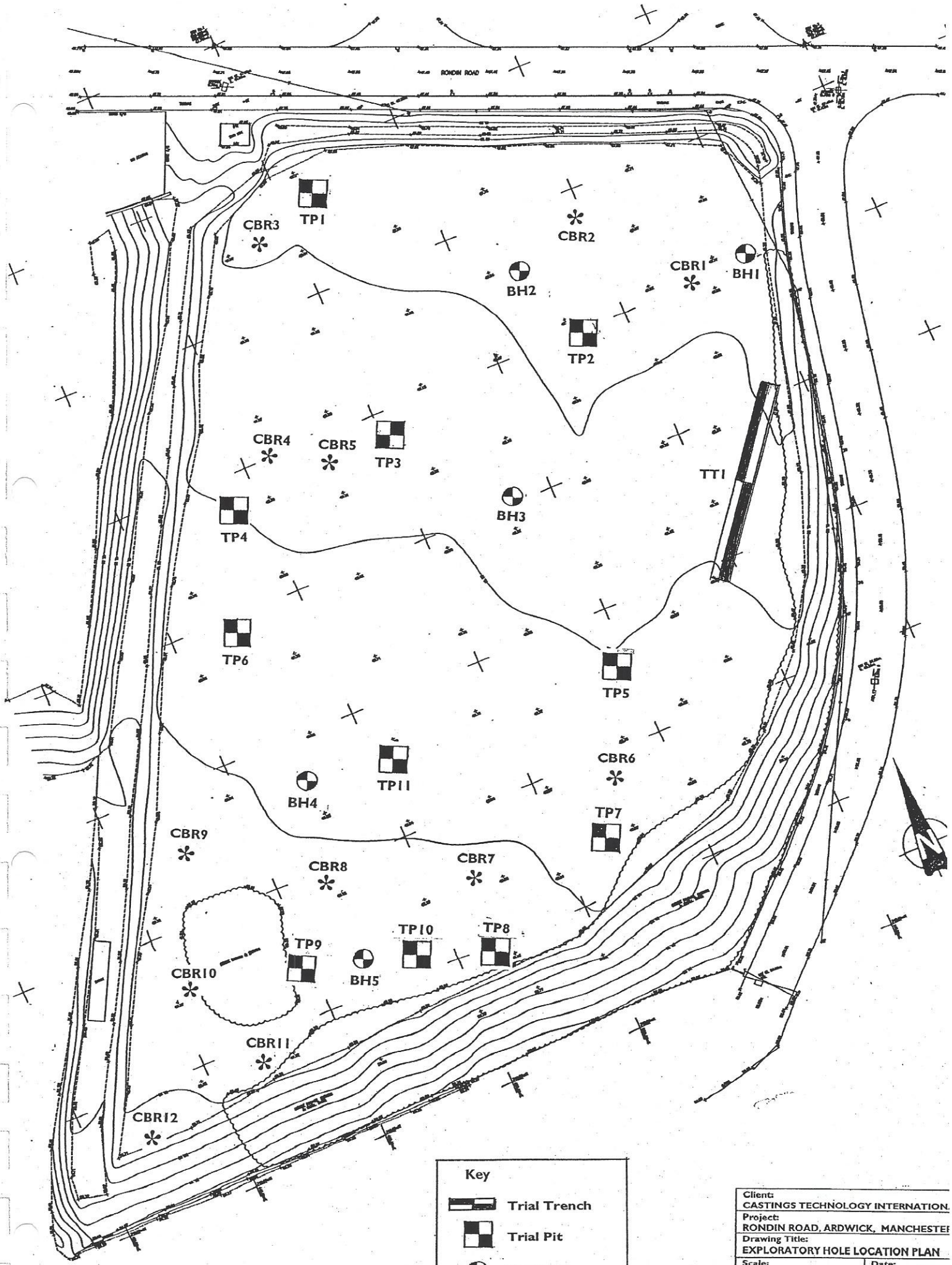
APPENDIX 8

EXPLORATORY HOLE LOCATION PLAN


RONDIN ROAD
TP1
CBR3
CBR2
CBR1
BH1
BH2
TP2
CBR4
CBR5
TP3
TT1
BH3
TP4
TP6
TP5
CBR6
TP11
BH4
TP7
CBR9
CBR8
CBR7
TP9
TP10
TP8
CBR10
BH5
CBR11
CBR12
N
Key
Trial Trench
Trial Pit
Borehole
Client:
CASTINGS TECHNOLOGY INTERNATION
Project:
RONDIN ROAD, ARDWICK, MANCHESTE
Drawing Title:
EXPLORATORY HOLE LOCATION PLAN
Scale:
1:500 Approx. @A3
Date:
NOVEMBER 200

Ground Investigation Report

M^CGUINNESS, ARDWICK, MANCHESTER

Marston & Grundy

Prepared by:	C. Bolan	Date: 02/02/01
Authorised by:	M. Fawcett	Date: 02/02/01

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McGUINESS & CO RELOCATION
ARDWICK, MANCHESTER
SITE INVESTIGATION

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1.0 INTRODUCTION

On behalf of ***GMPTE, Marston & Grundy*** are providing engineering and environmental consultancy services with respect to the proposed acquisition by ***Manchester City Council*** of a parcel of land presently owned by ***McGuiness & Co***, and the proposed development of an adjacent parcel of land, ownership of which will transfer from ***Manchester City Council*** to ***McGuiness & Co***. A site investigation was required to obtain information on ground conditions, with particular regard to the contamination status of the existing McGuiness premises, and contamination/geotechnical status of the proposed McGuiness premises.

Accordingly, ***CC GEOTECHNICAL*** were commissioned to prepare desk studies, undertake field investigation services, and carry out laboratory testing. This report is a compilation of data obtained in the course of the investigation. Recommendations on suitable foundation types are given, as is guidance on the selection of concrete constituent materials. Comments on soil contamination are given.

It must be borne in mind that the comments and opinions expressed in this report are based on exploratory excavations and boreholes, and the testing of small samples of soils and groundwaters, and no warranty is offered as to the sufficiency of the data herein to represent ground conditions prevailing on the site. Conditions may exist on the site which have not been revealed by this survey, and as such have not been taken into account. Furthermore, observations on groundwater levels relate only to the time of the exploratory work, and changes due to weather and/or season have not been considered.

2.0 SITE LOCATION, DESCRIPTION AND GEOLOGY

2.1 Site Location

The site is located adjacent to Ashton Old Road, Ardwick, Manchester, at approximate National Grid reference SJ 863975, as shown on Drawing 1494/001.

2.2 Site Description

The investigation site comprises two distinct areas.

The northerly area comprises a triangular area of land within the existing McGuiness & Co Ltd yard. It extends to an area of about 0.5 hectares, and is generally flat with a compacted hardcore pavement. The area contains crushing and screening plant associated with the McGuiness demolition rubble recycling business.

The southerly area comprises a rectangular plot enclosed within earth bunds along its southern and western boundaries, with a concrete panel fence to its northern boundary. The eastern boundary of the site adjoins further open space. The site has a covering of grass and small shrubs, with occasional small trees established, particularly in the western extremities of the site.

The relative positions and the layout of the investigation areas is shown on Drawing 1494/002.

2.3 Geology

The documented geology of the site is summarised on British Geological Survey Sheets, principally:-

Sheet 85 - MANCHESTER - Solid and Drift Editions, 1:50 000

These maps indicate the succession beneath the site to comprise of boulder clays of Glacial Origins overlying Collyhurst Sandstone.

3.0 FIELDWORK

The fieldwork for the investigation was undertaken in the period 4th to 11th January 2001, and comprised the excavation of nine trial pits by mechanical digger, and the drilling of five boreholes with associated logging and sampling, at the positions shown on Drawing 1494/002. Site investigation works were undertaken generally in accordance with the requirements of BS 5930: 1999.

The trial pits were excavated primarily to obtain visual and olfactory evidence of the presence of contamination, and to facilitate sampling and logging of the ground conditions. The observations of ground conditions and details of sampling are given on the Trial Pit Section Sheets in Appendix A.

The boreholes were drilled by light cable percussion rigs, each to a depth of 8.5mbgl. Standard Penetration Tests were carried out at regular intervals in granular soils. Undisturbed samples were recovered from cohesive soils. Groundwater/gas monitoring wells were installed in two of the boreholes, and were monitored on two occasions for the presence of landfill gases (Appendix E). The observations of ground conditions, results of insitu tests, and positions of samples are given on the Borehole Section Sheets in Appendix B.

4.0 LABORATORY WORK

6.1 Northern Sector

Further ground investigation by borehole drilling will be required to obtain appropriate information for foundation design in this area, although it is understood that the immediate assessment needs do not require assessment of foundation requirements.

6.2 Southern Sector

6.2.1 Spread Foundations

Spread foundations may be adopted for light to medium loaded buildings. Foundations will bear on the stiff clay at a typical depth of 2.0mbgl, although slightly increased depths may be where the thickness of the superficial weak ground is greater. A Presumed Bearing Value of 180kN/m^2 may be taken for foundations on the clay. Total settlements arising from this stress are likely to be less than 25mm.

It is important that a competent person inspects the foundation excavations, to verify that appropriate stratum has been exposed. Blinding concrete should be placed with the minimum of delay to preserve the integrity and strength of the foundation soil.

6.2.2 Piled Foundations

For heavy structures, it may be preferable to consider use of piled foundations. Piles may be installed in these conditions by CFA techniques.

Piles will derive their carrying capacities from a combination of shaft friction and end bearing. Taking the clay depth/cohesion profile as observed on the borehole logs, the safe carrying capacity of single isolated bored piles terminating in the clay at 9mbgl are estimated as hereunder:-

Pile diameter mm	Carrying Capacity kN
300	220
400	310
500	400

Piling contractors must be required to verify these estimates and/or provide estimates of the carrying capacity of their own proprietary pile type(s) in isolation and in groups as appropriate to the piling layout.

The following tests were carried out on samples recovered from the boreholes:-

- Determination of undrained shear strength of clay soils - BS 1377: Part 7: Clause 9: 1990
- Determination of one dimensional consolidation properties _ BS 1377: Part 5: 1990
- Contamination analyses were carried out on eight soil samples to the ICRCL 59/83 recommended suite.

The results of the soil engineering tests are given in Appendix C.

The results of the soil contamination analyses are given in Appendix D.

5.0 STRATIGRAPHY

The boreholes and trial pits confirmed the documented geology.

In the northern sector, the succession is observed to comprise of a very dense superficial layer of well graded crushed brick and concrete hardcore, intermittently underlain by "brickbat" concrete. These made ground layers were observed to be underlain by silty sands in TP1, or organic silt overlying stiff silty clay (TP2).

In the southern sector the sequence is observed to generally comprise of topsoil resting on soft/loose superficial deposits of made ground/reworked ground comprising largely of silty sandy clays and clayey sandy silts, extending to depths typically between 1.5 and 2.0mbgl. These deposits contain occasional isolated remnants of brick and concrete construction (walls and slabs), and are underlain by stiff to very stiff silty clays. Cohesion values in these clays are seen to be in the range 100-200kN/m^2. Coefficients of volume compressibility indicate the clay to be of low compressibility. The stiff clay generally extends to at least 8.5mbgl, based on borehole observations. BH1 exhibits some variation from this generalised sequence, insofar as the thickness of the superficial made ground/reworked ground is 2.7m, and the base of the underlying stiff clay is at 6.0mbgl, at which depth the borehole entered medium dense clayey sandy silt.

Very little groundwater was encountered. Occasional accumulations were contained in the superficial ground, retained on the clay. Seepage was observed in the silt underlying the clay in BH1.

6.0 FOUNDATIONS FOR FUTURE DEVELOPMENT

Economies in pile design may be available from longer piles, end bearing in bedrock. Further site investigation will be required to obtain data on the depth and properties of the bedrock.

7.0 GROUNDWATER

Minor groundwater seepages entered exploratory boreholes and trial pit excavations. Taking account of seasonal influences, groundwater may be expected to accumulate within the superficial ground and remain perched on the clay, and it should be anticipated that minor inflow to excavations below 1.00mbgl will occur, and contractors should allow for some pumping in excavations.

8.0 BURIED CONCRETE

Class 3 criteria in accordance with BRE Digest 363 should be adopted for mix design of buried concrete in the southern sector - see 10.1 hereunder.

In the absence of further site investigation, Class 3 criteria should be adopted for mix design of buried concrete in the northern sector.

9.0 ROAD PAVEMENT DESIGN

For road pavement design in the southern sector, a CBR of 1% should be taken as the basis of design.

The hardcore layers observed to be present in the northern sector will exhibit CBR values probably in excess of 50%, although further investigation will be required to establish the lateral and vertical extent of these materials.

10.0 SOIL CONTAMINATION

10.1 Site Fitness for Purpose

At present, in the United Kingdom the assessment of contaminated land is most commonly undertaken by reference to the Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL), Publication 59/83 "Guidance on the assessment and redevelopment of Contaminated Land", in which are published tentative guidelines for specific contaminants in soil. The guidelines are based on the use of two triggers, the Threshold Trigger and the Action Trigger, which define three zones of contamination - inferred to

be uncontaminated, marginal and contaminated. The trigger values vary in accordance with the proposed end use of the site with the most stringent requirements applicable to domestic gardens and allotments.

For the purposes of assessing the suitability of the site for redevelopment without remediation, the soil analyses have been compared to the criteria for buildings and hard cover.

The three soil samples obtained from the northern sector of the site are not significantly affected by contamination when assessed against the ICRCL 59/83 criteria for open space and hard cover, and on the basis of these results no remediation of the site will be necessary for normal development to proceed.

The five soil samples recovered from the southern sector are seen to be sporadically affected by elevated concentrations of sulphides (TP7) and by slightly elevated concentrations of arsenic (TP4, 5, 7, 8, 9). The presence of sulphides is consistent with the observations in trial pits, which indicated the presence of organic matter in which sulphides may be expected to be present. With regard to fitness for purpose, the arsenic levels are not significant in relation to an end use of commercial/industrial development, in which the soils will be effectively isolated under hard cover. The sulphide result obtained in TP7 is well above the Action Trigger given in ICRCL 59/83 for any end use. Remediation of the site to remove sulphides may not be a viable approach, as the incidence of "hot spots" may be frequent, and would need to be determined by further intensive investigation. Sulphides are often accompanied by acid pH conditions. However, given the generally neutral to slightly alkaline pH values prevailing on this site, it may be appropriate to leave these soils in place, and take appropriate measures to isolate them from human contact. Furthermore, it may be appropriate to adopt Class 3 criteria for buried concrete on this site.

With regard to long term environmental aspects of the site development, taking account of the context setting, the underlying clay aquiclude, and the proposed form of development, it is not considered that the site poses a potential hazard to the natural environment.

10.2 Health and Safety of Workers & The Public

For the purposes of assessing the risk to health and safety of construction workers and the general public in close proximity to the site during construction, it is necessary to take account of the cumulative effects of a number of potentially harmful contaminants present within the superficial soils.

It should be assumed that these risks apply to workers engaged on either sector of the site.

This health risk for construction workers and the general public will arise from exposure to airborne dust arising from construction activities or from direct contact with site soils. Contractors personnel engaged in groundworks should, as a matter of course, be counselled in good practice with particular regard to the avoidance of dust inhalation and skin contact with soils, not smoking or eating on the immediate worksite, and the importance of washing after contact with soils or plant operating on the site. Furthermore, for protection of workers and the general public, contractors would need to adopt effective dust suppression measures including *inter alia:*

- Water spraying in dry weather conditions
- Sheeting of lorries transporting site soils
- Wheel wash installations where vehicles leave the site

If these measures are applied effectively, the health risk to workers and the public during site construction works is considered to be low.

10.3 Water Supply Materials

Based on the criteria specified by North West Water for pipe materials selection, and assuming that the site subsoils are largely left in place, the results of PAH determinations on the site soils indicate that ductile iron water supply mains will be required.

Where rubber gaskets are deployed with ductile iron pipework, these must be protected by overwrapping.

It may be cost effective to reassess this requirement by further sampling/testing when the alignment of water supply pipes has been delineated Alternatively, if further testing is not undertaken, it may be economic to provide clean soil runs along water supply routes, to the extent that normal plastic mains can be adopted. Liaison with NWW is recommended in this regard.

10.4 Offsite Disposal of Soils

In north west England, the guidance tables published by the Greater Manchester Waste Regulation Authority (GMWRA) are widely used for the classification of soils proposed for offsite disposal. When reviewed against the classification tables of the GMWRA, the analyses from these sites classify as shown in Tables 1 and 2 hereunder:-

TABLE 1
ARDWICK MANCHESTER - NORTHERN SECTOR
CONTAMINATION CONCENTRATIONS AFTER GMWRA

Determinand	No of samples	Class A	Class B	Class C	Class D	Class E
pH	3	1			2	
Elemental sulphur	3	3				
PAH	3	3				
Arsenic	3	3				
Boron	3	3				
Cadmium	3	2	1			
Chromium	3	3				
Hex chromium	3	3				
Lead	3	3				
Ni/Cl	3	2	1			
Selenium	3	2	1			
Mercury	3	3				
Zinc	3	2	1			
Copper	3	2		1		
Total cyanide	3	3				
Ex. cyanide	3	3				
Thiocyanate	3	3				
Sulphate	3	3				
Phenols	3	3				
Sulphides	3	2		1		
TOTAL	60	52	4	2	2	

A = UNCONTAMINATED B = SLIGHTLY CONTAMINATED C = CONTAMINATED
D = HEAVILY CONTAMINATED E = UNUSUALLY HEAVILY CONTAMINATED

On the basis of these results, it would be reasonable to seek an overall classification of Class B on soils excavated on this site, although its must be stressed that classification of the soils is a matter for contractor and landfill operator to agree.

TABLE 2
ARDWICK MANCHESTER - SOUTHERN SECTOR
CONTAMINATION CONCENTRATIONS AFTER GMWRA

Determinand	No of samples	Class A	Class B	Class C	Class D	Class E
pH	5	3	2			
Elemental sulphur	5	4			1	
PAH	5	4	1			
Arsenic	5	5				
Boron	5	5				
Cadmium	5	5				
Chromium	5	5				
Hexchromium	5	5				
Lead	5	5				
Nickel	5	5				
Selenium	5	4	1			
Mercury	5	5				
Zinc	5	5				
Copper	5	1	4			
Total cyanide	5	5				
S.L. cyanide	5	5				
Thiocyanate	5	5				
Sulphate	5	5				
Phenols	5	5				
Sulphides	5			3	1	1
TOTAL	100	86	8	3	2	1

A = UNCONTAMINATED B = SLIGHTLY CONTAMINATED C = CONTAMINATED
D = HEAVILY CONTAMINATED E = UNUSUALLY HEAVILY CONTAMINATED

On the basis of these results, it would be reasonable to seek an overall classification of Class C on soils excavated on this site, although its must be stressed that classification of the soils is a matter for contractor and landfill operator to agree.

10.5 Landfill Gas

The results of gas monitoring (see Appendix D) indicate that the southern sector of the site is not affected by elevated concentrations of landfill gases, and no ameliorative design precautions are warranted

CC Geotechnical

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M^cGuinness, Ardwick, Manchester

Location Plan

00/1494/001

Essex House Bridle Road Bootle Merseyside L30 4UE
TEL: 0151 523 0202 FAX: 0151 523 0252

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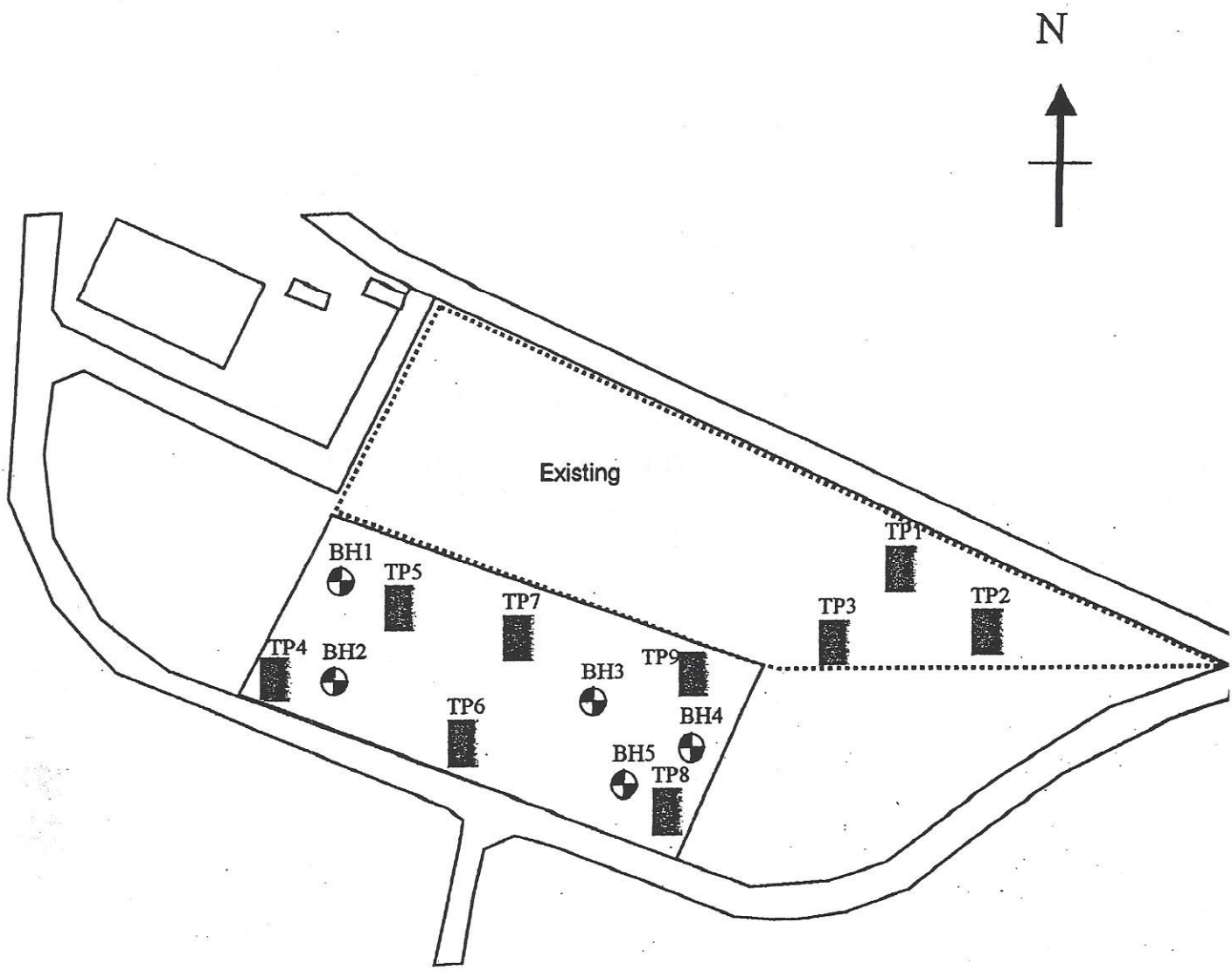


TP — Trial pit

BH1 — Borehole

McGuinness, Ardwick, Manchester

Exploratory Hole Location Plan 00/1494/002

Essex House Bridle Road Bootle Merseyside L30 4UE
TEL: 0151 523 0202 FAX: 0151 523 0252

APPENDIX A

TRIAL PIT SECTION SHEETS

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

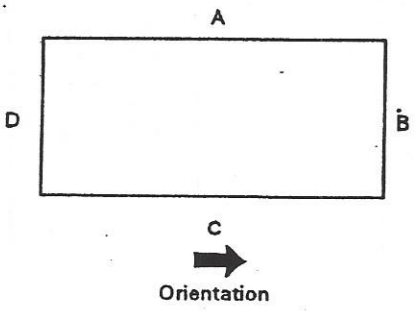
TRIAL PIT NO. TP1
Sheet 1 of 1

CLIENT: MARSTON & GRUNDY / GMPTE	SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.50				
1.20				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
				MADE GROUND comprising of very dense well graded broken brick and concrete hardcore (0.50)		
0.40	JAR		0.50	Hard brickbat CONCRETE slab (0.70)		
1.50	JAR		1.20	Dense yellow/brown fine very silty SAND with some organic matter		
			2.60			

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP2
Sheet 1 of 1

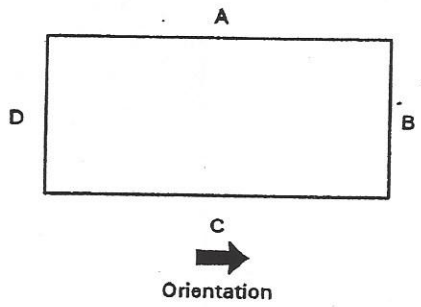
CLIENT: MARSTON & GRUNDY / GMPTE

SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.60				
1.00				
1.50				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
0.50	JAR		0.60	MADE GROUND comprising very dense 75mm down well graded brick and concrte hardcore (0.60)		
			1.00	MADE GROUND comprising very dense brick and concrete rubble (0.40)		
1.20	JAR		1.50	LIght brown very sandy SILT with much black organic matter (0.50)		
			2.50	Very stiff brown silty CLAY		

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP3
Sheet 1 of 1

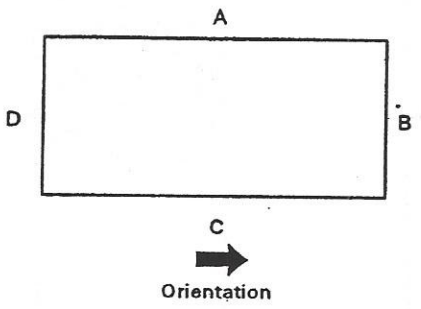
CLIENT: MARSTON & GRUNDY / GMPTE

SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.40				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
0.30	JAR		0.40	MADE GROUND comprsing very dense 75mm down well graded brick and concrete hardcore (0.40)		
			1.20	MADE GROUND comprising brickbat concrete base		
				Terminated - unable to progress		

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP4
Sheet 1 of 1

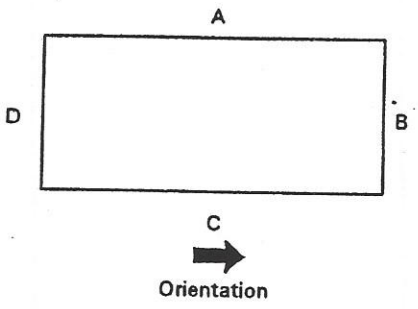
CLIENT: MARSTON & GRUNDY / GMPTE

SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.20				
1.00				
2.20				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
			0.20	Grassed topsoil (0.20)		
0.50	JAR			Loose MADE GROUND comprising soft clay with black ash, wood, brick etc (0.80)		
			1.00	Soft brown/black very silty CLAY varying to very clayey SILT (1.20)		
			2.20	Very stiff brown silty CLAY with frequent grey silt partings		
			2.60			

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

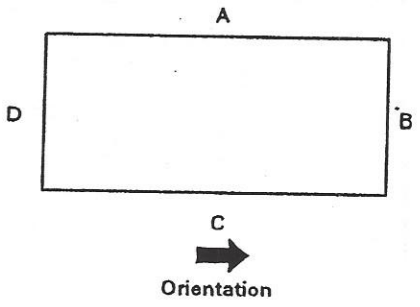
TRIAL PIT LOG

TRIAL PIT NO. TP5
Sheet 1 of 1

CLIENT: MARSTON & GRUNDY / GMPTE		SITE: McGUINESS & CO LTD, ARDWICK		
DATE OF FIELDWORK: 04/01/01-04/01/01	SCALE: 1:50	LEVEL/POSITION: SEE LOCATION PLAN	LOGGED BY: CB	JOB NO.: 00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.50				
2.50				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
0.40	JAR		0.50	Grass on MADE GROUND of black ash and gravel of brick. (0.50)		
1.50	JAR			Soft light brown very silty CLAY with frequent large pockets of black organic silt (2.00)		
			2.50	Very stiff brown very silty CLAY with frequent grey silt partings		
			3.20			

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP6
Sheet 1 of 1

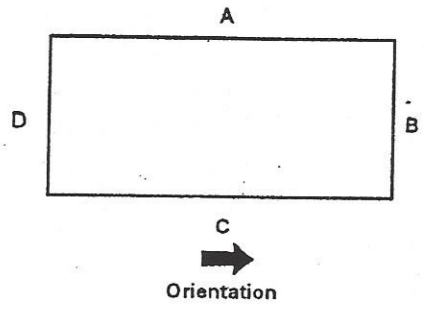
CLIENT: MARSTON & GRUNDY / GMPTE

SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.20				
1.00				
1.50				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
			0.20	Grassed topsoil (0.20)		
0.60	JAR			MADE GROUND comprising soft brown silty clay with much gravel of brick (0.80)		
			1.00			
				Soft light brown silty CLAY with large pockets of black organic silt (0.50)		
			1.50			
				Very stiff brown silty CLAY with frequent grey silt partings		
			2.80			

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP7
Sheet 1 of 1

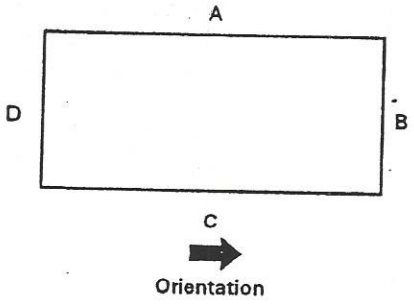
CLIENT: MARSTON & GRUNDY / GMPTE

SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
0.50				
1.90				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
0.30	JAR		0.50	Grass on MADE GROUND of loose black ash with clay (0.50)		
1.50	JAR		1.90	Very loose black clayey gravelly SILT (1.40)		
			2.80	Very stiff brown silty CLAY with frequent grey silt partings		

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP8
Sheet 1 of 1

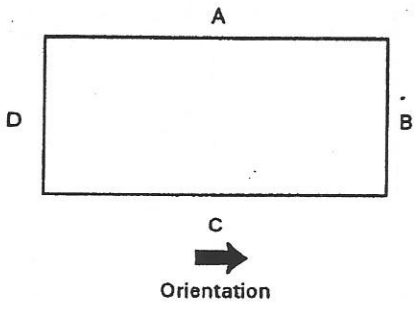
CLIENT: MARSTON & GRUNDY / GMPTE

SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION



DEPTH	FACE A	FACE B	FACE C	FACE D
1.20				
1.50				

FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
0.70	JAR		1.20	Grass on MADE GROUND comprising black ash, brick, masonry lumps, concrete boulders etc (1.20)		
			1.50	Black very silty CLAY tending to very clayey SILT (0.30)		
			2.80	Very stiff brown silty CLAY with frequent grey silt partings		

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

TRIAL PIT LOG

TRIAL PIT NO. TP9
Sheet 1 of 1

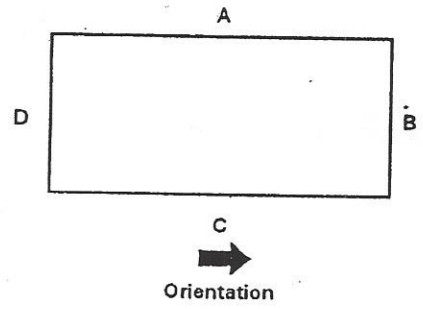
CLIENT: MARSTON & GRUNDY / GMPTE

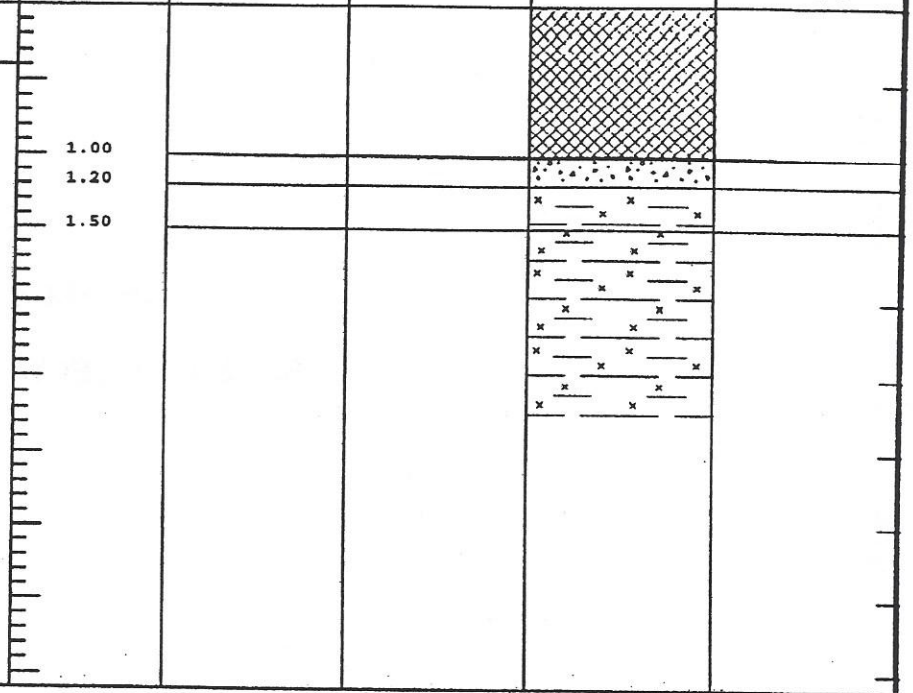
SITE: McGUINESS & CO LTD, ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	LOGGED BY	JOB NO.
04/01/01-04/01/01	1:50	SEE LOCATION PLAN	CB	00/1494

PIT DIMENSIONS A/C : 3.00 B/D : 1.00

ORIENTATION





FACE AND POSITION LOGGED ALL

SAMPLE AND TEST RECORD DEPTH	TYPE	RESULT	DEPTH	DESCRIPTION OF STRATUM (thickness)	STRATUM NO.	WATER DEPTH
				Grass on MADE GROUND comprising brick, ash, concrete, glass, clay, masonry lintels etc (1.00)		
0.80	JAR		1.00			
			1.20	Brick floor slab (0.20)		
			1.50	Soft light brown very silty CLAY tending to very clayey SILT (0.30)		
				Very stiff brown silty CLAY with frequent grey silt partings		
			2.80			

GROUNDWATER INFORMATION

DEPTH STRUCK	ELAPSED TIME	WATER LEVEL	REMARKS ON GROUNDWATER
NS			TRIAL PIT DRY

EXCAVATION METHOD AND REMARKS

JCB 3C

APPENDIX B

BOREHOLE SECTION SHEETS

CC Geotechnical Tel: 0151-523-0202 Fax: 0151-523-0252

BOREHOLE LOG

HOLE NO. BH1
Sheet 1 of 1

CLIENT: MARSTON & GRUNDY

SITE: McGUINNESS & Co. Ltd., ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
08/01/01-08/01/01	1:50	SEE LOCATION PLAN	SKF	PF	00/1494

SAMPLE RECORD DEPTH	TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEND
0.50	BULK			Very loose MADE GROUND comprising of bricks in a sand matrix (2.70)			
1.00 - 1.45	SPT	NIL					
1.50	BULK						
2.00 - 2.45	SPT	4					
2.50	BULK						
					2.70		
3.00 - 3.45	U100	(155)		Stiff varying to very stiff brown silty slightly gravelly CLAY (3.30)			
3.50	BULK						
4.00 - 4.45	U100	(109)					
4.50	BULK						
5.00 - 5.45	U100	(160)					
6.00	BULK						
				Medium dense brown clayey sandy SILT	6.00		
6.50 - 6.95	SPT	23					
7.50	BULK						
8.00 - 8.45	SPT	28					
				BOREHOLE TERMINATED	8.50		

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
6.00	4.00	20MINS	5.80	NS	STANDING WATER LEVEL

BORING METHOD AND REMARKS

DANDO 150
1hr INSTALLING 3m MONITORING WELL

CC Geotechnical
Tel: 0151-523-0202
Fax: 0151-523-0252

BOREHOLE LOG

HOLE NO. BH2
Sheet 1 of 1

CLIENT	SITE
MARSTON & GRUNDY	McGUINNESS & Co. Ltd., ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
09/01/01-09/01/01	1:50	SEE LOCATION PLAN	SKF	PF	00/1494

SAMPLE RECORD DEPTH	TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEN
				Grassed topsoil (0.20)			
0.50	BULK			MADE GROUND comprising very soft sandy clay with some gravel of brick (0.60)	0.20		
1.00 - 1.45	SPT	4		Soft to firm grey very silty sandy CLAY (1.20)	0.80		
1.50	BULK						
2.00 - 2.45	SPT	8					
2.50	BULK			Stiff brown silty CLAY with frequent grey silt partings	2.00		
3.00 - 3.45	U100	(161)					
3.50	BULK						
4.00 - 4.45	U100	(95)					
4.50	BULK						
5.00 - 5.45	U100						
6.00	BULK						
6.50 - 6.95	U100						
7.50	BULK						
8.00 - 8.45	U100	(100)			8.50		

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
0.80	0.80	20MINS	0.80	1.20	slight seepage from within superficial fill

BORING METHOD AND REMARKS

DANDO 150

CC Geotechnical
Tel: 0151-523-0202
Fax: 0151-523-0252

BOREHOLE LOG

HOLE NO. BH3
Sheet 1 of 1

CLIENT: MARSTON & GRUNDY

SITE: McGUINNESS & Co. Ltd., ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
10/01/01-10/01/01	1:50	SEE LOCATION PLAN	SKF	PF	00/1494

SAMPLE RECORD DEPTH	TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEND
0.50	BULK			Loose MADE GROUND comprising of clayey silty sand withe much gravel of brick (1.70)			
1.00 - 1.45	SPT	6					
1.50	BULK						
2.00 - 2.45	U100			Stiff brown silty CLAY with frequent grey silt partings	1.70		
2.50	BULK						
3.00 - 3.45	U100	(119)					
3.50	BULK						
4.00 - 4.45	U100	(149)					
4.50	BULK						
5.00 - 5.45	U100	(95)					
6.00	BULK						
6.50 - 6.95	U100	(81)					
7.50	BULK						
8.00 - 8.45	U100	(129)			8.50		

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
1.50	1.50	20MINS	1.20	1.80	Slight seepage from perched groundwater in superficial fill

BORING METHOD AND REMARKS

DANDO 150

CC Geotechnical	Tel: 0151-523-0202 Fax: 0151-523-0252	BOREHOLE LOG	HOLE NO. BH4 Sheet 1 of 1

CLIENT	SITE
MARSTON & GRUNDY	McGUINNESS & Co. Ltd., ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
11/01/01-11/01/01	1:50	SEE LOCATION PLAN	SKF	PF	00/1494

SAMPLE RECORD DEPTH	TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEND
0.50	BULK			Very loose MADE GROUND comprising of silty clayey sand with much gravel of brick (2.00)			
1.00 - 1.45	SPT	3					
1.50	BULK						
2.00 - 2.45	U100	(264)					
					2.00		
2.50	BULK			Stiff brown silty CLAY with frequent grey silt partings			
3.00 - 3.45	U100	(221)					
3.50	BULK						
4.00 - 4.45	U100	(174)					
4.50	BULK						
5.00 - 5.45	U100	(95)					
6.00	BULK						
6.50 - 6.95	U100	(97)					
7.50	BULK						
8.00 - 8.45	U100	(108)					
					8.50		

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
NS					borehole dry

BORING METHOD AND REMARKS

DANDO 150

CC Geotechnical	Tel: 0151-523-0202 Fax: 0151-523-0252	BOREHOLE LOG	HOLE NO. BH5 Sheet 1 of 1

CLIENT	SITE
MARSTON & GRUNDY	McGUINNESS & Co. Ltd., ARDWICK

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
10/01/01-10/01/01	1:50	SEE LOCATION PLAN	SKP	PF	00/1494

SAMPLE RECORD DEPTH	TYPE	SPT N (Cu-kN/m^2)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	REDUCED LEVEL	LEGEND
				Grassed topsoil (0.10)	0.10		
0.50	BULK			Loose MADE GROUND comprising black silty sandy ash with whole and broken brick (0.60)	0.70		
1.00 - 1.45	U100	(147)		Stiff to very stiff silty sandy CLAY with frequent grey silt partings			
1.50	BULK						
2.00 - 2.45	U100	(185)					
2.50	BULK						
3.00 - 3.45	U100	(164)					
3.50	BULK						
4.00 - 4.45	U100	(158)					
4.50	BULK						
5.00 - 5.45	U100	(88)					
6.00	BULK						
6.50 - 6.95	U100	(117)					
7.50	BULK						
8.00 - 8.45	U100	(111)			8.50		

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
NS					borehole dry

BORING METHOD AND REMARKS

DANDO 150

APPENDIX C

SOIL ENGINEERING TEST RESULTS

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with BS1377:Part 2:1990

Sample Number	Type	Depth From (m)	Depth To (m)	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425micron	Description
BH1	U100	3.00	3.45	20	2.14	1.79					
BH1	U100	4.00	4.45	18	2.14	1.82					
BH1	U100	5.00	5.45	16	2.21	1.91					
BH2	U100	3.00	3.45	21	2.13	1.77					
BH2	U100	4.00	4.45	18	2.14	1.81					
BH2	U100	8.00	8.45	19	2.21	1.86					
BH3	U100	3.00	3.45	20	2.15	1.80					
BH3	U100	4.00	4.45	19	2.12	1.77					
BH3	U100	5.00	5.45	19	2.15	1.81					
BH3	U100	6.50	6.95	20	2.07	1.73					
BH3	U100	8.00	8.45	16	2.17	1.87					
BH4	U100	2.00	2.45	17	2.23	1.91					
BH4	U100	3.00	3.45	13	2.26	2.01					
BH4	U100	4.00	4.45	12	2.30	2.05					
BH4	U100	5.00	5.45	16	2.19	1.89					

SITE: McGUINNESS & CO. LTD., ARDWICK

CLIENT: MARSTON & GRUNDY

DATE: Jan-01

SHEET: 1 of 2

1494RES1.xls

CC Geotechnical

Telephone: (0151) 523 0202

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with BS1377:Part 2:1990

Sample Number	Type	Depth From (m)	Depth To (m)	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	% passing 425micron	Description
BH4	U100	6.50	6.95	16	2.13	1.83					
BH4	U100	8.00	8.45	16	2.16	1.86					
BH5	U100	1.00	1.45	19	2.12	1.78					
BH5	U100	2.00	2.45	19	2.17	1.82					
BH5	U100	3.00	3.45	13	2.17	1.92					
BH5	U100	4.00	4.45	17	2.19	1.87					
BH5	U100	5.00	5.45	20	2.15	1.79					
BH5	U100	6.50	6.95	18	2.22	1.88					
BH5	U100	8.00	8.45	18	2.11	1.79					

SITE: McGUINNESS & CO. LTD., ARDWICK

CLIENT: MARSTON & GRUNDY

DATE: Jan-01

SHEET: 2 of 2

CC Geotechnical

Telephone: (0151) 523 0202

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

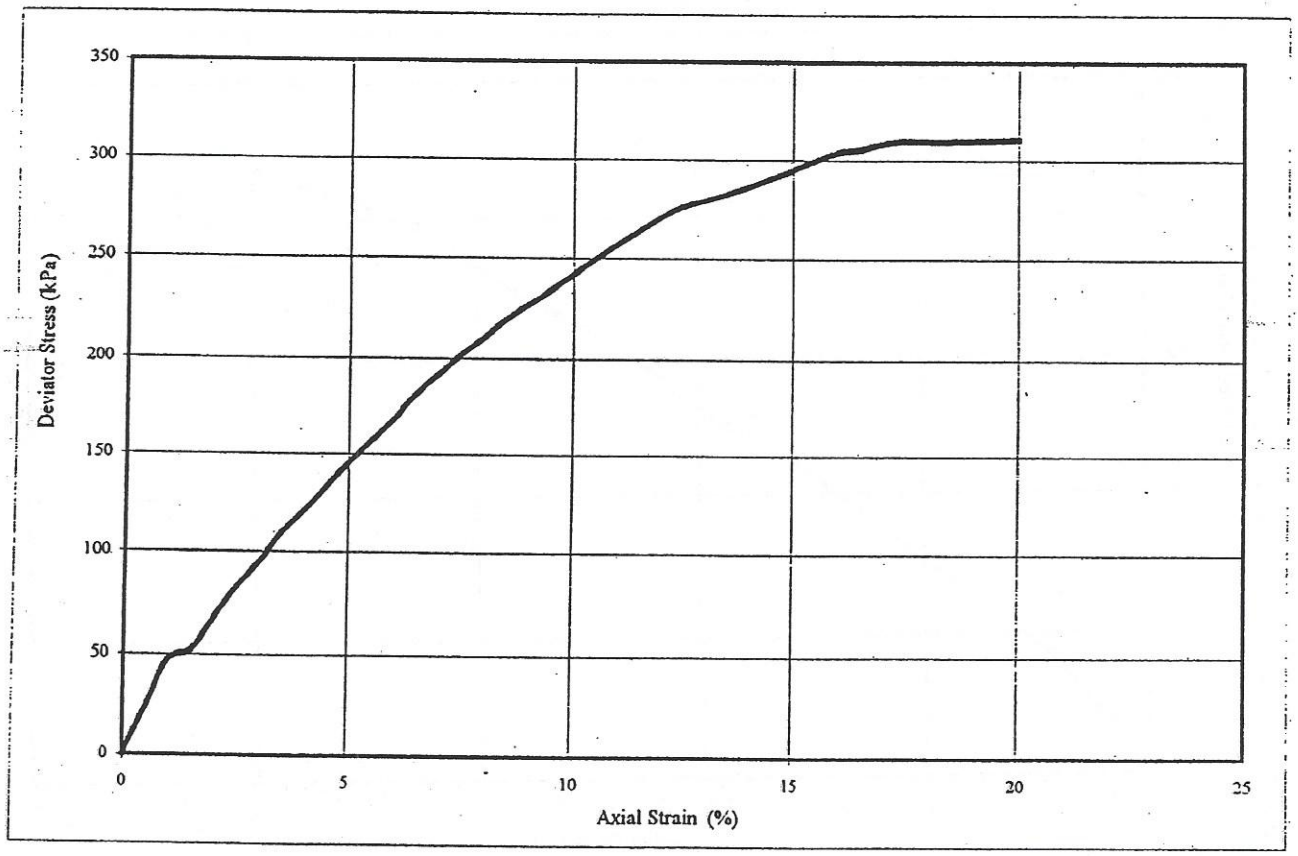
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	10/01/01	Site:	McGuiness & Co Ltd, Ardwick

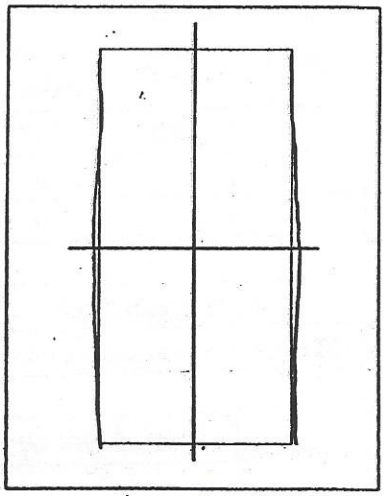
Borehole No.:	BH 1	Depth:	3.00 - 3.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.14 Mg/m^3
Mass:	3575.5 g	Dry Density:	1.79 Mg/m^3
Moisture Content:	20 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	60	310	309	155	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff red/brown slightly silty CLAY with occ fine gravel and occ coal fragments

1494BH130.xls	Carried Out by:	Checked by:
	AR	PF

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

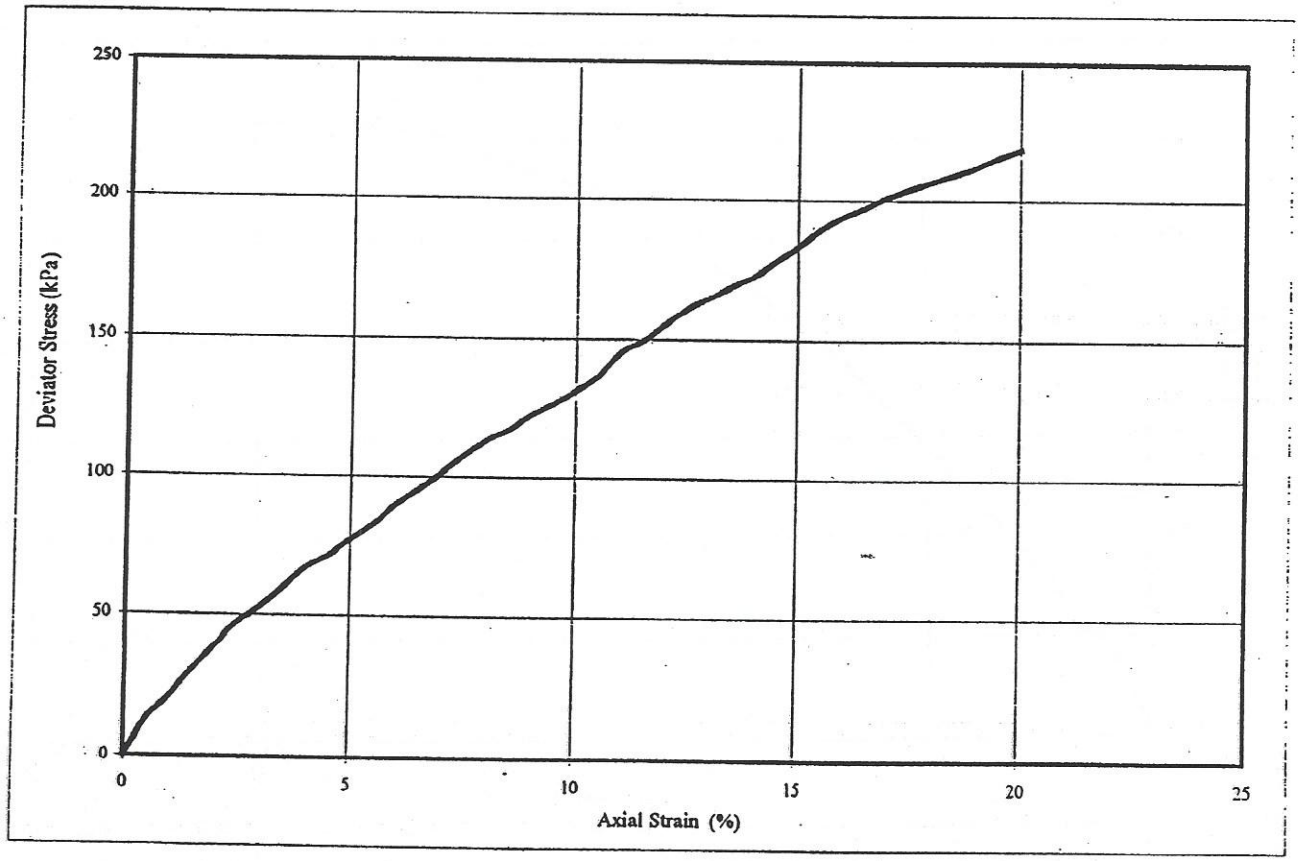
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	10/01/01	Site:	McGuiness & Co Ltd, Ardwick

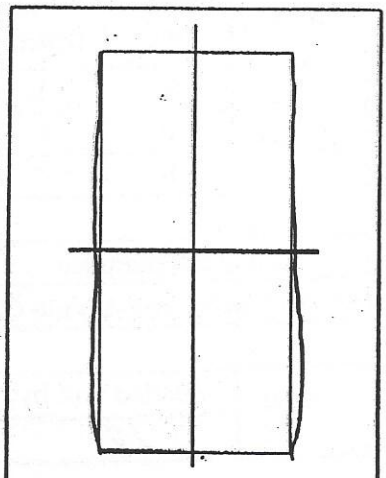
Borehole No.:	BH 1	Depth:	4.00 - 4.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.14 Mg/m^3
Mass:	3569.7 g	Dry Density:	1.82 Mg/m^3
Moisture Content:	18 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1 - \sigma_3)_{max}$ (kN/m^2)	$(\sigma 1 - \sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	80	218	217	109	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown Very silty/sandy CLAY

1494BH140.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

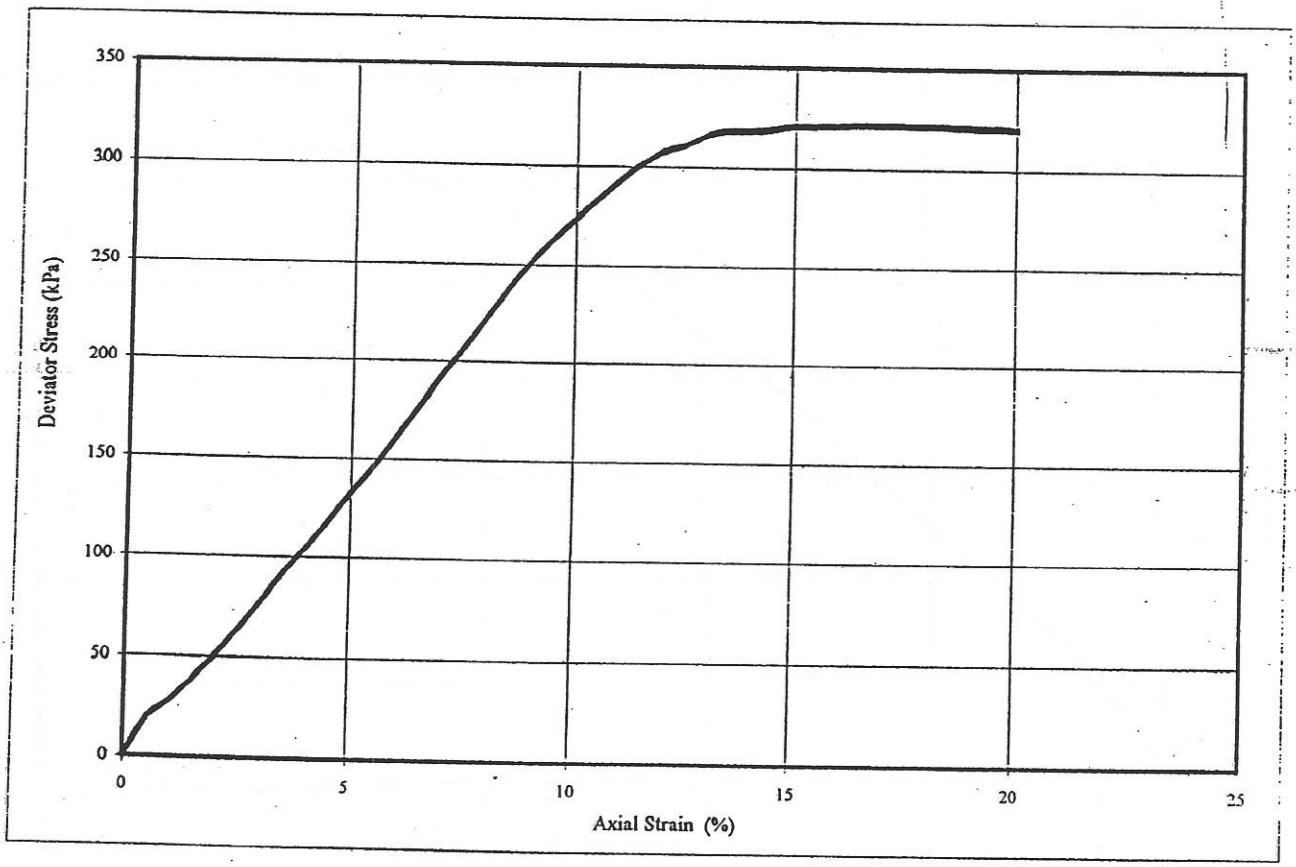
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	10/01/01	Site:	McGuiness & Co Ltd, Ardwick

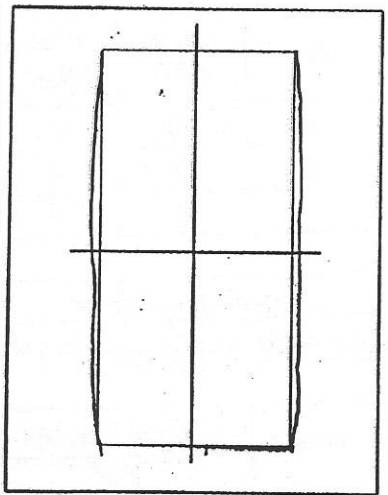
Borehole No.:	BH 1	Depth:	5.00 - 5.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.21 Mg/m^3
Mass:	3677.8 g	Dry Density:	1.91 Mg/m^3
Moisture Content:	16 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test	



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_r$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	100	321	320	160	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown slightly clayey SILT

1494BH150.xls	Carried Out by: AL	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

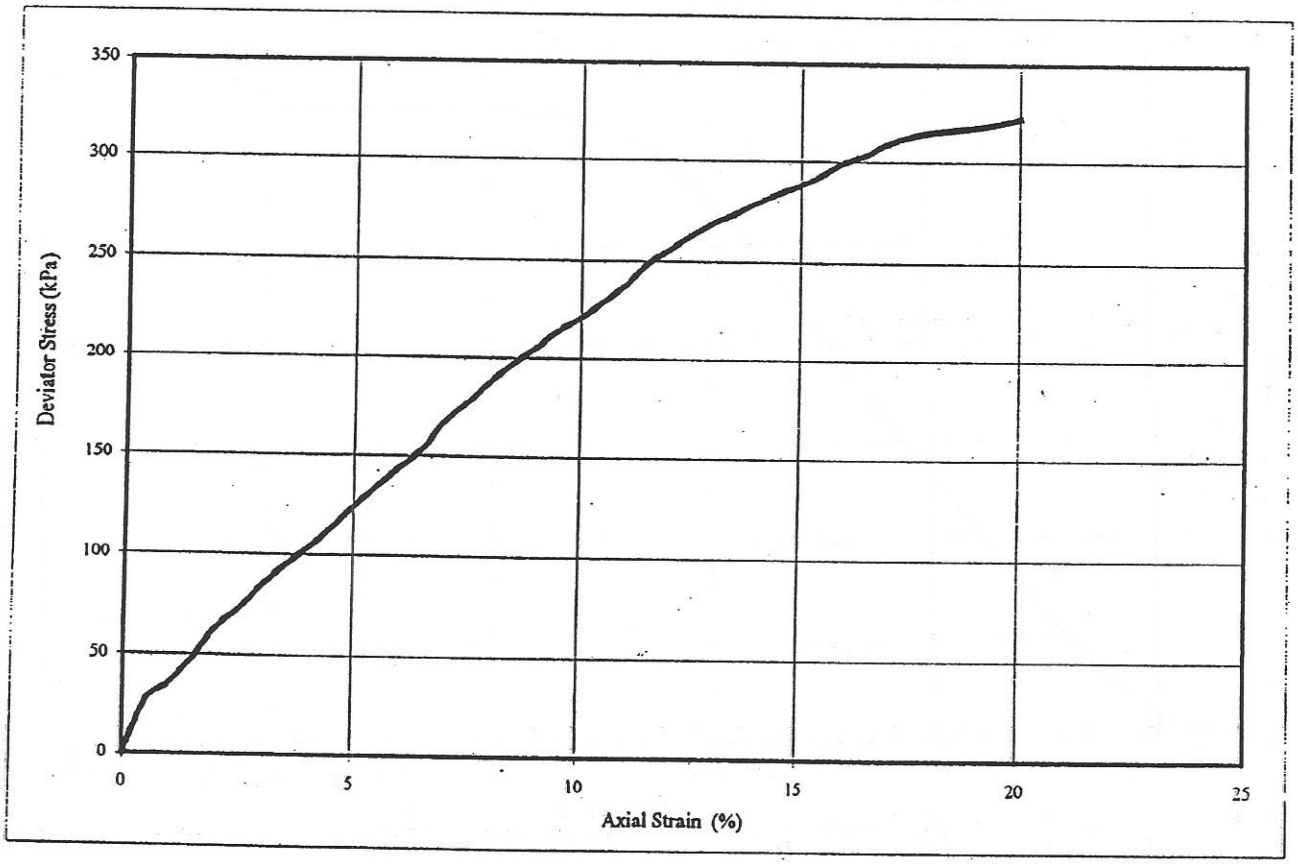
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	10/01/01	Site:	McGuiness & Co Ltd, Ardwick

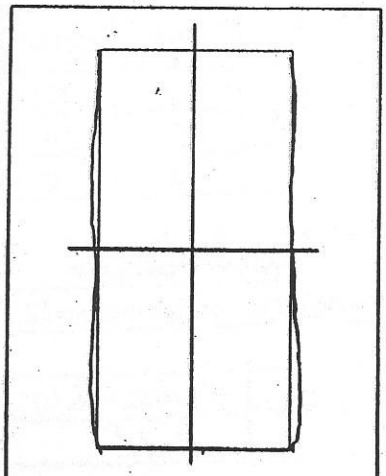
Borehole No.:	BH 2	Depth:	3.00 - 3.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.13 Mg/m^3
Mass:	3558.9 g	Dry Density:	1.77 Mg/m^3
Moisture Content:	21 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1 - \sigma_3)_{max}$ (kN/m^2)	$(\sigma 1 - \sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	60	322	321	161	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty CLAY with occasional fine gravel

1494BH230.xls	Carried Out by:	Checked by:

CC Geotechnical

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Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

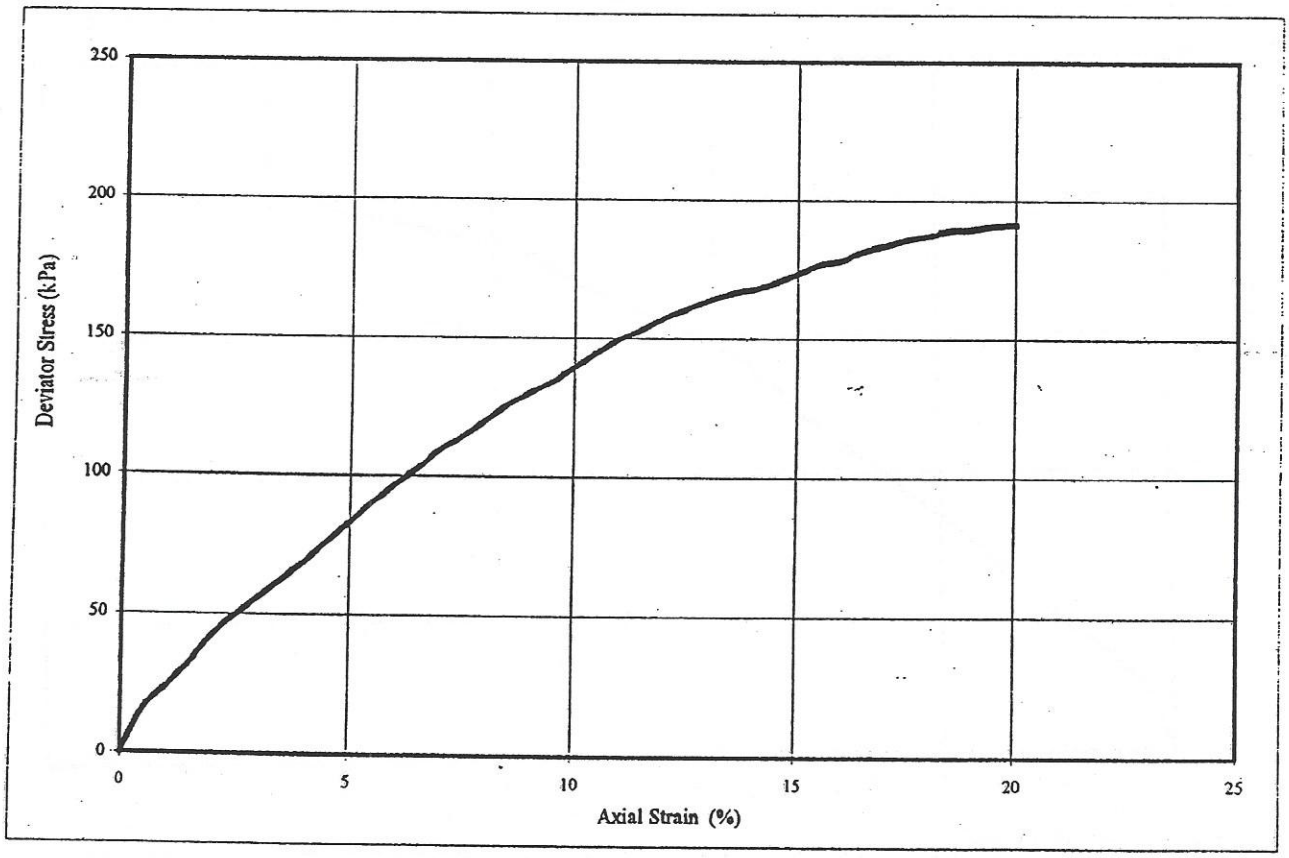
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co. Ltd, Ardwick

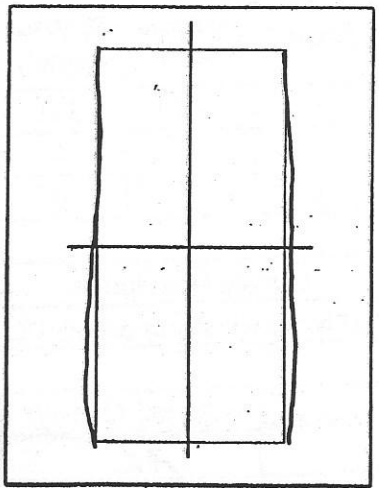
Borehole No.: **BH2** Depth: **4.00** - **4.45** metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.14 Mg/m^3
Mass:	3573.4 g	Dry Density:	1.81 Mg/m^3
Moisture Content:	18 %	Membrane Thickness:	0.5 mm

Rate of Strain: 1 % / min Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	80	191	190	95	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description

Stiff brown silty slightly gravelly CLAY with rare coal fragments

1494bh240.xls	Carried Out by: AL	Checked by: AF

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

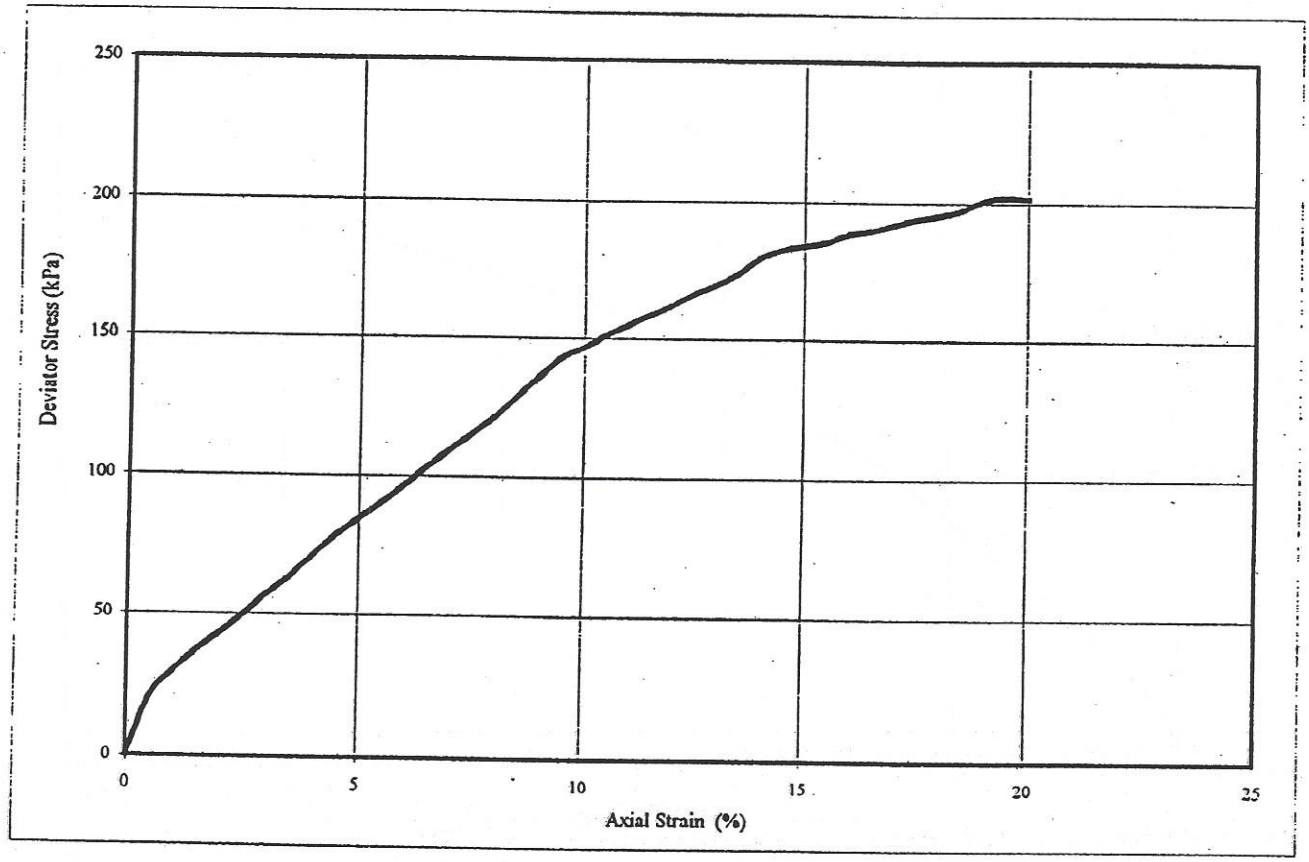
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co. Ltd, Ardwick

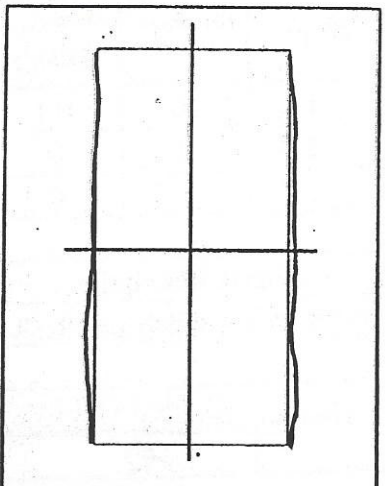
Borehole No.:	BH2	Depth:	8.00 - 8.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.21 Mg/m^3
Mass:	3685.6 g	Dry Density:	1.86 Mg/m^3
Moisture Content:	19 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	160	201	200	100	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty slightly gravelly CLAY

1494bh280.xls	Carried Out by:	Checked by:
	AL	AF

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

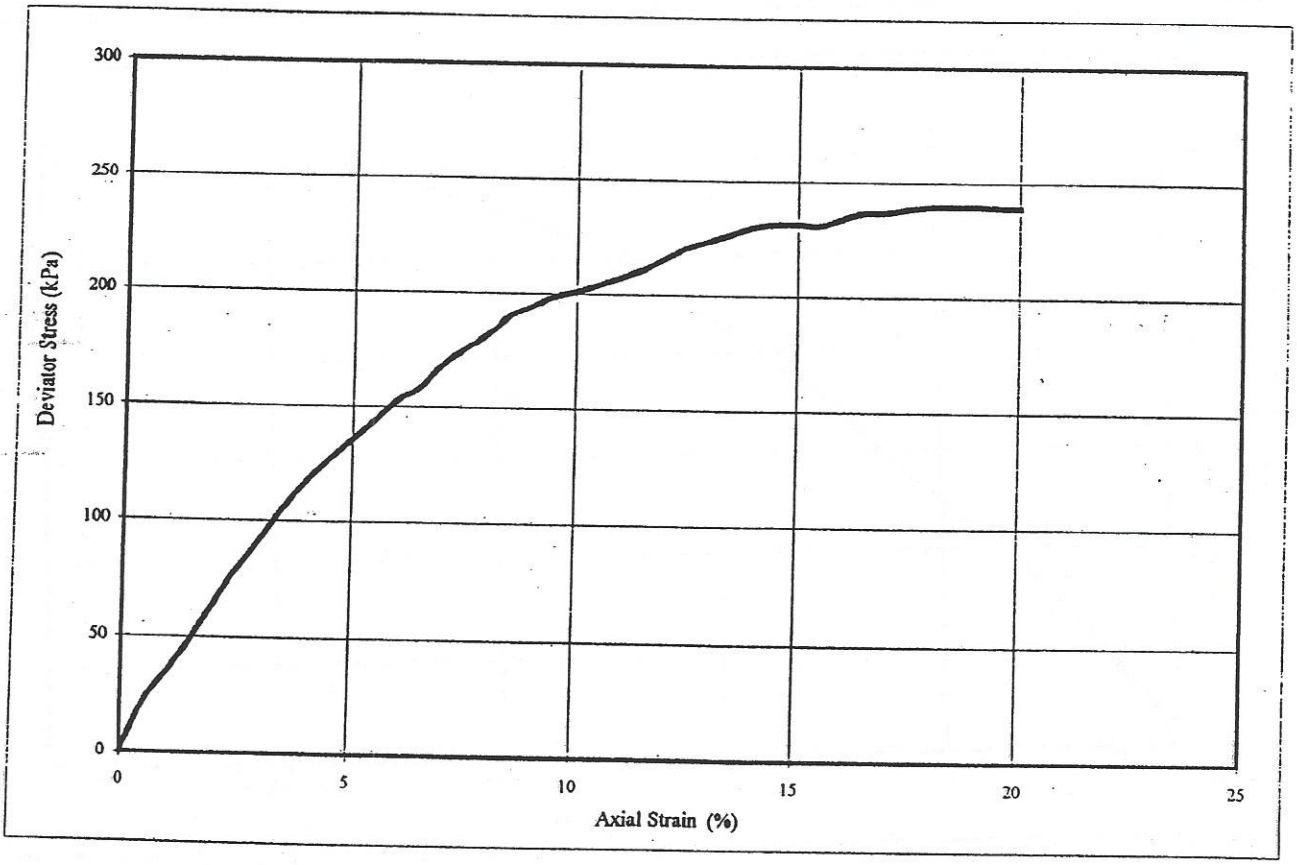
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co. Ltd, Ardwick.

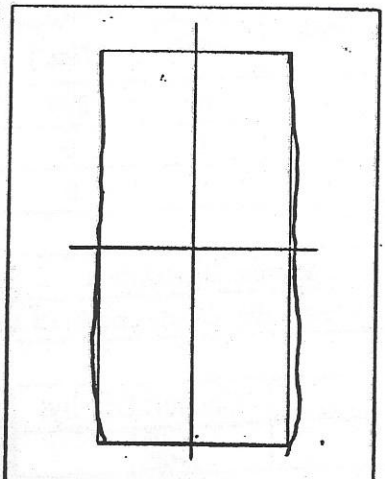
Borehole No.:	BH3	Depth:	3.00 - 3.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.15 Mg/m^3
Mass:	3590.6 g	Dry Density:	1.80 Mg/m^3
Moisture Content:	20 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1 - \sigma_3)_{max}$ (kN/m^2)	$(\sigma 1 - \sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	60	239	238	119	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty slightly gravelly CLAY with rare coal fragments

1494bh330.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

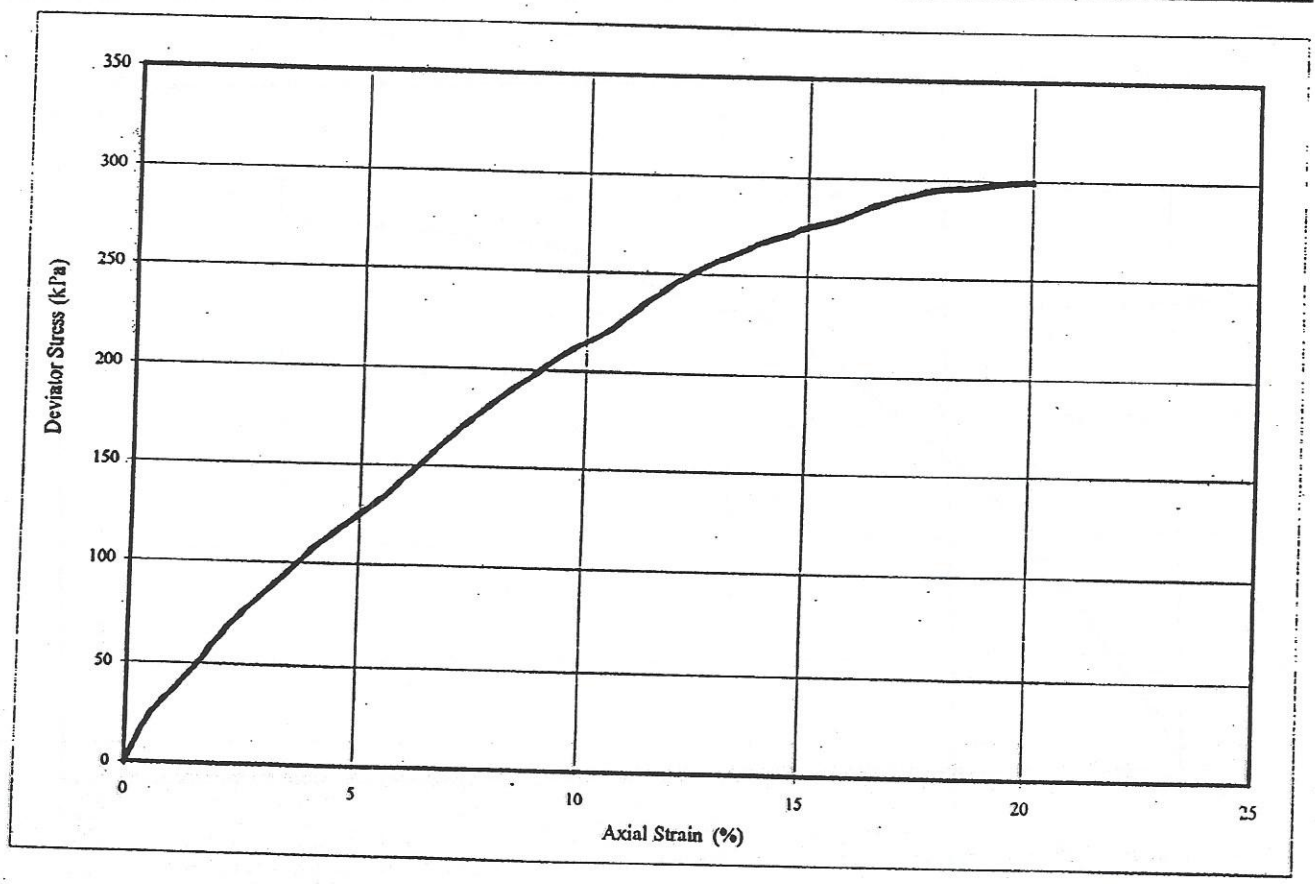
BS 1377: Part 7: Clause 9: 1990

Job No.: 00/1494	Client: Marston & Grundy
Date: 15/01/01	Site: McGuiness & Co. Ltd, Ardwick

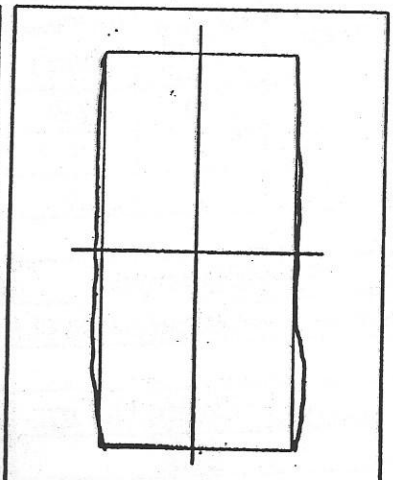
Borehole No.: BH3		Depth: 4.00 - 4.45 metres	

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.12 Mg/m^3
Mass:	3529.6 g	Dry Density:	1.77 Mg/m^3
Moisture Content:	19 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test	



Stage	Cell Pressure (kN/m^2)	$(\sigma_1 - \sigma_3)_{max}$ (kN/m^2)	$(\sigma 1 - \sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	80	299	298	149	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty slightly gravelly CLAY with rare coal fragments

1494bh340.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

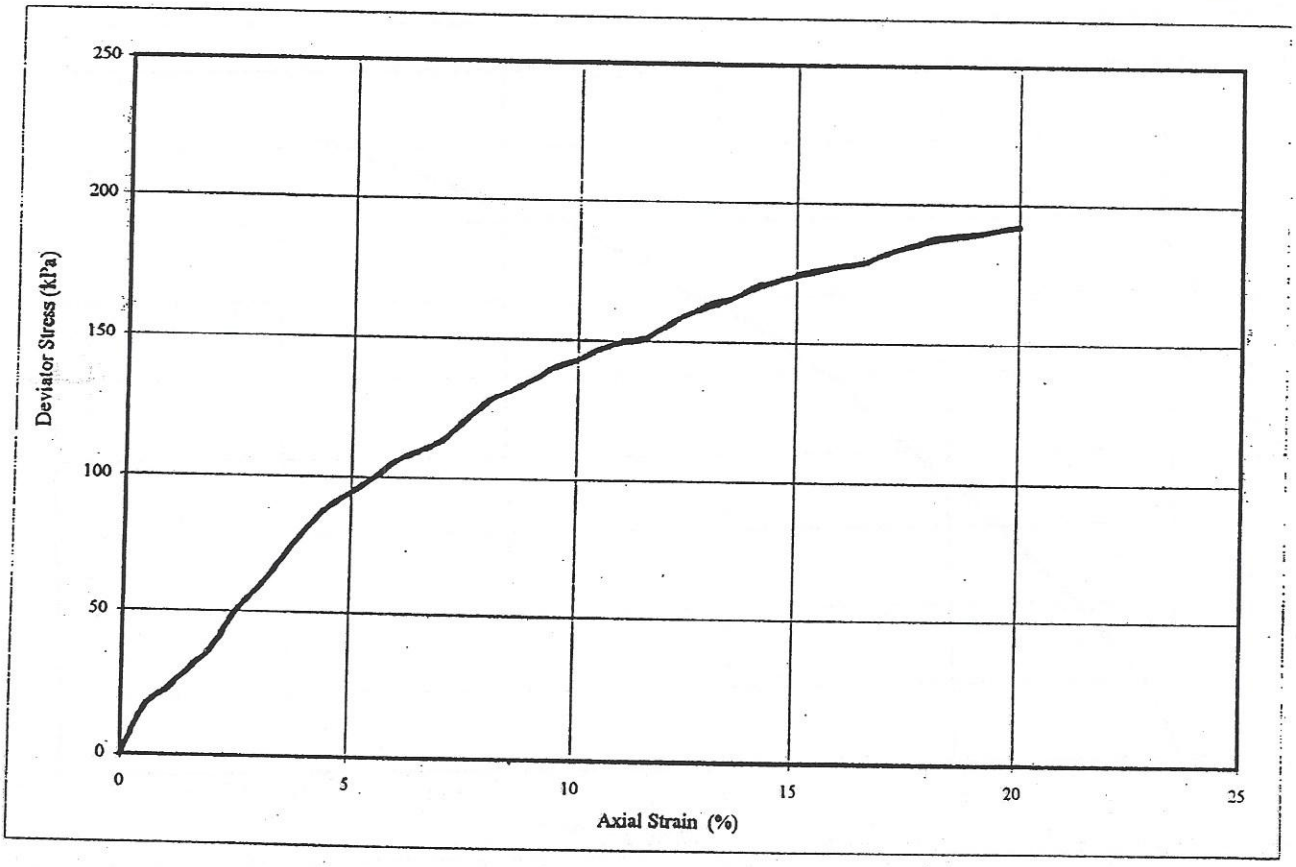
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuinness & Co Ltd, Ardwick

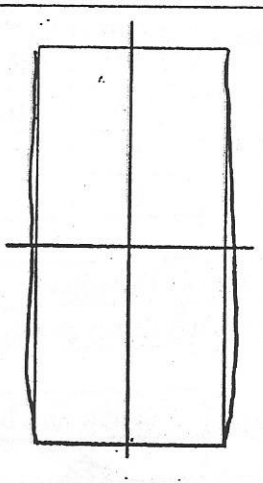
Borehole No.:	BH 3	Depth:	5.00 - 5.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.15 Mg/m^3
Mass:	3584.7 g	Dry Density:	1.81 Mg/m^3
Moisture Content:	19 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	100	191	190	95	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty CLAY with some fine/medium gravel and occ coal fragments

1494bh350.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

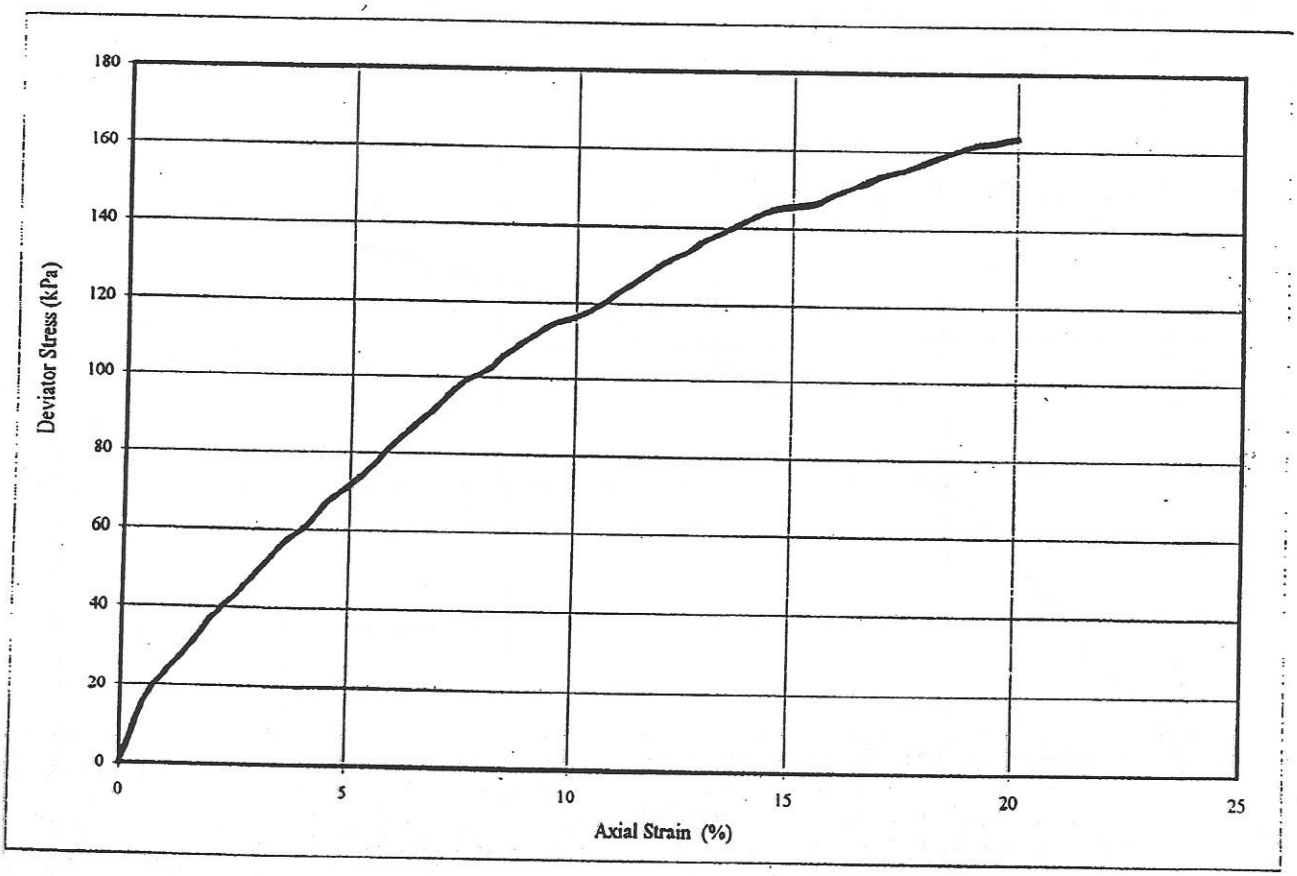
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co. Ltd, Ardwick

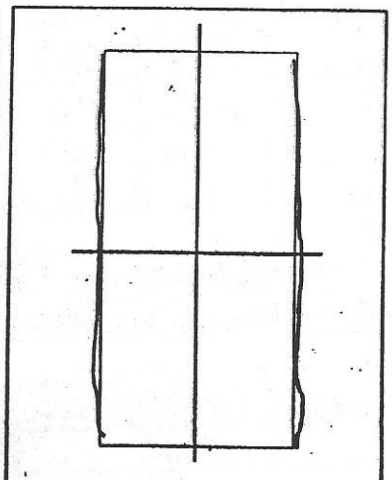
Borehole No.:	BH3	Depth:	6.50 - 6.95 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.07 Mg/m^3
Mass:	3445 g	Dry Density:	1.73 Mg/m^3
Moisture Content:	20 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	130	163	162	81	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty slightly gravelly CLAY with rare coal fragments

1494bh365.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

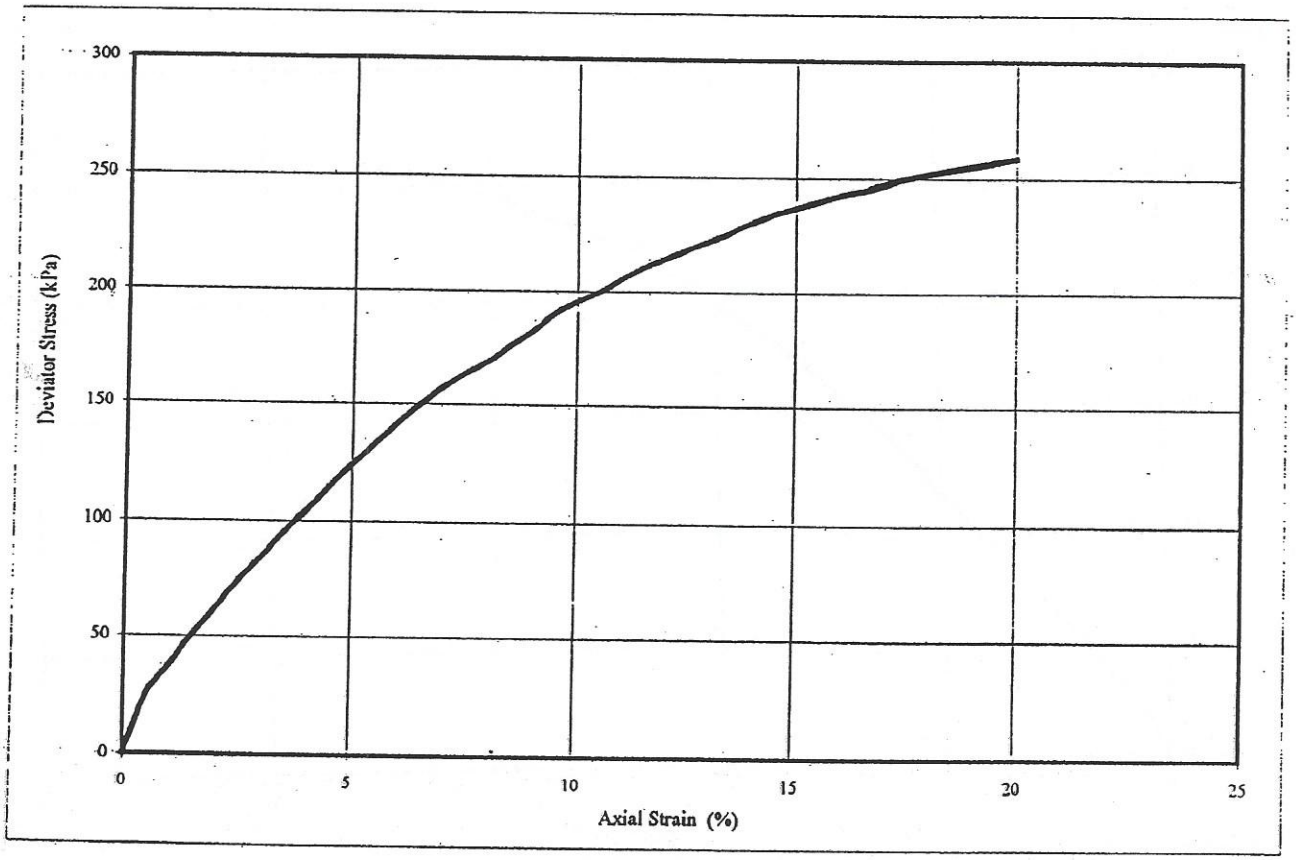
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co. Ltd, Ardwick

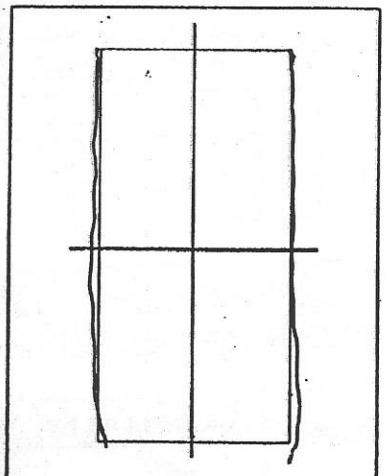
Borehole No.:	BH3	Depth:	8.00 - 8.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.17 Mg/m^3
Mass:	3623.2 g	Dry Density:	1.87 Mg/m^3
Moisture Content:	16 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1 - \sigma_3)_{max}$ (kN/m^2)	$(\sigma 1 - \sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	160	258	257	129	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty slightly gravelly CLAY

1494bh380.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

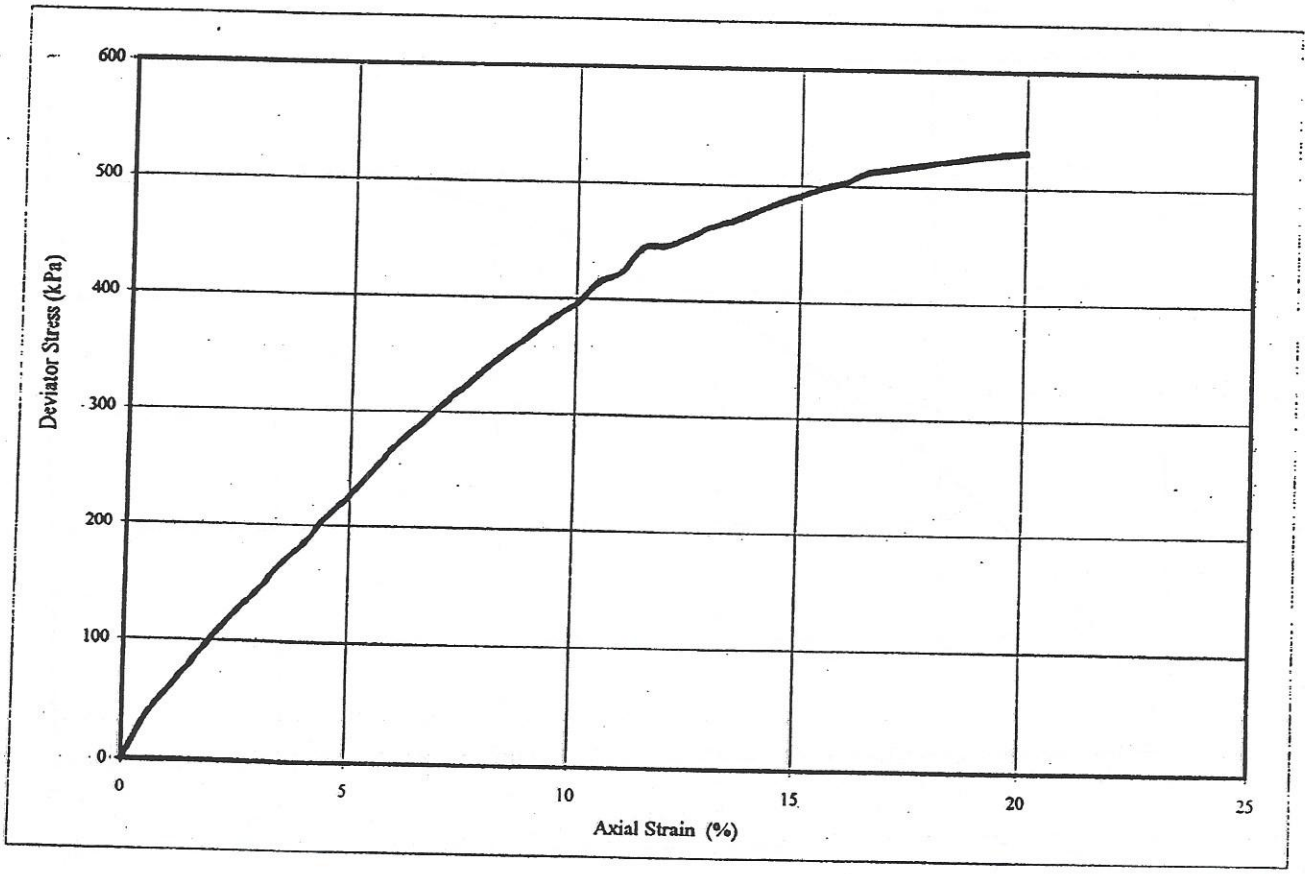
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuinness & Co Ltd, Ardwick

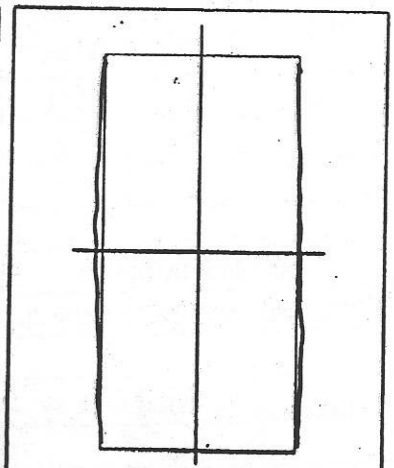
Borehole No.:	BH 4	Depth:	2.00 - 2.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.23 Mg/m^3
Mass:	3717.6 g	Dry Density:	1.91 Mg/m^3
Moisture Content:	17 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	40	529	528	264	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty CLAY with occasional fine to medium gravel

	Carried Out by:	Checked by:
1494bh450.xls		

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

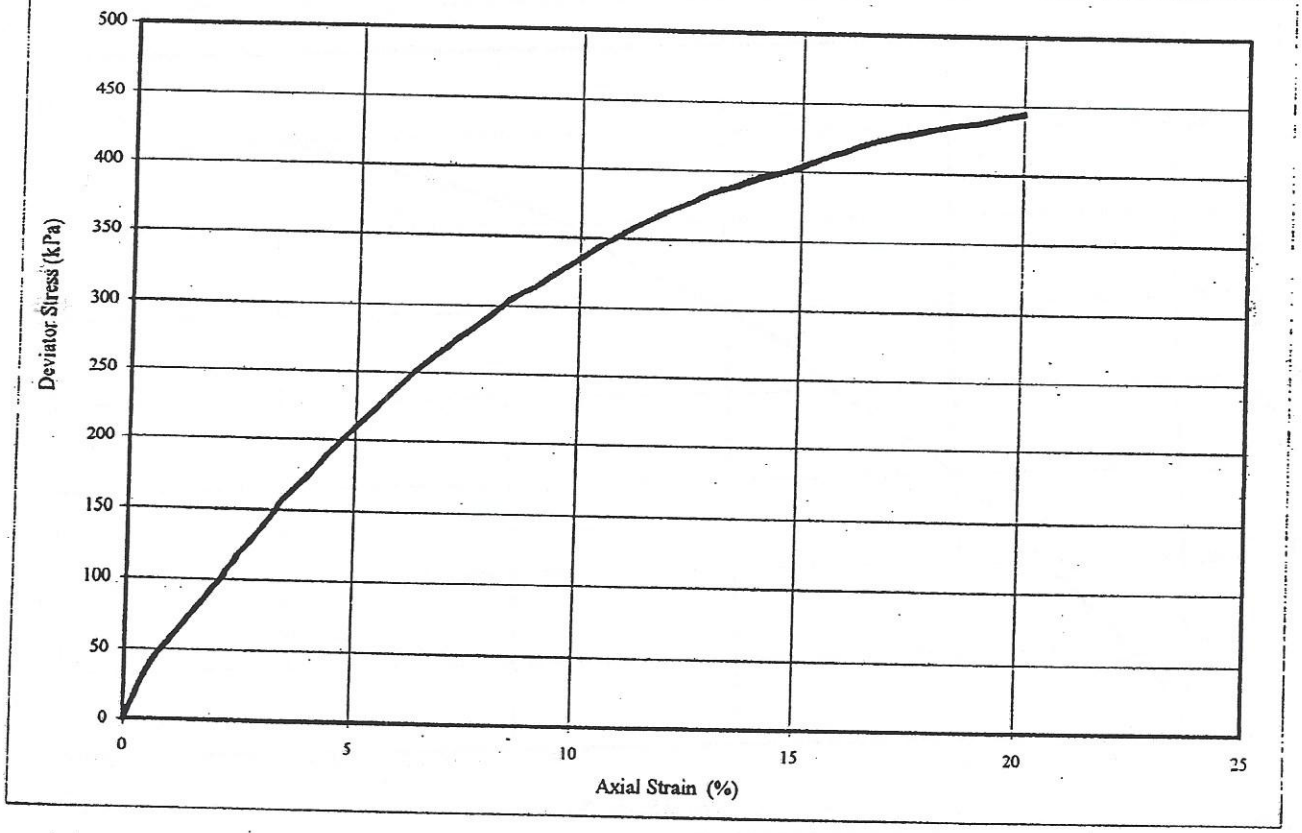
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuinness & Co Ltd, Ardwick

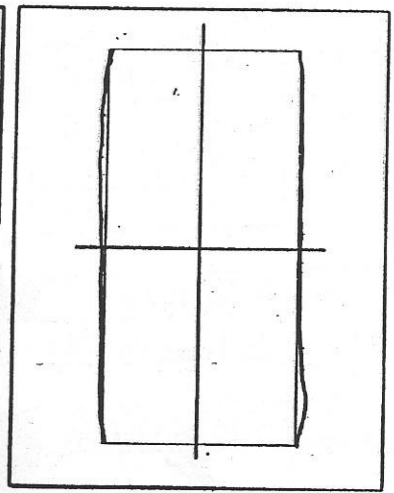
Borehole No.:	BH 4	Depth:	3.00 - 3.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.26 Mg/m^3
Mass:	3773.8 g	Dry Density:	2.01 Mg/m^3
Moisture Content:	13 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	60	443	442	221	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty CLAY with some fine/medium gravel and occ coal fragments

1494bh430.xls	Carried Out by:	Checked by:
	AL	PF

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

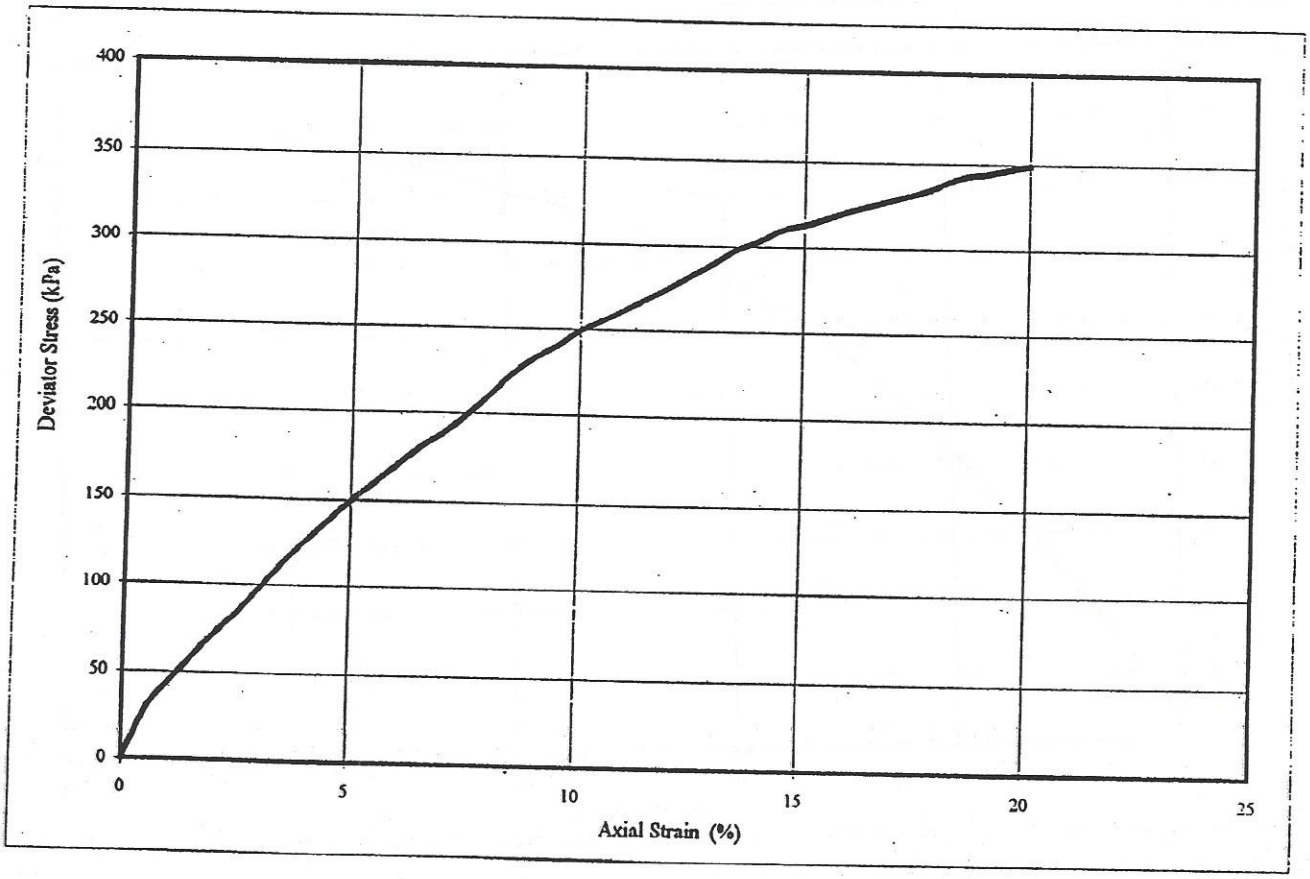
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuinness & Co Ltd, Ardwick

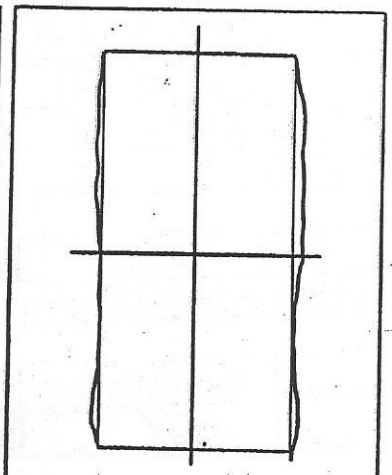
Borehole No.:	BH 4	Depth:	4.00 - 4.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.30 Mg/m^3
Mass:	3836.7 g	Dry Density:	2.05 Mg/m^3
Moisture Content:	12 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_r$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	80	348	347	174	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty gravelly CLAY with occasional brown sand pockets

1494bh440.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

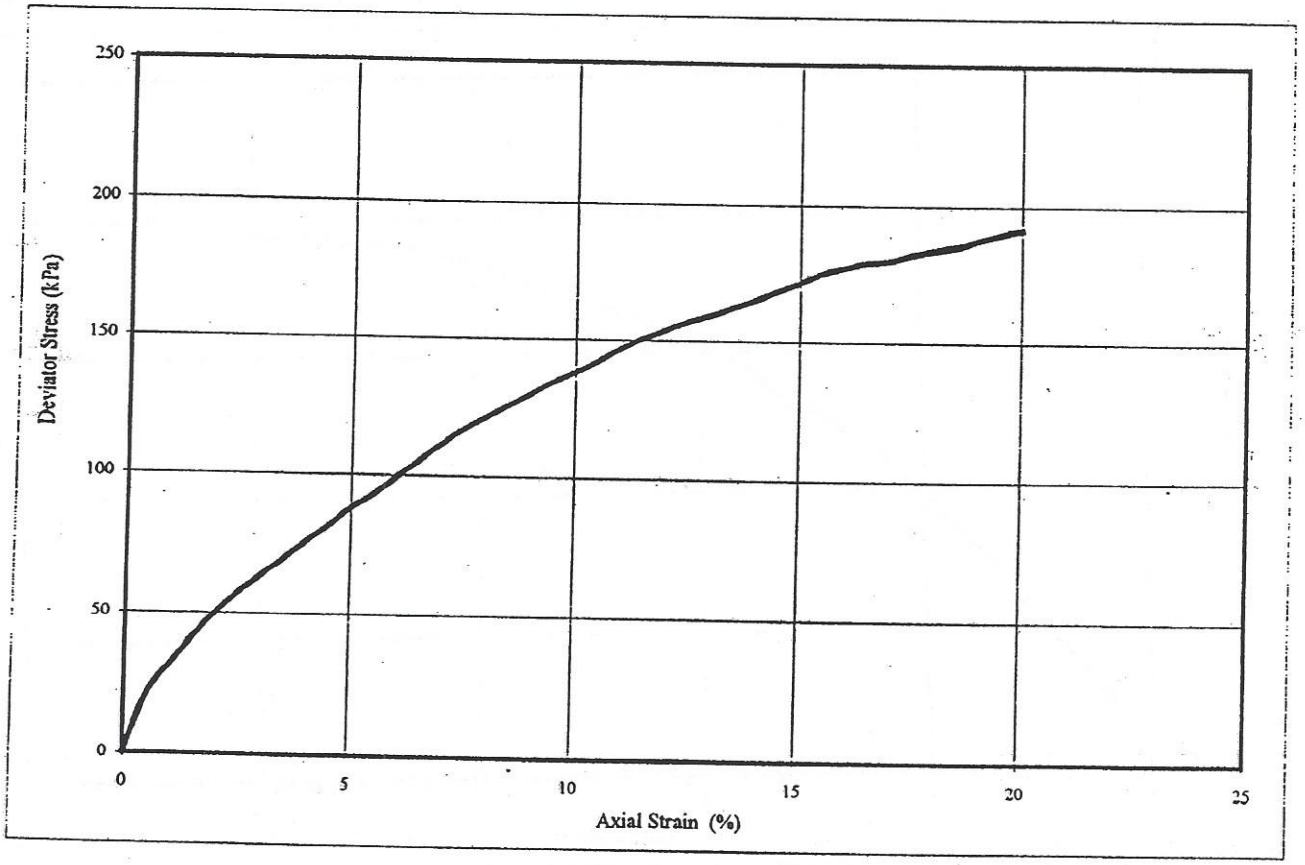
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co Ltd, Ardwick

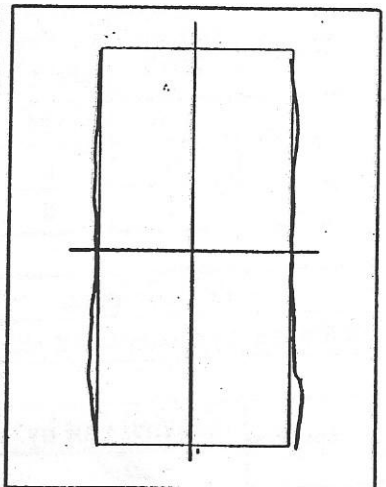
Borehole No.:	BH 4	Depth:	5.00 - 5.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.19 Mg/m^3
Mass:	3650 g	Dry Density:	1.89 Mg/m^3
Moisture Content:	16 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test	



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	100	191	190	95	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description

Stiff brown silty slightly gravelly CLAY

1494bh450.xls	Carried Out by:		Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

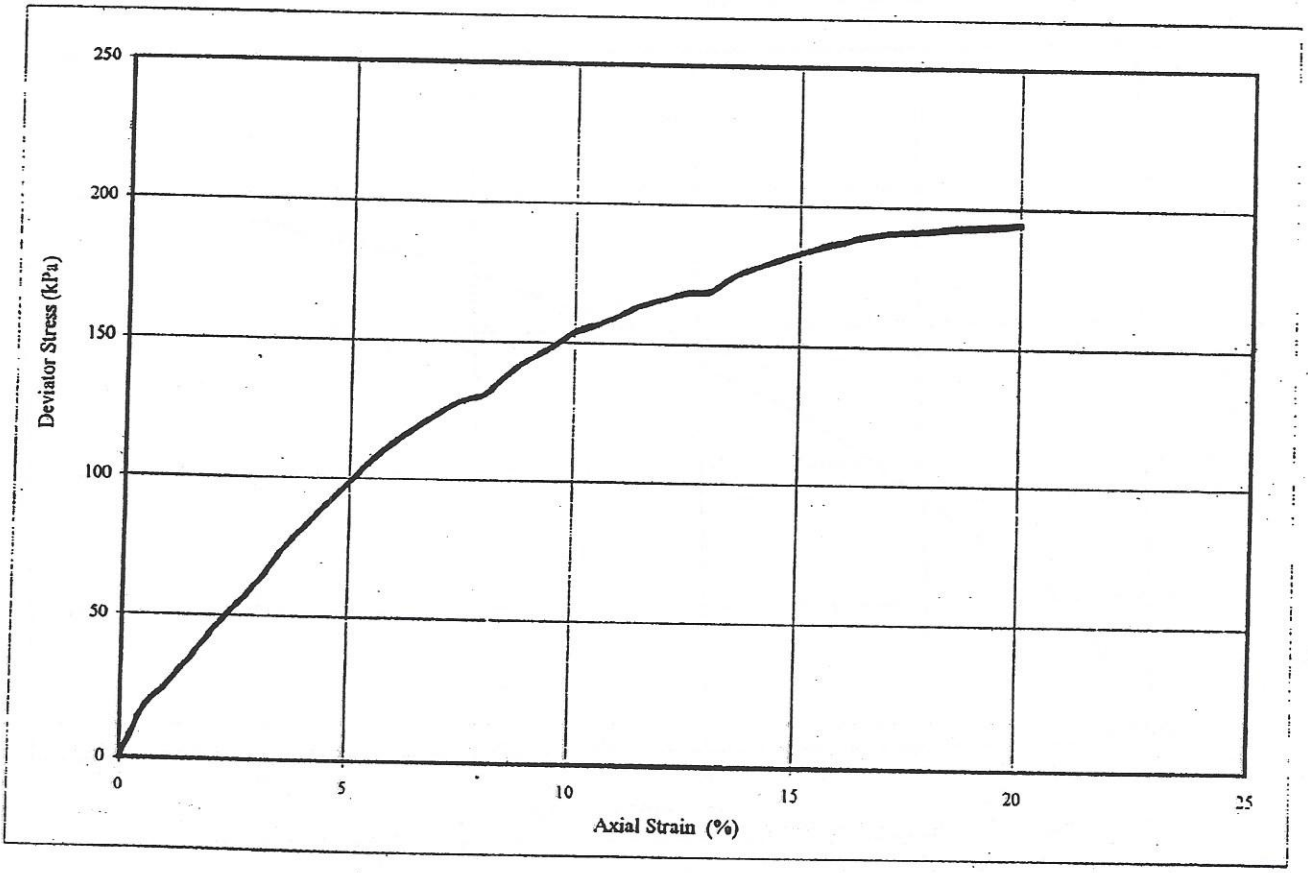
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co Ltd, Ardwick

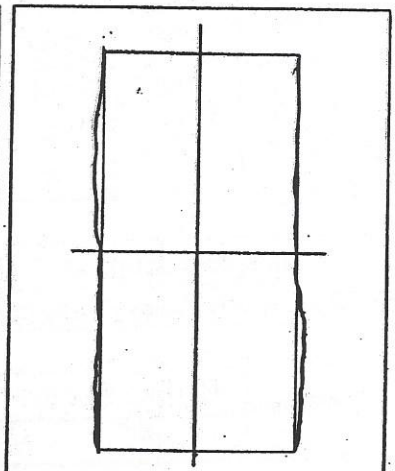
Borehole No.:	BH 4	Depth:	6.50 - 6.95 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.13 Mg/m^3
Mass:	3555.2 g	Dry Density:	1.83 Mg/m^3
Moisture Content:	16 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	130	194	193	97	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description

Stiff brown slightly silty CLAY with occasional fine/medium gravel

1494bb465.xls

Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

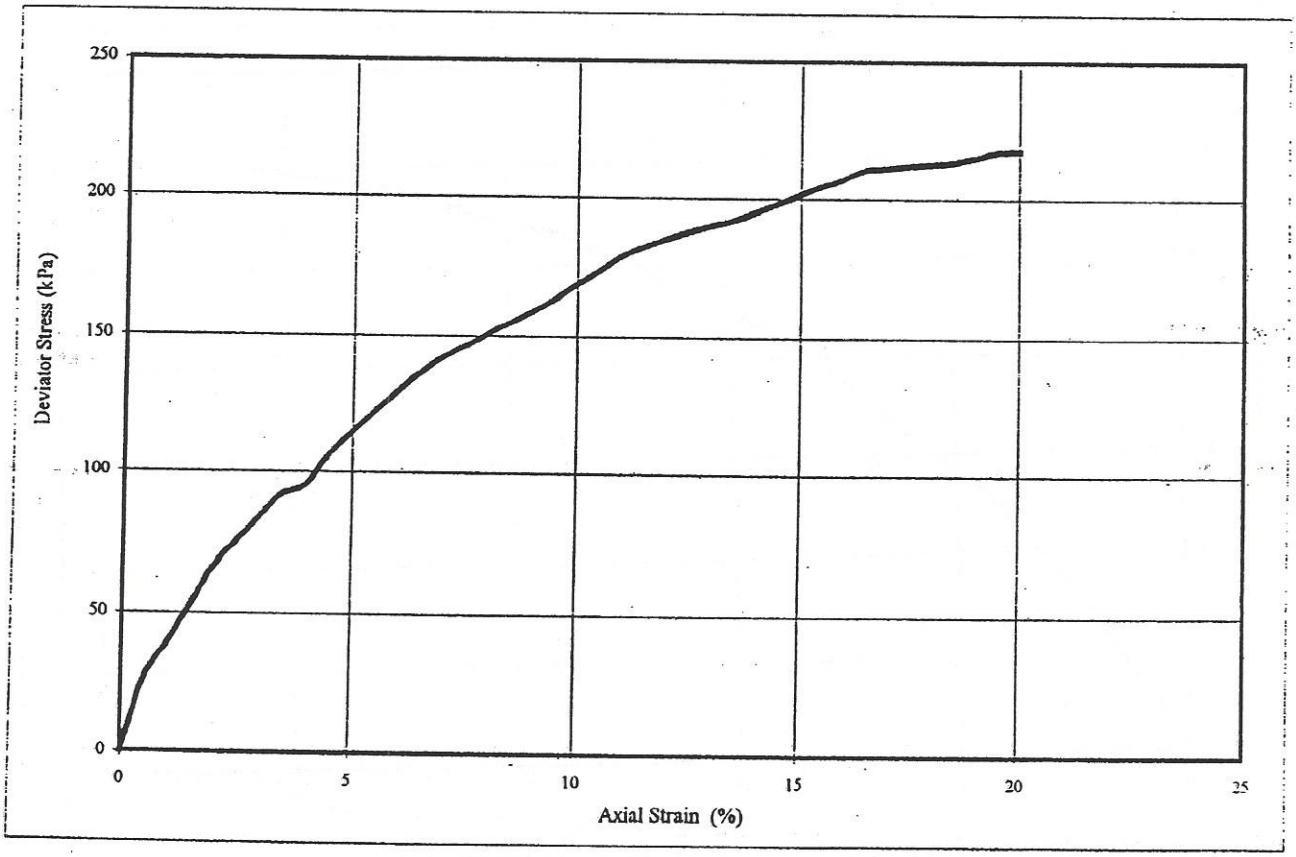
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuinness & Co Ltd, Ardwick

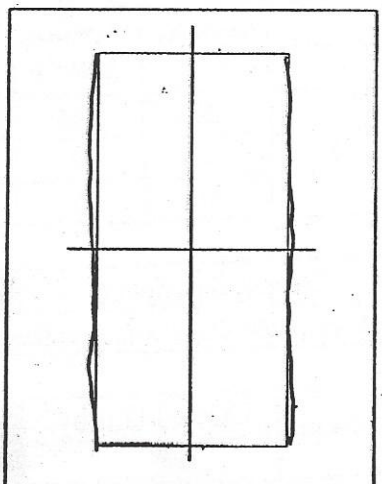
Borehole No.:	BH 4	Depth:	8.00 - 8.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.16 Mg/m^3
Mass:	3600.8 g	Dry Density:	1.86 Mg/m^3
Moisture Content:	16 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	160	217	216	108	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown slightly silty CLAY with occasional fine to medium gravel

1494bh480.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

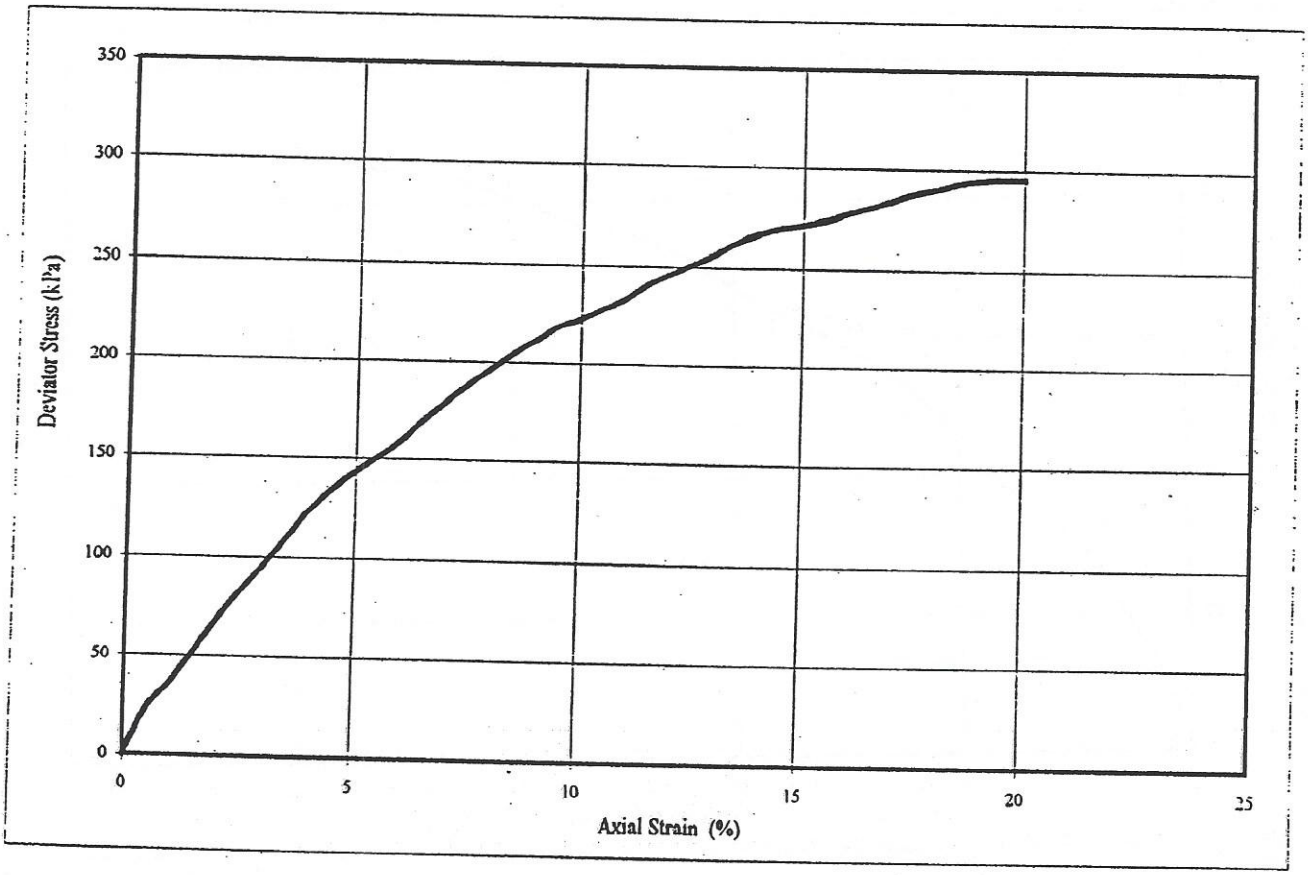
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co Ltd, Ardwick

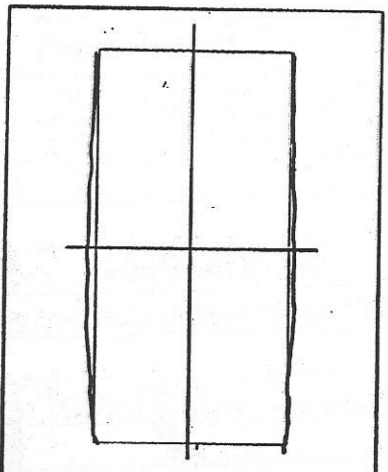
Borehole No.: **BH 5** Depth: **1.00** - **1.45** metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.12 Mg/m^3
Mass:	3540.8 g	Dry Density:	1.78 Mg/m^3
Moisture Content:	19 %	Membrane Thickness:	0.5 mm

Rate of Strain: 1 % / min — SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	20	295	294	147	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description

Stiff brown silty CLAY with some fine gravel and occasional coal fragments

1494bh510.xls

Carried Out by: [signature]

Checked by: [signature]

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

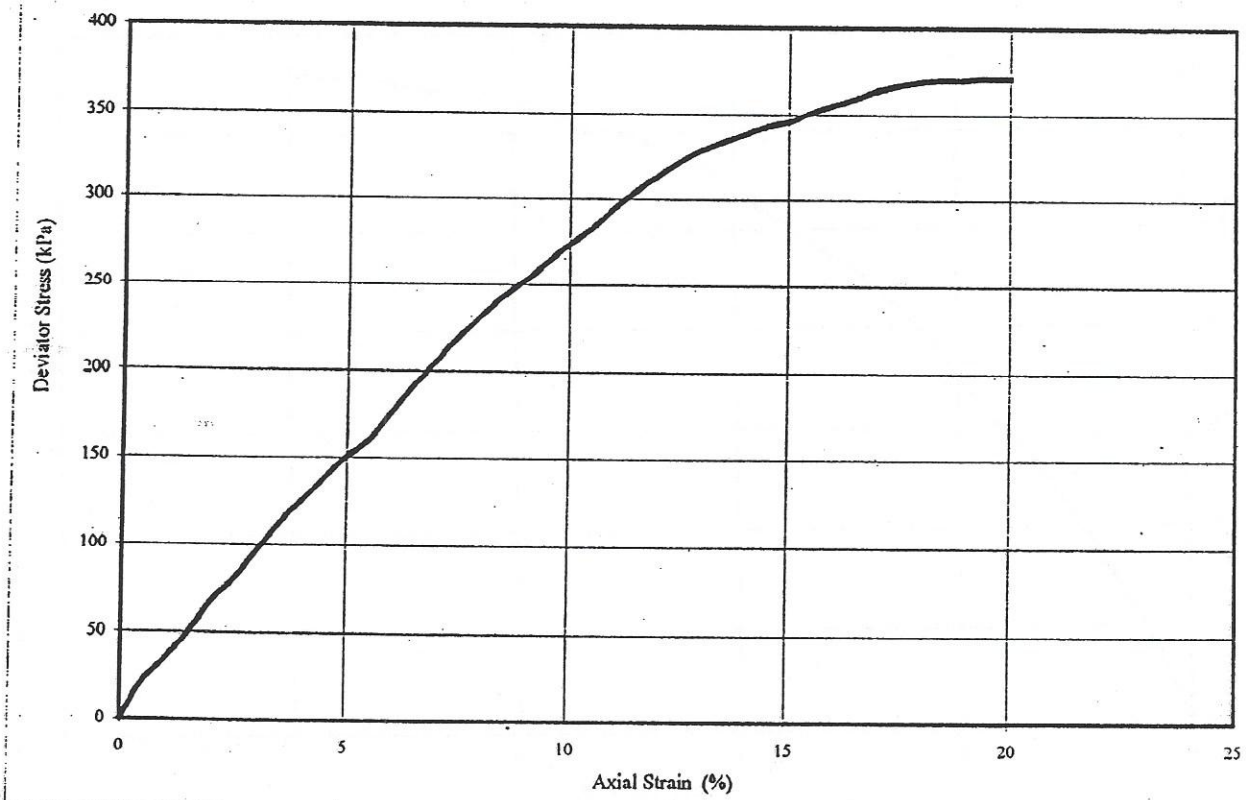
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuinness & Co Ltd, Ardwick

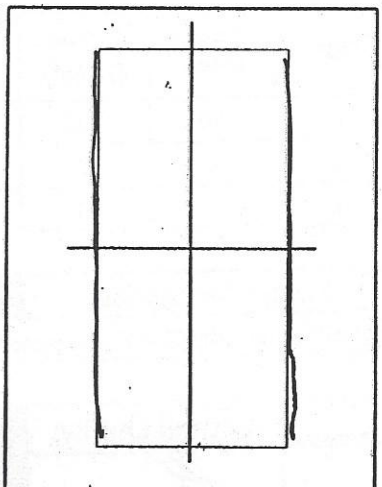
Borehole No.:	BH 5	Depth:	2.00 - 2.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.17 Mg/m^3
Mass:	3615.2 g	Dry Density:	1.82 Mg/m^3
Moisture Content:	19 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test	



Stage	Cell Pressure (kN/m^2)	$(\sigma_1 - \sigma_3)_{max}$ (kN/m^2)	$(\sigma 1 - \sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	40	370	369	185	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty CLAY with some fine to medium gravel and occ. coal fragments

1494bh520.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

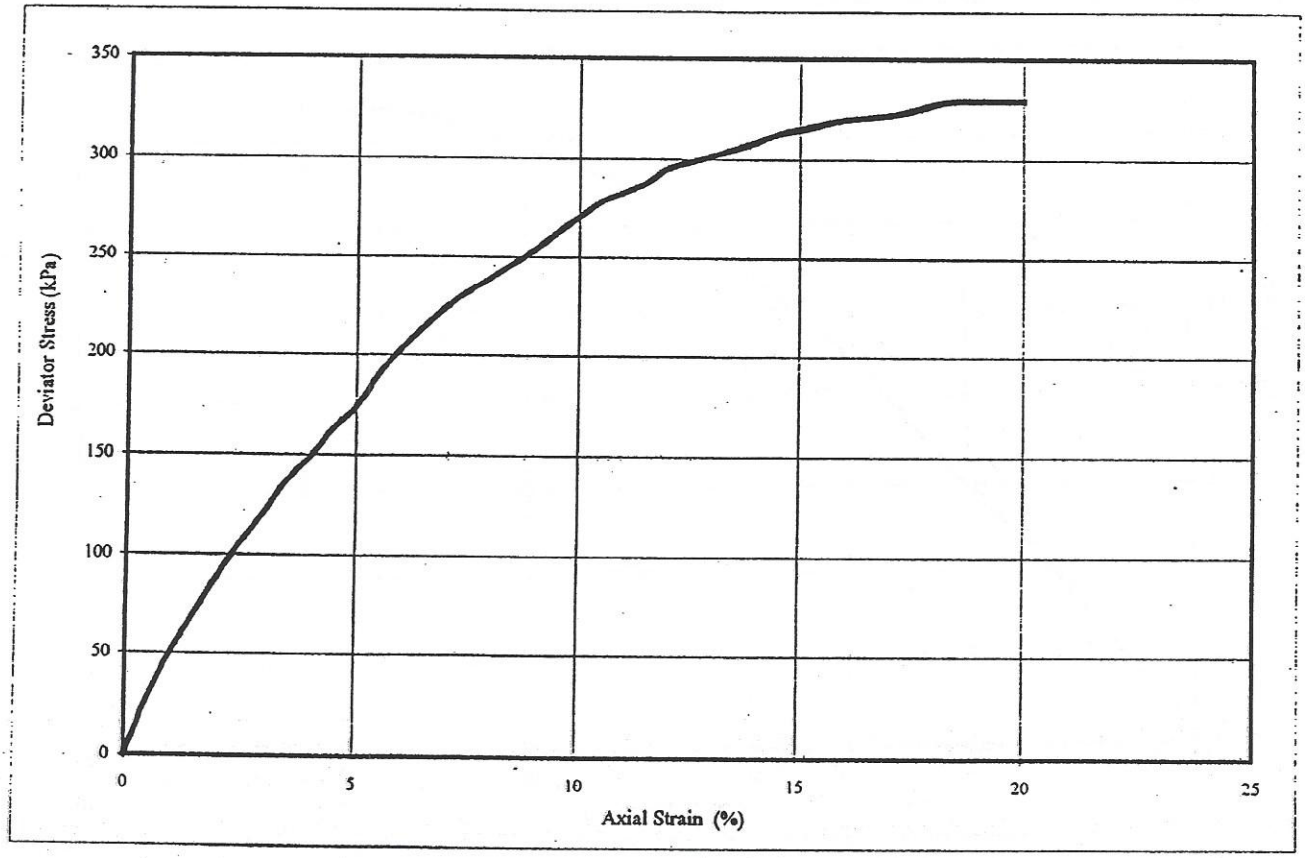
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	19/01/01	Site:	McGuinness & Co Ltd, Ardwick

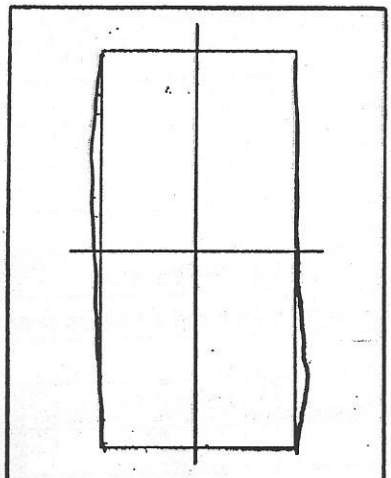
Borehole No.:	BH 5	Depth:	3.00 - 3.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.17 Mg/m^3
Mass:	3610.9 g	Dry Density:	1.92 Mg/m^3
Moisture Content:	13 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_r$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	60	328	327	164	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty CLAY with some fine to medium gravel

14940h530.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

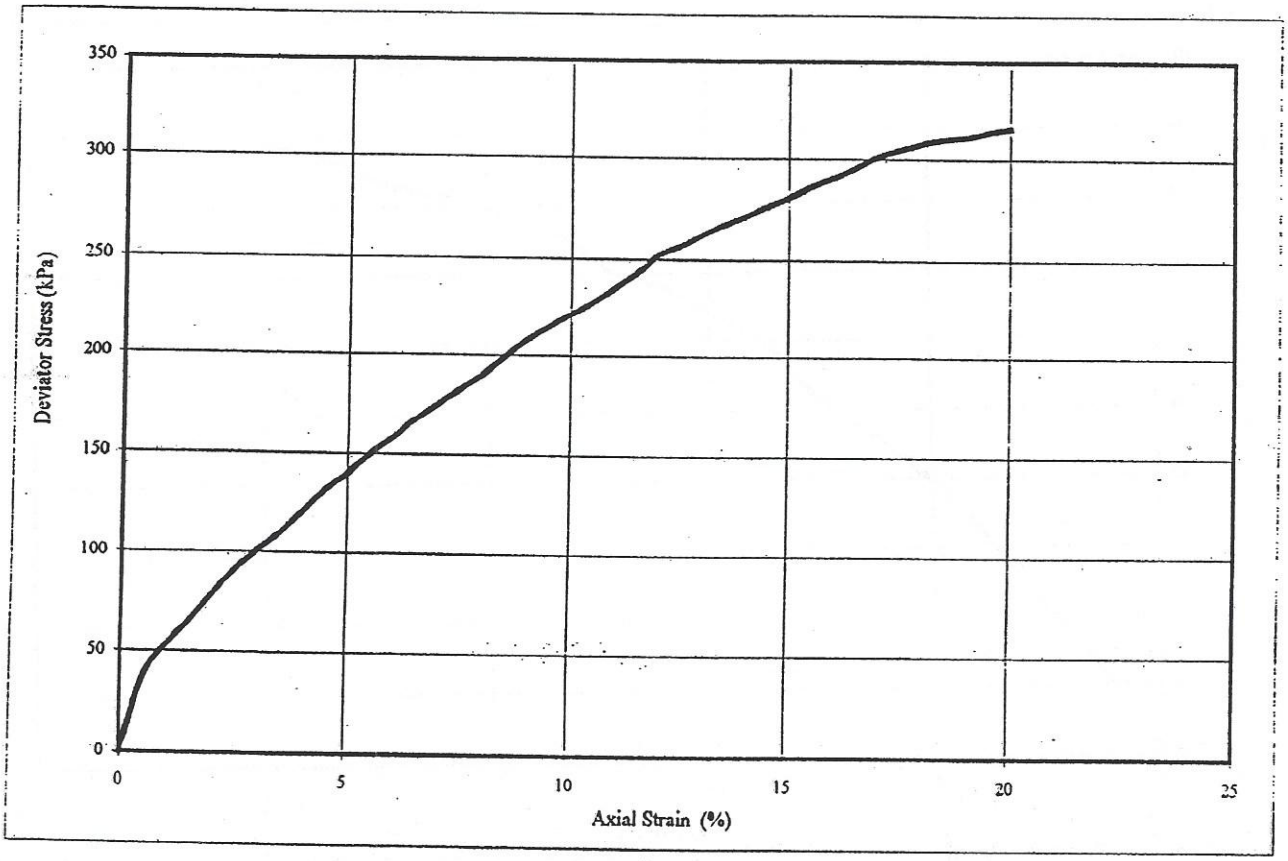
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	15/01/01	Site:	McGuiness & Co. Ltd, Ardwick

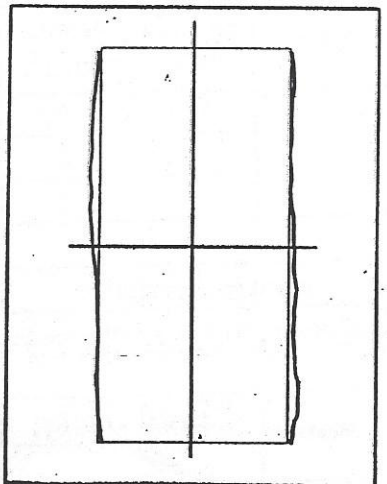
Borehole No.:	BH5	Depth:	4.00 - 4.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.19 Mg/m^3
Mass:	3654.6 g	Dry Density:	1.87 Mg/m^3
Moisture Content:	17 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	Single Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_r$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	80	316	315	158	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Very stiff brown silty slightly gravelly CLAY with rare coal fragments

1494bh540.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

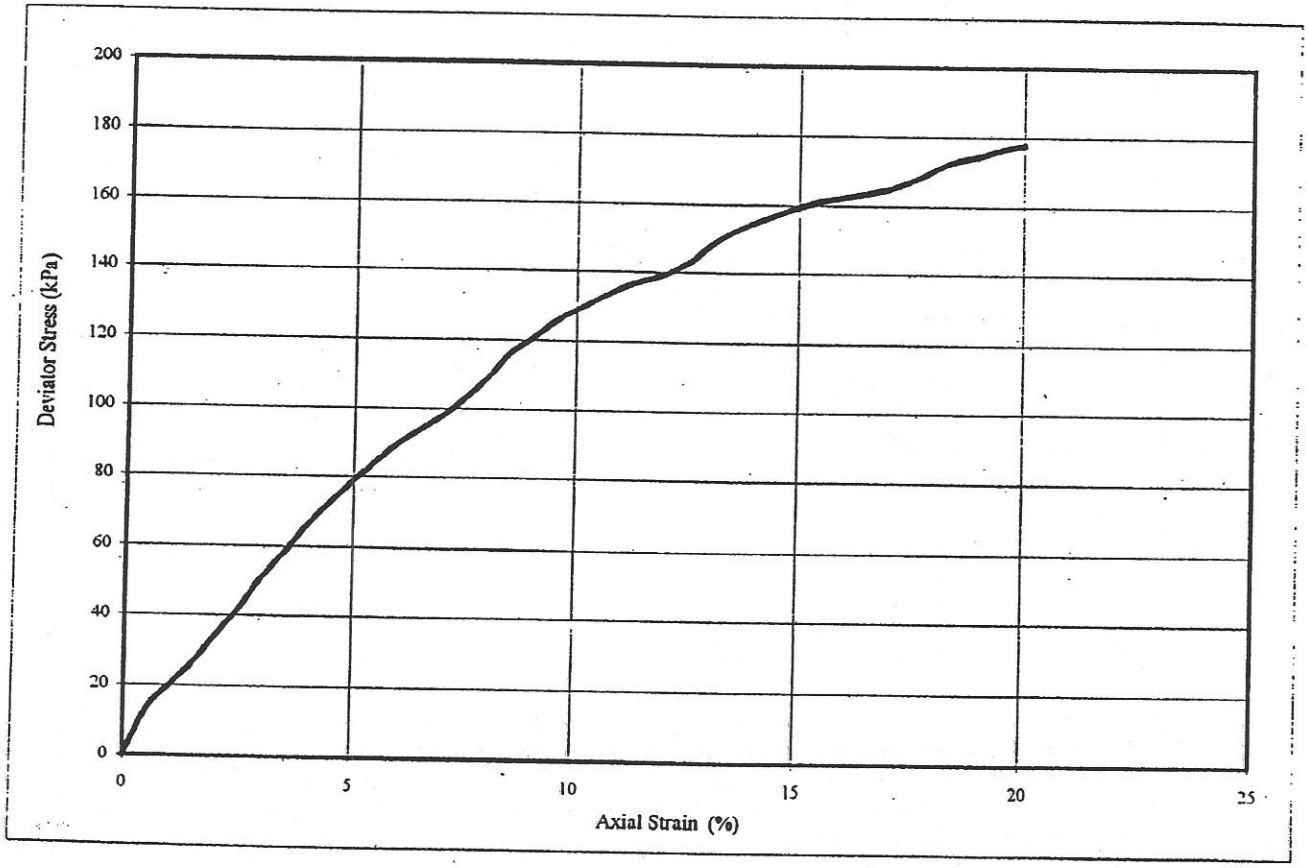
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	19/01/01	Site:	McGuiness & Co Ltd, Ardwick

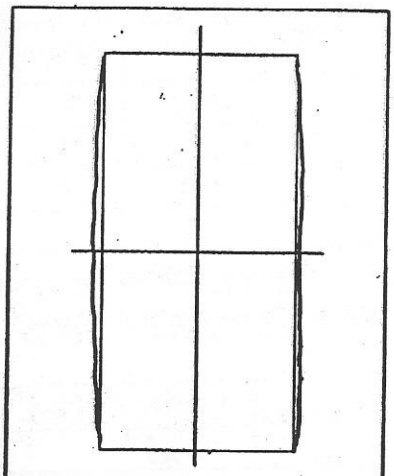
Borehole No.:	BH 5	Depth:	5.00 - 5.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.15 Mg/m^3
Mass:	3586.6 g	Dry Density:	1.79 Mg/m^3
Moisture Content:	20 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	100	177	176	88	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty CLAY with some fine/medium gravel and occasional coal fragments

1494bh550.xls	Carried Out by:	Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252

Determination of Undrained Shear Strength in Triaxial Compression

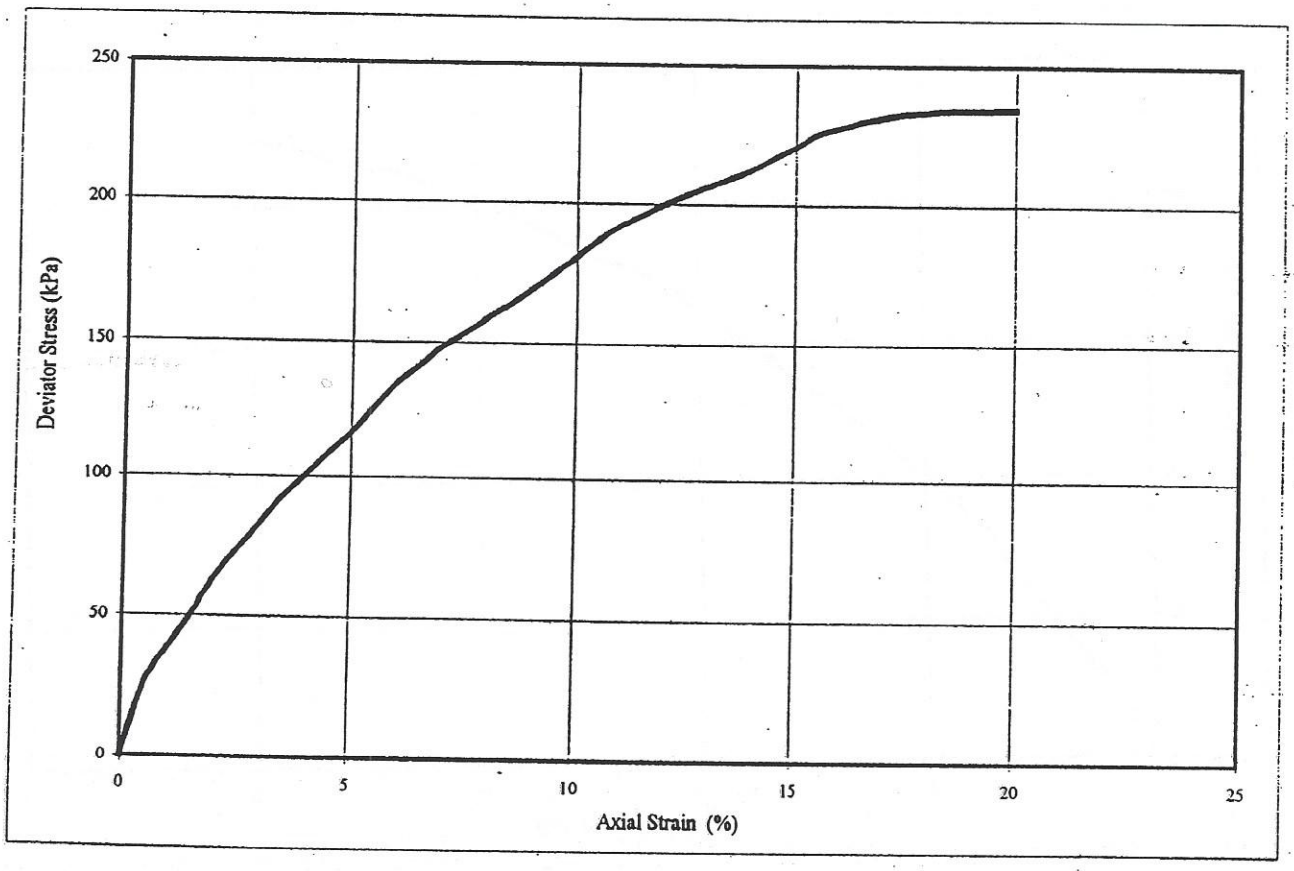
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	10/01/01	Site:	McGuiness & Co Ltd, Ardwick

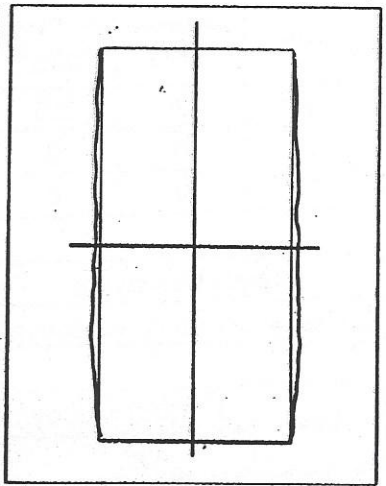
Borehole No.: **BH 5** Depth: **6.50** - **6.95** metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.22 Mg/m^3
Mass:	3694.3 g	Dry Density:	1.88 Mg/m^3
Moisture Content:	18 %	Membrane Thickness:	0.5 mm

Rate of Strain: 1 % / min SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	130	234	233	117	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description

Stiff brown silty CLAY with some fine/medium gravel and occ coal fragments

TriaxiaLxlt

Carried Out by:

Checked by:

CC Geotechnical

Tel: (0151) 523 0202
Fax: (0151) 523 0252.

Determination of Undrained Shear Strength in Triaxial Compression

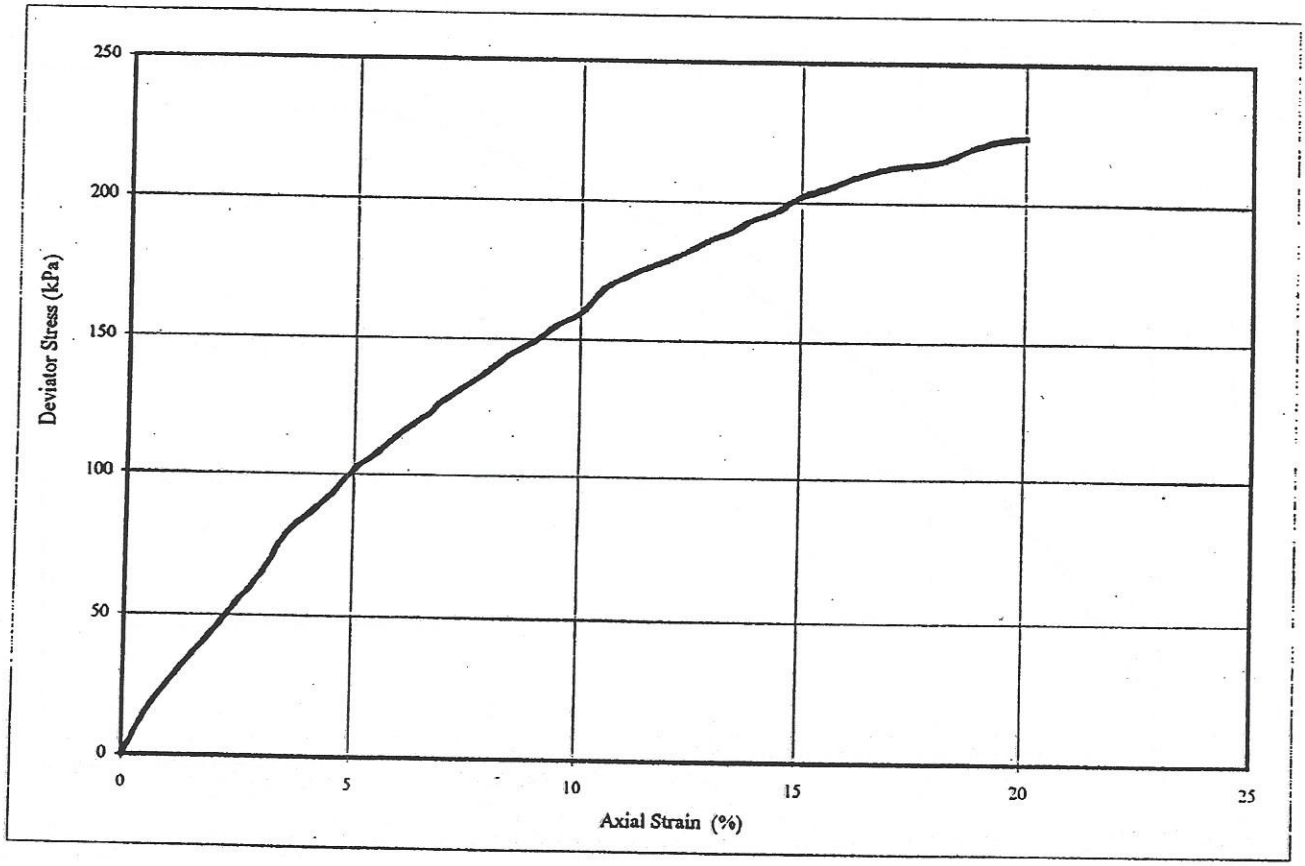
BS 1377: Part 7: Clause 9: 1990

Job No.:	00/1494	Client:	Marston & Grundy
Date:	10/01/01	Site:	McGuiness & Co Ltd, Ardwick

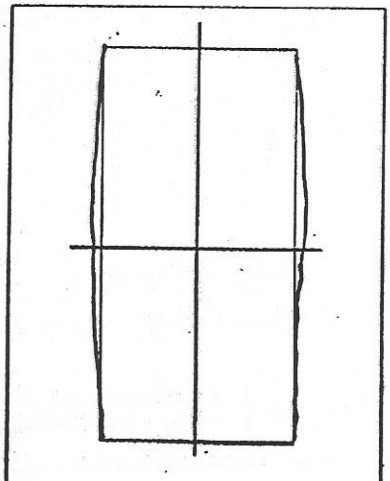
Borehole No.:	BH 5	Depth:	8.00 - 8.45 metres

Diameter:	102 mm	X-Sectional Area:	8171 mm^2
Height:	204 mm	Bulk Density:	2.11 Mg/m^3
Mass:	3511.9 g	Dry Density:	1.79 Mg/m^3
Moisture Content:	18 %	Membrane Thickness:	0.5 mm

Rate of Strain:	1 % / min	SINGLE Stage Test



Stage	Cell Pressure (kN/m^2)	$(\sigma_1-\sigma_3)_{max}$ (kN/m^2)	$(\sigma 1-\sigma 3)_f$ (kN/m^2)	Cohesion (kN/m^2)	Failure Strain (%)	Mode of Failure
1	160	223	222	111	20.0	0
2	0	0	-1	0	0.0	0
3	0	0	-1	0	0.0	0



Sample Description
Stiff brown silty CLAY with some fine/medium gravel

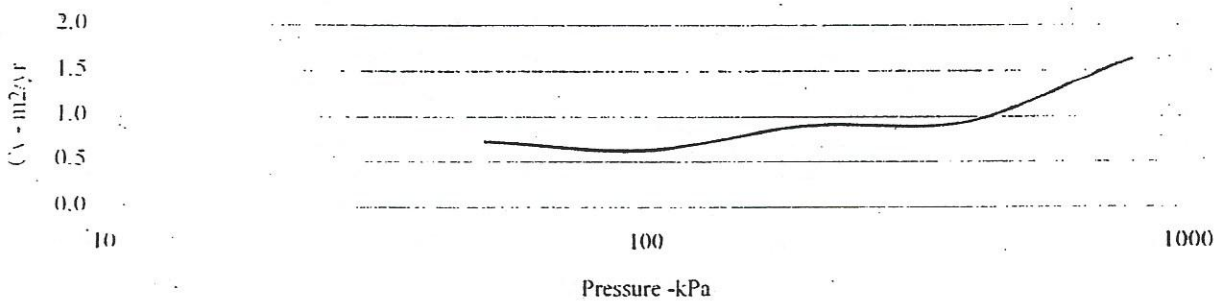
TriaxialXls	Carried Out by:	Checked by:
	AR	AF

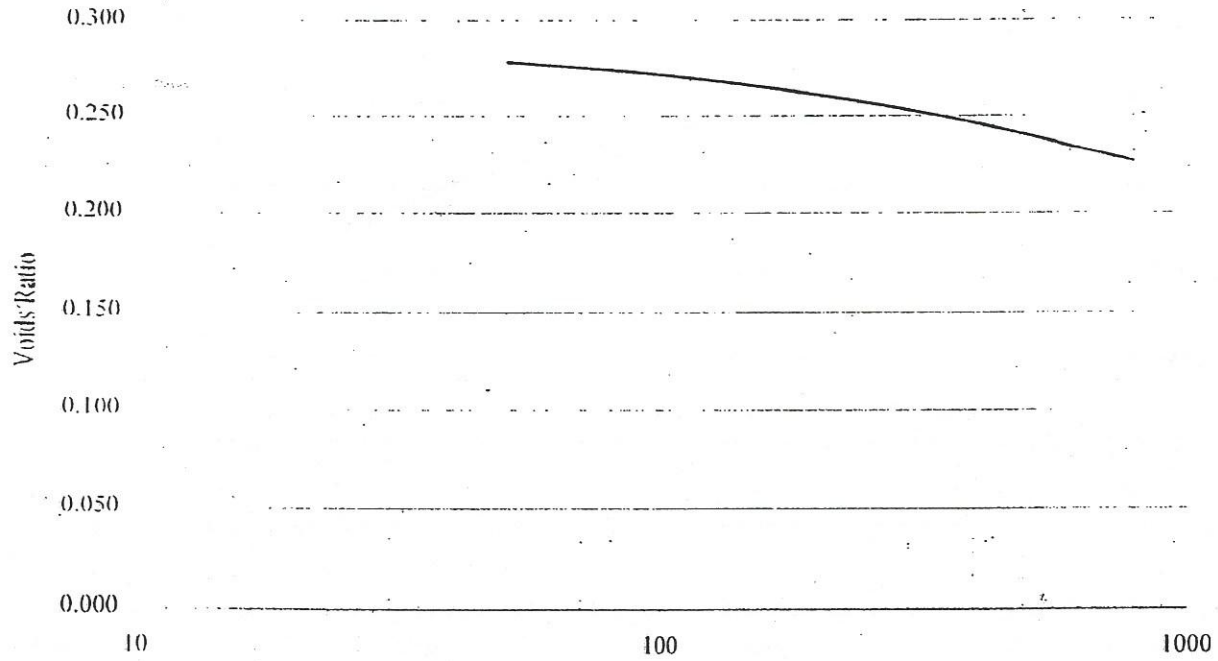
ONE DIMENSIONAL CONSOLIDATION

BS1377: Part 5: 1990

Borehole Number: 1 Sample Number: Depth (m): 4.00

Initial Conditions		Pressure Range kPa	Mv m2/MN	Cv m2/yr	Final Conditions	
Moisture Content (%):	5				Moisture Content (%) :	3
Bulk Density (Mg/m3):	2.13	0 - 50	0.316	0.718	Bulk Density (Mg/m3) :	2.22
Dry Density (Mg/m3):	2.04	50 - 100	0.107	0.625	Dry Density (Mg/m3)	2.16
Voids Ratio:	0.2984	100 - 200	0.082	0.898	Voids Ratio:	0.227
Degree of saturation:	40.9	200 - 400	0.057	0.944	Degree of Saturation: :	32.1
Height (mm):	19.33	400 - 800	0.039	1.634	Height (mm) :	18.27
Diameter (mm)	75				Remarks:	
Particle Density (Mg/m3): Assumed	2.65					





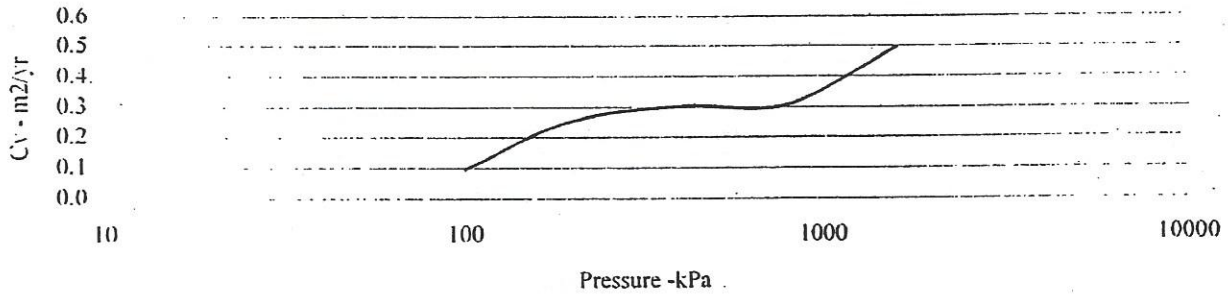
Checked and Approved By Date

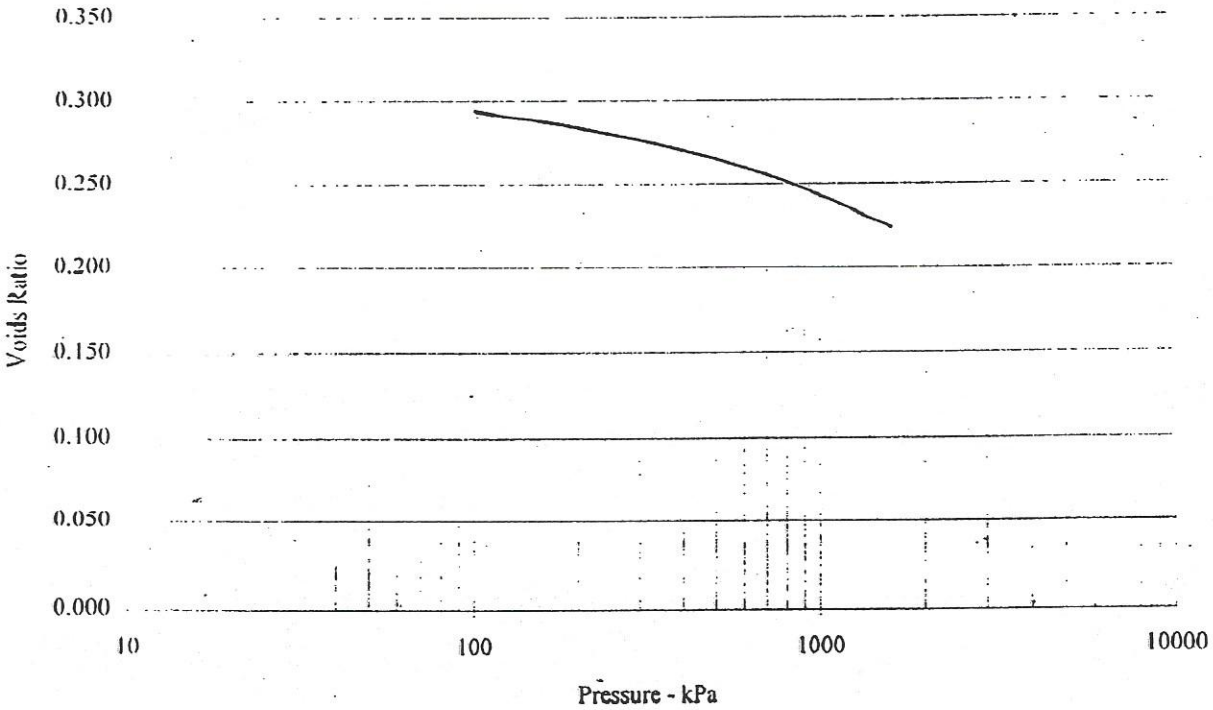
ONE DIMENSIONAL CONSOLIDATION

BS1377: Part 5: 1990

Borehole Number: 5 Sample Number: Depth (m): 4.00

Initial Conditions		Pressure Range kPa			Mv m2/MN	Cv m2/yr	Final Conditions	
Moisture Content (%):	6						Moisture Content (%) :	3
Bulk Density (Mg/m3):	2.14	0	-	100	0.121	0.097	Bulk Density (Mg/m3) :	2.24
Dry Density (Mg/m3):	2.02	100	-	200	0.079	0.256	Dry Density (Mg/m3)	2.17
Voids Ratio:	0.3098	200	-	400	0.053	0.303	Voids Ratio:	0.224
Degree of saturation:	47.6	400	-	800	0.038	0.308	Degree of Saturation: :	40.1
Height (mm):	19.38	800	-	1600	0.027	0.493	Height (mm) :	18.11
Diameter (mm)	75						Remarks:	
Particle Density (Mg/m3):	2.65							
Assumed								





Checked and Approved By

Date 28/01/01

THYSSEN GEOTECHNICAL

McGuiness, Ardwick
Manchester

Contract No. WL21019

Page . of

APPENDIX D

SOIL CONTAMINATION ANALYSES

ALcontrol Geochem

Chester Street,
Chester CH4 8RD
tel: (01244) 671121
fax: (01244) 683306
email: mkt@geochem.co

CERTIFICATE OF ANALYSIS

Client: CC Geotechnical

Essex House
Brindle Road
Bootle
L30 4 UE

Attention: Not specified

Date: 24 January, 2001

Our Reference: 01/00212/06/01

Your Reference:

Location: McGuiness, Manchester

A total of 8 samples were received for analysis on Wednesday, 10 January 2001. Accredited laboratory tests are defined in the log sheet, but opinions, interpretations and on-site data expressed herein are outside the scope of UKAS accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Signed A Cockshott

Amanda Cockshott
Project Co-ordinator
Analytical Services

Compiled By .....
Amanda Cockshott

GEOCHEM REMEDIATION TESTING

Client Name: CC Geotechnical **Location:** McGuiness, Manchester

GRT Job No.: 01/00212/06/01 **Reference:**

Client Sample No.	TP1	TP2	TP3	TP4	TP5	TP7	TP8	TP9		Units	LoD
Depth	0.40	1.20	0.30	0.50	0.40	1.50	0.70	0.80			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Date	10.01.01	10.01.01	10.01.01	10.01.01	10.01.01	10.01.01	10.01.01	10.01.01			
GRT Sample No.	1	2	3	4	5	6	7	8			
Acid Soluble Sulphide	16	6	36	110	62	2030	50	62	230	ppm	1
Arsenic	2	39	4	27	26	18	21	22		ppm	1
Hexavalent Chrome	<1	<1	<1	<1	<1	<1	<1	<1		ppm	1
Boron (Water Soluble)	<1	<1	<1	<1	<1	<1	<1	<1		ppm	1
Cadmium	<1	2	<1	<1	<1	<1	<1	<1		ppm	1
Chromium	8	37	14	26	27	22	29	21		ppm	1
Copper	18	288	28	157	158	147	138	45	130	ppm	1
Elemental Sulphur by HPLC	<50	<50	<50	129	<50	1287	105	278		ppm	50
Free Cyanide	<1	<1	<1	<1	<1	<1	<1	<1		ppm	1
Mercury	<1	<1	<1	<1	<1	<1	<1	<1		ppm	1
Nickel	4	37	9	26	34	20	31	20		ppm	1
PAH 16 Spec GC	6.8	34.5	10.6	3.4	68.5	10.3	9.0	<1.6		ppm	1.6
Lead	17	351	47	118	244	270	40	25		ppm	1
pH Value In Soil	11.21	6.93	11.86	8.02	7.68	8.15	7.57	7.48		NONE	1.00
Total Phenols HPLC	0.08	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01		ppm	0.01
Water Soluble Sulphate(2:1)	0.6	0.3	0.2	0.2	0.1	0.2	0.5	<0.1		g/l	0.1
Selenium	<1	3	<1	<1	1	<1	1	2		ppm	1
Thiocyanate	<5	<5	<5	<5	<5	<5	<5	<5		ppm	5
Total Cyanide	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5		ppm	2.5
TPH By Infra Red	1437	351	654	287	1490	<10	368	<10		ppm	10
Zinc	28	335	81	71	186	38	54	47		ppm	1

UKAS Accredited

Validated by Amanda Cockshott Date 24/01/2001

APPENDIX

1. Results are expressed as mg/kg dry weight unless otherwise stated, excluding analysis in (2) below.
2. Leach tests, cyanide, phenols by MS, hexavalent chrome, flash point, acid soluble sulphides, TPH by IR and volatiles are performed on wet soil as received, and results are expressed as mg/kg of wet soil or mg/l of leachate of specified leach test. Ammoniacal nitrogen and total phenols by HPLC are performed on wet sample but are then re-calculated and expressed as mg/kg of dry soil.
3. ICP metals results are analysed using a screening program and the data is accurate to within 20%.
4. The majority of analyses run to an accuracy of 10%.
5. Every tenth sample is run in duplicate, but not reported, as part of our internal QC procedure.
6. A sub sample of all samples received will be retained free of charge for 1 month from the issue of the certificate of analysis (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial one month period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.
7. With respect to turnaround, we will always endeavor to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
8. Please note that we take no responsibility for any test performed by sub-contractors (marked with an asterisk).
9. Asbestos screen is done in-house on soils and if no fibres are found will be reported as NFP-no fibres present. If asbestos is detected then identification & quantification is carried out by a sub-contractor. If a sample is suspected of containing asbestos then drying & crushing will be suspended on that sample until the asbestos result is known. If asbestos is present then no analysis requiring dry sample will be undertaken.

APPENDIX E

LANDFILL GAS MONITORING RESULTS

GAS MONITORING RESULTS

BOREHOLE	VISIT No	1	2										
	Date:	25/01/01	01/02/01										
1	Atmospheric Pressure (mbar)	995	995										
	CO_2 (%):	0.2	0.2										
	CH_4 (%):	nil	mil										
	O_2 (%):	20	19.4										
4	Date:	25/01/01	01/02/01										
	Atmospheric Pressure (mbar)	998	998										
	CO_2 (%):	nil	0.1										
	CH_4 (%):	nil	nil										
	O_2 (%):	20.1	20.3										
	Date:												
	Atmospheric Pressure (mbar)												
	$CO_{2(\%)}$:												
	CH_4 (%):												
	O_2 (%):												
	Date:												
	Atmospheric Pressure (mbar)												
	CO_2 (%):												
	CH_4 (%):												
	O_2 (%):												

Job No: 00/1494

Site: Mc Guiness, Ardwick, Manchester

CC Geotechnical

CC Geotechnical

Consulting Geotechnical & Geoenvironmental Engineers
Essex House, Bridle Road, BOOTLE, Merseyside. L30 4UE.

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