Chelmer
Site Investigations
'Groundbreaking Services'

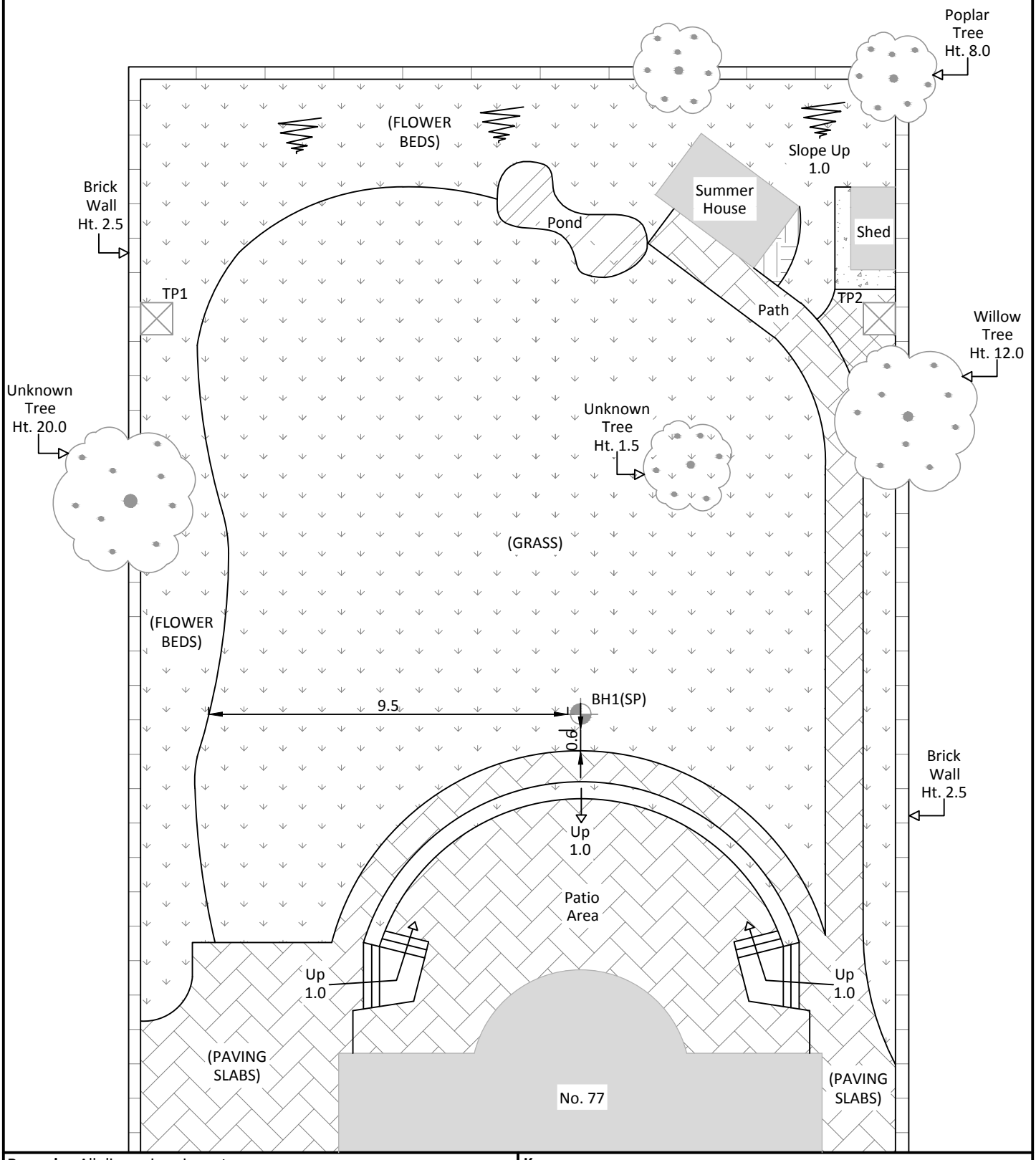
Factual Report

Site	77 Avenue Road
	London
	NW8 6JD
Client	Constructure
Date	23rd February 2017
Our Ref	FACT/8562

Chelmer Site Investigation Laboratories Ltd
Unit 15 East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB
Essex: 01245 400930 | London: 020 3640 9136 | info@siteinvestigations.co.uk | www.siteinvestigations.com

Site:		Client:			Site Plan ID:
77 Avenue Road, London NW8 6JD		Constructure			SP
Contract Number:	**Date:**	**Logged By:**	**Checked by:**	**Weather:**	
8562	23/02/17	J.P.	S.G.	Wet	Sheet 1 of 2
Easting:	**Northing:**	**Ground Level:**	**Plan:**		**Scale:**
N.D.	N.D.	N.D.	N.D.		N.T.S.

Site Plan



Remarks: All dimensions in metres.

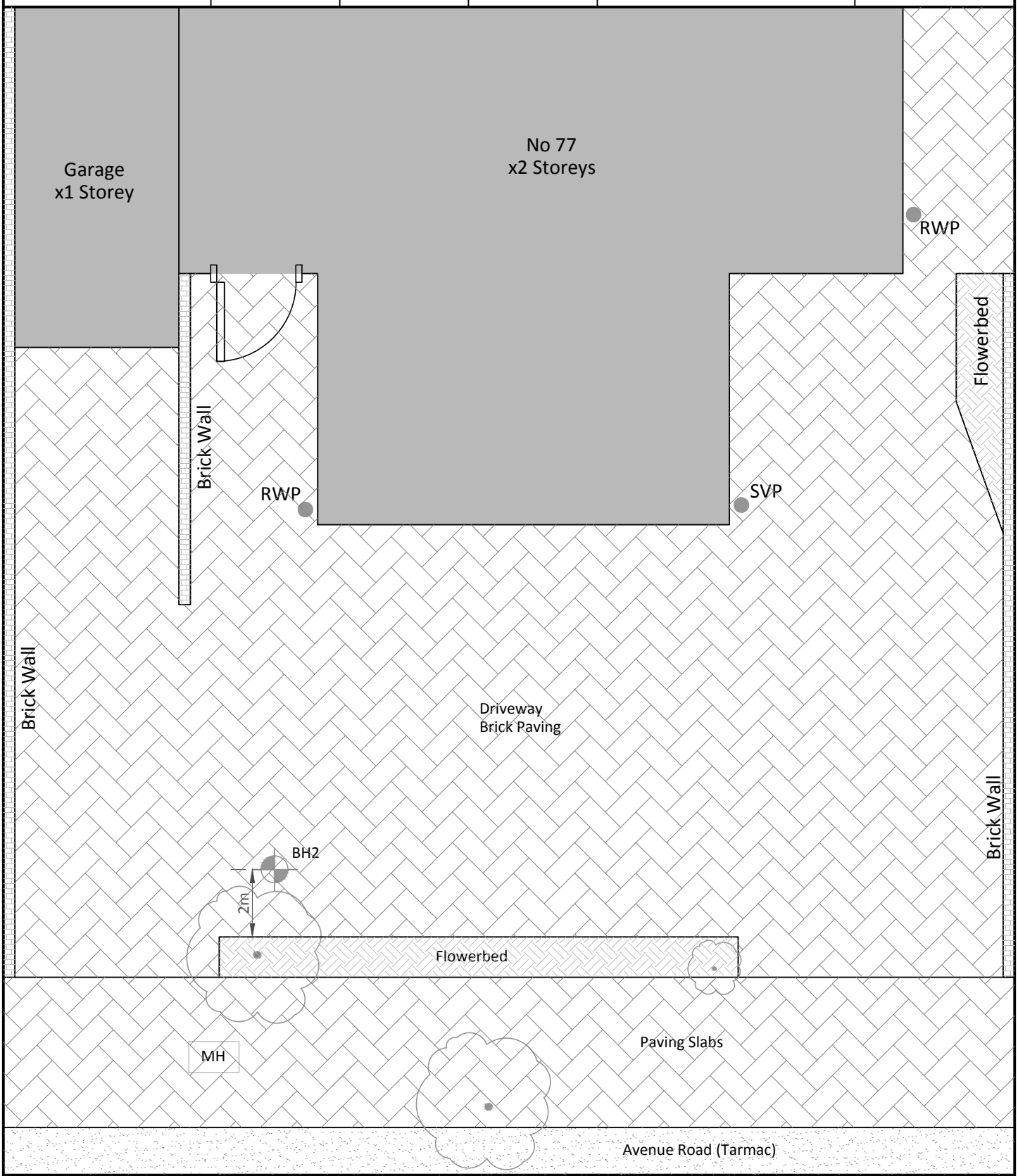
Key:

Borehole | Trial Pit | Tree/shrub

Chelmer Site Investigations
'Groundbreaking Services'

Site Plan

Site:		Client:			Site Plan ID:
77 Avenue Road, London NW8 6JD		Constructure			SP
Contract Number:	**Date:**	**Logged By:**	**Checked by:**	**Weather:**	
8562	23/02/17	J.P.	S.G.	Wet	Sheet 2 of 2
Easting:	**Northing:**	**Ground Level:**	**Plan:**		**Scale:**
N.D.	N.D.	N.D.	N.D.		N.T.S.



Remarks: All dimensions in metres.

Key:

BH — Borehole

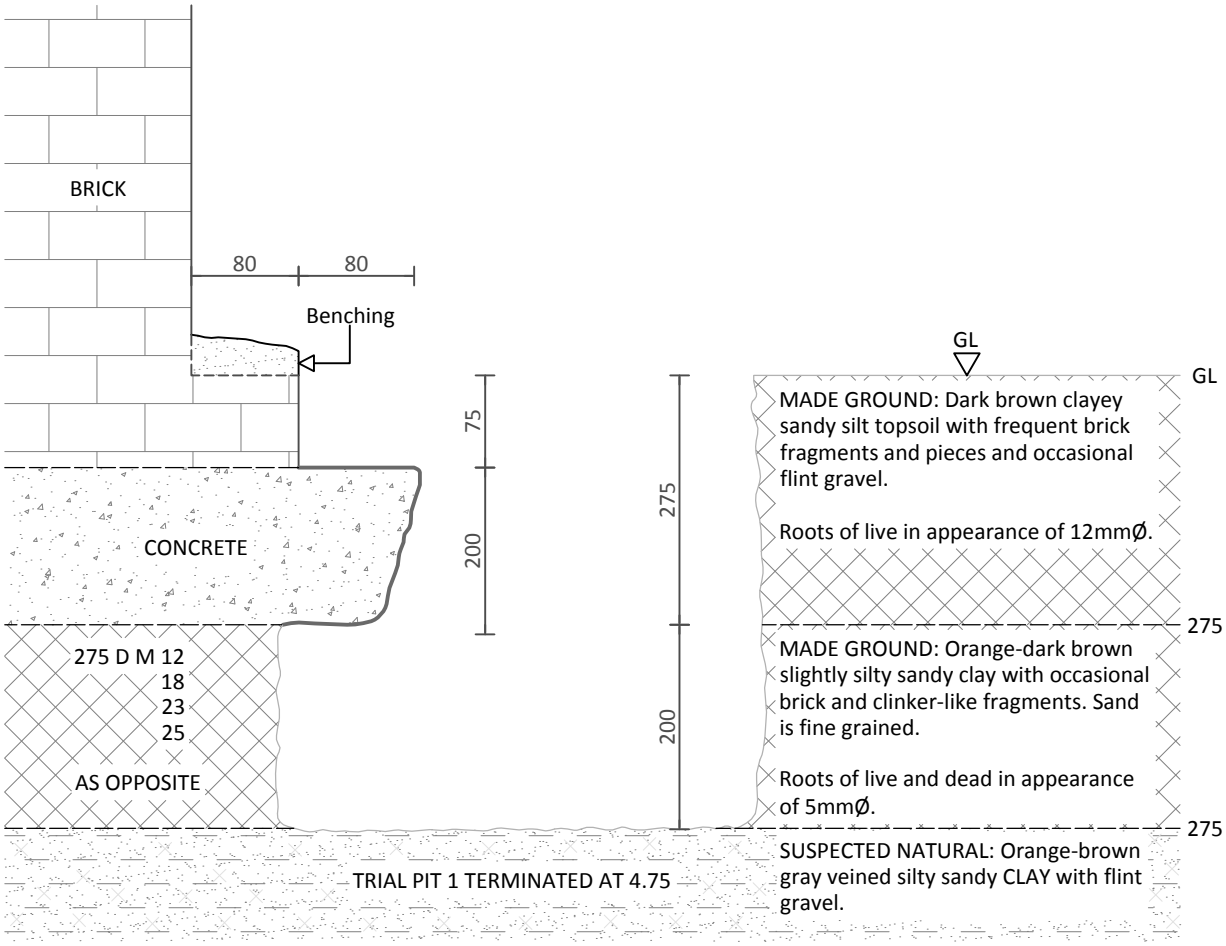
Tree/shrub

RWP/SVP — Rainwater/ soil vent pipe

MH — Manhole

Site:		Client:			Trial Pit ID:
77 Avenue Road, London NW8 6JD		Constructure			TP1
Contract Number:	**Date:**	**Logged By:**	**Checked by:**	**Weather:**	
8562	23.02.17	DB	SG	Wet	Sheet 1 of 1
Easting:	**Northing:**	**Ground Level:**	**Excavation Method:**		**Scale:**
N.D.	N.D.	N.D.	HAND TOOLS		N.T.S.

Trial Pit Log



Remarks:	Key:
All dimensions in millimeters.	GL - Ground Level D - Disturbed Sample M - Mackintosh Probe

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'Groundbreaking Services'

Constructure
77 Avenue Road, London, NW8 6JD
06.02.17
TRIAL PIT 1 PHOTOGRAPH

Chelmer Site Investigation Laboratories Ltd
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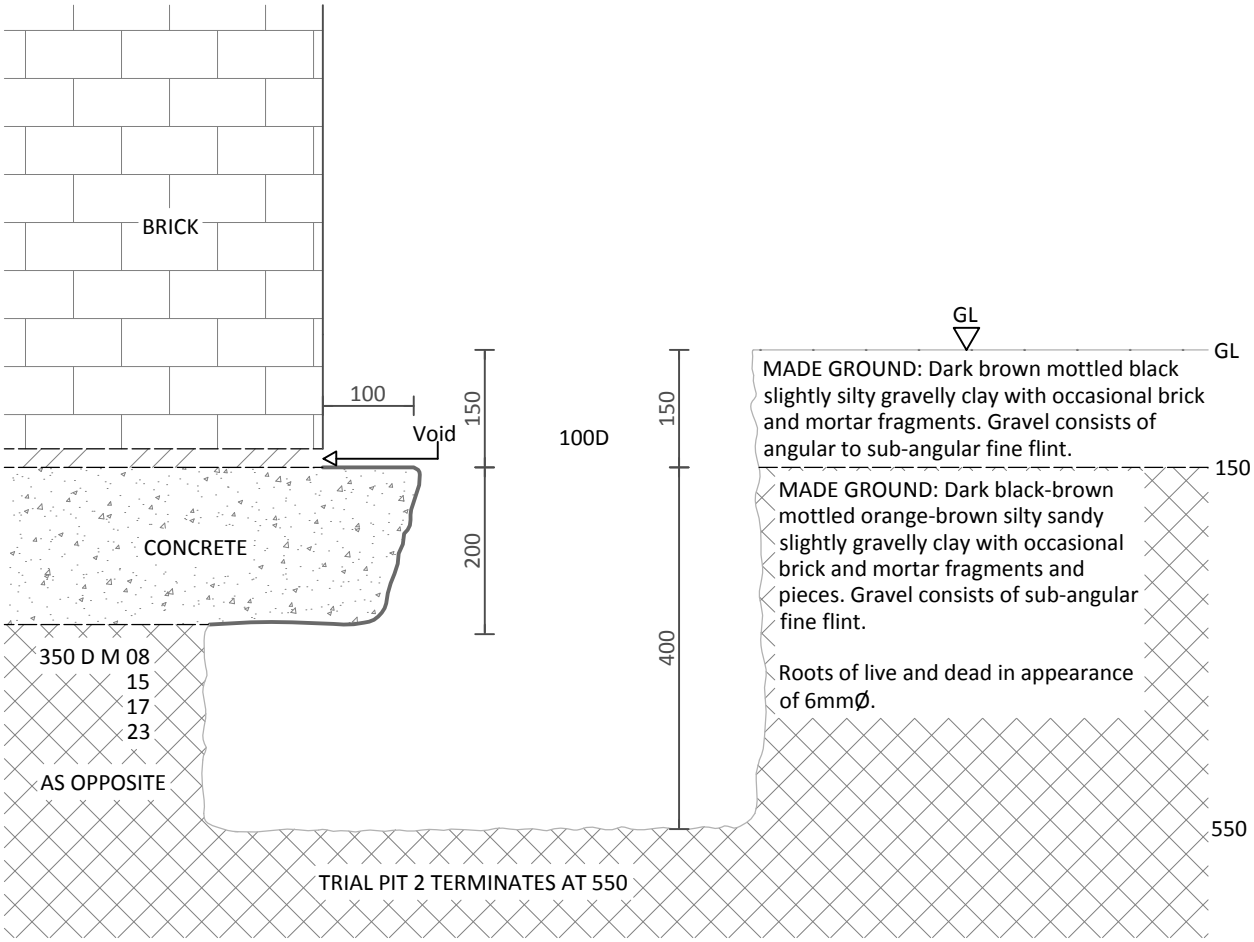
Chelmer Site Investigations 'Groundbreaking Services'	Site:		Client:			Trial Pit ID:
	77 Avenue Road, London NW8 6JD		Constructure			TP2
	Contract Number:	**Date:**	**Logged By:**	**Checked by:**	**Weather:**	
	8562	23.02.17	DB	SG	Wet	Sheet 1 of 1
Trial Pit Log	**Easting:**	**Northing:**	**Ground Level:**	**Excavation Method:**		**Scale:**
	N.D.	N.D.	N.D.	HAND TOOLS		N.T.S.



Remarks:	Key:
All dimensions in millimeters.	GL - Ground Level D - Disturbed Sample M - Mackintosh Probe

Constructure
77 Avenue Road, London, NW8 6JD
06.02.17
TRIAL PIT 2 PHOTOGRAPH

Chelmer Site Investigation Laboratories Ltd
Unit 15 East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB
Essex: 01245 400930 | London: 0203 67409136 | info@siteinvestigations.co.uk | www.siteinvestigations.com

Site:	Client:	Borehole ID:
77 Avenue Road, London NW8 6JD	Constructure	BH1

Contract Number:	Date:	Logged By:	Checked By:	Status:	
8562	23/02/2017	DB	SG	PRELIM	Sheet 1 of 2
Easting:	**Northing:**	**Ground Level:**	**Plant Used:**	**Weather:**	**Scale:**
		15.10mOD	100mmØ C.F.A Secondman	Overcast/Showers	1:50

Borehole Log

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.25	D1			0.10		Grass over TOPSOIL.		
0.50	D2			(0.60)		MADE GROUND: Dark brown silty sandy slightly gravelly clay with frequent brick fragments. Sand is fine to coarse grained. Gravel consists of sub-angular flint.		
1.00	D3			0.70 (0.60)		MADE GROUND: Dark yellow-brown `silty slightly gravelly clay with occasional brick and clinker-like fragments. Gravel consists of fine flint.		
1.50	D4			1.30 (0.50)		Stiff grey-brown veined silty slightly sandy CLAY with occasional sub-angular fine flint gravel and pockets of fine sand.		
2.00	D5			1.80		Stiff grey-brown veined silty CLAY with occasional partings of silt and fine sand. ....becoming slightly 'moist' from 3.8m. ....becoming very stiff from 5.6m.		
2.50	D6							
3.00	D7							
3.50	D8							
4.00	D9							
4.50	D10							
5.00	D11			(6.00)				
5.50	D12							
6.00	D13							
7.00	D14							
8.00	D15			7.80		Very stiff dark brown silty CLAY with rare disseminated selenite crystals.		
9.00	D16			(2.70)				
10.00	D17							
						Continued next sheet		

Remarks:

Slight groundwater 'seepage' at 3.8m.
Borehole 'dry' and open on completion.
50mmØ plastic standpipe installed 15m. (3.0m. plain pipe, 12.0m slotted pipe) with 3.0m bentonite and 12.0m shingle surround backfill. Bung and valve also provided.

Root Information:

Roots of live and dead in appearance to 1mmØ to a maximum depth of 0.60m.
Hair and fibrous roots observed to 0.90m.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.80			0		

Site:	Client:	Borehole ID:
77 Avenue Road, London NW8 6JD	Constructure	BH1

Contract Number:	Date:	Logged By:	Checked By:	Status:	
8562	23/02/2017	DB	SG	PRELIM	Sheet 2 of 2
Easting:	**Northing:**	**Ground Level:**	**Plant Used:**	**Weather:**	**Scale:**
		15.10mOD	100mmØ C.F.A Secondman	Overcast/Showers	1:50

Borehole Log

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				10.50		Very stiff dark brown silty CLAY with rare disseminated selenite crystals.		
11.00	D18					Very stiff dark grey silty CLAY with occasional claystone mudstone fragments and rare disseminated selenite crystals.		
12.00	D19							
				(4.60)				
13.00	D20							
14.00	D21							
15.00	D22			15.10		End of Borehole at 15.10m		

Remarks:

Slight groundwater 'seepage' at 3.8m.
Borehole 'dry' and open on completion.
50mmØ plastic standpipe installed 15m. (3.0m. plain pipe, 12.0m slotted pipe) with 3.0m bentonite and 12.0m shingle surround backfill. Bung and valve also provided.

Root Information:

Roots of live and dead in appearance to 1mmØ to a maximum depth of 0.60m.
Hair and fibrous roots observed to 0.90m.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.80			0		

Site:	Client:	Borehole ID:
77 Avenue Road, London NW8 6JD	Constructure	BH2

Contract Number:	Date:	Logged By:	Checked By:	Status:	
8562	01/03/2017	HR	SG	PRELIM	Sheet 1 of 3
Easting:	**Northing:**	**Ground Level:**	**Plant Used:**	**Weather:**	**Scale:**
		25.45mOD	Shell and Auger	Dry	1:50

Borehole Log

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				0.10		BLOCK PAVING		
				0.15		COARSE LEAN CEMENT		
						MADE GROUND: Dark Brown slightly gravelly sandy silty clay with occasional brick fragments. Sand is fine. Gravel is sub-angular of fine flint.		
1.00	D1			(1.85)				
1.20 - 1.65	D2	SPT(S) 1.20m, N=14 (2,2/2,3,4,5)						
1.80	D3							
2.00	D4			2.00				
2.00 - 2.45	U4					Brown boulder CLAY.		
2.80	D5							
3.00 - 3.45	D6	SPT(S) 3.00m, N=13 (2,2/3,3,3,4)		(2.00)				
3.80	D7							
4.00 - 4.45	U8			4.00		Firm brown grey veined silty CLAY with occasional partings of fine orange sand. (…becoming stiff from 5.0m).		
				(5.00)				
4.80	D9							
5.00 - 5.45	D10	SPT(S) 5.00m, N=15 (2,2/3,4,4,4)						
5.80	D11							
6.00 - 6.45	U12							
				(5.00)				
7.00	D13			7.00		Firm grey-brown mottled CLAY.		
8.00	D14	SPT(S) 8.00m, N=16 (2,4/3,4,4,5)		(2.00)				
9.00	D15			9.00		Stiff dark brown silty CLAY with rare pockets of fine orange sand and dissemented selenite crystals. Stiff fissured dark brownish grey silty CLAY .		
	U16							

Continued next sheet

Remarks:

Borehole 'dry' and open on completion.
50mmø plastic standpipe installed to 20.0m (2.0m plain pipe, 18.0m slotted pipe, 2.0m bentonite seal, 18.0m shingle surround, bung, valve and square plastic cover).

Root Information:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Site:	Client:	Borehole ID:
77 Avenue Road, London NW8 6JD	Constructure	BH2

Contract Number:	Date:	Logged By:	Checked By:	Status:	
8562	01/03/2017	HR	SG	PRELIM	Sheet 2 of 3
Easting:	**Northing:**	**Ground Level:**	**Plant Used:**	**Weather:**	**Scale:**
		25.45mOD	Shell and Auger	Dry	1:50

Borehole Log

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.00 - 10.45						Stiff fissured dark brownish grey silty CLAY .		
11.00	D17							
12.00	D18	SPT(S) 12.00m, N=15 (2,2/3,4,4,4)						
13.00	D19							
14.00 - 14.45	U20							
15.00	D21			(16.45)				
16.00	D22							
17.00	D23	SPT(S) 17.00m, N=15 (2,3/3,3,4,5)						
19.00	D24							
	U25							
						Continued next sheet		

Remarks:

Borehole 'dry' and open on completion.
50mmø plastic standpipe installed to 20.0m (2.0m plain pipe, 18.0m slotted pipe, 2.0m bentonite seal, 18.0m shingle surround, bung, valve and square plastic cover).

Root Information:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Site:	Client:	Borehole ID:
77 Avenue Road, London NW8 6JD	Constructure	BH2

Contract Number:	Date:	Logged By:	Checked By:	Status:	
8562	01/03/2017	HR	SG	PRELIM	Sheet 3 of 3
Easting:	**Northing:**	**Ground Level:**	**Plant Used:**	**Weather:**	**Scale:**
		25.45mOD	Shell and Auger	Dry	1:50

Borehole Log

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
20.00 - 20.45						Stiff fissured dark brownish grey silty CLAY .		
22.00	D26							
23.00	D27	SPT(S) 23.00m, N=21 (2,3/4,5,5,7)						
24.00	D28							
25.00 - 25.45	U29			25.45		End of Borehole at 25.45m		

Remarks:

Borehole 'dry' and open on completion.
50mmø plastic standpipe installed to 20.0m (2.0m plain pipe, 18.0m slotted pipe, 2.0m bentonite seal, 18.0m shingle surround, bung, valve and square plastic cover).

Root Information:

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

UKAS TESTING
8284

Chelmer
Geotechnical Laboratories
'Groundbreaking Services'

Laboratory Report

Site	**77 Avenue Road**
Client	**Constructure**
Date	**15-Mar-17**
Our Ref	**CSI8562**
CGL Ref	**CGL8562**

Chelmer Site Investigation Laboratories Ltd
Unit 15 East Hanningfield Industrial Estate, Old Church Road, East Hanningfield, Essex CM3 8AB
Essex: 01245 400930 | London: 0203 6409136 |info@siteinvestigations.co.uk | www.siteinvestigations.com

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Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Content Summary

This report contains all test results as indicated on the test instruction/summary.

CGL Reference : CGL8562

Client Reference : CSI8562

For the attention of : Constructure

This report comprises of the following :

1	Cover Page
1	Inside Cover/Contents Page
2	Pages of Results
1	Moisture/Shear Strength Chart
1	Plasticity Chart
2	Particle Size Distribution - Wet Sieving Charts
2	Particle Size Distribution - Sieve & Sedimentation Charts
7	Pages of Unconsolidated Undrained Shear Strengths
4	Pages of BRE SD1 Results
1	Limitations of Report Page

Notes :

General

Please refer to report summary notes for details pertaining to methods undertaken and their subsequent accreditations

Samples were supplied by Chelmer Site Investigations

All tests performed in-house unless otherwise stated

Deviant Samples

Samples were received in suitable containers	Yes
A date and time of sampling was provided	Yes
Arrived damaged and/or denatured	No

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL8562
Client : Constructure
Client Reference : CSI8562
Site Name : 77 Avenue Road

Date Received : 06/03/2017
Date Testing Started : 06/03/2017
Date Testing Completed : 15/03/2017
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH1	1.0	85899	D	26	<5	48	21	27	0.19	26	CI								
BH1	2.0	85901	D	30	<5	105	25	80	0.06	76	CE								
BH1	4.0	85905	D	29	<5	76	23	53	0.12	50	CV								
BH1	6.0	85909	D	29	<5	73	20	53	0.16	50	CV								
BH1	8.0	85911	D	30	<5	58	20	38	0.26	36	CH								
BH1	10.0	85913	D	30	<5	73	24	49	0.12	46	CV								
BH1	12.0	85915	D	29	<5	73	22	51	0.14	49	CV								
BH1	15.0	85918	D	29	<5	77	21	56	0.15	53	CV								

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D - Disturbed sample
B - Bulk sample
U - U100 (undisturbed sample)
W - Water sample
ENP - Essentially Non-Plastic
U/S - Underside Foundation

UKAS TESTING 8284

Comments :-

Technician :- CE

Checked & Authorised By:- Martyn Graham **Senior Laboratory Technician**
Chelmer Site Investigation Laboratories Ltd

Date Checked :- 15/03/2017

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL8562
Client : Constructure
Client Reference : CSI8562
Site Name : 77 Avenue Road

Date Received : 06/03/2017
Date Testing Started : 06/03/2017
Date Testing Completed : 15/03/2017
Laboratory Used : Chelmer Geotechnical, CM3 8AB

Sample Ref			Sample Type	*Moisture Content (%) [1]	*Soil Faction > 0.425mm (%) [2]	*Liquid Limit (%) [3]	*Plastic Limit (%) [4]	*Plasticity Index (%) [5]	*Liquidity Index (%) [5]	*Modified Plasticity Index (%) [6]	*Soil Class [7]	Filter Paper Contact Time (h) [8]	*Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	*pH Value [11]	*Sulphate Content (g/l)		
BH/TP/WS	Depth (m)	UID															SO_3 [12]	SO_4 [13]	Class [14]
BH2	1.8	86008	D	29	<5	70	22	48	0.14	46	CH								
BH2	3.0	86011	D	29	<5	72	24	48	0.10	46	CV								
BH2	4.8	86014	D	27	<5	64	21	43	0.13	41	CH								
BH2	7.0	86018	D	30	<5	74	23	51	0.14	49	CV								
BH2	11.0	86022	D	30	<5	77	24	53	0.12	51	CV								
BH2	15.0	86026	D	30	<5	84	27	57	0.04	54	CV								
BH2	19.0	86029	D	33	<5	81	26	55	0.13	52	CV								
BH2	24.0	86033	D	30	<5	81	27	54	0.05	52	CV								

Notes :- *UKAS Accredited Tests

[1] BS 1377 : Part 2 : 1990, Test No 3.2
[2] Estimated if <5%, otherwise measured
[3] BS 1377 : Part 2 : 1990, Test No 4.4
[4] BS 1377 : Part 2 : 1990, Test No 5.3
[5] BS 1377 : Part 2 : 1990, Test No 5.4
[6] BRE Digest 240 : 1993
[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils
[8] In-house method S9a adapted from BRE IP 4/93
[9] Values of shear strength were determined in situ by Chelmer Site Investigations using a Pilcon hand vane or Geonor vane (GV).
[10] BS 1377 : Part 3 : 1990, Test No 4
[11] BS 1377 : Part 2 : 1990, Test No 9
[12] BS 1377 : Part 3 : 1990, Test No 5.6
[13] $SO_4 = 1.2 \times SO_3$
[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005

Note that if the SO_4 content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D - Disturbed sample
B - Bulk sample
U - U100 (undisturbed sample)
W - Water sample
ENP - Essentially Non-Plastic
U/S - Underside Foundation

UKAS TESTING 8284

Comments :-

Technician :- CE

Checked & Authorised By:- Martyn Graham **Senior Laboratory Technician**
Chelmer Site Investigation Laboratories Ltd

Date Checked :- 15/03/2017

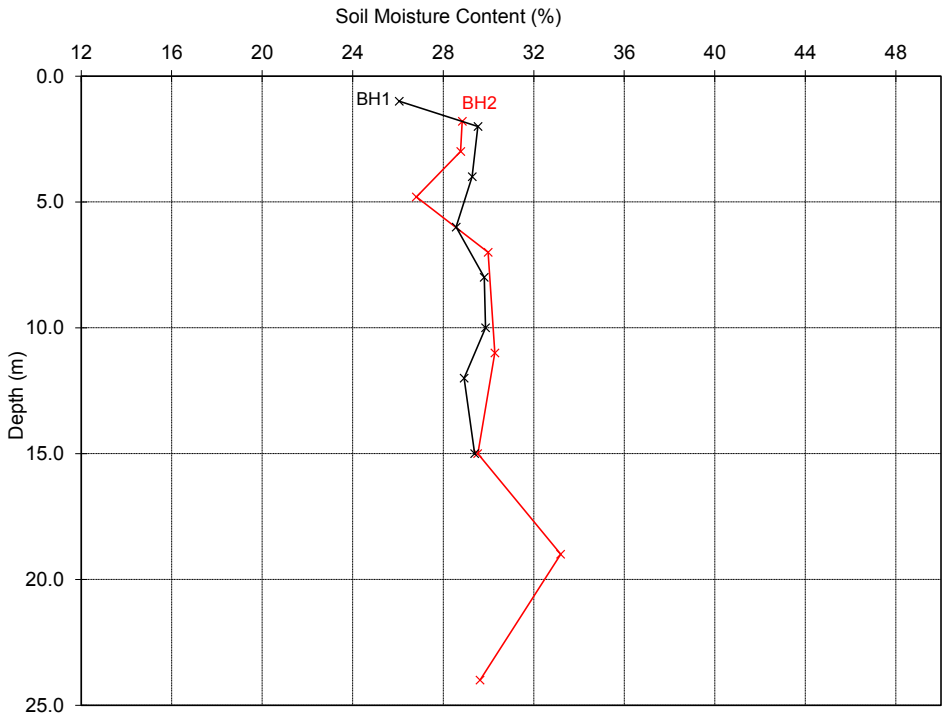
Laboratory Testing Results

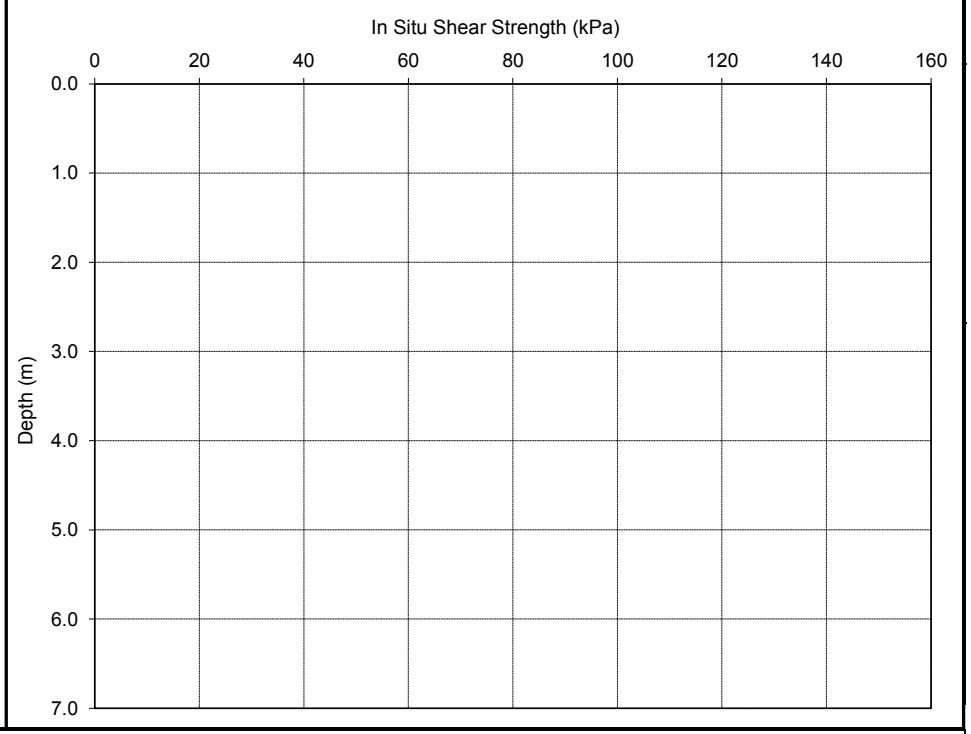
Moisture Content/Shear Strength Profile

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL8562
Client : Constructure
Client Reference : CSI8562
Site Name : 77 Avenue Road

Date Received : 06/03/2017
Date Testing Started : 06/03/2017
Date Testing Completed : 15/03/2017
Laboratory : Chelmer Geotechnical Laboratories, CM3 8AB





Notes :-

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly over consolidated clays) at shallow depths.

Unless otherwise stated, values of Shear Strength were determined in situ by Chelmer Site Investigations using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 140 kPa. (Not UKAS accredited)

UKAS TESTING 8284

Comments :-

Checked & Authorised By:- Martyn Graham **Senior Laboratory Technician**
Chelmer Site Investigation Laboratories Ltd

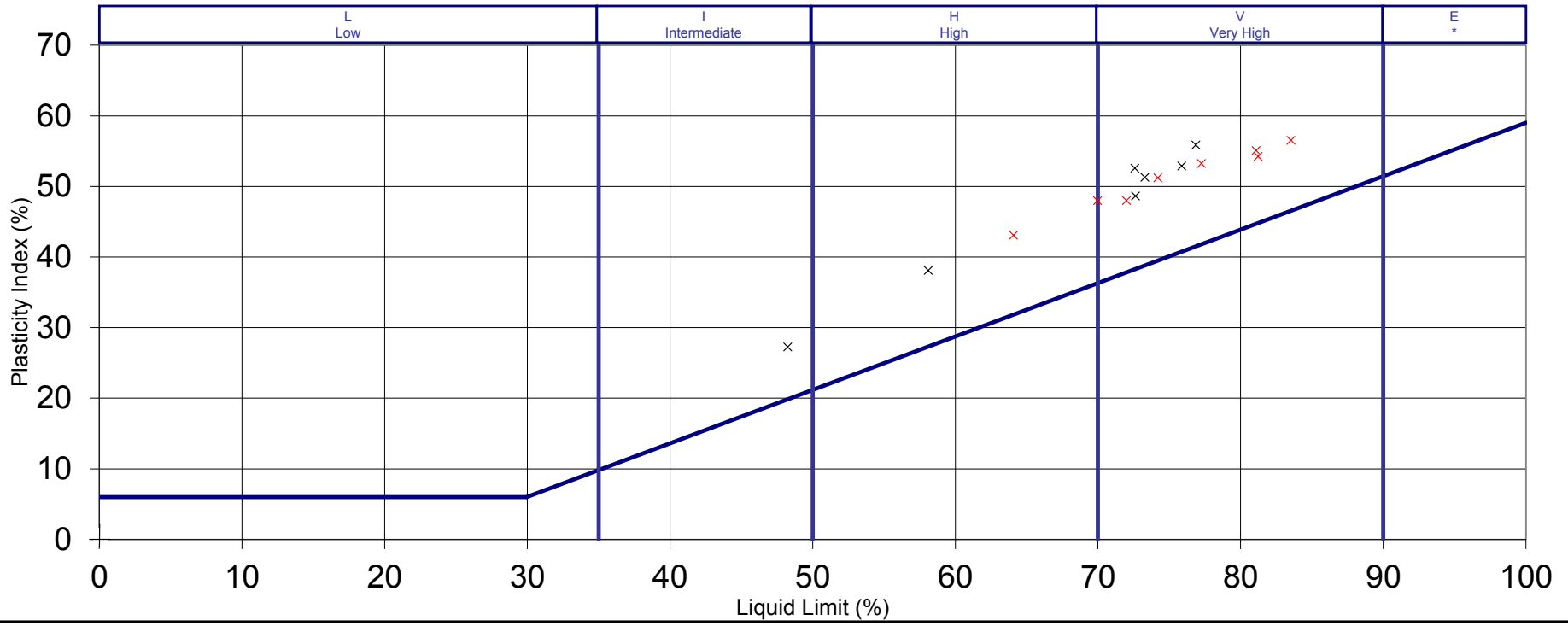
Date: 15/03/2017

Laboratory Testing Results

Plasticity Chart for the classification of fine soils and the finer part of coarse soils
In Compliance with BS5930 : 1999

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number :	CGL8562	Date Received :	06/03/2017
Client :	Constructure	Date Testing Started :	06/03/2017
Client Reference :	CSI8562	Date Testing Completed :	15/03/2017
Site Name :	77 Avenue Road	Laboratory :	Chelmer Geotechnical Laboratories, CM3 8AB



Notes :-

SILT (M-SOIL), M, plots below A-Line
CLAY, C, plots above A-Line }M and C may be combined as FINE SOIL, F.

Key :- BH1
BH2

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Comments :-

Checked & Authorised By:- Martyn Graham **Senior Laboratory Technician**
Chelmer Site Investigation Laboratories Ltd

Date: 15/03/2017

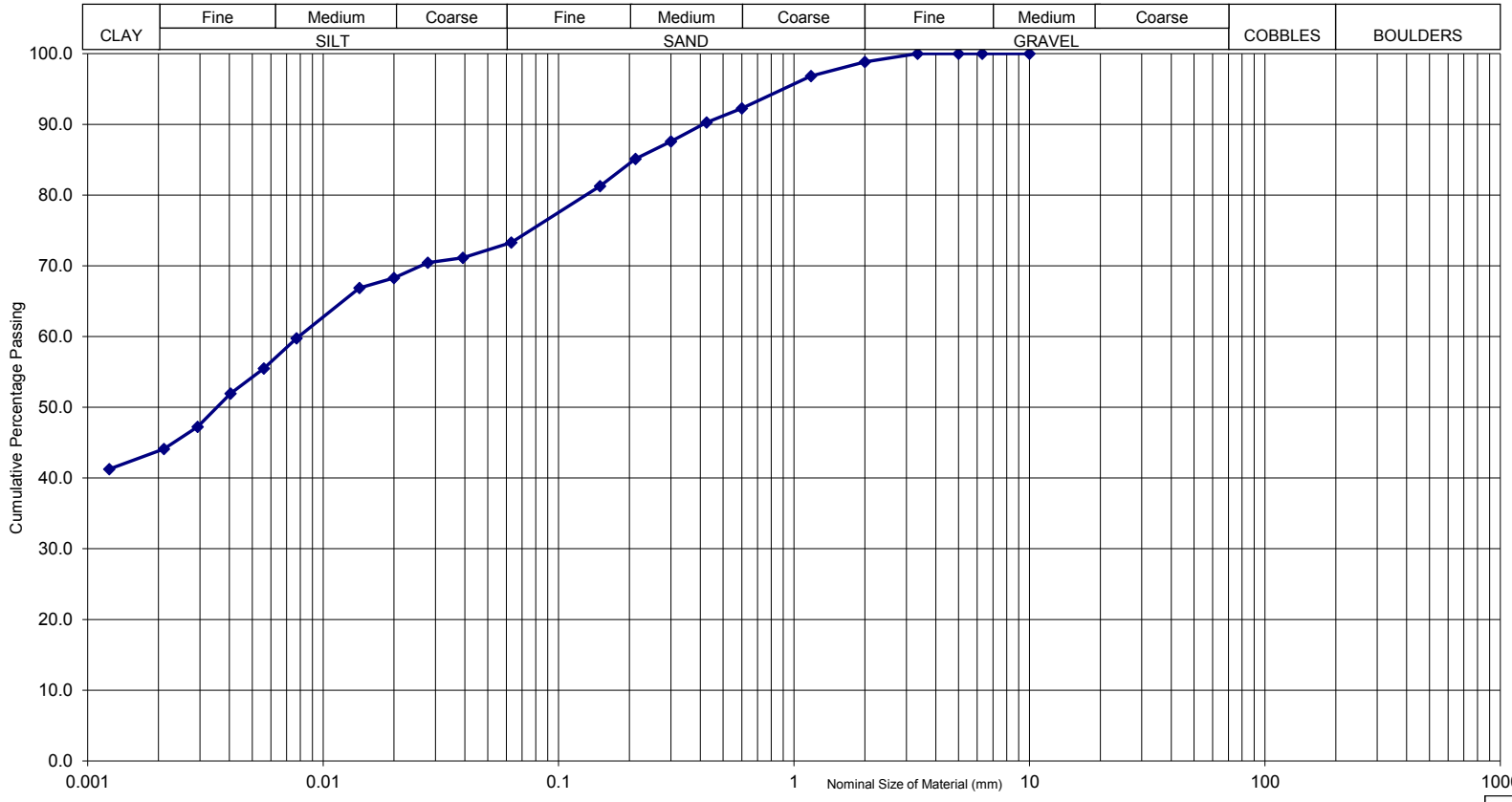
PARTICLE SIZE DISTRIBUTION

BS 1377-2:1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number :	CGL8562	Site Name :	77 Avenue Road
Sample Number :	BH2	Soil Description :	Slightly sandy silty CLAY with occasional fine crystals.
Depth (m) :	2.8		
Sample UID :	86010		

Type of Sieving :	Hydrometer
Date :	08-Mar-17
Tested By :	SW
Laboratory :	Chelmer Geotechnical CM3 8AB



Sieve Size (mm)	% Passing
90.0	100.0
75.0	100.0
63.0	100.0
50.0	100.0
37.5	100.0
28.0	100.0
20.0	100.0
14.0	100.0
10.0	100.0
6.3	100.0
5.0	100.0
3.35	100.0
2.00	98.8
1.18	96.8
0.600	92.3
0.425	90.3
0.300	87.6
0.212	85.1
0.150	81.3
0.063	73.3
0.039	71.1
0.028	70.4
0.020	68.3
0.014	66.9
0.008	59.8
0.006	55.5
0.004	51.9
0.003	47.2
0.002	44.1
0.001	41.3

Calculations :-

$$f = \frac{(M_1 - M_2) + P}{M_1} \times 100$$

$f = 100P/M_1$ (dry sieving)

f = Percentage of fines passing 0.063mm
M_1 = Mass of dried test sample before washing (kg)
M_2 = Mass of dried residue retained on the 0.063m (kg)
P = Mass of screened material remaining in the pan (kg)

Comments :-
Results Passing 63µm Sieve NOT UKAS accredited.

UKAS TESTING 8284

Checked By :- MG Date Checked :- 15-Mar-17

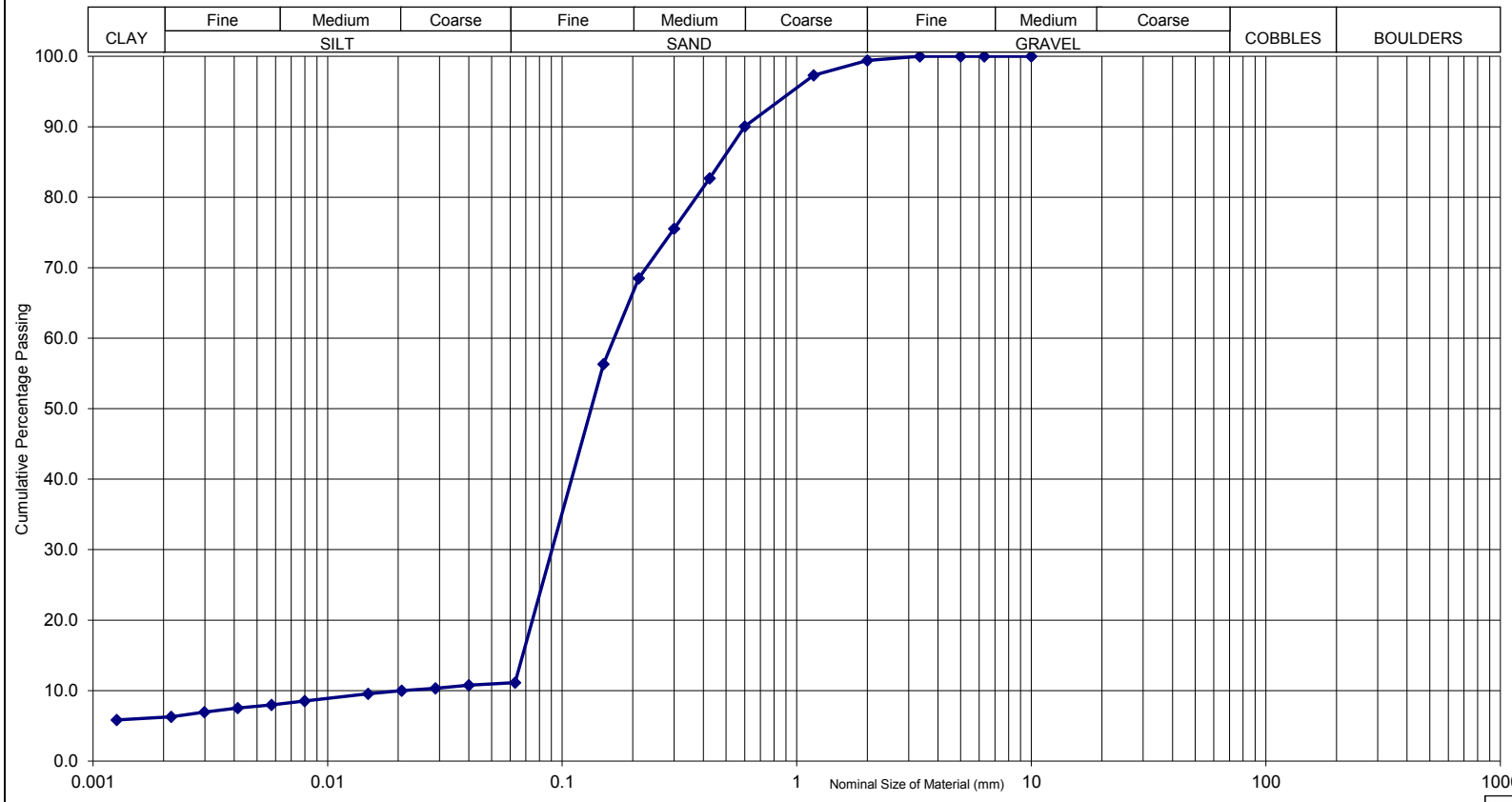
PARTICLE SIZE DISTRIBUTION

BS 1377-2:1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number :	CGL8562	Site Name :	77 Avenue Road
Sample Number :	BH2	Soil Description :	Silty fine to coarse SAND.
Depth (m) :	5.0		
Sample UID :	86015		

Type of Sieving :	Hydrometer
Date :	08-Mar-17
Tested By :	SW
Laboratory :	Chelmer Geotechnical CM3 8AB



Sieve Size (mm)	% Passing
90.0	100.0
75.0	100.0
63.0	100.0
50.0	100.0
37.5	100.0
28.0	100.0
20.0	100.0
14.0	100.0
10.0	100.0
6.3	100.0
5.0	100.0
3.35	100.0
2.00	99.4
1.18	97.3
0.600	90.0
0.425	82.7
0.300	75.5
0.212	68.5
0.150	56.3
0.063	11.1
0.040	10.8
0.029	10.3
0.021	10.0
0.015	9.5
0.008	8.5
0.006	8.0
0.004	7.5
0.003	7.0
0.002	6.3
0.001	5.8

Calculations :-

$$f = \frac{(M_1 - M_2) + P}{M_1} \times 100$$

$f = 100P/M_1$ (dry sieving)

f = Percentage of fines passing 0.063mm
M_1 = Mass of dried test sample before washing (kg)
M_2 = Mass of dried residue retained on the 0.063m (kg)
P = Mass of screened material remaining in the pan (kg)

Comments :-
Results Passing 63µm Sieve NOT UKAS accredited.

UKAS TESTING 8284

Checked By :- MG Date Checked :- 15-Mar-17

Laboratory Testing Results

BS 1377:1990: Part 7

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 2.00m	Sample UID :	86009
Project/Site :	77 Avenue Road		

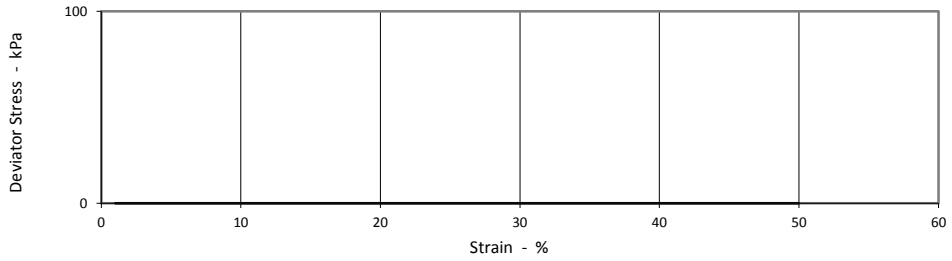
Sample Details

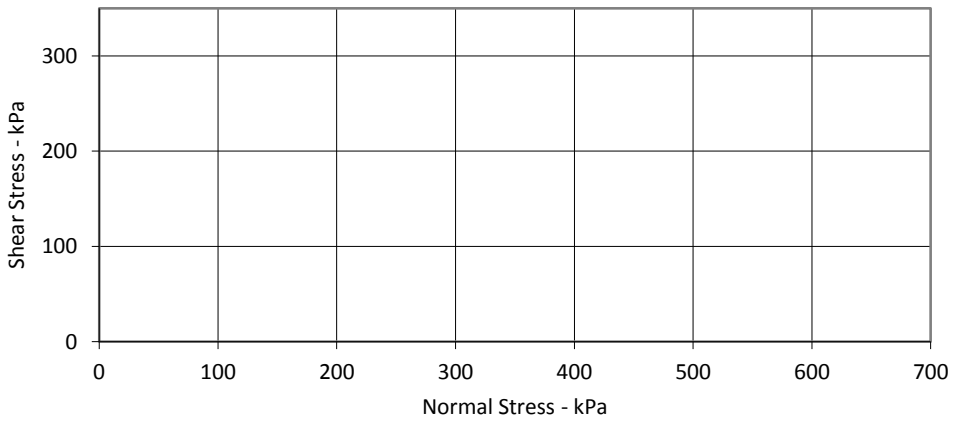
Description		Brown London Clay
Sample Condition		Undisturbed
Height	mm	0.0
Diameter	mm	0.0
Moisture Content	%	9.9
Bulk Density	Mg/m³	
Dry Density	Mg/m³	

Test Details

Membrane Thickness	mm	0.00
Membrane Correction	kPa	
Rate of Axial Displacement	%/min	
Cell Pressure	kPa	0
Strain at Failure	%	
Maximum Deviator Stress	kPa	
Shear Strength	kPa	
Mode of Failure		

Shear Strength Parameters		
C	-	kPa
Phi	-	°





Insufficient Sample So No Testing Was Carried Out

Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Technician

15/03/2017

Laboratory Testing Results

BS 1377:1990: Part 7

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 4.00m	Sample UID :	86013
Project/Site :	77 Avenue Road		

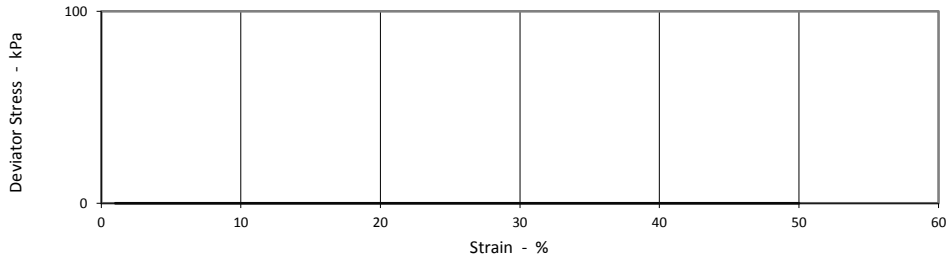
Sample Details

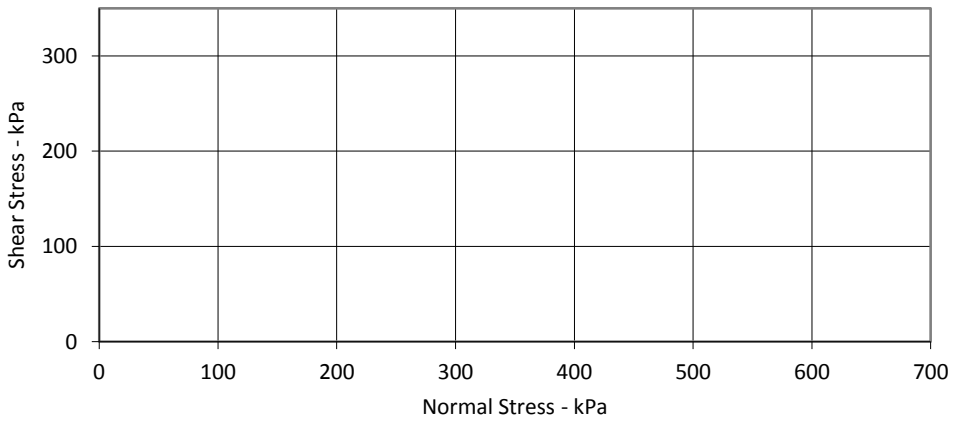
Description		Dark Brown Clay
Sample Condition		Undisturbed
Height	mm	0.0
Diameter	mm	0.0
Moisture Content	%	25
Bulk Density	Mg/m³	
Dry Density	Mg/m³	

Test Details

Membrane Thickness	mm	0.00
Membrane Correction	kPa	
Rate of Axial Displacement	%/min	
Cell Pressure	kPa	0
Strain at Failure	%	
Maximum Deviator Stress	kPa	
Shear Strength	kPa	
Mode of Failure		

Shear Strength Parameters		
C	-	kPa
Phi	-	°





Insufficient Sample So No Testing Carried Out

Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Technician

15/03/2017

Laboratory Testing Results

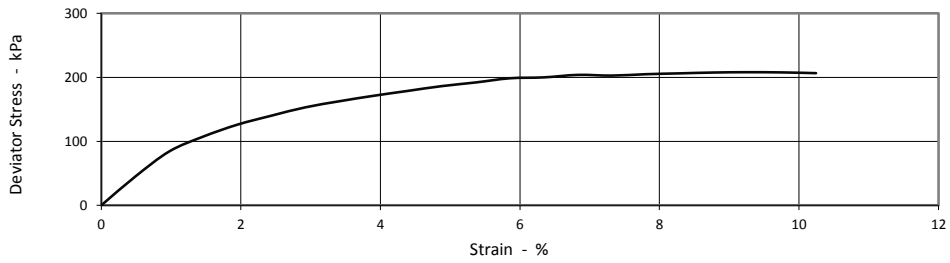
BS 1377:1990: Part 7

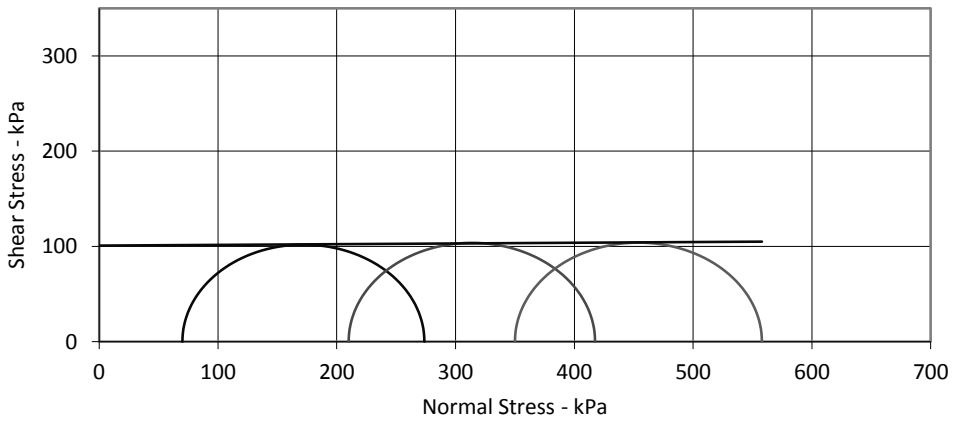
Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 6.00m	Sample UID :	86017
Project/Site :	77 Avenue Road		

Sample Details

Description		Stiff Light Brown Clay			
Sample Condition		Undisturbed			
Height	mm	205.0			
Diameter	mm	105.0			
Moisture Content	%	33			
Bulk Density	Mg/m³	1.83			
Dry Density	Mg/m³	1.37			
Test Details	**Stage**	**1**	**2**	**3**	
Membrane Thickness	mm	0.29	0.29	0.29	
Membrane Correction	kPa	0.46	0.56	0.59	
Rate of Axial Displacement	%/min	1.76	1.76	1.76	
Cell Pressure	kPa	70	210	350	
Strain at Failure	%	6.8	8.8	9.3	
Maximum Deviator Stress	kPa	204	207	208	
Shear Strength	kPa	**102**	**104**	**104**	
Mode of Failure				Intermediate	

Shear Strength Parameters	
C	**101 kPa**
Phi	**0.4 °**





Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Technician

15/03/2017

Laboratory Testing Results

BS 1377:1990: Part 7

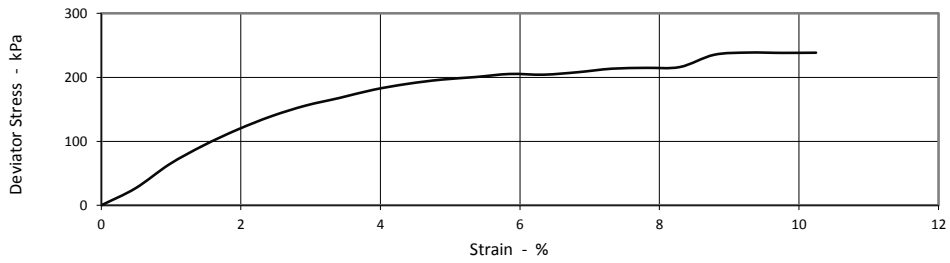
Chelmer Geotechnical Laboratories
'Groundbreaking Services'

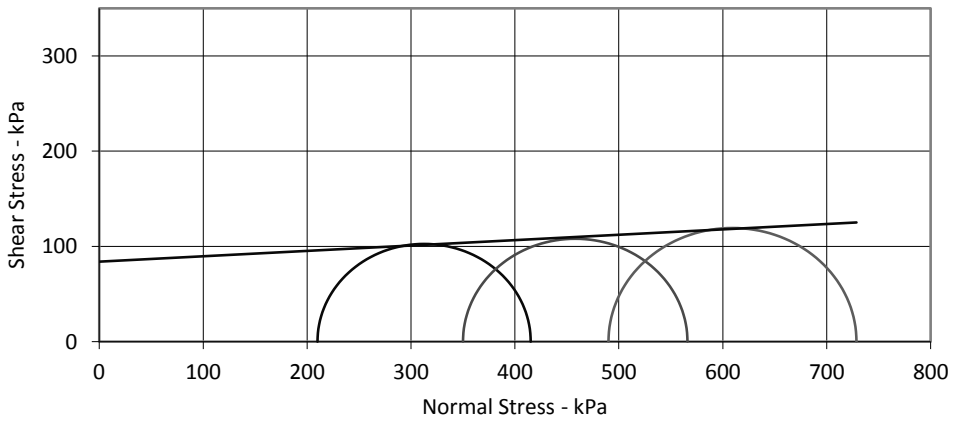
Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 10.00m	Sample UID :	86021
Project/Site :	77 Avenue Road		

Sample Details

Description		Stiff Light Brown Clay			
Sample Condition		Undisturbed			
Height	mm	205.0			
Diameter	mm	105.0			
Moisture Content	%	28			
Bulk Density	Mg/m³	1.88			
Dry Density	Mg/m³	1.47			
Test Details	**Stage**	**1**	**2**	**3**	
Membrane Thickness	mm	0.24	0.24	0.24	
Membrane Correction	kPa	0.34	0.45	0.49	
Rate of Axial Displacement	%/min	1.76	1.76	1.76	
Cell Pressure	kPa	210	350	490	
Strain at Failure	%	5.9	8.3	9.3	
Maximum Deviator Stress	kPa	205	216	239	
Shear Strength	kPa	**103**	**108**	**119**	
Mode of Failure				Intermediate	

Shear Strength Parameters	
C	**84 kPa**
Phi	**3.2 °**





Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Technician

15/03/2017

Laboratory Testing Results

BS 1377:1990: Part 7

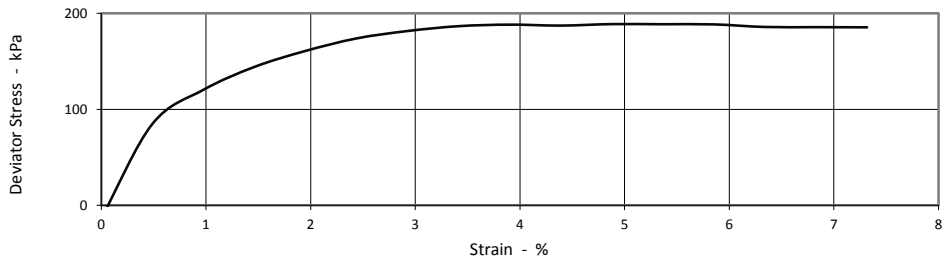
Chelmer Geotechnical Laboratories
'Groundbreaking Services'

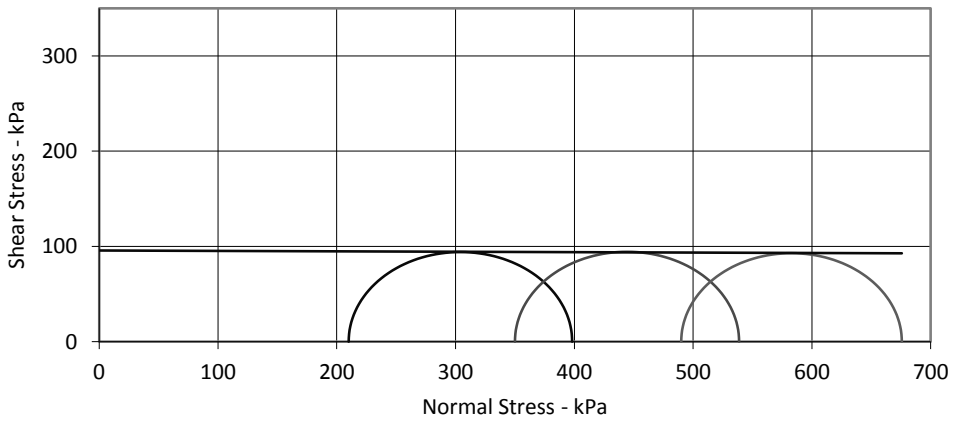
Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 14.00m	Sample UID :	86025
Project/Site :	77 Avenue Road		

Sample Details

Description		Stiff Brownish Black Clay			
Sample Condition		Undisturbed			
Height	mm	205.0			
Diameter	mm	105.0			
Moisture Content	%	30			
Bulk Density	Mg/m³	1.87			
Dry Density	Mg/m³	1.44			
Test Details	**Stage**	**1**	**2**	**3**	
Membrane Thickness	mm	0.28	0.28	0.28	
Membrane Correction	kPa	0.28	0.34	0.42	
Rate of Axial Displacement	%/min	1.76	1.76	1.76	
Cell Pressure	kPa	210	350	490	
Strain at Failure	%	3.9	4.9	6.3	
Maximum Deviator Stress	kPa	188	189	186	
Shear Strength	kPa	**94**	**94**	**93**	
Mode of Failure				Intermediate	

Shear Strength Parameters	
C	**96 kPa**
Phi	**-0.2 °**





Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Technician

15/03/2017

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Laboratory Testing Results

BS 1377:1990: Part 7

Chelmer Geotechnical Laboratories
'Groundbreaking Services'

Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 20.00m	Sample UID :	86030
Project/Site :	77 Avenue Road		

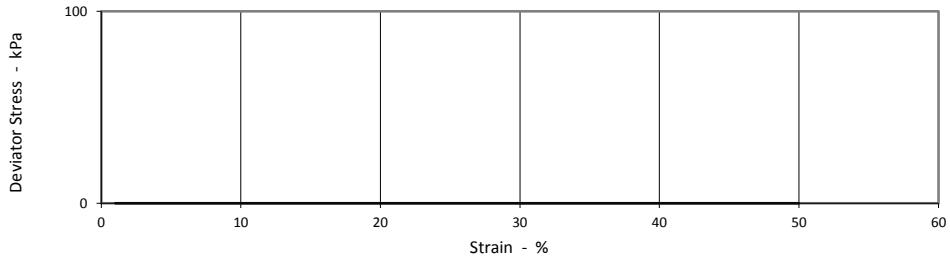
Sample Details

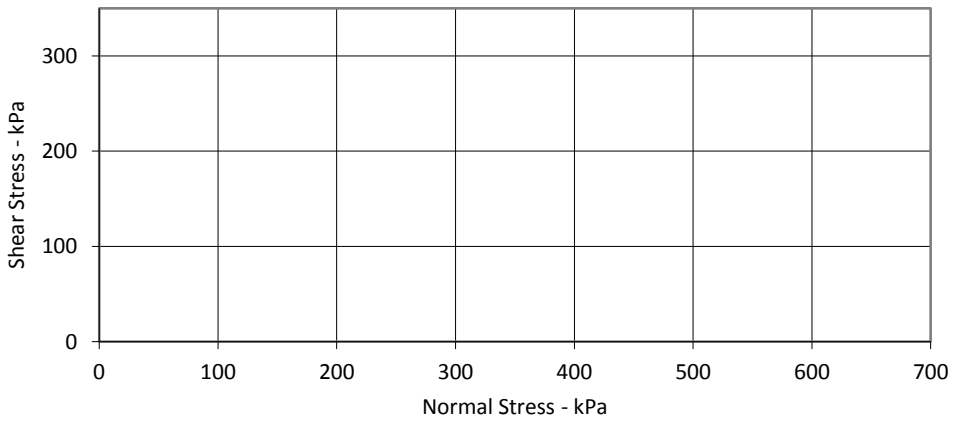
Description		Dark Brown Clay
Sample Condition		Undisturbed
Height	mm	0.0
Diameter	mm	0.0
Moisture Content	%	26
Bulk Density	Mg/m³	
Dry Density	Mg/m³	

Test Details

Membrane Thickness	mm	0.00
Membrane Correction	kPa	
Rate of Axial Displacement	%/min	
Cell Pressure	kPa	0
Strain at Failure	%	
Maximum Deviator Stress	kPa	
Shear Strength	kPa	
Mode of Failure		

Shear Strength Parameters		
C	-	kPa
Phi	-	°





Insufficient Sample So No Testing Carried Out

Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Techncian

15/03/2017

Laboratory Testing Results

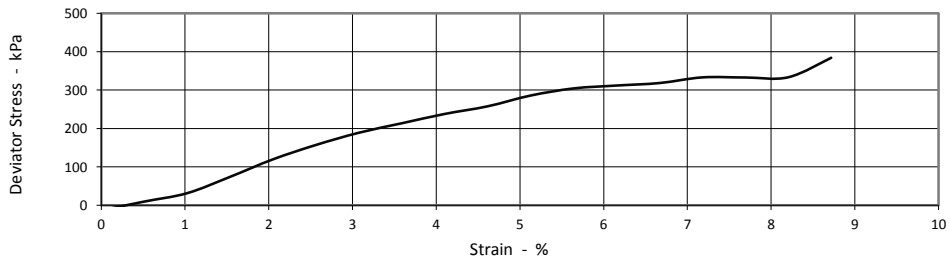
BS 1377:1990: Part 7

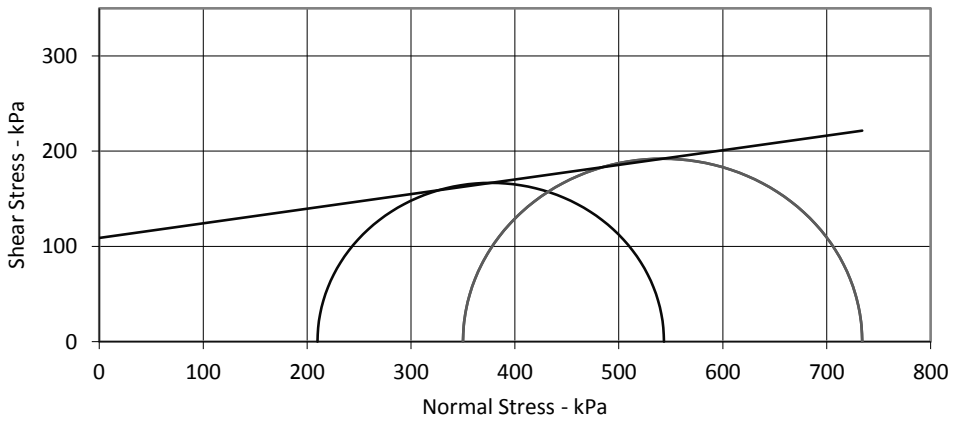
Job Number :	CGL8562	Date Tested :	10/03/2017
Client :	Constructure	Date Reported :	13/03/2017
Client Reference :	BH2 @ 25.00m	Sample UID :	86034
Project/Site :	77 Avenue Road		

Sample Details

Description		Stiff Dark Brown Clay	
Sample Condition		Undisturbed	
Height	mm	195.0	
Diameter	mm	105.0	
Moisture Content	%	30	
Bulk Density	Mg/m³	1.93	
Dry Density	Mg/m³	1.48	
Test Details	**Stage**	**1**	**2**
Membrane Thickness	mm	0.31	0.31
Membrane Correction	kPa	0.57	0.60
Rate of Axial Displacement	%/min	1.85	1.85
Cell Pressure	kPa	210	350
Strain at Failure	%	8.2	8.7
Maximum Deviator Stress	kPa	333	384
Shear Strength	kPa	**167**	**192**
Mode of Failure			Brittle

Shear Strength Parameters	
C	**109 kPa**
Phi	**8.7 °**





Unconsolidated Undrained Shear Strength Tested in Accordance with BS 1377: Part 7: 1990

Authorised Signatory: **Martyn Graham**
Senior Laboratory Technician

15/03/2017

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

Chelmer Site Investigations
Unit 15
East Hanningfield Industrial Estate
CM3 8AB

Analytical Test Report: L17/0573/CSI/001

Your Project Reference:	**CGL8562**	Samples Received on:	08.03.2017
Your Order Number:	7787	Testing Instruction Received:	08.03.2017
Report Issue Number:	1	Sample Tested:	08 to 15.03.2017
Samples Analysed:	4 Soils	Report issued:	15.03.2017

Signed

James Gane
Commercial Manager
Nicholls Colton Group

Notes:

General

Please refer to Methodologies tab for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report unless otherwise requested.

Samples were supplied by customer, results are representative of the material provided

Deviating Samples

Samples were received in suitable containers	**Yes**
A date and time of sampling was provided	**Yes**
Sample holding times were exceeded prior to analysis of determinants	**No**

Where samples do not meet one or more of the above criteria they will be classed as deviating, this means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

Date of Issue 24.01.2017
Owned by Emily Blissett - Customer Services Supervisor
Authorised by James Gane - Commercial Manager
G:\LE1 Production\Commercial\Current Reports\2017\L17\CSI - Chelmer\L17-0573-CSI\[L17-0573-CSI 001.xlsx]Cover Sheet

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L17/0573/CSI/001

Project Reference - CGL8562

Analytical Test Results - BRE Suite

NC Reference			17-7306	17-7307	17-7308	17-7309
Client Sample Reference			85898	85902	85907	85910
Client Sample Location			BH1	BH1	BH1	BH1
Depth (m)			0.50	2.50	5.00	7.00
Date of Sampling			02.03.2017	02.03.2017	02.03.2017	02.03.2017
Time of Sampling			AM	AM	AM	AM
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**				
Water soluble sulphate	(mg/l)	u	<10	630	2700	2800
Acid Soluble Sulphate	(%)	u	0.04	0.14	0.96	0.87
Total Sulphur	(%)	u	0.05	0.05	0.34	0.30
pH Value	pH Units	MCERTS	7.9	8.0	7.7	7.7

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L17/0573/CSI/001

Project Reference - CGL8562

Sample Descriptions

NC Reference	Client Sample Reference	Sample Location	Description	% Passing 2mm BS test sieve
17-7306	85898	BH1	Brown silty sandy gravelly clay with brick fragments and organic matter. (Fill)	75
17-7307	85902	BH1	Brown silty clay with organic matter.	100
17-7308	85907	BH1	Brown silty clay.	1000
17-7309	85910	BH1	Brown silty clay.	100

Nicholls Colton Group
7 - 11 Harding Street
Leicester
LE1 4DH

L17/0573/CSI/001

Project Reference - CGL8562

Analysis Methodologies

Matrix	Determinant	Sample condition for analysis	Test Method used
Soil	pH	As Received	In house method statement - MS - CL - pH in soils (using a 1:3 soil to water extraction)
Soil	Sulphate (w/s)	Oven Dried	In house method statement - MS - CL - Anions by Aquakem
Soil	Acid Sulphate	Oven Dried	In house method statement - MS - CL - BRE Analysis
Soil	Total Sulphur	Oven Dried	In house method statement - MS - CL - BRE Analysis

8284

Chelmer
Geotechnical Laboratories
'Groundbreaking Services'

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Where our involvement consists exclusively of testing samples, the results and comments (if provided) relate only to the samples tested.

Any samples that are deemed to be subject to deviation will be recorded as such within the test summary.