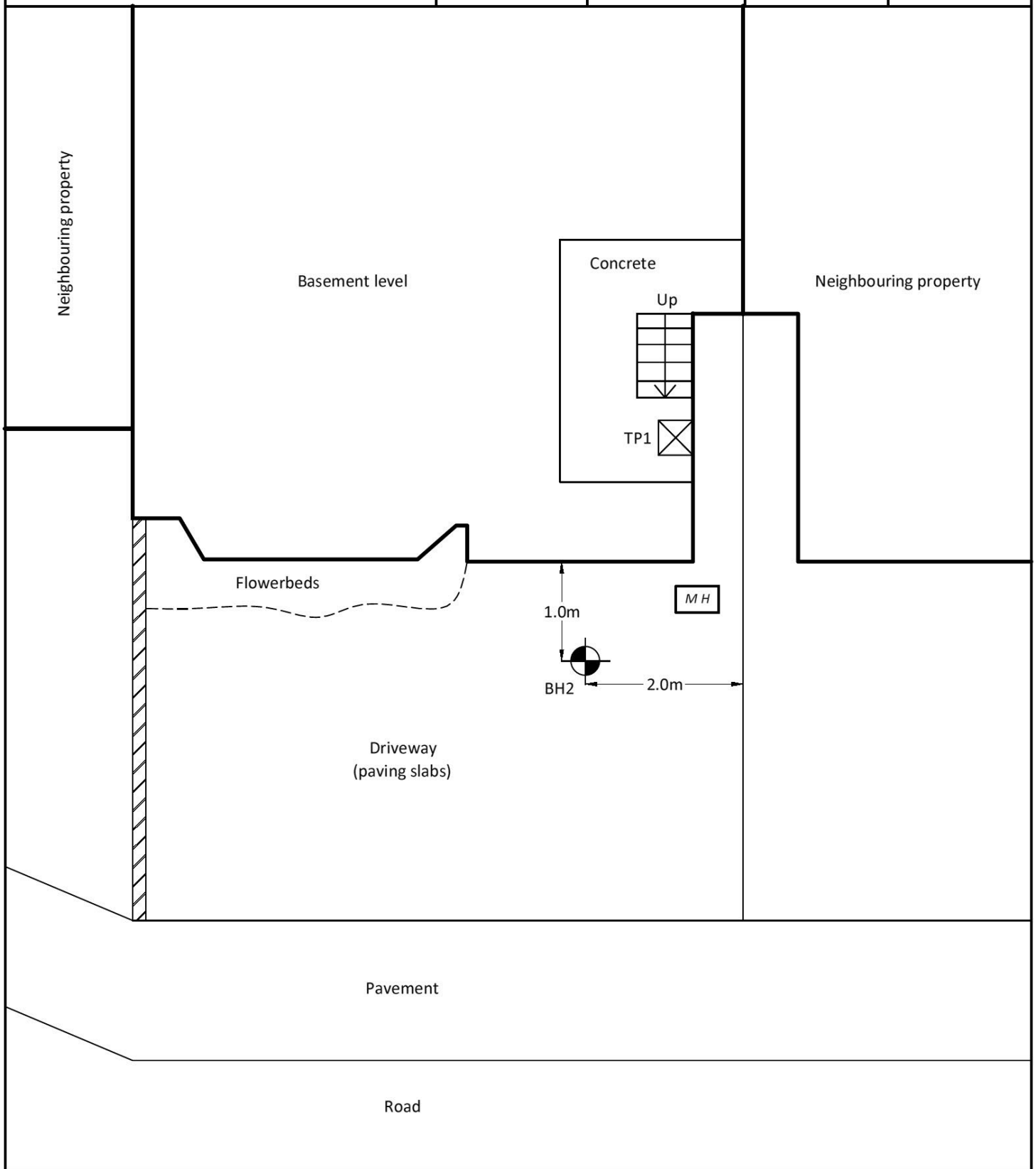
Chelmer Site Investigations
'Groundbreaking Services'

Client: Clague Architects		**Scale:** NTS	**Sheet:** 1 of 2	**Date:** 28.01.16	
Location: 190 Goldhurst Terrace, London NW6 3HN		**Job No:** 6366	**Weather:** Overcast	**Drawn by:** JP	**Checked by:** JH

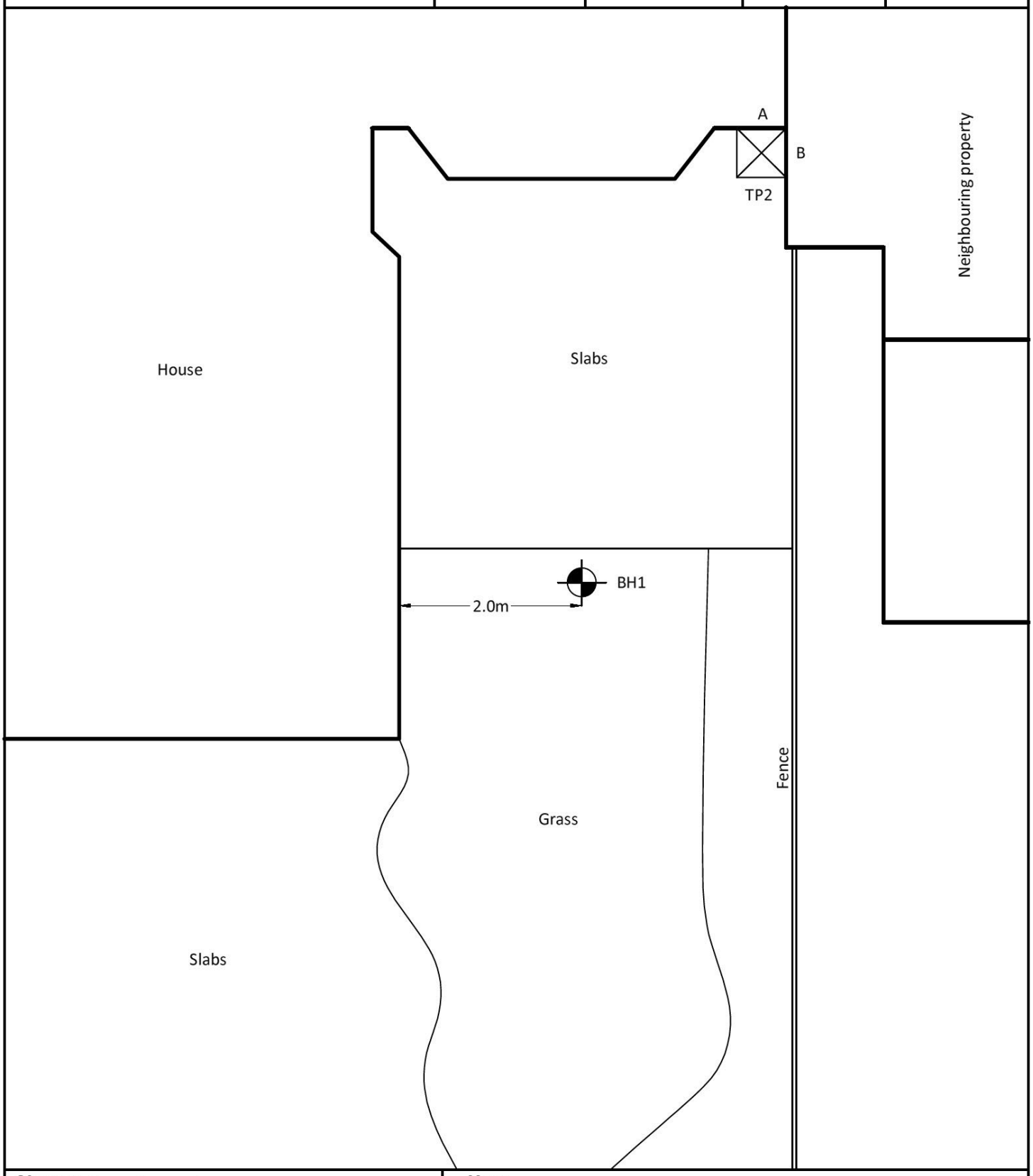


Notes: *Front of property.*

Key:

Borehole | Trial pit | MH Manhole

Client:	Clague Architects	Scale:	NTS	Sheet:	2 of 2	Date:	28.01.16	
Location:	190 Goldhurst Terrace, London NW6 3HN	Job No:	6366	Weather:	Overcast	Drawn by:	JP	Checked by: JH



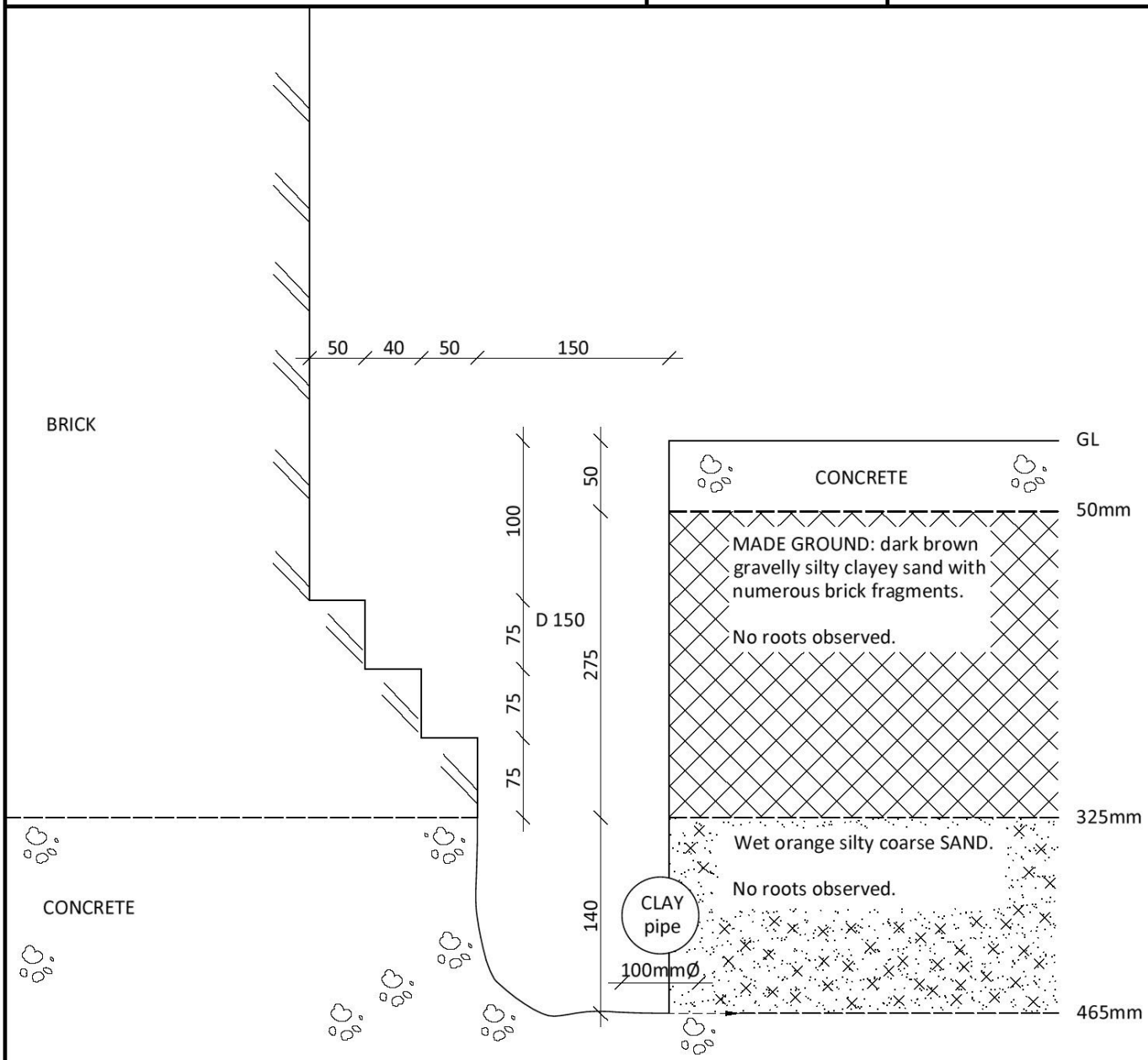
Notes: *Rear of property.*

Key:

Borehole

Trial Pit

Client: Clague Architects	**Scale:** NTS	**Sheet No:** 1 of 1	**Date:** 28.01.16
Location: 190 Goldhurst Terrace, London NW6 3HN	**Job No:** 6366	**Trial Pit No:** 1	**Weather:** Overcast
Excavation Method: Hand tools		**Drawn by:** JP	**Checked by:** JH



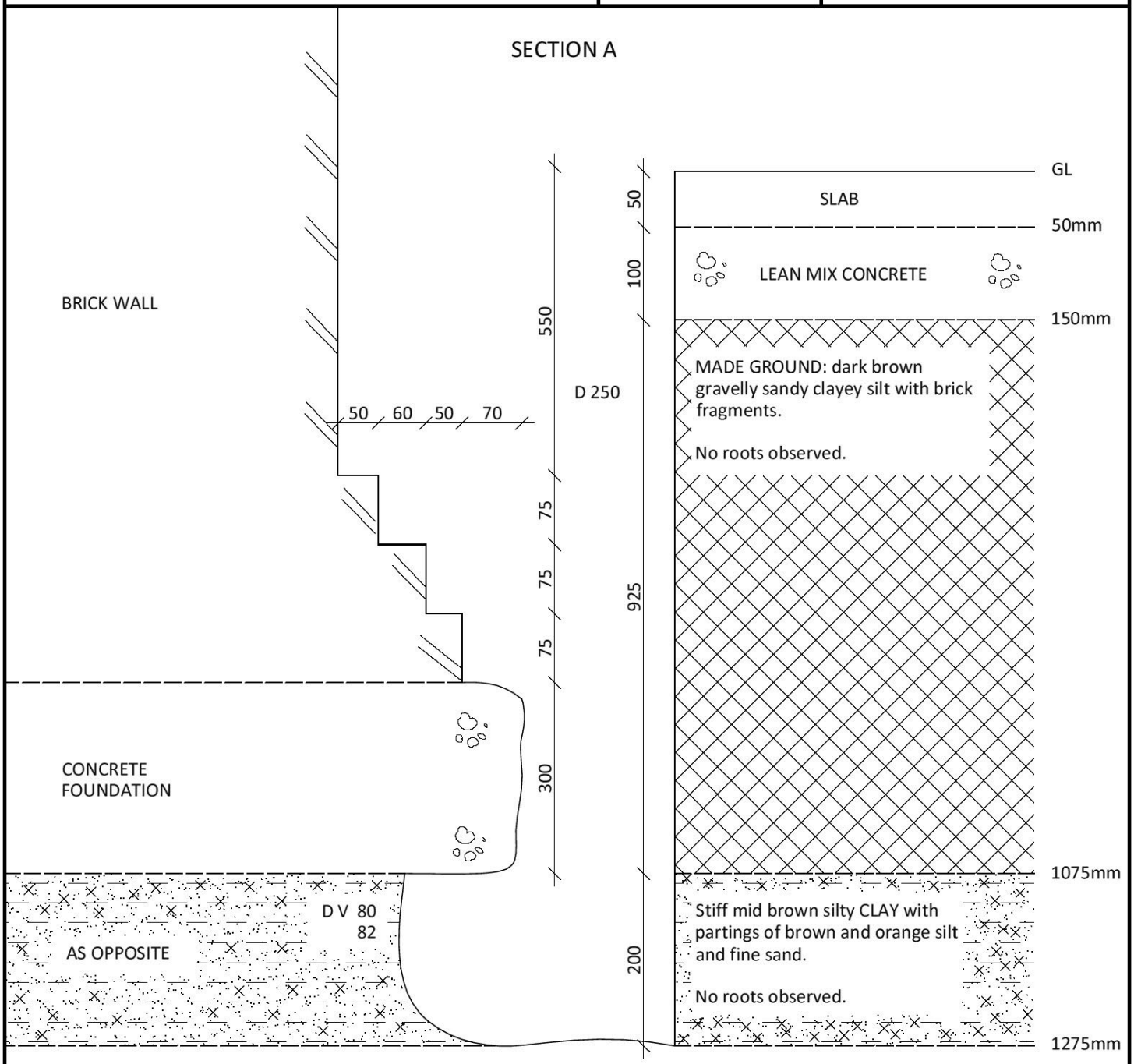
TP1 ENDS AT 465mm
DUE TO DRAINAGE OBSTRUCTION
UNABLE TO ESTABLISH EDGE OR UNDERSIDE OF FOUNDATION

Remarks:

Key:
GL Ground level
D Small disturbed sample

Client: Clague Architects	**Scale:** NTS	**Sheet No:** 1 of 1	**Date:** 28.01.16
Location: 190 Goldhurst Terrace, London NW6 3HN	**Job No:** 6366	**Trial Pit No:** 2	**Weather:** Overcast
Excavation Method: Hand tools		**Drawn by:** JP	**Checked by:** JH

SECTION A



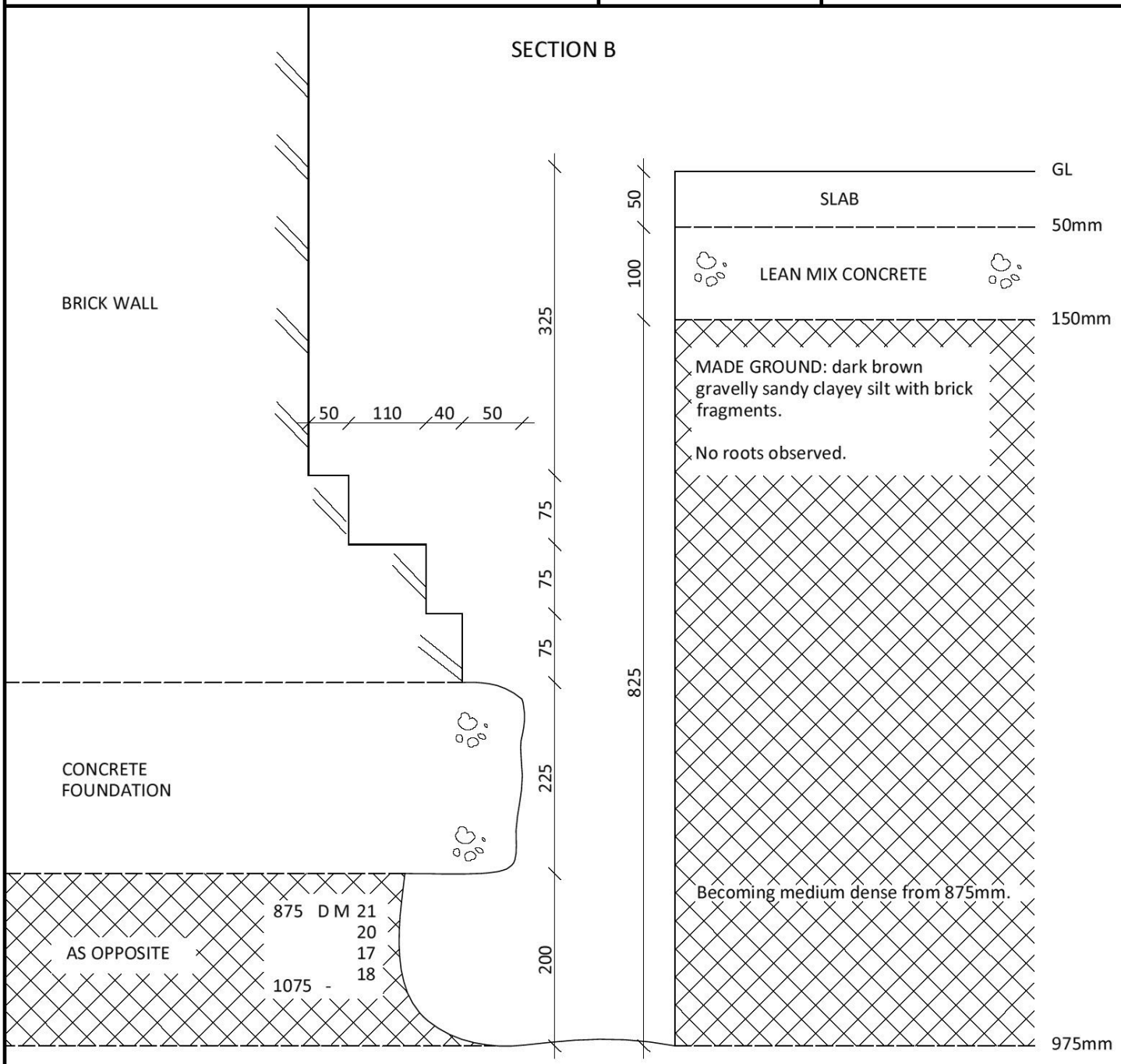
TP2 SECTION A ENDS AT 1275mm

Remarks:

Key:
GL Ground level
D Small disturbed sample
V Pilcon Vane (KPa)

Client: Clague Architects	**Scale:** NTS	**Sheet No:** 1 of 1	**Date:** 28.01.16
Location: 190 Goldhurst Terrace, London NW6 3HN	**Job No:** 6366	**Trial Pit No:** 2	**Weather:** Overcast
Excavation Method: Hand tools		**Drawn by:** JP	**Checked by:** JH

SECTION B



TP2 SECTION B ENDS AT 975mm

Remarks:

Key:
GL Ground level
D Small disturbed sample
M Mackintosh Probe

Chelmer Site Investigations 'Groundbreaking Services'

Client: Clague Architects	**Scale:** NTS	**Sheet No:** 1 of 1	**Weather:** Overcast	**Date:** 28.01.16
Site: 190 Goldhurst Terrace, London NW6 3HN	**Job No:** 6366	**Borehole No:** 1	**Boring method:** CFA 100mmØ Secondman	

Depth Mtrs	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
GL	TURF OVER TOPSOIL	0.2					No roots observed.		
0.2	MADE GROUND: dark brown gravelly silty clay with brick fragments and pieces.	0.7		D					0.25
				D					0.5
								0.8	
0.9	Stiff mid brown grey veined silty CLAY with partings of brown and orange silt and fine sand and occasional fine gravel.	2.6		D	V	80 82		*0.9*	1.0
				D					1.5
				D	V	102 102			2.0
				D					2.5
	Becoming very stiff from 3.0m.			D	V	140+ 140+			3.0
3.5	Very stiff dark brown silty CLAY with partings of brown and orange silt and fine sand and crystals.	2.0		D					3.5
				D	V	140+ 140+			4.0
				D					4.5
				D	V	140+ 140+			5.0
5.5	Very stiff mid grey silty CLAY with crystals.	2.5		D					5.5
				D	V	140+ 140+			6.0
				D	V	140+ 140+			7.0
8.0	BOREHOLE ENDS AT 8.0m			D	V	140+ 140+			8.0

Drawn by: JP **Approved by:** JH

Remarks: *Groundwater strike at 0.8m.*
Groundwater standing at 0.9m.
Borehole open on completion.
Plastic standpipe installed to 6.0m.

Key:
CFA Continuous Flight Auger
D Small disturbed sample
V Pilcon Vane

Chelmer Site Investigations 'Groundbreaking Services'

Client: Clague Architects	Scale: N.T.S.	Sheet No: 1 of 1	Weather: Overcast	Date: 28.01.16
Site: 190 Goldhurst Terrace, London NW6 3HN	Job No: 6366	Borehole No: 2	Boring method: CFA 100mmØ Secondman	

Depth Mtrs	Description of Strata	Thick-ness	Legend	Sample	Test Type	Test Result	Root Information	Depth to Water	Depth Mtrs
GL	SLAB	0.04					No roots observed.		
0.04	CONCRETE	0.06							
0.1	MADE GROUND: dark brown gravelly sandy silty clay with numerous brick and concrete fragments.	1.1		D					0.25
				D					0.5
				D	M	22 21 20 22			1.0
1.2	Stiff mid brown grey veined silty CLAY with partings of brown and orange silt and fine sand and occasional gravel.			D					1.5
				D					2.0
				D					2.5
	Becoming stiff from 3.0m.	3.8		D	V	140+ 140+			3.0
				D					3.5
				D	V	140+ 140+			4.0
				D					4.5
5.0	Very stiff mid to dark brown CLAY with partings of brown and orange silt and fine sand and crystals.	1.0		D	V	140+ 140+			5.0
				D					5.5
6.0	Very stiff mid grey silty CLAY with crystals.	2.0		D	V	140+ 140+			6.0
				D	V	140+ 140+			7.0
8.0	BOREHOLE ENDS AT 8.0m			D	V	140+ 140+			8.0

Drawn by: JP **Approved by:** JH

Remarks: *Borehole dry and open on completion. Plastic standpipe installed to 8.0m.*

Key:
CFA Continuous Flight Auger
D Small disturbed sample
V Pilcon Vane
M Mackintosh Probe

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL6366
Client : Clague LLP
Client Reference : CSI6366
Site Name : 190 Goldhurst Terrace, London, NW6 3HN

Date Received : 03/02/2016
Date Testing Started : 05/02/2016
Date Testing Completed : 09/02/2016
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	69745	D	33	27	70	23	47	0.20	35	CV			81					
BH1	2.5	69746	D	33	<5	70	26	44	0.17	42	CV								
BH1	4.0	69747	D	37	<5	70	25	45	0.26	43	CV			140+					
BH1	8.0	69748	D	38	<5	81	32	49	0.13	47	CV			140+					

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 :- SW/HS/LA
Checked By :- SG
Date Checked :- 15-Feb-16

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL6366
Client : Clague LLP
Client Reference : CSI6366
Site Name : 190 Goldhurst Terrace, London, NW6 3HN

Date Received : 03/02/2016
Date Testing Started : 05/02/2016
Date Testing Completed : 09/02/2016
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	1.5	69750	D	30	<5	73	23	50	0.15	47	CV								
BH2	3.5	69751	D	32	<5	73	24	49	0.16	46	CV								
BH2	5.5	69752	D	31	<5	74	25	49	0.13	46	CV								
BH2	8.0	69753	D	31	<5	77	23	54	0.16	51	CV			140+					

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 :- SW/HS/LA
Checked By :- SG
Date Checked :- 15-Feb-16

Laboratory Testing Results

BS 1377 : 1990

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL6366
Client : Clague LLP
Client Reference : CSI6366
Site Name : 190 Goldhurst Terrace, London, NW6 3HN

Date Received : 03/02/2016
Date Testing Started : 05/02/2016
Date Testing Completed : 09/02/2016
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]
TP2A	1.075	69755	D	31	23	83	27	56	0.07	43	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

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Comments :-

Technician :- SW/HS/LA
Checked By :- SG
Date Checked :- 15-Feb-16

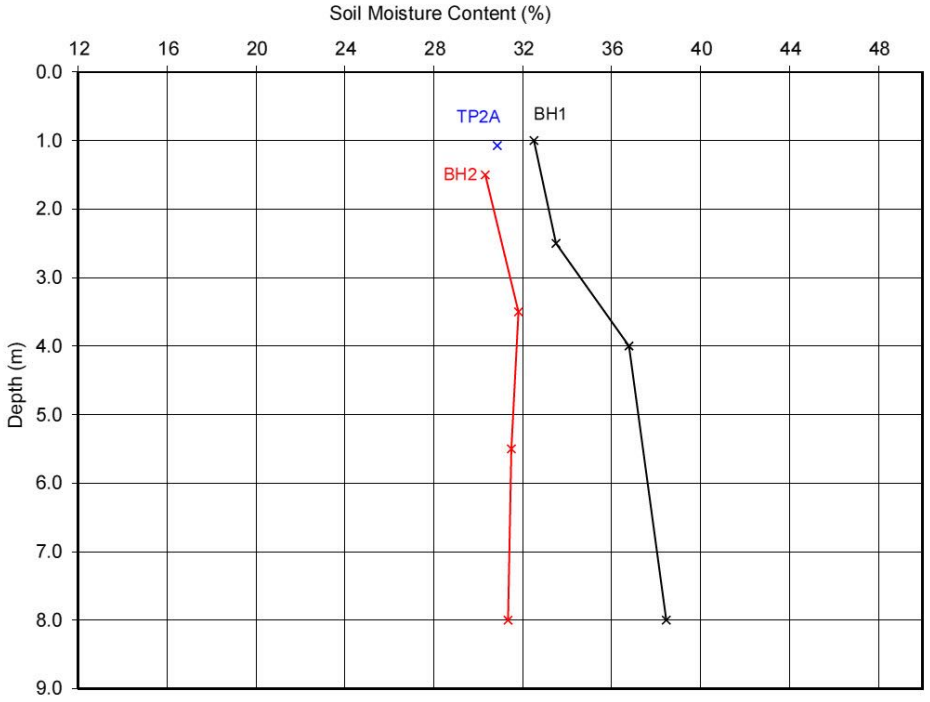
Laboratory Testing Results

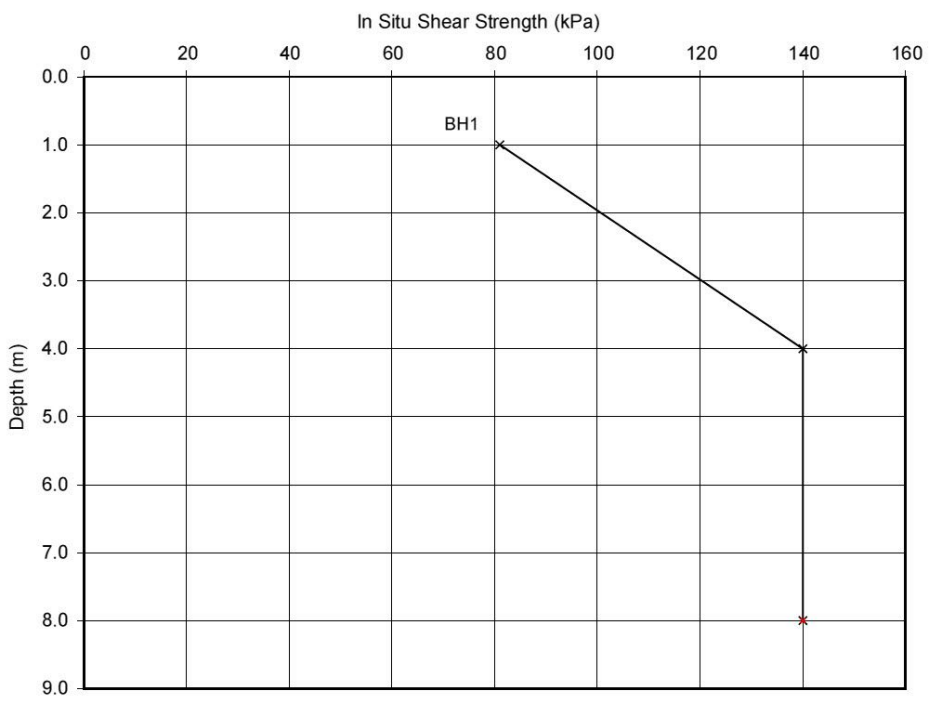
Moisture Content/Shear Strength Profile

Chelmer Geotechnical Laboratories 'Groundbreaking Services'

Job Number : CGL6366
Client : Clague LLP
Client Reference : CSI6366
Site Name : 190 Goldhurst Terrace, London, NW6 3HN

Date Received : 03/02/2016
Date Testing Started : 05/02/2016
Date Testing Completed : 09/02/2016
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)

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Comments :-

Checked By :- SG

Date Checked :- 15-Feb-16

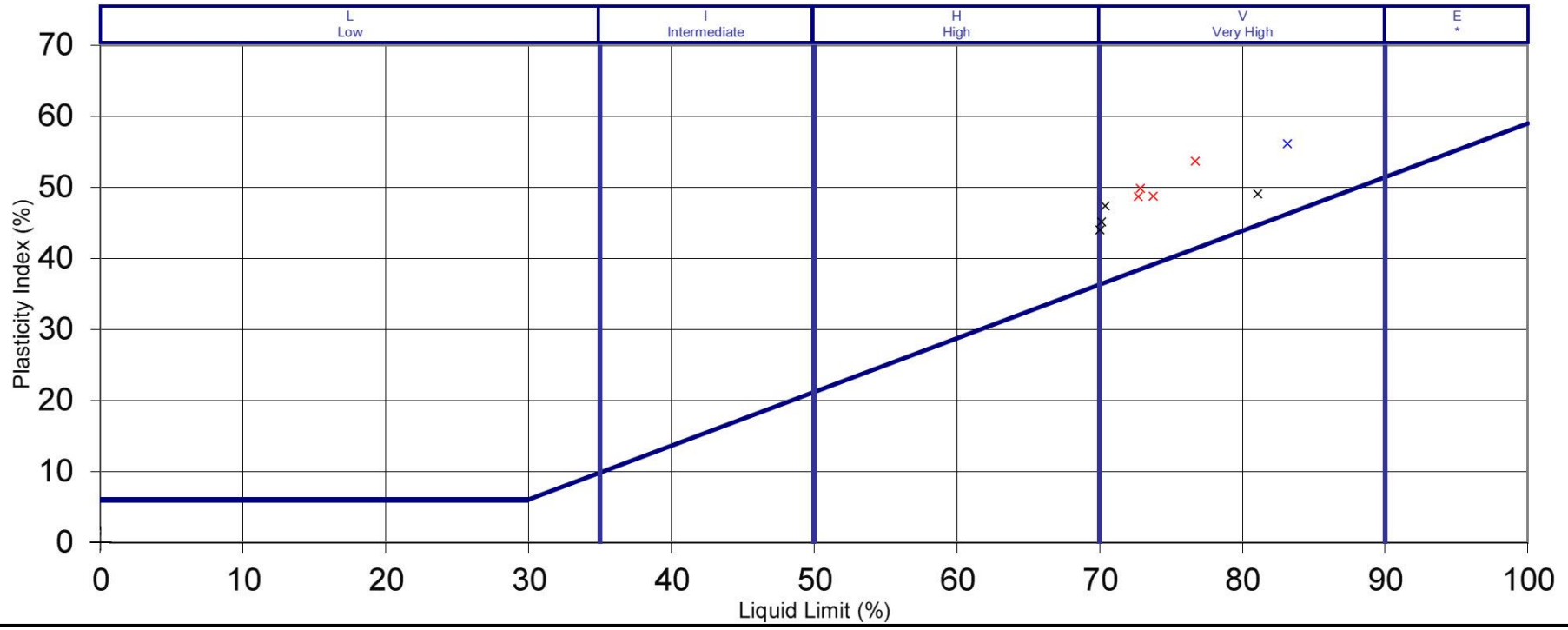
Laboratory Testing Results

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 : CGL6366
Client : Clague LLP
Client Reference : CSI6366
Site Name : 190 Goldhurst Terrace, London, NW6 3HN

Date Received : 03/02/2016
Date Testing Started : 05/02/2016
Date Testing Completed : 09/02/2016
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
TP2A

UKAS TESTING
8284

Comments :-

Checked By :- SG

Date Checked :- 15-Feb-16

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

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

Analytical Test Report: L16/0269/CSI/001

Your Project Reference:	**CGL6366**	Samples Received on:	05.02.2016
Your Order Number:	5894	Testing Instruction Received:	05.02.2016
Report Issue Number:	1	Sample Tested:	05 to 11.02.2016
Samples Analysed:	7 Soils	Report issued:	11.02.2016

Signed

James Gane
Manager - Data Logistics
Nicholls Colton Analytical

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.

Moisture Content was determined in accordance with NCA method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with NCA method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

With the exception of Sulphate and Sulpur which are crushed over the 2mm test sieve, concentrations are reported as a percentage mass of the dry soil passing the 10mm BS test sieve. As received samples have been corrected for moisture content but not stone content.

Samples were supplied by customer.

Accreditation Key

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

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

L16/0269/CSI/001

Project Reference - CGL6366

Analytical Test Results - BRE Suite

NCA Reference			16-3360	16-3363	16-3364	16-3366	16-3367	16-3372
Client Sample Reference			69744	69746	69748	69749	69750	69752
Client Sample Location			BH1	BH1	BH1	BH2	BH2	BH2
Depth (m)			0.50	2.50	8.00	1.00	1.50	5.50
Date of Sampling			28.01.2016	28.01.2016	28.01.2016	28.01.2016	28.01.2016	28.01.2016
Time of Sampling			AM	AM	AM	AM	AM	AM
Sample Matrix			Clay	Clay	Clay	Clay	Clay	Clay
Determinant	**Units**	**Accreditation**						
Water soluble sulphate	(mg/l)	u	90	120	3000	1200	170	120
Acid Soluble Sulphate	(%)	u	0.09	0.05	0.40	0.10	0.05	1.10
Total Sulphur	(%)	u	0.06	0.02	0.81	0.05	0.03	0.36
pH Value	pH Units	u	7.6	7.5	7.5	7.5	7.6	8.3

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

L16/0269/CSI/001

Project Reference - CGL6366

Analytical Test Results - BRE Suite

NCA Reference			16-3374
Client Sample Reference			69754
Client Sample Location			TP2A
Depth (m)			0.25
Date of Sampling			28.01.2016
Time of Sampling			AM
Sample Matrix			Clay
Determinant	**Units**	**Accreditation**	
Water soluble sulphate	(mg/l)	u	200
Acid Soluble Sulphate	(%)	u	0.07
Total Sulphur	(%)	u	0.03
pH Value	pH Units	u	7.8

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

L16/0269/CSI/001

Project Reference - CGL6366

Sample Descriptions

NCA Reference	Client Sample Reference	Sample Location	Description	% Passing 2mm BS test sieve
16-3360	69744.00	BH1	Brown slightly sandy clay with brick fragments	92
16-3363	69746.00	BH1	Brown sandy clay	100
16-3364	69748.00	BH1	Grey brown sandy clay	100
16-3366	69749.00	BH2	Brown sandy clay with crushed rock and brick fragments	100
16-3367	69750	BH2	Brown slightly sandy clay	100
16-3372	69752.0	BH2	Brown sandy clay	100
16-3374	69754.0	TP2A	Brown sandy gravelly clay	91

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

L16/0269/CSI/001

Project Reference - CGL6366

Analysis Methodologies

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

Landborne Gas Assessment

Site Ref: 6366
Site Name: 190 Goldhurst Terrace, London NW6 3HN

Well	Date	Methane Peak	Methane Steady	Methane GSV	Carbon Dioxide Peak	Carbon Dioxide Steady	Carbon Dioxide GSV	Oxygen	Atmos.	Flow	Response Zone	Depth to Water	CO	H2S	VOC
		%v/v	%v/v	l/hr	%v/v	%v/v	l/hr	%v/v	mbar	l/hr	m bgl	m bgl	ppm	ppm	ppm
BH1	03.03.16	0.1	0.1	0.0000	0.6	0.3	0.0000		1003	0.0		0.67	0	0	
	10.03.16	0.1	0.1	0.0001	0.4	0.1	0.0004	21.7	1017	0.1		0.56	0	0	
BH2	03.03.16	0.1	0.1	0.0000	3.8	3.8	0.0000		1003	0.0		5.91	0	0	
	10.03.16	0.1	0.1	0.0001	3.7	3.7	0.0037	17.5	1017	0.1		5.43	0	0	

Notes

NR = Not recorded
Values in Red exceed CIRIA 665 criteria (CO_2 >5.0% and CH_4 >1.0%)