undulating discontinuities 26.27-26.95 m medium spaced planar smooth wavy discontinuities 27.18-27.23 m gravel 27.25-27.38 m fractures present subvertically at approximately 45 deg (drilling induced) 28.15-28.25 m gravel 28.51-28.58 m fractures present subvertically at approximately 90 deg (drilling induced) 29.21-29.50 m fractures present subvertically at approximately 20 deg (drilling induced?)	(4.15)		
EXPLORATORY HOLE ENDS AT 29.75 m	29.75 *+66.44*		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

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Borehole

BH112

Borehole Log

Soil Mechanics

Drilled PC **Logged** CH **Checked** JH	**Start** 08/08/2007 **End** 09/08/2007	**Equipment, Methods and Remarks** Dando 2000 Cable percussion boring Environmental soil samples recovered by Wardell Armstrong.	**Depth from** 0.00m	**to** 4.10m	**Diameter** 150mm	**Casing Depth** 4.10m

Ground Level +96.79 mOD
Coordinates E 434605.96
National Grid N 406394.08
Chainage

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.50	ES 4			
1.00	ES 5			
2.00-2.45 2.00-2.45	SPT S B 1	N=25 (6,5/5,6,7,7)		
3.00-3.45	U 2	150 blows		
3.50	D 3			
			08/08/2007 4.10	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Flagstones. (MADE GROUND) (Foreman's description)	0.05 *+96.74*		
Dense brown hardcore and sandstone. (MADE GROUND)	(1.15)		
Medium dense brown very clayey slightly gravelly SAND. Gravel is subangular fine to medium of sandstone and mudstone. Slight hydrocarbon odour. (MADE GROUND)	1.20 *+95.59*		
	(1.80)		
Brown very clayey gravelly SAND (ash). Gravel is subangular fine to medium of concrete and sandstone. (MADE GROUND)	3.00 *+93.79*		
	(0.60)		
Yellow and brown angular to subangular medium to coarse GRAVEL of sandstone. (MADE GROUND)	3.60 *+93.19*		
	(0.50)		
EXPLORATORY HOLE ENDS AT 4.10 m	4.10 *+92.69*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
4.10		Hole terminated due to service strike

Chiselling

Depths (m)	Time	Tools used
1.30 -1.80	30 mins	
3.60 -4.10	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project No. A7088
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Borehole
BH114
Sheet 1 of 1

Borehole Log

Soil Mechanics

Drilled PB **Logged** CH **Checked** JH	**Start** 01/08/2007 **End** 03/08/2007	**Equipment, Methods and Remarks** Dando 150. Comacchio Cable percussion boring. Rotary open hole drilling using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 3.45m / 150mm / 3.00m 3.45m / 30.00m / 115mm / 3.70m	**Ground Level** +89.63 mOD **Coordinates** E 434795.80 **National Grid** N 406287.49 **Chainage**	

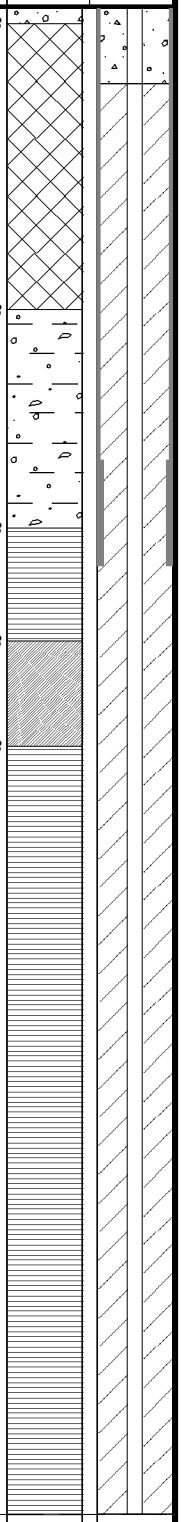
Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.50	ES 7			
1.00-1.45	SPT S	N=4 (1,1/1,1,1,1)	1.00	dry
1.00-1.45	D 1			
1.00	ES 1A			
1.50-2.00	B 2			
2.00-2.45	U 3	60 blows		
2.50-2.60	D 4			
3.00-3.45	SPT S	N=12 (2,2/2,3,3,4)		
3.00-3.45	D 5			
3.00	ES 5A		01/08/2007	
3.00-3.40	B 6		3.00	dry
			03/08/2007	0800
			3.70	

Strata

Description	Depth, *Level* (Thickness)
CONCRETE. (Foreman's description)	0.10 *+89.53*
Soft grey and brown locally black slightly sandy gravelly CLAY, locally silt with occasional cobbles. Gravel is subangular to subrounded fine to coarse of mudstone, coal and brick. (MADE GROUND)	(1.90)
Firm to stiff brown becoming dark grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone. (Weathered MUDSTONE)	2.00 *+87.63* (1.45)
Grey MUDSTONE (Foreman's description)	3.45 *+86.18* (0.75)
COAL (Foreman's description)	4.20 *+85.43* (0.70)
Grey MUDSTONE (Foreman's description)	4.90 *+84.73*
Stratum continues to 16.60 m	

Legend / Backfill/ Instruments



Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
3.45		Cable percussion refusal due to hard stratum

Chiselling

Depths (m)	Time	Tools used
3.00 -3.40	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:39:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH115

Borehole Log

Soil Mechanics

Drilled PB **Logged** CH **Checked** JH	**Start** 01/08/2007 **End** 03/08/2007	**Equipment, Methods and Remarks** Dando 150. Comacchio Cable percussion boring. Rotary open hole drilling using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 3.45m / 150mm / 3.00m 3.45m / 30.00m / 115mm / 3.70m	**Ground Level** +89.63 mOD **Coordinates** E 434795.80 **National Grid** N 406287.49 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water

Strata

Description (Continued from Sheet 1)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Grey MUDSTONE (Foreman's description)	(11.70)		
Grey MUDSTONE (Foreman's description)	16.60 *+73.03*		
Stratum continues to 25.50 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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408.24 20/11/2007 16:39:51

Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH115

Borehole Log

Soil Mechanics

Drilled PB **Logged** CH **Checked** JH	**Start** 01/08/2007 **End** 03/08/2007	**Equipment, Methods and Remarks** Dando 150. Comacchio Cable percussion boring. Rotary open hole drilling using mud flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 3.45m / 150mm / 3.00m 3.45m / 30.00m / 115mm / 3.70m	**Ground Level** +89.63 mOD **Coordinates** E 434795.80 **National Grid** N 406287.49 **Chainage**	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			03/08/2007	3.70

Strata

Description (Continued from Sheet 2)	Depth, *Level* (Thickness)
Grey MUDSTONE (Foreman's description)	(8.90)
COAL (Foreman's description)	25.50 *+64.13* (0.60)
Grey MUDSTONE (Foreman's description)	26.10 *+63.53* (3.90)
EXPLORATORY HOLE ENDS AT 30.00 m	

Legend

Backfill/ Instruments

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH115

Sheet 3 of 3

Borehole Log

Soil Mechanics

Drilled PB/DS **Logged** CH **Checked** JH	**Start** 31/07/2007 **End** 08/08/2007	**Equipment, Methods and Remarks** Dando 150/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.25m / 150mm / 6.25m 6.25m / 27.50m / 121mm / 12.80m			**Ground Level** +89.78 mOD **Coordinates** E 434820.61 **National Grid** N 406319.99 **Chainage**	

Samples and Tests

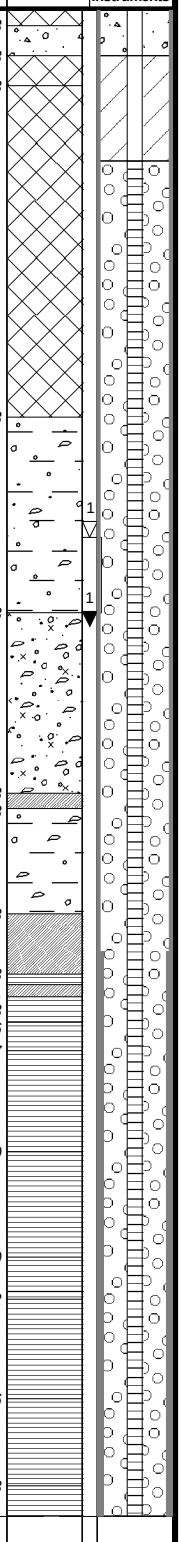
Depth	Type & No	Records	Date Casing	Time Water
0.50	ES 19			
1.00-1.45	SPT S	N=4 (1,1/1,1,1,1)	1.00	dry
1.00-1.45	D 1			
1.00	ES 1A			
1.10-1.20	D 2			
1.20-2.00	B 3			
2.00-2.45	U 4	110 blows		
2.45-2.60	D 5			
3.00-3.45	SPT S	N=17 (4,7/5,4,4,4)	3.00	dry
3.00-3.45	D 6			
3.00	ES 6A			
3.50-4.00	B 7			
4.00-4.45	SPT S	N=22 (3,4/5,5,6,6)	4.00	3.50
4.00	D 8			
4.00	ES 8A			
4.50-5.00	B 9			
5.00-5.45	SPT S	N=14 (1,2/3,5,3,3)	5.00	dry
5.00-5.45	D 10			
5.50-6.00	B 11			
6.00-6.23	SPT S	30 (12,28/30)	31/07/2007	
6.00-6.25	D 12		6.00	dry
			06/08/2007	0800
		Flush: 6.25-6.90 water, 100 %	6.40	5.90
		Flush: 6.90-8.10 water, 80 %		
6.40-9.80	85 34 14			
		Flush: 8.10-8.80 water, 100 %		
		Flush: 8.80-9.80 water, 90 %		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, *Level* / (Thickness)
TARMACADAM. (Foreman's description) (MADE GROUND)	0.10 *+89.68* 0.30 *+89.48*
CONCRETE. (Foreman's description)	0.50 *+89.28*
Limestone HARDCORE. (MADE GROUND) (Foreman's description)	
Soft brown locally black slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of coal, mudstone and sandstone. (MADE GROUND)	(2.20)
2.45-2.60 m 1No. sandstone ~~boulder~~	
Firm grey and brown slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to coarse of mudstone, coal and sandstone.	2.70 *+87.08* (1.30)
Medium dense dark grey and brown silty sandy GRAVEL. Gravel is angular to subangular fine to coarse of mudstone and sandstone.	4.00 *+85.78* (1.20)
Weak black vitreous COAL recovered as angular fine to medium gravel.	5.20 *+84.58* 5.30 *+84.48*
Firm to stiff dark grey and blue gravelly CLAY. Gravel is angular to subangular fine to coarse of mudstone. (Weathered MUDSTONE)	(0.70) 6.00 *+83.78*
Weak black vitreous COAL recovered as angular fine to medium gravel.	(0.40) 6.40 *+83.38*
Very weak dark grey MUDSTONE recovered as soft dark grey to black silty clay with sandstone and coal gravel.	6.47 *+83.31* 6.55 *+83.23* 6.72 *+83.06* 6.91 *+82.87*
Strong black vitreous COAL recovered as gravel <60mm.	7.10-7.22 m subvertical ~~fracture~~ (0.67)
Weak grey to black MUDSTONE with pebbles of coal and sandstone.	7.58 *+82.20*
Weak grey MUDSTONE recovered as a gravelly silty clay.	(0.70)
Weak to moderately weak light grey MUDSTONE.	8.28 *+81.50*
Weak grey MUDSTONE with extremely closely spaced black mudstone bands.	(0.28) 8.56 *+81.22*
Moderately weak light grey MUDSTONE containing plant remains.	(0.66)
Weak grey MUDSTONE recovered as gravelly silty clay.	9.22 *+80.56*
Weak grey MUDSTONE containing plant	(0.58)
	9.80 *+79.98*
Stratum continues to 10.14 m	(0.34)

Legend / **Backfill/ Instruments**



Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	4.00	Rose to 3.50 m after 20 minutes. slow inflow	4.50

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
6.25		Cable percussion refusal due to hard stratum

Chiselling

Depths (m)	Time	Tools used
2.50 -2.70	30 mins	
6.00 -6.25	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH116

Borehole Log

Soil Mechanics

Drilled PB/DS **Logged** CH **Checked** JH	**Start** 31/07/2007 **End** 08/08/2007	**Equipment, Methods and Remarks** Dando 150/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.25m / 150mm / 6.25m 6.25m / 27.50m / 121mm / 12.80m	**Ground Level** +89.78 mOD **Coordinates** E 434820.61 **National Grid** N 406319.99 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
10.77-10.81			CS 14		
9.80-12.30	92 48 20			06/08/2007 8.10	1.30
				07/08/2007 8.10	0800 4.90
13.00-13.14			CS 15		
			Flush: 9.80-16.90 water, 80 %		
12.30-15.40	100 56 25				
15.06-15.20			CS 16		
15.40-18.00	92 27 0				
			Flush: 16.90-19.30 water, 70 %		
18.00-20.80	81 56 26				

Strata

Description (Continued from Sheet 1)

Depth, *Level* (Thickness)	Description	Legend	Backfill/ Instruments
10.14 *+79.64*	9.22m - 9.80m : remains.		
(0.49)	9.80m - 10.14m : Weak to moderately strong grey MUDSTONE.		
10.63 *+79.15*	Weak grey MUDSTONE recovered as silty gravelly clay.		
(0.69)	Weak to moderately weak grey MUDSTONE with plant remains.		
11.32 *+78.46*	Moderately strong dark grey MUDSTONE.		
11.55 *+78.23*	Moderately weak light grey shaley MUDSTONE. 11.75-11.92 m recovered as silty clay; 12.09-12.28 m recovered as silty clay		
(0.61)	Strong light grey MUDSTONE.		
12.16 *+77.62*	Strong light grey MUDSTONE subhorizontal planar closely spaced laminations.		
12.30 *+77.48*			
(0.50)	Moderately strong light grey SILTSTONE with dark grey closely spaced subhorizontal planar laminations.		
12.80 *+76.98*			
13.05 *+76.73*	Moderately strong light grey interbedded MUDSTONE and SILTSTONE with dark grey planar horizontal thinly laminated. 13.58-13.60 m shaley mudstone		
(2.35)			
15.40 *+74.38*	Moderately weak to strong light to dark grey interbedded (thickly laminated) MUDSTONE and SILTSTONE. 16.14-16.22 m recovered as soft silty clay; 17.10-17.16 m recovered as gravelly silty clay; 17.54-17.58 m recovered as soft silty clay		SP
(2.60)			
18.00 *+71.78*	Weak to moderately weak dark grey SILTSTONE.		
(0.63)			
18.63 *+71.15*	Strong black vitreous COAL.		
18.78 *+71.00*	Very weak black to grey shaley MUDSTONE.		
(0.26)			
19.04 *+70.74*	Weak to moderately weak interbedded (thinly laminated) MUDSTONE and shaley COAL, subhorizontal undulating smooth discontinuities.		
19.15 *+70.63*			
(0.62)			
19.77 *+70.01*			

Stratum continues to 20.34 m

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:39:57

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH116

Borehole Log

Soil Mechanics

Drilled PB/DS **Logged** CH **Checked** JH	**Start** 31/07/2007 **End** 08/08/2007	**Equipment, Methods and Remarks** Dando 150/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.25m / 150mm / 6.25m 6.25m / 27.50m / 121mm / 12.80m	**Ground Level** +89.78 mOD **Coordinates** E 434820.61 **National Grid** N 406319.99 **Chainage**		

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
20.06-20.30			CS 13		
			Flush: 19.30-23.00 water, 50 %		
				07/08/2007 12.80	1.90
				08/08/2007 12.80	0800 2.45
20.80-23.80	95 79 70				
23.35-23.53			Flush: 23.00-23.80 water, 80 % CS 17		
24.76-25.01			CS 18		
23.80-26.50	93 74 43		Flush: 23.80-27.50 water, 90 %		
26.50-27.50	96 6 0				
				08/08/2007 12.80	1.30

Strata

Description (Continued from Sheet 2)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
19.15m - 19.77m : Moderately strong black COAL with occasional interbedded moderately strong shaley MUDSTONE. Coal recovered as gravel. 19.77m - 20.34m : Moderately weak to moderately strong light grey SILTSTONE.	(0.57) 20.34 *+69.44*		
Moderately strong dark grey to light grey interbedded (thinly laminated) SILTSTONE and MUDSTONE. 21.66-22.00 m shaley mudstone	(2.85)		
Moderately weak to moderately strong dark grey interbedded (thinly laminated) SILTSTONE and MUDSTONE. Rough planar discontinuity (possible drilling induced). 24.11-24.27 m at 60 deg 25.02-25.09 m recovered as weak shaley mudstone 25.56-25.68 m recovered as weak shaley mudstone 25.95-26.06 m recovered as soft silty clay	23.19 *+66.59* (3.31)		
Moderately weak to moderately strong dark grey interbedded (thinly laminated) SILTSTONE and MUDSTONE.	26.50 *+63.28* (0.62)		
Weak grey MUDSTONE recovered as silty gravelly clay.	27.12 *+62.66* (0.38)		
EXPLORATORY HOLE ENDS AT 27.50 m	27.50 *+62.28*		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:39:58

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH116

Borehole Log

Soil Mechanics

Drilled PC/DS **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 13/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.10m / 150mm / 6.10m 6.10m / 30.20m / 121mm / 6.10m	**Ground Level** +91.81 mOD **Coordinates** E 434767.66 **National Grid** N 406349.77 **Chainage**			

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 4			
0.30	D 1			
0.50	D 2			
0.50	ES 2A			
1.00	D 3			
1.00	ES 3A			
1.20-1.65	SPT S	N=27 (5,7/6,8,7,6)		
1.20-1.65	D 5			
1.20-1.70	B 6			
2.00-2.45	U 7	47 blows		
2.50	D 8			
2.80	D 9			
3.00-3.45	SPT S	N=26 (7,6/6,8,7,5)		
3.00-3.45	D 10			
3.00-3.50	B 11			
4.00-4.45	U 12	98 blows		
4.50	D 13			
5.00-5.45	SPT S	N=38 (9,7/8,9,11,10)		
5.00-5.45	D 14			
5.90	D 15		07/08/2007	
6.00-6.10	SPT S	50 (25 for 70mm/50 for 25mm)	6.10	
6.00-6.10	D 16		09/08/2007 6.10	0800 5.40
6.10-9.30	96 8 0			
		Flush: 6.10-11.70 water, 90 %		

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
TARMACADAM. (MADE GROUND)	0.10 *+91.71*		
CONCRETE. (Foreman's description)	0.30 *+91.51*		
Soft black slightly sandy (ash) very gravelly CLAY. Gravel is angular to subangular fine to medium of brick and clinker. (MADE GROUND)	0.50 *+91.31*		
Firm orange slightly sandy gravelly CLAY. Gravel is subangular fine to coarse of brick and mudstone. (MADE GROUND)	(2.30)		
Stiff brown and orange slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse of mudstone and sandstone.	2.80 *+89.01*		
Stiff light brown and orange very gravelly CLAY. Gravel is subangular fine to coarse of mudstone. (Weathered MUDSTONE)	(1.70)		
	4.50 *+87.31*		
	(1.60)		
Moderately strong to strong yellow/orange to grey interbedded (thickly laminated) coarse grained SANDSTONE/MUDSTONE with widely spaced iron stained undulating smooth discontinuities. — 6.10-6.28 m subangular cobbles — 6.78-7.56 m gravel	6.10 *+85.71*		
Very weak dark grey MUDSTONE recovered as soft to firm gravelly clay.	(0.53)		
Moderately weak to strong light grey MUDSTONE.	6.63 *+85.18*		
	6.78 *+85.03*		
	(1.70)		
Weak dark grey MUDSTONE. — 8.10-8.28 m gravel — 9.00-9.70 m soft gravelly clay	8.48 *+83.33*		
	(0.82)		
Weak grey MUDSTONE recovered as a soft gravelly clay. Fine gravel also contains sandstone and coal. — 9.37-9.45 m subhorizontal and subvertical fractures	9.30 *+82.51*		
Stratum continues to 10.87 m	9.54 *+82.27*		

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
6.10		Cable percussion refusal due to hard stratum

Chiselling

Depths (m)	Time	Tools used
5.40 -6.00	30 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:40:02

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH117

Borehole Log

Soil Mechanics

Drilled PC/DS **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 13/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.10m / 150mm / 6.10m 6.10m / 30.20m / 121mm / 6.10m	**Ground Level** +91.81 mOD **Coordinates** E 434767.66 **National Grid** N 406349.77 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
9.30-11.70	91 22 6				
				09/08/2007 6.10	0.00
				10/08/2007 6.10	0800 3.24
11.70-14.10 12.94-13.14	87 41 18		CS 25		
14.78-14.96			CS 18		
14.10-16.75	72 72 38		Flush: 11.70-20.30 water, 50 %		
16.75-17.03			CS 21		
17.82-17.96 16.75-19.00	119 71 54		CS 20		
				10/08/2007 6.10	
				13/08/2007 6.10	0800 4.93

Strata

Description (Continued from Sheet 1)

Moderately weak to moderately strong dark grey MUDSTONE. Gravel of mudstone and coal.

10.50-10.55 m soft silty gravelly clay

10.70-10.78 m soft silty gravelly clay

Moderately strong black vitreous COAL.

10.86-11.07 m coarse gravel

Very weak to weak dark grey shaley MUDSTONE with extremely closely spaced smooth planar discontinuities of coal.

11.26-11.70 m no recovery

11.88-12.11 m medium gravel

Moderately weak to moderately strong grey MUDSTONE with occasional rounded sandstone pebbles and plant remains.

13.47-13.57 m gravel

Weak to moderately weak grey to black shaley MUDSTONE.

Moderately weak to strong pale grey to dark grey very thinly bedded SILTSTONE/MUDSTONE with closely spaced, subhorizontal, smooth planar discontinuities.

17.74-17.78 m 30 deg fracture (drilling induced)

18.00-18.10 m gravel

18.67-18.75 m gravel

19.35-19.53 m gravel

Weak to moderately strong black

19.78-19.87 m gravel

Stratum continues to 20.24 m

Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
(1.33)		
10.87 *+80.94*		
(0.30)		
11.17 *+80.64*		
(0.94)		
12.11 *+79.70*		
(1.46)		
13.57 *+78.24*		
(0.48)		
14.05 *+77.76*		SP
(5.58)		
19.63 *+72.18*		
(0.36)		
19.99 *+71.82*		

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:40:04

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH117

Borehole Log

Soil Mechanics

Drilled PC/DS **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 13/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.10m / 150mm / 6.10m 6.10m / 30.20m / 121mm / 6.10m	**Ground Level** +91.81 mOD **Coordinates** E 434767.66 **National Grid** N 406349.77 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
19.00-22.20	85 35 13		Flush: 20.30-21.60 water, 30 %		
22.20-24.50	91 76 52				
24.19-24.32			CS 19		
24.76-25.10			CS 22		
25.38-25.52			CS 23		
24.50-27.50	91 84 61		Flush: 21.60-30.20 water, 0 %		
26.99-27.29			CS 24		
27.50-30.20	92 67 53				
29.86-29.98			CS 17		

Strata

Description (Continued from Sheet 2)

19.63m - 19.99m : interbedded (thinly laminated) SILTSTONE/MUDSTONE with closely spaced, subhorizontal, planar smooth discontinuities.

19.99m - 20.24m : Weak to moderately strong interbedded (thinly laminated) black to grey MUDSTONE/SILTSTONE.

Moderately weak to moderately strong black vitreous COAL recovered as gravel.

Very strong pale grey to brown MUDSTONE.

No recovery

Soft silty gravelly CLAY gravel of mudstone coal and sandstone. (Possible void infill material).

Moderately weak to strong pale grey to brown thinly interbedded SILTSTONE/MUDSTONE containing plant material.

22.67 m subhorizontal 10 deg fracture (drilling induced)

Moderately strong to strong grey and interbedded SILTSTONE/MUDSTONE with moderately spaced subhorizontal planar smooth discontinuities.

25.29 m subhorizontal 40 deg fracture (drilling induced)

Moderately strong to strong pale grey medium grained SANDSTONE with thinly laminated siltstone and mudstone, widely spaced, subhorizontal, undulating smooth discontinuities.

28.46-28.73 m closely spaced discontinuities

29.64-29.76 m subvertical 80 deg fracture

Stratum continues to 30.20 m

Depth, *Level* / (Thickness)	Legend	Backfill/ Instruments
20.24 *+71.57*		
(0.40)		
20.64 *+71.17*		
20.78 *+71.03*		
(0.56)		
21.34 *+70.47*		
21.59 *+70.22*		
(0.61)		
22.20 *+69.61*		
(4.00)		
26.20 *+65.61*		
(4.00)		

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH117

Borehole Log

Soil Mechanics

Drilled PC/DS **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 13/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush. Environmental soil samples recovered by Wardell Armstrong.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 6.10m / 150mm / 6.10m 6.10m / 30.20m / 121mm / 6.10m	**Ground Level** +91.81 mOD **Coordinates** E 434767.66 **National Grid** N 406349.77 **Chainage**			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
				13/08/2007 6.10	

Strata

Description (Continued from Sheet 3)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Moderately strong to strong pale grey medium grained SANDSTONE with thinly laminated siltstone and mudstone, widely spaced, subhorizontal, undulating smooth discontinuities.	30.20 *+61.61*		
EXPLORATORY HOLE ENDS AT 30.20 m			

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
None observed (see Key Sheet)			

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH117

Borehole Log

Soil Mechanics

Drilled PC **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 16/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 9.90m / 150mm / 9.00m 9.90m / 29.60m / 121mm / 9.90m				**Ground Level** +92.11 mOD **Coordinates** E 434793.55 **National Grid** N 406391.47 **Chainage**		

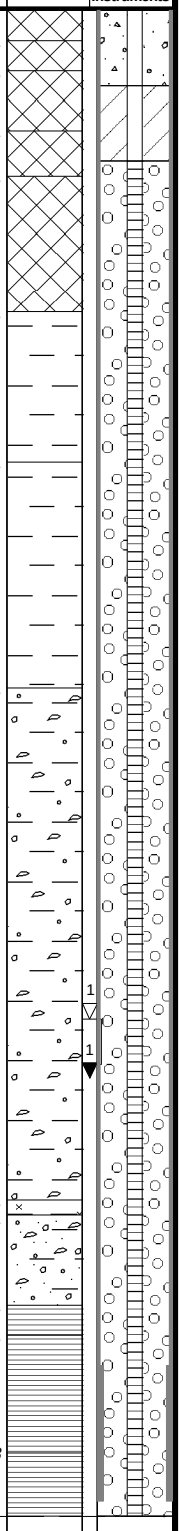
Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.20	B 27			
0.20	D 28			
0.50	ES 17			
1.00	ES 18		07/08/2007	
1.20-1.65	SPT S	N=13 (2,3/4,3,3,3)		
1.20-1.65	D 1		09/08/2007	0800
1.20-1.70	B 2			
2.00-2.45	SPT S	N=15 (4,3/4,3,3,5)		
2.00-2.45	D 3			
2.00-2.50	B 4			
3.00-3.45	U 5	57 blows		
3.50	D 6			
4.00-4.45	SPT S	N=26 (5,7/6,8,6,6)		
4.00-4.45	D 7			
4.00-4.50	B 8		09/08/2007 4.50	
			10/08/2007 4.50	0800
5.00-5.45	U 9	48 blows		
5.50	D 10			
7.00-7.45	SPT S	N=45 (12,11/15,10,9,11)		
7.00-7.45	D 11			
7.00-7.50	B 12			
7.90	D 13			
8.00-9.00	B 14			
9.00-9.10		150 blows U 15		
9.10		D 15A		
			10/08/2007	
9.40		D 16		
			14/08/2007	0800 6.70

Strata

Description	Depth, *Level* (Thickness)
TARMACADAM. (MADE GROUND) (Foreman's description)	0.20 *+91.91* 0.40 *+91.71*
Yellow limestone HARDCORE. (MADE GROUND) (Foreman's description)	(0.40) 0.80 *+91.31*
Dense black ash FILL. (MADE GROUND) (Foreman's description)	(0.30) 1.10 *+91.01*
Grey and black silty CLAY. (MADE GROUND) (Foreman's description)	(0.90)
Firm brown and orange locally grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of mudstone and sandstone. (MADE GROUND)	2.00 *+90.11* (1.00)
Firm thinly laminated grey and brown slightly sandy CLAY.	3.00 *+89.11*
Firm to stiff thinly laminated brown gleyed grey slightly sandy CLAY with occasional plant remains.	(1.50)
Firm dark brown slightly gravelly CLAY. Gravel is subrounded fine to medium of mudstone.	4.50 *+87.61* (3.40)
Firm light brown and grey slightly sandy SILT/CLAY.	7.90 *+84.21* 8.00 *+84.11*
Very weak grey and brown clayey very sandy GRAVEL. Gravel is subrounded fine to coarse of mudstone. (Weathered MUDSTONE)	(0.60) 8.60 *+83.51*
Weak orange to brown interbedded (thickly laminated MUDSTONE/SANDSTONE recovered as gravelly silty clay.	8.80 *+83.31* (0.78)
Weak pale grey MUDSTONE recovered as gravelly silty clay.	9.58 *+82.53*
9.88-9.94 m ⊏	
Stratum continues to 11.40 m	

Legend



Backfill/ Instruments

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	7.00	Rose to 6.70 m after 20 minutes.	-

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
9.40		Cable percussion refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used
7.45 -7.90	60 mins	
9.00 -9.30	60 mins	

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

408.24 20/11/2007 16:40:11

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH118

Borehole Log

Soil Mechanics

Drilled PC **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 16/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush.	**Depth from** / **to** / **Diameter** / **Casing Depth** 0.00m / 9.90m / 150mm / 9.00m 9.90m / 29.60m / 121mm / 9.90m	**Ground Level** +92.11 mOD **Coordinates** E 434793.55 **National Grid** N 406391.47 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
8.60-11.40	102 29 0				
11.40-14.00	92 12 0			14/08/2007	14.00
				15/08/2007	0800 4.90
14.40-17.15	92 32 16				
16.81-16.99			CS 21		
17.48-17.86			CS 19		
17.15-20.15	99 65 47		Flush: 8.60-29.60 water, 90 %		
19.61-19.76			CS 20		

Strata

Description (Continued from Sheet 1)	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Very weak to weak grey MUDSTONE. gravelly clay 10.16-10.40 m gravelly clay; 10.60-10.88 m gravelly clay; 11.07-11.14 m gravelly clay	(1.82)		
Weak to moderately weak grey MUDSTONE.	11.40 *+80.71*		
Weak to moderately weak grey MUDSTONE recovered as gravelly clay with subrounded cobbles. 11.90-12.01 m solid core	11.56 *+80.55* (0.40) 11.96 *+80.15*		
Weak to moderately weak grey to dark grey very thinly bedded SILTSTONE/MUDSTONE recovered as soft to firm silty gravelly clay. 12.65-12.70 m solid core; 12.86-13.03 m solid core	(1.24)		
Weak to moderately weak grey to black shaley interbedded (thinly laminated) SILTSTONE/MUDSTONE.	13.20 *+78.91* (0.80)		
Very weak grey to black interbedded (thickly laminated) SILTSTONE and medium grained SANDSTONE recovered as soft gravelly clay, contains occasional coal fragments.	14.00 *+78.11* (0.50) 14.50 *+77.61*		
Very weak black shaley COAL.	14.55 *+77.56* 14.71 *+77.40*		
Very weak to weak grey black shaley MUDSTONE with closely spaced, subhorizontal, smooth undulating discontinuities, with vitreous shale on surfaces.	(0.79)		SP
Moderately weak black COAL recovered as gravel.	15.50 *+76.61* (0.30) 15.80 *+76.31*		
Weak to moderately weak pale grey silty MUDSTONE with organic remains, recovered as cobbles.	15.96 *+76.15* (0.30) 16.26 *+75.85*		
Moderately weak to moderately strong pale grey to grey MUDSTONE with organic matter.	(0.89)		
Weak to moderately weak grey MUDSTONE recovered as cobbles. 17.02-17.06 m silty gravelly clay	17.15 *+74.96*		
Moderately strong pale grey (thinly laminated) SILTSTONE/MUDSTONE. 17.64-18.65 m subhorizontal medium spaced fractures (drilling induced?)			
Moderately strong pale grey interbedded (thinly laminated) MUDSTONE/SANDSTONE with closely spaced, smooth undulating discontinuities.	(1.68)		
18.65-18.83 m subvertical fracture (drilling induced)	18.83 *+73.28*		
Weak to moderately weak dark grey interbedded (thickly laminated SILTSTONE/MUDSTONE. 18.83-19.42 m cobbles			
	(1.32)		
19.57-20.01 m medium spaced subhorizontal fractures (drilling			
Stratum continues to 20.15 m			

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole BH118

Borehole Log

Soil Mechanics

Drilled PC **Logged** CH **Checked** JH	**Start** 07/08/2007 **End** 16/08/2007	**Equipment, Methods and Remarks** Dando 2000/Comachio Cable percussion boring. Rotary core drilling (PWF size) using water flush.	**Depth from / to / Diameter / Casing Depth** 0.00m / 9.90m / 150mm / 9.00m 9.90m / 29.60m / 121mm / 9.90m	**Ground Level** +92.11 mOD **Coordinates** E 434793.55 **National Grid** N 406391.47 **Chainage**	

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
20.15-22.30	105 44 7				
21.55-21.68			CS 22		
				15/08/2007 9.00	
				16/08/2007 9.00	0800 4.20
22.30-24.40	96 22 6				
24.40-27.50	74 65 60				
26.15-26.36			CS 23		
26.48-26.96			CS 26		
27.05-28.00			CS 24		
28.00-28.34			CS 25		
27.50-29.60	116 116 106				
				16/08/2007 9.00	

Strata

Description (Continued from Sheet 2)	Depth, *Level* / (Thickness)	Legend	Backfill/ Instruments
Weak to moderately weak dark grey interbedded (thickly laminated SILTSTONE/MUDSTONE.	20.15 *+71.96*		
Moderately strong to strong dark grey SILTSTONE.	(1.66)		
Weak to moderately weak grey to black interbedded (thickly laminated) shaley MUDSTONE/SILTSTONE recovered as cobbles.	21.81 *+70.30*		
Moderately strong black COAL recovered as cobbles	(1.13)		
Very weak brown to grey silty shaley MUDSTONE recovered as stiff gravelly clay.	22.94 *+69.17*		
Moderately weak to moderately strong pale grey MUDSTONE contains organic remains.	(0.38)		
Moderately strong to strong pale grey to brown silty SANDSTONE.	23.32 *+68.79*		
	23.50 *+68.61*		
	(1.10)		
	24.60 *+67.51*		
	(5.00)		
EXPLORATORY HOLE ENDS AT 29.60 m	29.60 *+62.51*		

induced?)

20.46-20.52 m gravel

20.58-20.62 m gravel

20.71-20.79 m fractured subvertically (drilling induced?)

21.62-21.70 m gravel

22.64-22.94 m medium spaced vitreous subhorizontal undulating discontinuities

23.80 m fractured subhorizontally (drilling induced?)

26.06-29.18 m closely spaced subhorizontal fractures

29.15-29.60 m planar subhorizontal smooth discontinuities with dark brown to black surfaces

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

Depth Related Remarks *

From	to (m)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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408.24 20/11/2007 16:40:14

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

BH118

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 17/08/2007 **End** 17/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +94.35 mOD **Coordinates** E 434755.39 **National Grid** N 406274.25 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.50	ES 2			
0.70-1.00 0.80	B 1 D 3		17/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
FLAGSTONE. (MADE GROUND)	0.05 *+94.30*		
Black gravelly SAND (ash). Gravel is subangular fine to medium of concrete. (MADE GROUND)	(0.95)		
EXPLORATORY HOLE ENDS AT 1.00 m	1.00 *+93.35*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.00	Hand excavated inspection pit
1.00		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

WS103

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 17/08/2007 **End** 17/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +94.31 mOD **Coordinates** E 434749.99 **National Grid** N 406287.11 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.50	ES 1A			
0.70-1.20	B 1			
1.20-2.20	L 2			
1.90	ES 2A			
2.20-3.20	L 3			
3.00	ES 4		17/08/2007	2.56

Strata

Description	Depth, *Level* (Thickness)
Flagstones. (MADE GROUND) (Foreman's description)	0.05 *+94.26* 0.10 *+94.21* 0.25 *+94.06*
Brown SAND. (MADE GROUND) (Foreman's description)	(0.45) 0.70 *+93.61*
Hardcore. (MADE GROUND) (Foreman's description)	(1.50)
Brick FILL. (MADE GROUND) (Foreman's description)	
Brown and black sandy GRAVEL. Gravel is subangular fine to coarse of sandstone and concrete with occasional pockets of ash and coal. 2.10-2.20 m whole brick (MADE GROUND)	2.20 *+92.11*
Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of mudstone and sandstone.	(0.80) 3.00 *+91.31*
Stiff grey slightly gravelly CLAY. Gravel is subangular fine to medium of mudstone and sandstone.	3.20 *+91.11*
EXPLORATORY HOLE ENDS AT 3.20 m	

Legend: 1

Backfill/ Instruments

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	2.56	Remained at 2.56 m after 20 minutes.	-

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit.
3.20		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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408.24 10/11/2007 10:47:53

AGS

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

WS103A

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 15/08/2007 **End** 15/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling	**Depth from to Diameter Casing Depth** 0.00m 0.50m 200mm	**Ground Level** +91.18 mOD **Coordinates** E 434743.77 **National Grid** N 406311.45 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			15/08/2007	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (Foreman's description)	(0.50)		
	0.50 *+90.68*		
EXPLORATORY HOLE ENDS AT 0.50 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.50		9' concrete coring

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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408.24 10/11/2007 10:47:59

Project BARNSLEY MARKET

Project No. A7088

Carried out for White Young Green Consulting Limited

Borehole

WS105

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 15/08/2007 **End** 15/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling	**Depth from to Diameter Casing Depth**	**Ground Level** +91.20 mOD **Coordinates** E 434718.41 **National Grid** N 406307.26 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.30	B 1			
0.30-1.00	L 2			
0.50	ES 2A			
1.00-2.00	L 3			
1.70	ES 3A			
2.00-3.00	L 4			
3.00-4.00	L 5			
3.80	ES 5A			
4.00-4.30	L 6		15/08/2007	dry

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (MADE GROUND)	(0.30) 0.30 +90.90		
Firm grey and brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of brick, burnt shale and mudstone. Strong hydrocarbon odour. (MADE GROUND)	(3.30)		
Black viscous tar with occasional pockets of soft to firm brown slightly sandy clay. Strong hydrocarbon odour. (MADE GROUND)	3.60 +87.60 (0.70)		
EXPLORATORY HOLE ENDS AT 4.30 m	4.30 +86.90		SP

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.30	150mm diameter concrete coring
4.30		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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408.24 10/11/2007 10:47:56

Project	**BARNSLEY MARKET**
Project No.	**A7088**
Carried out for	**White Young Green Consulting Limited**

Borehole

WS105A

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled	AN	Start	14/08/2007	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	+91.89 mOD
Logged	CH	End	14/08/2007	Terrier 2002 Windowless sampling					Coordinates	E 434673.77
Checked	JH								National Grid	N 406249.77
									Chainage	

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.30	B 1			
0.30-1.00	L 2			
1.00-2.00	L 3		14/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (Foreman's description)	(0.30) 0.30 +91.59		
Very weak light grey stained orange thinly laminated MUDSTONE. Recovered as angular to subangular fine to coarse gravel.	(1.70)		
EXPLORATORY HOLE ENDS AT 2.00 m	2.00 +89.89		SP

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.30	225mm diameter concrete coring
2.00		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project No.	A7088
Carried out for	White Young Green Consulting Limited

Borehole

WS107

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 14/08/2007 **End** 14/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling	**Depth from to Diameter Casing Depth**	**Ground Level** +91.18 mOD **Coordinates** E 434694.83 **National Grid** N 406337.01 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.30	B 1			
0.30-0.50	L 2		14/08/2007	dry

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (Foreman's description)	(0.30) 0.30 +90.88		
Firm grey and brown locally black slightly sandy very gravelly CLAY. Gravel is subangular fine to coarse of mudstone, coal and sandstone. (MADE GROUND)	0.50 +90.68		
EXPLORATORY HOLE ENDS AT 0.50 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.30	225mm diameter concrete coring
0.50		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project No. A7088

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Borehole

WS109

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 15/08/2007 **End** 15/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +91.21 mOD **Coordinates** E 434734.02 **National Grid** N 406351.92 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.60	ES 1			
1.50	ES 2			
3.30	ES 3			
3.80	ES 4			
			15/08/2007	dry

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (Foreman's description)	(0.32) 0.32 +90.89		
Brown clayey sandy GRAVEL. Gravel is angular to subangular fine to medium of sandstone and mudstone. (MADE GROUND)	0.45 +90.76		
Black slightly gravelly SAND (ash). Gravel is subangular fine to medium of clinker. (MADE GROUND)	(1.05) 1.50 +89.71		
Stiff grey and orange very sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium of sandstone and mudstone. (MADE GROUND)	(1.50) 3.00 +88.21		
Dark grey stained black very gravelly SAND (ash). Gravel is angular to subangular fine to medium of clinker. Strong hydrocarbon odour. (MADE GROUND)	(0.40) 3.40 +87.81		
Very weak light grey and brown thinly laminated MUDSTONE.	(1.60)		SP
EXPLORATORY HOLE ENDS AT 5.00 m	5.00 +86.21		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.32	150mm diameter concrete coring
5.00		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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WS110

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 16/08/2007 **End** 16/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling	**Depth from to Diameter Casing Depth**	**Ground Level** +96.73 mOD **Coordinates** E 434592.97 **National Grid** N 406374.09 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.09-0.50	B 1			
0.40	ES 1A			
0.50-1.20	B 2			
0.90	ES 2A			
2.00	ES 3			
4.40	ES 4			
			16/08/2007	dry

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
Monoblock Paving. (MADE GROUND)	0.06 +96.67 0.09 +96.64		
SAND. (MADE GROUND) (Foreman's description)	(1.11)		
Black and grey very sandy (ash) GRAVEL. Gravel is angular to subangular fine to coarse of concrete, coal and tarmacadam. (MADE GROUND)	1.20 +95.53 (0.35)		
Dark brown very gravelly SAND (ash). Gravel is subangular fine to medium of sandstone. (MADE GROUND)	1.55 +95.18 (0.45)		
Stiff grey and brown slightly sandy (ash) very gravelly CLAY. Gravel is subangular fine to coarse of sandstone, mudstone and clinker. (MADE GROUND)	2.00 +94.73 2.20 +94.53		
Black and dark brown very sandy (ash) GRAVEL. Gravel is angular to subangular fine to medium locally coarse of clinker and concrete . (MADE GROUND)			
Brown very clayey sandy GRAVEL. Gravel is angular to subangular fine to medium of sandstone, coal and mudstone.	(3.20)		
Very weak light brown and grey thinly laminated MUDSTONE.	5.40 +91.33 (0.60)		
EXPLORATORY HOLE ENDS AT 6.00 m	6.00 +90.73		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project No. A7088

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WS113

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 14/08/2007 **End** 14/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +90.52 mOD **Coordinates** E 434809.86 **National Grid** N 406251.21 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-1.00	L 1			
0.20	ES 1A			
0.50	ES 2A			
1.00-2.00	L 2			
1.80	ES 3		14/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)
Black sandy GRAVEL. Gravel is angular to subangular fine to medium locally coarse of ash, concrete and occasional sandstone. (MADE GROUND)	0.20 *+90.32*
Yellow and orange very sandy GRAVEL. Gravel is subangular fine to coarse of sandstone. Occasional subangular cobbles of sandstone. (MADE GROUND)	(1.50)
Firm to stiff brown locally grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of coal and mudstone.	1.70 *+88.82* (0.30) 2.00 *+88.52*
EXPLORATORY HOLE ENDS AT 2.00 m	

Legend

Backfill/ Instruments: SP

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
2.00	-	Hole terminated due to uncertainties regarding the position
2.00	-	of Sough Dyke

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

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Project No. A7088

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Borehole

WS119

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 09/08/2007 **End** 09/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +89.86 mOD **Coordinates** E 434821.88 **National Grid** N 406297.84 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.45-0.55	B 1			
0.50	ES 1A			
0.55-0.75	B 2			
0.75-1.20	B 3			
1.20	ES 3A			
1.20-2.20	L 4			
2.00	ES 4A			
2.20-3.20	L 5			
3.20-4.20	L 6			
3.50	ES 5A			
4.20-5.20	L 7			
5.20-6.20	L 8			
			09/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
TARMACADAM. (MADE GROUND) (Foreman's description)	0.10 +89.76 (0.30)		
HARDCORE. (MADE GROUND) (Foreman's description) 0.35-0.75 m subangular sandstone cobbles	0.40 +89.46 0.45 +89.41 (0.30) 0.75 +89.11		
CONCRETE. (MADE GROUND) (Foreman's description)			
Black and grey gravelly SAND. Gravel is angular to subangular fine to coarse of concrete and ash. (MADE GROUND)	(1.25)		
Black and brown very sandy GRAVEL. Gravel is angular to subangular fine to coarse of ash and occasional brick. (MADE GROUND) 2.20-2.40 m subangular cobbles of sandstone	2.00 +87.86 (1.10)		
Firm to stiff dark brown sandy slightly gravelly CLAY. Gravel is angular fine to medium of brick and sandstone. (MADE GROUND)	3.10 +86.76		
Black clayey sandy GRAVEL. Gravel is angular to subangular fine to coarse of coal, brick, ash and clinker. (MADE GROUND)	(1.35)		
Firm grey and orange sandy gravelly CLAY. Gravel is subangular fine to medium of mudstone, coal and sandstone. (MADE GROUND)	4.45 +85.41 (0.30) 4.75 +85.11		
Firm light brown and grey sandy gravelly CLAY. Gravel is angular to subangular fine to medium of mudstone.	5.00 +84.86		
Stiff grey stained orange gravelly CLAY. Gravel is subangular to subrounded fine to medium of mudstone. (Weathered MUDSTONE)	(1.20)		
EXPLORATORY HOLE ENDS AT 6.20 m	6.20 +83.66		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Borehole

WS120

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 08/08/2007 **End** 08/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +89.76 mOD **Coordinates** E 434787.39 **National Grid** N 406311.86 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.10	B 1			
0.10	ES 1A			
0.10-0.25	B 2			
0.25-0.40	B 3			
0.50	ES 3A			
1.60	ES 4			
			08/08/2007	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (MADE GROUND)	0.10 +89.66		
	(0.35)		
Black very gravelly SAND. Gravel is angular to subangular fine to medium of ash, coal and clinker. (MADE GROUND)	0.45 +89.31 0.60 +89.16		
0.85-0.93 m mudstone			
Yellow and brown gravelly SAND. Gravel is subangular medium of sandstone. (MADE GROUND)	(0.90)		
Dark brown clayey sandy GRAVEL. Gravel is subrounded fine to medium of mudstone, ash and coal. (MADE GROUND)	1.50 +88.26 (0.50)		
Orange and brown very clayey sandy GRAVEL. Gravel is subangular to subrounded fine to medium of mudstone. (MADE GROUND)	2.00 +87.76 (0.40)		
Stiff light brown and grey slightly gravelly CLAY. Gravel is subangular fine to medium of mudstone.	2.40 +87.36		
Orange and brown very clayey GRAVEL. Gravel is subangular fine to medium of mudstone. (Weathered MUDSTONE)	(1.85)		
Very weak thinly laminated light grey MUDSTONE. Recovered as angular fine to medium gravel. (Weathered MUDSTONE)	4.25 +85.51 (0.89)	1	
EXPLORATORY HOLE ENDS AT 5.14 m	5.14 +84.62		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	4.96	-	-

Depth Related Remarks *

From	to (m)	
0.00	0.10	225mm diameter concrete coring
5.14		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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WS121

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 18/08/2007 **End** 18/08/2007	**Equipment, Methods and Remarks** Handheld Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +89.86 mOD **Coordinates** E 434790.88 **National Grid** N 406343.62 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.00-0.09 0.09-1.00	B 1 L 2			
0.50	ES 1A			
1.00-1.56 1.00	L 3 ES 4			
			18/08/2007	dry

Strata

Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (MADE GROUND) (Foreman's description)	0.09 +89.77 (0.51)		
Brown very clayey slightly gravelly SAND. Gravel is subangular to subrounded fine to medium of sandstone.	0.60 +89.26 (0.60)		
Brown and orange sandy GRAVEL with occasional subangular cobbles. Gravel is subangular fine to coarse of sandstone.	1.20 +88.66 (0.40)		
Stiff dark brown slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to medium of sandstone, coal and mudstone.	1.60 +88.26 (0.40)		
Very stiff brown yellow sandy gravelly CLAY. Gravel is subangular fine to coarse of sandstone and mudstone.	2.00 +87.86		
EXPLORATORY HOLE ENDS AT 2.00 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.09	225mm diameter concrete coring
2.00		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Borehole

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Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 09/08/2007 **End** 09/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless Sampling.	**Depth from to Diameter Casing Depth**	**Ground Level** +90.11 mOD **Coordinates** E 434814.39 **National Grid** N 406346.74 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
			09/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
Tarmacadam. (MADE GROUND) (Foreman's description)	0.10 *+90.01*		
Concrete. (Foreman's description)	(0.75)		
EXPLORATORY HOLE ENDS AT 0.85 m	0.85 *+89.26*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.85	Hand excavated inspection pit
0.85		Hole terminated due to refusal at hard stratum. (Concrete)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Borehole

WS123

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 13/08/2007	**Equipment, Methods and Remarks** Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +89.94 mOD **Coordinates** E 434813.72 **National Grid** N 406336.69 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.60-0.90 0.60	B 1 ES 1A		13/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
TARMACADAM. (MADE GROUND) (Foreman's description)	0.15 *+89.79* 0.25 *+89.69*		
	(0.35)		
HARDCORE. (MADE GROUND) (Foreman's description)	0.60 *+89.34*		
	(0.30)		
CONCRETE. (MADE GROUND) (Foreman's description)	0.90 *+89.04*		
Brown sandy GRAVEL. Gravel is angular to subangular fine to coarse of sandstone and concrete. (MADE GROUND)			
EXPLORATORY HOLE ENDS AT 0.90 m			

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	0.90	Hand excavated inspection pit
0.90		Hole terminated due to refusal at hard stratum (concrete)

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project BARNSLEY MARKET

Project No. A7088

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Borehole

WS123A

Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 09/08/2007 **End** 09/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +91.34 mOD **Coordinates** E 434803.87 **National Grid** N 406368.41 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.10-0.20	B 1			
0.20-0.50	B 2			
0.50	ES 2A			
0.50-1.20	B 3			
1.00	ES 3A			
1.20-2.20	L 4			
1.60	ES 4A			
2.20-3.20	L 5			
3.20-4.20	L 6			
4.20-4.80	L 7		09/08/2007	

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
CONCRETE. (MADE GROUND) (Foreman's description)	0.10 *+91.24* (0.40)		
Black and brown very sandy GRAVEL. Gravel is angular to subrounded fine to coarse of brick, mudstone and ash. (MADE GROUND)	0.50 *+90.84* (1.20)		1
Firm dark brown very gravelly CLAY. Gravel is angular to subangular fine to medium of mudstone. (MADE GROUND)	1.70 *+89.64* (0.95)		
Stiff thinly laminated grey and black gravelly CLAY. Gravel is subangular to rounded fine to medium of mudstone.	2.65 *+88.69* (2.15)		SP
Stiff thinly laminated grey and brown locally stained orange slightly gravelly CLAY. Gravel is subangular fine to medium of siltstone and mudstone. (Weathered MUDSTONE)			
EXPLORATORY HOLE ENDS AT 4.80 m	4.80 *+86.54*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)
1	1.20	0	-

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
4.80		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Sheet 1 of 1

Window Sampler Hole Log

Soil Mechanics

Drilled AN **Logged** CH **Checked** JH	**Start** 13/08/2007 **End** 13/08/2007	**Equipment, Methods and Remarks** Terrier 2002 Windowless sampling Environmental soil samples recovered by Wardell Armstrong.	**Depth from to Diameter Casing Depth**	**Ground Level** +91.68 mOD **Coordinates** E 434774.64 **National Grid** N 406362.87 **Chainage**

Samples and Tests

Depth	Type & No	Records	Date Casing	Time Water
0.60-0.85	B 1			
0.60	ES 1A			
0.85-1.00	L 2			
1.00-2.00	L 3			
1.80	ES 3A			
2.00-3.00	L 4			
3.00-4.00	L 5			
3.50	ES 5A			
4.00-5.00	L 6			
			13/08/2007	dry

Strata

Description	Depth, *Level* (Thickness)	Legend	Backfill/ Instruments
TARMACADAM. (MADE GROUND) (Foreman's description)	0.15 *+91.53* (0.35)		
Brown HARDCORE. (MADE GROUND) (Foreman's description)	0.50 *+91.18* (0.50)		
Yellow and red slightly clayey sandy GRAVEL. Gravel is subangular fine to coarse of brick and sandstone. (MADE GROUND) 1.30-1.75 m numerous subangular cobbles of sandstone	1.00 *+90.68* (0.75)		
Red and brown clayey very sandy GRAVEL. Gravel is subangular fine to coarse of brick and concrete. (MADE GROUND)	1.75 *+89.93*		
Firm to stiff light brown locally gleyed grey gravelly CLAY. Gravel is subangular fine to medium of sandstone, mudstone and occasional fragments of burnt shale. (MADE GROUND)	(1.65)		
Firm light grey becoming brown slightly sandy SILT/CLAY.	3.40 *+88.28* (0.30)		
Orange and brown clayey sandy GRAVEL. Gravel is subangular to subrounded fine to medium of mudstone, sandstone and occasional fragments of coal.	3.70 *+87.98* (1.30)		
EXPLORATORY HOLE ENDS AT 5.00 m	5.00 *+86.68*		

Depth	Type & No	Records	Date Casing	Time Water

Groundwater Entries

No.	Struck (m)	Post strike behaviour	Depth sealed (m)

None observed (see Key Sheet)

Depth Related Remarks *

From	to (m)	
0.00	1.20	Hand excavated inspection pit
5.00		Hole terminated due to refusal at hard stratum

Chiselling

Depths (m)	Time	Tools used

Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Borehole

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Sheet 1 of 1

ENCLOSURE B
INSTRUMENTATION

Installation Details B1

Groundwater Installation Details

Soil Mechanics

Hole No	Instrument ID	Installation Type	Date of Installation	Reference depth (mBGL)	Piezometer Diameter (mm)	Top of response zone (mBGL)	Base of response zone (mBGL)	Tubing Completion Details	Headworks	Remarks
BH101		SP	24 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
BH102A		SP	22 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
BH104		SP	22 Aug 2007	0.00	50	1.00	10.00	Gas tap	Stop cock cover	
BH106A		SP	24 Aug 2007	0.00	50	1.00	16.00	Gas tap	Stop cock cover	
BH108		SP	20 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
BH112		SP	23 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
BH115		SP	3 Aug 2007	0.00	50	20.00	30.00	Gas tap	Stop cock cover	
BH116		SP	14 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
BH117		SP	14 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
BH118		SP	16 Aug 2007	0.00	50	1.00	15.00	Gas tap	Stop cock cover	
WS105A		SP	15 Aug 2007	0.00	50	0.50	4.30	Gas tap	Stop cock cover	
WS107		SP	14 Aug 2007	0.00	50	0.50	2.00	Gas tap	Stop cock cover	
WS110		SP	15 Aug 2007	0.00	50	0.50	4.00	Gas tap	Stop cock cover	
WS119		SP	14 Aug 2007	0.00	50	0.50	2.00	Gas tap	Stop cock cover	
WS124		SP	9 Aug 2007	0.00	50	0.50	4.00	Gas tap	Stop cock cover	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Electronic Piezometer Prepared: 24/09/2007 09:33

AGS

Project BARNSLEY MARKET
Project No. A7088
Carried out for White Young Green

Table B1
Sheet 1 of 1

ENCLOSURE C

GEOTECHNICAL LABORATORY TEST RESULTS

Index Properties – Summary of Results	INDX 1
Unconsolidated Undrained Triaxial Compression Tests – Summary of Results	UUSUM 1
Particle Size Distribution Analyses	PSD 1 to 21
Dry Density / Moisture Content Relationship	COMPL 1 and 2
Moisture Condition Value Test	MCV 1 to 3
Consolidated Undrained Triaxial Compression Test	2 Sheets
One Dimensional Consolidation Test	OED 1 to 7
Point Load Index Test	PLT 1 to 6
Uniaxial Compressive Strength	RUCS 1

INDEX PROPERTIES - SUMMARY OF RESULTS

Project No	Project Name
A7088	BARNSLEY MARKET

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m^3	ρ_d Mg/m^3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m^3	Remarks
BH101	2	1.50	2.00	B	Brown slightly sandy slightly gravelly CLAY.			15	63 s	36 a	20	16		
BH106A	6	1.20	1.70	B	Greyish brown slightly sandy gravelly CLAY/SILT.			24	41 s	42 a	30	12		
BH106A	8	2.00	2.50	B	Brown and grey slightly sandy slightly gravelly CLAY. Gravel is weak mudstone.			18	100 n	43 a	24	19		
BH111	12	3.00	3.50	B	Brown slightly sandy slightly gravelly CLAY.			17	67 s	33 a	18	15		
BH112	9	2.00	2.50	B	Brownish grey slightly sandy slightly gravelly CLAY.			20	58 s	48 a	25	23		
BH114	1	2.00	2.45	B	Brown sandy gravelly CLAY.			6.9	52 s	27 a	17	10		
BH115	2	1.50	2.00	B	Brown and grey slightly sandy gravelly CLAY with some cobbles.			22	51 s	41 a	25	16		
BH115	6	3.00	3.40	B	Brownish grey friable slightly sandy slightly gravelly CLAY.			18	87 s	48 a	24	24		
BH116	3	1.20	2.00	B	Brownish grey slightly sandy slightly gravelly CLAY.			26	58 s	51 a	25	26		
BH116	7	3.50	4.00	B	Brown slightly sandy gravelly CLAY.			14	53 s	28 a	15	13		
BH116	11	5.50	6.00	B	Brown slightly sandy slightly gravelly CLAY.			16	57 s	36 a	19	17		
BH117	6	1.20	1.70	B	Brown slightly sandy gravelly CLAY.			14	39 s	35 a	20	15		
BH117	11	3.00	3.50	B	Brown slightly sandy gravelly CLAY.			18	45 s	35 a	17	18		
BH118	2	1.20	1.70	B	Grey and brown slightly sandy slightly gravelly CLAY.			23	77 n	50 a	24	26		
BH118	4	2.00	2.50	B	Brown and grey slightly sandy slightly gravelly CLAY with rare plant remains.			29	69 s	50 a	26	24		
BH118	8	4.00	4.50	B	Grey and brown slightly sandy slightly gravelly CLAY with mudstone.			16	72 n	38 a	21	17		
BH118	12	7.00	7.50	B	Brown sandy slightly gravelly CLAY.			21	96 n	40 a	24	16		

General notes: All above tests carried out to BS1377 : 1990 definitive method in all cases unless annotated otherwise. See individual test reports for further details.

Key :

ρ	bulk density, linear	W_L Liquid limit	W_P	Plastic limit	<425um preparation	ρ_s particle density
ρ_d	dry density	a 4 point cone test	NP	non - plastic	n from natural soil	-g = gas jar
w	moisture content	b 1 point cone test	I_P	Plasticity Index	s sieved specimen	-p = small pyknometer

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE PRESSURE - SUMMARY OF RESULTS

Project No	Project Name
A7088	BARNSLEY MARKET

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	Density bulk Mg/m³	Density dry Mg/m³	w %	Test type	Dia. mm	$\acute{o}_3$ kPa	At failure / end of stage: Axial strain %	$\acute{o}_1 - \acute{o}_3$ kPa	c_u kPa	MODE	Remarks
BH106A	9	3.00	3.45	U	Soft to firm brownish grey and grey slightly sandy slightly gravelly CLAY.	1.97	1.57	26	UUM	103.0	100	2.0	26	13	P	
										103.0	200	3.9	42	21		
										103.0	300	19.7	80	40		
BH111	14	5.50	5.95	U	Firm to stiff grey and brown sandy very gravelly CLAY.	2.26	1.96	15	UUM	103.5	100	8.9	267	133	C	
										103.5	200	11.3	327	164		
										103.5	300	19.7	408	204		
BH112	6	1.20	1.65	U	Firm greyish brown slightly sandy gravelly CLAY.	2.19	1.86	18	UUM	102.2	25	3.5	61	30	C	
										102.2	75	5.4	84	42		
										102.2	125	19.8	125	63		
BH112	10	3.00	3.45	U	Firm to stiff brown sandy gravelly CLAY.	2.29	1.99	15	UUM	102.9	100	2.0	42	21	C	
										102.9	200	6.4	111	56		
										102.9	300	19.6	214	107		
BH115	3	2.00	2.45	U	Firm to stiff brown and grey sandy very gravelly CLAY.	2.12	1.80	18	UUM	102.6	50	3.0	59	30	C	
										102.6	100	5.9	103	52		
										102.6	150	19.8	209	105		
BH117	7	2.00	2.45	U	Firm brown slightly sandy gravelly CLAY.	2.20	1.90	16	UUM	103.8	50	2.0	39	20	P	
										103.8	100	3.9	63	31		
										103.8	150	19.7	124	62		
BH117	12	4.00	4.45	U	Very stiff greyish brown sandy very gravelly CLAY.	2.19	1.89	16	UUM	104.0	100	3.9	144	72	C	
										104.0	200	6.9	237	118		
										104.0	300	15.7	325	162		
BH118	5	3.00	3.45	U	Stiff greyish brown slightly sandy slightly gravelly CLAY.	2.06	1.70	21	UUM	103.7	75	2.5	80	40	C	
										103.7	150	3.9	95	47		
										103.7	225	19.6	152	76		

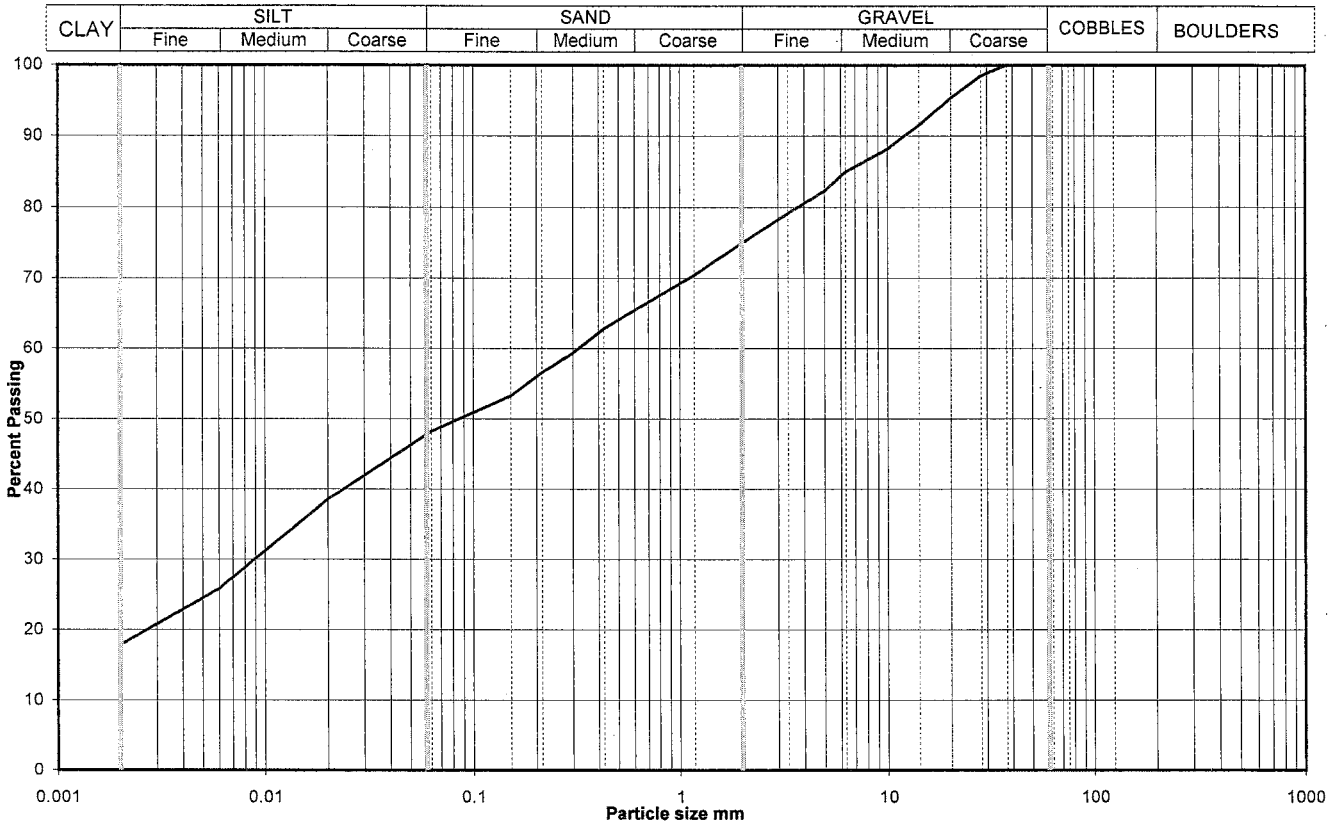
General notes: Tests carried out in accordance with BS1377: Part 7: 1990, clause 8 for single stage, clause 9 for multistage tests. Specimens nominally 2:1 height diameter ratio and tested at a rate of strain of 2%/minute, unless annotated otherwise. See individual test reports for further details.

Legend

UU - single stage test (may be in sets of specimens)	$\acute{o}_3$	cell pressure	Mode of failure	P	plastic
UUM - multistage test on a single specimen	$\acute{o}_1 - \acute{o}_3$	deviator stress		B	brittle
suffix R - remoulded or recompacted	c_u	undrained shear strength		C	compound

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH101		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.50		
			Samp No	2	Type	B
			ID	ESGA708820070820000000O021		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	39
90	100	0.0060	26
75	100	0.0020	18
63	100		
50	100		
37.5	100		
28	98		
20	95		
14	91		
10	88		
6.3	85		
5.0	82		
3.35	79		
2.00	75		
1.18	70	Particle density, Mg/m3	
0.600	65		
0.425	63	2.65 assumed	
0.300	59	Dry mass of sample, kg	
0.212	57		
0.150	53	4.2	
0.063	48		

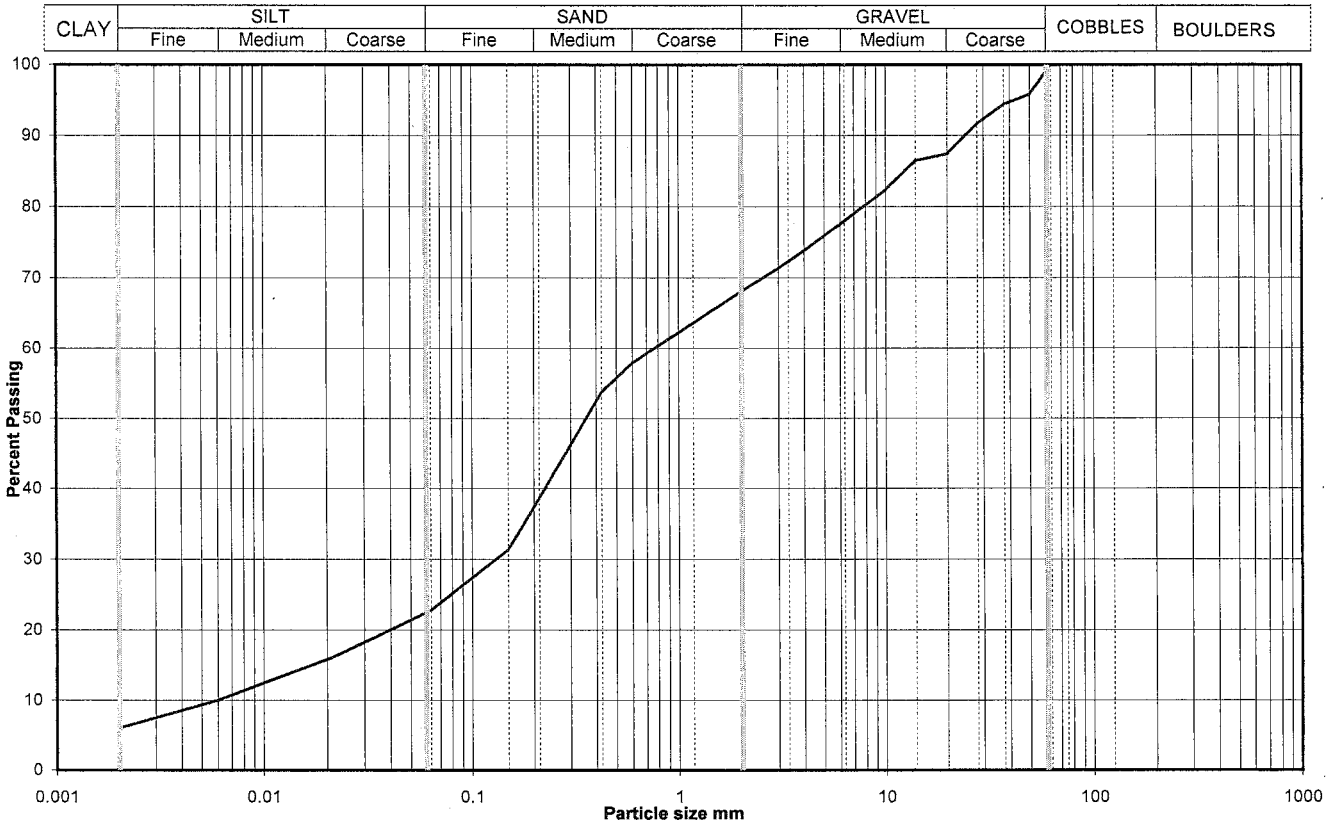
Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	25	25
	Sand	27	27
	Silt	30	30
	Clay	18	18

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH104		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.20		
			Samp No	6	Type	B
			ID	ESGA708820070821331658		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	16
90	100	0.0060	10
75	100	0.0020	6
63	100		
50	96		
37.5	94		
28	92		
20	87		
14	86		
10	82		
6.3	78		
5.0	76		
3.35	72		
2.00	68		
1.18	64	Particle density, Mg/m3	
0.600	58		
0.425	54	2.65 assumed	
0.300	46	Dry mass of sample, kg	
0.212	39		
0.150	31	4.2	
0.063	23		

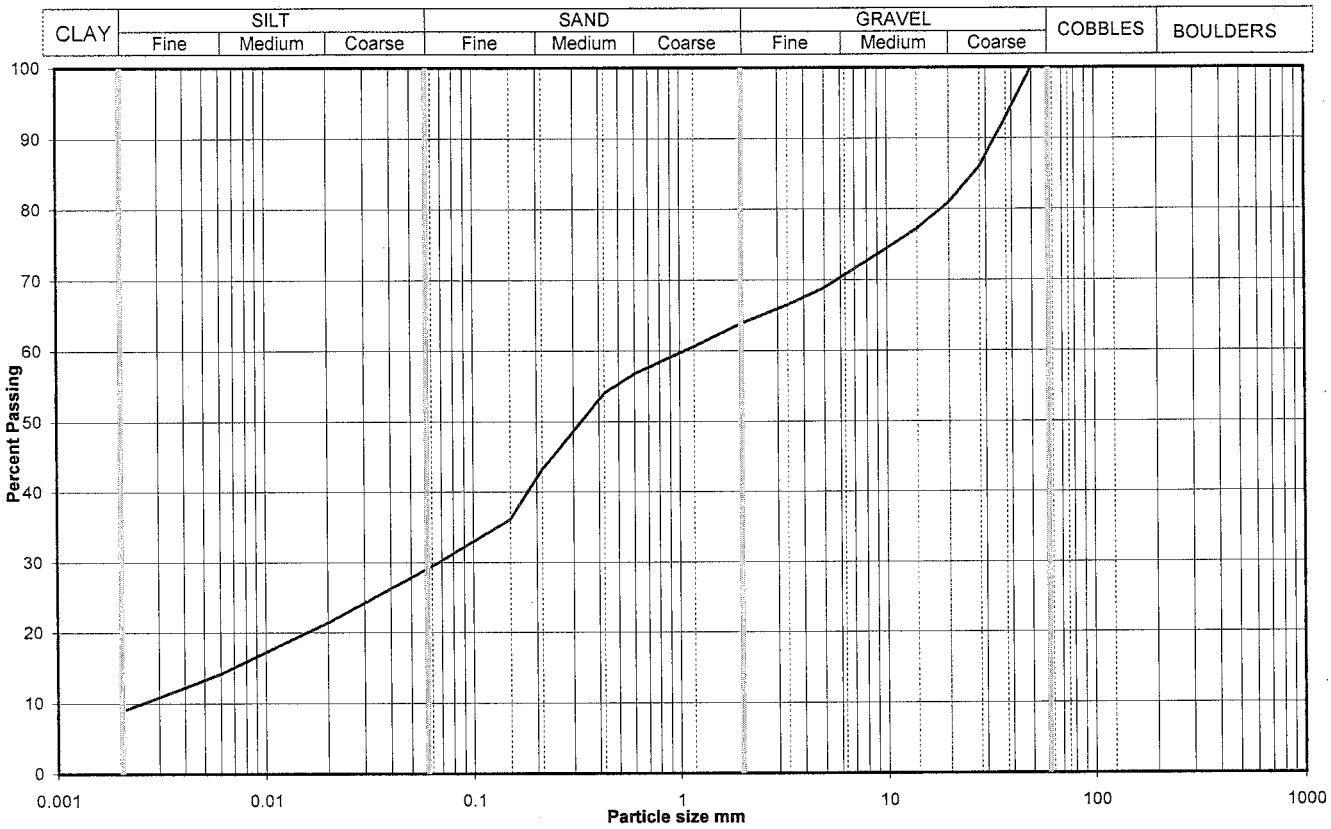
Soil description	Dark brownish grey sandy slightly gravelly CLAY/SILT.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	1	0
	Gravel	31	31
	Sand	46	46
	Silt	16	16
	Clay	6	6

Uniformity Coefficient	D_{60} / D_{10}	128

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH106A		
Project Name	BARNSLEY MARKET		Depth (m BGL)	0.00		
			Samp No	4	Type	B
			ID	ESGA708820070821000000055		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	21
90	100	0.0060	14
75	100	0.0020	9
63	100		
50	100		
37.5	93		
28	86		
20	81		
14	77		
10	74		
6.3	71		
5.0	69		
3.35	66		
2.00	64		
1.18	61	Particle density, Mg/m3	
0.600	57		
0.425	54	2.65 assumed	
0.300	49	Dry mass of sample, kg	
0.212	43		
0.150	36	4.6	
0.063	29		

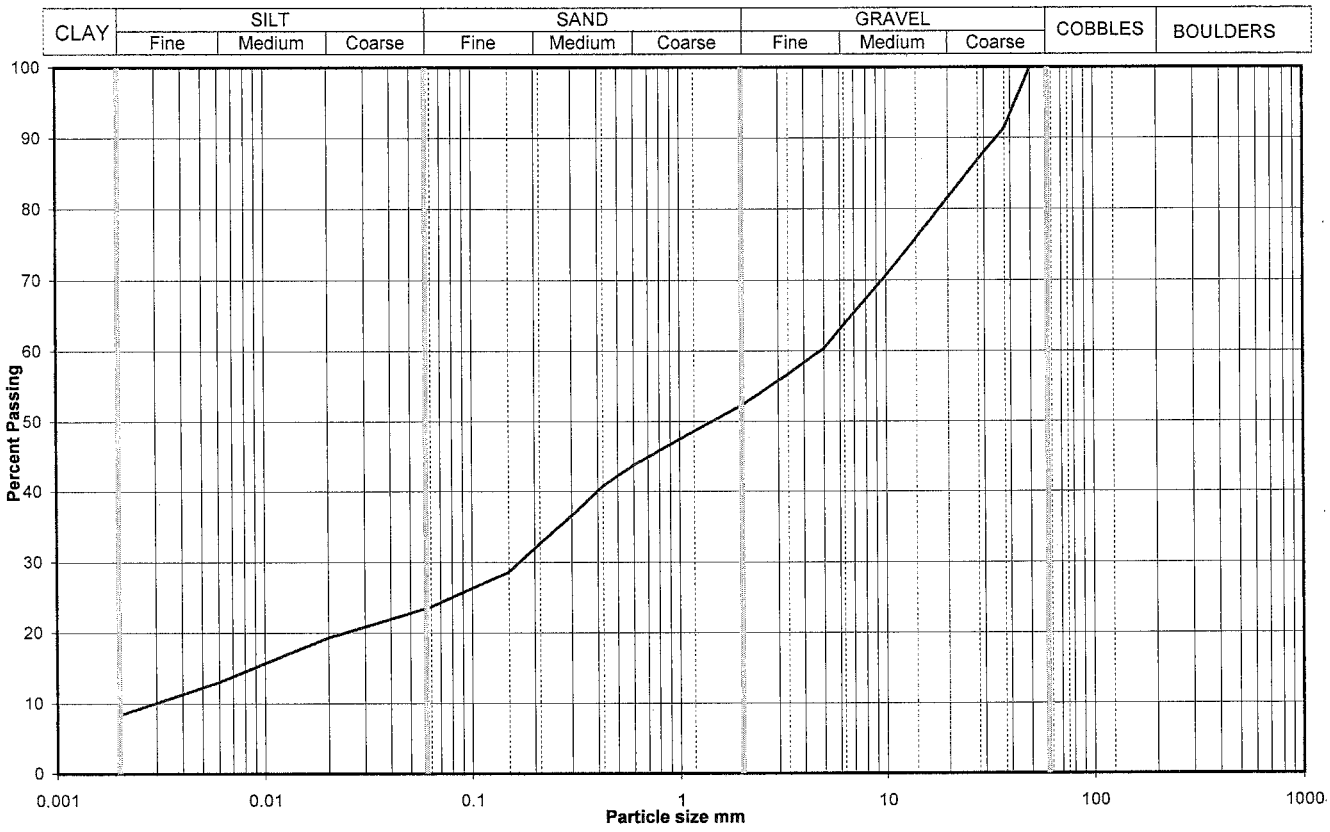
Soil description	Brown sandy gravelly CLAY/SILT.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	36	36
	Sand	35	35
	Silt	20	20
	Clay	9	9

Uniformity Coefficient	D_{60} / D_{10}	422

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH106A		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.20		
			Samp No	6	Type	B
			ID	ESGA708820070821000000060		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	19
90	100	0.0060	13
75	100	0.0020	8
63	100		
50	100		
37.5	91		
28	87		
20	82		
14	76		
10	71		
6.3	64		
5.0	60		
3.35	57		
2.00	52		
1.18	49	Particle density, Mg/m3	
0.600	44		
0.425	41	2.65 assumed	
0.300	37	Dry mass of sample, kg	
0.212	33		
0.150	29	3.2	
0.063	24		

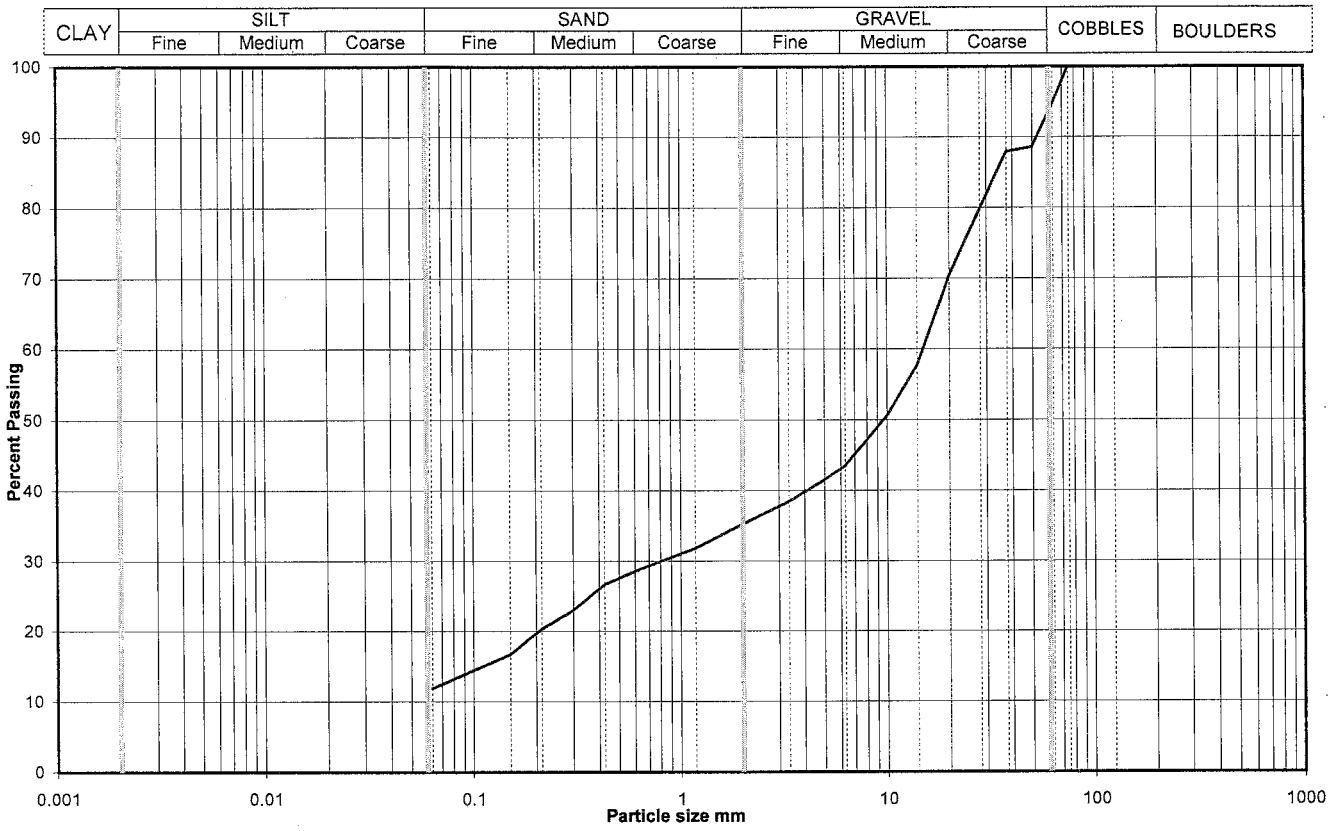
Soil description	Greyish brown slightly sandy gravelly CLAY/SILT.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	48	48
	Sand	29	29
	Silt	15	15
	Clay	8	8

Uniformity Coefficient	D_{60} / D_{10}	1631

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH111		
Project Name	BARNSLEY MARKET		Depth (m BGL)	0.00		
			Samp No	5	Type	B
			ID	ESGA708820070821000000100		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	95		
50	89		
37.5	88		
28	80		
20	70		
14	58		
10	51		
6.3	43		
5.0	41		
3.35	38		
2.00	35		
1.18	32		
0.600	29		
0.425	27		
0.300	23	Dry mass of sample, kg	
0.212	20		
0.150	17	6.2	
0.063	12		

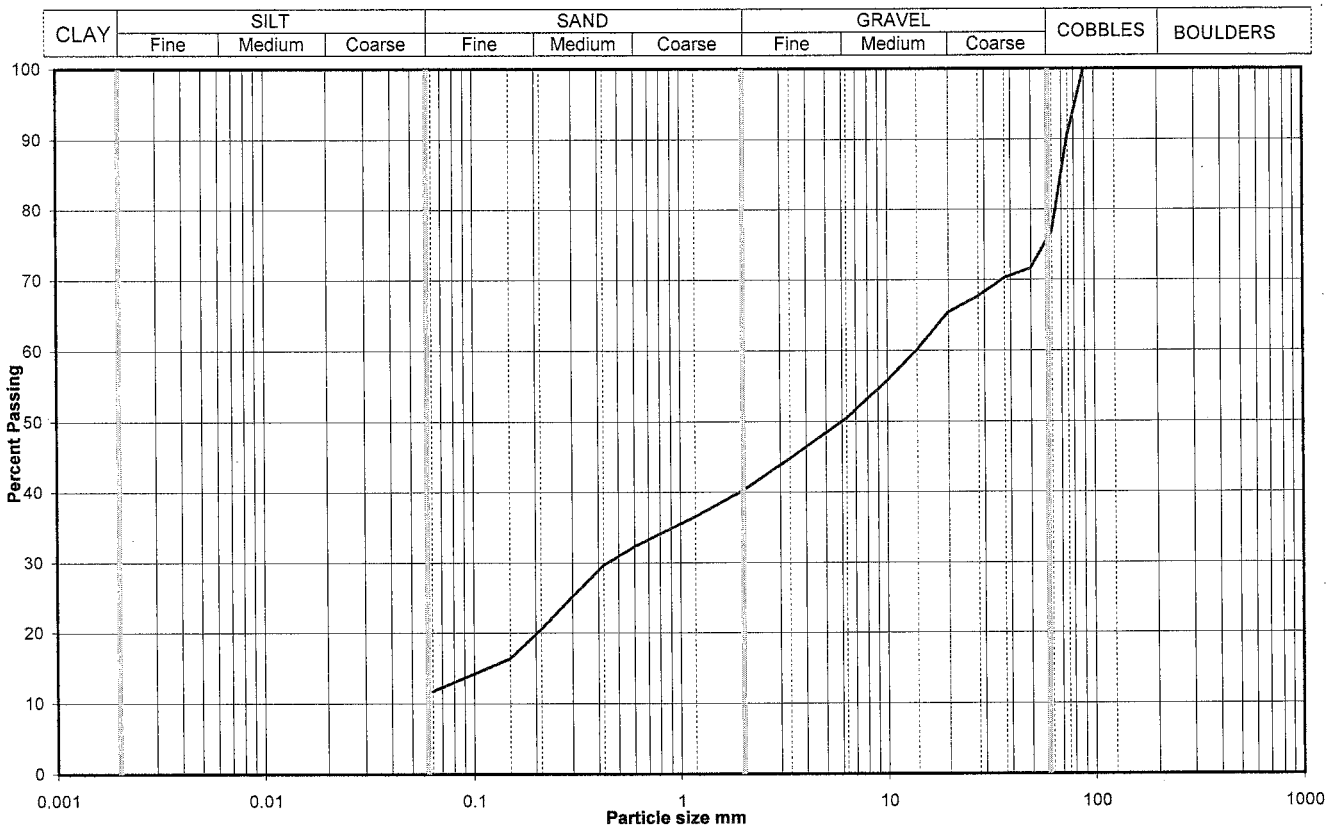
Soil description	Brown and black silty very sandy GRAVEL with some cobbles.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	7	0
	Gravel	58	62
	Sand	23	25
	Silt	silt+clay =	
	Clay	12	13

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH111		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.20		
			Samp No	7	Type	B
			ID	ESGA708820070821000000106		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	91		
63	77		
50	72		
37.5	70		
28	68		
20	65		
14	60		
10	56		
6.3	50		
5.0	48		
3.35	45		
2.00	40		
1.18	37		
0.600	32		
0.425	30		
0.300	25	Dry mass of sample, kg	
0.212	21	7.9	
0.150	16		
0.063	12		

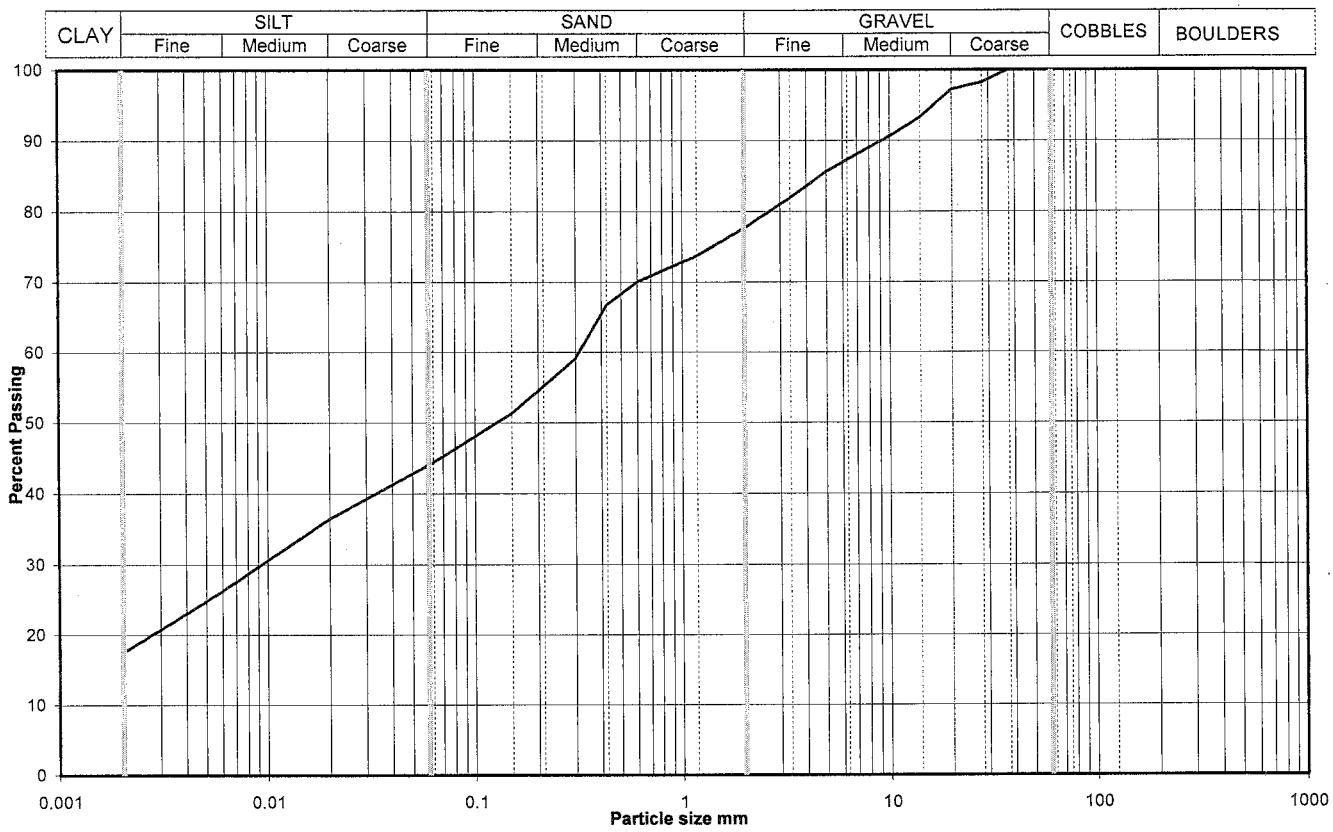
Soil description	Brown clayey very sandy GRAVEL with many cobbles.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	24	0
	Gravel	36	47
	Sand	29	38
	Silt	silt+clay =	
	Clay	11	14

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH111		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.00		
			Samp No	12	Type	B
			ID	ESGA708820070821000000111		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	36
90	100	0.0060	26
75	100	0.0020	18
63	100		
50	100		
37.5	100		
28	98		
20	97		
14	93		
10	91		
6.3	87		
5.0	86		
3.35	82		
2.00	78		
1.18	74	Particle density, Mg/m3	
0.600	70		
0.425	67	2.65 assumed	
0.300	59	Dry mass of sample, kg	
0.212	55		
0.150	51	2.3	
0.063	44		

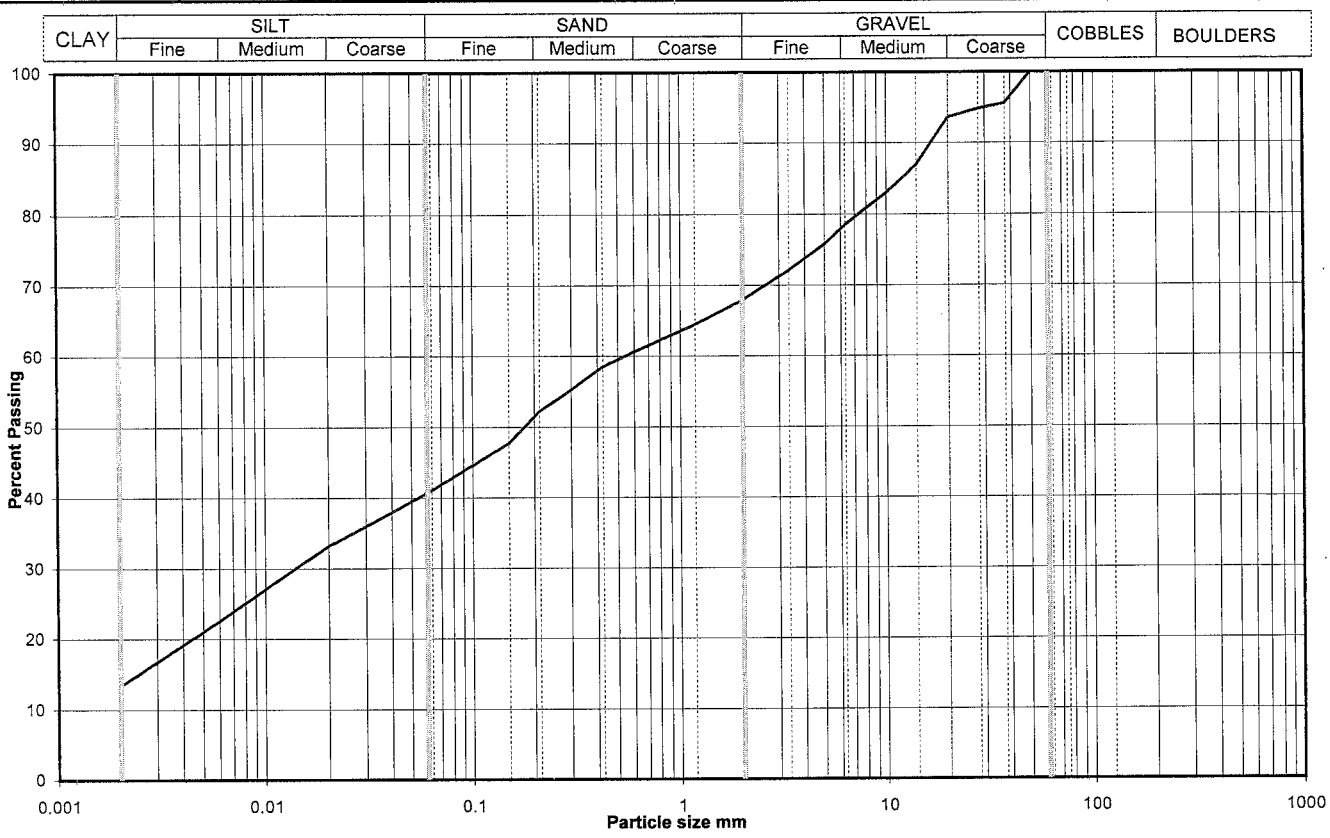
Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	22	22
	Sand	34	34
	Silt	26	26
	Clay	18	18

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH112		
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00		
			Samp No	9	Type	B
			ID	ESGA708820070821000000125		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	33
90	100	0.0060	23
75	100	0.0020	13
63	100		
50	100		
37.5	96		
28	95		
20	94		
14	87		
10	83		
6.3	78		
5.0	76		
3.35	72		
2.00	68		
1.18	64	Particle density, Mg/m3	
0.600	61		
0.425	58	2.65 assumed	
0.300	55	Dry mass of sample, kg	
0.212	52		
0.150	48	3.4	
0.063	41		

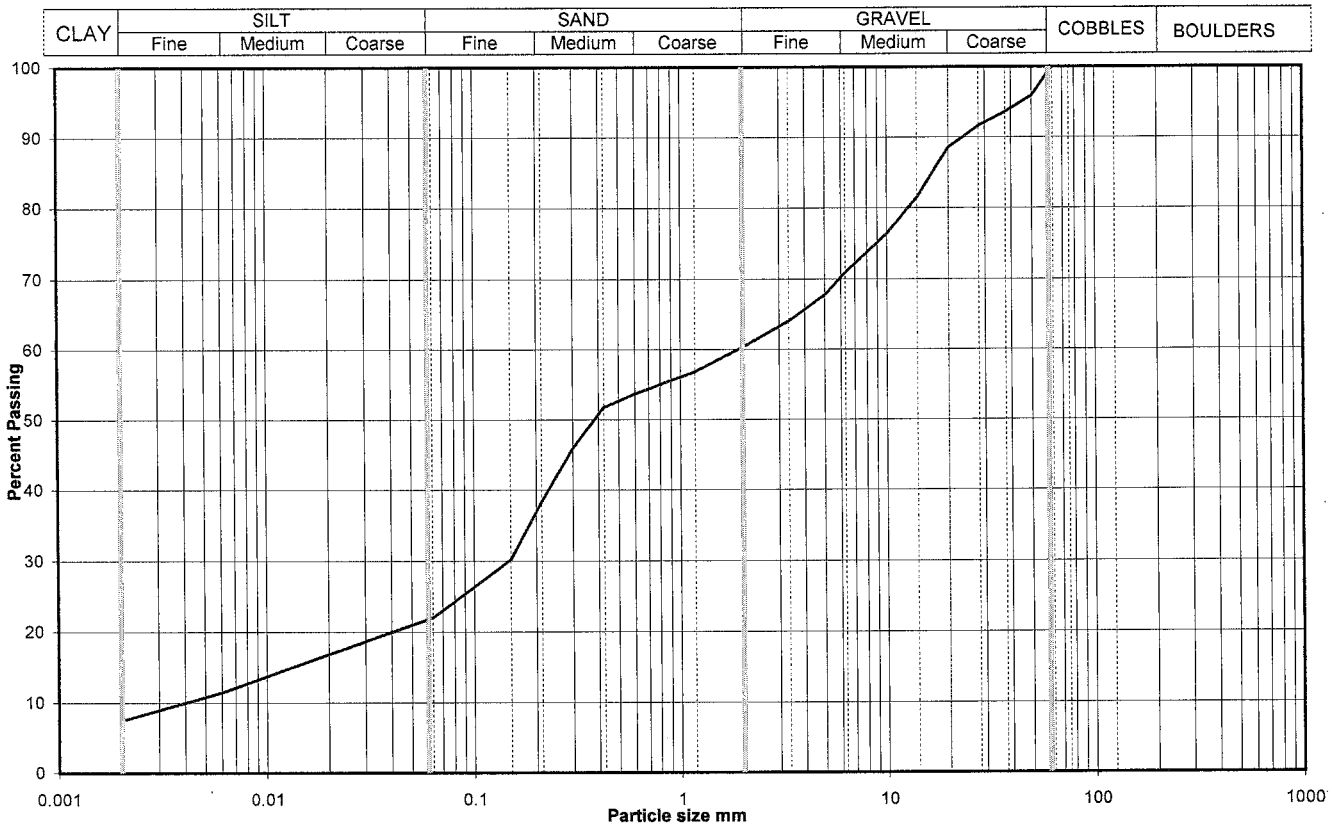
Soil description	Brownish grey slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	32	32
	Sand	27	27
	Silt	28	28
	Clay	13	13

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH114		
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00		
			Samp No	1	Type	B
			ID	ESGA708820070821000000131		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	17
90	100	0.0060	11
75	100	0.0020	7
63	100		
50	96		
37.5	94		
28	92		
20	88		
14	81		
10	76		
6.3	71		
5.0	68		
3.35	64		
2.00	60		
1.18	57	Particle density, Mg/m3	
0.600	54		
0.425	52	2.65 assumed	
0.300	46	Dry mass of sample, kg	
0.212	38		
0.150	30	6.6	
0.063	22		

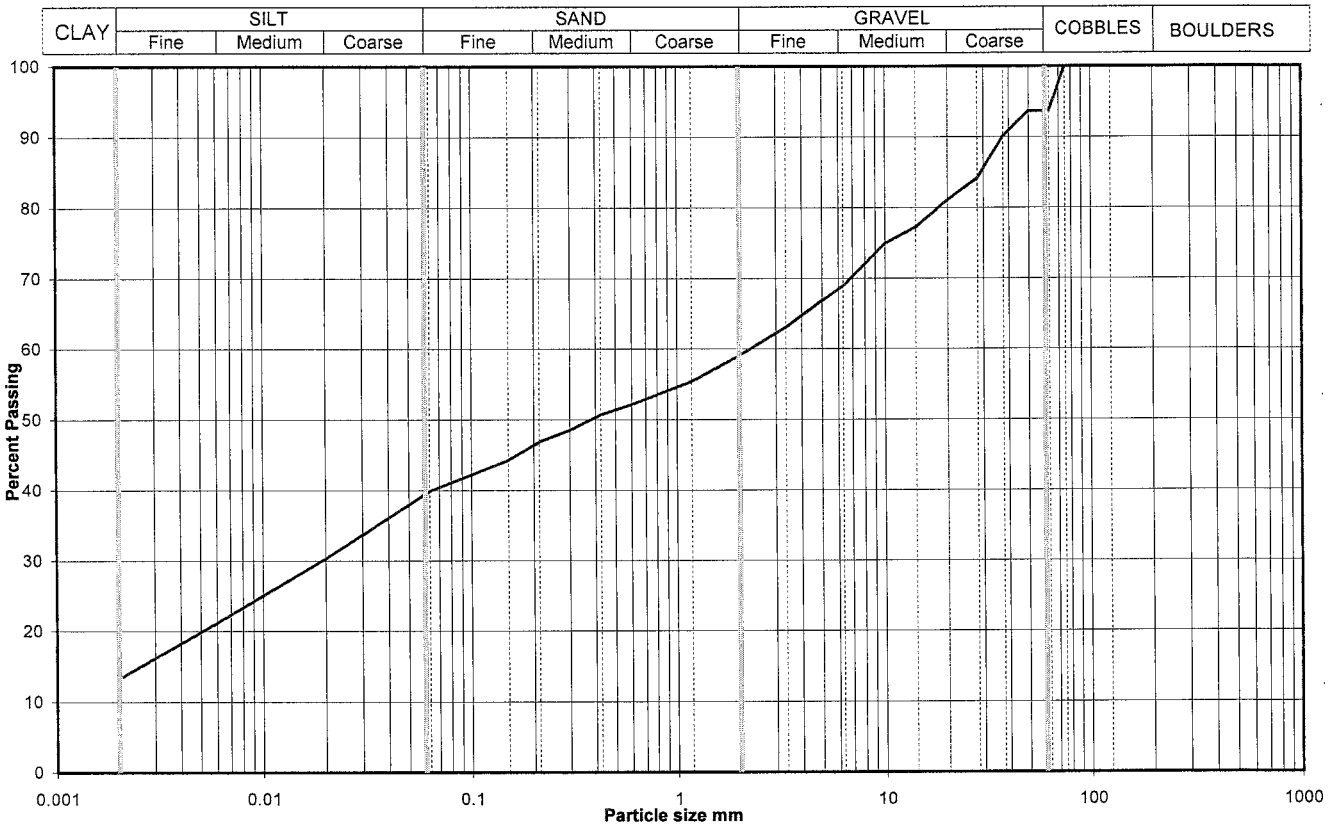
Soil description	Brown sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	1	0
	Gravel	39	39
	Sand	39	39
	Silt	14	14
	Clay	7	7

Uniformity Coefficient	D_{60} / D_{10}	474

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH115		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.50		
			Samp No	2	Type	B
			ID	ESGA708820070820000000003		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	30
90	100	0.0060	21
75	100	0.0020	13
63	94		
50	94		
37.5	90		
28	84		
20	81		
14	77		
10	75		
6.3	69		
5.0	67		
3.35	63		
2.00	59		
1.18	55	Particle density, Mg/m3	
0.600	52	2.65 assumed	
0.425	51		
0.300	48	Dry mass of sample, kg	
0.212	47	6.0	
0.150	44		
0.063	40		

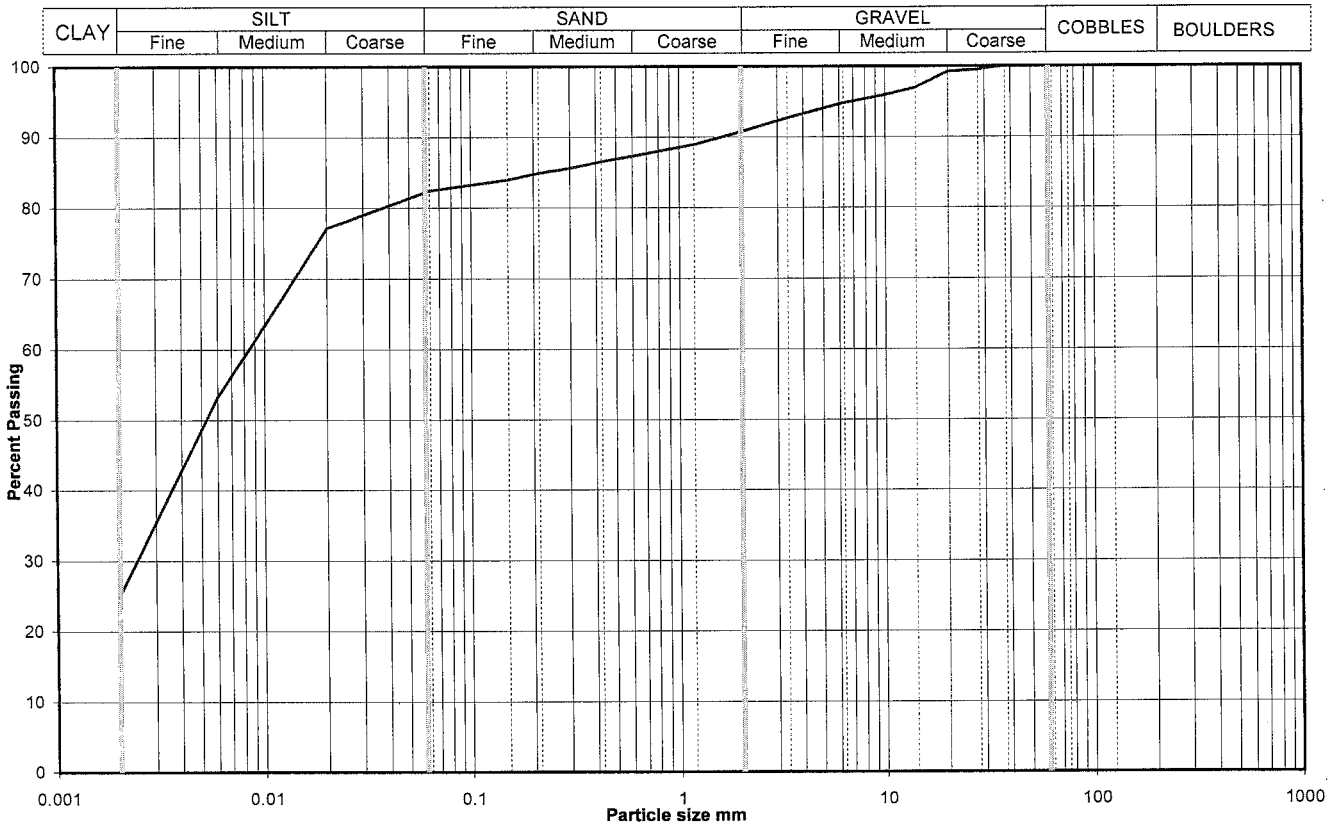
Soil description	Brown and grey slightly sandy gravelly CLAY with some cobbles.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	6	0
	Gravel	35	37
	Sand	20	21
	Silt	26	28
	Clay	13	14

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH115		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.00		
			Samp No	6	Type	B
			ID	ESGA708820070820000000007		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	77
90	100	0.0060	53
75	100	0.0020	25
63	100		
50	100		
37.5	100		
28	99		
20	99		
14	97		
10	96		
6.3	95		
5.0	94		
3.35	93		
2.00	91		
1.18	89	Particle density, Mg/m3	
0.600	87		
0.425	87	2.65 assumed	
0.300	86	Dry mass of sample, kg	
0.212	85		
0.150	84	6.0	
0.063	82		

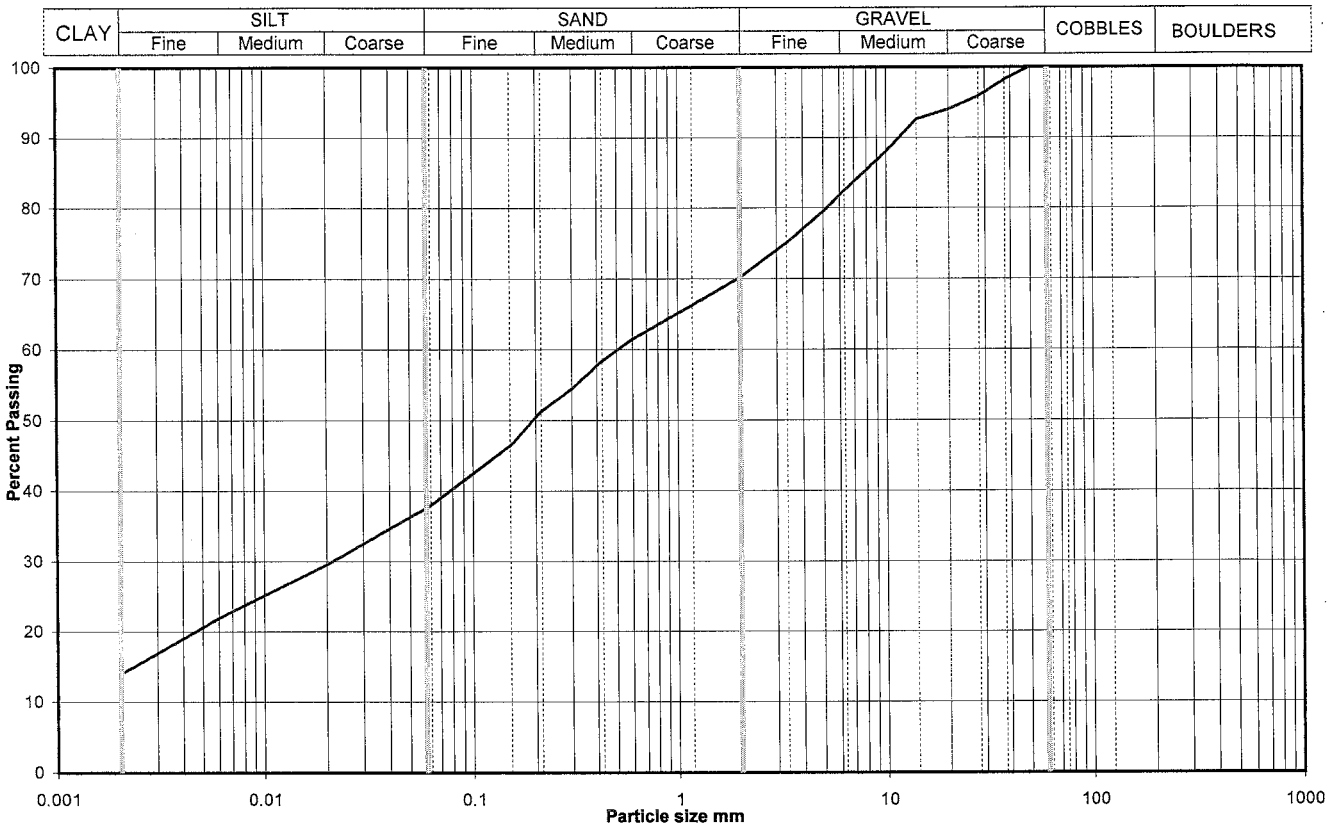
Soil description	Brownish grey friable slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	9	9
	Sand	9	9
	Silt	57	57
	Clay	25	25

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH116		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.20		
			Samp No	3	Type	B
			ID	ESGA708820070820000000010		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	30
90	100	0.0060	22
75	100	0.0020	14
63	100		
50	100		
37.5	98		
28	96		
20	94		
14	93		
10	88		
6.3	82		
5.0	79		
3.35	75		
2.00	70		
1.18	66	Particle density, Mg/m3	
0.600	61		
0.425	58	2.65 assumed	
0.300	54	Dry mass of sample, kg	
0.212	51		
0.150	46	8.1	
0.063	38		

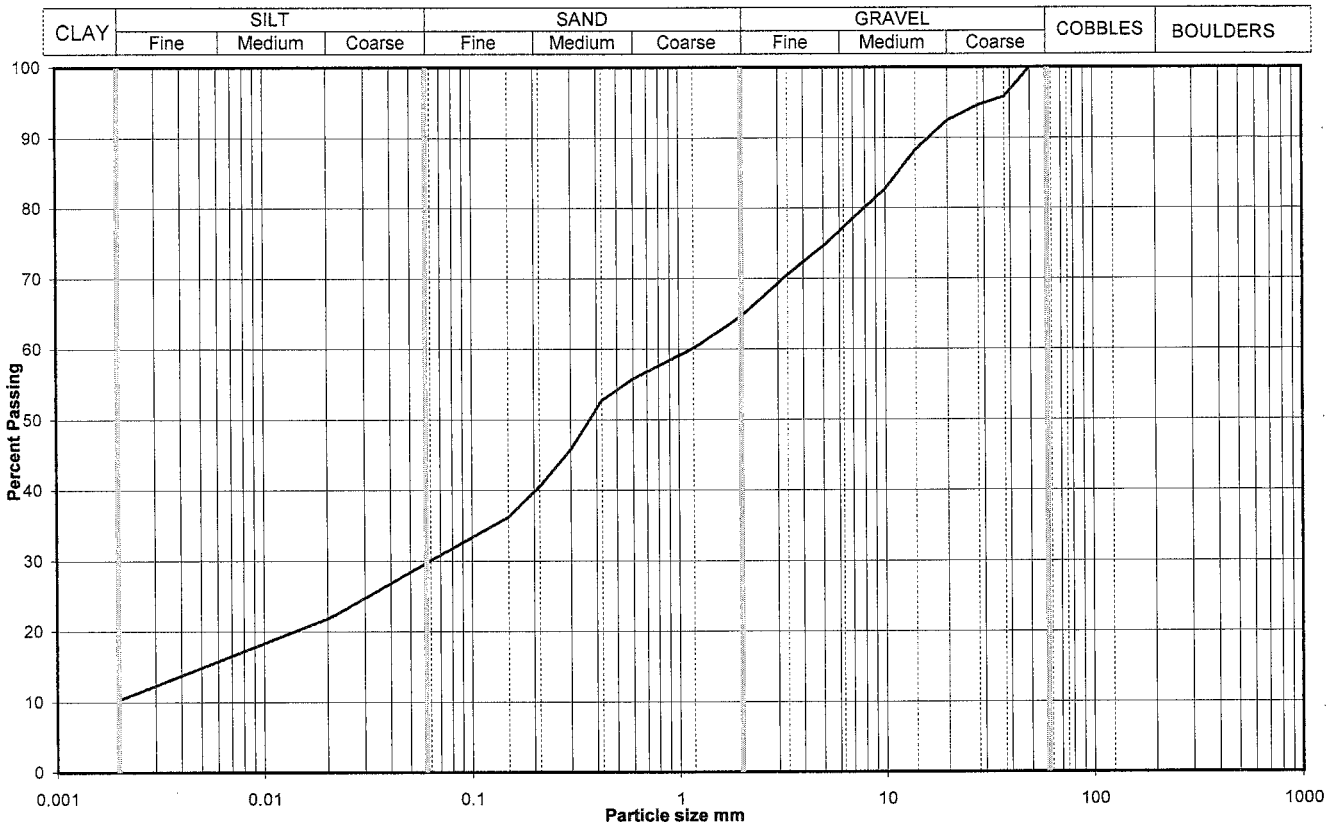
Soil description	Brownish grey slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	30	30
	Sand	33	33
	Silt	23	23
	Clay	14	14

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH116		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.50		
			Samp No	7	Type	B
			ID	ESGA708820070820000000014		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	22
90	100	0.0060	16
75	100	0.0020	10
63	100		
50	100		
37.5	96		
28	95		
20	92		
14	88		
10	83		
6.3	77		
5.0	75		
3.35	71		
2.00	65		
1.18	60	Particle density, Mg/m3	
0.600	56		
0.425	53	2.65 assumed	
0.300	46	Dry mass of sample, kg	
0.212	40		
0.150	36	5.5	
0.063	30		

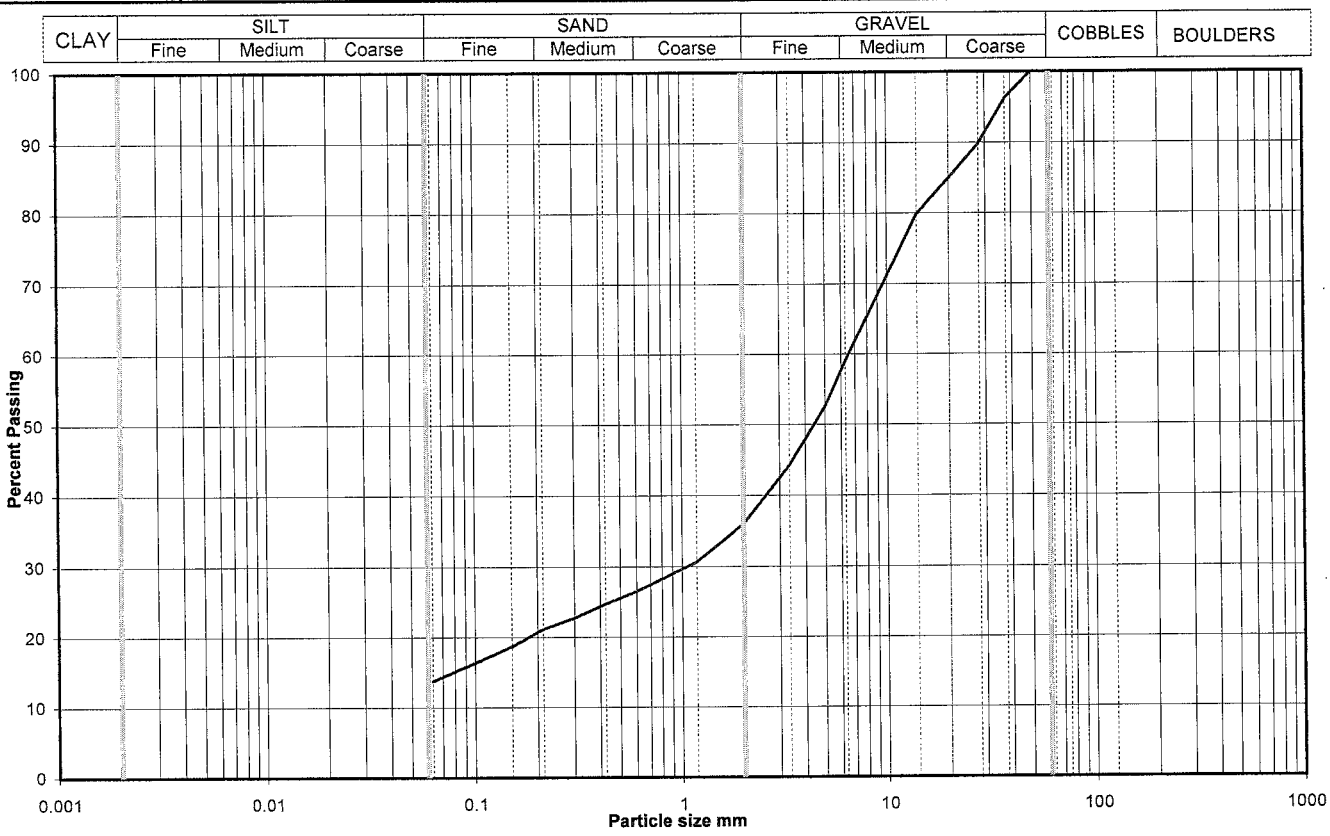
Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	35	35
	Sand	35	35
	Silt	20	20
	Clay	10	10

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH116		
Project Name	BARNSLEY MARKET		Depth (m BGL)	4.50		
			Samp No	9	Type	B
			ID	ESGA708820070820000000016		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	90		
20	85		
14	80		
10	71		
6.3	59		
5.0	52		
3.35	44		
2.00	36		
1.18	31		
0.600	26		
0.425	25		
0.300	23	Dry mass of sample, kg	
0.212	21		
0.150	19	8.1	
0.063	14		

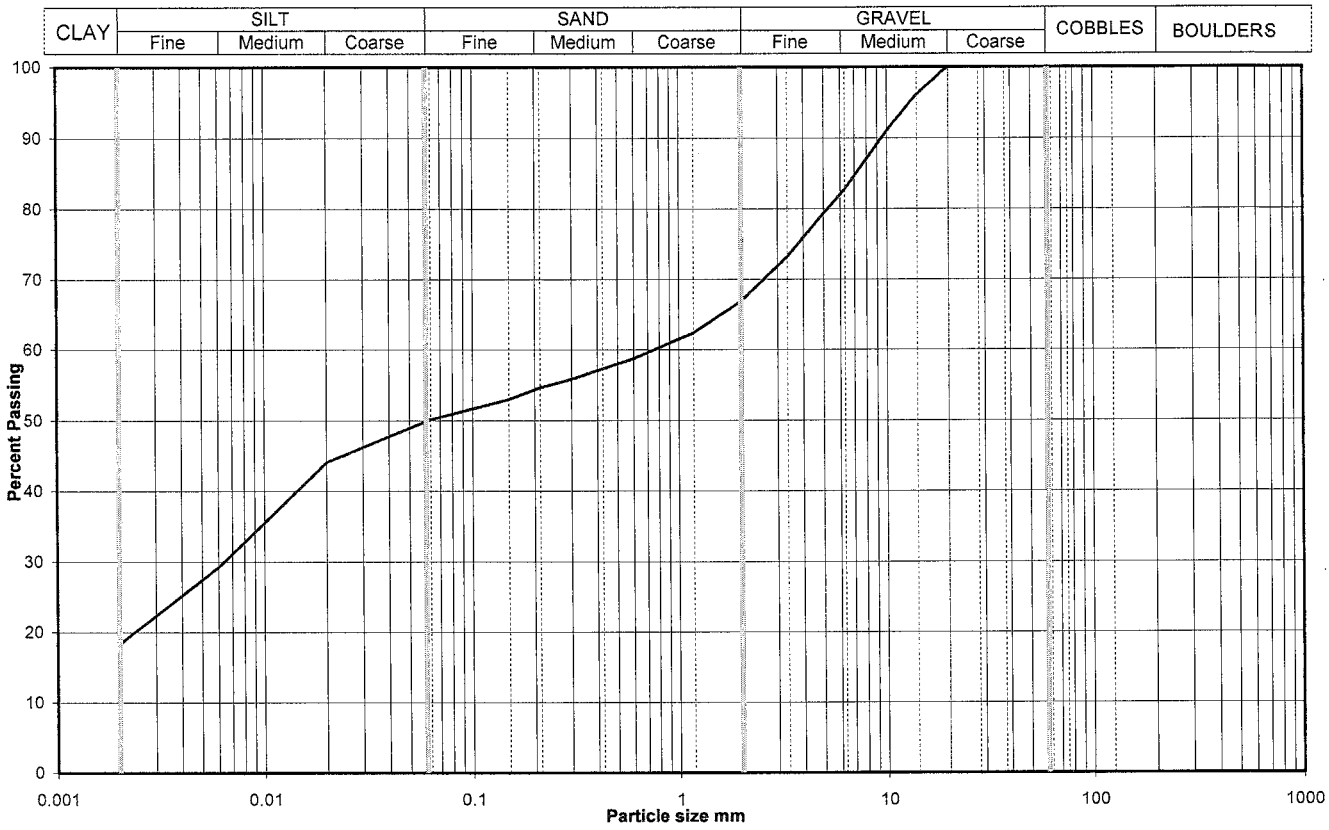
Soil description	Brown silty very sandy GRAVEL.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	64	64
	Sand	22	22
	Silt	silt+clay =	
	Clay	14	14

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH116		
Project Name	BARNSLEY MARKET		Depth (m BGL)	5.50		
			Samp No	11	Type	B
			ID	ESGA708820070820000000018		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	44
90	100	0.0060	29
75	100	0.0020	18
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	96		
10	91		
6.3	83		
5.0	79		
3.35	73		
2.00	67		
1.18	62	Particle density, Mg/m3	
0.600	59		
0.425	57	2.65 assumed	
0.300	56	Dry mass of sample, kg	
0.212	55		
0.150	53	5.7	
0.063	50		

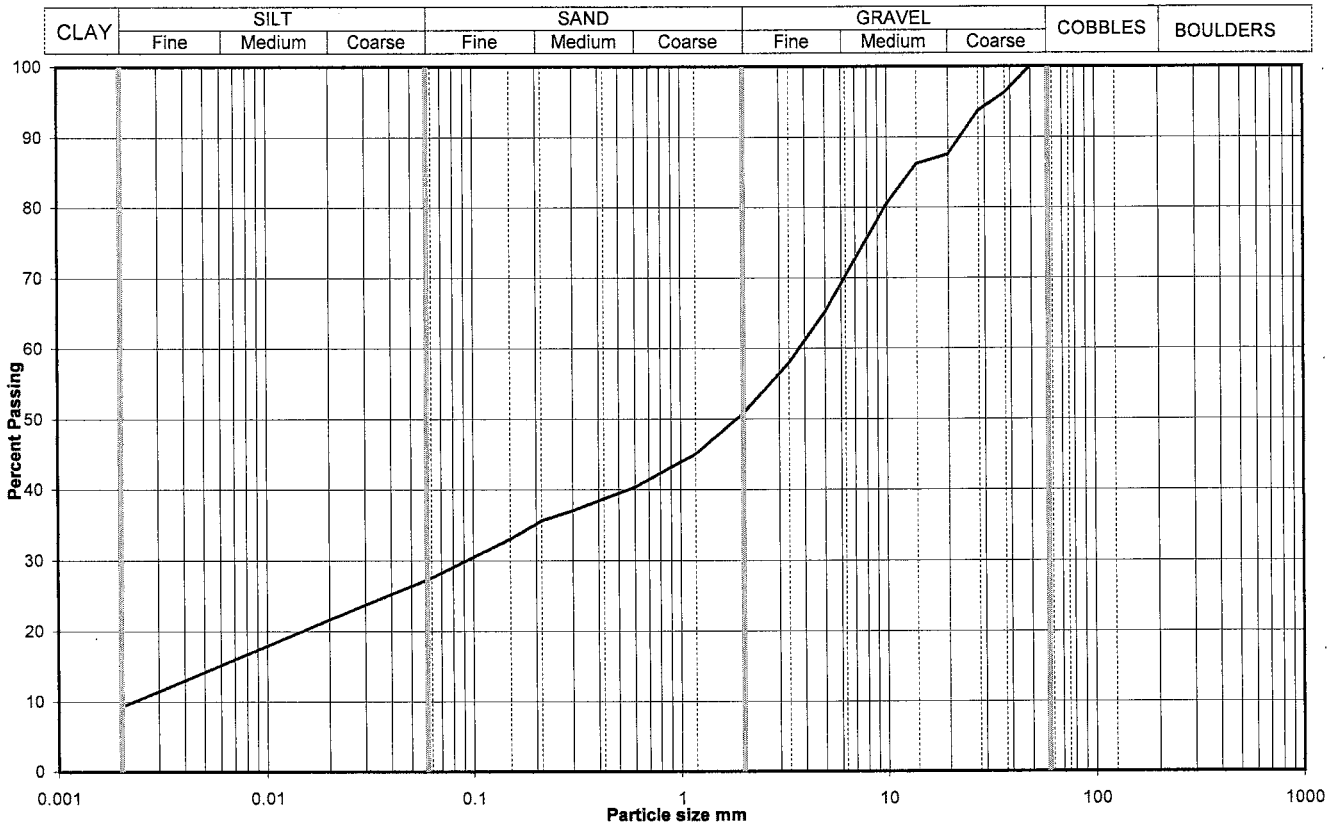
Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	33	33
	Sand	17	17
	Silt	32	32
	Clay	18	18

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH117		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.20		
			Samp No	6	Type	B
			ID	ESGA708820070821000000139		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	22
90	100	0.0060	15
75	100	0.0020	9
63	100		
50	100		
37.5	96		
28	94		
20	88		
14	86		
10	80		
6.3	70		
5.0	65		
3.35	58		
2.00	51		
1.18	45	Particle density, Mg/m3	
0.600	40		
0.425	39	2.65 assumed	
0.300	37	Dry mass of sample, kg	
0.212	36		
0.150	33	2.8	
0.063	28		

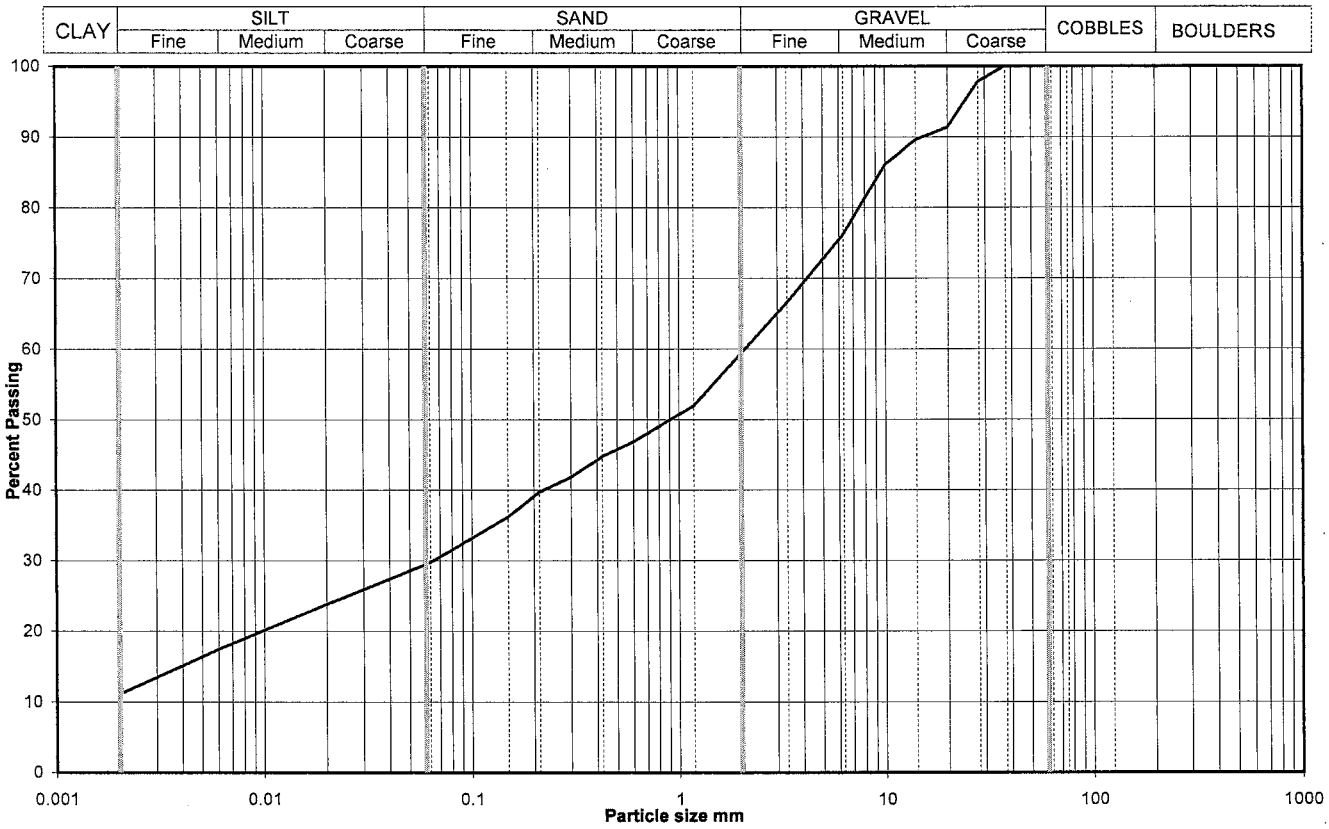
Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only	Cobbles / boulders	Whole 0	*<60mm 0
	Gravel	49	49
	Sand	23	23
	Silt	18	18
	Clay	10	10

Uniformity Coefficient	D_{60} / D_{10}	1635

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH117		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.00		
			Samp No	11	Type	B
			ID	ESGA708820070821000000144		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	24
90	100	0.0060	17
75	100	0.0020	11
63	100		
50	100		
37.5	100		
28	98		
20	91		
14	90		
10	86		
6.3	76		
5.0	73		
3.35	67		
2.00	59		
1.18	52	Particle density, Mg/m3	
0.600	47		
0.425	45	2.65 assumed	
0.300	42	Dry mass of sample, kg	
0.212	40		
0.150	36	4.1	
0.063	30		

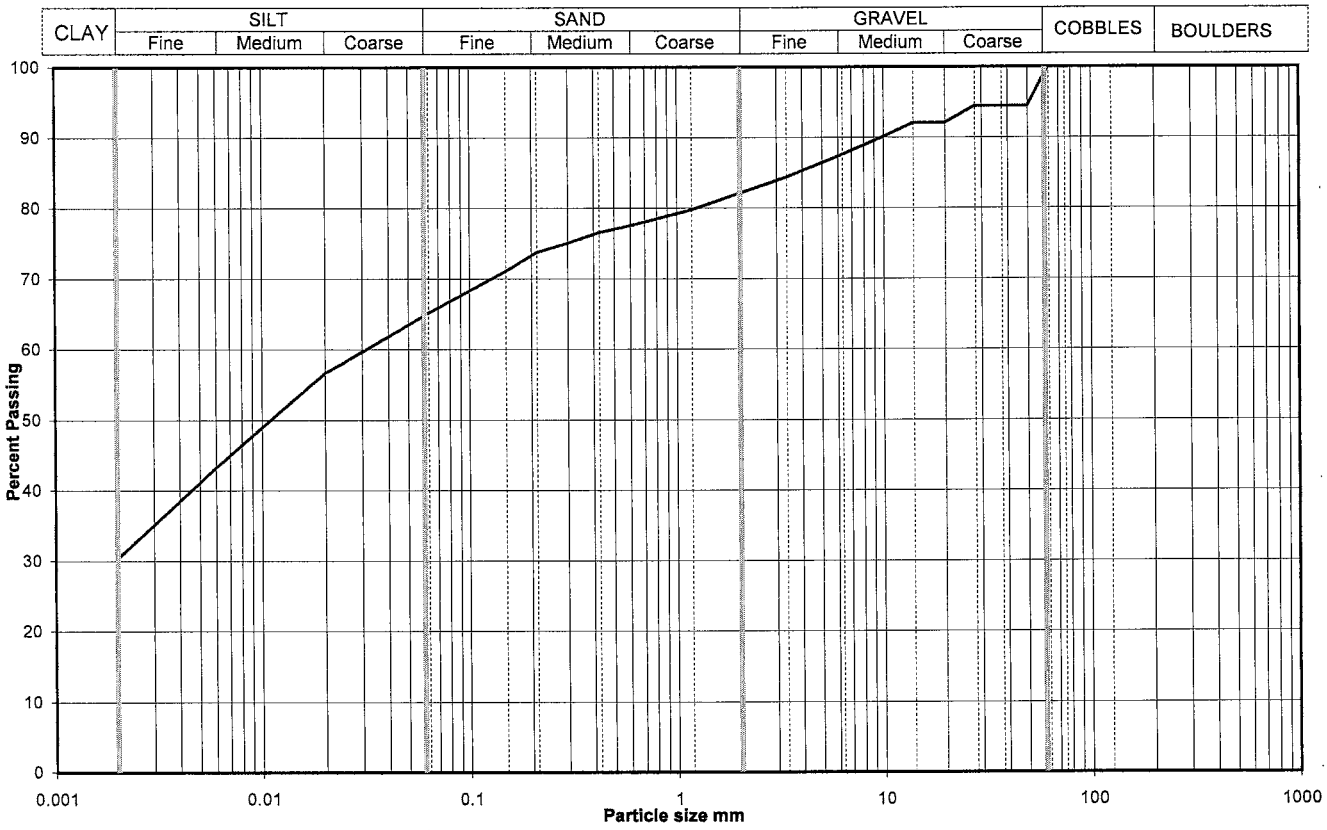
Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	41	41
	Sand	30	30
	Silt	18	18
	Clay	11	11

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH118		
Project Name	BARNSLEY MARKET		Depth (m BGL)	1.20		
			Samp No	2	Type	B
			ID	ESGA708820070820000000024		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	57
90	100	0.0060	43
75	100	0.0020	30
63	100		
50	94		
37.5	94		
28	94		
20	92		
14	92		
10	90		
6.3	88		
5.0	86		
3.35	84		
2.00	82		
1.18	80	Particle density, Mg/m3	
0.600	78		
0.425	77	2.65 assumed	
0.300	75	Dry mass of sample, kg	
0.212	74		
0.150	71	4.5	
0.063	65		

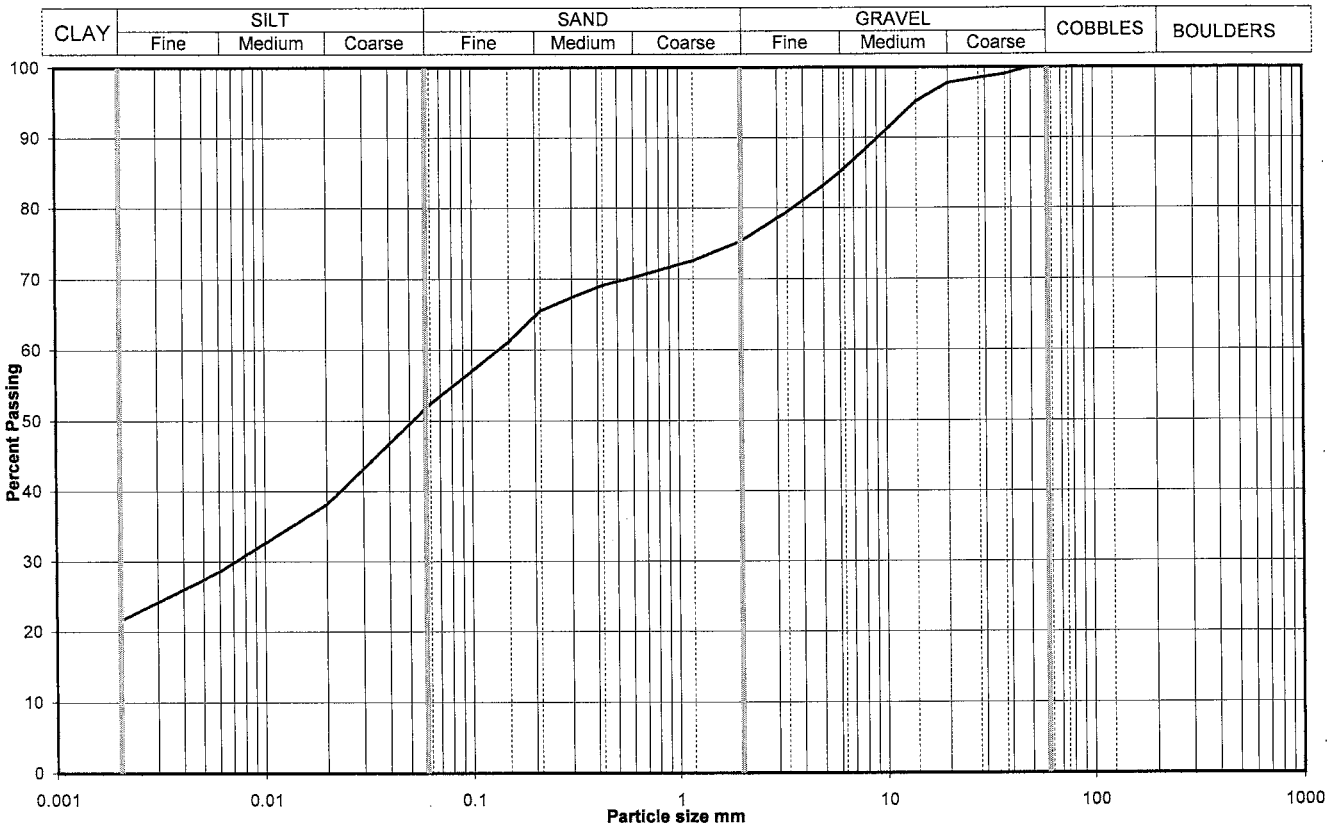
Soil description	Grey and brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	1	0
	Gravel	17	17
	Sand	17	17
	Silt	35	35
	Clay	30	30

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH118		
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00		
			Samp No	4	Type	B
			ID	ESGA708820070820000000026		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	38
90	100	0.0060	29
75	100	0.0020	22
63	100		
50	100		
37.5	99		
28	98		
20	98		
14	95		
10	91		
6.3	86		
5.0	83		
3.35	79		
2.00	75		
1.18	73	Particle density, Mg/m3	
0.600	70		
0.425	69	2.65 assumed	
0.300	67	Dry mass of sample, kg	
0.212	65		
0.150	61	6.9	
0.063	52		

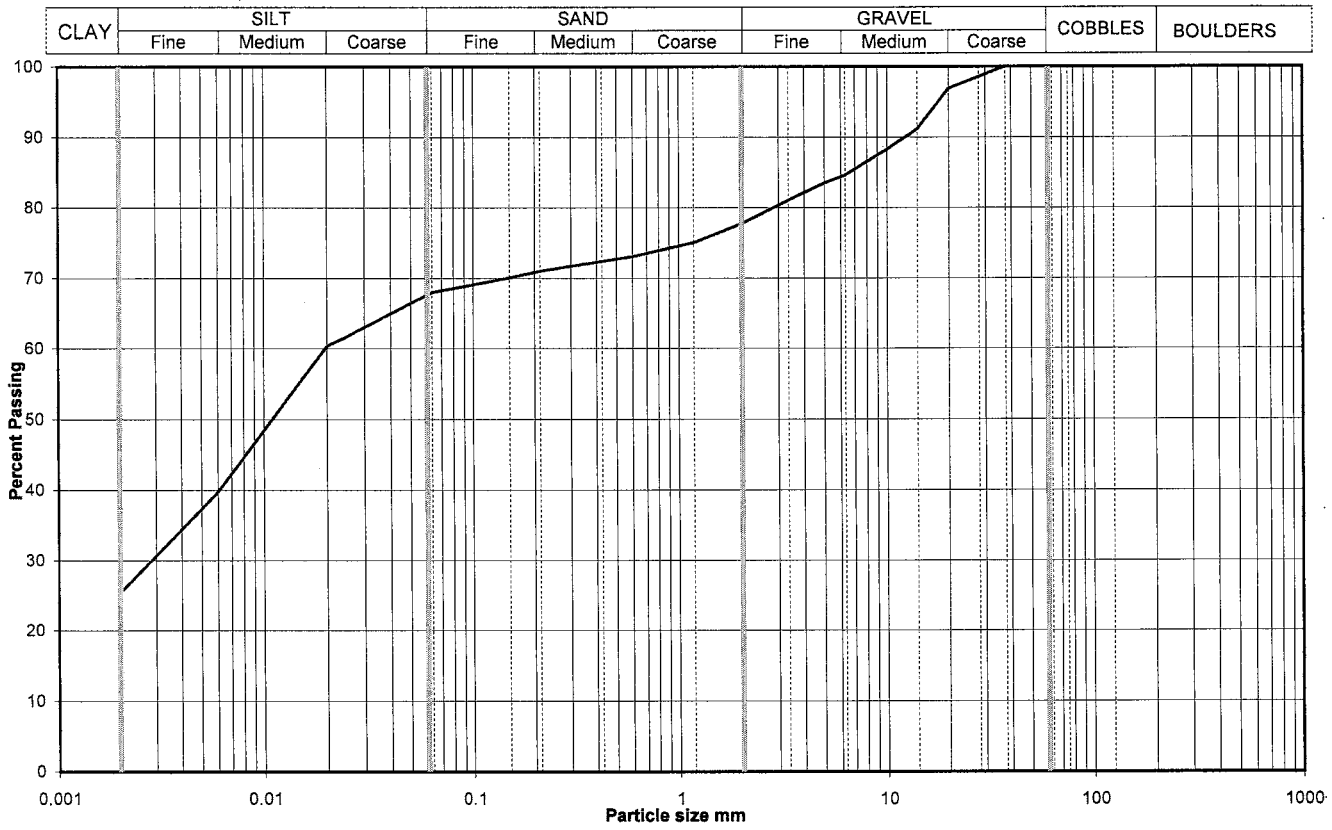
Soil description	Brown and grey slightly sandy slightly gravelly CLAY with rare plant remains.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only	Cobbles / boulders	Whole 0	*<60mm 0
	Gravel	25	25
	Sand	23	23
	Silt	30	30
	Clay	22	22

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH118		
Project Name	BARNSLEY MARKET		Depth (m BGL)	4.00		
			Samp No	8	Type	B
			ID	ESGA708820070820000000030		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	60
90	100	0.0060	40
75	100	0.0020	25
63	100		
50	100		
37.5	100		
28	99		
20	97		
14	91		
10	88		
6.3	85		
5.0	83		
3.35	81		
2.00	78		
1.18	75	Particle density, Mg/m3	
0.600	73		
0.425	72	2.65 assumed	
0.300	72	Dry mass of sample, kg	
0.212	71		
0.150	70	4.2	
0.063	68		

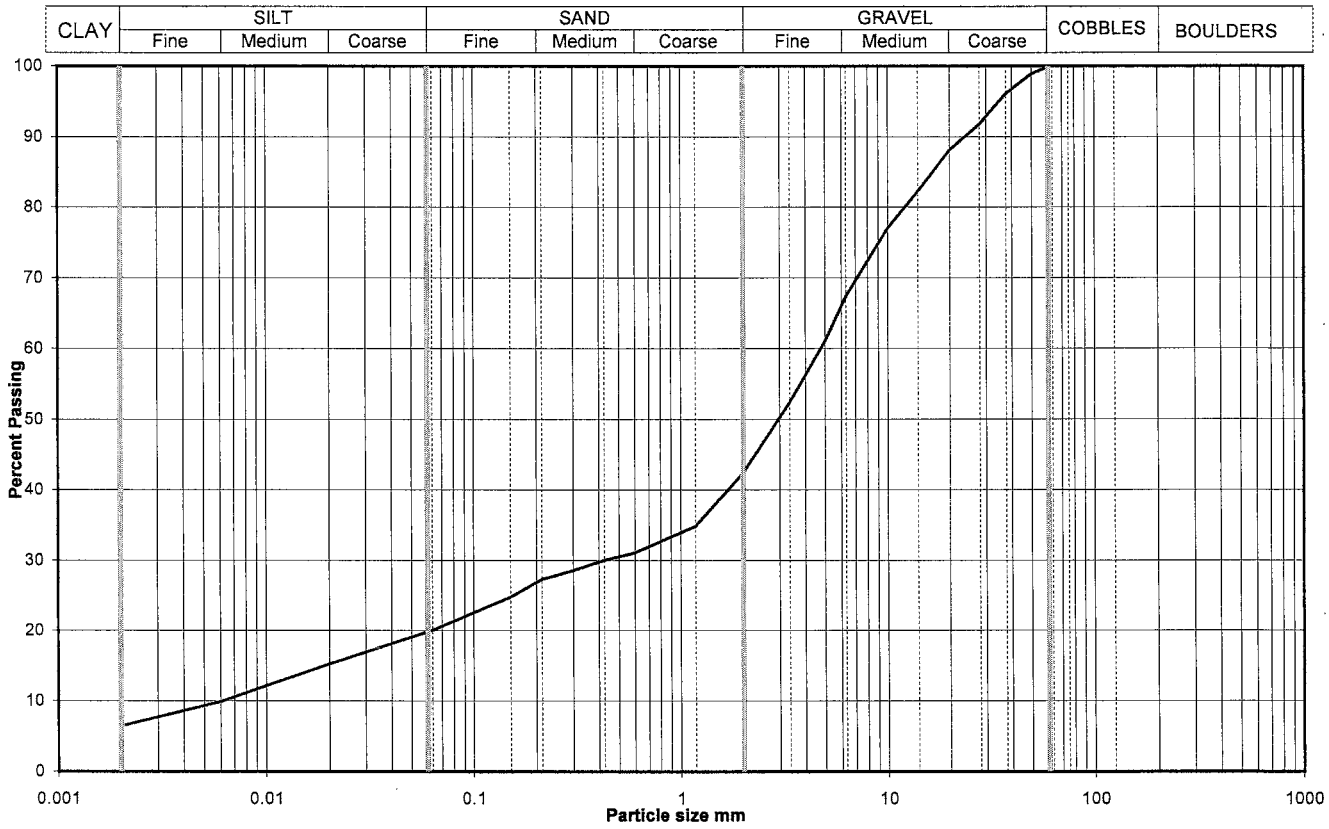
Soil description	Grey and brown slightly sandy slightly gravelly CLAY with mudstone.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	22	22
	Sand	10	10
	Silt	42	42
	Clay	26	26

Uniformity Coefficient	D_{60} / D_{10}	#N/A

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Project No	A7088	Sample Details:	Hole No	BH118		
Project Name	BARNSLEY MARKET		Depth (m BGL)	8.00		
			Samp No	14	Type	B
			ID	ESGA708820070820000000036		
			Spec Ref			



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	15
90	100	0.0060	10
75	100	0.0020	6
63	100		
50	99		
37.5	96		
28	92		
20	88		
14	82		
10	77		
6.3	67		
5.0	61		
3.35	52		
2.00	42		
1.18	35	Particle density, Mg/m3	
0.600	31		
0.425	30	2.65 assumed	
0.300	29	Dry mass of sample, kg	
0.212	27		
0.150	25	10.5	
0.063	20		

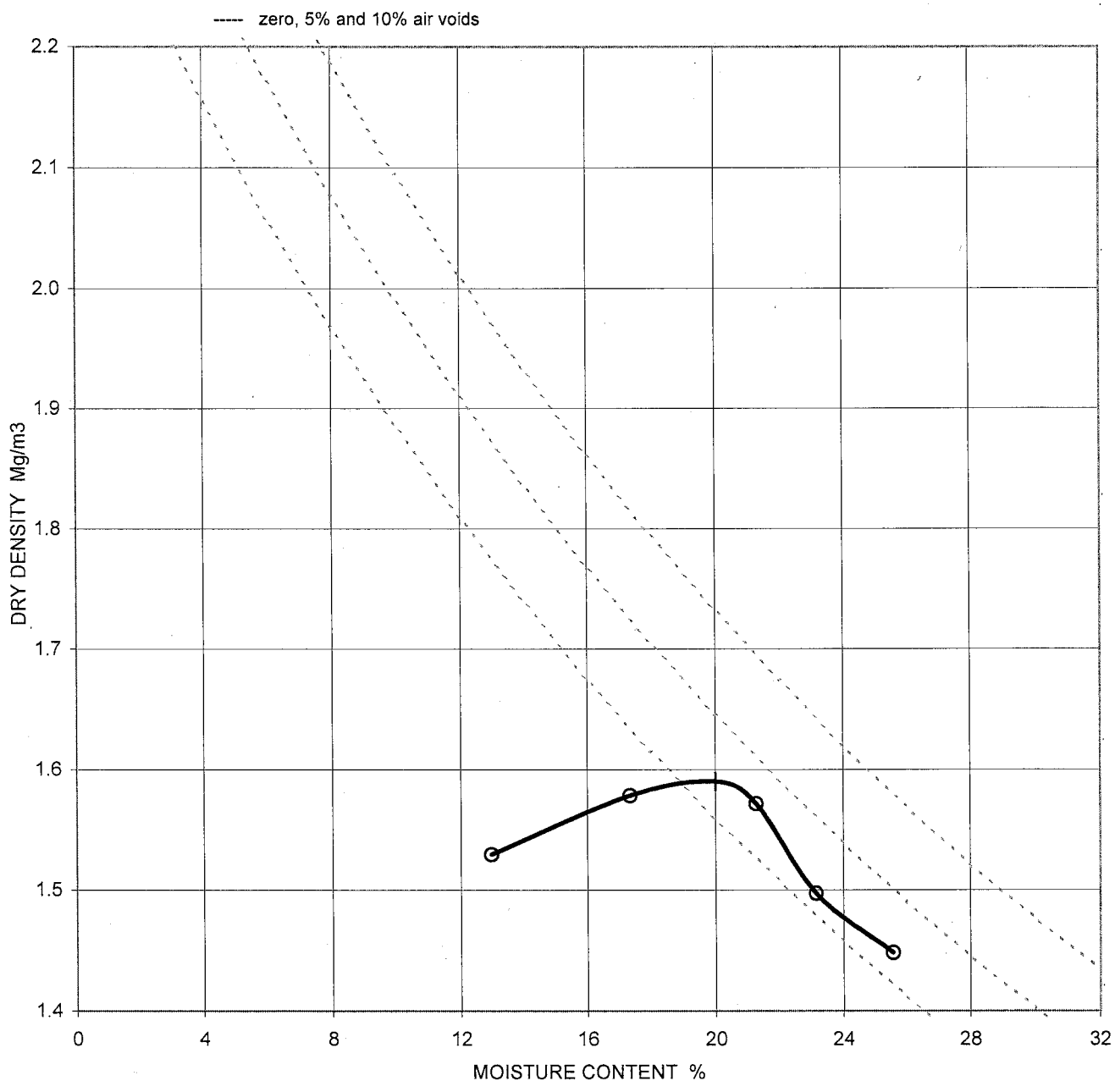
Soil description	Brown slightly sandy gravelly CLAY/SILT.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions *<60mm values to aid description only		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	58	58
	Sand	23	23
	Silt	13	13
	Clay	6	6

Uniformity Coefficient	D_{60} / D_{10}	772

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Project No	A7088	Sample Details:	Hole No	BH104		
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00		
			Samp No	8	Type	AMAL
			ID	ESGN5000368222		
			Spec Ref			



Soil description	Dark brownish grey sandy gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.3, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	2	%	
Particle density, Mg/m^3	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3

1.59

Optimum moisture content, %

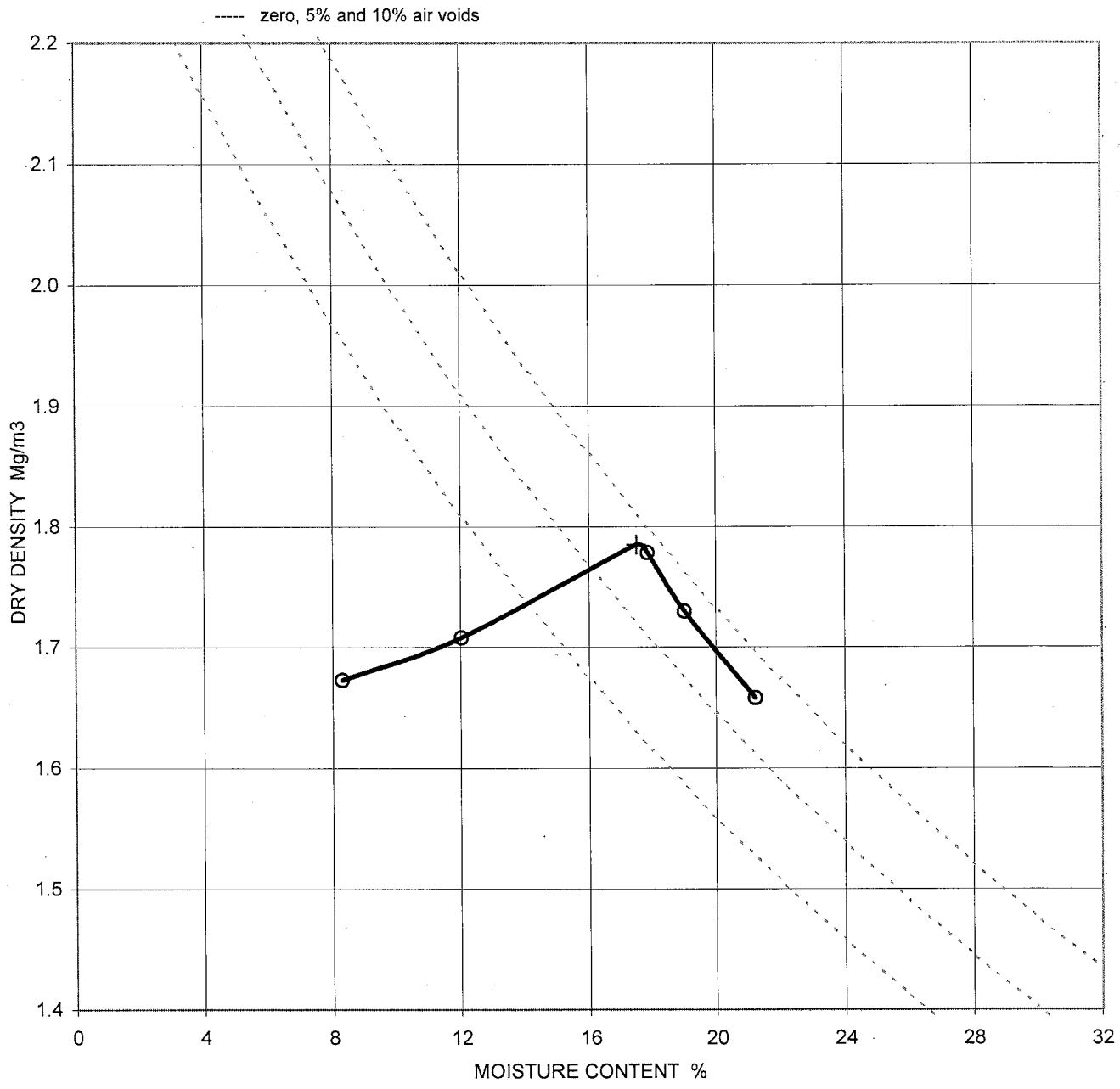
20

QA Ref			Figure
SLD 4, 3.3/4 Rev 60 Jul 07	Soil Mechanics	Printed:09/10/2007 12:26	**COMPL 1**

UKAS TESTING 1157

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Project No	A7088	Sample Details:	Hole No	BH117		
Project Name	BARNSLEY MARKET		Depth (m BGL)	0.00		
			Samp No	4	Type	B
			ID	ESGA708820070821000000134		
			Spec Ref			



Soil description	Dark greyish brown sandy gravelly CLAY with occasional cobbles.		
Test method	BS 1377:part 4:1990: clause 3.3, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	26	%	
Material < 37.5mm > 20mm	3	%	
Particle density, Mg/m^3	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3

1.79

Optimum moisture content, %

18

MOISTURE CONDITION VALUE (MCV) TEST
BS1377:PART 4 : 1990 : CLAUSE 5.4

Project No	A7088	Sample Details:	Hole No	BH106A	
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00	
			Samp No	8	Type B
			ID	ESGA708820070821000000062	
Work Order No	1		Spec Ref		

Soil Description	Brown and grey slightly sandy slightly gravelly CLAY. Gravel is weak mudstone.	
Preparation procedure	as BS1377: Part 4 clause 5.4	at natural moisture content

Natural Moisture Content	17.5	%
Initial sample mass	2094.8	g
Retained on 20mm sieve	12 g	1 %

Mould diameter	100 mm
Height of drop	250 mm
Mass of rammer	7 kg

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	97.1	20.5
2	87.0	19.7
3	81.1	18.3
4	76.6	15.8
6	70.9	11.9
8	67.3	8.8
12	62.8	4.5
16	60.8	2.6
24	59.0	1.1
32	58.5	0.6
48	58.3	0.9
64	58.2	1.0
96	57.9	
128	57.9	
192	57.4	
256	57.2	

Specimen after test

Vane shear strength	kPa	
Final height	mm	87.69
Mass	g	1465.6

Moisture content

Tin No.		
Tin mass	g	1277.4
Tin + wet mass	g	2265
Tin + dry mass	g	2118.1
Moisture Content	%	**17.5**

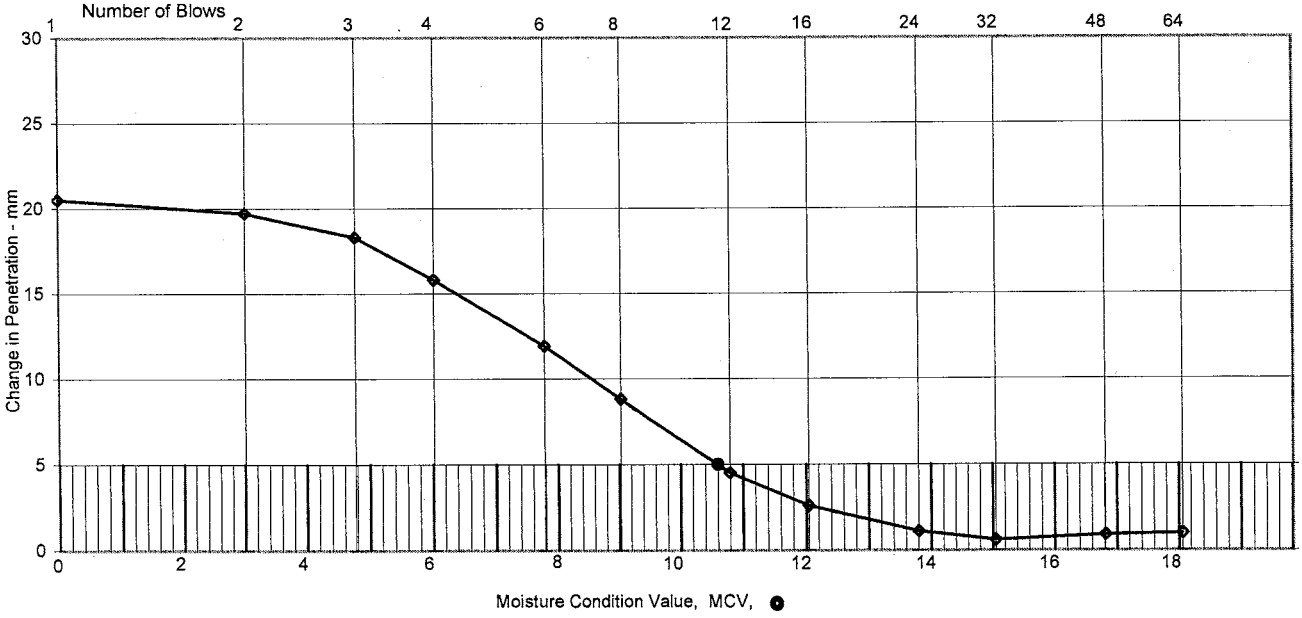
Densities (assumes diameter = 100mm)

Bulk density	Mg/m^3	2.13
Dry density	Mg/m^3	1.81

Method of interpretation
delete as appropriate on data sheet

○ Steepest straight line
○ Best fit line

MCV	**10.6**



QA Ref SLR 4, 5.4 Rev 40 Jul 07	Soil Mechanics	UKAS TESTING 1157	Printed:09/10/2007 12:29	**Figure** **MCV 1**

MOISTURE CONDITION VALUE (MCV) TEST
BS1377:PART 4 : 1990 : CLAUSE 5.4

Project No	A7088	Sample Details:	Hole No	BH111		
Project Name	BARNSLEY MARKET		Depth (m BGL)	4.00		
			Samp No	13	Type	B
			ID	ESGA708820070821000000112		
Work Order No	1		Spec Ref			

Soil Description	Grey slightly sandy slightly gravelly CLAY.	
Preparation procedure	as BS1377: Part 4 clause 5.4	at natural moisture content

Natural Moisture Content	22.75	%		
Initial sample mass	3149.3	g		
Retained on 20mm sieve	71.2	g	2	%

Mould diameter	100 mm
Height of drop	250 mm
Mass of rammer	7 kg

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	92.0	25.7
2	80.4	19.1
3	71.6	10.8
4	66.3	5.5
6	62.2	1.7
8	61.3	0.8
12	60.8	0.4
16	60.8	
24	60.5	
32	60.5	
48	60.4	
64		
96		
128		
192		
256		

Specimen after test

Vane shear strength	kPa	41
Final height	mm	93.41
Mass	g	1470.3

Moisture content

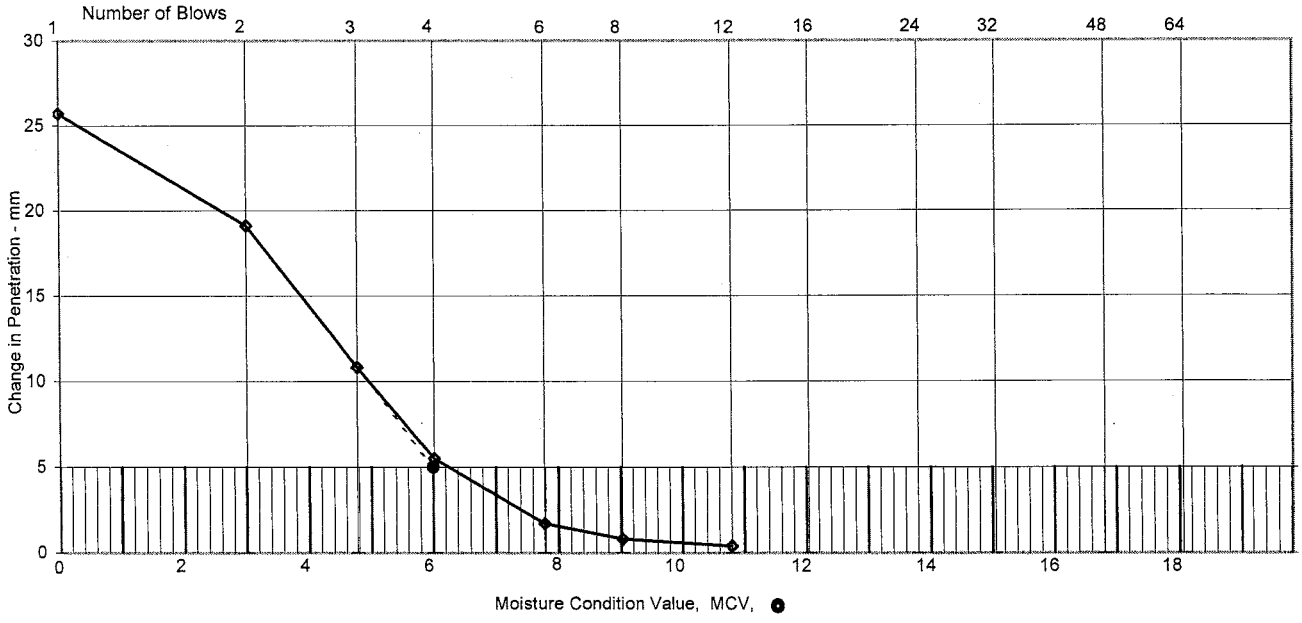
Tin No.		
Tin mass	g	1278.3
Tin + wet mass	g	2748.3
Tin + dry mass	g	2491.4
Moisture Content	%	**21.2**

Densities (assumes diameter = 100mm)

Bulk density	Mg/m^3	2.00
Dry density	Mg/m^3	1.65

Method of interpretation (delete as appropriate on data sheet)
(●) Steepest straight line
( ) Best fit line

MCV	**6.0**



QA Ref			
SLR 4, 5.4 Rev 40 Jul 07	Soil Mechanics	Printed:09/10/2007 12:29	Figure **MCV 2**

MOISTURE CONDITION VALUE (MCV) TEST
BS1377:PART 4 : 1990 : CLAUSE 5.4

Project No	A7088	Sample Details:	Hole No	BH112	
Project Name	BARNSLEY MARKET		Depth (m BGL)	0.00	
			Samp No	5	Type B
			ID	ESGA708820070821000000117	
Work Order No	1		Spec Ref		

Soil Description	Dark brown slightly sandy slightly gravelly CLAY.	
Preparation procedure	as BS1377: Part 4 clause 5.4	at natural moisture content

Natural Moisture Content	29.96	%		
Initial sample mass	12382	g		
Retained on 20mm sieve	41.2	g	0	%

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	112.3	28.6
2	97.9	24.4
3	89.6	18.2
4	83.7	12.5
6	77.0	6.0
8	73.5	2.8
12	71.4	0.9
16	71.2	1.1
24	71.0	1.6
32	70.7	2.0
48	70.5	2.9
64	70.1	3.2
96	69.4	
128	68.7	
192	67.6	
256	66.9	

Specimen after test

Vane shear strength	kPa	49
Final height	mm	99.89
Mass	g	1424.9

Moisture content

Tin No.		
Tin mass	g	1042
Tin + wet mass	g	2466.8
Tin + dry mass	g	2139.5
Moisture Content	%	**29.8**

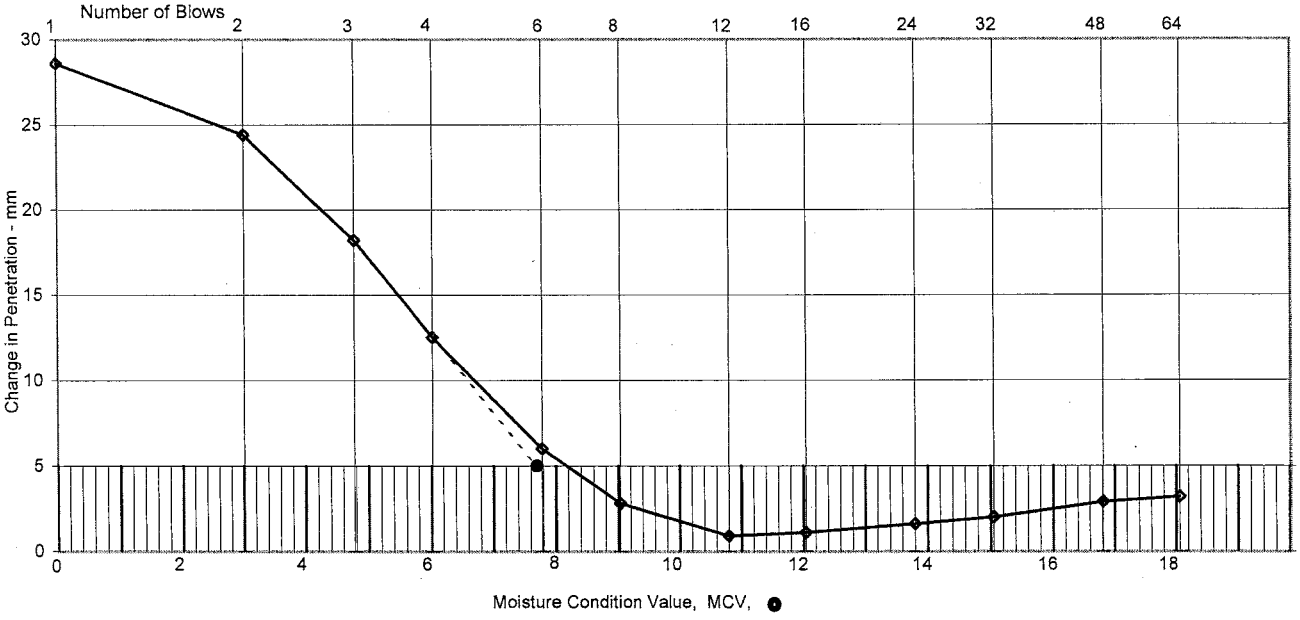
Densities (assumes diameter = 100mm)

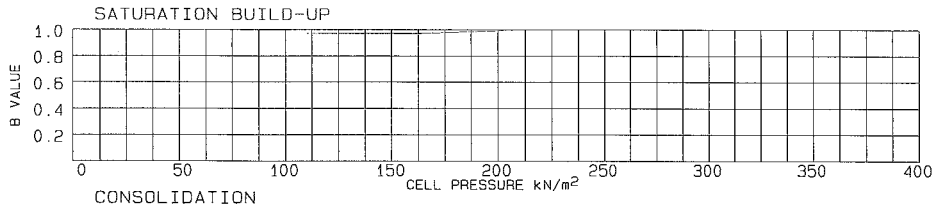
Bulk density	Mg/m^3	1.82
Dry density	Mg/m^3	1.40

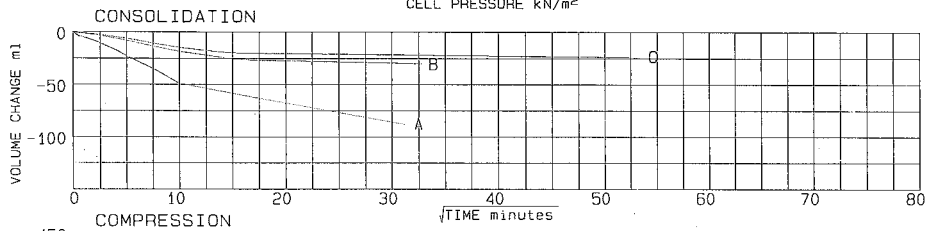
Method of interpretation
delete as appropriate on data sheet

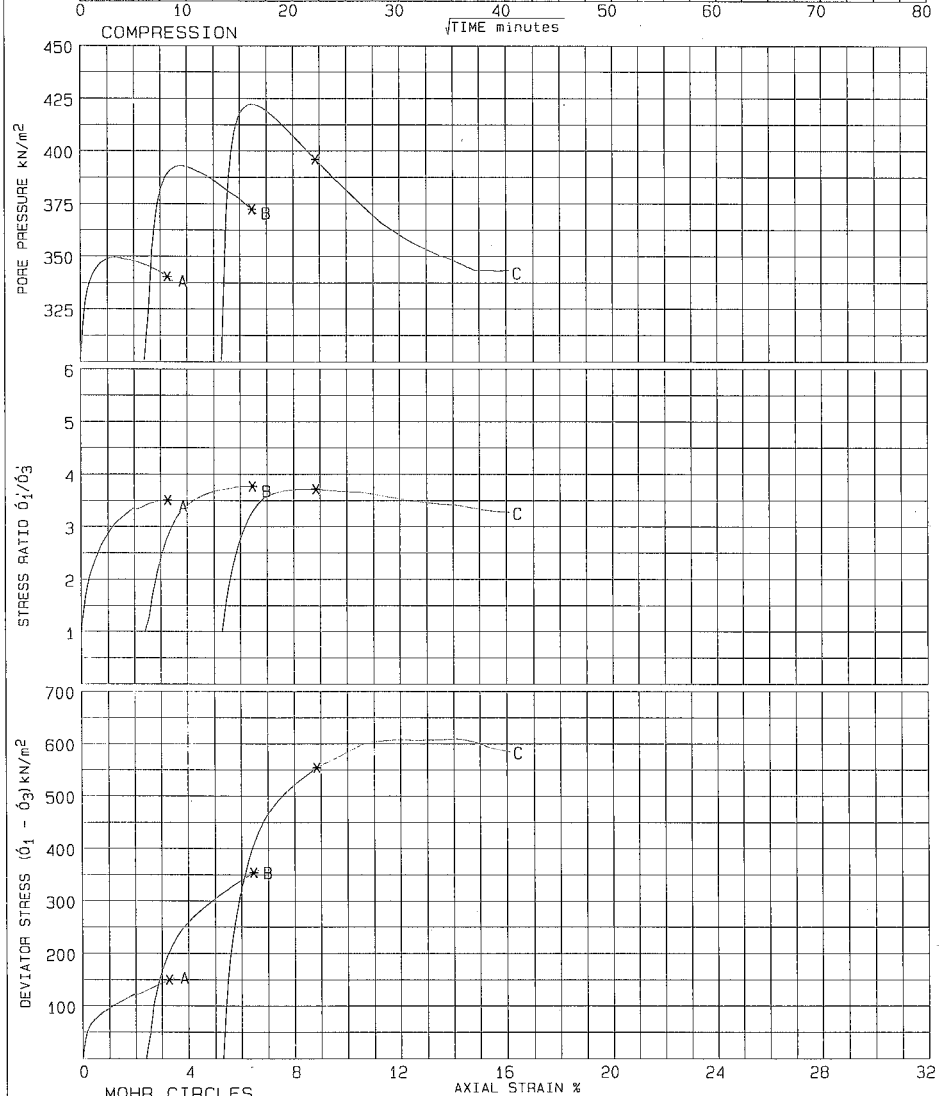
(●) Steepest straight line
( ) Best fit line

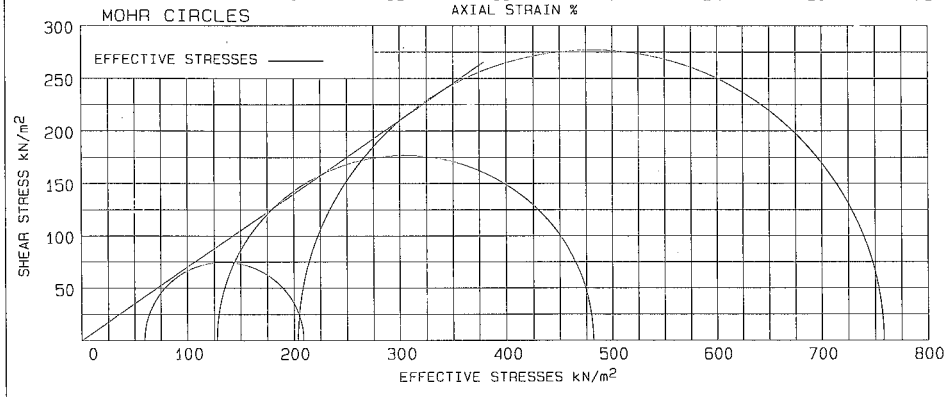
MCV	**7.7**











	STAGE		A	B	C
INITIAL	Density Mg/m³		1.99	2.06	2.08
	Moisture %		27	24	23
	Dry Density Mg/m³		1.57	1.66	1.69
AFTER CONSOLIDATION	Density Mg/m³		2.06	2.08	2.09
	Moisture %		24	23	22
	Dry Density Mg/m³		1.66	1.69	1.72
SATURATION STAGE	Initial pwp	kN/m²	0		
	Saturated pwp		205		
	Final cell pressure		210		
	B value		1.00		
CONSOLIDATION STAGE	Cell Pressure	kN/m²	400	500	600
	Back Pressure		300	300	300
	Initial pwp		395	415	418
	Final pwp		301	301	300
CONSOLIDATION PARAMETERS	C_{v_3} m²/year		0.69	0.89	0.88
	m_{v_3} m²/MN		0.55	0.16	0.13
COMPRESSION STAGE	Cell Pressure	kN/m²	400	500	600
	Initial pwp		300	300	300
	Inital $\acute{o}_3$'		100	200	300
	Rate of strain % per hour		0.53	0.53	0.53
FAILURE CONDITIONS AT PEAK STRESS RATIO	Axial Strain %		3.3	6.5	8.8
	$(\acute{o}_1 - \acute{o}_3)_f$	kN/m²	149	354	554
	u_f		340	372	396
	$\acute{o}_3{}'_f$		60	128	204
	$\acute{o}_1{}'_f$		209	482	758
	A_f		0.27	0.20	0.17
	Time to failure hours		6.2	12.2	16.7
	MODE OF FAILURE				

SHEAR STRENGTH PARAMETERS (COMPUTED)	C' (-3)	Ø' (35½°)
ASSESSED VALUES	0 kN/m²	35 °

NOTES

Saturation by application of cell/back pressure increments of 50 kN/m2 with a differential of 10 kN/m2.

Drainage during consolidation to top with Vertical side drains fitted

Stress/strain curves corrected for area change, side drains and .33 mm thick membrane

SOIL DESCRIPTION
Firm grey CLAY/SILT changing to firm light brown CLAY towards base.

TYPE OF SPECIMEN UNDISTURBED

SPECIMEN DIMENSIONS 103.0 mm dia x 203.8 mm long

Test carried out to BS 1377 : Part 8 : 1990 : Test 7 and in house procedure IHP0041, multistage test

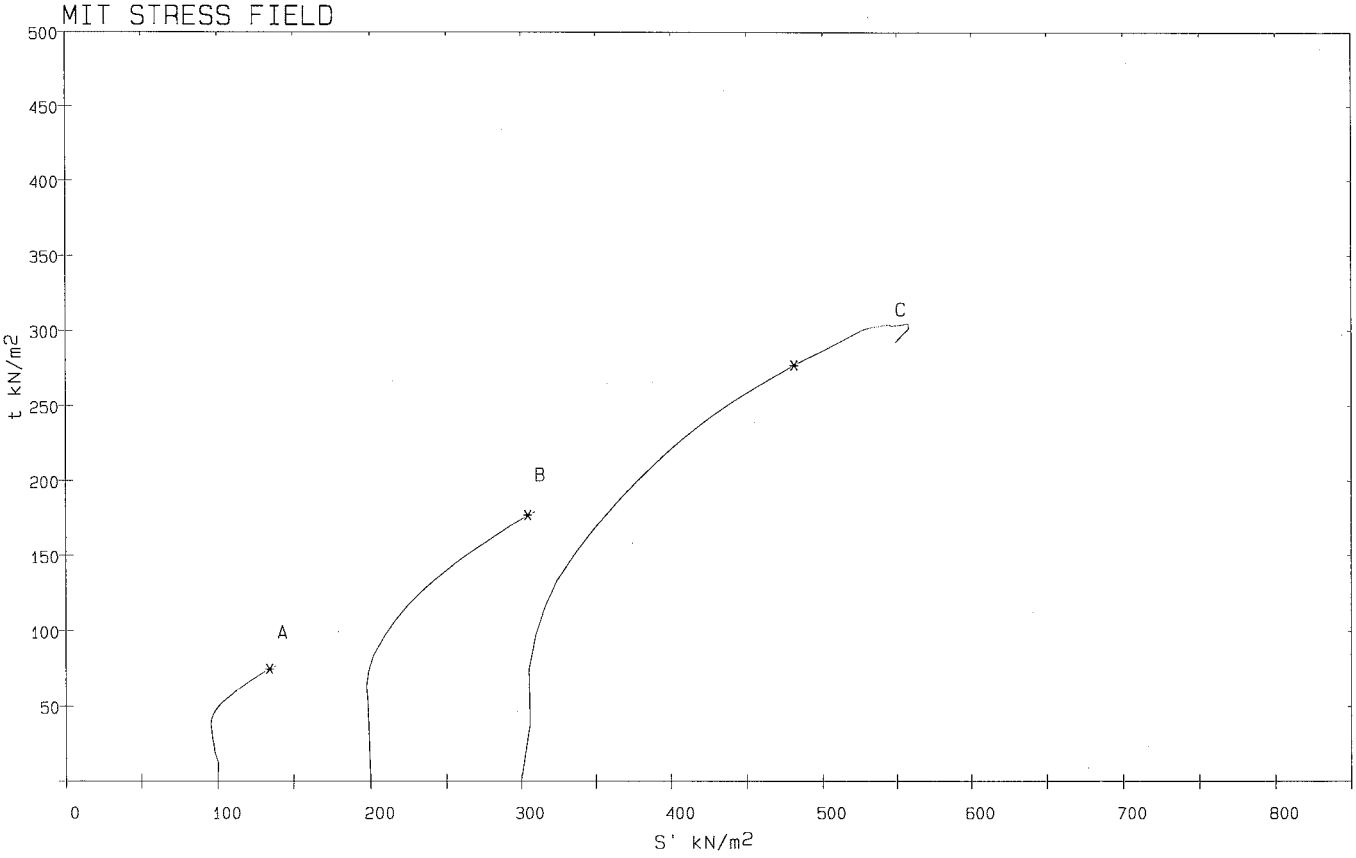
Consolidated Undrained Triaxial Compression Test with measurement of Pore Pressure - Multistage Test

Borehole No. BH118 Depth 5.00-5.45m
Sample No. U9

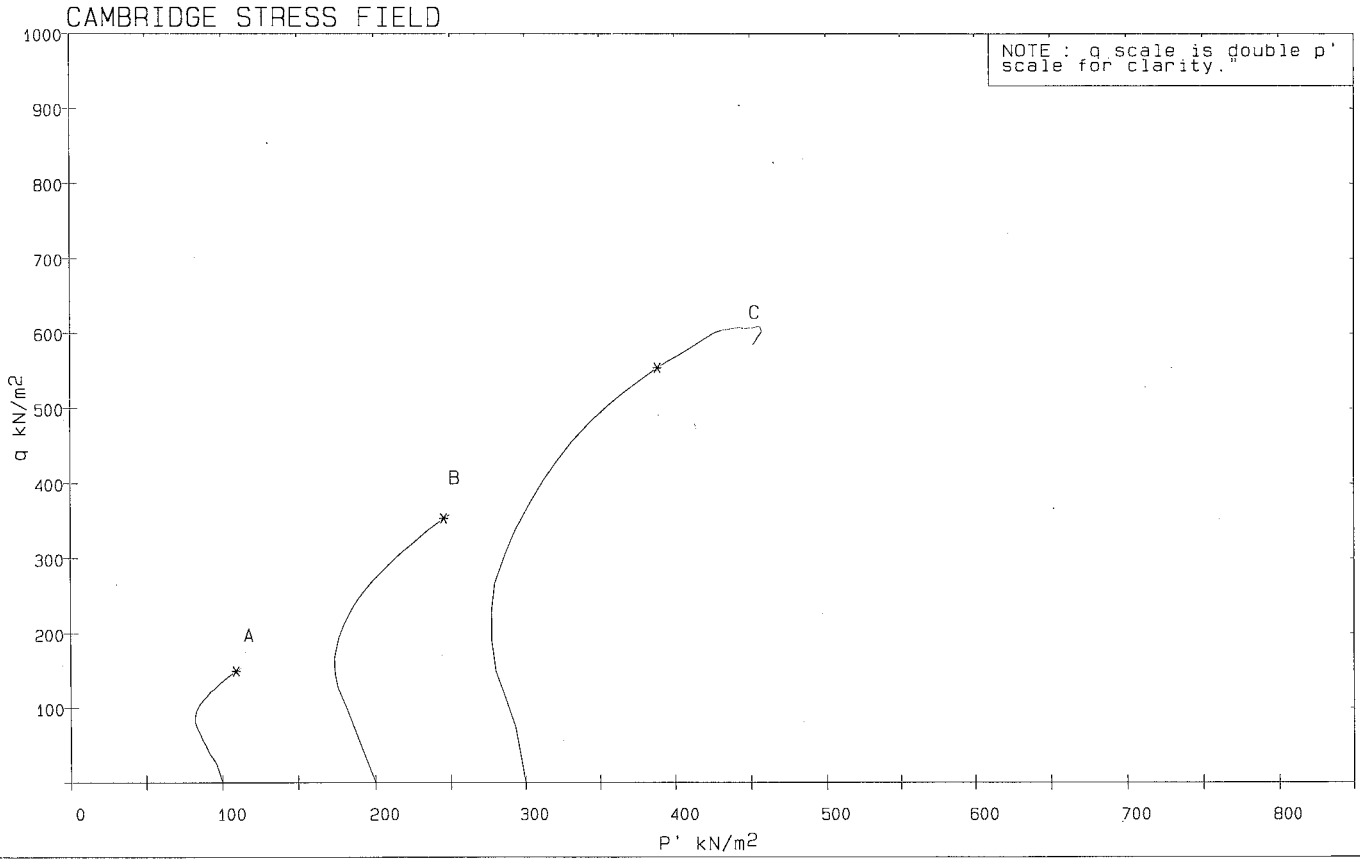
SLRIH 8.7A	Soil Mechanics	Location: BARNSLEY MARKETS	Loc. No. A7088	Fig.

NOTE : Tested at rate of strain based on pore pressure equalisation at failure only.

MIT STRESS FIELD



CAMBRIDGE STRESS FIELD



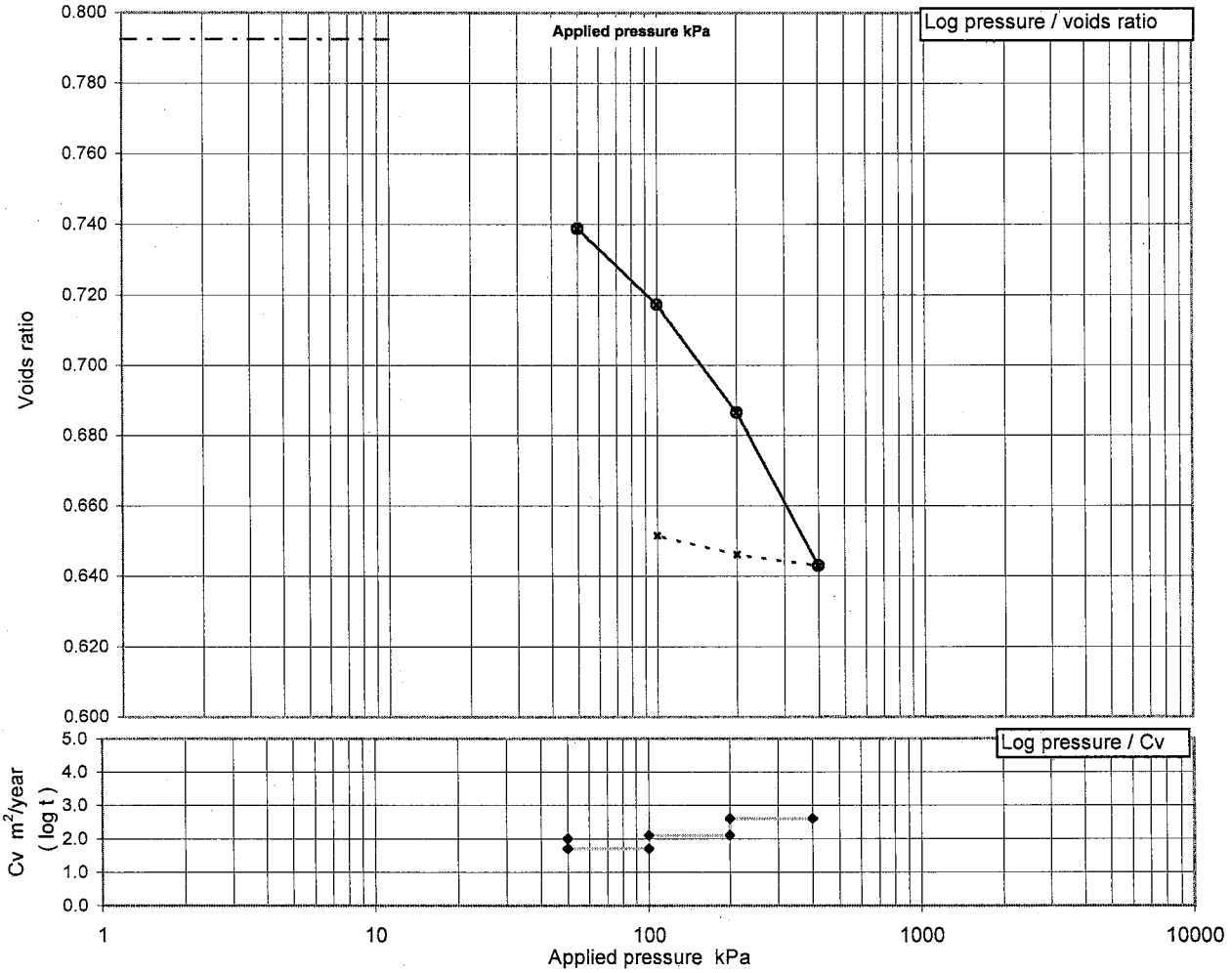
Consolidated Undrained Triaxial Compression Test with measurement of Pore Pressure - Multistage test

Borehole No. BH118 Depth 5.00-5.45m
Sample No. U9

SLR 8.7B	Soil Mechanics	Location: BARNSLEY MARKETS	Loc. No. A7088	Fig.

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH106A		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.00		
			Samp No	9	Type	U
			ID	ESGA708820070821000000063		
			Spec Ref			



Soil description	Soft to firm brownish grey and grey slightly sandy slightly gravelly CLAY.	Liquid limit %	
Preparation	Undisturbed	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m³
Diameter	74.79		mm
Height	19.48	17.95	mm
Voids ratio	0.793	0.651	
Moisture content	27	23	%
Bulk density	1.95	2.05	Mg/m³
Dry density	1.53	1.67	Mg/m³
Saturation	94	98	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

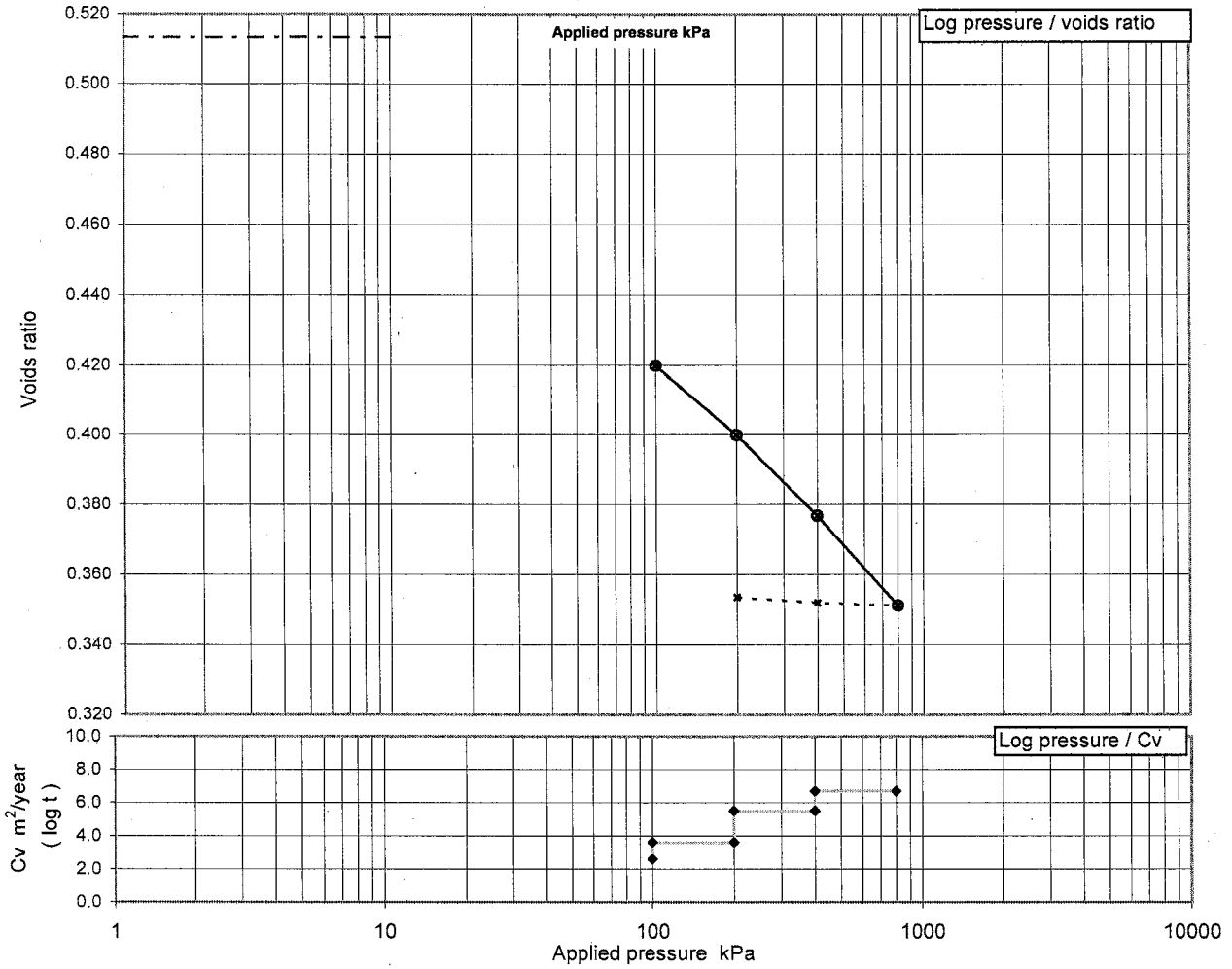
Notes :

Specimen taken 40 mm from base of sample

Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	0.7925				
50	0.7388	0.600	2	2.2	
100	0.7173	0.248	1.7	1.8	
200	0.6865	0.179	2.1	2.6	
400	0.6429	0.129	2.6	2.8	
200	0.6461	0.010	-	-	
100	0.6515	0.032	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH111	
Project Name	BARNSLEY MARKET		Depth (m BGL)	5.50	
			Samp No	14	Type U
			ID	ESGA708820070821000000114	
			Spec Ref		



Soil description	Firm to stiff grey and brown sandy very gravelly CLAY.	Liquid limit %	
Preparation	Recompacted	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m³
Diameter	75.01		mm
Height	19.18	17.15	mm
Voids ratio	0.513	0.354	
Moisture content	19	13	%
Bulk density	2.17	2.31	Mg/m³
Dry density	1.82	2.03	Mg/m³
Saturation	103	105	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

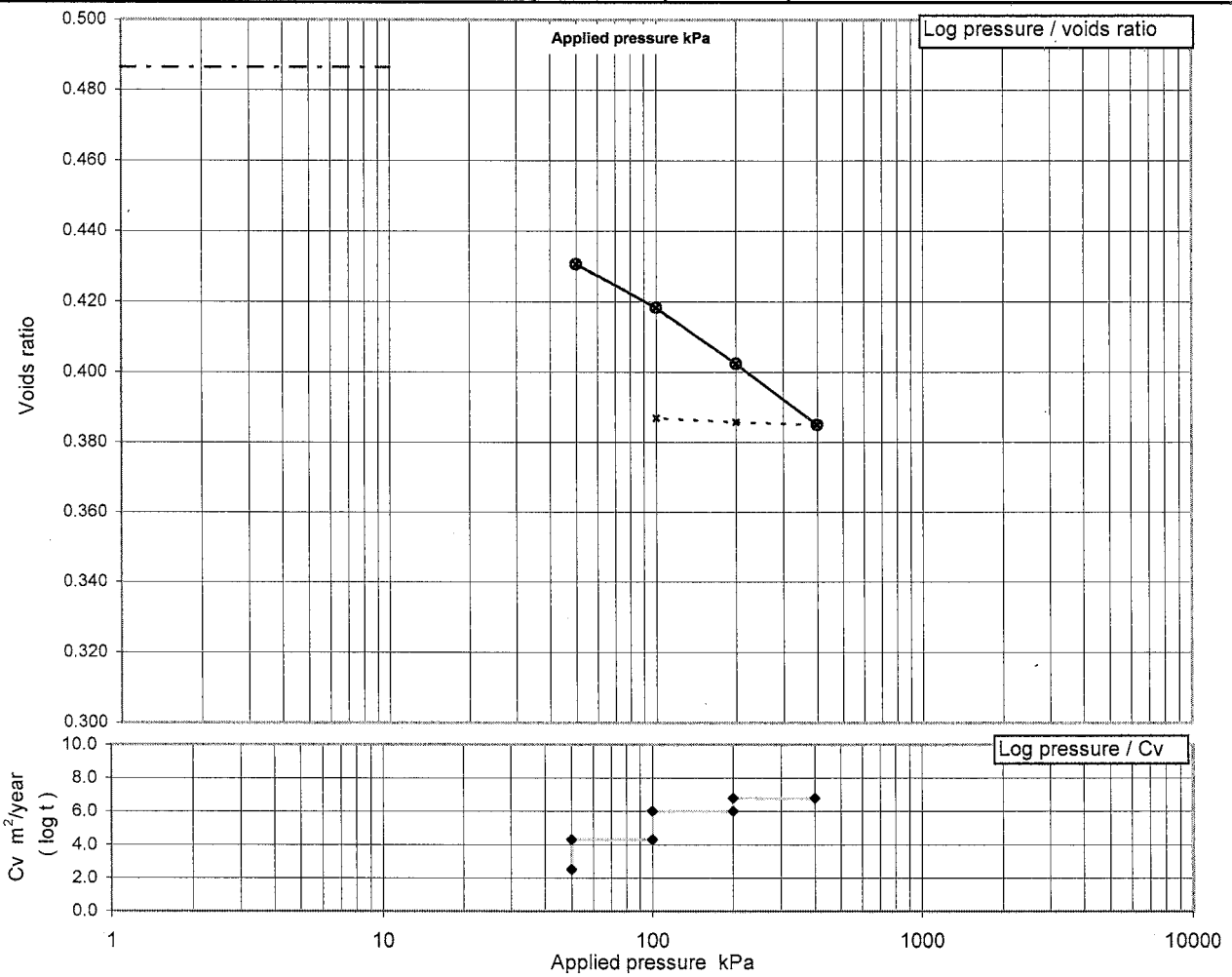
Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	0.5134				
100	0.4198	0.619	2.6	2.6	
200	0.3998	0.141	3.6	3.8	
400	0.3767	0.083	5.5	5.6	
800	0.3511	0.047	6.7	7.9	
400	0.3519	0.002	-	-	
200	0.3535	0.006	-	-	

Notes : Recompacted using 2.5kg equivalent effort on material below 10mm at as received moisture content.

Specimen taken 0 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH112		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.00		
			Samp No	10	Type	U
			ID	ESGA708820070821000000126		
			Spec Ref			



Soil description	Firm to stiff brown sandy gravelly CLAY.	Liquid limit %	
Preparation	Recompacted	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m^3
Diameter	75.05		mm
Height	19.38	18.08	mm
Voids ratio	0.487	0.387	
Moisture content	18	15	%
Bulk density	2.18	2.28	Mg/m^3
Dry density	1.85	1.98	Mg/m^3
Saturation	102	105	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

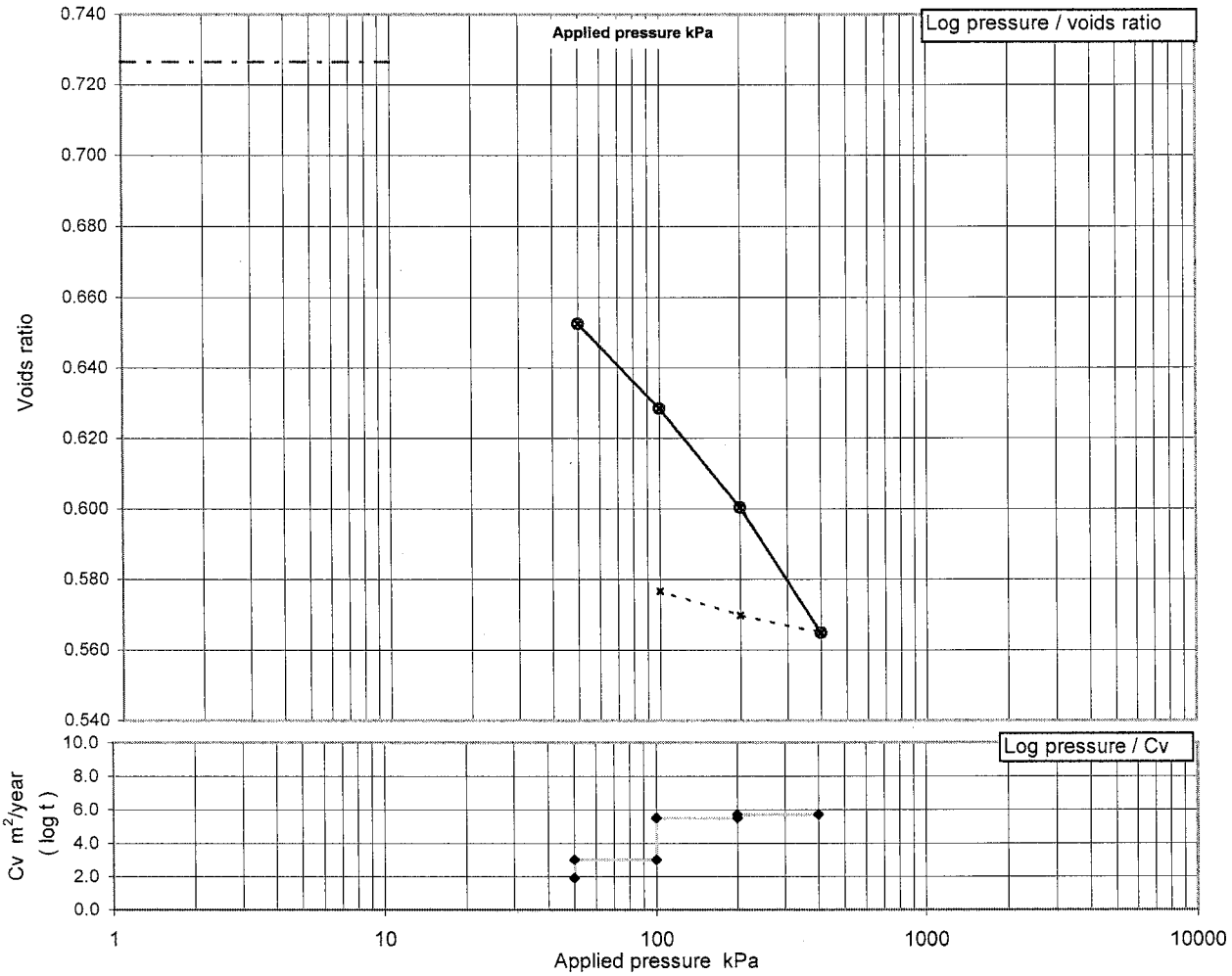
Applied Pressure kPa	Voids ratio	M_v m^2/MN	C_v ($t_{50, log}$) m^2/year	C_v ($t_{90, root}$) m^2/year	
0	0.4865				
50	0.4306	0.752	2.5	2.4	
100	0.4183	0.173	4.3	4.5	
200	0.4024	0.112	6	6.8	
400	0.3850	0.062	6.8	7.6	
200	0.3857	0.003	-	-	
100	0.3870	0.009	-	-	

Notes : Sample recompacted using 2.5kg equivalent effort on material below 10mm at as received moisture content.

Specimen taken 0 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH115		
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00		
			Samp No	3	Type	U
			ID	ESGA7088200708200000000004		
			Spec Ref			



Soil description	Firm to stiff brown and grey sandy very gravelly CLAY.	Liquid limit %	
Preparation	Recompacted	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m³
Diameter	74.94		mm
Height	19.52	17.83	mm
Voids ratio	0.726	0.577	
Moisture content	24	20	%
Bulk density	1.98	2.10	Mg/m³
Dry density	1.59	1.74	Mg/m³
Saturation	92	97	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

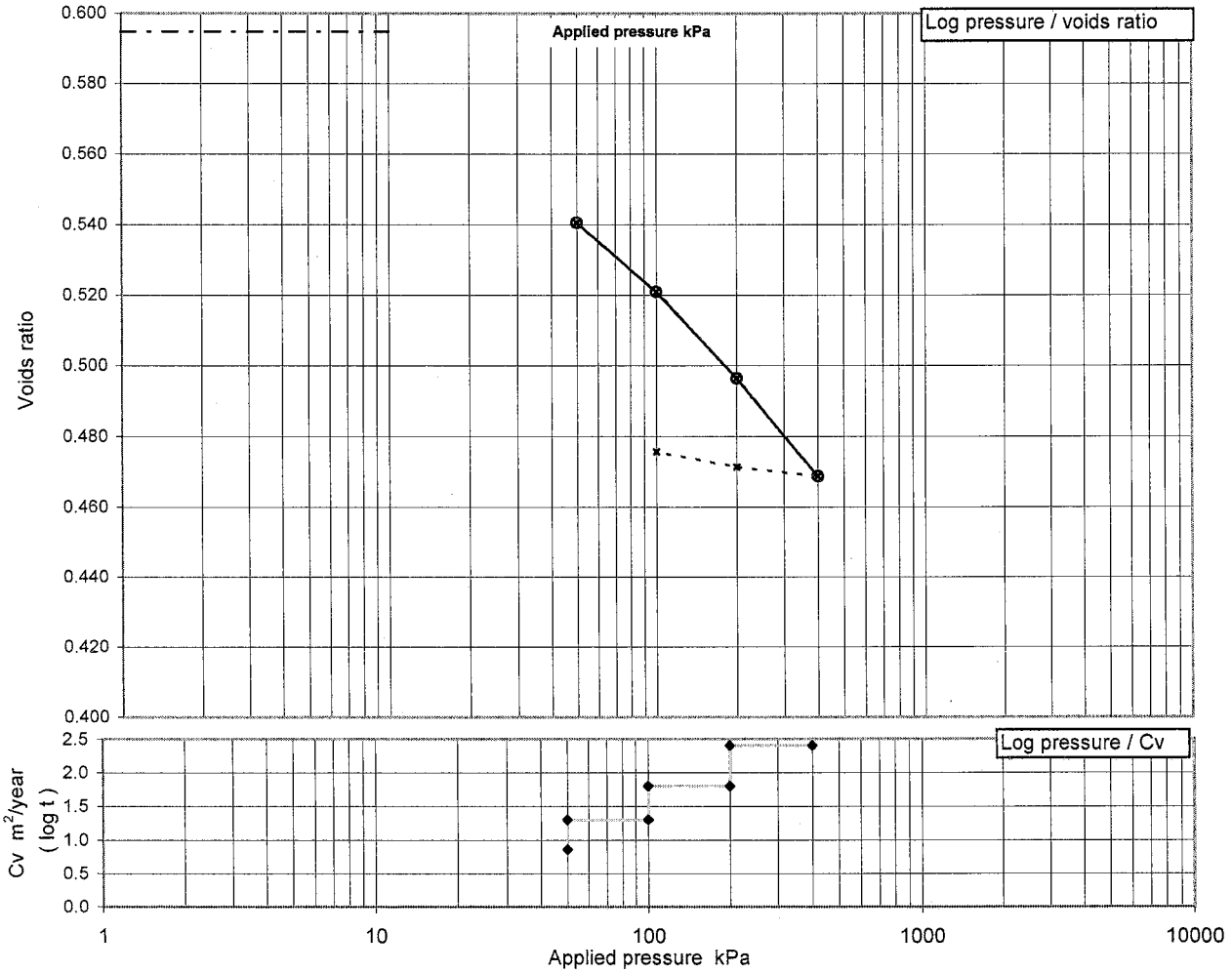
Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	0.7265				
50	0.6524	0.857	1.9	1.9	
100	0.6284	0.291	3	3.3	
200	0.6004	0.172	5.5	5.2	
400	0.5648	0.111	5.7	6.6	
200	0.5698	0.016	-	-	
100	0.5767	0.044	-	-	

Notes : Recompacted using 2.5kg equivalent effort on material below 10mm at as received moisture content.

Specimen taken 0 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH117		
Project Name	BARNSLEY MARKET		Depth (m BGL)	2.00		
			Samp No	7	Type	U
			ID	ESGA708820070821000000140		
			Spec Ref			



Soil description	Firm brown slightly sandy gravelly CLAY.	Liquid limit %	
Preparation	Recompacted	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m³
Diameter	74.85		mm
Height	19.36	17.91	mm
Voids ratio	0.595	0.476	
Moisture content	20	17	%
Bulk density	2.07	2.18	Mg/m³
Dry density	1.72	1.86	Mg/m³
Saturation	93	97	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

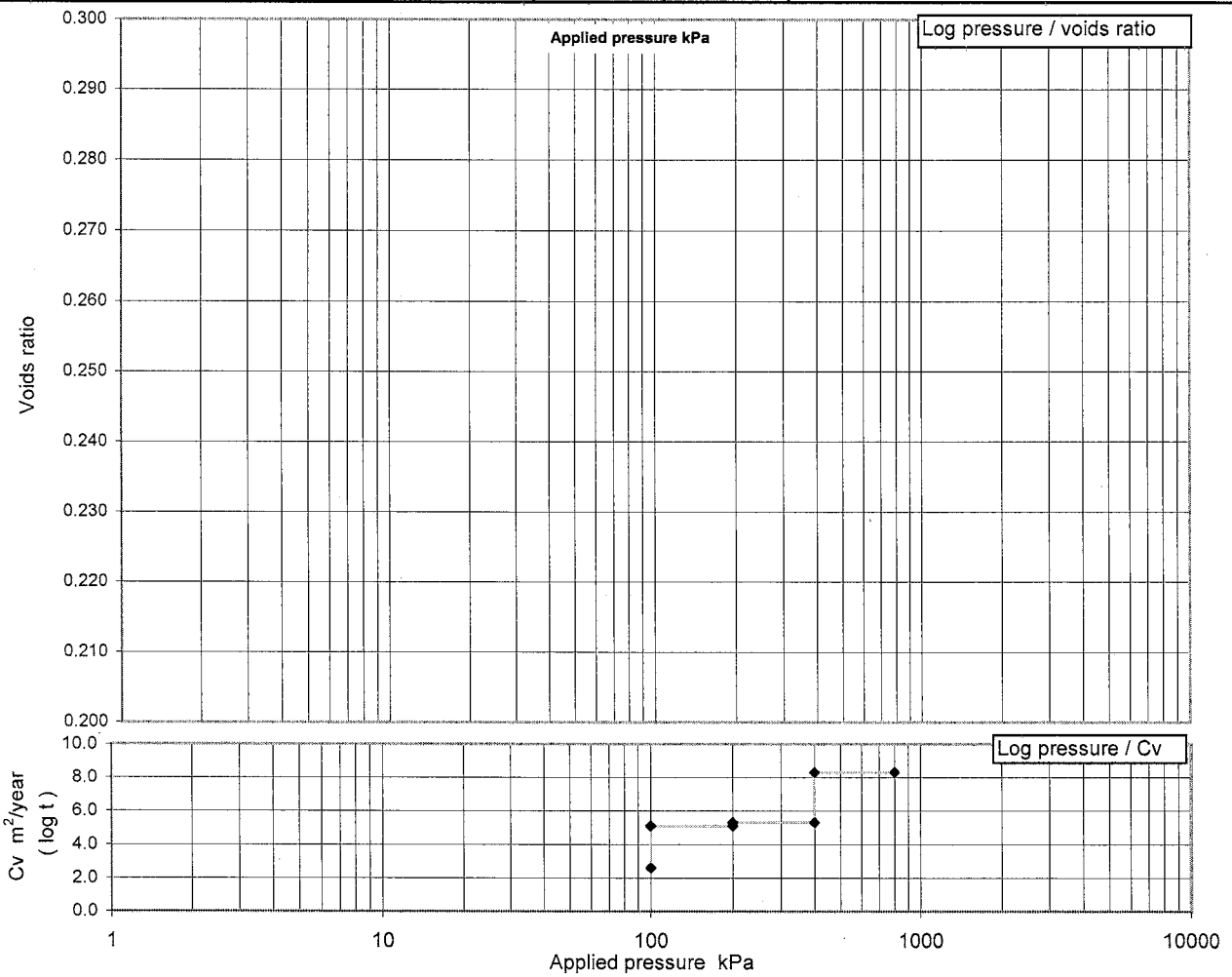
Notes : Sample recompacted using 2.5kg equivalent effort on material below 10mm at as received moisture content.

Specimen taken 0 mm from base of sample

Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	0.5948				
50	0.5405	0.680	0.86	0.85	
100	0.5209	0.256	1.3	1.4	
200	0.4964	0.161	1.8	1.7	
400	0.4687	0.093	2.4	2.5	
200	0.4714	0.009	-	-	
100	0.4757	0.029	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH117	
Project Name	BARNSLEY MARKET		Depth (m BGL)	4.00	
			Samp No	12	Type U
			ID	ESGA708820070821000000145	
			Spec Ref		



Soil description	Very stiff greyish brown sandy very gravelly CLAY.	Liquid limit %	
Preparation	Recompacted	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m³
Diameter	74.83		mm
Height	19.57	18.18	mm
Voids ratio	0.426	0.325	
Moisture content	16	12	%
Bulk density	2.24	2.33	Mg/m³
Dry density	1.93	2.08	Mg/m³
Saturation	106	105	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

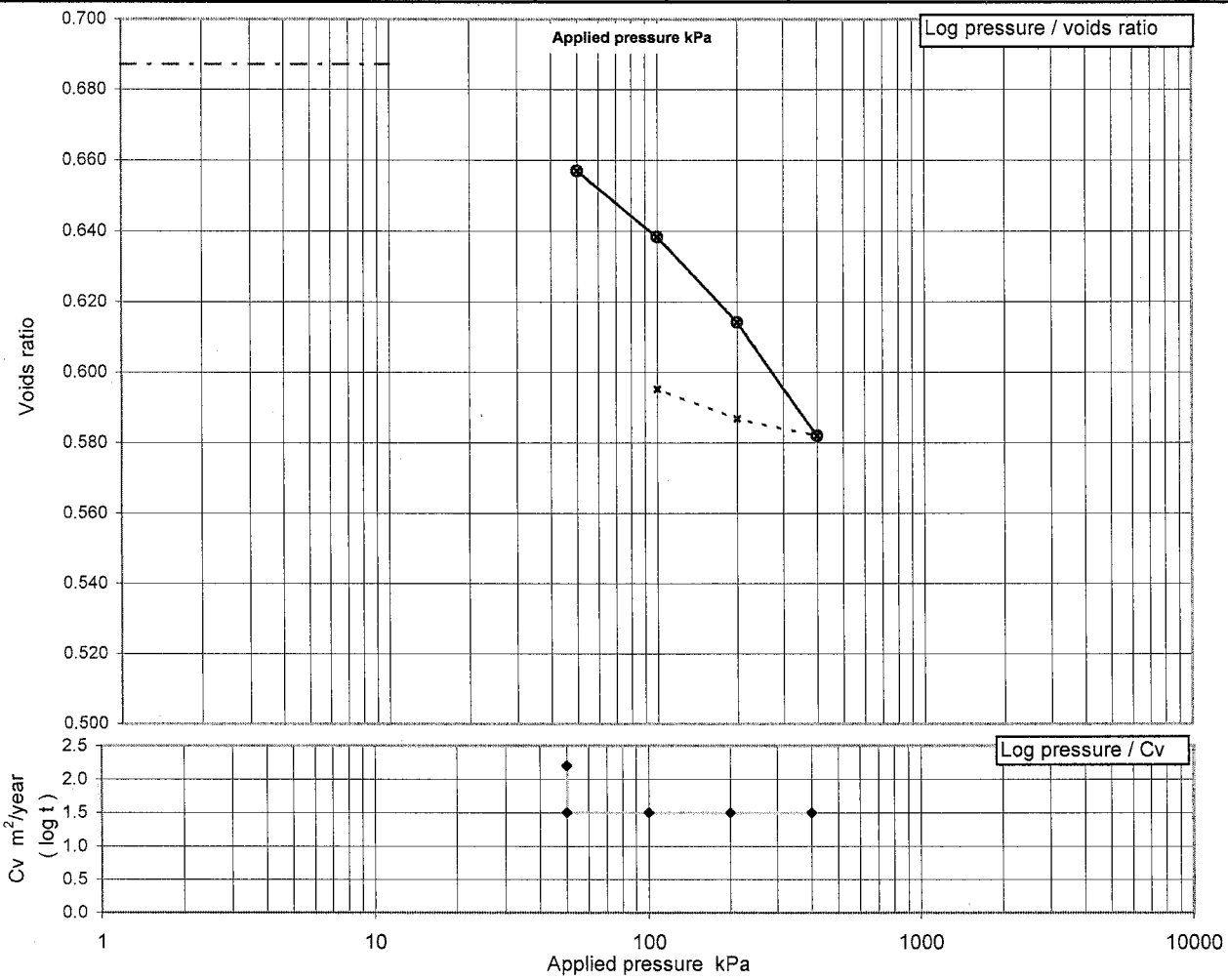
Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	0.4264				
100	0.3687	0.404	2.6	2.6	
200	0.3568	0.087	5.1	4.3	
400	0.3421	0.054	5.3	7	
800	0.3235	0.035	8.3	9.3	
400	0.3241	0.001	-	-	
200	0.3253	0.004	-	-	

Notes : Recompacted using 2.5kg equivalent effort on material below 10mm at as received moisture content.

Specimen taken 0 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST
BS 1377 : Part 5 : 1990 : clause 3

Project No	A7088	Sample Details:	Hole No	BH118		
Project Name	BARNSLEY MARKET		Depth (m BGL)	3.00		
			Samp No	5	Type	U
			ID	ESGA708820070820000000027		
			Spec Ref			



Soil description	Stiff greyish brown slightly sandy slightly gravelly CLAY.	Liquid limit %	
Preparation	Recompacted	Plastic limit %	

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m³
Diameter	74.96		mm
Height	19.42	18.36	mm
Voids ratio	0.687	0.595	
Moisture content	23	22	%
Bulk density	2.01	2.10	Mg/m³
Dry density	1.63	1.72	Mg/m³
Saturation	92	100	%
Average temperature for test	22		°C

Swelling pressure: not measured kPa

Applied Pressure kPa	Voids ratio	M_v m²/MN	C_v ($t_{50, log}$) m²/year	C_v ($t_{90, root}$) m²/year	
0	0.6872				
50	0.6569	0.358	2.2	1.8	
100	0.6384	0.224	1.5	1.4	
200	0.6141	0.148	1.5	1.5	
400	0.5820	0.100	1.5	1.5	
200	0.5868	0.015	-	-	
100	0.5953	0.053	-	-	

Notes : Recompacted using 2.5kg equivalent effort on material below 10mm at as received moisture content.

Specimen taken 0 mm from base of sample

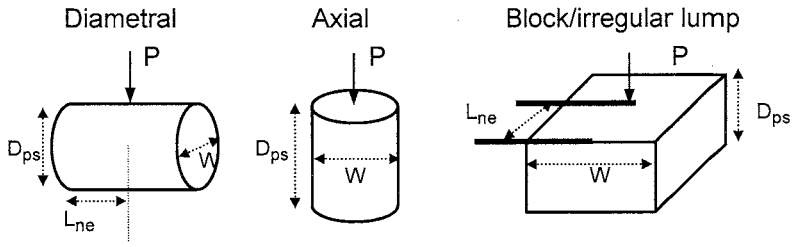
QA Ref			
SLR 5.3 Rev 104 Jul 07	Soil Mechanics UKAS TESTING 1157	Printed:09/10/2007 12:31	Figure **OED 7**

Point Load Index Test
ISRM:1985

Project No	Project Name
A7088	BARNSLEY MARKET

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Test Type
D - Diametral, A - Axial, I - Irregular Lump
Direction (U = unknown or random)
Par - parallel to planes of weakness
Per - perpendicular to planes of weakness
Dimensions
D_{ps} - Distance between platens (platen separation)
D_{ps}' - at failure
L_{ne} - Length from platens to nearest free end
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Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			LOAD P	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)^{0.45}$		Remarks
							Type (D, A, I)	Direction (Par/Per/U)		Lne mm	Dps' mm	W mm	kN		I_s	$I_{s(50)}$	
BH101	12.93 - 13.05	7	CS			MUDSTONE	D	U	Y	50	75	80	4.80	77.4597	0.80	0.97	
BH101	12.93 - 13.05	7	CS	1		MUDSTONE	A	U	Y	35	38	80	4.70	62.2145	1.21	1.34	
BH101	14.95 - 15.12	8	CS			MUDSTONE	D	U	Y	55	81	85	4.90	82.9759	0.71	0.89	
BH101	14.95 - 15.12	8	CS	1		MUDSTONE	A	U	Y	37	57	85	12.00	78.542	1.95	2.38	
BH101	16.63 - 16.73	9	CS			MUDSTONE	D	U	Y	45	81	85	2.60	82.9759	0.38	0.47	
BH101	16.63 - 16.73	9	CS	1		MUDSTONE	A	U	Y	37	28	85	4.40	55.0483	1.45	1.52	
BH101	19.50 - 19.72	11	CS			MUDSTONE	D	U	Y	55	81	86	2.00	83.4626	0.29	0.36	
BH101	19.50 - 19.72	11	CS	1		MUDSTONE	A	U	Y	36	55	86	4.60	77.6043	0.76	0.93	
BH101	19.95 - 20.10	12	CS			MUDSTONE	D	par	Y	51	81	86	4.80	83.4626	0.69	0.87	Laminated
BH101	19.95 - 20.10	12	CS	1		MUDSTONE	A	per	Y	38	45	86	16.00	70.1957	3.25	3.78	Laminated
BH101	20.47 - 20.58	13	CS			MUDSTONE	D	par	Y	40	80	83	1.00	81.4862	0.15	0.19	Laminated
BH101	20.47 - 20.58	13	CS	1		MUDSTONE	A	per	Y	35	35	83	13.00	60.8174	3.51	3.84	Laminated
BH101	21.63 - 21.75	14	CS			MUDSTONE	D	U	Y	35	77	82	2.40	79.4607	0.38	0.47	
BH101	21.63 - 21.75	14	CS	1		MUDSTONE	A	U	Y	35	27	82	2.10	53.0938	0.74	0.77	
BH101	23.24 - 23.36	15	CS			MUDSTONE	D	par	Y	50	78	81	0.20	79.4858	0.03	0.04	Laminated
BH101	23.24 - 23.36	15	CS	1		MUDSTONE	A	per	Y	30	33	81	1.30	58.3384	0.38	0.41	Laminated
BH101	25.61 - 25.77	16	CS			MUDSTONE	D	U	Y	40	80	85	2.60	82.4621	0.38	0.48	
BH101	25.61 - 25.77	16	CS	1		MUDSTONE	A	U	Y	36	32	85	2.80	58.8491	0.81	0.87	
BH102A	9.60 - 9.80	5	CS			MUDSTONE/SILTSTONE	D	U	Y	50	78	85	5.20	81.4248	0.78	0.98	
BH102A	9.60 - 9.80	5	CS	1		MUDSTONE/SILTSTONE	A	U	Y	37	52	85	10.00	75.0181	1.78	2.13	

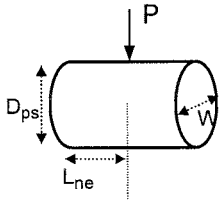
Point Load Index Test
ISRM:1985

Project No	Project Name
A7088	BARNSLEY MARKET

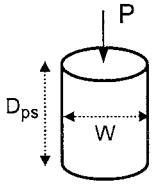
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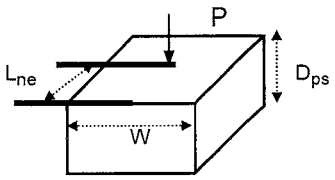
Diametral



Axial



Block/irregular lump



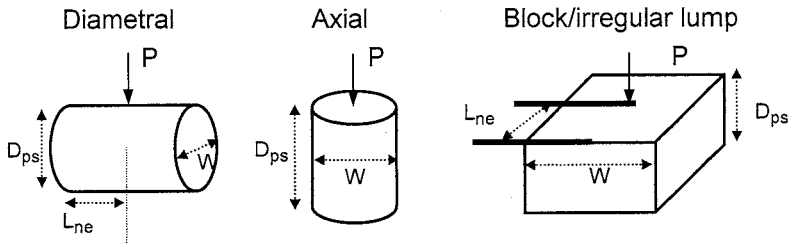
Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			LOAD P	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)^{0.45}$		Remarks
							Type (D, A, I)	Direction (Par/Per/U)		Lne mm	Dps' mm	W mm	kN		I_s	$I_{s(50)}$	
BH102A	10.15 - 10.38	6	CS			SILTSTONE	D	U	Y	45	80	85	3.20	82.4621	0.47	0.59	
BH102A	10.15 - 10.38	6	CS	1		SILTSTONE	A	U	Y	38	28	85	12.00	55.0483	3.96	4.14	
BH102A	18.81 - 18.93	8	CS			MUDSTONE	D	U	Y	25	79	83	1.30	80.9753	0.20	0.25	
BH102A	18.81 - 18.93	8	CS	1		MUDSTONE	A	U	Y	35	39	83	1.60	64.1987	0.39	0.43	
BH102A	19.96 - 20.10	9	CS			SILTSTONE	D	U	Y	50	75	83	5.10	78.8987	0.82	1.01	
BH102A	19.96 - 20.10	9	CS	1		SILTSTONE	A	U	Y	36	34	83	12.00	59.9423	3.34	3.62	
BH102A	24.21 - 24.31	10	CS			MUDSTONE	D	U	Y	45	76	82	4.70	78.943	0.75	0.93	
BH102A	24.21 - 24.31	10	CS	1		MUDSTONE	A	U	Y	35	35	82	6.00	60.45	1.64	1.79	
BH102A	27.65 - 27.82	11	CS			MUDSTONE	D	U	Y	40	76	82	0.90	78.943	0.14	0.18	
BH102A	27.65 - 27.82	11	CS	1		MUDSTONE	A	U	Y	35	23	82	1.10	49.0034	0.46	0.45	
BH104	15.69 - 15.96	18	CS			MUDSTONE/SILTSTONE	D	par	Y	60	80	85	1.00	82.4621	0.15	0.18	Interlaminated
BH104	15.69 - 15.96	18	CS	1		MUDSTONE/SILTSTONE	A	per	Y	35	31	85	11.00	57.9222	3.28	3.50	Interlaminated
BH104	18.71 - 18.93	20	CS			MUDSTONE	D	U	Y	50	82	85	8.00	83.4865	1.15	1.45	
BH104	18.71 - 18.93	20	CS	1		MUDSTONE	A	U	Y	36	28	85	10.00	55.0483	3.30	3.45	
BH104	25.10 - 25.32	22	CS			MUDSTONE	D	U	Y	45	74	84	19.00	78.8416	3.06	3.75	
BH104	25.10 - 25.32	22	CS	1		MUDSTONE	A	U	Y	37	37	84	19.00	62.9065	4.80	5.32	
BH104	26.28 - 26.45	23	CS			MUDSTONE/SILTSTONE	D	par	Y	50	79	84	7.00	81.4616	1.05	1.31	Interlaminated
BH104	26.28 - 26.45	23	CS	1		MUDSTONE/SILTSTONE	A	per	Y	35	32	84	16.00	58.5019	4.67	5.02	Interlaminated
BH104	28.80 - 29.00	25	CS			SILTSTONE	D	par	Y	50	80	85	3.60	82.4621	0.53	0.66	Interlaminated
BH104	28.80 - 29.00	25	CS	1		SILTSTONE	A	per	Y	36	31	85	16.00	57.9222	4.77	5.10	Interlaminated

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Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			LOAD P	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)^{0.45}$		Remarks
							Type (D, A, I)	Direction (Par/Per/U)		Lne mm	Dps' mm	W mm	kN		I_s	$I_{s(50)}$	
BH104	29.46 - 29.69	26	CS			SILTSTONE	D	U	Y	50	81	85	10.00	82.9759	1.45	1.82	
BH104	29.46 - 29.69	26	CS	1		SILTSTONE	A	U	Y	37	47	85	26.00	71.3203	5.11	6.00	
BH108	4.69 - 4.88	4	CS			SILTSTONE	D	par	Y	42	78	83	2.60	80.4612	0.40	0.50	Laminated
BH108	4.69 - 4.88	4	CS	1		SILTSTONE	A	per	Y	36	36	83	7.00	61.6801	1.84	2.02	Laminated
BH108	5.34 - 5.55	5	CS			MUDSTONE	D	U	Y	50	74	80	7.00	76.9415	1.18	1.44	
BH108	5.34 - 5.55	5	CS	1		MUDSTONE	A	U	Y	35	33	80	11.00	57.9772	3.27	3.50	
BH108	12.00 - 12.15	6	CS			MUDSTONE	D	U	Y	55	75	80	25.00	77.4597	4.17	5.07	
BH108	12.00 - 12.15	6	CS	1		MUDSTONE	A	U	Y	35	39	80	24.00	63.0278	6.04	6.71	
BH108	15.20 - 15.34	8	CS			MUDSTONE	D	U	Y	35	77	82	6.00	79.4607	0.95	1.17	
BH108	15.20 - 15.34	8	CS	1		MUDSTONE	A	U	Y	35	42	82	18.00	66.2196	4.10	4.66	
BH108	16.48 - 16.75	9	CS			MUDSTONE	D	U	Y	45	73	79	4.70	75.9408	0.81	0.98	
BH108	16.48 - 16.75	9	CS	1		MUDSTONE	A	U	Y	32	39	79	8.00	62.6327	2.04	2.26	
BH108	16.86 - 17.04	10	CS			MUDSTONE	D	U	Y	45	72	78	3.10	74.94	0.55	0.66	
BH108	16.86 - 17.04	10	CS	1		MUDSTONE	A	U	Y	32	45	77	2.40	66.4212	0.54	0.62	
BH108	20.75 - 20.90	11	CS			MUDSTONE	D	par	Y	25	79	83	4.80	80.9753	0.73	0.91	Laminated
BH108	20.75 - 20.90	11	CS	1		MUDSTONE	A	per	Y	35	27	83	5.10	53.4166	1.79	1.84	Laminated
BH108	23.15 - 23.35	12	CS			SILTSTONE	D	U	Y	47	67	72	10.00	69.455	2.07	2.40	
BH108	23.15 - 23.35	12	CS	1		SILTSTONE	A	U	Y	30	53	72	10.00	69.7042	2.06	2.39	
BH108	26.50 - 26.75	13	CS			SILTSTONE	D	U	Y	45	76	81	16.00	78.4602	2.60	3.18	
BH108	26.50 - 26.75	13	CS	1		SILTSTONE	A	U	Y	35	50	81	14.00	71.8096	2.71	3.20	

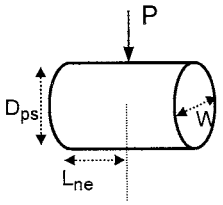
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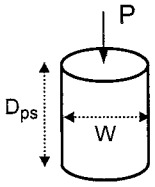
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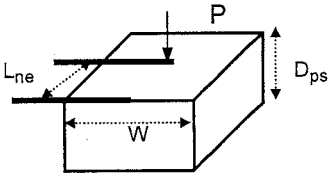
Diametral



Axial



Block/irregular lump



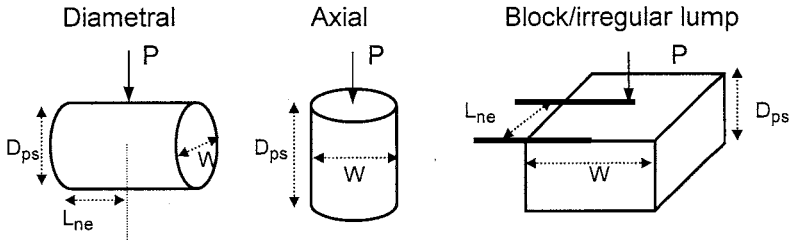
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							Type (D, A, I)	Direction (Par/Per/U)		Lne mm	Dps' mm	W mm	kN		I_s	$I_{s(50)}$	
BH112	8.45 - 8.50	14	CS			SILTSTONE	D	par	Y	10	78	80	0.10	78.9937	0.02	0.02	Laminated
BH112	8.45 - 8.50	14	CS	1		SILTSTONE	A	per	Y	35	20	80	5.20	45.1352	2.55	2.44	Laminated
BH112	14.74 - 14.90	16	CS			MUDSTONE	D	U	Y	50	65	78	4.00	71.2039	0.79	0.93	
BH112	14.74 - 14.90	16	CS	1		MUDSTONE	A	U	Y	35	40	78	4.80	63.0278	1.21	1.34	
BH112	18.86 - 19.10	18	CS			SILTSTONE	D	U	Y	45	65	78	14.00	71.2039	2.76	3.24	
BH112	18.86 - 19.10	18	CS	1		SILTSTONE	A	U	Y	34	49	78	12.00	69.759	2.47	2.86	
BH112	22.29 - 22.40	20	CS			SILTSTONE	D	U	Y	40	59	65	4.80	61.9274	1.25	1.38	
BH112	22.29 - 22.40	20	CS	1		SILTSTONE	A	U	Y	27	44	65	10.00	60.3446	2.75	2.99	
BH112	27.00 - 27.08	23	CS			MUDSTONE	D	U	Y	30	76	83	5.00	79.4229	0.79	0.98	
BH112	27.00 - 27.08	23	CS	1		MUDSTONE	A	U	Y	36	25	83	13.00	51.4001	4.92	4.98	
BH112	27.79 - 27.98	24	CS			SILTSTONE	D	U	Y	50	67	78	10.00	72.2911	1.91	2.26	
BH112	27.79 - 27.98	24	CS	1		SILTSTONE	A	U	Y	35	45	78	23.00	66.8511	5.15	5.87	
BH112	28.31 - 28.45	25	CS			MUDSTONE	D	par	Y	45	70	80	8.00	74.8331	1.43	1.71	Laminated
BH112	28.31 - 28.45	25	CS	1		MUDSTONE	A	per	Y	34	23	80	13.00	48.4021	5.55	5.47	Laminated
BH112	29.08 - 29.25	26	CS			MUDSTONE	D	par	Y	40	73	82	9.00	77.3692	1.50	1.83	Laminated
BH112	29.08 - 29.25	26	CS	1		MUDSTONE	A	per	Y	35	32	82	22.00	57.8012	6.58	7.03	Laminated
BH116	10.77 - 10.81	14	CS	1		MUDSTONE	A	U	Y	34	26	81	5.10	51.7826	1.90	1.93	Sufficient for axial test only
BH116	13.00 - 13.14	15	CS			SILTSTONE	D	U	Y	45	81	84	5.20	82.4864	0.76	0.96	
BH116	13.00 - 13.14	15	CS	1		SILTSTONE	A	U	Y	37	34	84	9.00	60.3023	2.47	2.69	
BH116	15.06 - 15.20	16	CS			MUDSTONE	D	U	Y	30	79	80	0.50	79.4984	0.08	0.10	

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							Type (D, A, I)	Direction (Par/Per/U)		Lne mm	Dps' mm	W mm	kN		I_s	$I_{s(50)}$	
BH116	15.06 - 15.20	16	CS	1		MUDSTONE	A	U	Y	35	38	80	3.70	62.2145	0.96	1.05	
BH116	23.35 - 23.53	17	CS			SILTSTONE	D	U	Y	52	80	84	3.20	81.9756	0.48	0.59	
BH116	23.35 - 23.53	17	CS	1		SILTSTONE	A	U	Y	36	27	84	15.00	53.7374	5.19	5.37	
BH117	12.94 - 13.14	25	CS			MUDSTONE	D	U	Y	35	73	79	2.20	75.9408	0.38	0.46	
BH117	12.94 - 13.14	25	CS	1		MUDSTONE	A	U	Y	34	22	79	3.10	47.0414	1.40	1.36	
BH117	14.78 - 14.96	18	CS			MUDSTONE	D	U	Y	45	80	82	2.70	80.9938	0.41	0.51	
BH117	14.78 - 14.96	18	CS	1		MUDSTONE	A	U	Y	35	43	82	13.00	67.0033	2.90	3.30	
BH117	16.75 - 17.03	21	CS			MUDSTONE	D	U	Y	30	76	81	8.00	78.4602	1.30	1.59	
BH117	16.75 - 17.03	21	CS	1		MUDSTONE	A	U	Y	34	30	81	12.00	55.6235	3.88	4.07	
BH117	17.82 - 17.96	20	CS			MUDSTONE	D	U	Y	23	82	83	0.40	82.4985	0.06	0.07	
BH117	17.82 - 17.96	20	CS	1		MUDSTONE	A	U	Y	35	20	83	2.60	45.9737	1.23	1.18	
BH117	24.19 - 24.32	19	CS			MUDSTONE	D	U	Y	40	81	83	3.50	81.9939	0.52	0.65	
BH117	24.19 - 24.32	19	CS	1		MUDSTONE	A	U	Y	35	25	83	10.00	51.4001	3.79	3.83	
BH117	25.38 - 25.52	23	CS			MUDSTONE	D	U	Y	35	79	82	4.20	80.486	0.65	0.80	
BH117	25.38 - 25.52	23	CS	1		MUDSTONE	A	U	Y	35	33	82	7.00	58.6974	2.03	2.18	
BH117	29.86 - 29.98	17	CS			SILTSTONE	D	U	Y	41	80	84	9.00	81.9756	1.34	1.67	
BH117	29.86 - 29.98	17	CS	1		SILTSTONE	A	U	Y	35	37	84	9.00	62.9065	2.27	2.52	
BH118	16.81 - 16.99	21	CS			MUDSTONE	D	par	Y	35	78	83	0.30	80.4612	0.05	0.06	Laminated
BH118	16.81 - 16.99	21	CS	1		MUDSTONE	A	per	Y	36	33	83	4.70	59.0542	1.35	1.45	Laminated
BH118	19.61 - 19.76	20	CS			MUDSTONE	D	U	Y	45	77	84	5.20	80.4239	0.80	1.00	

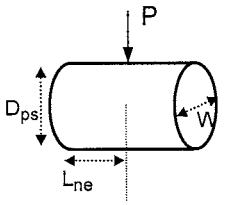
Point Load Index Test
ISRM:1985

Project No	Project Name
A7088	BARNSLEY MARKET

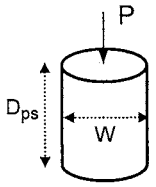
All specimens tested at **as received water content** unless shown otherwise

Test Type
D - Diametral, A - Axial, I - Irregular Lump
Direction (U = unknown or random)
Par - parallel to planes of weakness
Per - perpendicular to planes of weakness
Dimensions
D_{ps} - Distance between platens (platen separation)
D_{ps}' - at failure
L_{ne} - Length from platens to nearest free end
W - Width of shortest dimension perpendicular to load, P

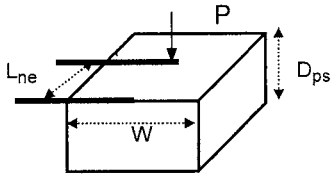
Diametral



Axial



Block/irregular lump



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			LOAD P	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)^{0.45}$		Remarks
							Type (D, A, I)	Direction (Par/Per/U)		Lne mm	Dps' mm	W mm	kN		I_s	$I_{s(50)}$	
BH118	19.61 - 19.76	20	CS	1		MUDSTONE	A	U	Y	38	38	84	14.00	63.7509	3.44	3.84	
BH118	21.55 - 21.68	22	CS			MUDSTONE	D	par	Y	40	78	84	0.80	80.9444	0.12	0.15	Laminated
BH118	21.55 - 21.68	22	CS	1		MUDSTONE	A	per	Y	36	40	84	2.70	65.4071	0.63	0.71	Laminated
BH118	26.15 - 26.36	23	CS			MUDSTONE	D	par	Y	52	76	85	5.10	80.3741	0.79	0.98	Laminated
BH118	26.15 - 26.36	23	CS	1		MUDSTONE	A	per	Y	37	33	85	13.00	59.7615	3.64	3.94	Laminated
BH118	28.00 - 28.34	25	CS			MUDSTONE	D	par	Y	45	76	85	5.20	80.3741	0.80	1.00	Laminated
BH118	28.00 - 28.34	25	CS	1		MUDSTONE	A	per	Y	37	24	85	12.00	50.9648	4.62	4.66	Laminated

QA Ref			Figure
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UNIAXIAL COMPRESSIVE STRENGTH OF ROCK - SUMMARY OF RESULTS

Project No	Project Name
A7088	BARNSLEY MARKET

Hole No.	Sample				Rock Type	Specimen Dimensions[2]			Bulk Density[2]	Water Content[1]	Uniaxial Compression[3]				Remarks
	No.	Depth (m)		type		Dia.	Height	H/D			Load Rate	Time to failure	Mode of failure	UCS	
		from	to			mm	mm		Mg/m^3	%	kN/min	secs		MPa	
BH101	10	18.35	18.75	CS	SILTSTONE	86.0	235.7	2.7	2.46	2.2	20	968	F	57.5	
BH101	17	25.93	26.30	CS	MUDSTONE	85.1	186.8	2.2	2.58	2	20	471	AC	28.9	Outside ISRM
BH102A	7	11.60	11.96	CS	MUDSTONE/ SILTSTONE	83.9	225.1	2.7	2.54	2.2	20	355	AC	22.2	
BH102A	12	28.93	29.24	CS	MUDSTONE	82.6	217.5	2.6	2.59	2	20	347	AC	23.3	
BH104	19	17.20	17.70	CS	SILTSTONE	85.4	236.1	2.8	2.56	1.8	20	715	F	43.2	
BH104	21	24.05	24.37	CS	MUDSTONE	83.8	233.0	2.8	2.61	2	20	492	AC	31.2	
BH104	24	27.50	27.85	CS	MUDSTONE	72.0	231.3	3.2	3.6	1.8	20	655	AC	57.9	
BH108	7	12.84	13.21	CS	MUDSTONE	81.0	186.2	2.3	2.55	1.5	20	704	AC	47.1	Outside ISRM
BH108	14	28.28	28.72	CS	SILTSTONE	72.9	203.3	2.8	2.38	3.8	20	516	AC	43.1	
BH112	15	11.27	11.59	CS	SILTSTONE	80.3	206.6	2.6	2.39	3.8	20	752	AC	51.4	
BH112	17	19.03	19.35	CS	SILTSTONE	74.3	203.1	2.7	2.43	2.3	20	685	AC	54.3	
BH112	19	19.13	19.50	CS	SILTSTONE	84.4	225.6	2.7	2.44	2.5	30	611	AC	56.3	
BH112	21	24.50	24.80	CS	MUDSTONE	81.8	227.6	2.8	2.6	1.6	20	484	AC	32.3	
BH112	22	25.84	26.26	CS	SILTSTONE	80.6	221.9	2.8	2.49	2.1	30	859	AC	86.7	
BH116	13	20.06	20.30	CS	MUDSTONE	83.0	206.1	2.5	2.57	2.1	15	324	AC	17.4	
BH116	18	24.76	25.01	CS	MUDSTONE	83.8	218.1	2.6	2.6	2.1	15	64	AC	39.5	
BH117	22	24.76	25.10	CS	MUDSTONE	82.8	215.0	2.6	2.62	1.9	15	914	F	44.8	
BH117	24	26.99	27.29	CS	SILTSTONE	84.0	234.2	2.8	2.48	3.4	30	512	F	52	
BH118	19	17.48	17.86	CS	MUDSTONE/ SILTSTONE	84.7	224.8	2.7	2.56	1.5	20	736	F	44.6	
BH118	26	26.48	26.96	CS	MUDSTONE	84.3	220.7	2.6	2.61	1.6	30	591	AC	54.8	
BH118	24	27.05	28.00	CS	MUDSTONE	85.0	229.5	2.7	2.62	1.6	30	554	AC	50.8	

Notes : Test Specification : International Society for Rock Mechanics (ISRM), Rock Characterization Testing and Monitoring, Suggested Methods, 1981

1 ISRM p83 test 1, water-content at 105 ± 3 °C, specimen as received at the laboratory

2 ISRM p83 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density

3 ISRM p113 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials

above notes apply unless annotated otherwise in the remarks

Mode of failure :

S - Single shear MS - multiple shear

AC - Axial cleavage F - Fragmented