Richard F. Gill & Associates

Consulting Structural Engineers

[redacted]

Partner: I.R. Gill, B.Sc.(Hon), C.Eng., M.I.Struct.E.
L.A. Gill, B.Sc.(Hon), C.Eng., M.I.Struct.E., M.I.C.E.,

STRUCTURAL ENGINEER'S REPORT ON CAUSATION

INSURED NAME: [redacted]

ADDRESS: **67 Aberdare Gardens**
London
NW6 3AN

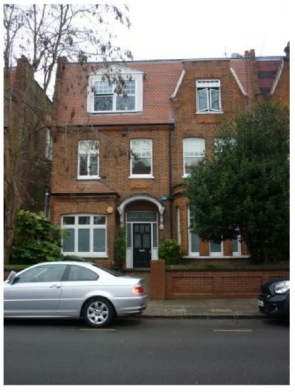
ENGINEERING PRACTICE: **Richard F Gill & Associates LLP**
[redacted]

INSPECTING ENGINEER: **R.E. Rock** BEng Hons.,C.Eng.,M.I.Struct.E.

DATE OF INSPECTION: **11th March 2020**

INSURER: [redacted]

ENGINEERS REFERENCE: [redacted]



1st April 2020

Also at
[redacted]

INTRODUCTION

This report follows our preliminary report dated 20th February 2020.

SITE INVESTIGATIONS

A single trial pit and borehole were excavated to the front right-hand bay protrusion, as indicated on the attached site plan prepared by Arkley Soil Investigation LLP.

Foundations were seen to comprise a concrete strip foundation resting 1400mm deep below ground level on London Clay. A borehole within the trial pit revealed natural London Clay from underside of foundation to termination of the borehole at 4m below ground level.

Roots of live appearance up to 3mm in diameter were noted at underside of foundation with fine live roots to 2.5m. Roots taken from the trial pit and borehole were sent for analysis and were identified as live Acacia roots, live Prunus and live Bay, which is consistent with the vegetation observed on site.

Laboratory testing indicates clays of very high plasticity with slight desiccation to 2.5m but no desiccation at 3.0m or below. This assessment is consistent with the root evidence and in situ shear strength profile.

CONCLUSIONS

The property has suffered very slight crack damage to the front right-hand bay protrusion, Category 1 when assessed in accordance with BRE Digest 251. Damage has been caused by clay shrinkage due to the action of tree roots on the very highly shrinkable clay sub-soil. The primary causes are the Acacia and Bay trees located within the front garden although a contribution from the adjoining owners' shrubs could be anticipated from the root evidence.

RECOMMENDATION

Continue crack width monitoring internally and externally.

Appoint arboricultural consultant to inspect and advise on mitigation.

LIMITATIONS

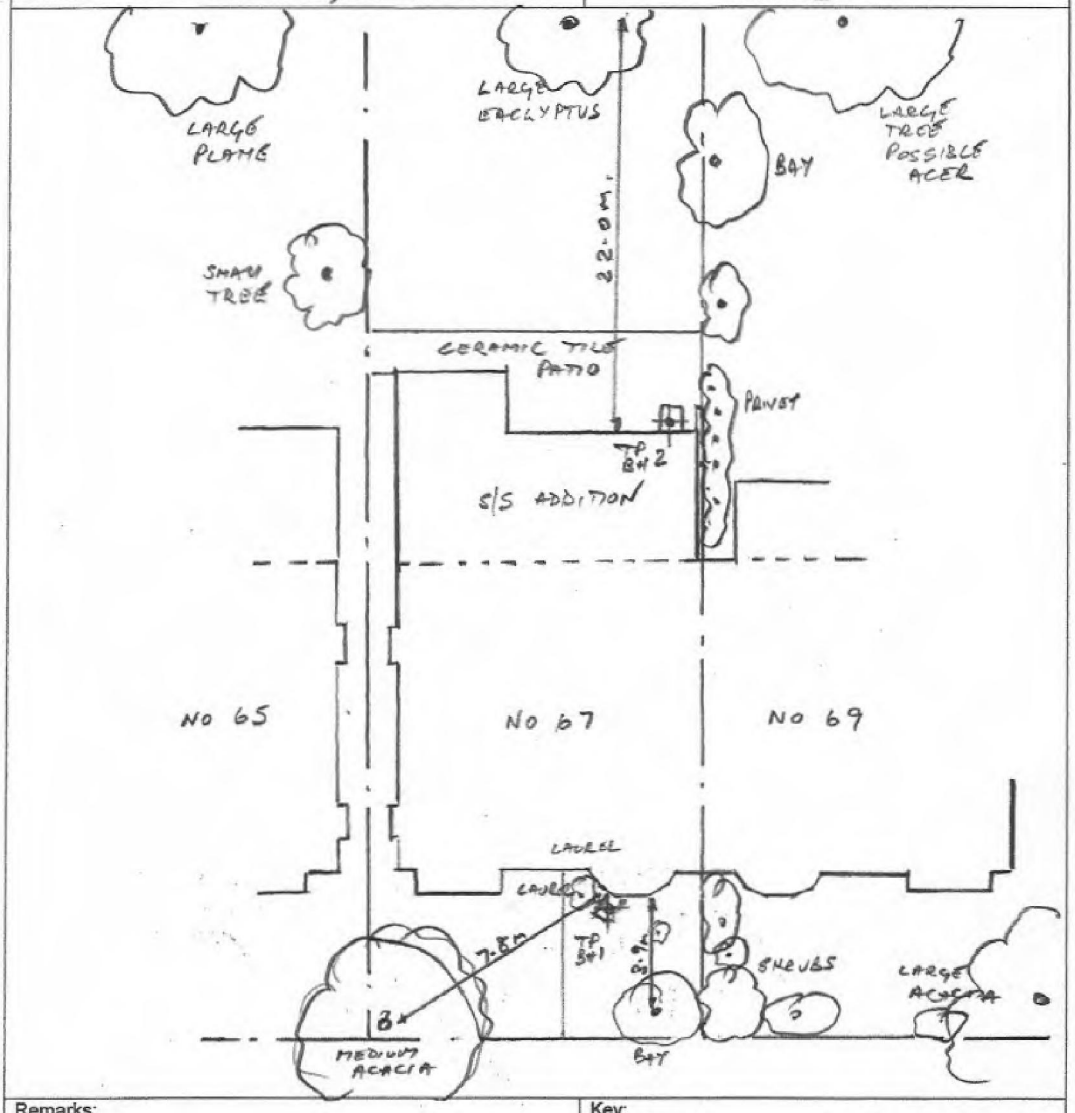
We have not inspected woodwork, damp proof courses, services, foundations except where exposed, or any other part of the structure which was covered, unexposed or inaccessible, and we are therefore unable to report any such part free from defect.

This report has been prepared for the sole use and benefit of insurers, and the liability of R. F. Gill and Associates LLP shall not be extended to any third party.

R.E. Rock BEng (Hons.) CEng MIStructE
For Richard F. Gill and Associates LLP

1st April 2020

Site Plan:	Sheet: 1 OF 1	ARKLEY SOIL INVESTIGATION LLP Foundation Investigation & Test Drilling
	Ref No:	[redacted]
Not to scale:	Date: 11-03-2020	Site: 67 ABERDARE GARDENS LONDON NW6
Client: RICHARD F GILL & ASSOC		



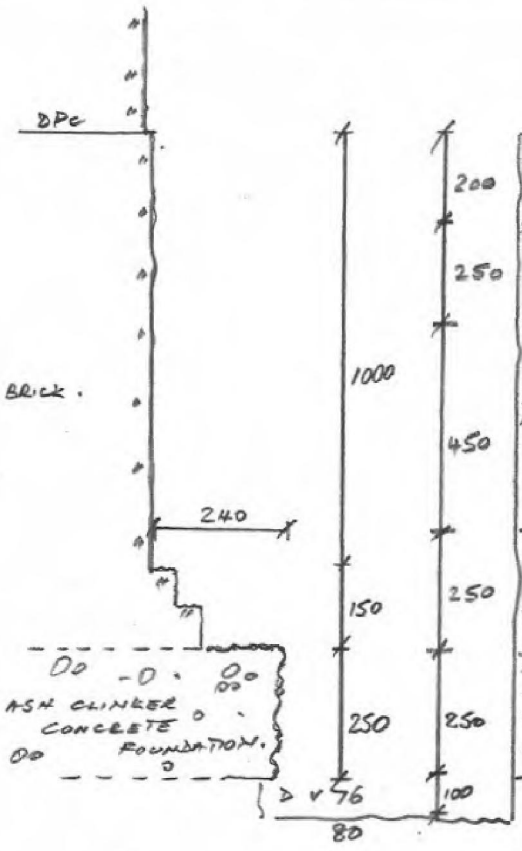
Remarks:

Tree identification not authenticated.

Key:

T.P = Trial pit.
B.H = Borehole.
H = Approximate height.
G = Gulley.
SVP = Soil vent pipe.
IC = Inspection chamber.
IL = Invert level.
RWP = Rain water pipe.
RWG = Rain water gulley.

Trial pit No: 1	Sheet: 1 OF 1	ARKLEY SOIL INVESTIGATION LLP Foundation Investigation & Test Drilling
	Ref No: [redacted]	
Not to scale:	Date: 11-03-2020	Site: 67 ABERDARE GARDENS LONDON NW6
Client: RICHARD F GILL & ASSOC		



Remarks:	Key: D = Small Disturbed sample W = Water sample U = Undisturbed sample B = Bulk sample S.P.T. = Standard Penetration Test J = Jar sample M = Mackintosh Probe Penetration Test blows per 75mm V = Pilcon Shear Vane Test

11:50

Borehole No: 1

Sheet: 1 of 1

Ref No:

ARKLEY SOIL INVESTIGATION LLP
Foundation Investigation & Test Drilling

Boring Method: HAND TOOLS

Date: 11-03-2020

Site: 67 ABERDARE GARDENS LONDON NW6

Client: RICHARD K GILL & ASSOC

Depth (m)	Description	Sample	Test Type Result	Field Comments	Depth to Water
.1					
.2					
.3					
.4					
.5					
.6					
.7	AS TRIAL PIT 1			AS TRIAL PIT 1	
.8					
.9					
.0					
.1					
.2					
.3					
.4					
1 .5	FIRM MID BROWN - ORANGE			1.5m SEVERAL	
.6	SLIGHTLY GRAVELLY VERY			ROOTS OF LIVE	
.7	SILTY CLAY			APPEARANCE TO	
.8				2mm ø	
1.9 .0	FIRM MID BROWN GREY VEINED	2.0			
.0	SILTY CLAY WITH CLAYSTONE	D	V 56	2.0m SEVERAL	
.1	NODULES		66	HAIR & FIBROUS	
.2				ROOTS	
.3					
.4		2.5			
.5		D	V 66	TO 2.5m.	
.6			70		
.7					
.8					
.9		3.0			
3 .0	STIFF MID BROWN GREY VEINED	D	V 90		
.1	SILTY CLAY WITH CRYSTALS		90		
.2					
.3					
.4		3.5			
.5		D			
.6					
.7					
.8					
.9		4.0			
4 .0	BH ENDS AT 4.0m.	D	V 140+		
.1			140+		
.2					
.3					
.4					
.5					
.6					
.7					
.8					
.9					
.0					

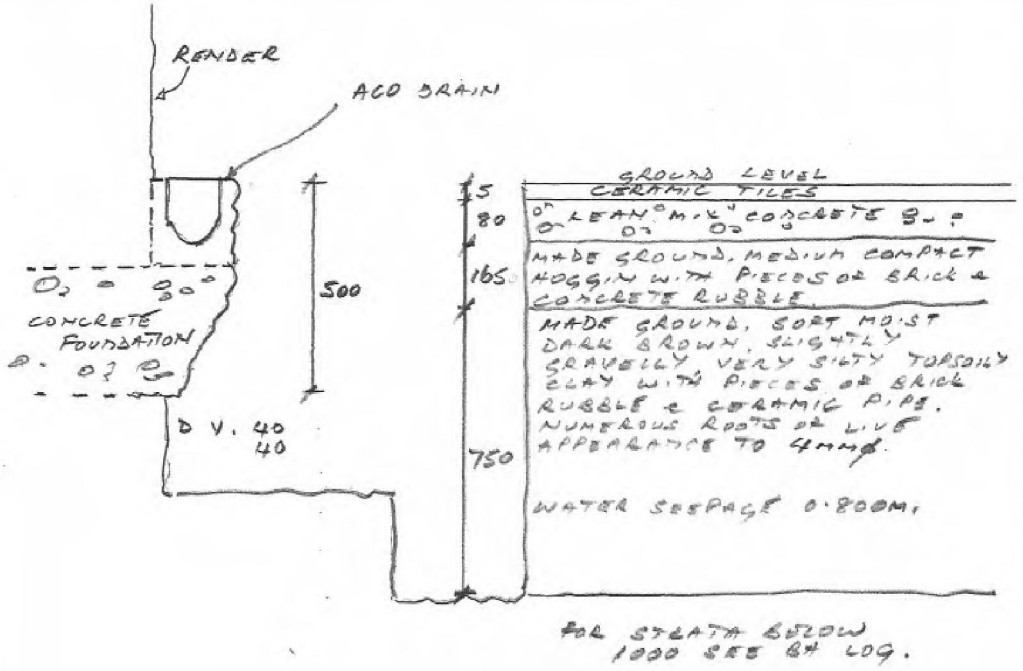
Remarks:

BH DRY & OPEN ON COMPLETION

Key:

D = Small Disturbed sample
U = Undisturbed sample
S.P.T. = Standard Penetration Test
M = Mackintosh Probe Penetration Test blows per 75mm
V = Pilcon Shear Vane Test
W = Water sample
B = Bulk sample
J = Jar sample

Trial pit No: 2	Sheet: 1 of 1	ARKLEY SOIL INVESTIGATION LLP Foundation Investigation & Test Drilling
	Ref No: [redacted]	
Not to scale:	Date: 11-03-2020	Site: 67 ABERDARE GARDENS LONDON NW6
Client: RICHARD F GILL & ASSOC		



Remarks:	Key: **D** = Small Disturbed sample **W** = Water sample **U** = Undisturbed sample **B** = Bulk sample **S.P.T.** = Standard Penetration Test **J** = Jar sample **M** = Mackintosh Probe Penetration Test blows per 75mm **V** = Pilcon Shear Vane Test

Borehole No: 2

Sheet: 1 of 1

Ref No:

ARKLEY SOIL INVESTIGATION LLP
Foundation Investigation & Test Drilling

Boring Method: HAND TOOLS

Date: 11-03-2020

Site: 67 ABERDARE GARDENS LONDON NW6

Client: RICHARD P GILL & ASSOC

Depth (m)	Description	Sample	Test Type Result	Field Comments	Depth to Water
.1					
.2					
.3					
.4					
.5	AS TRIAL PIT 2			AS TRIAL PIT 2	
.6					
.7					
.8					
.9		1.0			
1.0	MADE GROUND FIRM MID BROWN	D	V 50	NO ROOTS	
.1	SLIGHTLY GRAVELLY SILTY CLAY		60	OBSERVED	
.2	WITH PIECES OF BRICK RUBBLE				
.3					
1.4	MADE GROUND SOFT MOIST DARK	1.5			
.5	GREY SLIGHTLY GRAVELLY	D	V 40		
.6	VERY SILTY PUNGENT CLAY		40		
.7					
1.8	SOFT MOIST MID BROWN GREY				
.9	VEINED SILTY CLAY	2.0			
2.0		D	V 48		
2.0	SOFT TO FIRM AS ABOVE		58		
.2					
.3					
.4		2.5			
2.5	FIRM MOIST MID BROWN	D	V 70	WATER SEEPAGE	2.5M
.6	GREY VEINED SILTY CLAY		70		
.7	WITH CLAYSTONE NODULES				
.8					
.9		3.0			
3.0	STIFF MID BROWN GREY	D	V 96		
.1	VEINED SILTY CLAY WITH		100		
.2	CRYSTALS				
.3					
.4		3.5			
.5		D			
.6					
.7					
.8					
.9		4.0			
4.0	BH ENDS AT 4.0M.	D	V 140+		
.1			140+		
.2					
.3					
.4					
.5					
.6					
.7					
.8					
.9					
.0					

Remarks:

BH OPEN ON COMPLETION
STANDING WATER 3.9M BELOW G.L ON COMPLETION.

Key:
D = Small Disturbed sample
U = Undisturbed sample
S.P.T. = Standard Penetration Test
M = Mackintosh Probe Penetration Test blows per 75mm
V = Pilcon Shear Vane Test
W = Water sample
B = Bulk sample
J = Jar sample

Richardson's Botanical Identifications

Root identification
Vegetation surveys
Tree/Building investigations
Plant taxonomy

Dr Ian B K Richardson
BSc, MSc, PhD, MRSB, FLS
James Richardson
BSc (Hons. Biology)

Enterprise House
[redacted]

Arkley Soil Investigation LLP
Unit 10, Reeds Farm Estate
Roxwell Road
WRITTLE
Chelmsford CM1 3ST

30/03/2020

Dear Stephen

67 Aberdare Gdns, London NW6 3AN

The samples you sent in relation to the above have been examined. Their structures were referable as follows:

TP1, u/s foundation		
1 no.	Examined root: similar in many ways to PRUNUS species (Cherries, Plums and Damsons, Almonds, Peaches and Apricots, Blackthorn/Sloe, as well as the shrubby Cherry-laurel and Portugal-laurel).	Alive, recently*.
1 no.	Examined root: the family LEGUMINOSAE (a group of closely related trees: Robinia (False Acacia), Laburnum, Sophora (Pagoda tree), Gleditsia (Honey Locust), Cercis (Judas tree/Redbud), Albizia (Silk tree), Acacia (Mimosa), as well as such shrubs as Wisteria, Lupins, Gorse and Brooms).	Alive, recently*.
10 no.	Examined root: most referable to LAURUS (Bay).	Alive, recently*.
1 no.	Examined root: a SHRUB, could be CORNUS (Dogwoods). Slightly tentative.	Dead*.
2 no.	Sections of either twig, stem or sucker only - NOT roots. Although both were examined in our laboratory, neither were identifiable.	
10 no.	Unfortunately all with insufficient cells for identification.	
BH1, 1.5-2.0m		
4 no.	Examined root: the family LEGUMINOSAE (as listed above).	Alive, recently*.
5 no.	Examined root: again, could be LAURUS (Bay).	Alive, recently*.
6 no.	Unfortunately all with insufficient cells for identification.	

/ continued overleaf

TP2, u/s foundation		
4 no.	Examined root: HEDERA (Ivy) - or the related FATSIA (a robust shrub with fig-like leaves).	Alive, recently*.
30 no.	Examined root: another type of SHRUB. In many ways like CISTACEAE (includes CISTUS and HELIANTHEMUM (small shrubs with very delicate and short-lived pink, yellow or white-ish flowers)); also in some ways like LAVANDULA (Lavender). Tentative.	Alive, recently*.
4 no.	Sections of either twig, stem or sucker only - NOT roots. Although examined in our laboratory, they were not identifiable.	
10 no.	Unfortunately all with insufficient cells for identification.	

Click here for more information: LAURUS LEGUMINOSAE PRUNUS

I trust this is of help. Please call us if you have any queries; our Invoice is enclosed.

Yours sincerely

[redacted]

Dr Ian B K Richardson

* Based mainly on the Iodine test for starch. Starch is present in some cells of a living woody root, but is more or less rapidly broken down by soil micro-organisms on death of the root, sometimes before decay is evident. This result need not reflect the state of the parent tree.

Meridian Soils Limited

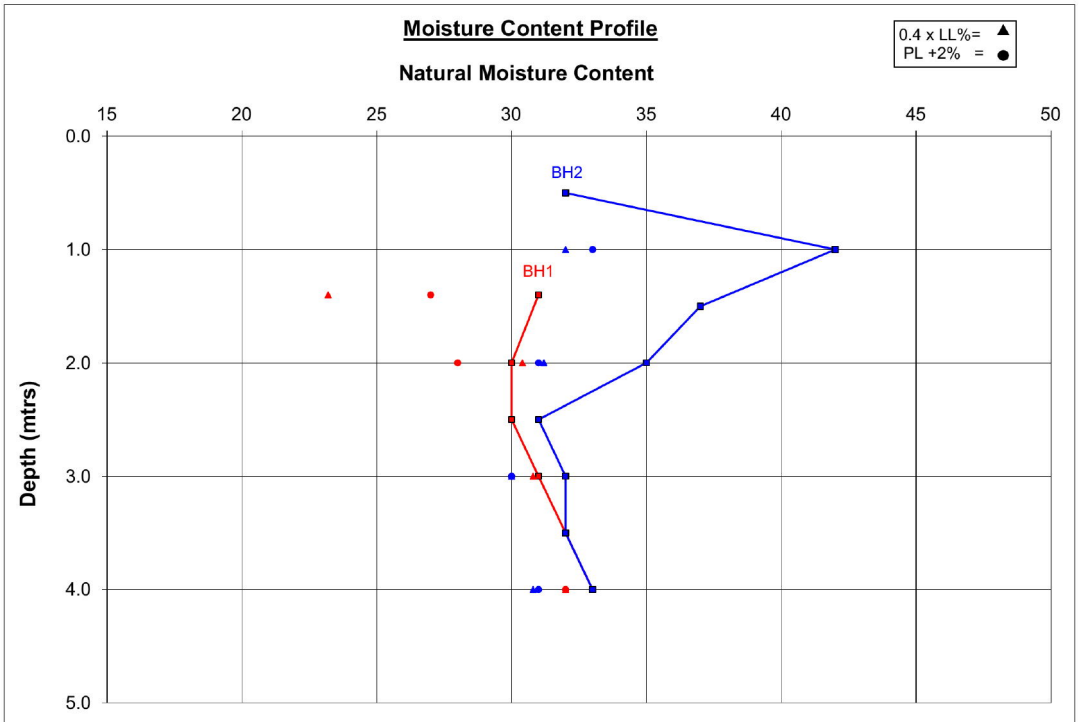
[redacted]

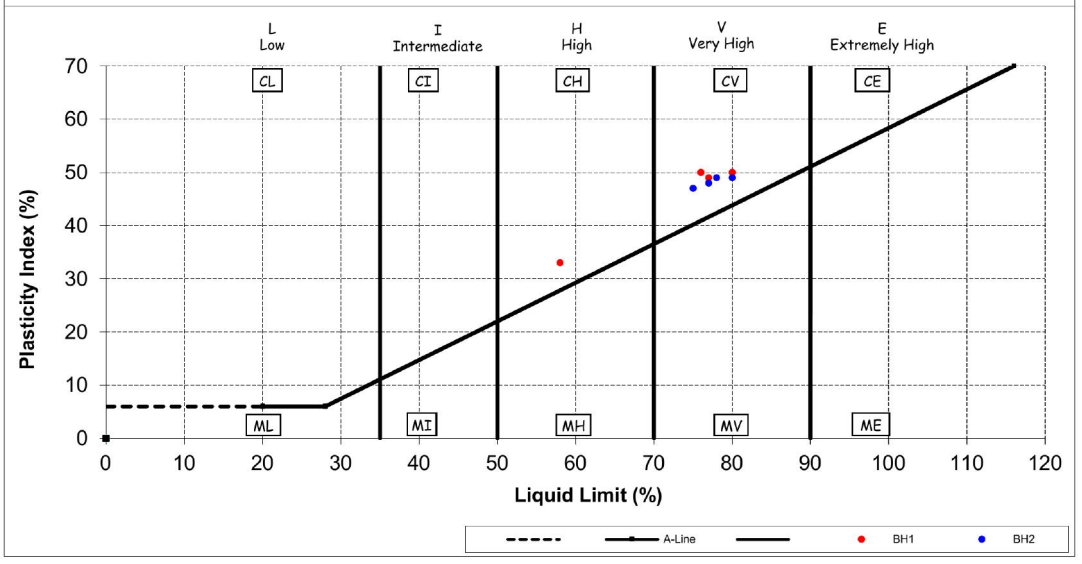
[redacted]

Location: 67 Aberdare Gardens, London, NW6 3AN

Client Ref:

Date: 25th March 2020





In Compliance with BS. 5930: 1982

Notes:

1) Unless specifically noted, the profiles have not been related to a site datum

2) If plotted, 0.4 LL and PL +2 (after Driscoll, 1983) should only be applied to London Clay (and similar overconsolidated clays) at shallow depths.

Meridian Soils Limited

[redacted]

[redacted]

Location: 67 Aberdare Gardens, London, NW6 3AN

Client Ref:

Date: 25th March 2020

TP/BH No.	Sample No.	Depth mtrs.	Moisture Content %	Passing 0.425um sieve %	Equivalent Moisture %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Soil Class	Modified Plasticity Index %	Water Soluble Sulphate (g/l^{-1} SO_4)	pH value	Sulphate Class
1		1.40 (U.S)	31	72	43	58	25	33	CH	24			
		2.00	30	100	30	76	26	50	CV	50			
		2.50	30										
		3.00	31	100	31	77	28	49	CV	49			
		3.50	32										
		4.00	33	100	33	80	30	50	CV	50			

References

BS 1377:Part 2:1990
BS 5930:1981

Meridian Soils Limited

[redacted]

[redacted]

Location: 67 Aberdare Gardens, London, NW6 3AN

Client Ref:

Date: 25th March 2020

TP/BH No.	Sample No.	Depth mtrs.	Moisture Content %	Passing 0.425um sieve %	Equivalent Moisture %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Soil Class	Modified Plasticity Index %	Water Soluble Sulphate (g/l^{-1} SO_4)	pH value	Sulphate Class
2		0.50 (U.S)	32										
		1.00	42	98	43	80	31	49	CV	48			
		1.50	37										
		2.00	35	100	35	78	29	49	CV	49			
		2.50	31										
		3.00	32	100	32	75	28	47	CV	47			
		3.50	32										
		4.00	33	100	33	77	29	48	CV	48			

References

BS 1377:Part 2:1990

BS 5930:1981