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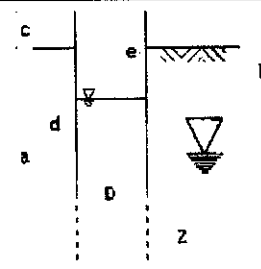
Site 41 HIGHGATE WEST HILL, LONDON N6																																																																															
Client DEWRACE MANAGEMENT SERVICES																																																																															
Date 16/03/09	Type of Test Falling Head		Level mOD 125.90																																																																												
Depth of borehole during test, a : 14.00 m																																																																															
Depth to equilibrium watertable, b : 11.00 m Measured																																																																															
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Length of response zone, Z : 13.00 m																																																																															
Diameter of response zone, D : 0.15 m																																																																															
Intake factor, F : 15.8443 (From Condition D of fig. 7 BS5930:1981)																																																																															
Soil Type at test level Sandy CLAY/clayey SAND																																																																															
PERMEABILITY(after Hvorslev 1951) Basic Time Lag Approach Plot log $\frac{H_t}{H_0}$ v t * * then $k = \frac{A}{60FT} \text{ m/sec}$ $k = 4.65E-05 \text{ m/sec}$																																																																															
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In-Situ Permeability Test			Bh No BH1																																																																												
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Site 41 HIGHGATE WEST HILL, LONDON N6

Client DEWRACE MANAGEMENT SERVICES

Date 16/03/09 Type of Test Falling Head Level mod 125.50

Depth of borehole during test, a : 15.00 m
 Depth to equilibrium watertable, b : 10.59 m Measured
 Height of casing above ground level, c : 0.00 m
 Depth of casing below ground level, d : 1.00 m
 Length of response zone, Z : 14.00 m
 Diameter of response zone, D : 0.15 m
 Intake factor, F : 16.8213
 (From Condition D of fig. 7 BS5930:1981)



PERMEABILITY(after Hvorslev 1951)

Basic Time Lag Approach

Plot $\log \frac{H_t}{H_0}$ v t * * *

then

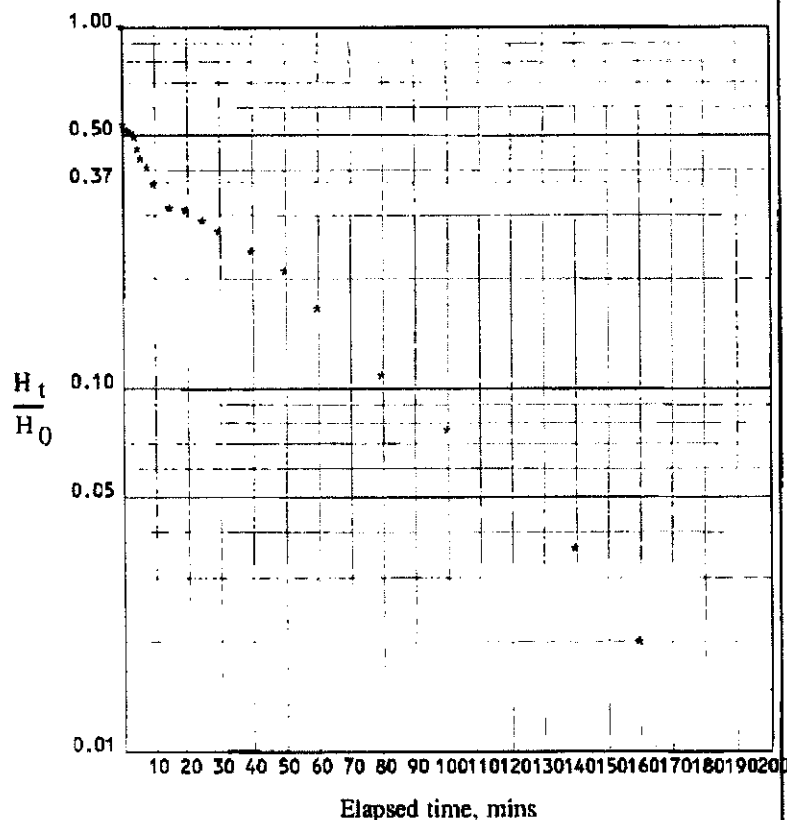
$$k = \frac{A}{60FT} \text{ m/sec}$$

Soil Type at test level

Sandy CLAY/clayey SAND

$$k = 1.82E-06 \text{ m/sec}$$

Elapsed time, t mins	Depth to water, e m	Head of water, H m	Ht/Ho
0.00	8.10	2.49	1.000
0.50	9.26	1.33	0.534
1.00	9.30	1.29	0.518
2.00	9.31	1.28	0.514
3.00	9.33	1.26	0.506
4.00	9.36	1.23	0.494
5.00	9.45	1.14	0.458
6.00	9.52	1.07	0.430
8.00	9.58	1.01	0.406
10.00	9.68	0.91	0.365
15.00	9.81	0.78	0.313
20.00	9.82	0.77	0.309
25.00	9.87	0.72	0.289
30.00	9.92	0.67	0.269
40.00	10.00	0.59	0.237
50.00	10.07	0.52	0.209
60.00	10.18	0.41	0.165
80.00	10.32	0.27	0.108
100.00	10.40	0.19	0.076
140.00	10.50	0.09	0.036
160.00	10.54	0.05	0.020
180.00	10.58	0.01	0.004
200.00	10.63	-0.04	-0.016



REMARKS:

11681

In-Situ Permeability Test

Bh No

Fig No

BH2

Site 41 HIGHGATE WEST HILL, LONDON N6																																																																																							
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APPENDIX 5

GEOTECHNICAL LABORATORY TEST RESULTS

LABORATORY TEST RESULTS

CONTRACT WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l	pH	
BH1	B1	0.50 - 1.10												156			6.9	SOIL CLASSIFICATION = CI 1% retained on 425µm sieve
	U1	3.00 - 3.50	42	19	23	27												
	U2	5.00 - 5.30	41	22	19	20												
	B7	8.90 - 9.40	34	26	8	32												
	W1	9.00														82	8.2	
	U3	15.00 - 15.50	43	20	23	31												SOIL CLASSIFICATION = CI 0% retained on 425µm sieve
	U2	15.50														140	8.2	
	U4	16.60 - 17.10	63	27	36	32												SOIL CLASSIFICATION = CH 0% retained on 425µm sieve
BH2	B1	0.60 - 1.10												49			7.6	

U - UNDISTURBED SAMPLE
 D - DISTURBED SAMPLE
 B - BULK SAMPLE
 W - WATER SAMPLE
 C.U. - CONSOLIDATED UNDRAINED
 C.D. - CONSOLIDATED DRAINED
 Q. - IMMEDIATE UNDRAINED
 Q.M. - IMMEDIATE UNDRAINED MULTISTAGE

Aqueous Extract 2:1 Water:Soil

GROUND ENGINEERING PETERBOROUGH

LABORATORY TEST RESULTS

CONTRACT WITANHURST, 41 HIGHGATE WEST HILL, LONDON W6

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks	
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil		Water	pH		
														Total % Dry Wt	Aqueous Extract mg/l	mg/l			
BH2	U1	4.00 - 4.40	40	19	21	24													SOIL CLASSIFICATION = CI 0% retained on 425µm sieve
	BB	9.00 - 9.50	36	26	10	39													SOIL CLASSIFICATION = MI 0% retained on 425µm sieve
	W1	9.90														123	8.1		
	B10	12.70 - 13.20	35	25	10	35													SOIL CLASSIFICATION = ML/MI 0% retained on 425µm sieve
BH3	B2	0.70 - 1.20													91		7.7		
	U1	2.90 - 3.35	39	19	20	24													SOIL CLASSIFICATION = CI 0% retained on 425µm sieve
	U2	5.00 - 5.45	34	27	7	13													SOIL CLASSIFICATION = ML 0% retained on 425µm sieve
	BB	7.50 - 8.00	43	23	20	38													SOIL CLASSIFICATION = CI 0% retained on 425µm sieve

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Aqueous Extract 2:1 Water:Soil

GROUND ENGINEERING PETERBOROUGH

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LABORATORY TEST RESULTS

CONTRACT WJ1AMHURST, 41 HIGHGATE WEST HILL, LONDON N6

Bore-hole	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Soil		Water	pH	
														Total % Dry Wt.	Aqueous Extract mg/l	mg/l		
BH3	B12	13.90 - 14.40	57	21	36	30												SOIL CLASSIFICATION = CH 0% retained on 425µm sieve
	U3	16.50 - 16.95	64	26	38	27												SOIL CLASSIFICATION = CH 0% retained on 425µm sieve
	U4	18.00 - 18.45	67	25	42	30												SOIL CLASSIFICATION = CH 0% retained on 425µm sieve

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Aqueous Extract 2:1 Water:Soil

GROUND ENGINEERING PETERBOROUGH

LABORATORY TEST RESULTS

CONTRACT WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6

Trial-pit	Sample	Depth m	Classification				Density		Triaxial Compression					Sulphates (SO ₄)				Remarks
			Liquid Limit %	Plastic Limit %	Plasticity Index %	Moisture Content %	Bulk Mg/m ³	Dry Mg/m ³	Type	Principal Stress Difference kPa	Cell Pressure kPa	Shear Strength kPa	Angle of Shear Resistance degrees	Total % Dry Wt.	Aqueous Extract mg/l	Water mg/l	pH	
TP1	B6	3.00	52	23	29	22												SOIL CLASSIFICATION = CH 17% retained on 425µm sieve
TP2	B6	3.00	33	23	10	26												SOIL CLASSIFICATION = CL 8% retained on 425µm sieve
TP3	B6	3.00	42	22	20	24												SOIL CLASSIFICATION = CI 28% retained on 425µm sieve

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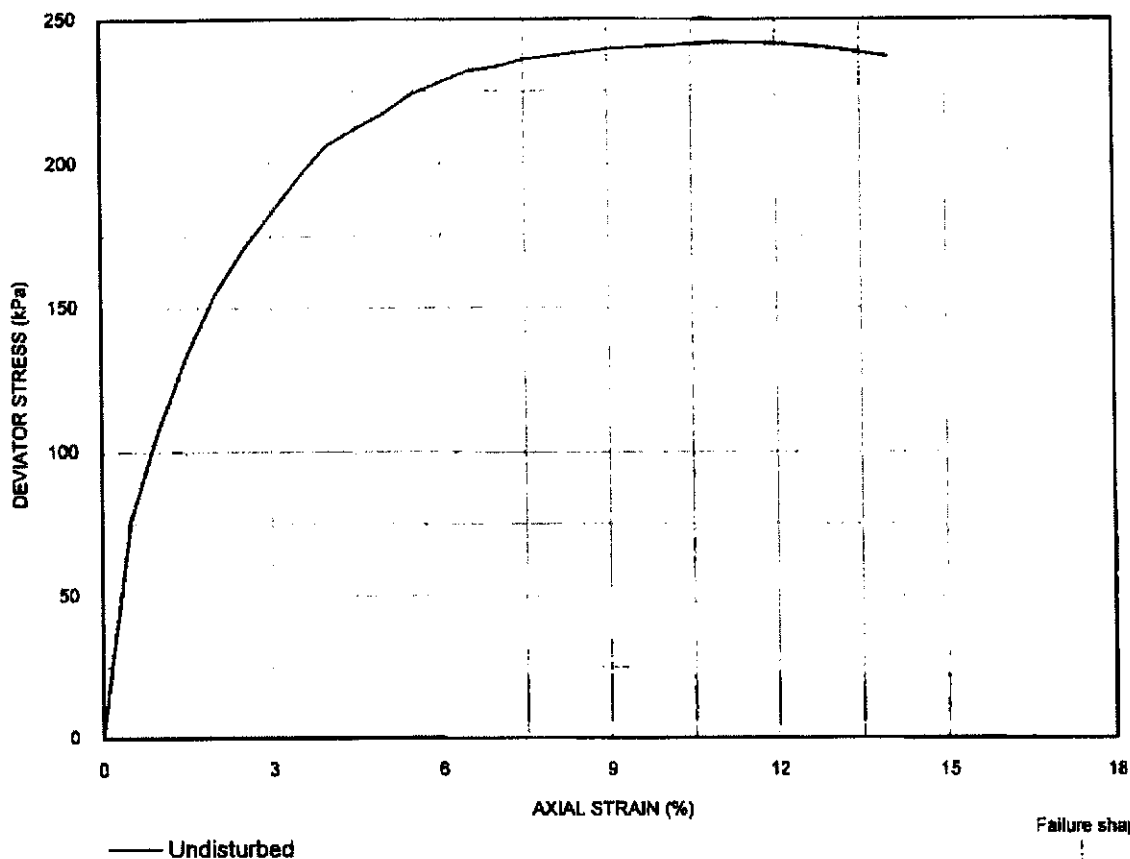
Aqueous Extract 2:1 Water:Soil

GROUND ENGINEERING PETERBOROUGH

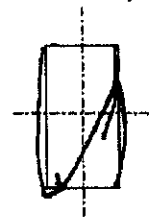
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**GROUND ENGINEERING
HIGHGATE**

Drawn by: MJR Date: 15/04/2008



Failure shape



Failure Conditions

Cell pressure	(kPa)	: 730
Membrane correction	(kPa)	: 1
Corrected deviator stress	(kPa)	: 242
Strain at failure	(%)	: 11.0
Undrained shear strength	(kPa)	: 121

Date: 16/04/08

Date: 16/04/08

Checked by: MR

Approved by: HS

Initial Conditions				Borehole : BH1 Sample : U5 Depth (m) : 18.30
Sample length	: 202.0 mm	Bulk density	: 1.93 Mg/m ³	
Sample diameter	: 103.0 mm	Dry density	: 1.56 Mg/m ³	
Membrane thickness	: 0.3 mm	Moisture content	: 24 %	
Rate of strain	: 2.0 %/min			
Stiff brown grey CLAY with silt				

**UNCONSOLIDATED UNDRAINED
TRIAXIAL COMPRESSION TEST**

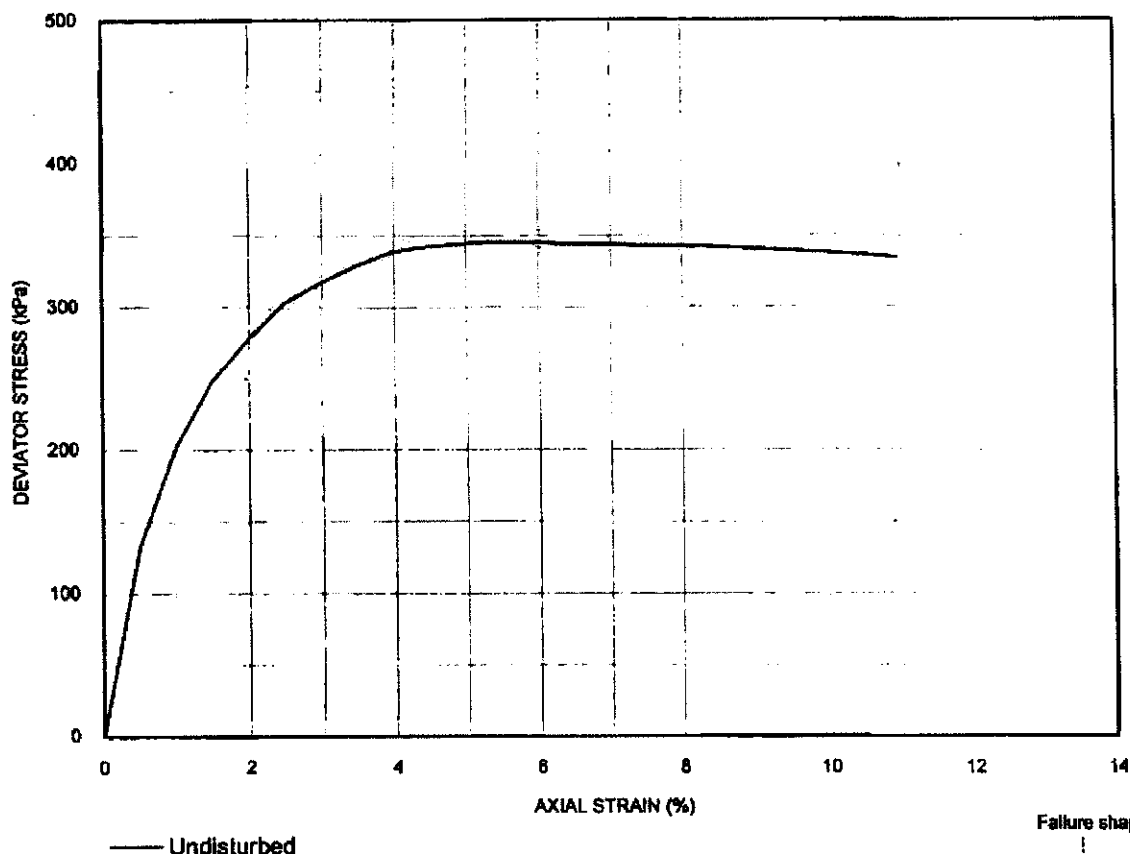
S · G · C

Surrey Geotechnical Consultants Limited

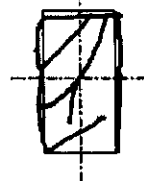
Certificate No: 20921005

GROUND ENGINEERING HIGHGATE

Drawn by: MR Date: 15/04/2009



Failure shape



Failure Conditions

Cell pressure	(kPa)	: 780
Membrane correction	(kPa)	: 0
Corrected deviator stress	(kPa)	: 346
Strain at failure	(%)	: 5.5
Undrained shear strength	(kPa)	: 173

Date : 16/04/09

Date : 16/04/09

Checked by: MR

Approved by: HS

Initial Conditions				Borehole : 1 Sample : U6 Depth (m) : 19.60
Sample length	: 203.0 mm	Bulk density	: 2.07 Mg/m ³	
Sample diameter	: 101.0 mm	Dry density	: 1.70 Mg/m ³	
Membrane thickness	: 0.3 mm	Moisture content	: 22 %	
Rate of strain	: 2.0 %/min			
stiff gray CLAY with silt.				

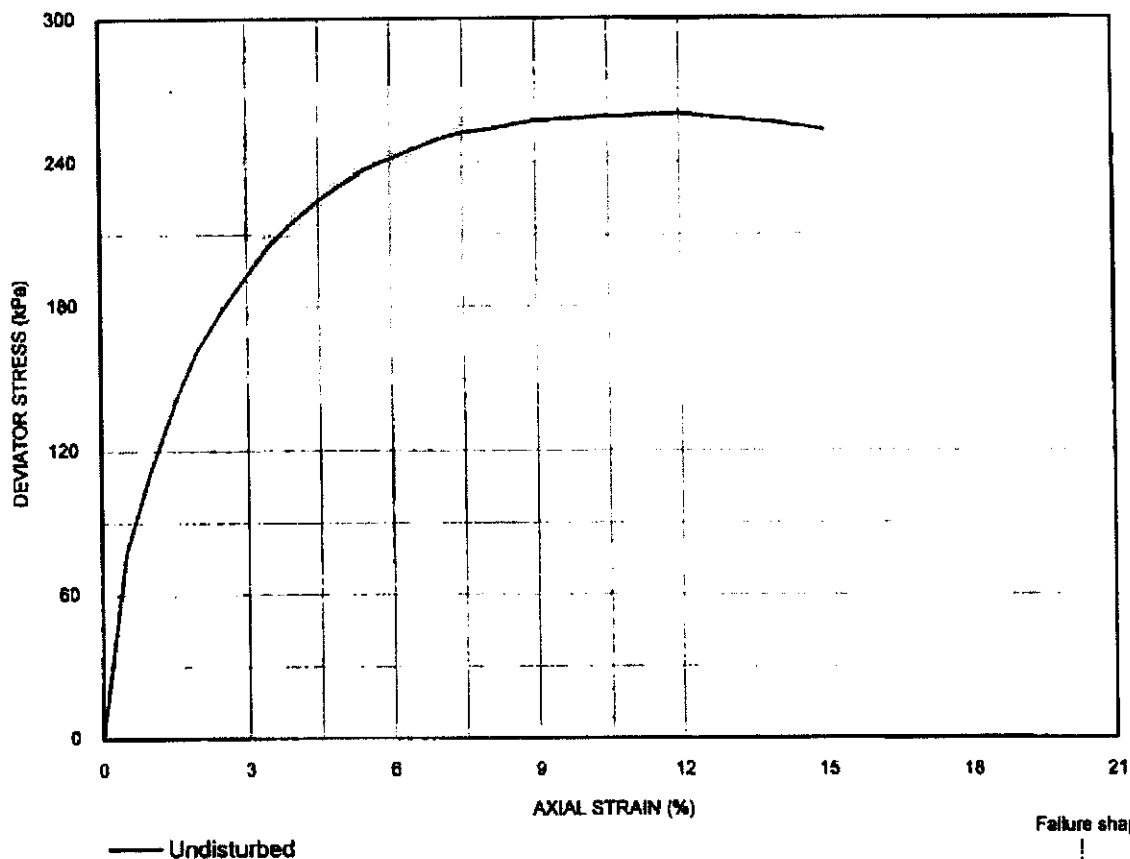
UNCONSOLIDATED UNDRAINED TRIAxIAL COMPRESSION TEST

S · G · C

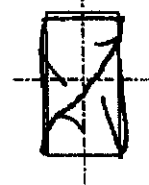
Surrey Geotechnical Consultants Limited

GROUND ENGINEERING HIGHGATE

Drawn by: MR Date: 16/04/2009



Failure shape



Failure Conditions

Cell pressure	(kPa)	: 850
Membrane correction	(kPa)	: 1
Corrected deviator stress	(kPa)	: 260
Strain at failure	(%)	: 12.0
Undrained shear strength	(kPa)	: 130

Date: 16/04/09

Date: 16/04/09

Checked by: MR

Approved by: HS

Initial Conditions				Borehole : 1 Sample : U7 Depth (m) : 21.20
Sample length	: 202.0 mm	Bulk density	: 2.08 Mg/m ³	
Sample diameter	: 101.0 mm	Dry density	: 1.70 Mg/m ³	
Membrane thickness	: 0.3 mm	Moisture content	: 22 %	
Rate of strain	: 2.0 %/min			
Firm to stiff grey CLAY with silt.				

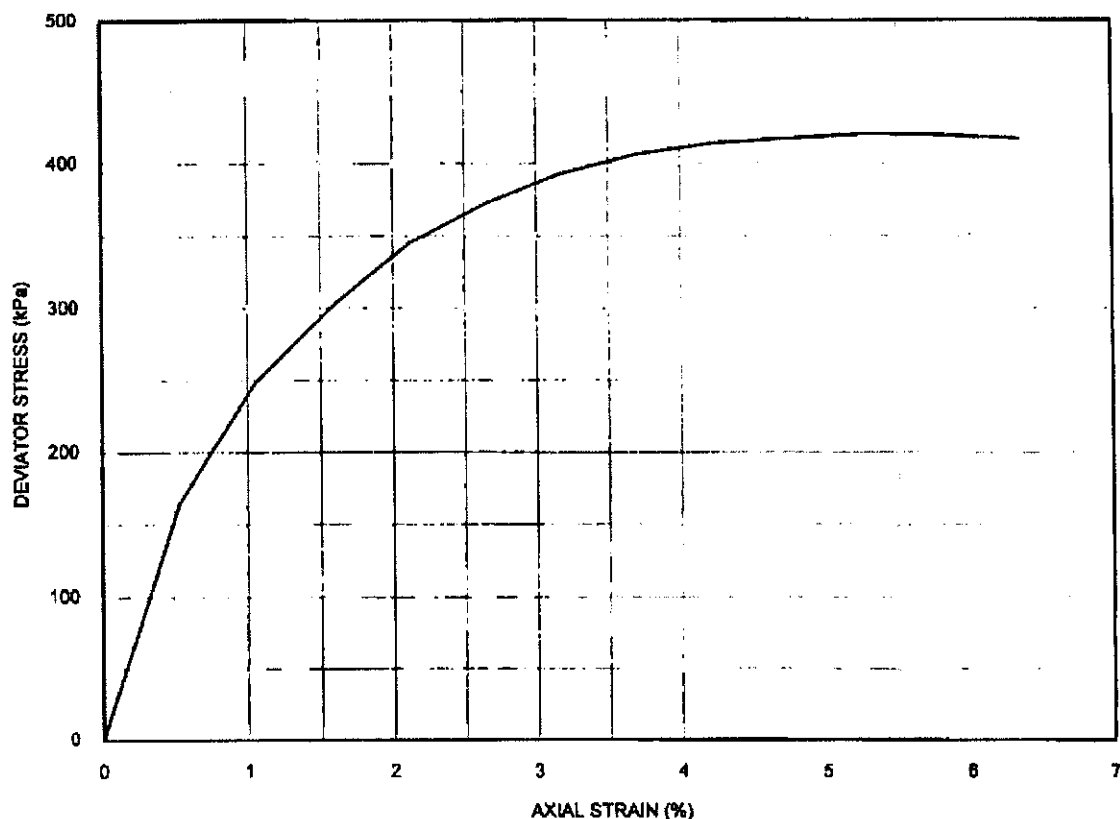
UNCONSOLIDATED UNDRAINED
TRIAxIAL COMPRESSION TEST

S · G · C

Survey Geotechnical Consultants Limited

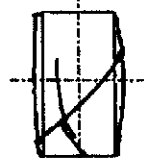
GROUND ENGINEERING HIGHGATE

Drawn by: MR Date: 15/04/2009



— Undisturbed

Failure shape



Failure Conditions

Cell pressure	(kPa)	: 900
Membrane correction	(kPa)	: 0
Corrected deviator stress	(kPa)	: 421
Strain at failure	(%)	: 5.3
Undrained shear strength	(kPa)	: 210

Date: 15/04/08

Date: 15/04/08

Checked by: MR

Approved by: HS

Initial Conditions

Sample length	: 191.0 mm	Bulk density	: 2.07 Mg/m ³
Sample diameter	: 100.0 mm	Dry density	: 1.71 Mg/m ³
Membrane thickness	: 0.3 mm	Moisture content	: 21 %
Rate of strain	: 2.0 %/min		

Borehole : 1

Sample : U8

Depth (m) : 22.60

Stiff grey CLAY with silt. Note: may have contained wax, disturbed in tube.

UNCONSOLIDATED UNDRAINED TRIAxIAL COMPRESSION TEST

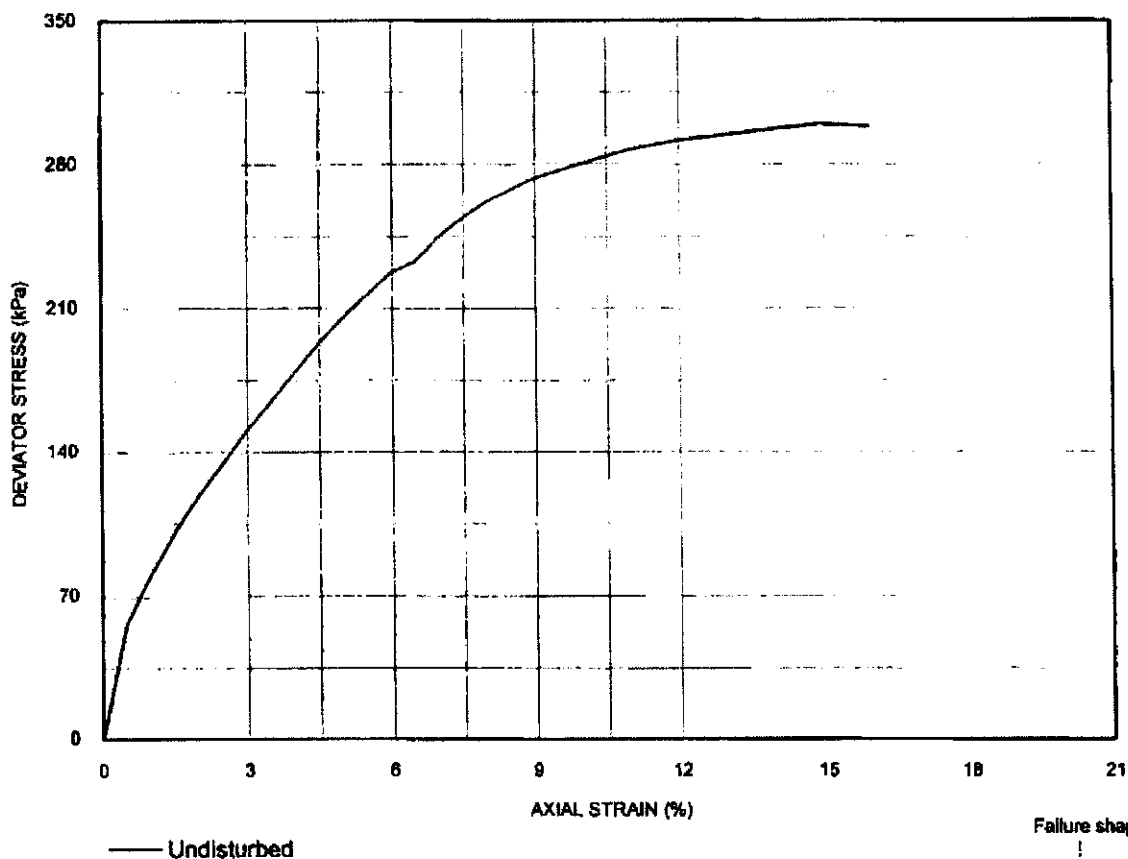
S · G · C

Survey Geotechnical Consultants Limited

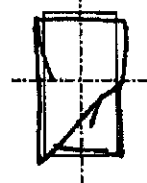
Certificate No: 20921005

**GROUND ENGINEERING
HIGHGATE**

Drawn by: MR Date: 14/04/2009



Failure shape



Failure Conditions

Cell pressure	(kPa)	: 980
Membrane correction	(kPa)	: 1
Corrected deviator stress	(kPa)	: 300
Strain at failure	(%)	: 14.9
Undrained shear strength	(kPa)	: 150

Date: 16/04/09

Date: 18/04/09

Checked by: MR

Approved by: HS

Initial Conditions					
Sample length	: 203.0 mm	Bulk density	: 2.03 Mg/m ³	Borehole	: 1
Sample diameter	: 102.0 mm	Dry density	: 1.62 Mg/m ³	Sample	: U9
Membrane thickness	: 0.3 mm	Moisture content	: 25 %	Depth (m)	: 24.00
Rate of strain	: 2.0 %/min				
Stiff brown grey CLAY with pockets of sand.					

**UNCONSOLIDATED UNDRAINED
TRIAxIAL COMPRESSION TEST**

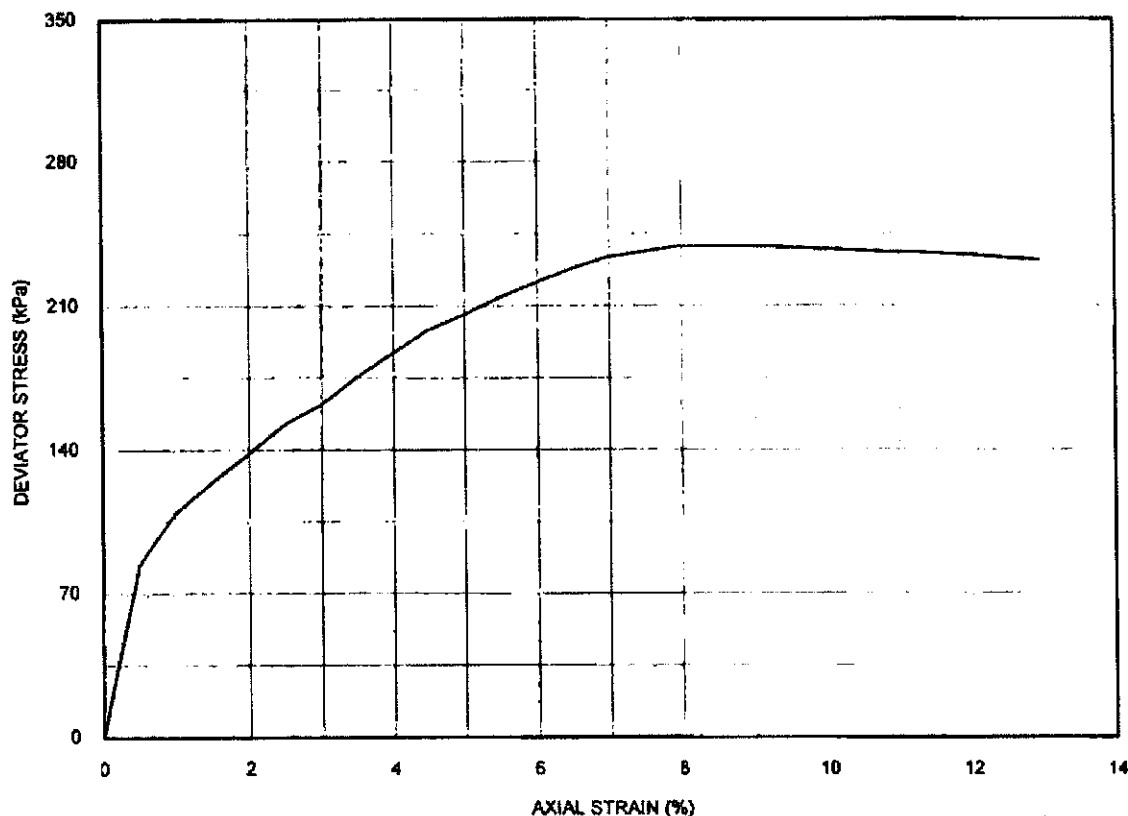
S · G · C

Soil & Geotechnical Consultants Limited

Certificate No: 20921005

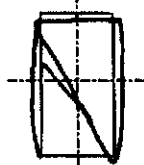
GROUND ENGINEERING HIGHGATE

Drawn by: MR Date: 14/04/2008



— Undisturbed

Failure shape



Failure Conditions

Cell pressure	(kPa)	: 780
Membrane correction	(kPa)	: 1
Corrected deviator stress	(kPa)	: 239
Strain at failure	(%)	: 8.0
Undrained shear strength	(kPa)	: 119

Initial Conditions

Sample length	: 203.0 mm	Bulk density	: 1.99 Mg/m ³
Sample diameter	: 101.0 mm	Dry density	: 1.59 Mg/m ³
Membrane thickness	: 0.3 mm	Moisture content	: 25 %
Rate of strain	: 2.0 %/min		

Firm brown grey CLAY with sand.

Borehole : 3

Sample : U5

Depth (m) : 19.50

UNCONSOLIDATED UNDRAINED TRIAxIAL COMPRESSION TEST

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Surrey Geotechnical Consultants Limited

Certificate No: 20921005

Date : 18/04/08

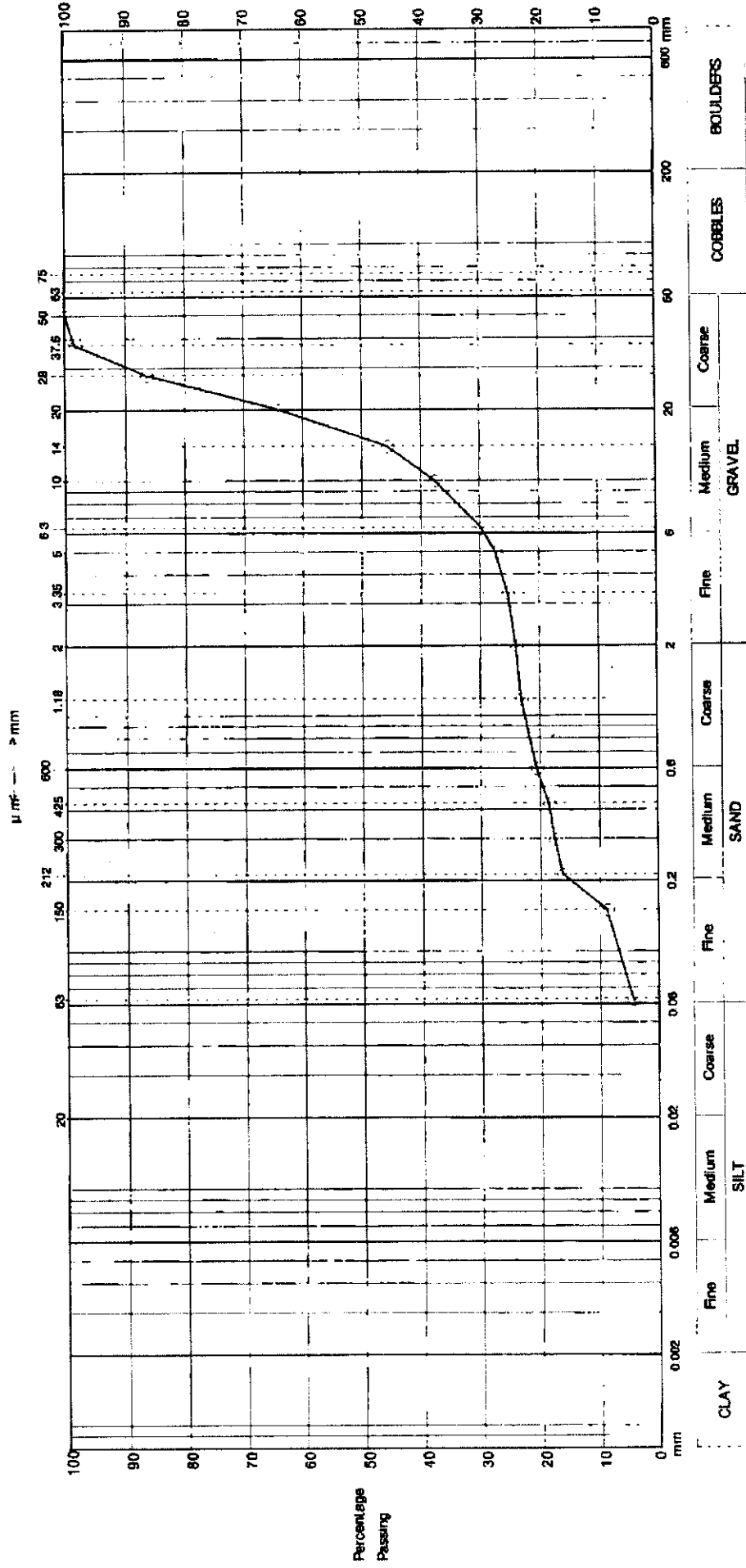
Date : 18/04/08

Checked by: MR

Approved by: HS

PARTICLE SIZE DISTRIBUTION

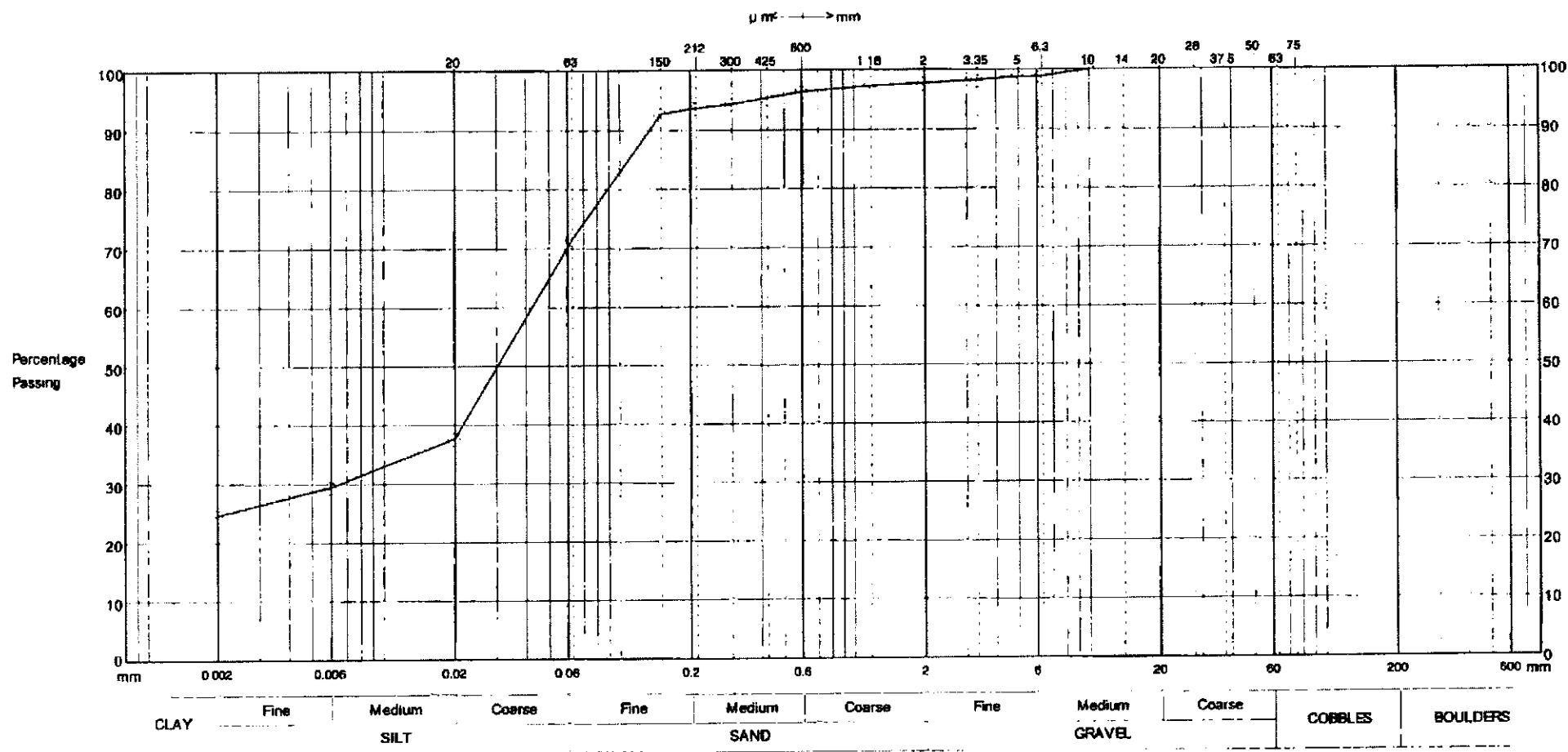
Sieve Size	Size μm										Size mm													
	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	-	-	-	4	9	16	18	19	21	23	24	25	27	30	36	46	64	86	98	100	-	-	-	-



Remarks		Method Wet Sieve	Sample Number B2	Depth 1.20 - 1.70	BH/TP Number BH1	11681
Site		WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6				

PARTICLE SIZE DISTRIBUTION

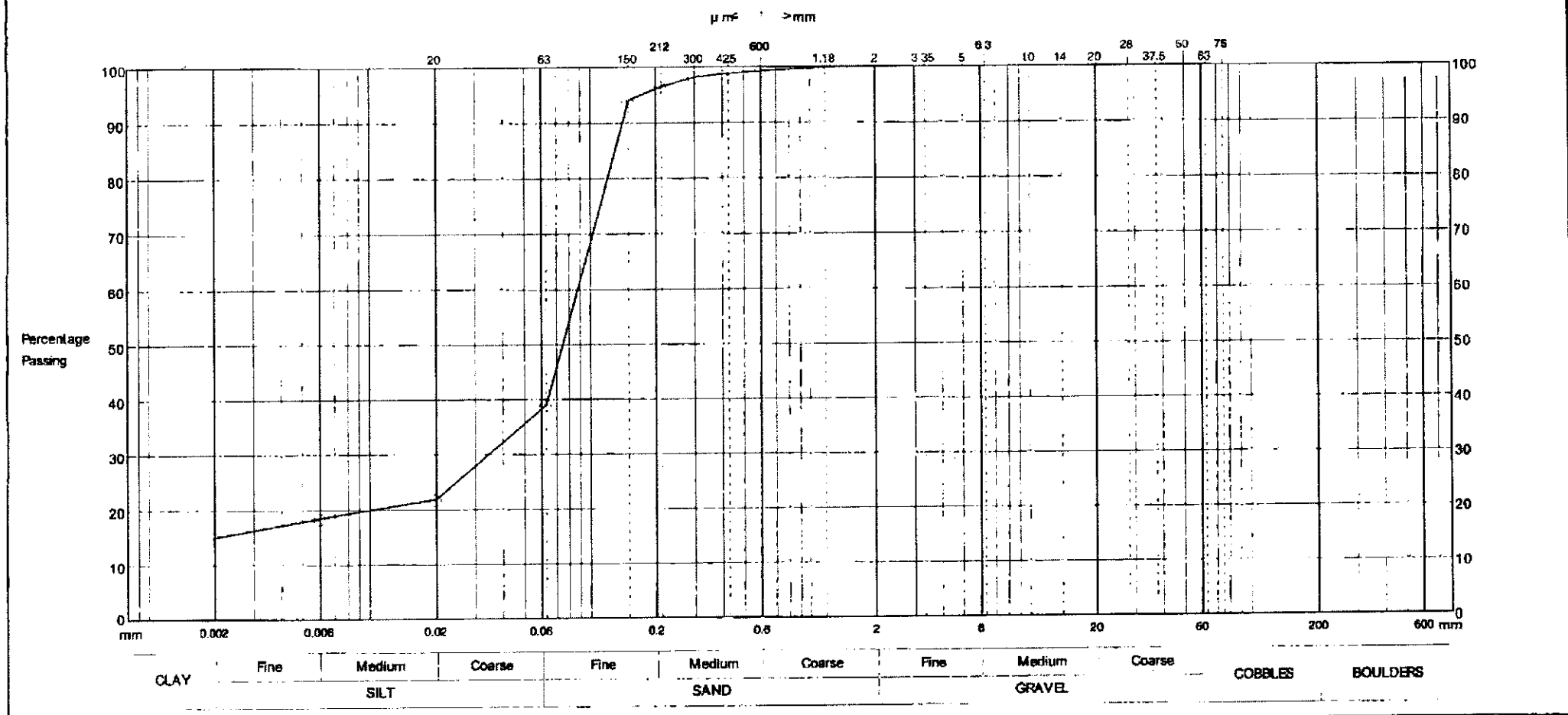
Sieve Size	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	25	29	38	72	93	94	94	95	96	97	98	98	99	99	100	-	-	-	-	-	-	-	-	-



Remarks	Method Wet Sieve/Sedimentation	Sample Number U1	Depth 3.00 - 3.50	BH/TP Number BH1	11681
	Site WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6				

PARTICLE SIZE DISTRIBUTION

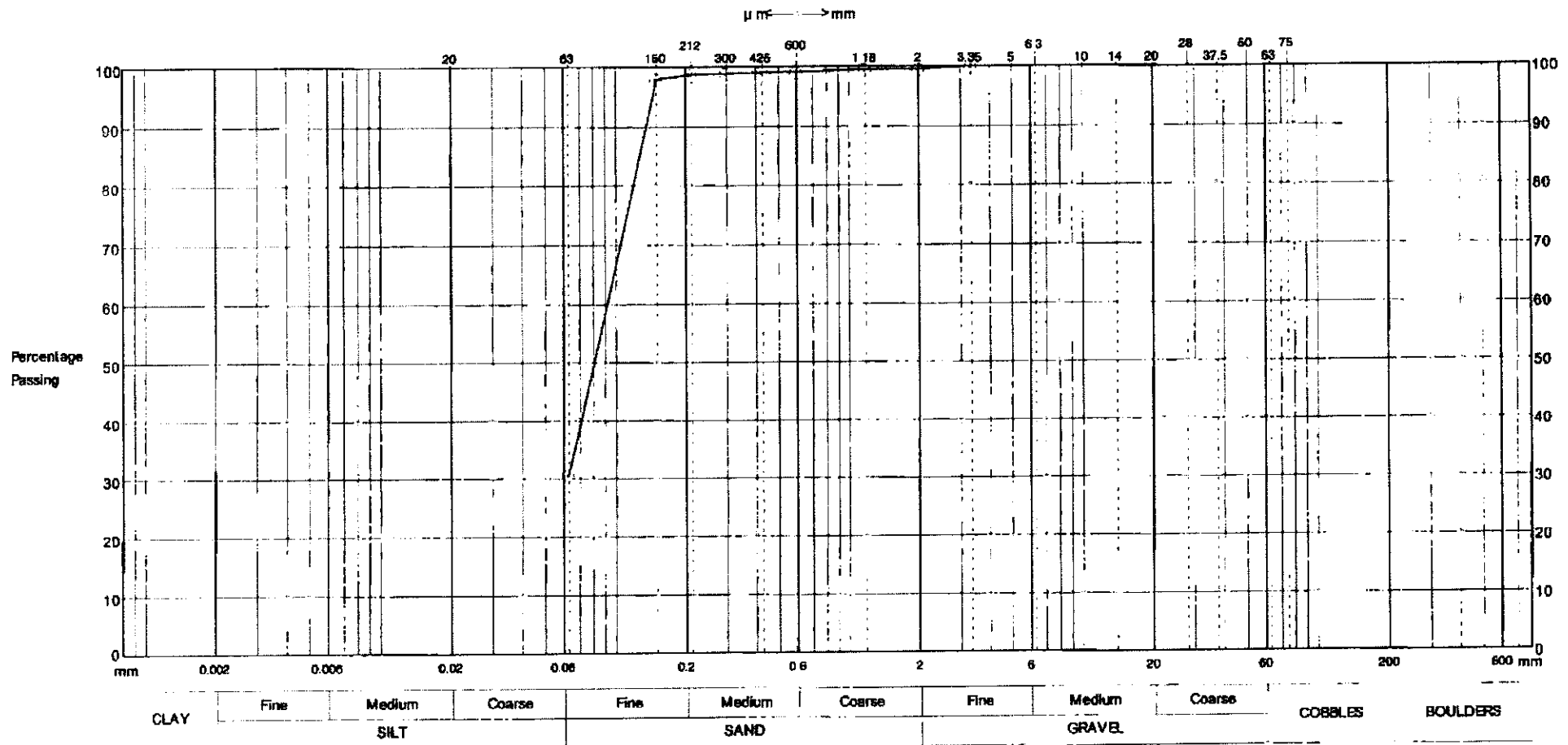
Sieve Size	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	15	18	22	39	94	97	98	99	99	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-



Remarks	Method	Sample Number	Depth	BH/TP Number	11681
	Wet Sieve/Sedimentation	U2	5.00 - 5.30	8H1	
Site WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6					

PARTICLE SIZE DISTRIBUTION

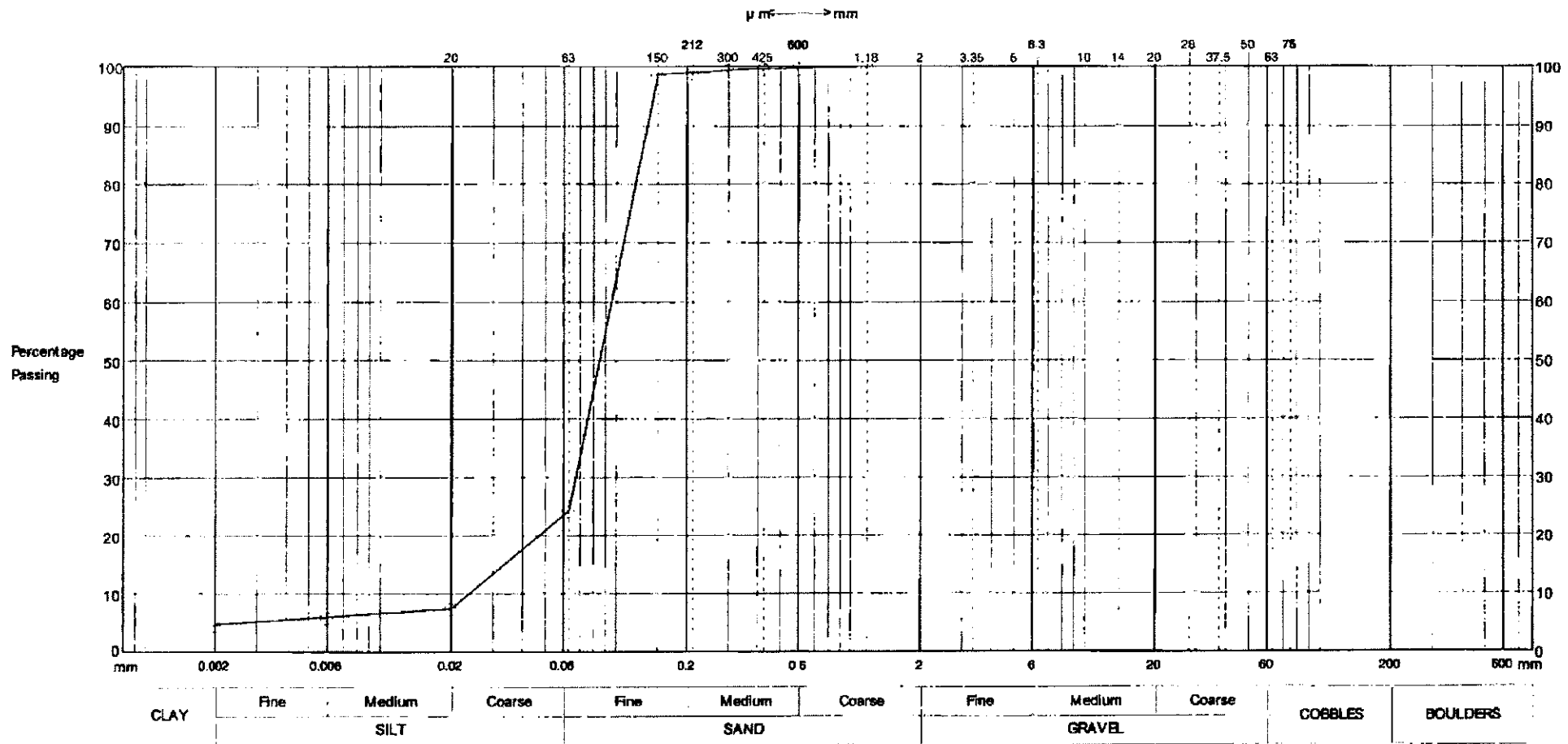
Sieve Size	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	-	-	-	31	98	99	99	99	99	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-



Remarks	Method Wet Sieve	Sample Number B5	Depth 6.40 - 6.90	BH/TP Number BH1	11681
	Site WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6				

PARTICLE SIZE DISTRIBUTION

Sieve Size	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	5	6	7	24	99	99	99	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Remarks

Method
Wet Sieve/Sedimentation

Sample Number
87

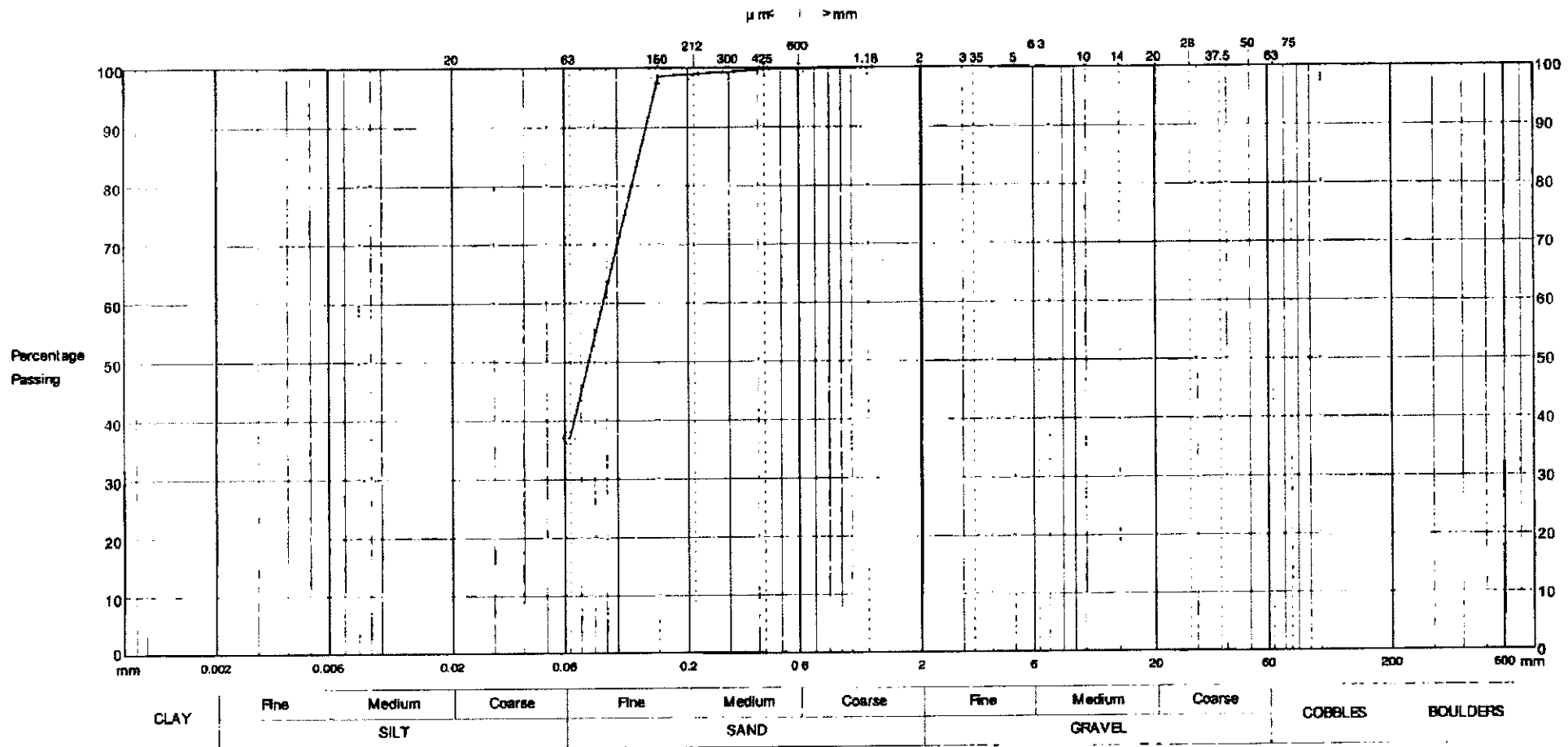
Depth
8.90 - 9.40

BH/TP Number
BH1 11681

Site
WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6

PARTICLE SIZE DISTRIBUTION

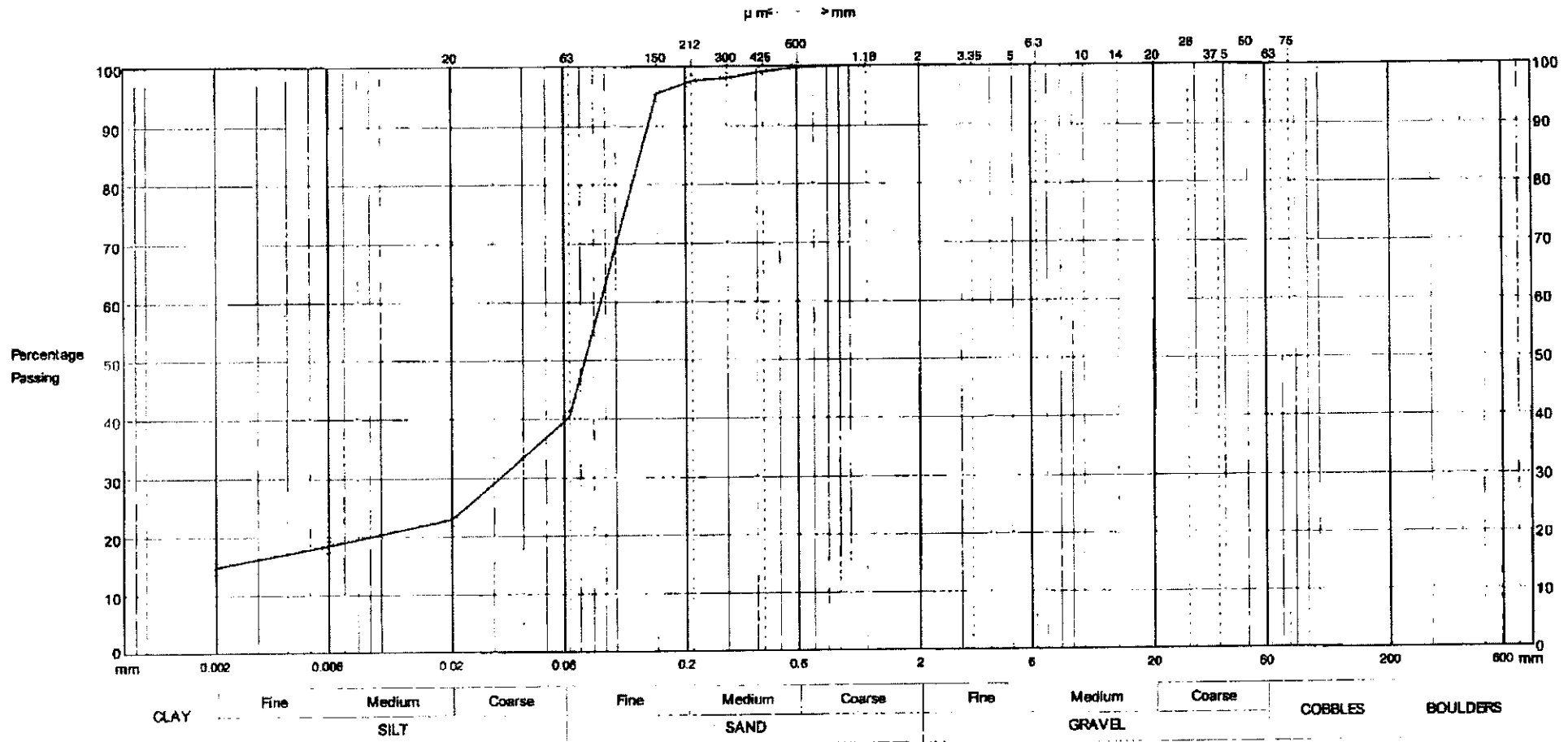
	Size μm									Size mm														
Sieve Size	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	-	-	-	37	99	99	99	100	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Remarks	Method	Sample Number	Depth	BH/TP Number
	Wet Sieve	89	12.10 - 12.60	BH1
Site				
WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6				

PARTICLE SIZE DISTRIBUTION

Sieve Size	2	6	20	63	150	212	300	425	600	1.18	2	3.35	5	6.3	10	14	20	28	37.5	50	63	75	90	120
Percentage by Mass Passing Sieve	15	18	23	40	95	98	98	99	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Remarks

Method
Wet Sieve/Sedimentation

Sample Number
U3

Depth
15.00 - 15.50

BH/TP Number
BH1 11681

Site

WITANHURST, 41 HIGHGATE WEST HILL, LONDON N6