ROBERT WEST CONSULTING

HARTS FARM DEPOT, HAVANT

FACTUAL REPORT ON GROUND INVESTIGATION



FOUNDATION & EXPLORATION SERVICES

Specialists in geotechnical engineering

ROBERT WEST CONSULTING

HARTS FARM DEPOT, HAVANT

FACTUAL REPORT ON GROUND INVESTIGATION

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FACTUAL REPORT ON
GROUND INVESTIGATION

1. INTRODUCTION

On the instructions and under the supervision of Robert West Consulting (the Engineer and Client), a site investigation has been carried out by Foundation and Exploration Services Limited (FES) at Harts Farm Depot, Havant on the site of an operational council works depot.

The objective of the investigation was to determine the ground and groundwater conditions at the site and to provide information that would assist the Engineer in assessing the nature of any contamination present at the site. The scope of the investigation was determined by the Engineer.

A factual report was requested including exploratory hole and field testing records, laboratory test results and site plan.

The site work, which comprised six light cable tool percussion boreholes to a maximum depth of 13.20 metres, and 8 trial pits, was carried out between the 29th January and 5th February 2002.

2. THE SITE AND GEOLOGY

2.1 Site Location and Description

The site is located in Harts Farm Way, Havant, Hampshire.

The approximate National Grid reference of the site is SU 708 059.

At the time of the investigation the site was an operational council works depot, comprising offices, storage and maintenance sheds, access roads, storage areas and areas of soft landscaping. In the western section of the site there is a tarmacadam covered car park. The far eastern extremes of the site lie outside of the depot and comprise a number of former dwellings, a small pond surrounded by grassed areas and other commercial premises.

2.2 Geology

The records of the British Geological Survey (Sheet 331of the 1:50 000 Series Geological Map, Drift Edition) indicate that the site is underlain by Brickearth and Head Deposits overlying Chalk.

Further background research such as a desk study was not required within the terms of reference for the work.

3. METHOD OF INVESTIGATION

3.1 General

A Cable Avoidance Tool (CAT) survey was undertaken at the exploratory hole locations. Prior to the sinking of the boreholes, inspection pits were dug by hand at each location in order to identify the presence of any services. Services were not encountered.

Details of the in-situ sampling and testing carried out, together with the descriptions of the strata encountered are given on the borehole and trial pit records. An explanation of the symbols and abbreviations used on all the exploratory hole records, together with the method of strata description utilised, is given in the General Notes on Exploratory Hole Records (KS/01 to KS/04). The investigation was generally carried out in accordance with BS 5930 : 1999[1]

All samples were transported to the laboratories and offices of FES in Basingstoke for examination and testing as scheduled by the Engineer.

3.2 Cable Percussion Boring

Six, 150mm minimum diameter, boreholes (BH's 1 to 6) were sunk to depths below ground level (bgl) of up to 13.20m using light cable percussion boring techniques. The borehole records are given in Figures BH1 to BH6.

Disturbed samples were taken at each change in soil type and at regular vertical intervals during boring in order to identify and give a record of the strata encountered.

In cohesive soils nominal 100mm diameter general purpose driven open tube (U100) samples were taken and subsequently sealed to preserve their natural moisture contents.

Standard penetration tests (SPT) using a split spoon (S) or a solid 60° cone (C) were carried out in granular soils. The results are shown as S(N) and C(N) values on the borehole records at the relevant depths.

During the course of boring attention was given to recording any evidence of water inflow in order that the groundwater level beneath the site could be established. Water levels at breaks in boring were recorded where appropriate. Water samples were taken in the boreholes, where sufficient water was encountered to allow sampling. Where water was added to facilitate penetration of the soil strata, or to maintain a positive hydrostatic head in the granular strata, this is noted on the borehole records.

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1 BS 5930 : 1999, Code of Practice for Site Investigation. British Standards Institution.

3.3 Trial Pits

Eight trial pits were excavated by machine using a JCB 3CX excavator to depths below ground level of between 2.60m and 3.00m. The pits were logged by a geotechnical engineer from FES who took samples and carried out in-situ testing as shown on the trial pit records (Figures TP1 to TP8). Notes on excavation stability and any groundwater encountered are also given on the records.

During the course of excavation attention was given to recording any evidence of water inflow in order that the groundwater level beneath the site could be established. The depth at which water seepage or ingress was encountered has been noted on the trial pit records. Water samples were taken in the trial pits where sufficient water was encountered to allow sampling.

3.4 Instrumentation

On completion of boring, a total of 6 slotted 50mm gas monitoring standpipes were installed in the boreholes at depths below ground level of between 7.60m and 13.20m.

Details of the installations are given on the relevant borehole records.

Water level and gas readings were taken from the standpipes after the fieldwork period and the results are given in Figure FT1/1

3.5 Survey

The ground levels at the borehole and trial pit positions were supplied by the Engineer.

The position of the boreholes and trial pits were set out by reference to features shown on the site plan.

4. RESULTS OF EXPLORATORY HOLES

4.1 General

Borehole records (Figures BH1 to BH6) and trial pit records (Figures TP1 to TP8) giving details of the strata encountered are provided later in the report. A site plan showing the approximate positions of the exploratory holes is presented in Figures SP1 and SP2.

The strata descriptions given in the borehole records, unless otherwise noted, are compiled from an examination of the disturbed samples only, together with the results of any field and laboratory testing. Relative density descriptions are based on the results of the SPT and have not been amended to take into account any overburden effects. The consistency of cohesive strata and the relative proportions, percentages and dimensions of the components of the various materials are based on visual assessment together with any available laboratory test results. Where there is a degree of uncertainty regarding the relative density or consistency of the soil, the terms 'probably' or 'possibly' are used and the descriptions should be treated with some caution.

Any interpolation of strata from exploratory holes is an estimate only of the likely stratification and is subject to the interpretation of the reader. There may be ground conditions at the site which have not been revealed by the investigation. The records should be read in conjunction with the Notes on Exploratory Hole Records. ***Particular attention is drawn to the comments made on groundwater and interpretation which are given in these Notes.***

4.2 Strata and Groundwater Encountered

The boreholes and trial pits encountered the following general succession of strata which aside the Made Ground concurs with that anticipated from published geological records:

MADE GROUND

CLAY

GRAVEL

CHALK

Groundwater was encountered during boring and excavation, details of the strikes can be found on the relevant exploratory hole records.

5. GEOTECHNICAL LABORATORY TESTING

5.1 Introduction

The following laboratory tests were scheduled by the Engineer and carried out by or for FES in accordance with BS1377:1990[2] "Methods of test for Soils for civil engineering purposes" where applicable. The results are given in tabular and or graphical form as appropriate in Appendix C. ***Attention is drawn to the comments on interpretation of the results of the investigation on Figure KS/01 of the General Notes on Exploratory Hole Records.*** Notes and keysheets (Figures LKS/01 and 02) also precede the laboratory test results.

All tests were carried out in the Basingstoke laboratory of FES and the tests for which the FES Basingstoke laboratory has UKAS (NAMAS) accreditation are detailed on the Schedules in Appendix E.

5.2 Index Properties

Liquid and plastic limit and natural moisture content determinations were made on ten samples of the cohesive soils in order to classify the plasticity and shrinkability of the materials and the results are given on the Summary of Classification Tests (Figures LT1/1 and LT1/2).

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2 BS 1377 : 1990, Methods of test for Soils for civil engineering purposes. British Standards Institution.

5.3 Particle Size Analyses

Particle size analyses were undertaken on a total of thirty samples by a combination of sieving and sedimentation. The results are given as particle size distribution curves (Figures LT2/1 to LT2/30).

6. CONTAMINATION TESTING

6.1 Introduction

The following laboratory tests were scheduled by the Engineer. The tests were carried out for FES by Derwentside Environmental Testing Services Ltd whose laboratory is accredited by UKAS and details of their current accreditation may be obtained from them. The results are given as Certificates of Analysis in Appendix F.

A total of twenty soil samples, one groundwater sample and three surface water samples were tested.

6.2 Chemical Analyses on Soil Samples

A total of twenty soil samples from the boreholes and trial pits were tested for a range of parameters generally consistent with those outlined by the Interdepartmental Committee for the Redevelopment of Contaminated Land (ICRCL)[3]. The samples were analysed for the following suite of determinands:

	Number of tests
Arsenic (total)	20
Cadmium (total)	20
Chromium (total)	20
Lead (total)	20
Mercury (total)	20
Selenium (total)	20
Copper (total/available)	20
Nickel (total/available)	20
Zinc (total/available)	20
Boron (water soluble)	20
pH	20
Sulphate (total/water soluble)	20
Sulphide	20
Sulphur (total/free)	20
Cyanide (total)	20
Toluene Extractable Material (TEM)	20
Phenols (total)	20
Polyaromatic Hydrocarbons (PAH - total by gas chromatography)	20

The results are given in Appendix F.

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3 Interdepartmental Committee on the Redevelopment of Contaminated Land. Guidance on the Assessment and Redevelopment of Contaminated Land. Guidance Note 59/83, 2nd Edition, July 1987.

In addition, sixteen samples were analysed for asbestos content.

6.3 Chemical Analyses on Groundwater/Surface Water Samples

Chemical analyses were made on one sample of groundwater and three water samples collected from the stream and pond at the site to assess the level of a range of possible contaminants present. The samples were tested to determine their value or content of:

	Number of tests
Arsenic	4
Cadmium	4
Chromium	4
Lead	4
Mercury	4
Copper	4
Nickel	4
Zinc	4
Cyanide	4
Phenols	4
Sulphide	4
Sulphate	4
pH	4
Electrical Conductivity	4
Ammoniacal Nitrogen	4
Total Organic Carbon (TOC)	4

The results of the analyses completed on samples of groundwater and /or surface water are given in Appendix F.

[redacted]

T JUDGE
PROJECT ENGINEER

J CHAYTOR
ENGINEERING MANAGER

IJ/ij/al/JC/Final

APPENDIX A

EXPLORATORY HOLE RECORDS

General Notes and Key Sheets on Exploratory Hole Records	Figures KS/01 to KS/04
Borehole Records	Figures BH1 to BH6
Trial Pit Records	Figures TP1 to TP8

GENERAL NOTES

1 OPERATING PROCEDURES

The procedure used for cable percussion boring, rotary drilling, trial pitting, sampling, in-situ and laboratory testing and sample descriptions are generally in accordance with BS5930:1981 'Code of practice for Site investigations', and BS1377:1990 'Methods of test for Soils for civil engineering purposes', unless stated otherwise.

2 GROUNDWATER

Exploratory hole water levels are recorded together with the depths at which seepages or inflows of water are detected. These observations are noted on the Records, but may be misleading for the following reasons:

a) The exploratory hole is rarely left open at the relevant depth for a sufficient time for the water level to reach equilibrium.
b) A permeable stratum may have been sealed off by the borehole casing.
c) Water may have been added to the borehole to facilitate progress.

Standpipes or piezometers should be installed when an accurate record of groundwater level is required, however, it should be noted that groundwater levels may vary significantly due to seasonal, climatic or man-made effects. Water levels recorded during the investigation and any advice or comment made accordingly may, therefore, not be appropriate to particular foundation, geotechnical design, or temporary works solutions. Long term monitoring of standpipes or piezometers is always recommended when water levels are likely to have a significant effect on design.

3 CHISELLING

The remarks in the Borehole Records contain information on the time spent advancing the borehole by 'Chiselling Techniques', and the depth of borehole over which it was required. Such information may be affected by a wide range of variable factors, unrelated to the geotechnical properties of the strata. Such factors include, but are not restricted to: plant, equipment and operator. The data should, therefore, only be used subjectively and with extreme caution.

4 IDENTIFICATION AND DESCRIPTION OF SOILS - SEE ALSO SHEET 3

The identification system is based on Table 6, BS5930:1981. Composite soil type descriptions have been amended in accordance with Norbury et al, A critical review of Section 8 (BS5930) - Soil and Rock Description. Engineering Group of the Geological Society, 20th Regional Meeting, September, 1984.

The strength descriptions have been amended to include Standard Penetration Test interpretation of relative density, and cohesion ranges added to field identification of clay shear strengths. The sub-divisions of strength for cohesive soils (BS 5930:1981 pp 103) are not used. Where the terms 'soft to firm', 'firm to stiff' etc are used they indicate a strength based on inspection (and not supported by laboratory testing) which is close to the borderline between the two terms and cannot be precisely defined by inspection only.

Where 'to' links two terms, as in 'slightly sandy to sandy' this again represents a borderline case, where the precise proportion of constituents cannot be determined by inspection only.

5 INTERPRETATION OF THE RESULTS OF THE INVESTIGATION

The description of ground conditions encountered and any engineering interpretation included in the report are based on the results of the boreholes and trial pits and the field and laboratory testing carried out. There may be ground conditions at the site which have not been revealed by the investigation and consequently have not been taken into account.

Any interpolation or extrapolation of strata between exploratory holes shown on any cross-sections or site plans is an estimate only of the likely stratification based on general experience of the ground conditions and is subject to the interpretation of the reader.

The term "TOPSOIL" is used in this report to describe the surface, usually organic rich, layer including turf, subsoil and weathered material with roots. The use of this term may not imply that the soil satisfies the requirements of Clause 3 of BS 3882 (1965), "Recommendations and Classification of Topsoil", or is suitable for general horticultural and agricultural purposes.

Laboratory test results in this report give the soil properties of individual specimens tested under specified conditions. Individual results or groups of results may not be appropriate for use as design parameters for some geotechnical analyses. The samples may be non-representative, disturbed internally, or prepared and tested under conditions suited for different geotechnical applications. Unless the selection of design parameters is discussed in this report, it is recommended that the advice of a Geotechnical Specialist is sought.

IN-SITU TESTING AND SAMPLING

STANDARD PENETRATION TESTS

S( ) Standard Penetration Test (SPT). A 50mm diameter split barrel sampler is driven 450mm into the soil using a 63.6kg hammer with a 760mm drop. The penetration resistance (also known as the 'N' value) is expressed as the number of blows required to obtain 300mm penetration below an initial seating drive of 150mm which is taken through any ground which may be disturbed at the base of the borehole. The test is usually completed when the number of blows recorded during the test drive only reaches 50 in soils or 100 in weak rock. If a sample is not recovered in the sampler, a disturbed sample is taken on completion of the test and given the same depth as the top of the Standard Penetration Test drive.

C( ) Standard Penetration Test carried out with a 60° cone. A test usually conducted in coarse granular soils or weak rock using the same procedure as for the SPT, but with a 50mm diameter, 60° apex, solid cone fitted to the split barrel. A bulk disturbed sample is taken and given the same depth as the top of the test drive.

The depth on the borehole record at the left hand side of the 'depth' column is that at the start of the normal 450mm penetration. Where the full penetration of 300mm for the test drive is obtained, the penetration resistance ('N' value) is reported in the 'SPT Blows/N' column. If the full penetration of 300mm in the test drive is not obtained, then the length of drive (test length in mm) and the penetration resistance (number of blows) are both reported. Blows through the initial seating drive (normally 150mm) are not reported.

* in the 'Test Length' column denotes that the blows and penetration were all in the initial Seating Drive section.

OTHER IN-SITU TESTS

The following in-situ tests are reported on the **Borehole Records**, in the 'Test Length' and 'SPT Blows' columns where appropriate.

k In-Situ Permeability Test - refer to detailed test results for permeability values.

PMT Pressuremeter Test - refer to detailed test results for modulus values, etc.

VN/R( ) Borehole Shear Vane Test (Undrained Shear strength - c_u - in kPa) - refer also to detailed test results
N - 'Natural' or peak shear strength
R - Remoulded shear strength

The following in-situ tests are reported on **Trial Pit** and/or **Window Sample Records** in the 'Type' and 'Result' columns, where appropriate.

VN/R( ) Hand Shear Vane Test (Direct reading of Undrained Shear strength in kPa) N - Natural or Peak R - Remoulded

PP( ) Pocket Penetrometer (Penetration resistance reported in kg/cm² or as equivalent c_u in kPa)

MX ( ) Mexecone Reading given as equivalent CBR% value to the nearest 0.5% at 75mm intervals

CBR( ) California Bearing Ratio Test (CBR%) - refer also to detailed test results

PID( ) Photo-Ionisation Detector Readings in headspace of small disturbed chemical samples. Result given in ppm by volume.

SOIL SAMPLES

U General purpose open tube sample. Sample normally taken with open tube sampler approximately 0.1m diameter and 0.45m long and driven with 80kg sinker bar and 56kg sliding hammer, unless noted otherwise. "XX" in U100 blows column denotes the number of hammer blows. The height of hammer drop can be variable depending on operator technique. Depths are given to the top of the sample if full penetration and recovery are achieved, otherwise actual lengths of penetration and recovery are given in the appropriate columns.

U(X) General purpose open tube sample (X) mm diameter

TW(X) Thin wall (push) sample (X) mm diameter

P(X) Piston sample (X) mm diameter

CBR Sample taken in CBR Mould

D Small disturbed sample (jar with air tight lid)

B Bulk disturbed sample (polythene bag, tied at neck - size dependent on purpose)

W Water sample

Sample not recovered

CD Sample for chemical analysis in a plastic tub

K Sample for chemical analysis in an amber glass jar

VL Sample for chemical analysis in a glass vial

KEY TO BOREHOLE AND TRIAL PIT RECORDS

Identification and Description of Soils

	Basic Soil Type	Particle Size (mm)	Visual Identification
VERY COARSE SOILS	BOULDERS		Only seen complete in pits or exposures.
	COBBLES	200	Often difficult to recover from boreholes.
COARSE SOILS (Typically over 65% Sand and Gravel Sizes)	GRAVEL	60 coarse	Easily visible to naked eye; particle shape can be described, grading can be described.
		20 medium	Well graded: wide range of grain sizes, well distributed. Poorly graded: not well graded. (May be uniform: size of most particles lies between narrow limits; or gap graded; an intermediate size of particle is markedly under represented).
		6 fine	
	SAND	2 coarse	Visible to naked eye; no cohesion when dry; grading can be described.
		0.6 medium	Well graded: wide range of grain sizes, well distributed. Poorly graded: not well graded. (May be uniform: size of most particles lies between narrow limits; or gap graded; an intermediate size of particle is markedly under represented).
		0.2 fine	
FINE SOILS (Typically over 35% Silt and Clay Sizes)	SILT	0.06 coarse	Only coarse silt visible with hand lens; exhibits little plasticity and marked dilatancy; slightly granular or silky to the touch. Disintegrates in water; lumps dry quickly; possesses cohesion but can be powdered easily between fingers.
		medium	
		0.02 fine	
	CLAY/SILT	0.006	Intermediate behaviour between clay and silt. Slightly dilatant
	CLAY	0.002	Dry lumps can be broken but not powdered between the fingers; they also disintegrate under water but more slowly than silt; smooth to the touch; exhibits plasticity but no dilatancy; sticks to the fingers and dries slowly; shrinks appreciably on drying usually showing cracks. Intermediate and high plasticity clays show these properties to a moderate and high degree, respectively.
ORGANIC SOILS	ORGANIC CLAY, SILT or SAND	Varies	Contains varying amounts of organic vegetable matter - defined by colour: grey - slightly organic; dark grey - organic; black - very organic.
	PEAT	Varies	Predominantly plant remains usually dark brown or black in colour, often with distinctive smell; low bulk density. Can contain disseminated or discrete mineral soils.

Particle Nature and Plasticity

Particle shape

Angular
Subangular
Subrounded
Rounded
Flat
Elongate

Texture

Rough
Smooth
Polished

Composite Soil Types (Mixtures of basic soil types)

Scale of secondary constituents with coarse and very coarse soils. Term either before or after constituent.

Term before	Principal	Term after	Approx % Secondary
Slightly (sandy*)	SAND, GRAVEL, COBBLES or BOULDERS	Used to describe components of secondary constituents. e.g. Gravel is fine and medium subangular sandstone and mudstone.	<5
--(sandy*)			5 to 20†
Very (sandy*)			20† to 40†
--		and (sand*) or and (cobbles+)	50†

* Fine or coarse soil type as appropriate
\+ Very coarse soil type as appropriate
† or described as fine soil depending on mass behaviour

Scale of secondary constituents with fine soils. Terms either before or after principal constituent.

Term before	Principal	Term after	Approx % Secondary
Slightly (sandy*)	CLAY or SILT	Used to describe components of secondary constituents e.g. gravelly sandy CLAY. Gravel is coarse rounded quartzite fragments.	<35
-- (sandy*)			35 to 65
Very (sandy*)			>65†

* Coarse soil type as appropriate
† or described as coarse soil depending on mass behaviour

EXAMPLES OF COMPOSITE TYPES
(Indicating preferred order for description)

Loose brown very sandy subangular coarse GRAVEL with many pockets (<5mm across) of soft grey clay.

Firm brown thinly interlaminated SILT and CLAY.

Dense light brown clayey fine and medium SAND.

Compactness/Strength

Term	Field Test
Loose	By inspection of voids and particle packing
Dense	

Standard Penetration Test in Borehole

No of blows	Relative Density
<4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
>50	Very Dense

Slightly cemented	Visual Examination: pick removes soil in lumps which can be abraded.	
Un-compact	Easily moulded or crushed in the fingers	
Compact	Can be moulded or crushed by strong pressure in the fingers	
Very soft	Finger easily pushed in up to 25 mm	c_u (kPa) <20
Soft	Finger pushed in up to 10 mm	20 to 40
Firm	Thumb makes impression easily	40 to 75
Stiff	Can be indented slightly by thumb	75 to 150
Very Stiff	Can be indented by thumbnail	150 to 300
Hard	Can be scratched by thumb nail	>300
Firm	Fibres already compressed together	
Spongy	Very compressible and open structure	
Plastic	Can be moulded in hand and smears fingers	

Structure

Term	Field Identification
Homo-geneous	Deposit consists essentially of one type.
Inter-bedded or inter-laminated	Alternating layers of varying types. Pre-qualified by thickness term if in equal pro-portions. Other-wise thickness of and spacing between subordinate layers defined.
Hetero-geneous	A mixture of types.
Weathered	Particles may be weakened and may show concentric layering.
Fissured	Breaks into blocks along unpolished discontinuities.
Sheared	Breaks into blocks along polished discontinuities
Intact	No fissures.
Homo-geneous	Deposit consists essentially of one type.
Inter-bedded or inter-laminated	As described for coarse soils above.
Weathered	Usually has crumb or columnar structure.
Fibrous	Plant remains recognisable and retain some strength.
Pseudo-fibrous	Plant remains recognisable, strength lost.
Amorphous	Recognisable plant remains absent.

Interval Scales

Scale of Bedding Spacing

Term	Mean Spacing mm
Very thickly bedded	over 2000
Thickly bedded	2000-600
Medium bedded	600-200
Thinly bedded	200-60
Very thinly bedded	60-20
Thickly laminated	20-6
Thinly laminated	under 6

Spacing terms may also be used for distance between partings, isolated beds or laminae, desiccation cracks, rootlets etc.

Scale of spacing of other discontinuities

Term	Mean spacing mm
Very widely spaced	over 2000
Widely spaced	2000-600
Medium spaced	600-200
Closely spaced	200-60
Very closely spaced	60-20
Extremely closely spaced	under 20

KEY TO BOREHOLE AND TRIAL PIT RECORDS

SOIL TYPES

Coarse grained, Non-cohesive

- Boulders
- Cobbles
- Gravel
- Sand

Fine grained, Cohesive

- Silt
- Clay

Other Soil Types

- Topsoil
- Peat
- Made Ground

Note: Composite soil types may be signified by combined symbols

Rock Types

Sedimentary

- Sandstone
- Siltstone
- Conglomerate
- Chalk
- Limestone
- Breccia
- Coal
- Mudstone/ Claystone/Shale

Metamorphic

- Coarse/Medium-grained
- Fine-grained

Igneous

- Coarse-grained
- Medium-grained
- Fine-grained

KEY TO SITE PLANS AND CROSS SECTIONS



- Highest recorded water level in piezometer or standpipe
- Length of piezometer/standpipe response zone (• Tip Depth)
- Highest recorded water level in hole
- Water strike
- Standard Penetration Test (SPT) 'N' value using split spoon
- Standard Penetration Test (SPT) 'N' value using solid 60 cone
- Undrained cohesion in kPa

- Borehole position
- Trial Pit Position

A — A'

Line of Section

		Input by	Date	Checked by	Date		
		RJE	28/09/01				

FOUNDATION & EXPLORATION SERVICES	NOTES ON EXPLORATORY HOLE RECORDS	Contract No B01429
		Sheet No KS/04

Drilling Method: Cable Percussion	Borehole Diameter: 150mm to 7.60m	Casing Diameter: 150mm to 7.10m	**BOREHOLE No. BH1**
Equipment: Dando 2000			Ground Level: 3.97 m OD
Dates Drilled: Start 29/01/2002, End 30/01/2002	Logged by: AH	Compiled by: dc 12/02/2002	Checked by: 12/2/02

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
29/01									MADE GROUND: Tarmacadam, driller notes concrete. Tipped waste tarmacadam and concrete.	(0.35)		
29/01										0.35	3.62	
30/01			0.50-0.55		D	1			MADE GROUND: Black dark brown sandy clayey gravel fill. Gravel is angular to subangular fine to coarse sized flints, red brick and occasional tarmacadam.	(0.35)		
			0.70-0.75		D	2				0.70	3.27	
			0.70-1.20		B	3				(0.60)		
			1.20		D	4			MADE GROUND: Black dark brown gravelly clay / very clayey gravel fill. Gravel is angular to rounded fine to coarse sized flints, red brick and occasional tarmacadam.	1.30	2.67	
	NIL	DRY	1.20-1.65		D		S14			(0.15)		
			1.20-1.70		B	5				1.45	2.52	
			2.00-2.05		D	6			Firm dark brown / brown CLAY with occasional subangular to rounded fine to coarse flints. Gravel becoming more predominant with depth with orange veining in the clay.	(0.90)		
			2.00-2.50		B	7				2.35	1.62	
	1.40	1.80	2.50		D	8			Beige / brown slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to coarse sized flints fine and medium chalk fragments and occasional organic matter. From 2.00m; becoming more sandy.			
			2.50-2.95		D		S12					
			2.50		D	9						
			2.50-3.00		B	10						
			3.00-3.05		D	11						
			3.00-3.50		B	12						
	3.50	3.00	3.50-4.00		B	13			Medium dense off white / beige sandy very silty angular to rounded fine to coarse flint GRAVEL with occasional fine intact chalk fragments. Occasional flint cobbles. Sand and silt is predominantly chalk. At 3.50m; slightly silty			
			3.50-3.95				C21					
			4.25-4.30		D	14						
			4.50-5.00		B	15			Below 4.50m; dense.	(4.25)		
	4.50	2.10	4.50-4.95				C32					
			5.15-5.30		D	16						
			6.00-6.50		B	17						
	6.00	3.95	6.00-6.45				C32					
			6.60-6.65		D	18			White / beige CHALK. Locally orange brown stained.	6.60	-2.63	
										(1.00)		
30/01			7.50-7.60		D	19			End of Borehole	7.60	-3.63	

Remarks (See notes & keysheets)

1. Groundwater was encountered at 2.50m during boring and rose to 1.95m after 5 mins, 1.90m after 10 mins, 1.85m after 15 mins, 1.80m after 20 mins.
2. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
3. On completion a 50mm diameter standpipe (slotted from 1.00m to 7.60m) was installed to 7.60m (see sheet 2).

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

Project: HARTS FARM DEPOT, HAVANT

Contract No. B01429

Figure No. BH1 (1 of 2)

Drilling Method Cable Percussion **Equipment** Dando 2000 **Dates Drilled** Start 29/01/2002 End 30/01/2002	**Borehole Diameter**	**Casing Diameter**	**BOREHOLE No.** BH1 **Ground Level** 3.97 m OD
	Logged by AH	**Compiled by** dc 12/02/2002	**Checked by** 12/04/02

Description	Depth (m)	Level m OD	
Concrete	0.30	3.67	Flush stopcock box cover with gas tap. Pipe diameter 50mm to 7.60m.
Cement/Bentonite Seal	1.00	2.97	
Gravel Filter			
	7.60	-3.63	Base of Hole

Remarks
(See notes & keysheets)

FOUNDATION & EXPLORATION SERVICES

Project
HARTS FARM DEPOT
HAVANT

Contract No. B01429

Figure No. BH1 (2 of 2)

Drilling Method: Cable Percussion Equipment: Dando 2000 Dates Drilled: Start 30/01/2002, End 31/01/2002	Borehole Diameter: 150mm to 11.50m Casing Diameter: 150mm to 10.60m Logged by: AH Compiled by: dc 12/02/2002 Checked by: 12/4/02	**BOREHOLE No. BH2** Ground Level: 3.71 m OD	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
30/01			0.25	0.30	D	1			MADE GROUND: Tarmacadam fill (drillers description)	(0.25)		
										0.25	3.46	
			0.50	1.00	B	2			MADE GROUND: Dark brown / brown slightly gravelly clay fill. Gravel is angular to subrounded fine to coarse flint and occasional brick, occasional cobbles of chalk. Orange and grey staining in clay. Presence of roots. Possibly natural ground below 0.70m.	(1.05)		
	NIL	DRY	1.20	1.65	U	3		10		1.30	2.41	
									Moist light brown gravelly CLAY. (drillers description)	(0.20)		
			1.65	1.70	D	4				1.50	2.21	
			2.00	2.50	B	5			Medium dense beige / orange / grey / brown angular to subrounded fine to coarse flint GRAVEL with occasional pockets of sandy clay and occasional chalk fragments.	(1.00)		
30/01			2.50	3.00	B	6						
31/01			2.50	2.95			C24		Medium dense off white / beige sandy very silty angular to subrounded fine to coarse flint GRAVEL with occasional fine gravel of chalk. Sand and silt is predominantly chalk.	2.50	1.21	
			3.25	3.30	D	7						
	3.50	2.00	3.50	3.95	B	8	C29		At 3.50m; slightly silty			
			4.25	4.30	D	9						
	4.50	3.10	4.50	4.95	B	10	C35		At 4.50m; dense.	(4.50)		
			5.50	5.55	D	11						
	6.00	4.70	6.00	6.45	B	12	C22					
			7.00	7.05	D	13						
									Dense off white / beige sandy very silty angular to subangular fine to coarse flint GRAVEL with occasional fine gravel of chalk. Occasional flint cobbles. Sand and silt is predominantly chalk.	7.00	-3.29	
	7.50	3.90	7.50	7.95	B	14	C46					
			8.50	8.55	D	15				(3.40)		
	9.00	6.00	9.00	9.45	B	16	C34					
			10.00	10.05	D	17						

Remarks (See notes & keysheets)

1. Groundwater was not apparent during boring.
2. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
3. The borehole was advanced by chiselling methods from 3.30m to 3.50m (0.5 hr) and 5.20m to 5.45m (0.5 hr).
4. On completion a 50mm diameter standpipe (slotted from 1.00m to 11.50m) was installed to 11.50m (see sheet 3).

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

Project: HARTS FARM DEPOT, HAVANT

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Figure No. BH2 (1 of 3)

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH2
Equipment	Dando 2000			Ground Level	3.71 m OD
Dates Drilled	Start 30/01/2002 End 31/01/2002	Logged by AH	Compiled by dc 12/02/2002	Checked by 12/04/02	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
			10.40	10.45	D	18						
			10.40	11.50	B	19			Beige / off white CHALK.	10.40	-6.69	
										(1.10)		
31/01			11.50		D	20			End of Borehole	11.50	-7.79	

Remarks
(See notes & keysheets)

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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Contract No. B01429

Figure No. BH2 (2 of 3)

Drilling Method Cable Percussion	**Borehole Diameter**	**Casing Diameter**	**BOREHOLE No.** BH2
Equipment Dando 2000			
	Logged by AH	**Compiled by** dc 12/02/2002	**Checked by** 12/02/02
Dates Drilled Start 30/01/2002 End 31/01/2002			**Ground Level** 3.71 m OD

Description	Depth (m)	Level m OD	
Concrete	0.30	3.41	Flush stopcock box cover with gas tap. Pipe diameter 50mm to 11.50m.
Cement/Bentonite Seal	1.00	2.71	
Gravel Filter			
	11.50	-7.79	Base of Hole

Remarks
(See notes & keysheets)

Scale Fixed

FOUNDATION & EXPLORATION SERVICES

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HARTS FARM DEPOT
HAVANT

Contract No. B01429

Figure No. BH2 (3 of 3)

Drilling Method: Cable Percussion	Borehole Diameter: 150mm to 11.25m	Casing Diameter: 150mm to 10.40m	**BOREHOLE No. BH3**
Equipment: Dando 2000			Ground Level: 3.94 m OD
Dates Drilled: Start 06/02/2002, End 06/02/2002	Logged by: AH	Compiled by: dc 12/02/2002	Checked by: 12/04/02

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
06/02									Grey black TOPSOIL (drillers description)	(0.35)		
			0.35-0.40		D	1				0.35	3.59	
									Dark brown sandy gravelly CLAY. Gravel is angular to subrounded fine and medium flint and chalk. Occasional roots and rootlets.	(0.35)		
			0.70-0.75		D	2				0.70	3.24	
			0.70-1.20		B	3						
									Brown / dark brown sandy gravelly CLAY / clayey GRAVEL. Gravel is angular to subangular fine and medium flint. Sand is fine to coarse.	(0.70)		
			1.20-1.70		B	4						
	NIL	DRY	1.20-1.65				C10			1.40	2.54	
			1.20-1.25		D	5						
			1.40-1.45		D	6						
									Loose light brown, orange and grey slightly sandy angular to subrounded fine to coarse flint and occasional chalk GRAVEL.	(0.60)		
										2.00	1.94	
									Loose orange, light brown and off white silty sandy angular to subrounded fine to coarse flint and occasional chalk GRAVEL. Sand is fine to coarse. Occasional flint cobbles. Sand and silt is predominantly chalk fragments.			
	2.50	1.55	2.50-3.00		B	7						
			2.50-2.95				C6					
	3.50	1.50	3.50-4.00		B	8						
			3.50-3.95				C9					
	4.50	2.55	4.50-5.00		B	9						
			4.50-4.95				C10					
			5.50-5.55		D	10						
	6.00	5.00	6.00-6.50		B	11				(8.25)		
			6.00-6.45				C11					
			7.00-7.05		D	12						
	7.50	5.40	7.50-8.00		B	13			Below 7.50m; medium dense.			
			7.50-7.95				C15					
			8.50-8.55		D	14						
	9.00	7.00	9.00-9.50		B	15						
			9.00-9.45				C17					
			10.00-10.05		D	16						

Remarks (See notes & keysheets)

1. Groundwater was not apparent during boring.
2. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
3. On completion a 50mm diameter standpipe (slotted from 1.00m to 11.25m) was installed to 11.25m (see sheet 3).

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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Figure No. BH3 (1 of 3)

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH3
Equipment	Dando 2000			Ground Level	3.94 m OD
Dates Drilled	Start 06/02/2002 End 06/02/2002	Logged by AH	Compiled by dc 12/02/2002	Checked by	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
									Off white CHALK. recovered as sandy silt and gravel size fragments.	10.25 (1.00)	-6.31	
06/02									End of Borehole	11.25	-7.31	

Remarks
(See notes & keysheets)

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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Figure No. BH3 (2 of 3)

Drilling Method Cable Percussion Equipment Dando 2000 Dates Drilled Start 06/02/2002 End 06/02/2002	Borehole Diameter Casing Diameter Logged by AH Compiled by dc 12/02/2002 Checked by	**BOREHOLE No. BH3** Ground Level 3.94 m OD

Description	Depth (m)	Level m OD	
Concrete	0.30	3.64	Flush stopcock box cover with gas tap. Pipe diameter 50mm to 11.25m.
Cement/Bentonite Seal	1.00	2.94	
Gravel Filter			
	11.25	-7.31	Base of Hole

Remarks
(See notes & keysheets)

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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Figure No. BH3 (3 of 3)

3/09/02

Drilling Method: Cable Percussion	Borehole Diameter: 150mm to 9.10m	Casing Diameter: 150mm to 8.35m	**BOREHOLE No. BH4**
Equipment: Dando 2000			Ground Level: 3.85 m OD
Dates Drilled: Start 01/02/2002, End 01/02/2002	Logged by: AH	Compiled by: dc 12/02/2002	Checked by: 12/02/02

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
01/02			0.50	0.55	D	1			MADE GROUND: Orange / brown / dark brown slightly sandy slightly gravelly clay fill. Gravel is angular to subrounded fine and medium sized flints, fine red brick and chalk fragments. Occasional tarmacadam fragments.	(1.20)		
			0.50	1.20	B	2						
			1.20	1.65	D	3				1.20	2.65	
	NIL	DRY	1.20	1.65			S16		Medium dense orange brown very clayey sandy GRAVEL. Gravel is angular to subrounded fine to coarse flint, sand is fine to coarse.	(0.85)		
			1.20	1.70	B	4						
			2.00	2.05	D	5			From 2.00m to 2.05m; beige / brown gravelly clay. Gravel is angular to subrounded fine and medium sized chalk and flint.	2.05	1.80	
			2.05	2.10	D	6						
			2.05	2.50	B	7						
			2.50	3.00	B	8			Medium dense off white / beige sandy very silty angular to subrounded fine to coarse flint GRAVEL with a little fine chalk gravel. Sand and silt is predominantly chalk.			
	2.50	2.40	2.50	2.95			C13					
			3.25	3.30	D	9						
			3.50	4.00	B	10			At 3.50m; slightly silty.			
	3.50	1.60	3.50	3.95			C16					
			4.25	4.30	D	11						
			4.50	5.00	B	12						
	4.50	2.60	4.50	4.95			C14			(5.90)		
			5.50	5.55	D	13			From 5.50m; chalk becoming coarser in size.			
			6.00	6.50	B	14			At 6.00m; clayey very sandy gravel.			
	6.00	4.80	6.00	6.45			C24					
			7.00	7.05	D	15						
			7.50	8.00	B	16						
	7.50	4.90	7.50	7.95			C27					
			8.00	9.00	B	17			Moderately weak off white CHALK. Recovered as gravel and cobble sized fragments.	7.95	-4.10	
			8.00	8.05	D	18				(1.15)		
01/02										9.10	-5.25	
									End of Borehole			

Remarks (See notes & keysheets)

1. Groundwater was encountered at 2.05m during boring and rose to 2.40m after 10 mins.
2. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
3. On completion a 50mm diameter standpipe (slotted from 1.00m to 9.10m) was installed to 9.10m (see sheet 2).

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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Figure No. BH4 (1 of 2)

301/03

Drilling Method Cable Percussion	Borehole Diameter	Casing Diameter	**BOREHOLE No. BH4**
Equipment Dando 2000			Ground Level 3.85 m OD
Dates Drilled Start 01/02/2002 End 01/02/2002	Logged by AH	Compiled by dc 12/02/2002	Checked by 12/2/02

Description	Depth (m)	Level m OD	
Concrete	0.30	3.55	Flush stopcock box cover with gas tap. Pipe diameter 50mm to 9.10m.
Cement/Bentonite Seal	1.00	2.85	
Gravel Filter			
	9.10	-5.25	Base of Hole

Remarks
(See notes & keysheets)

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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HAVANT

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Figure No. BH4 (2 of 2)

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH5
Equipment	Dando 2000	150mm to 13.20m	150mm to 12.40m		
		Logged by AH	Compiled by dc 12/02/2002	Checked by IRF 12/2/02	Ground Level 3.77 m OD
Dates Drilled	Start 04/02/2002 End 04/02/2002				

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
04/02									MADE GROUND: Tarmacadam (drillers description)	(0.10)		
										0.10	3.67	
									MADE GROUND: Concrete (drillers description)	(0.15)		
										0.25	3.52	
			0.55-0.60	D	1					(0.30)		
			0.55-0.90	B	2				MADE GROUND: Brown sandy gravel (drillers description)	0.55	3.22	
			0.90-0.95	D	3					(0.35)		
										0.90	2.87	
			1.20-1.60	B	4				MADE GROUND: Beige / grey sandy clayey gravel fill. Gravel is angular to subangular fine to coarse flint and chalk. Sand is fine and medium. Occasional tarmacadam and red brick fragments.	(0.70)		
	NIL	DRY	1.20-1.65				S9					
			1.60-2.00	B	5					1.60	2.17	
										(0.40)		
			2.00-2.05	D	6				MADE GROUND: Soft gravelly chalk fill. Gravel is angular to rounded fine and medium sized flint. Chalk is pinkish white comminuted chalk with some fine and medium gravel sized intact chalk fragments.	2.00	1.77	
			2.50-3.00	B	7							
	2.50	1.45	2.50-2.95				C14		Beige / orange / grey / brown slightly clayey sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine.			
			3.20-3.25	D	8				Off white / beige sandy very silty angular to rounded fine to coarse flint GRAVEL with a little fine gravel size chalk fragments. Sand and silt is predominantly chalk.			
			3.50-4.00	B	9							
	3.50	2.00	3.50-3.95				C24					
			4.20-4.25	D	10							
			4.50-5.00	B	11				From 4.50m; predominantly fine gravel and more angular flints.			
	4.50	1.80	4.50-4.95				C20					
			5.50-5.55	D	12							
			6.00-6.50	B	13				From 6.00m; chalk gravel becoming fine and medium with orange staining.			
	6.00	5.40	6.00-6.45				C14					
			7.00-7.05	D	14					(10.20)		
			7.50-8.00	B	15							
	7.50	4.90	7.50-7.95				C20					
			8.50-8.55	D	16							
			9.00-9.50	B	17				From 9.00m; chalk content increasing.			
	9.00	7.50	9.00-9.45				C10					
			10.00-10.05	D	18							

Remarks (See notes & keysheets)

1. Groundwater was encountered at 1.65m during boring and rose to 1.30m after 20 mins.
2. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
3. On completion a 50mm diameter standpipe (slotted from 1.00m to 13.20m) was installed to 13.20m (see sheet 3).

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

Project: HARTS FARM DEPOT, HAVANT

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Figure No. BH5 (1 of 3)

301/03

Drilling Method	Cable Percussion	Borehole Diameter	Casing Diameter	BOREHOLE No.	BH5
Equipment	Dando 2000			Ground Level	3.77 m OD
Dates Drilled	Start 04/02/2002 End 04/02/2002	Logged by AH	Compiled by dc 12/02/2002	Checked by	

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
	10.50	9.00	10.50	11.00	B	19	C17					
			10.50	10.95								
			11.50	11.55	D	20						
	12.00	2.00	12.00	13.20	B	21	C8					
			12.00	12.45								
									Off white / white CHALK.	12.20 (1.00)	-8.43	
04/02									End of Borehole	13.20	-9.43	

Remarks
(See notes & keysheets)

Scale 1:50

FOUNDATION & EXPLORATION SERVICES

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Figure No. BH5 (2 of 3)

Drilling Method Cable Percussion **Equipment** Dando 2000	**Borehole Diameter** **Casing Diameter**	**BOREHOLE No.** **BH5**
Dates Drilled Start 04/02/2002 End 04/02/2002	**Logged by** AH **Compiled by** dc 12/02/2002 **Checked by** 12/02/02	**Ground Level** 3.77 m OD

Description	Depth (m)	Level m OD	
Concrete	0.30	3.47	Flush stopcock box cover with gas tap. Pipe diameter 50mm to 13.20m.
Cement/Bentonite Seal	1.00	2.77	
Gravel Filter			
	13.20	-9.43	Base of Hole

Remarks
(See notes & keysheets)

Not to scale

Drilling Method: Cable Percussion	Borehole Diameter: 150mm to 10.20m	Casing Diameter: 150mm to 9.50m	**BOREHOLE No. BH6**
Equipment: Dando 2000			Ground Level: 3.83 m OD
Dates Drilled: Start 05/02/2002, End 05/02/2002	Logged by: AH	Compiled by: dc 12/02/2002	Checked by: 12/02/02

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm Test	U100 Blows/ Recovery mm Result	Description of Strata	Depth (Thick-ness) (m)	Level	Legend
05/02									MADE GROUND: Tarmacadam (drillers description)	(0.10)		
			0.35	0.40	D	1				0.10	3.73	
			0.50	0.55	D	2			MADE GROUND: Orange brown sandy gravelly clay fill. Gravel is angular to subrounded fine and medium flints. Sand is medium to coarse. Occasional pockets of pinkish white chalk.	(0.40)		
			0.70	0.75	D	3				0.50	3.33	
			0.70	1.20	B	4				(0.20)		
			1.20	1.45	B	5				0.70	3.13	
	NIL	DRY	1.20	1.65			C18		MADE GROUND: Off white / beige / grey clayey chalk fill. Chalk is fine and medium gravel sized. Occasional pockets of pinkish white chalk and occasional orange / brown staining.	(0.75)		
			1.45	2.00	B	6				1.45	2.38	
			1.45	1.50	D	7			Dark grey brown sandy very gravelly CLAY / clayey GRAVEL. Gravel is angular to subrounded fine to coarse flint and chalk. Occasional pockets of pinkish white chalk.			
	2.50	1.50	2.50	3.00	B	8						
			2.50	2.95			C18		Off white / beige slightly sandy locally very silty angular to rounded fine to coarse flint GRAVEL with a little fine gravel size chalk fragments. Sand and silt is predominantly chalk.			
	3.50	2.90	3.50	4.00	B	9						
			3.50	3.95			C11					
			4.20	4.25	D	10						
			4.50	5.00	B	11						
	4.50	3.00	4.50	4.95			C22					
			5.50	5.55	D	12			From 5.50m; gravel becoming predominantly fine and medium.	(7.75)		
			6.00	6.50	B	13						
	6.00	3.25	6.00	6.45			C28					
			7.00	7.05	D	14						
			7.50	8.00	B	15						
	7.50	3.50	7.50	7.95			C23		From 7.50m; chalk becoming medium sized fragments.			
			8.50	8.55	D	16						
			9.00	10.20	B	17						
	9.00	4.20	9.00	9.45			C12					
									Off white CHALK. Recovered as gravel and sandy silt sized fragments.	9.20	-5.37	
										(1.00)		

Remarks (See notes & keysheets)

1. Groundwater was encountered at 1.20m during boring and rose to 1.10m after 20 mins.
2. Prior to boring a Cable Avoidance Tool (CAT) survey was carried out. An inspection pit was hand-dug to 1.20m depth and rescanned using the CAT to check for services. Services were not located.
3. On completion a 50mm diameter standpipe (slotted from 1.00m to 10.20m) was installed to 10.20m (see sheet 3).

Scale 1:50

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Project: HARTS FARM DEPOT, HAVANT

Contract No. B01429

Figure No. BH6 (1 of 3)

Drilling Method: Cable Percussion	Borehole Diameter:	Casing Diameter:	**BOREHOLE No. BH6**
Equipment: Dando 2000			Ground Level: 3.83 m OD
Dates Drilled: Start 05/02/2002, End 05/02/2002	Logged by: AH	Compiled by: dc 12/02/2002	Checked by: 12/2/02

Date & Time	Casing Depth (m)	Depth to Water (m)	Sample Details: Depth (m) From	To	Type	No.	SPT Blows/N Drive mm: Test	U100 Blows/ Recovery mm: Result	Description of Strata	Depth (Thickness) (m)	Level	Legend
05/02									End of Borehole	10.20	-6.37	

Remarks
(See notes & keysheets)

Scale 1:50

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Contract No. B01429

Figure No. BH6 (2 of 3)

Drilling Method Cable Percussion Equipment Dando 2000 Dates Drilled Start 05/02/2002 End 05/02/2002	Borehole Diameter Casing Diameter Logged by AH Compiled by dc 12/02/2002 Checked by	**BOREHOLE No. BH6** Ground Level 3.83 m OD

Description	Depth (m)	Level m OD	
Concrete	0.30	3.53	Flush stopcock box cover. Pipe diameter 50mm to 10.20m.
Bentonite Seal	1.00	2.83	
Gravel Filter			
	10.20	-6.37	Base of Hole

Remarks
(See notes & keysheets)

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Project
HARTS FARM DEPOT
HAVANT

Contract No. B01429

Figure No. BH6 (3 of 3)

Method of Excavation	JCB 3CX	Plan	**TRIAL PIT No. TP1**
Surface Dimensions	1.00m x 3.00m		
Date Excavated Start	30/01/2002		Ground Level 3.73 m OD
End	30/01/2002		
Logged by AH 30/01/2002	Compiled by dc 04/02/2002	Checked by 12/4/02.	

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
			0.15	D	1	MADE GROUND: Black / dark brown tarmacadam, tipped, with occasional angular to rounded medium to coarse sized flint gravel.	(0.20)		
			0.15	CD	2		0.20	3.53	
			0.45	CD	3	MADE GROUND: Grey brown sandy gravelly clay. Gravel is angular to subrounded fine to coarse flint gravel, red brick and chalk. Sand is fine and medium.	(0.48)		
			0.50	D	5				
			0.90	CD	4	Stiff to very stiff orange brown sandy CLAY with occasional grey veining and staining. With occasional angular to rounded fine to coarse flint gravel.	0.68	3.05	
			1.00	B	6				
			1.20	CD	7	From 1.20m; with a little fine and medium gravel sized chalk fragments.	(1.02)		
			1.70	B	8	Off white / beige sandy silty angular to subangular fine to coarse flint GRAVEL. Occasional cobble sized flint. Sand and silt is predominantly chalk.	1.70	2.03	
			1.70	D	9				
			2.30	D	10		(1.30)		
			2.70	B	11	From 2.80m; gravel becoming fine.			
			2.80	D	12				
			3.00	B	13				
						End of Trial Pit	3.00	0.73	

Remarks (See notes & keysheets)

1. The walls of the pit were stable during excavation until 1.70m.
2. Groundwater was encountered at 1.70m during excavation.
3. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4. On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

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Project: HARTS FARM DEPOT HAVANT

Contract No. B01429

Figure No. TP1 (1 of 1)

Method of Excavation	JCB 3CX	Plan	TRIAL PIT No. TP2
Surface Dimensions	0.50m x 2.50m	→ 90°	Ground Level 4.63 m OD
Date Excavated Start	30/01/2002		
End	30/01/2002		
Logged by AH 30/01/2002	Compiled by dc 04/02/2002	Checked by 12/02/02	

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Comprising fragments and layers of tarmacadam, concrete and chalk.	(0.80)		
						MADE GROUND: Tarmacadam.	0.80 (0.20)	3.83	
			1.00	D	1				
			1.00	B	3	MADE GROUND: Comprised of brown clay and angular to subrounded fine to coarse gravel sized fragments of concrete and chalk. Occasional lenses of sandy clay.	1.00 (0.10)	3.63	
			1.10	D	4		1.10 (0.10)	3.53	
			1.10	W	5				
			1.15	CD	2		1.20 (0.20)	3.43	
			1.30	B	6				
			1.45	CD	7	MADE GROUND: Orange brown medium to coarse sand with some fine to coarse sandstone fragments.	1.40	3.23	
			1.50	D	8				
						MADE GROUND: Off white / beige with occasional dark grey staining sandy chalk silt and angular fine to coarse chalk gravel.			
			1.90	CD	9	Soft to firm grey locally orange brown CLAY. Occasional angular to subrounded fine to coarse flint gravel. From 1.70m; occasional fine gravel sized chalk fragments, lenses of fine sand and occasional beige staining. From 1.90m; with some gravel.	(1.10)		
			2.20	CD	12				
			2.30	D	10				
			2.30	B	11				
						Beige, orange, grey and brown very silty sandy angular to subrounded fine to coarse flint GRAVEL with occasional lenses of clay. Occasional cobble sized flints. Sand and silt is predominantly chalk.	2.50 (0.50)	2.13	
			2.90	B	13				
			3.00	B	14				
						End of Trial Pit	3.00	1.63	

Remarks (See notes & keysheets)

1. The walls of the pit were unstable during excavation.
2. Groundwater was encountered at 1.90m during excavation.
3. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4. The trial pit was excavated through spoil heap - top 0.80m.
5. Trial pit terminated at 3.0m due to collapse of sidewalls and strong groundwater ingress.
6. On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

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Project: HARTS FARM DEPOT, HAVANT

Contract No. B01429

Figure No. TP2 (1 of 1)

Method of Excavation	JCB 3CX	Plan	TRIAL PIT No. TP3
Surface Dimensions	0.50m x 2.50m	→ 90°	Ground Level 3.87 m OD
Date Excavated Start	31/01/2002		
End	31/01/2002		
Logged by AH 31/01/2002	Compiled by dc 04/02/2002	Checked by 12/02/02	

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
			0.15	CD	1	TOPSOIL : Grass	(0.10) 0.10	3.77	
			0.15	D	2	Brown and dark brown gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint with occasional chalk fragments and roots.			
			0.45	CD	3		(0.70)		
			0.50	D	4				
			0.90	CD	5	Grey and brown clayey sandy GRAVEL. Gravel is angular to subrounded fine to coarse flint with occasional boulder sized flints.	0.80	3.07	
			0.90	D	6				
			1.00	B	7		(0.50)		
			1.20	CD	8				
			1.20	D	9	Beige and brown very silty sandy angular to subrounded fine to coarse flint GRAVEL. Occasional cobble sized flint. Sand and silt is predominantly chalk.	1.30	2.57	
			1.80	B	10		(1.30)		
						From 2.10m; becoming orange brown.			
			2.20	D	11				
			2.50	B	12				
						End of Trial Pit	2.60	1.27	

Remarks (See notes & keysheets)

1. The walls of the pit were severely compromised due to groundwater ingress being very strong from 1.10m.
2. Groundwater was encountered at 1.10m during excavation.
3. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4. On completion the trial pit was backfilled with compacted arisings.
5. Trial pit terminated at 2.60m due to sidewalls collapsing beyond safe level.

Scale 1:25

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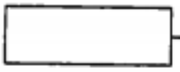
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Figure No. TP3 (1 of 1)

Method of Excavation	JCB 3CX
Surface Dimensions	0.50m x 2.50m
Date Excavated Start	31/01/2002
End	31/01/2002

Plan



TRIAL PIT No. TP4

Ground Level 3.79 m OD

Logged by	Compiled by	Checked by
AH	dc	
31/01/2002	04/02/2002	12/4/02.

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
			0.15	CD	1	MADE GROUND: Concrete	(0.30)		
			0.15	D	2				
			0.30	D	4		0.30	3.49	
			0.45	CD	3	MADE GROUND: Pink and red clayey sandy angular fine to coarse flint and brick gravel.	(0.10) 0.40	3.39	
			0.90	CD	5	MADE GROUND: Brown sandy clay with boulder sized concrete slab fragments and gravel sized fragments of red brick and tarmacadam.	(0.50)		
			0.90	D	6	Brown very gravelly CLAY. Gravel is angular to subrounded fine to coarse flint.	0.90	2.89	
			1.00	B	7		(0.30)		
			1.20	CD	9	Grey off white beige very silty sandy angular to subrounded fine to coarse flint GRAVEL. Sand and silt is predominantly chalk.	1.20	2.59	
			1.30	B	8	From 1.60m; becoming orange brown.			
			2.00	D	10	From 1.90m; becoming beige orange with fine gravel sized chalk fragments.	(1.80)		
			2.30	B	11				
			2.50	D	12				
			3.00	W	13	End of Trial Pit	3.00	0.79	
			3.00	B	14				

Remarks (See notes & keysheets)

1 The walls of the pit were unstable after water strike at 1.20m.
2 Groundwater was encountered at 1.20m during excavation.
3 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. HV cable found.
4 On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

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Project: HARTS FARM DEPOT, HAVANT

Contract No. B01429

Figure No. TP4 (1 of 1)

Method of Excavation	JCB 3CX	Plan	TRIAL PIT No. TP5
Surface Dimensions	0.50m x 2.50m		
Date Excavated Start	30/01/2002		
End	30/01/2002		
Logged by AH 30/01/2002	Compiled by dc 04/02/2002	Checked by 12/02/02	Ground Level 3.73 m OD

In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
			0.15	CD	1	MADE GROUND: Beige / black / orange / brown gravelly clay / very clayey gravel. Gravel is subangular to subrounded fine to coarse brick, tile and flint gravel. Presence of concrete blocks, occasional tarmacadam and wood fragments. From 0.25m; gravel content decreases with depth.	(0.38)		
			0.15	D	2				
			0.30	B	6				
			0.40	D	5		0.38	3.35	
			0.45	CD	3				
			0.60	B	7	Off white / white chalk SILT with a little brown clay and angular to subangular fine to coarse flint gravel.	(0.62)		
			0.90	CD	4				
			1.20	D	8	Off white grey with orange brown staining gravelly CLAY. Gravel is angular to subangular fine to coarse flint and chalk. Occasional cobble sized flints.	1.00	2.73	
			1.20	CD	9				
			1.80	B	10		(1.30)		
			2.30	D	11				
						Off white / beige sandy very silty angular to subrounded fine to coarse flint GRAVEL. Occasional cobble sized flint. Silt and sand is predominantly chalk.	2.30	1.43	
			2.80	B	12		(0.70)		
			3.00	D	13	From 2.90m; becoming orange brown.			
						End of Trial Pit	3.00	0.73	

Remarks (See notes & keysheets)

1. The walls of the pit were unstable from 2.30m following water strike.
2. Groundwater was encountered at 2.30m during excavation.
3. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4. On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

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Project: HARTS FARM DEPOT, HAVANT

Contract No. BD1429

Figure No. TP5 (1 of 1)

Method of Excavation	JCB 3CX	**Plan**	**TRIAL PIT No.** TP6
Surface Dimensions	0.50m x 2.50m		
Date Excavated Start	30/01/2002	→ 90°	**Ground Level** 3.76 m OD
End	30/01/2002		
Logged by AH 30/01/2002	**Compiled by** dc 04/02/2002	**Checked by** 12/04/02.	

In-situ Testing			Samples			Description of Strata	Depth (Thick-ness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Grass.	(0.10)		
			0.15	CD	1	MADE GROUND: Dark brown slightly sandy gravelly clay / silt. Sand is fine and medium. Gravel is angular to rounded fine to coarse flint and red brick. From 0.40m; fine gravel size chalk fragments.	0.10	3.66	
			0.15	D	2				
			0.45	CD	3		(0.50)		
			0.50	D	5				
						Orange brown very clayey GRAVEL. Gravel is angular to subrounded fine and medium flint and chalk.	0.60 (0.20)	3.16	
			0.85	D	6		0.80	2.96	
			0.90	CD	4	Off white, grey locally orange and brown stained sandy very silty angular to subrounded fine to coarse flint GRAVEL. Occasional cobble sized flint. Sand and silt is predominantly chalk. At 1.00m; organic clay noted in sample on carrying out laboratory testing.			
			1.00	B	7				
			1.20	CD	8				
			1.30	D	9				
						Below 1.80m; with a little fine chalk gravel.	(2.20)		
			1.90	D	11				
			2.30	B	10				
						From 2.70m; becoming orange brown.			
			2.80	B	12				
			3.00	D	13				
						End of Trial Pit	3.00	0.76	

Remarks (See notes & keysheets)

1. The walls of the pit were unstable after 1.80m following water strike.
2. Groundwater was encountered at 1.80m during excavation.
3. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4. On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

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Project HARTS FARM DEPOT HAVANT

Contract No. B01429

Figure No. TP6 (1 of 1)

Method of Excavation	JCB 3CX	Plan	**TRIAL PIT No. TP7**
Surface Dimensions	0.50m x 2.50m		
Date Excavated Start	31/01/2002		Ground Level 3.90 m OD
End	31/01/2002		
Logged by AH 31/01/2002	Compiled by dc 04/02/2002	Checked by 12/02/02.	

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
			0.15	CD	1	MADE GROUND: Comprised of tarmacadam slabs, gravel sized fragments of tarmacadam , sand, glass, clinker, roots, red brick and concrete. Occasional boulder size fragments of concrete and whole bricks.	(0.30)		
			0.15	D	2		0.30	3.60	
			0.45	CD	3	MADE GROUND: Orange grey and brown coarse sand and angular to rounded fine to coarse flint gravel with some paper, tarmacadam, glass fragments and occasional boulder sixe fragments of concrete.	(0.60)		
			0.60	D	4				
			0.90	CD	5		0.90	3.00	
			0.90	D	6	MADE GROUND: Grey brown gravelly clay / clayey gravel. Gravel is fine to coarse flint, tarmacadam and red brick fragments	(0.30)		
			1.00	B	7		1.20	2.70	
			1.20	CD	8	Light grey silty sandy GRAVEL. Gravel is angular to subrounded fine to coarse flint. Occasional flint cobbles.	(1.00)		
			1.50	D	9				
			2.00	B	10		2.20	1.70	
			2.50	D	11	Off white beige sandy very silty angular to subrounded fine to coarse flint GRAVEL. Occasional cobble sized flints. Sand and silt is predominantly chalk.	(0.60)		
			2.80	B	12		2.80	1.10	
						End of Trial Pit			

Remarks (See notes & keysheets)

1 The walls of the pit were unstable at 1.20m following water strike.
2 Groundwater was encountered at 1.20m and 2.20m during excavation.
3 Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4 On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

FOUNDATION & EXPLORATION SERVICES

Project: HARTS FARM DEPOT HAVANT

Contract No. B01429

Figure No. TP7 (1 of 1)

Method of Excavation	JCB 3CX	Plan	TRIAL PIT No. TP8
Surface Dimensions	0.50m x 2.50m	→ 90°	Ground Level 3.81 m OD
Date Excavated Start	30/01/2002		
End	30/01/2002		
Logged by AH 30/01/2002	Compiled by dc 04/02/2002	Checked by 12/2/02	

In-situ Testing			Samples			Description of Strata	Depth (Thickness) (m)	Level	Legend
Depth (m)	Type	Result	Depth (m)	Type	No.				
						MADE GROUND: Grass.	(0.10)		
			0.15	CD	1		0.10	3.71	
			0.15	D	2	MADE GROUND: Dark brown sandy slightly gravelly clay / silt. Sand is fine and medium. Gravel is angular to rounded fine and medium flint and red brick. Presence of concrete slabs and tarmacadam.	(0.50)		
			0.45	CD	3				
			0.60	D	5		0.60	3.21	
						Off white / white angular to subrounded fine to coarse flint and chalk gravel. Compact. Possible Made Ground	(0.10)		
							0.70	3.11	
			0.90	CD	4	Orange brown gravelly CLAY. Gravel is angular to subrounded fine to coarse flint.			
			1.00	B	6		(0.80)		
			1.20	CD	7				
			1.50	D	8		1.50	2.31	
						Off white grey with orange brown staining chalk SILT with a little angular to subrounded fine to coarse flint gravel. Occasional flint cobbles.	(0.50)		
			2.00	B	9		2.00	1.81	
						Beige sandy silty angular to subrounded fine to coarse flint GRAVEL. Occasional flint cobbles. Sand and silt is predominantly chalk.			
			2.50	D	10		(1.00)		
			3.00	B	11				
						End of Trial Pit	3.00	0.81	

Remarks (See notes & keysheets)

1. The walls of the pit were unstable from 1.50m following water strike.
2. Groundwater was encountered at 1.15m during excavation.
3. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out.
4. On completion the trial pit was backfilled with compacted arisings.

Scale 1:25

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Figure No. TP8 (1 of 1)

APPENDIX B

FIELD TEST RESULTS

Water Level and Gas Readings in Standpipe Piezometers — Figure FT1/1

RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Date	18/02/02
Weather/Surface Conditions	Fine, sunny.
Instrument Number and Type	1240, GA90

Hole Number		BH1	BH2	BH3	BH4	BH5	BH6
Depth to Sampling Point (m)		Surface	Surface	Surface	Surface	Surface	Surface
Depth to Water (m)		1.90	1.47	1.12	1.83	1.72	1.77
Time of day		09:16:00	09:25:00	08:30:00	09:35:00	08:15:00	09:41:00
Atmospheric Pressure (millibars)		1017	1016	1016	1015	1018	1016
Flow Rate (m/sec)		0.00	0.00	0.00	0.00	0.00	0.00
In-situ Differential Pressure (millibars)		0	0	0	0	0	0
Flammable Gas as methane (CH_4)	% LEL	NR	NR	NR	NR	NR	NR
	% VOL	0.0	0.0	0.0	0.0	0.0	0.0
Oxygen (O_2)	% VOL	18.9	19.8	18.8	17.6	20.2	18.7
Carbon Dioxide (CO_2)	% VOL	1.5	0.3	1.2	1.4	0.2	1.1
Hydrogen Sulphide (H_2S)	ppm	NR	NR	NR	NR	NR	NR
Downhole Temperature	°C	NR	NR	NR	NR	NR	NR
Remarks		NR	NR	NR	NR	NR	NR

Key: LEL - Lower Explosive Limit

111/01

Operator	Date	Input by	Date	Checked by	Date	Authorised by	Date
		ij	18/02/2002			IJ	18/02/02

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Project: HARTS FARM DEPOT, HAVENT

Contract No: B01429

Figure No: FT1/1 pg 1

APPENDIX C

GEOTECHNICAL LABORATORY TEST RESULTS

General Notes on Laboratory Test Results	Figures LKS/01 to LKS/02
Summary of Classification Tests	Figure LT1/1 to LT1/2
Particle Size Distribution Curves	Figures LT2/1 to LT2/30

GENERAL NOTES ON LABORATORY TEST RESULTS

1. TEST METHODS

The tests reported on the following sheets have been carried out in accordance with the methods given in BS 1377 : 1990 'Methods of test for Soils for civil engineering purposes, subject to a small number of variances as described below under the respective headings. These notes also serve as keysheets to any notation used in reporting the laboratory tests.

2. KEY TO NOTATION OF SAMPLE TYPE

D: Disturbed sample.
B: Bulk disturbed sample.
U: General purpose open drive tube sample.
P: Piston sample.
TW: Thin wall sample.
RC: Rotary core sample.

3. CLASSIFICATION TESTS

% passing 425µm: this figure is only correctly reported when 'WS' is shown in the 'Method' of preparation column. For 'HP' and 'AR', the reported figure is an estimate only.

WS: sample prepared by Wet Sieving.
HP: sample prepared by Hand Picking (removal) of gravel sized fragments.
AR: sample tested As Received.
NP: non-plastic.

4. COMPACTION RELATED TESTS

Sample preparation: **Individual** indicates test carried out on individual sub-samples.

Single indicates test carried out on a single sample.

Assumed values of particle density are reported in brackets e.g. (2.67)

5. CHEMICAL TESTS

The methods of analysis are subject to a small number of minor variances from BS 1377, which may be summarised as follows:

- The fraction coarser than 2mm is not removed during sample preparation and is ground and crushed in the normal manner to ensure that any salts contained in the coarse fraction are included in the analysis.
- Aliquots of soil and water samples may vary from those recommended in the Standard. These are chosen from experience to achieve specific masses of precipitate or titration values identified in the Standard or in accordance with good laboratory practice.
- Balances are used which are commensurate with the sensitivity of the individual analyses. These do not necessarily correspond exactly to the requirements of the Standard.
- For the determination of water soluble chloride, a 10:1 aqueous extract is used in preference to the 2:1 extract stipulated by the Standard. This offers the advantage that the chloride is more effectively dissolved.
- The Mohr's Method for the determination of chloride content recommended in the Notes given in Clauses 7.1.1 and 7.2.2 of the Standard is used in preference to Volhard's Method.
- The pH of soil samples is determined on material 'as received' and not on an oven-dried and ground powder as specified by the Standard.
- For the determination of pH, duplicate readings are measured within 0.3 pH units.

6. SAMPLE DESCRIPTIONS

The sample descriptions shown on the test report sheets are the technician's visual descriptions of the test samples, in accordance with Clause 9.1 of Part 1 of BS 1377 : 1990 and do not necessarily comply with the requirements of BS 5930 : 1983. For a more comprehensive description of the soil samples to BS 5930, reference should be made to the exploratory hole records, or an engineering description can be provided on request.

		Input by	Date	Checked by	Date		
		RJE	3/04/98	NHA	04/04/98		
FOUNDATION & EXPLORATION SERVICES		NOTES ON LABORATORY TEST RESULTS				Contract No B01429	
						Sheet No LKS/01	

GENERAL NOTES ON LABORATORY TEST RESULTS

7. INTERPRETATION OF TEST RESULTS

Laboratory test results in this report give the soil properties of individual specimens tested under specified conditions. Individual results or groups of results may not be appropriate for use as design parameters for some geotechnical analyses. The samples may be non-representative, disturbed internally, or prepared and tested under conditions suited for different geotechnical applications. Unless the selection of design parameters is discussed in this report, it is recommended that the advice of an appropriately qualified and experienced specialist is sought.

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

Hole	Type	Depth	Sample No.	Classification Tests									
				Bulk Density (Mg/m^3)	Moisture Content (%)	Dry Density (Mg/m^3)	Particle Density (Mg/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 μm	Method	Description
BH1	B	2.00	7		22			39	16	23	62	WS	Brown CLAY with a little sand and a little gravel
BH2	B	0.50	2		26			42	20	22	97	WS	Brown grey CLAY with a little sand and a little gravel
BH4	B	0.50	2		33			45	28	17	55	WS	Grey SILT with a little sand a little gravel and a few rootlets
BH4	B	1.20	4		31			51	32	19	46	WS	Brown SILT with a little sand and a little gravel
BH5	B	0.55	2		12			28	17	11	29	WS	Brown grey CLAY with a little sand and some gravel
BH6	B	0.70	4		24			48	37	11	43	WS	Grey SILT with a little sand and a little gravel
TP1	B	1.00	6		29			46	17	29	76	WS	Brown CLAY with a little sand and a little gravel

Input by [signature] Date 04/03/2002 Checked by [signature] Date 04/03/2002

FOUNDATION & EXPLORATION SERVICES

Project: HARTS FARM WAY

Contract No: B01429

Figure No: LT1/1

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SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

Hole	Type	Depth	Sample No.	Classification Tests									
				Bulk Density (Mg/m^3)	Moisture Content (%)	Dry Density (Mg/m^3)	Particle Density (Mg/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 μm	Method	Description
TP3	B	1.00	7		15			64	29	35	12	WS	Brown grey GRAVEL with a little sand and a little clay

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FOUNDATION & EXPLORATION SERVICES

Project: HARTS FARM WAY

Contract No: B01429

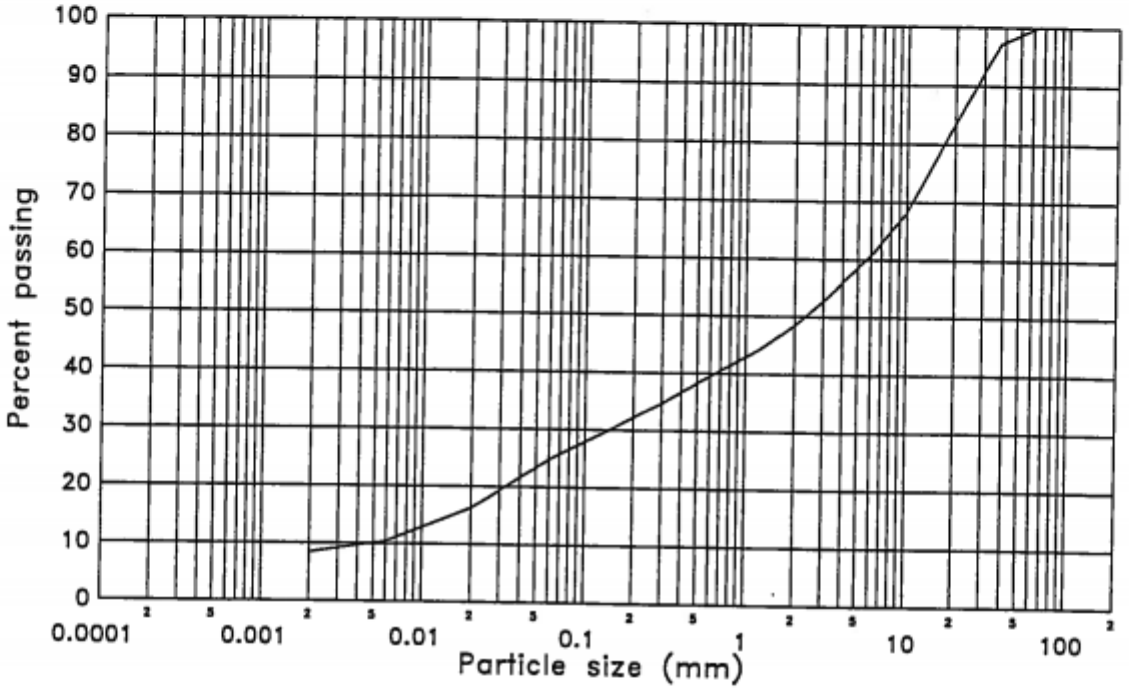
Figure No: LT1/ 2

102/02

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: BH1	Sample No: 5	Sample Type: B	Depth: 1.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with
BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
8	17	23	52	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with much clay and much sand
Uniformity Coefficient:	972.2	

[redacted]

FOUNDATION & EXPLORATION SERVICES

HARTS FARM WAY

Contract No B01429

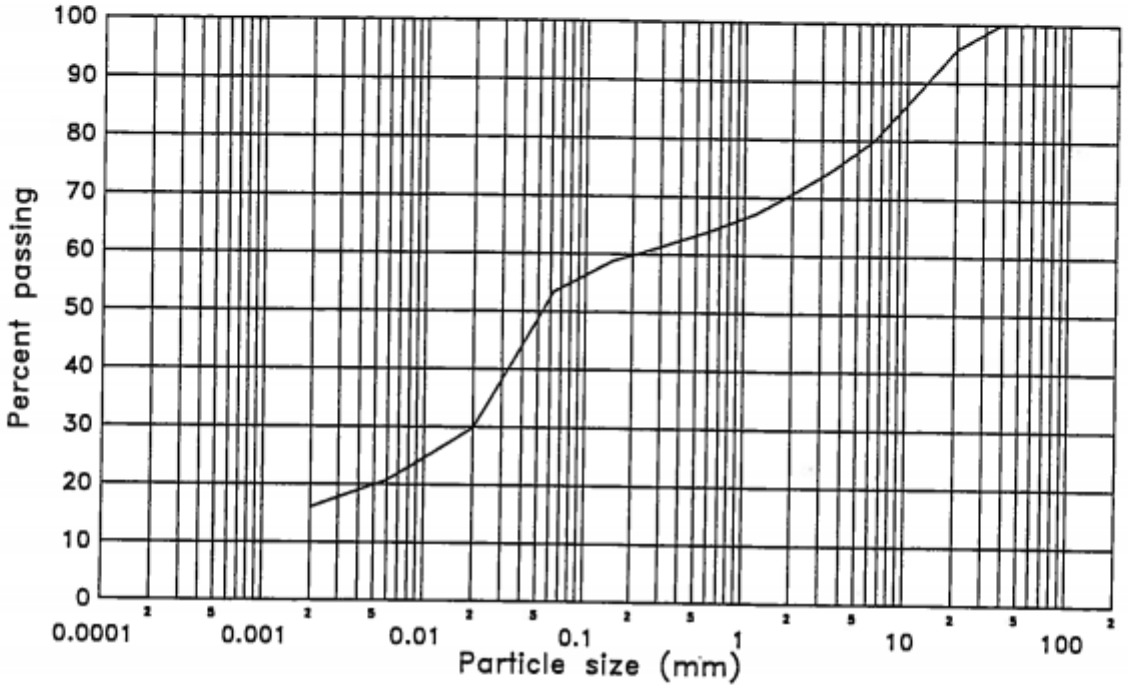
Figure No LT2/1

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: BH1	Sample No: 7	Sample Type: B	Depth: 2.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
16	37	18	29	0

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	Not Applicable

Description
Brown CLAY with a little gravel and a little sand

[redacted]

Input [redacted] Date 5.3.02

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Project HARTS FARM WAY

Contract No B01429

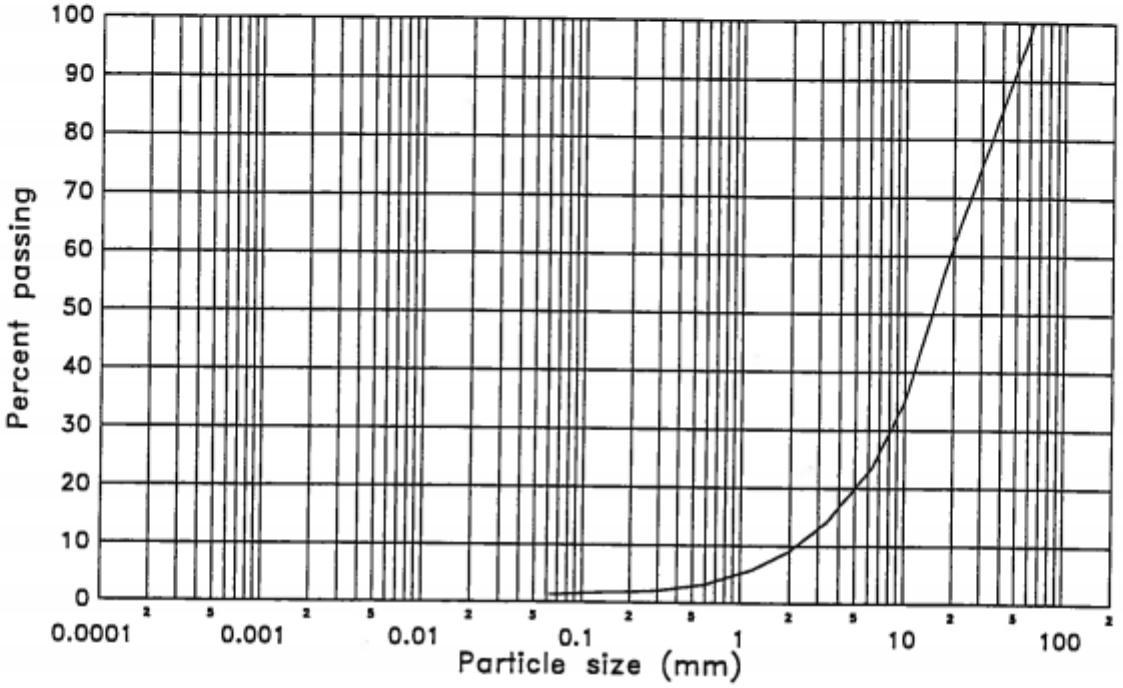
Figure No LT2/2

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH1	Sample No: 13	Sample Type: B	Depth: 3.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	1	8	91	0

Loss on Pretreatment: Not Applicable
Test Date: 25/02/2002
Uniformity Coefficient: 6.2

Description
Brown GRAVEL with some sand and a little silt

[redacted]

Date 5.3.02

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HARTS FARM WAY

Contract No B01429

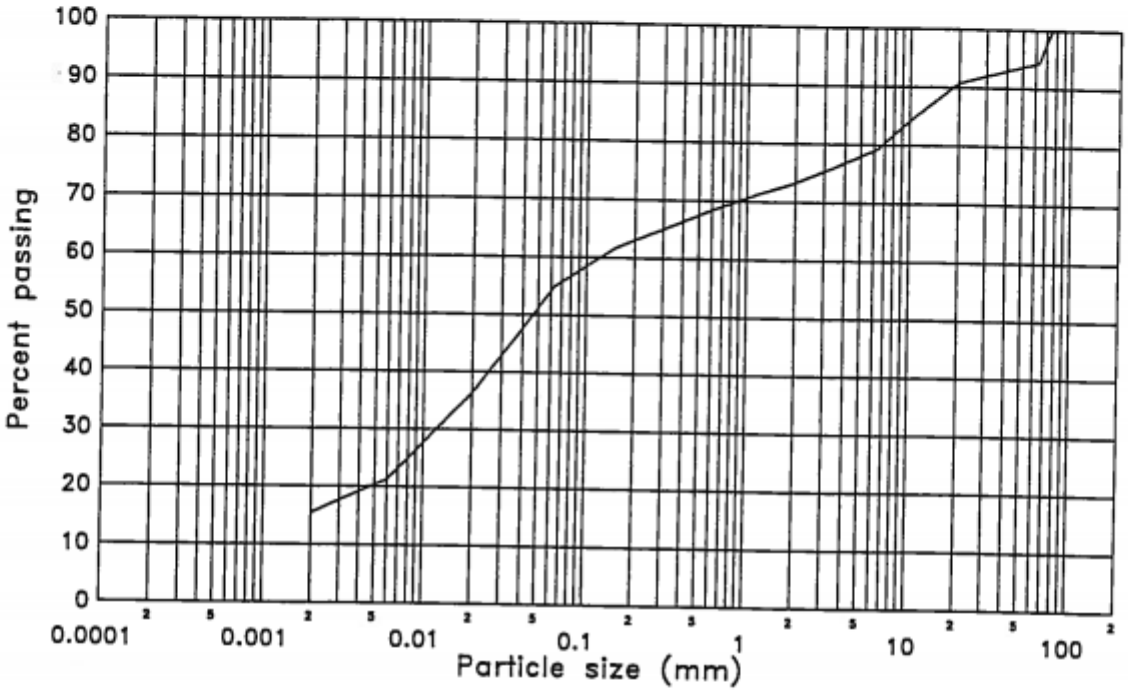
Figure No LT2/3

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: BH2	Sample No: 2	Sample Type: B	Depth: 0.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
15	40	18	21	6

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	Not Applicable

Description: Brown CLAY with a little gravel and a little sand

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HARTS FARM WAY

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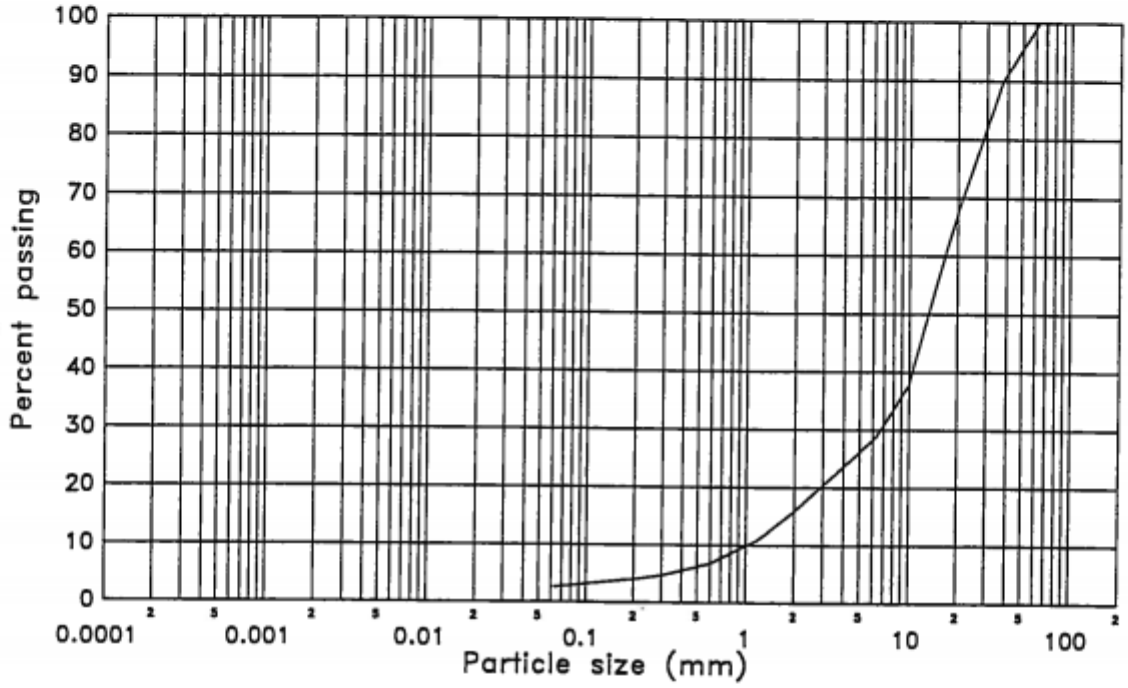
Figure No LT2/4

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH2	Sample No: 5	Sample Type: B	Depth: 2.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	3	13	84	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some sand and a little silt
Uniformity Coefficient:	12.7	

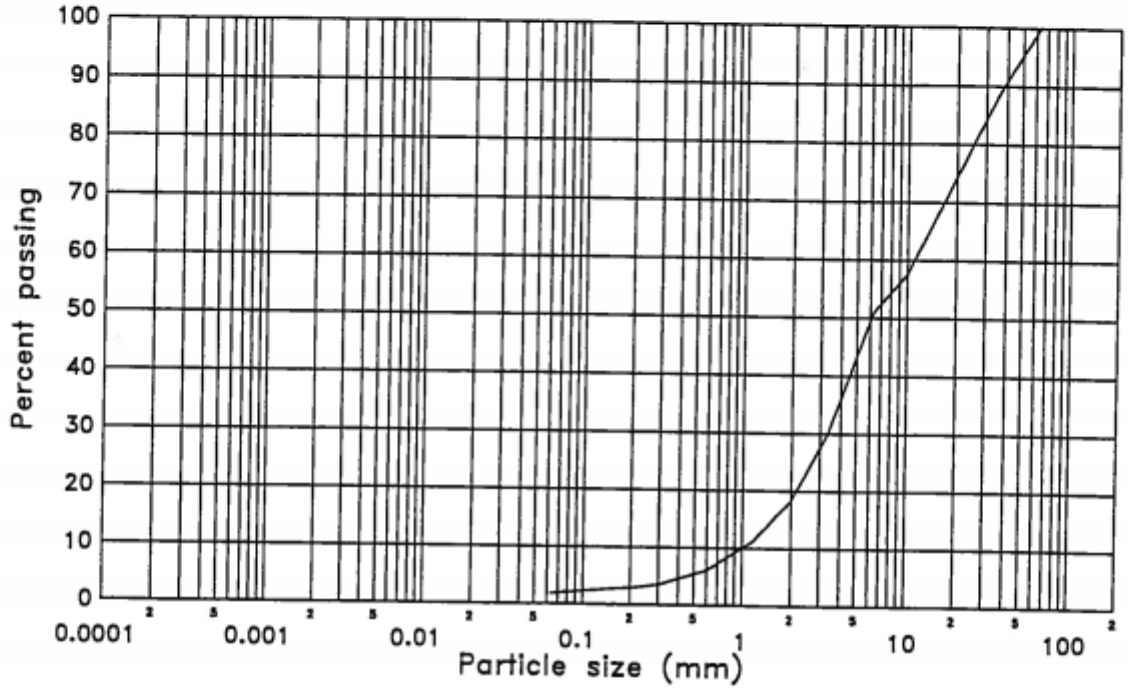
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FOUNDATION & EXPLORATION SERVICES	Proje HARTS FARM WAY	Contract No B01429	
		Figure No LT2/5	105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH2	Sample No: 8	Sample Type: B	Depth: 3.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	2	16	82	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some sand and a little silt
Uniformity Coefficient:	10.5	

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FOUNDATION & EXPLORATION SERVICES

HARTS FARM WAY

Contract No B01429

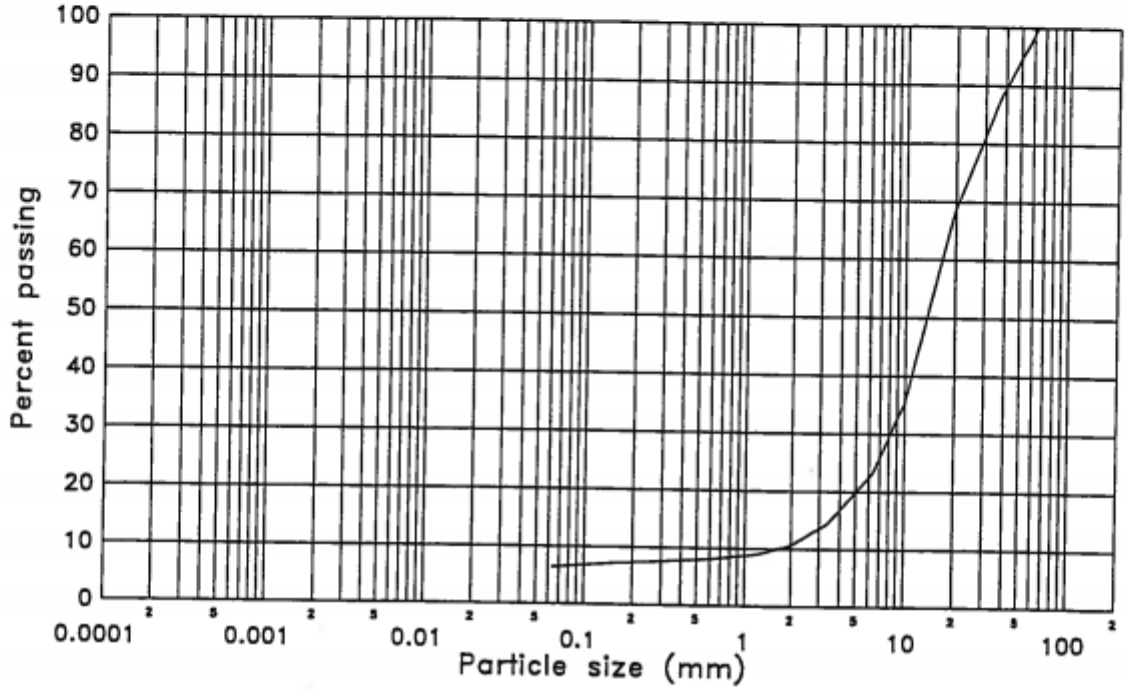
Figure No LT2/6

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH3	Sample No: 4	Sample Type: B	Depth: 1.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with
BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	6	5	89	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some silt and some sand
Uniformity Coefficient:	7.8	

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Contract No B01429

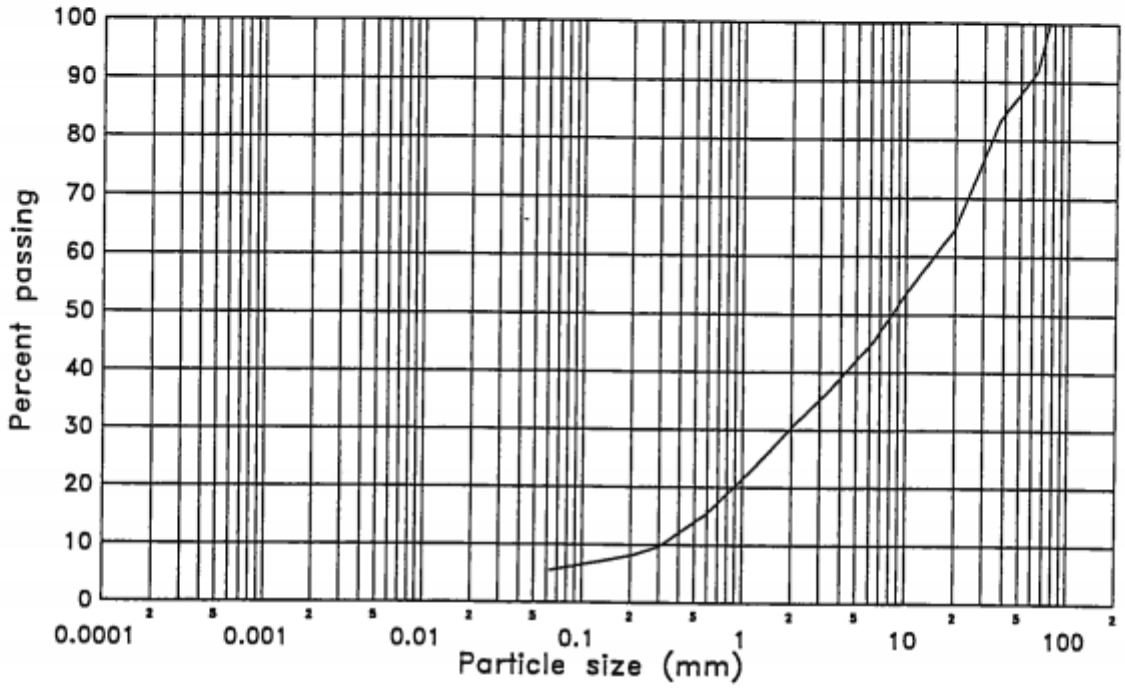
Figure No LT2/7

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH3	Sample No: 8	Sample Type: B	Depth: 3.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with
BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	6	24	62	8

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with much sand and some silt
Uniformity Coefficient:	39.7	

Inp [redacted] Date 5.3.02

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Pro [redacted] HARTS FARM WAY

Contract No B01429

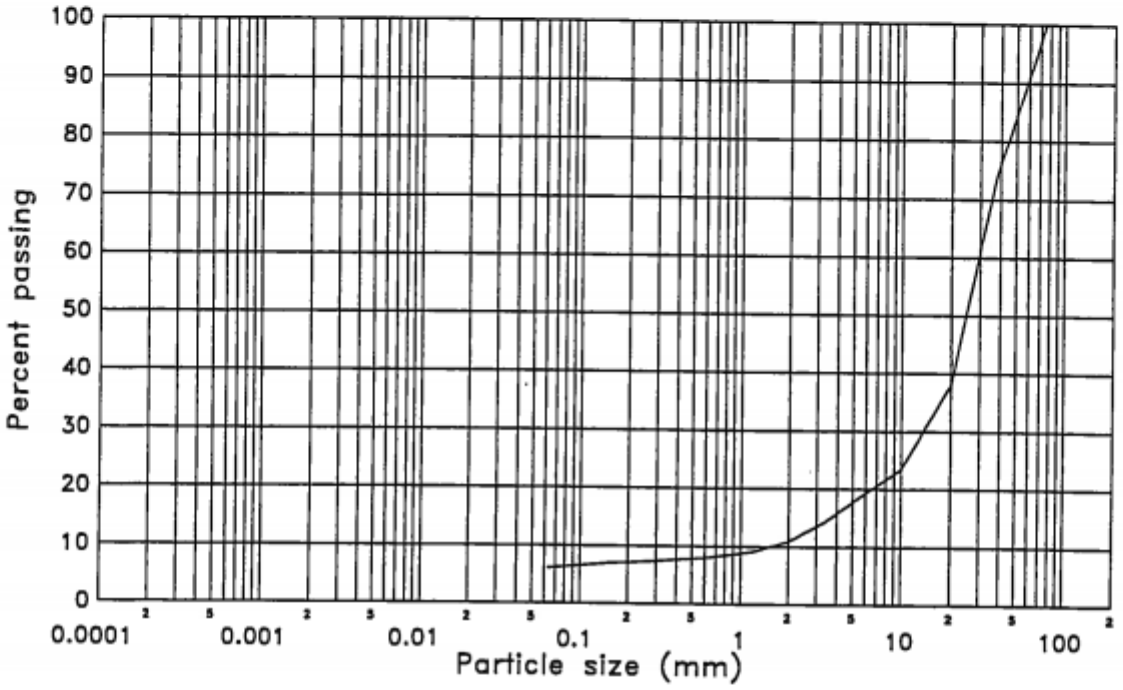
Figure No LT2/8

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH3	Sample No: 13	Sample Type: B	Depth: 7.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	6	5	82	7

Loss on Pretreatment: Not Applicable
Test Date: 25/02/2002
Uniformity Coefficient: 19.2

Description
Brown GRAVEL with some cobbles some silt and some sand

[redacted]

Date 5.3.02

FOUNDATION & EXPLORATION SERVICES

HARTS FARM WAY

Contract No B01429

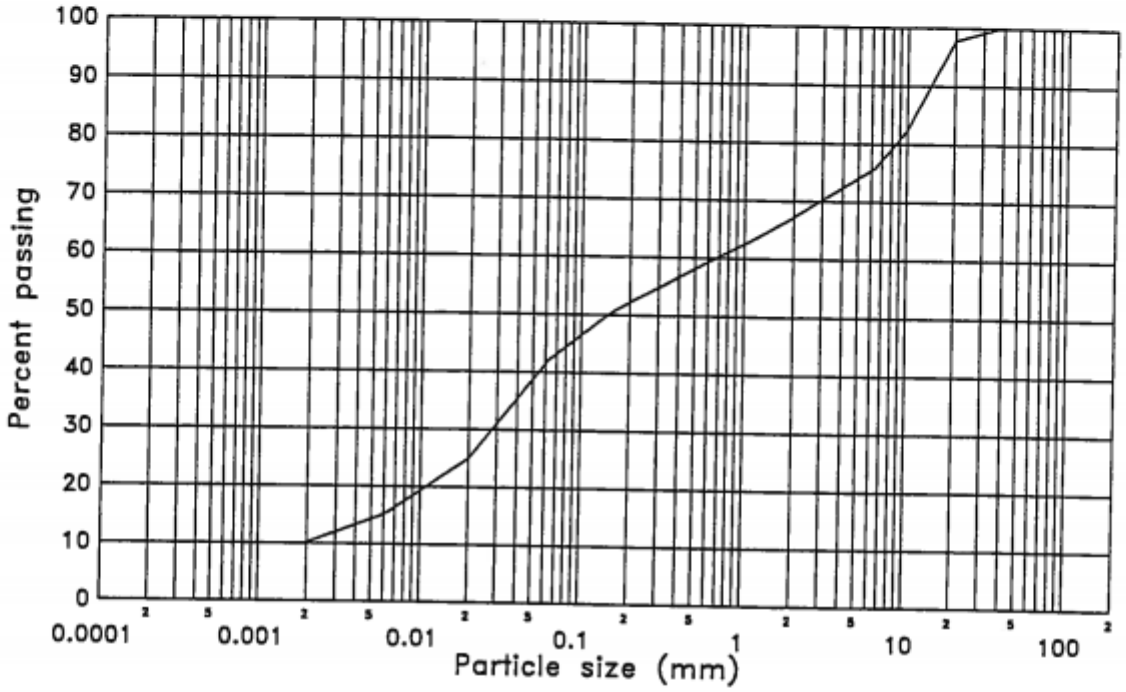
Figure No LT2/9

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH4	Sample No: 2	Sample Type: B	Depth: 0.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
10	32	25	33	0

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	Not Applicable

Description
Brown CLAY with a little gravel and a little sand

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Date 1.3.02

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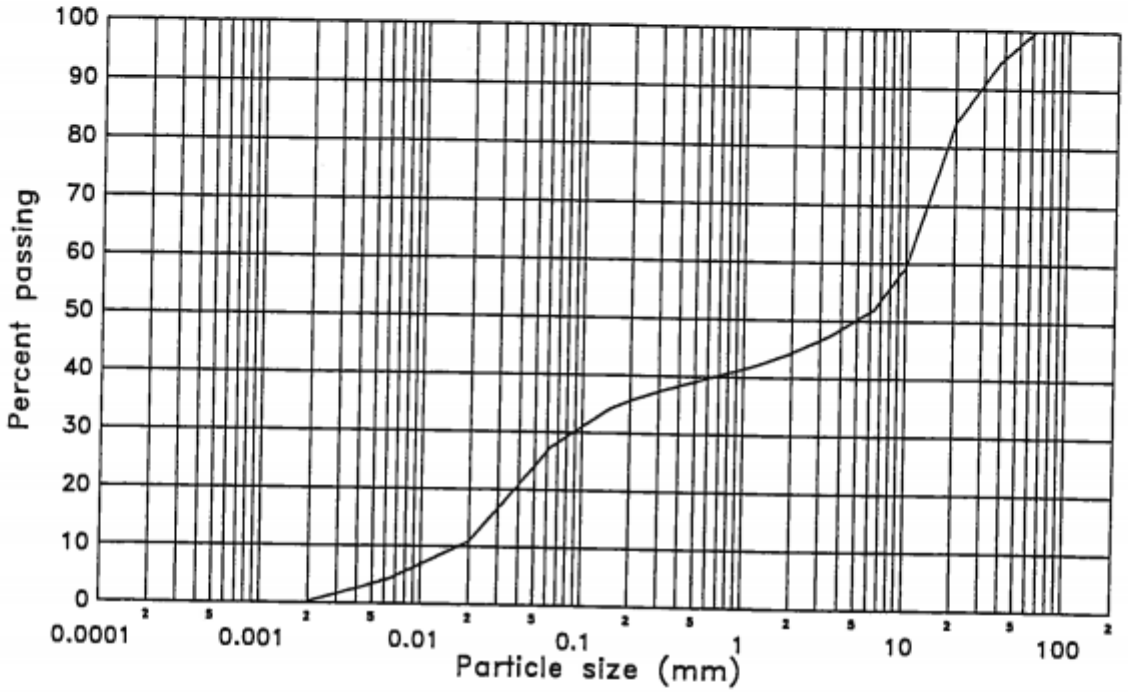
Figure No LT2/10

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: BH4	Sample No: 4	Sample Type: B	Depth: 1.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	27	17	56	0

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	590.3

Description
Brown GRAVEL with much silt and some sand

Inpu [redacted]

Date 5.3.02

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Contract No B01429

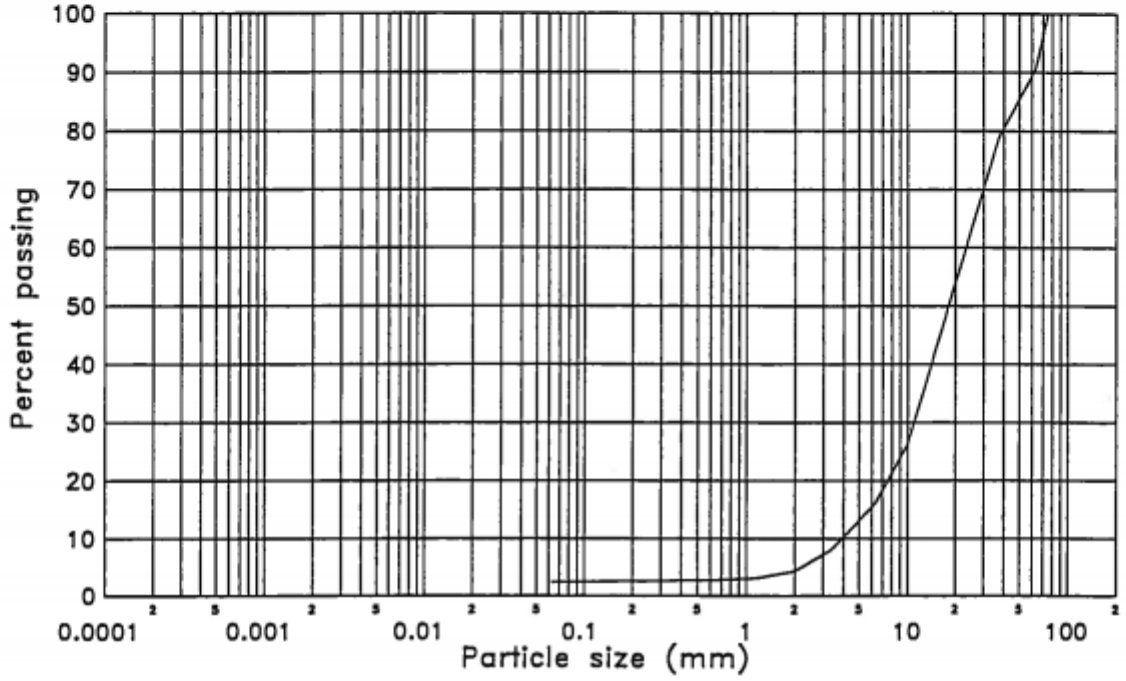
Figure No LT2/11

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH4	Sample No: 10	Sample Type: B	Depth: 3.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	2	2	87	9

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some cobbles a little sand and a little silt
Uniformity Coefficient:	6.3	

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FOUNDATION & EXPLORATION SERVICES

Project

Contract No B01429

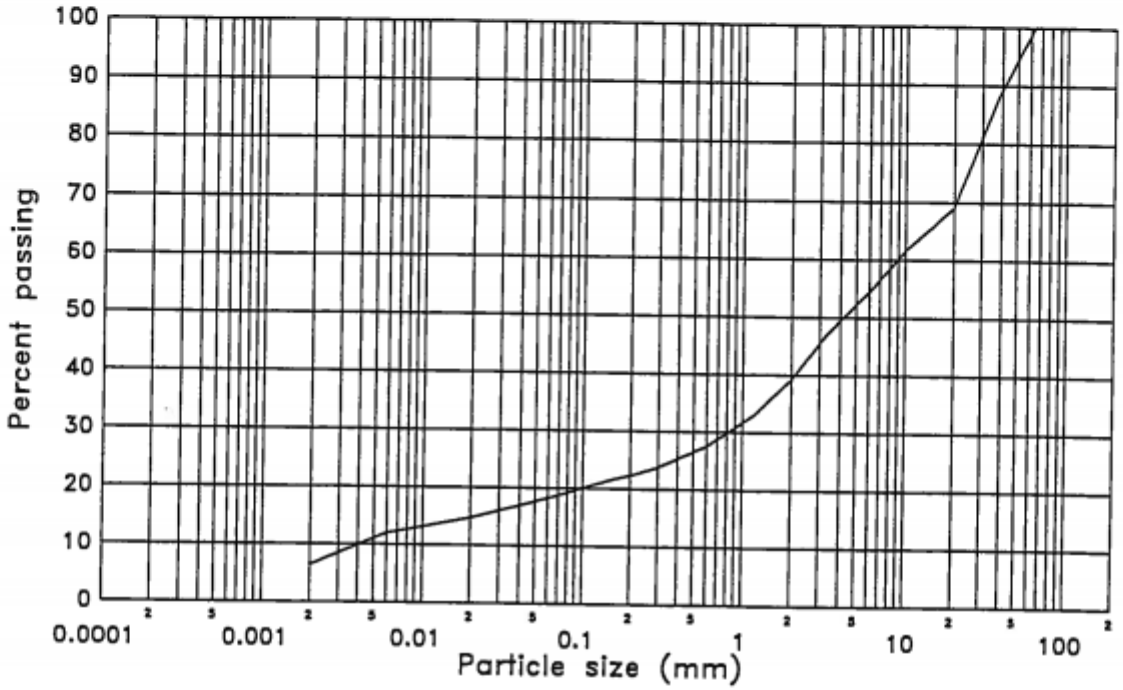
Figure No LT2/12

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: BH4	Sample No: 14	Sample Type: B	Depth: 6.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
6	12	21	61	0

Loss on Pretreatment: Not Applicable
Test Date: 25/02/2002
Uniformity Coefficient: 2186.3

Description
Brown GRAVEL with much sand and some clay

[redacted]

Date 6.3.02

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Contract No B01429

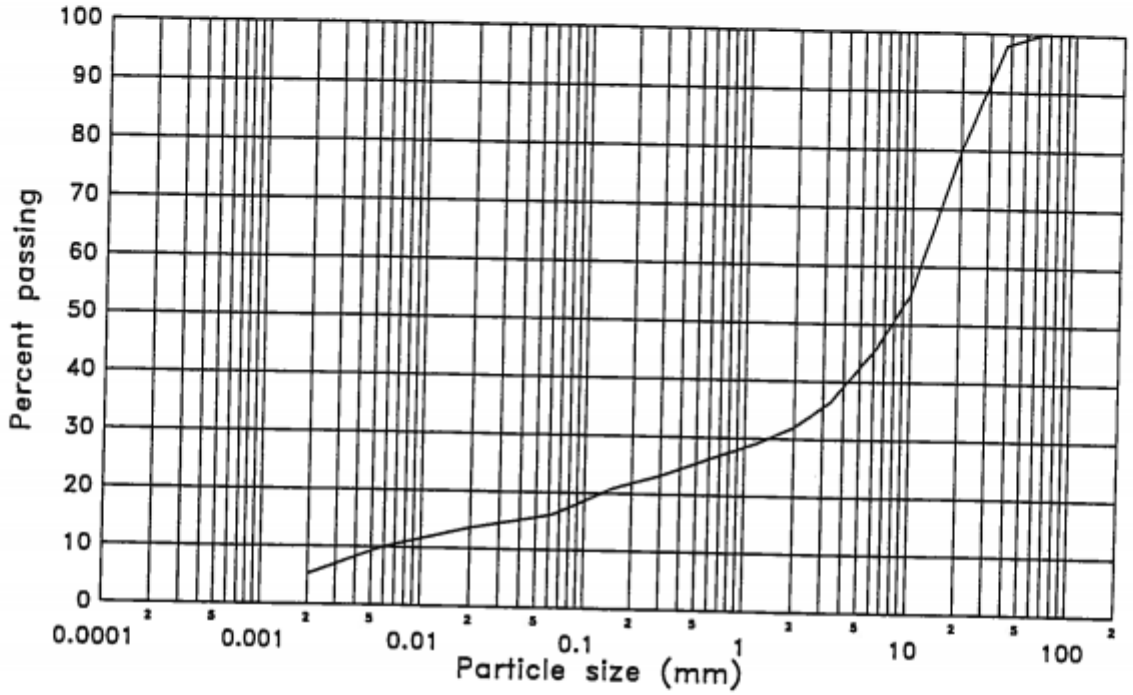
Figure No LT2/13

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: BH5	Sample No: 2	Sample Type: B	Depth: 0.55



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
5	11	16	68	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some sand and some clay
Uniformity Coefficient:	1807.4	

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Date 5.7.02.

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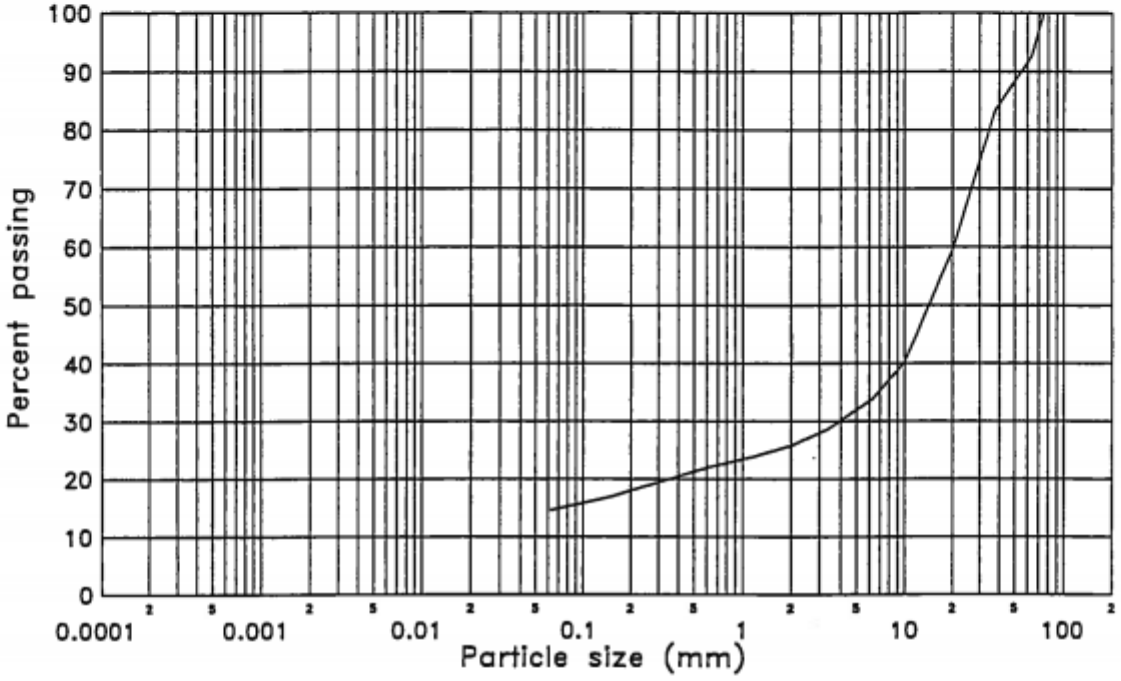
Contract No B01429

Figure No LT2/14

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH5	Sample No: 4	Sample Type: B	Depth: 1.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with
BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	15	11	67	7

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some clay some sand and some cobbles
Uniformity Coefficient:	461.8	

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Date 5.3.02

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Contract No B01429

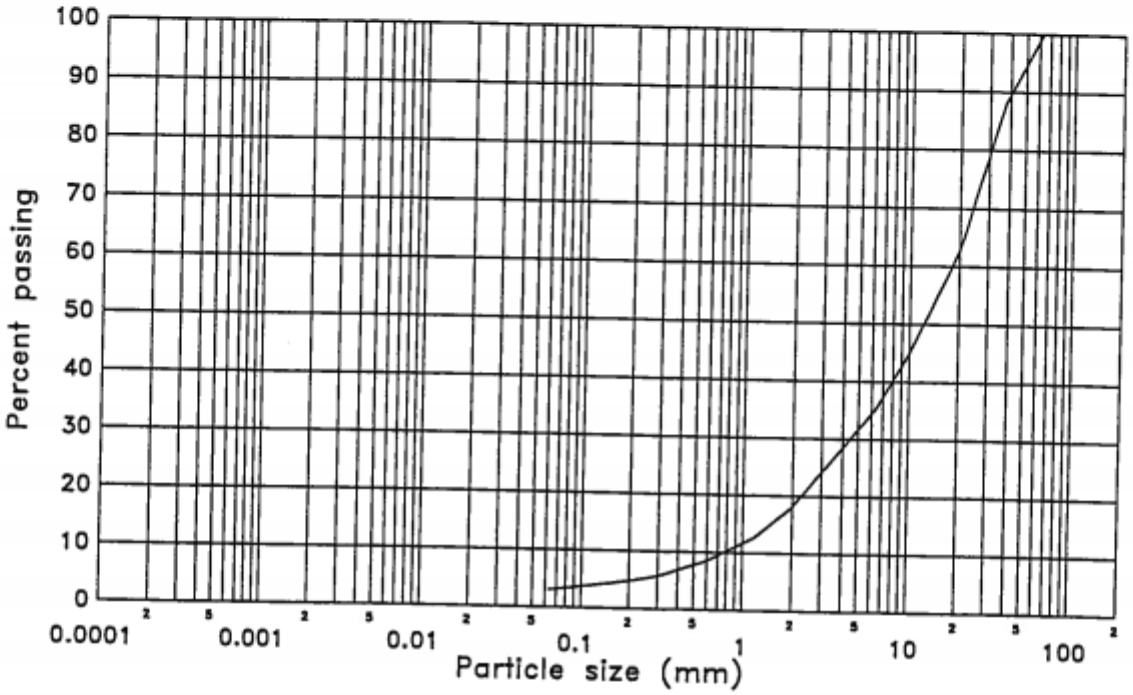
Figure No LT2/15

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH5	Sample No: 5	Sample Type: B	Depth: 1.60



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	3	15	82	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with some sand and a little silt
Uniformity Coefficient:	17.4	

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Date 5-3-02

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Contract No B01429

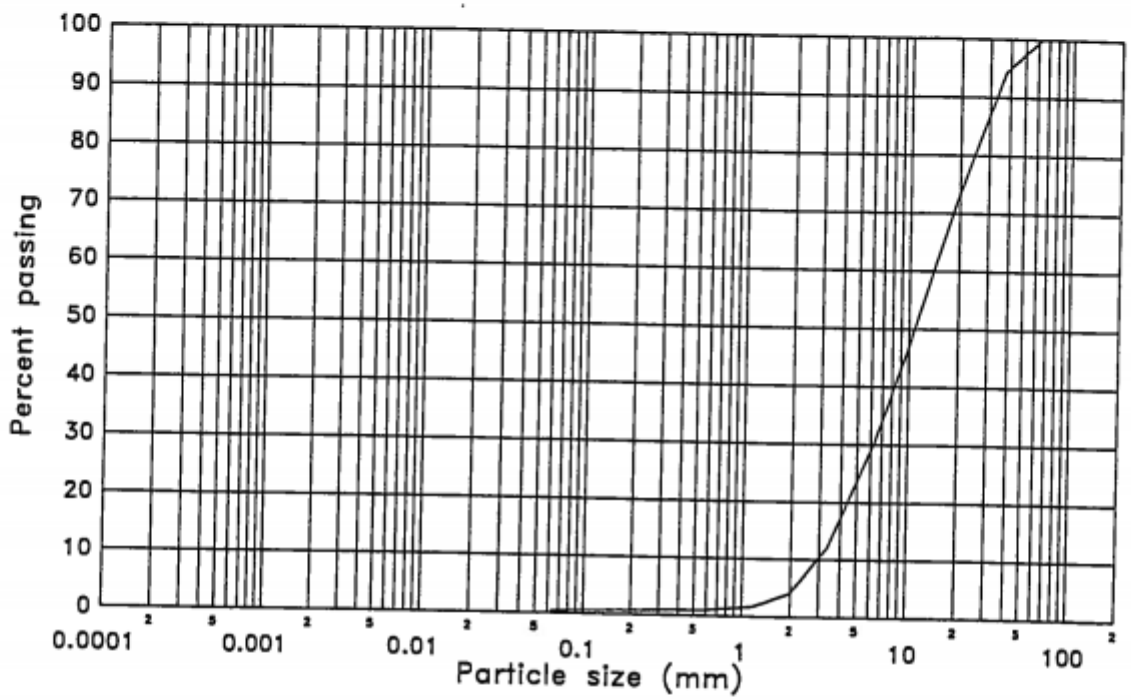
Figure No LT2/16

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: BH6	Sample No: 6	Sample Type: B	Depth: 1.45



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	0	4	96	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with a little sand
Uniformity Coefficient:	4.0	

Input b [redacted] Date 5.3.02.

FOUNDATION & EXPLORATION SERVICES

Project HARTS FARM WAY

Contract No B01429

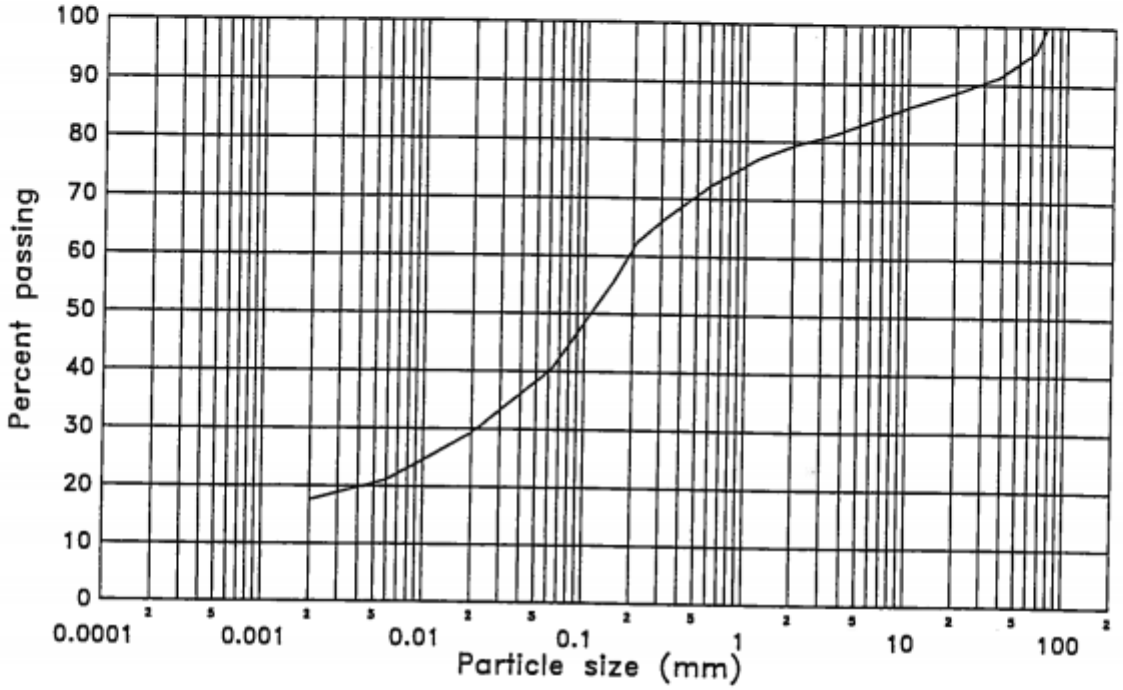
Figure No LT2/18

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP1	Sample No: 6	Sample Type: B	Depth: 1.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
18	23	38	17	4

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown CLAY with some sand a little gravel and occasional cobbles
Uniformity Coefficient:	Not Applicable	

[redacted]

Date 6.3.02

FOUNDATION & EXPLORATION SERVICES

HARTS FARM WAY

Contract No B01429

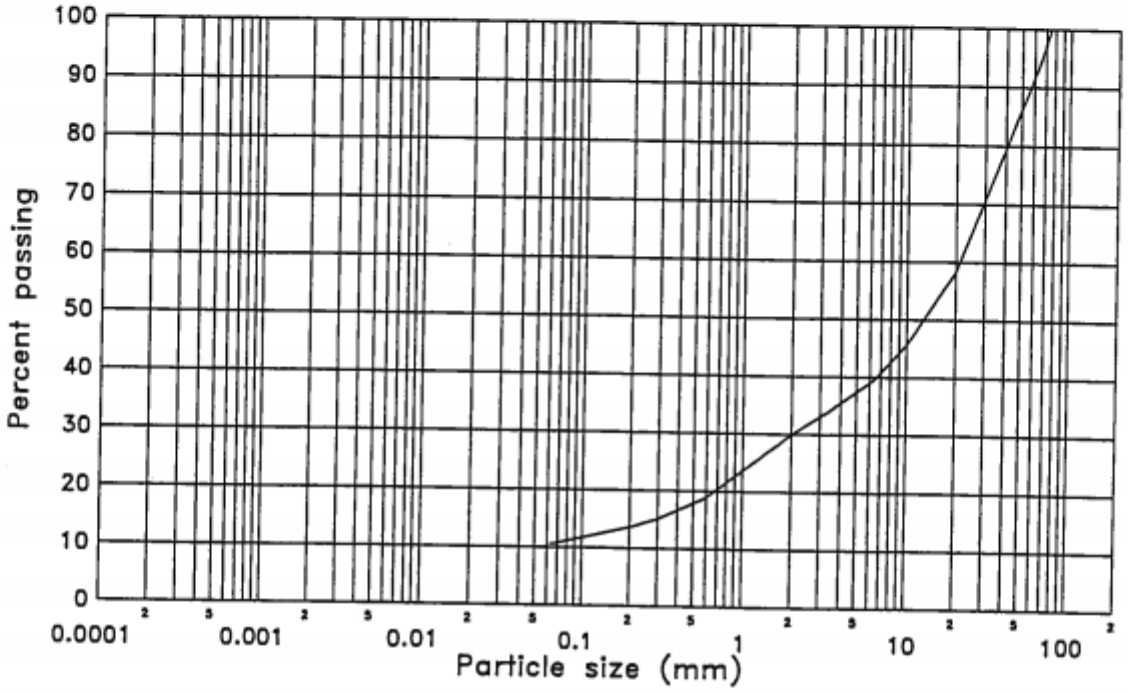
Figure No LT2/19

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: TP1	Sample No: 8	Sample Type: B	Depth: 1.70



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with
BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	11	19	63	7

Loss on Pretreatment:	Not Applicable	Description
Test Date:	14/02/2002	Yellow brown GRAVEL with some sand some silt and some cobbles
Uniformity Coefficient:	354.6	

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FOUNDATION & EXPLORATION SERVICES

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Contract No B01429

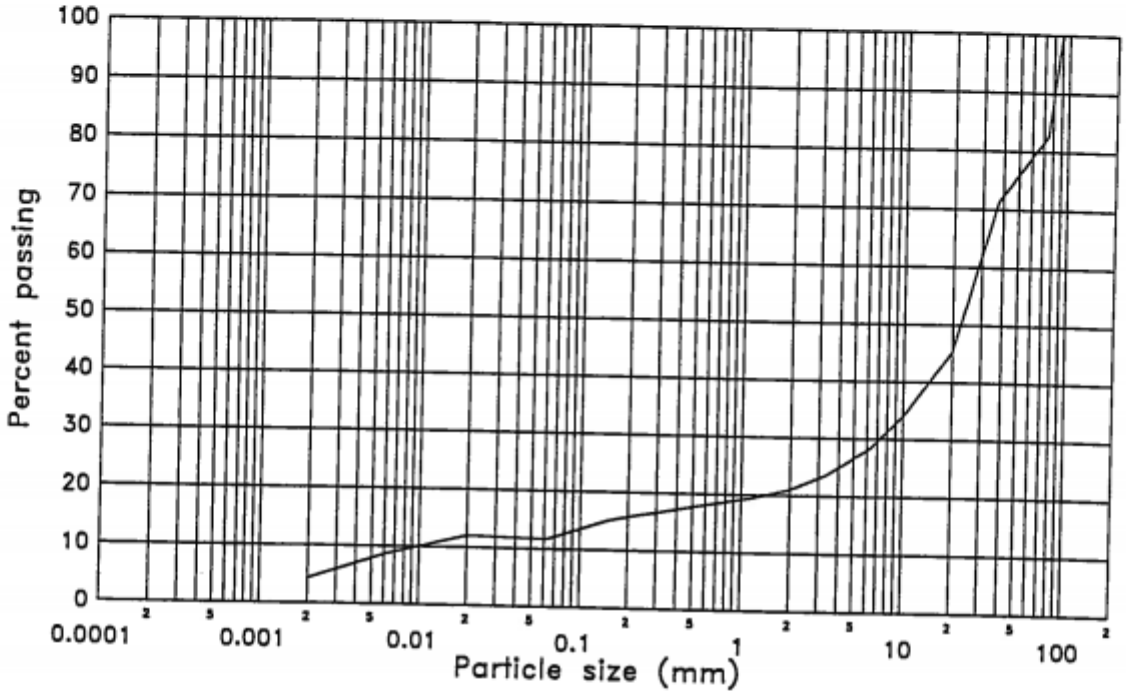
Figure No LT2/20

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP2	Sample No: 6	Sample Type: B	Depth: 1.30



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
4	8	9	62	17

Loss on Pretreatment: Not Applicable
Test Date: 25/02/2002
Uniformity Coefficient: 2897.0

Description
Brown GRAVEL with some cobbles some silt and some sand

Input [redacted] Date 6.3.02

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Project [redacted] HARTS FARM WAY

Contract No B01429

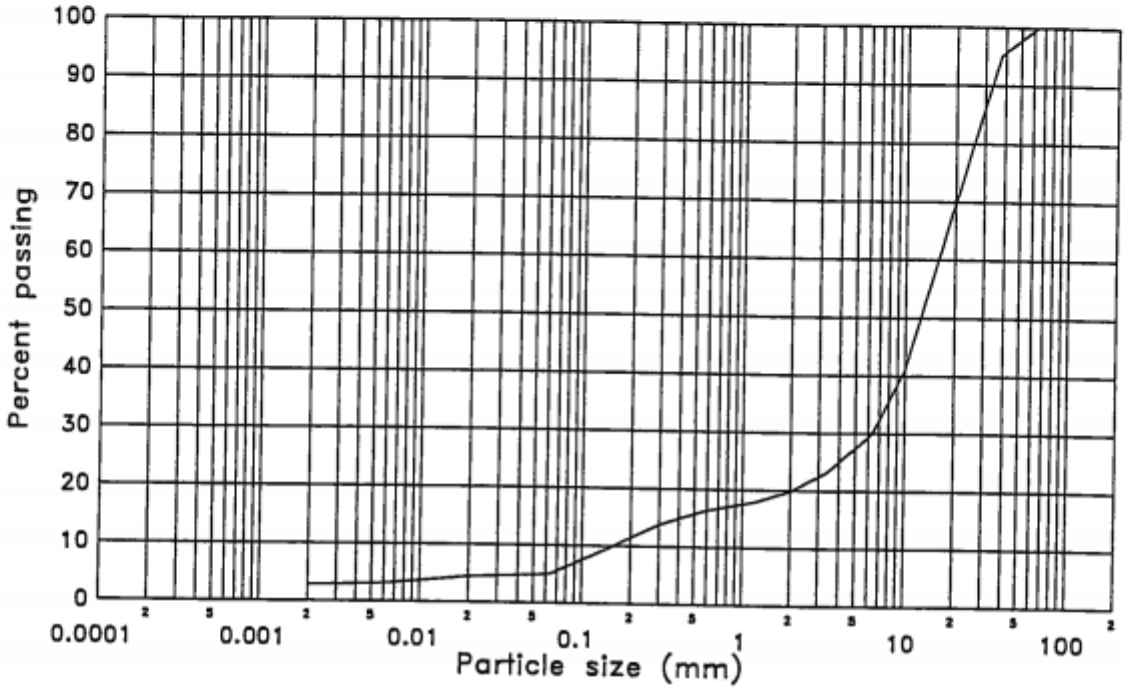
Figure No LT2/21

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP3	Sample No: 7	Sample Type: B	Depth: 1.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
3	2	15	80	0

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	79.3

Description
Grey brown GRAVEL with some sand and some clay

[redacted]

Date 5.3.02.

FOUNDATION & EXPLORATION SERVICES

HARTS FARM WAY

Contract No B01429

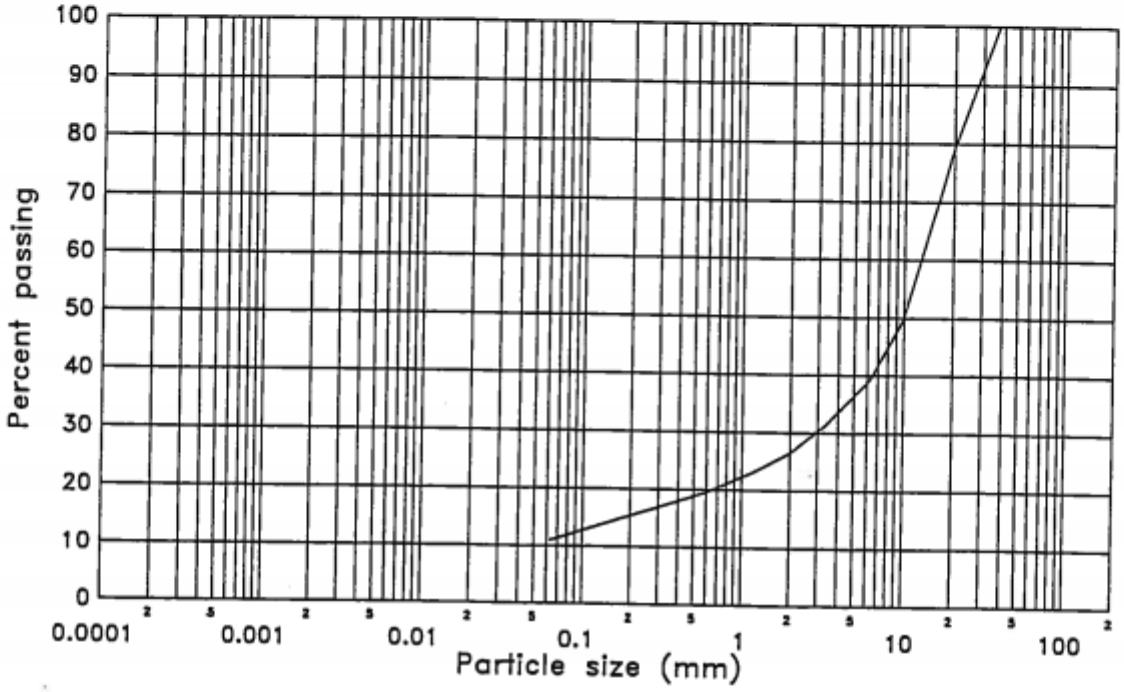
Figure No LT2/22

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: TP4	Sample No: 4	Sample Type: D	Depth: 0.30



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	11	16	73	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	14/02/2002	Red brown GRAVEL with some sand and some silt
Uniformity Coefficient:	197.7	

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Date 13.3.02.

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Contract No B01429

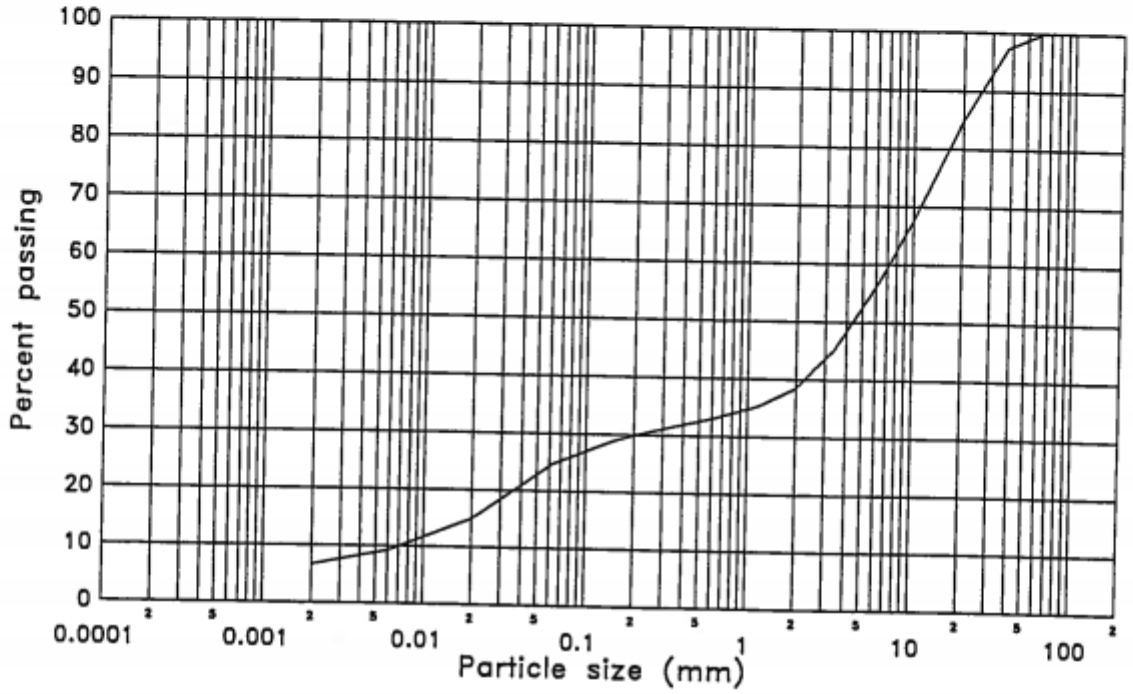
Figure No LT2/23

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP5	Sample No: 6	Sample Type: B	Depth: 0.30



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
7	18	14	61	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with much clay and some sand
Uniformity Coefficient:	1021.5	

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Date 6.3.02

FOUNDATION & EXPLORATION SERVICES

Contract No B01429

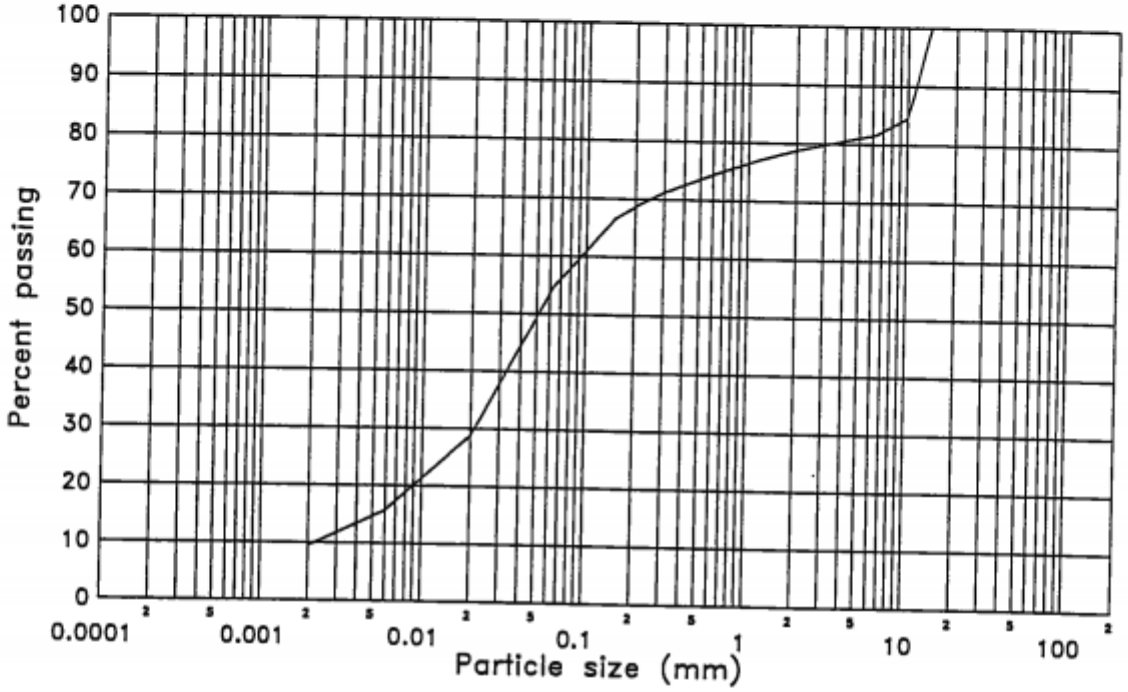
Figure No LT2/24

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP6	Sample No: 5	Sample Type: D	Depth: 0.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Insufficient material to comply with BS1377 - treat results with caution

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
9	46	24	21	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	14/02/2002	Brown SILT with a little sand and a little gravel
Uniformity Coefficient:	31.0	

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Date 13.2.02

FOUNDATION & EXPLORATION SERVICES

Contract No B01429

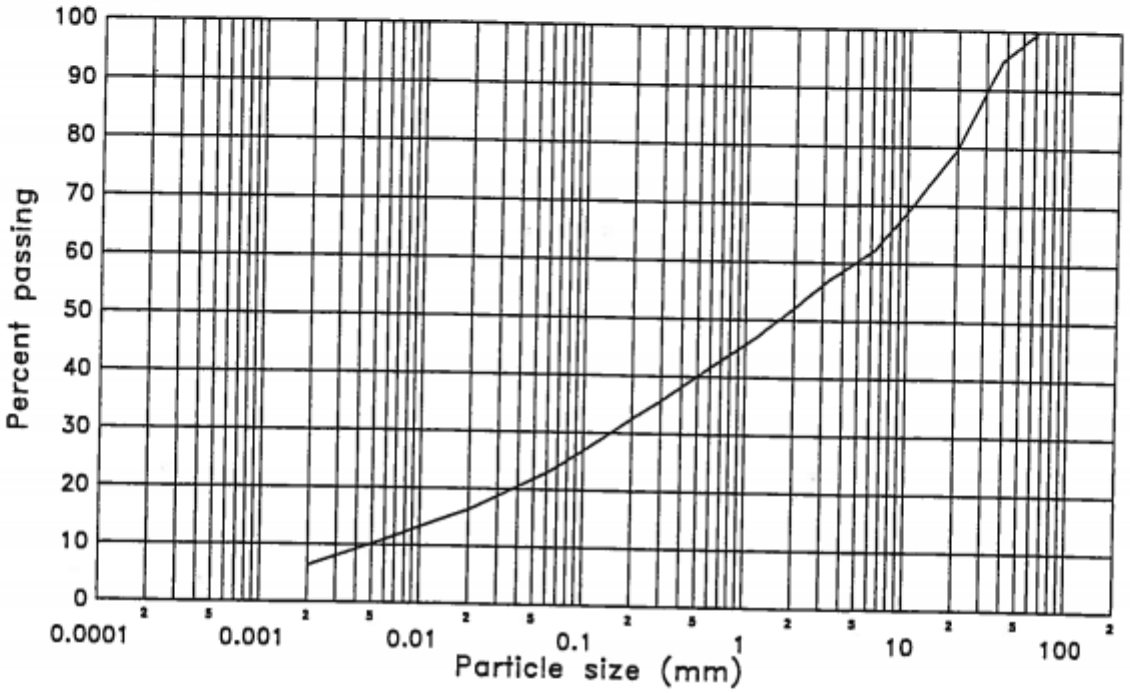
Figure No LT2/25

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP6	Sample No: 7	Sample Type: B	Depth: 1.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
6	17	29	48	0

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	873.6

Description
Black brown GRAVEL with much sand and much organic clay

[redacted]

Date 6.3.02

FOUNDATION & EXPLORATION SERVICES

Contract No B01429

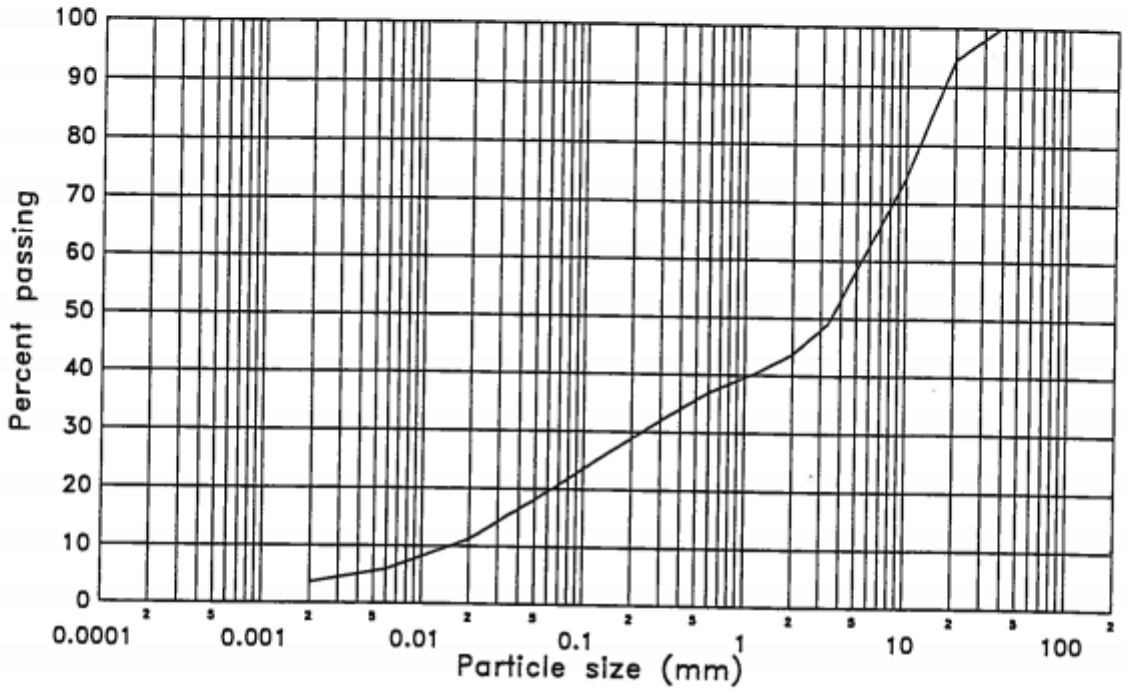
Figure No LT2/26

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP7	Sample No: 6+7	Sample Type: D	Depth: 0.90



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
4	16	24	56	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	25/02/2002	Brown GRAVEL with much sand and some to much clay
Uniformity Coefficient:	300.5	

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3.02

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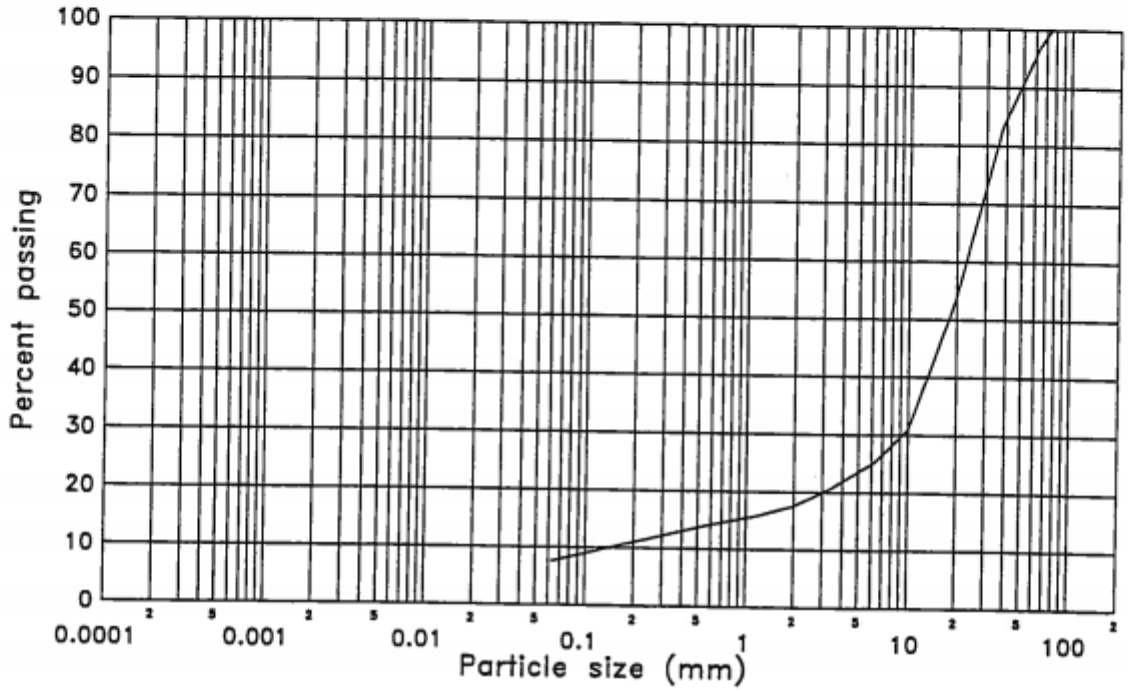
Figure No LT2/27

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3/9.4/9.5~~

Sample Details			
Borehole No: TP7	Sample No: 10	Sample Type: B	Depth: 2.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	8	10	79	3

Loss on Pretreatment: Not Applicable
Test Date: 25/02/2002
Uniformity Coefficient: 307.8

Description
Brown GRAVEL with some sand some clay and occasional cobbles

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Date 5.3.02.

FOUNDATION & EXPLORATION SERVICES

Contract No B01429

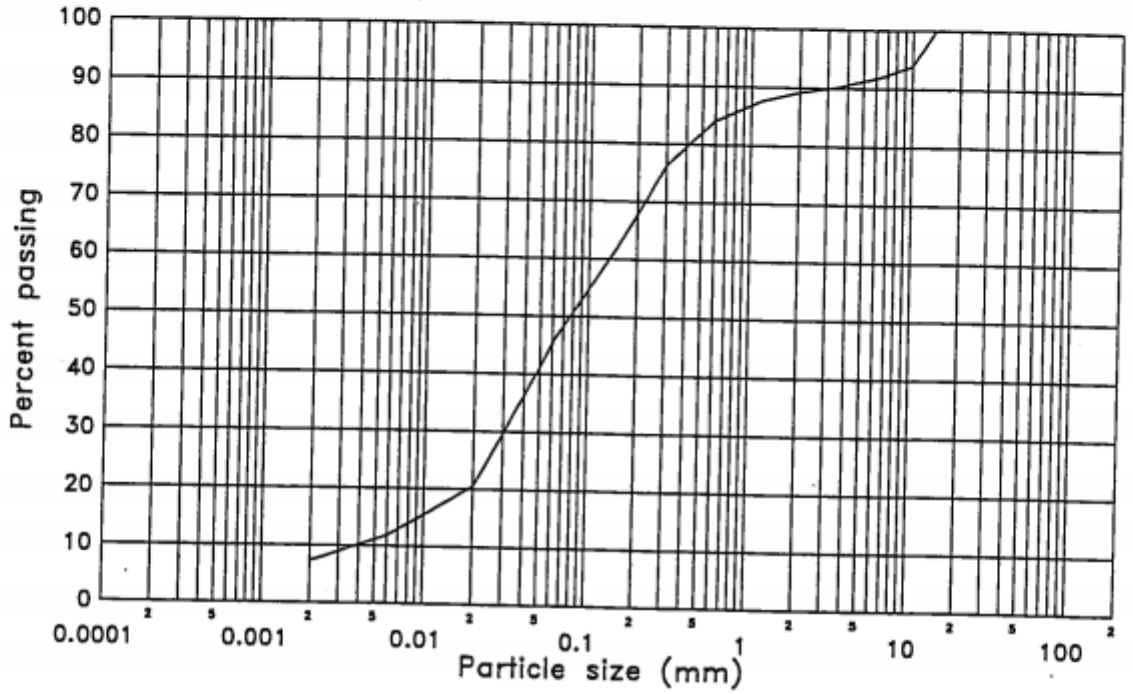
Figure No LT2/28

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP8	Sample No: 2+3	Sample Type: D	Depth: 0.15



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
7	39	43	11	0

Loss on Pretreatment:	Not Applicable	Description
Test Date:	14/02/2002	Brown SILT with some sand and a little gravel
Uniformity Coefficient:	19.0	

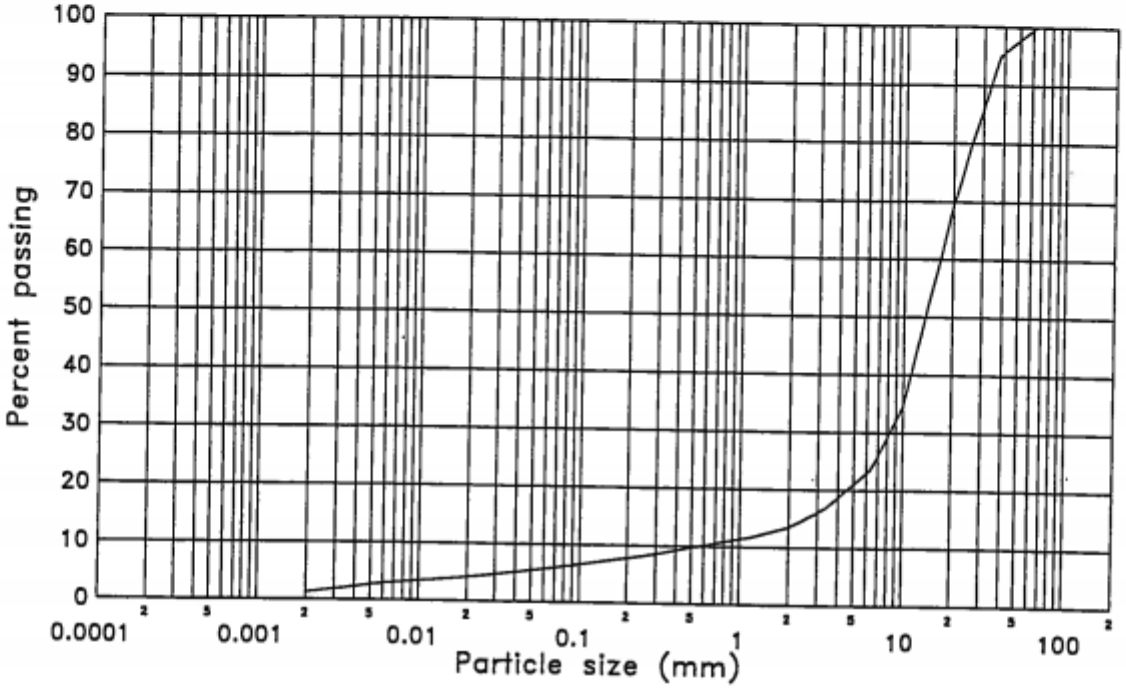
		Input [redacted]	Date 13.2.02	
FOUNDATION & EXPLORATION SERVICES		Proje HARTS FARM WAY	Contract No B01429	
			Figure No LT2/29	

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/~~9.3~~/9.4/~~9.5~~

Sample Details			
Borehole No: TP8	Sample No: 9	Sample Type: B	Depth: 2.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
1	5	8	86	0

Loss on Pretreatment:	Not Applicable
Test Date:	25/02/2002
Uniformity Coefficient:	31.4

Description
Brown GRAVEL with some sand and some clay

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Date 6.3.02

FOUNDATION & EXPLORATION SERVICES

Contract No B01429

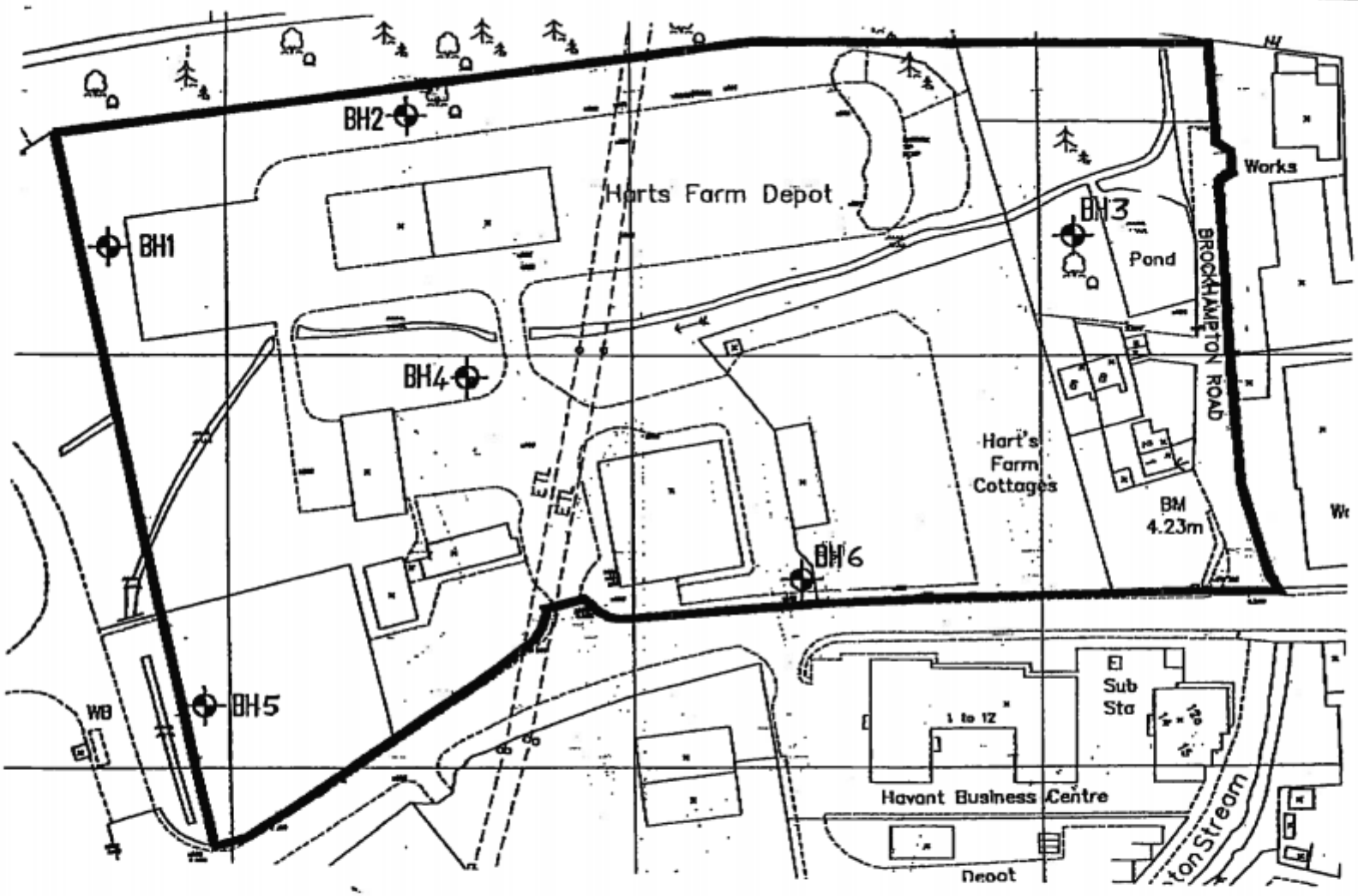
Figure No LT2/30

105/03

APPENDIX D

DRAWINGS

EXPLORATORY HOLE LOCATION PLAN — Figures SP1 AND SP2

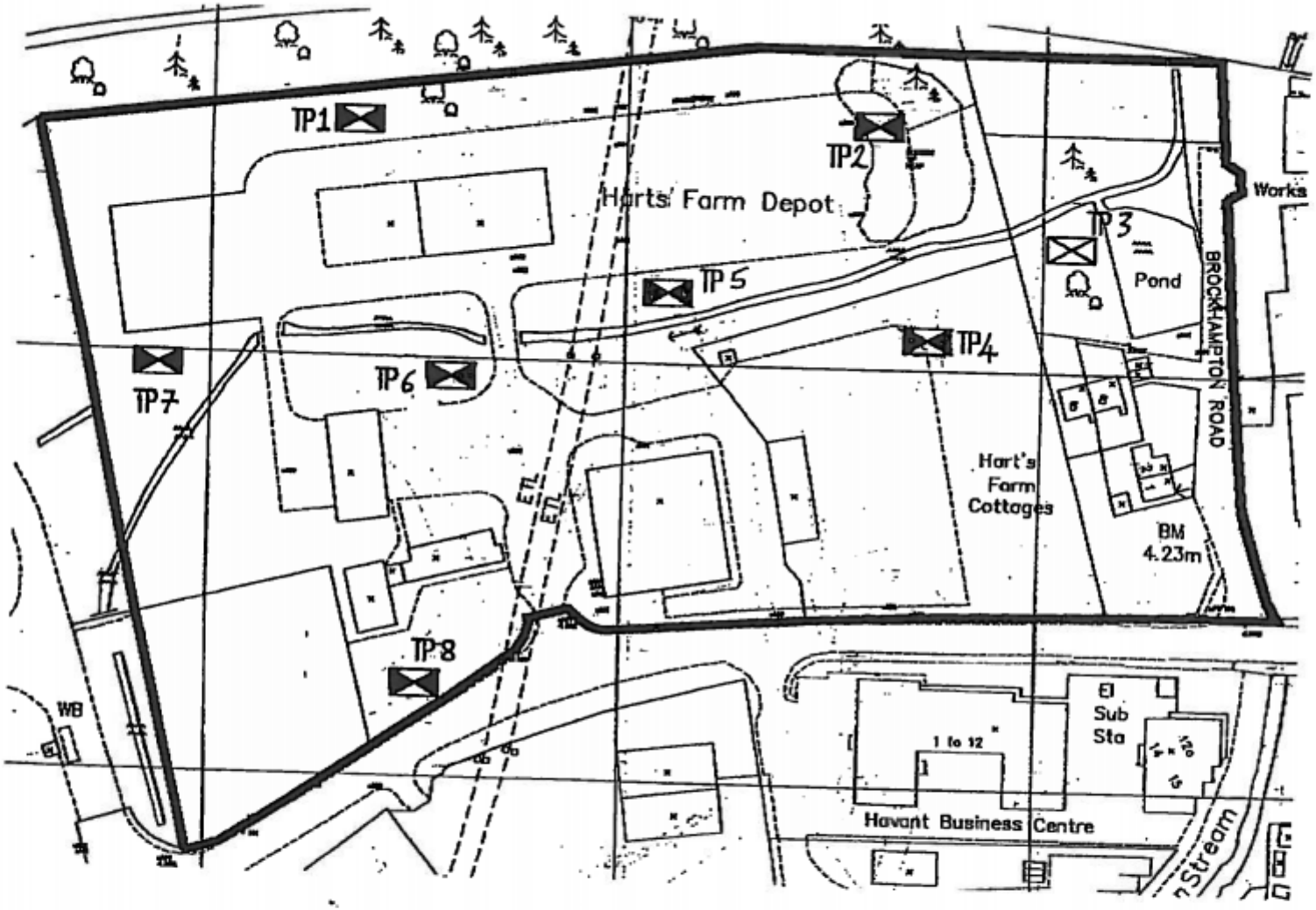


Borehole Location Plan

Not To Scale

Based on Drawing Provided By Robert West Consulting

		Input by	Date	Checked by	Date		
				IPJ	12/04/02		
UNDATION EXPLORATION VICES		Project	Harts Farm Depot Havent			Contract No	B01429
						Figure No	SP1



Trial Pit Location Plan

Not To Scale

Based on Drawing Provided By Robert West Consulting

		Input by	Date	Checked by	Date		
FOUNDATION & EXPLORATION SERVICES				IPJ	12/04/02		
	Project	Harts Farm Depot Havent				Contract No	B01429
						Figure No	SP2

APPENDIX E

GUIDANCE NOTES

Geotechnical Testing Schedules of UKAS Accreditation

Standard Protocols for Water/Gas Sampling and Gas Monitoring Figure PCL/01

SCHEDULE OF UKAS ACCREDITED LABORATORY TESTS FOR SOILS FOR CIVIL ENGINEERING PURPOSES

Types of Test/Properties Measured Range of Measurement		Standard Specification Equipment/Techniques Used
Physical Tests	Moisture content - oven drying method	BS 1377: Part 2: 1990
	Saturation moisture content of chalk	BS 1377: Part 2: 1990
	Liquid limit - cone penetrometer	BS 1377: Part 2: 1990
	Liquid limit - cone penetrometer, one point method	BS 1377: Part 2: 1990
	Plastic limit	BS 1377: Part 2: 1990
	Plasticity index and liquidity index	BS 1377: Part 2: 1990
	Density - linear measurement	BS 1377: Part 2: 1990
	Density - immersion in water	BS 1377: Part 2: 1990
	Density - water displacement	BS 1377: Part 2: 1990
	Particle density - small pyknometer	BS 1377: Part 2: 1990
	Particle size distribution - wet sieving	BS 1377: Part 2: 1990
	Particle size distribution - dry sieving	BS 1377: Part 2: 1990
	Particle size distribution - sedimentation - pipette method	BS 1377: Part 2: 1990
	Dry density/moisture content relationship (2.5kg rammer)	BS 1377: Part 4: 1990
	Dry density/moisture content relationship (4.5kg rammer)	BS 1377: Part 4: 1990
	Dry density/moisture content relationship (vibrating hammer)	BS 1377: Part 4: 1990
	Moisture condition value (MCV)	BS 1377: Part 4: 1990
	Chalk crushing value	BS 1377: Part 4: 1990
	One-dimensional consolidation properties	BS 1377: Part 5: 1990
	Permeability in a hydraulic consolidation cell	BS 1377: Part 6: 1990
	Permeability in a triaxial cell	BS 1377: Part 6: 1990

Types of Test/Properties Measured Range of Measurement		Standard Specification Equipment/Techniques Used
Mechanical Tests	California Bearing Ratio (CBR) (loads from 0 to 20kN)	BS 1377: Part 4: 1990
	Shear strength - small shearbox (shear force from 0 to 5.0kN)	BS 1377: Part 7: 1990
	Shear strength - large shearbox (shear force from 0 to 48kN)	BS 1377: Part 7: 1990
	Unconfined compressive strength - load frame method (loads from 0 to 48kN)	BS 1377: Part 7: 1990
	Undrained shear strength - triaxial compression without measurement of pore pressure (loads from 0 to 48kN)	BS 1377: Part 7: 1990
	Undrained shear strength - triaxial compression with multistage loading and without measurement of pore pressure (loads from 0 to 48kN)	BS 1377: Part 7: 1990

PROCEDURES FOR WATER SAMPLING, GAS MONITORING AND GAS SAMPLING

This key sheet sets out in-house procedures for sampling groundwaters from monitoring wells and for gas monitoring and sampling gases from monitoring standpipes. Any deviations from these procedures (Client specified procedures) or additional steps are set out in the report text or on the monitoring data sheets. Results and details of equipment used are presented on the relevant datasheets in the appropriate appendix for field test results. Unless detailed below equipment is calibrated at regular intervals as specified by the manufacturer and calibration certificates can be supplied on request. Instrument limits of detection and reading accuracy are presented in the attached table and the reading presented on the data sheets should be read in conjunction with this information.

GAS MONITORING

In-situ measurements of gas concentrations, gas emission rate and in-situ differential pressure in the standpipes are made first when gas monitoring is required. The first reading is the in-situ differential pressure and air flow velocities in the standpipe. Soil gas concentrations are measured immediately following the measurements of in-situ differential pressure. Concentrations of methane (CH_4), and carbon dioxide (CO_2) and oxygen (O_2) are measured as standard. Where reported, concentrations of hydrogen sulphide and hydrogen cyanide are measured using individual gas pods attached to the GA90. Concentrations of volatile gases (VOC) are measured using a photo-ionisation detector calibrated on site against a standard reference gas (100ppm iso-butylene in air). The measurements are made both prior to and after soil gas concentrations. The in-situ differential pressure and air flow velocities are again measured following the measurement of soil gas concentrations if required. The groundwater level in the gas standpipes is measured following soil gas concentration monitoring. The recorded groundwater levels are given on the same summary tables as the gas monitoring results.

GAS SAMPLING

Samples of soil gas are collected from the gas standpipes immediately following the measurement of soil gas concentrations. The soil gas samples are collected using a Gresham hand pump. Reusable carbon coated sampling tubes purged prior to sampling by half filling and discharging three times with air. As a further check, pressure, flow and gas concentration measurements are recorded after taking the sample.

WATER SAMPLING

Each monitoring well is purged prior to water sampling by the removal of three well volumes (V multiplied by 3). A well volume is calculated from the height of the column of water in the standpipe (or for a sealed installation the thickness of the saturated zone surrounding the installation), the borehole diameter and the pipe diameter, taking account of the porosity of the gravel pack:

$$V = \pi \times H \times [r_p^2 + \tfrac{1}{4}(r_b^2 - r_p^2)] \times 1000 \text{ where}$$

H = length or height of water column
r_p = radius of pipe and
r_b = radius of borehole
All dimensions are in metres and the volume (V) is given in litres.

Field measurements of pH, electrical conductivity and temperature are made during purging if required.

Unless specified on the data sheets groundwater samples are collected immediately after purging. Field measurements of pH, electrical conductivity, temperature and redox potential are generally carried out as standard on a sub sample. Dissolved oxygen is also carried out where required. The instruments are calibrated prior to each use or each day, whichever is the lesser, against standard reference solutions.

The sample handling (filtration and preservation), storage and transportation arrangements are detailed on the data sheets. In general, samples will be stored in insulated boxes with frozen ice blocks and transported to the designated laboratory for filtering and preservation as deemed appropriate by the laboratory and necessary to comply with their in-house procedures/methodologies or according to Client specifications if instructed prior to sampling.

ENVIRONMENTAL MONITORING AND ON SITE TESTING EQUIPMENT

Instrument	Parameter	Range	Accuracy
Infra-red Gas Analyser GA90 Geotechnical Instruments	Methane Carbon Dioxide Oxygen Hydrogen Sulphide Hydrogen Cyanide	0 - 5 % (LEL) 5 - 15% (UEL) >15% 0 - 5 % 5 - 15% 15 - 50%(max) 0 - 21% (max) 0 - 50 ppm 0 - 100 ppm	±0.5 % ±1.0 % ±3.0 % ±0.5 % ±1.0 % ±3.0 % ±1.0 % to 0.1 ppm to 1 ppm
Infra-red Gas Analyser Analox 1200 Geotechnical Instruments	Methane Carbon Dioxide Oxygen	0 - 5% (LEL) 5 - 15% (UEL) >15% 0 - 5% 5 - 15% 15 - 50%(max) 0 - 30% (max)	±0.5 % ±1.0 % ±3.0 % ±0.5 % ±1.0 % ±3.0 % ±1.0 %
Intrinsically Safe Gas Monitor Exotox 55 Neotronics	Carbon Monoxide Hydrogen Sulphide Oxygen Explosive Gases (includes most hydrocarbons)	0 - 999ppm 0 - 500ppm 0 - 32% 0 - 100% (LEL)	to 1ppm to 1ppm ±0.1% ±1.0 %
Intrinsically Safe Gas Monitor Exotox 50 Neotronics	Carbon Dioxide Hydrogen Sulphide Oxygen Explosive Gases (includes most hydrocarbons)	0 - 5.0% 0 - 500ppm 0 - 32% 0 - 100% (LEL)	±0.1% to 1ppm ±0.1% ±1.0 %
Landfill Gas Flow Meter GF60P Gas Data	Gas flow Gas pressure	+60/-6 l/hr +300/-30 Pa	±2% full scale ±2% full scale
Thermal Anemometer TA-5 Airflow	Gas flow	0 - 30 m/s	0 - 2 m/s ±2% reading ±0.005m/s, 2 -30 m/s ±2% reading ±0.2m/s
Micro-manometer P200UL Digitron	Gas pressure	0-199.9, 0-500mbar 0-19.9, 0-50.0kPa 0-1.999,0-5.10mH_2O	0.15% of reading+0.15% full scale +1 digit
Gas/Water Temperature Meter TES	Temperature	-50 to 1300°C	At 0.1°C resolution: ±(0.3% + 1°C)
Gas Sampling Pump Draeger			
Gas Sampling Pump Gresham			
Photo-Ionization Detector MiniRAE2000 (Intrinsically Safe)	Volatile organic compounds	0-10,000ppm	<2000ppm ±2 ppm or <10%, >2000ppm ±20%

ENVIRONMENTAL MONITORING AND ON SITE TESTING EQUIPMENT

Instrument	Parameter	Range	Accuracy
Photo-Ionization Detector Photovac 2020 (Intrinsically Safe)	Volatile organic compounds	0.5 - 2,000ppm	±2 ppm or <10%
Scintillation Mini Monitor Series 900-Gamma Sources Mini-Instruments	Gamma Radiation	1-5000 c/s	±10%
Scintillation Mini Monitor Series 900-Beta Sources Mini-Instruments	Beta Radiation	0.5-2000 c/s	±10%
Air Sampling Pump AS408 Casella	Air sampling for acid mists & vapours, toxic dusts & fumes, & fibres	0.5 - 5l/min	Not provided
Personal Air Sampling Pump AFC 123 Casella	Air sampling for acid mists & vapours, toxic dusts & fumes, & fibres	1 - 2.3l/min	±5% for pressure drop of upto 40cms H_2O
Electrochemical On Site Water Meter Hanna Water Test	pH Redox Potential Conductivity Temperature	0 to 14 ±1000mV 0 to 1999µS/cm 0 - 60°C	to 0.1±0.2 to 1 mV ±5 to 1µS/cm ±2% fs to 0.1°C ±1°C
Dissolved Oxygen Meter Model 9150 Jenway	Dissolved Oxygen	0 to 19.99mg/l	0.01mg/l ±2%
Dissolved Oxygen Meter Model 9071 (serial 1754) Jenway	Dissolved Oxygen Temperature	0 to 200% 0 to 19.99mg/l (ppm) -30 to +150°C	±2% full scale within ±10°C calibration temperature ±0.5°C
Groundwater Pump WX10 Honda	Development and purging of wells	5 to 25l/minute depending on ground conditions	Not Applicable
Groundwater Pump MP1 Grundfoss	Development and purging of wells		Not Applicable
Electronic Dipmeter BGS & GMI	Water & Leachate Levels	0 - 50m	±1cm operator reading off tape
Oil/Water Interface Meter GMI	Depths/Thickness of Floating & Sinking product (LNAPL & DNAPL)	0 - 30m	±1mm operator reading off tape
Soils Screening Hanby Field Test Kit HNU	Rapid site screening for soils & waters (TPH, PCB, DDT)	Typical detection limit 1ppm soils 0.1ppm water	Screen Test Not for heavy hydrocarbons or DRO
Soils Screening Immunoassay test kit Ensys Inc.	Rapid site screening for soils & waters (TPH, PCB, PAHs)	Result reported within concentration range as directed by manufacturer	Screen Test

APPENDIX F

RESULTS OF CHEMICAL CONTAMINATION TESTING

Certificate of Analysis issued by Derwentside Environmental Testing Services Ltd

2139

CERTIFICATE OF ANALYSIS

Certificate Number : 04217

Client Reference : B01429

20 February 2002

Our Reference : 04217

Clients Name : Foundation & Exploration Services Ltd
Clients Address: Brunel House
Stephenson Road
Houndmills Estate
Basingstoke
RG21 6XR

Contract Title : Harts Farm Lane, Havant

Description : Twenty soil samples and four water samples

Date Received : 14 February 2002

Test Procedures : Method details and performance data available on request

Notes : * Denotes test not included in laboratory scope of accreditation

Comments, observations and opinions are outside the UKAS Accreditation Scope

Approved By:

R Bennett
Authorised Signatory

HARTS FARM LANE, HAVANT

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Arsenic (mg/kg As)	Total Cadmium (mg/kg Cd)	Total Chromium (mg/kg Cr)	Total Lead (mg/kg Pb)	Total Mercury (mg/kg Hg)	Total Selenium (mg/kg Se)	Total Copper (mg/kg Cu)	Total Nickel (mg/kg Ni)	Total Zinc (mg/kg Zn)	Water Soluble Boron (B) (mg/kg)
BH 1	1.20	5	B	04217/1	<2	0.6	14	28	<0.3	<0.3	12	18	37	2.7
BH 2	0.50	2	B	04217/2	<2	0.6	25	10	0.3	<0.3	17	30	48	1.7
BH 4	0.50	2	B	04217/3	<2	5.6	31	59	0.7	0.4	83	16	180	3.2
BH 4	1.20	4	B	04217/4	<2	2.3	16	28	0.3	0.3	314	14	65	3.6
BH 5	0.55	2	B	04217/5	<2	1.2	22	5	<0.3	<0.3	20	14	24	2.3
BH 5	1.20	4	B	04217/6	<2	0.8	5	3	<0.3	<0.3	4	12	17	2.0
BH 5	1.60	5	B	04217/7	<2	0.5	7	<1	<0.3	<0.3	3	7	3	1.1
BH 6	0.35	1/2	D	04217/8	<2	0.8	<3	3	<0.3	<0.3	2	6	10	1.6
TP 1	0.45	3	CD	04217/9	4	0.5	12	15	<0.3	<0.3	9	17	25	2.1
TP 1	1.00	6	B	04217/10	<2	0.4	19	<1	<0.3	<0.3	10	32	29	1.8
TP 2	1.60	6	B	04217/11	<2	0.7	<3	<1	<0.3	<0.3	<2	4	3	1.2
TP 3	1.00	7	B	04217/12	<2	0.7	9	<1	<0.3	<0.3	3	19	20	1.6
TP 4	0.45	3	CD	04217/13	<2	0.7	12	88	<0.3	0.3	37	25	43	2.5
TP 5	0.30	6	B	04217/14	<2	0.8	9	41	<0.3	<0.3	17	16	49	1.4
TP 6	0.45	3	CD	04217/15	7	12	78	91	1.3	0.8	170	24	310	4.3
TP 6	1.00	7	B	04217/16	<2	13	63	76	1.3	0.7	170	21	310	5.1
TP 7	0.45	3	CD	04217/17	<2	0.9	8	9	<0.3	<0.3	8	6	27	2.0
TP 7	0.90	5	CD	04217/18	<2	1.2	10	140	0.6	<0.3	26	15	93	2.3
TP 7	2.00	10	B	04217/19	5	0.4	14	10	<0.3	<0.3	9	13	34	2.2
TP 8	0.15	1	CD	04217/20	<2	1.0	15	25	<0.3	<0.3	12	11	45	2.9

Approved By:
Date:

Client Reference:B01429

Laboratory Reference: 04127

HARTS FARM LANE, HAVANT

Summary of Chemical Analyses on Soil Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide (mg/kg CN)	Free Cyanide (mg/kg CN)	Thiocyanate (mg/kg CNS)	Elemental Sulphur * (mg/kg S)	Sulphide (mg/kg S^{2-})	Sulphate content (% SO_3)	Sulphate content (% SO_4)	pH Value	Total Phenols (mg/kg)	Total PAH * (mg/kg)
BH 1	1.20	5	B	04217/1	<1	<1	<1	<50	<10	0.02	0.02	7.7	2.9	11
BH 2	0.50	2	B	04217/2	<1	<1	<1	<50	<10	0.03	0.04	7.7	4.0	<5
BH 4	0.50	2	B	04217/3	<1	<1	<1	<50	12	0.01	0.01	7.7	10	<5
BH 4	1.20	4	B	04217/4	<1	<1	<1	<50	<10	0.02	0.02	8.2	2.6	<5
BH 5	0.55	2	B	04217/5	<1	<1	<1	<50	16	0.02	0.02	11.0	1.0	<5
BH 5	1.20	4	B	04217/6	<1	<1	<1	<50	<10	0.02	0.02	9.5	0.8	<5
BH 5	1.60	5	B	04217/7	<1	<1	<1	<50	<10	0.02	0.02	9.4	<0.2	<5
BH 6	0.35	1/2	D	04217/8	<1	<1	1.9	<50	<10	0.06	0.07	8.9	0.8	<5
TP 1	0.45	3	CD	04217/9	<1	<1	<1	<50	<10	0.02	0.02	8.4	0.9	<5
TP 1	1.00	6	B	04217/10	<1	<1	<1	<50	<10	0.03	0.04	8.0	<0.2	<5
TP 2	1.60	6	B	04217/11	<1	<1	<1	<50	<10	0.04	0.05	9.2	0.5	<5
TP 3	1.00	7	B	04217/12	<1	<1	<1	<50	<10	0.02	0.02	8.5	1.5	<5
TP 4	0.45	3	CD	04217/13	<1	<1	<1	<50	<10	0.04	0.05	8.5	0.6	<5
TP 5	0.30	6	B	04217/14	<1	<1	<1	<50	<10	0.02	0.02	8.4	1.1	<5
TP 6	0.45	3	CD	04217/15	<1	<1	<1	<50	<10	0.02	0.02	7.6	4.9	<5
TP 6	1.00	7	B	04217/16	<1	<1	<1	<50	<10	0.02	0.02	7.5	8.4	<5
TP 7	0.45	3	CD	04217/17	<1	<1	<1	<50	12	0.09	0.11	10.5	1.7	<5
TP 7	0.90	5	CD	04217/18	<1	<1	<1	<50	33	0.04	0.05	7.7	8.0	<5
TP 7	2.00	10	B	04217/19	<1	<1	<1	<50	12	0.01	0.01	8.0	0.8	<5
TP 8	0.15	1	CD	04217/20	<1	<1	<1	<50	<10	0.02	0.02	7.9	9.0	<5

Approved By:
Date:

Client Reference:B01429

Laboratory Reference: 04127

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

HARTS FARM LANE, HAVANT

Summary of Chemical Analyses on Water Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Arsenic (mg/l As)	Total Cadmium (mg/l Cd)	Total Chromium (mg/l Cr)	Total Lead (mg/l Pb)	Total Mercury (mg/l Hg)	Total Selenium (mg/l Se)	Total Copper (mg/l Cu)	Total Nickel (mg/l Ni)	Total Zinc (mg/l Zn)	Boron (mg/l B)
WS 1				04217/21	<0.001	<0.002	0.03	<0.03	<0.0002	<0.003	<0.002	0.01	0.003	<0.1
WS 2				04217/22	<0.001	<0.002	<0.02	<0.03	<0.0002	<0.003	<0.002	0.01	0.003	<0.1
WS 3				04217/23	0.010	<0.002	<0.02	<0.03	<0.0002	<0.003	<0.002	0.01	0.023	<0.1
TP 2	1.1	5	W	04217/24	<0.001	<0.002	<0.02	<0.03	<0.0002	<0.003	<0.002	0.03	0.174	<0.1

Approved By:
Date:

Client Reference: B01429

Laboratory Reference: 04217

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

HARTS FARM LANE, HAVANT

Summary of Chemical Analyses on Water Samples

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Total Cyanide (mg/l CN)	Free Cyanide (mg/l CN)	Thiocyanate (mg/l CNS)	Sulphide (mg/l S^{2-})	Sulphate content (g/l SO_3)	Sulphate content (g/l SO_4)	pH Value	Total Phenols (mg/l)	Total PAH * (mg/l)
WS 1				04217/21	<0.02	<0.02	<0.2	<0.2	0.12	0.14	7.6	<0.04	<0.01
WS 2				04217/22	<0.02	<0.02	<0.2	<0.2	0.09	0.11	7.6	<0.04	<0.01
WS 3				04217/23	<0.02	<0.02	<0.2	<0.2	0.11	0.13	7.5	<0.04	<0.01
TP 2	1.1	5	W	04217/24	<0.02	<0.02	<0.2	<0.2	0.59	0.71	9.9	<0.04	<0.01

Approved By:
Date:

Client Reference: B01429

Laboratory Reference: 04217

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

BULK ANALYSIS REPORT

CUSTOMER DETAILS — **Job Number** HW 8355

Customer Name/ Address Details:	Derwentside Environmental Testing Services Ltd Unit 4A Park Road Industrial Estate Consett Co Durham, DH8 5PY		
Telephone No	01207 582333	**Fax Number**	01207 582444
Order Number		**Contact:**	Mr R Bennett

SURVEY DETAILS

Location:	Harts Farm Lane		
Sampled By:	As Received	**Analysed By:**	D.E. Bullerwell
Date Received	16/02/2002	**Date Analysed**	21/02/2002

ANALYTICAL PROCEDURE

Fibres found in the sample or small portions of the sample were mounted on glass slides in specific refractive index liquids and examined using polarised light and dispersion staining microscopy. Fibres were identified by comparison of their optical properties with those of standard asbestos materials and published data. MIS Limited accepts responsibility only for results obtained from samples received. No responsibility is accepted for errors which may have arisen during the sampling or transportation of the samples.

RESULTS

Sample	MIS Analyst Code	Sampling Details	Result	Amount	Condition
YJY	N/A	04217/1, 1.20m sample no 5 B, BH1	NOF	Trace	As received
YJZ	N/A	04217/2, 0.50m sample no 2 B, BH2	NOF	Trace	As received
YKA	N/A	04217/3, 0.50m sample no 2 B, BH4	NOF	Trace	As received
YKB	N/A	04217/4, 0.20m sample no 4 B, BH4	NOF	Trace	As received
YKC	N/A	04217/5, 0.55m sample no 2 B, BH5	NOF	Trace	As received
YKD	N/A	04217/8, 0.35mm sample no 1/2 D, BH6	NOF	Trace	As received
YKE	N/A	04217/9, 0.45m sample no 3, CD TP1	NOF	Trace	As received
YKG	N/A	04217/11, 1.60m sample no 6 B, TP2	NOF	Trace	As received
YKH	N/A	04217/12, 1.00m sample no 7 B, TP3	NOF	Trace	As received
YKI	N/A	04217/13, 0.45m sample no 3 CD, TP4	NOF	Trace	As received
YKJ	N/A	04217/14, 0.30m sample no 6 B, TP5	No fibres	N/A	As received

COMMENTS

No asbestos fibres were found to be present in the above sample(s)

KEY	ASBESTOS		NON ASBESTOS
	Crocidolite (Blue Asbestos)		MMMF (Man Made Mineral Fibres)
	Amosite (Brown Asbestos)		NOF (Natural Organic Fibres)
	Chrysotile (White Asbestos)		MMOF (Man Made Organic Fibres)
CONTENT	Major (>10%)	Minor (1 - 10%)	Trace (<1%)

UKAS TESTING No. 0244

ANALYST: [redacted] D.E. Bullerwell

AUTHORISED _____

Comments, observations and opinions are outside the UKAS Accreditation scope

Unit 2, Watling Street Industrial Estate, Leadgate,
Consett, Co. Durham. DH8 6TA
Tel: (01207) 500463/Fax: (01207) 590240

MIS Ltd ENVIRONMENTAL