APPENDIX A
Conditions and Limitations

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to 28 Maresfield Gardens, South Hampstead, London NW3 5SX.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

APPENDIX B
Fieldwork Logs

Ground and Water Ltd			Borehole No **BH1** Sheet 1 of 2
Project Name: 28 Marefield Gardens	Project No.: GWPR1761	Co-ords: -	Hole Type: WLS
Location: South Hampstead, London NW3 5SX		Level: -	Scale: 1:50
Client: Mr and Mrs Freedman		Dates: 05/08/2016	Logged By: RF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
					0.07			MADE GROUND: Tarmac
		0.20	D		0.20			MADE GROUND: Brick and sand sub-base.
		0.50	D		0.60			MADE GROUND: Dark brown slightly gravelly silty clay. Gravel is occasional, fine to medium, sub-angular to sub-rounded flint and gravel and rare fine sub-angular to sub-rounded carbonaceous material (ash/clinker).
		0.80	D					
		1.00	SPT	N=4				LONDON CLAY FORMATION: Brown silty CLAY with rare fine selenite crystals.
		1.00	D	(1,1/ 1,1,1,1)				
		1.80	D					
		2.00	SPT	N=8				
		2.00	D	(1,1/ 1,2,2,3)				
		2.50	D		2.60			LONDON CLAY FORMATION: Brown silty CLAY with pockets of orange silt, veins of grey silt and rare fine selenite crystals.
		3.00	SPT	N=7				
		3.00	D	(2,3/ 2,1,2,2)				
		3.50	D					
		4.00	SPT	N=14				
		4.00	D	(2,2/ 3,3,4,4)				
		4.50	D					
		5.00	SPT	N=15				
		5.00	D	(3,4/ 4,4,3,4)				
		5.50	D					
		6.00	SPT	N=17				
		6.00	D	(4,4/ 3,4,5,5)				
		6.50	D					
		7.00	SPT	N=21				
		7.00	D	(4,5/ 5,5,6,5)	7.20			LONDON CLAY FORMATION: Dark grey brown silty CLAY with rare fine selenite crystals.
		7.50	D					
		8.00	SPT	N=21				
		8.00	D	(5,5/ 5,6,5,5)				
		8.50	D					
		9.00	SPT	N=25				
		9.00	D	(5,5/ 6,6,6,7)				
		9.50	D					
			Type	Results				Continued next sheet

Remarks: No groundwater encountered.
Roots noted to 1.50m bgl.
Decaying roots noted at 3.50m bgl.

AGS

Ground and Water Ltd

Borehole No
BH1
Sheet 2 of 2

Project Name: 28 Marefield Gardens	Project No.: GWPR1761	Co-ords: -	Hole Type: WLS
Location: South Hampstead, London NW3 5SX		Level: -	Scale: 1:50
Client: Mr and Mrs Freedman		Dates: 05/08/2016	Logged By: RF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		10.00 10.00	SPT D	N=32 (7,8/ 8,8,8,8)	10.45			LONDON CLAY FORMATION: Dark grey brown silty CLAY with rare fine selenite crystals. End of Borehole at 10.45 m

Type	Results

Remarks: No groundwater encountered.
Roots noted to 1.50m bgl.
Decaying roots noted at 3.50m bgl.

AGS

Ground and Water Ltd

Borehole No
WS2
Sheet 1 of 1

Project Name 28 Marefield Gardens	Project No. GWPR1761	Co-ords: -	Hole Type WS
Location: South Hampstead, London NW3 5SX		Level: -	Scale 1:50
Client: Mr and Mrs Freedman		Dates: 05/08/2016	Logged By RF

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		0.20	D					MADE GROUND: Dark brown slightly gravelly silty clay. Gravel is occasional, fine to medium, sub-angular to sub-rounded brick and rare to occasional fine sub-angular to sub-rounded carbonaceous material (ash/clinker).
		0.50	D					
		0.80	D					
		1.00	D		0.90			LONDON CLAY FORMATION: Brown silty CLAY with very rare fine selenite crystals.
		1.50	D					
		2.00	D		1.90			LONDON CLAY FORMATION: Brown silty CLAY with fine selenite crystals and sub-rounded flint gravel
		2.50	D		2.20			LONDON CLAY FORMATION: Brown silty CLAY with veins of grey silt, pockets of orange silt and rare fine selenite crystals.
		3.00	D					
		3.50	D					
		4.00	D					
		4.50	D					
		5.00	D		5.00			End of Borehole at 5.00 m
			Type	Results				

Remarks: No groundwater encountered.
Fine roots to 1.00m bgl.
Decayed root noted at 3.50m bgl.

AGS

APPENDIX C
Geotechnical Laboratory Test Results

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
21471	28 Maresfield Gardens, South Hampstead, London NW3	Samples received	24/08/2016
		Schedule received	23/08/2016
Project No.	Client	Project started	24/08/2016
GWPR1761	Ground and Water Ltd	Testing Started	09/09/2016

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top	Base	Type		%	%	%	%	%	
BH1	S	1.00	-	D	Brown and occasional orangish brown silty CLAY with rare medium angular gravel	34					
BH1	S	1.50	-	D	Brown silty CLAY with rare roots	33	100	75	26	49	
BH1	S	2.00	-	D	Brown and rare grey silty CLAY with rare siltstone noduls and medium sub-rounded gravel	30					
BH1	S	2.50	-	D	Brown slightly mottled grey silty CLAY with occasional orange fine sand pockets	38					
BH1	S	3.00	-	D	Brown and occasional grey silty CLAY with rare fine selenite crystals	38	100	86	30	56	
BH1	S	3.50	-	D	Brown slightly mottled grey silty CLAY with rare carbonaceous deposits and occasional selenite crystals	36					
WS2	S	1.00	-	D	Brown and rare orangish brown silty CLAY with traces of carbonaceous deposits and rare fmc sub-angular gravel	33	99	79	26	53	
WS2	S	1.50	-	D	Brown silty CLAY	31					
WS2	S	2.00	-	D	Brown gravelly silty CLAY (gravel is fmc and sub-angular to sub-rounded)	21					
WS2	S	2.50	-	D	Brown and rare orangish brown silty CLAY with rare fine mudstone fragments and rare fine gravel	32	99	80	28	52	
WS2	S	3.00	-	D	Brown slightly mottled grey silty CLAY with rare orange fine sand pockets	36					
WS2	S	3.50	-	D	Brown slightly mottled grey silty CLAY	34					

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials **J.P**

Date: 13/09/2016

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results

Tested in accordance with BS1377 : Part 3 : 1990, clause 5.3 and clause 9

Job No.	Project Name	Programme	
21471	28 Maresfield Gardens, South Hampstead, London NW3	Samples received	24/08/2016
		Schedule received	23/08/2016
Project No.	Client	Project started	24/08/2016
GWPR1761	Ground and Water Ltd	Testing Started	08/09/2016

Hole No.	Sample				Soil description	Dry Mass passing 2mm	SO3 Content	SO4 Content	pH	Remarks
	Ref	Top	Base	Type		%	g/l	g/l		
BH1	S	1.00	-	D	Brown and occasional orangish brown silty CLAY with rare medium angular gravel	98	0.23	0.28	8.26	
WS2	S	2.00	-	D	Brown gravelly silty CLAY (gravel is fmc and sub-angular to sub-rounded)	56	0.25	0.30	8.32	

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials J.P

Date: 13/09/2016

Francis Williams
Ground & Water Ltd
2 The Long Barn
Norton Farm
Selborne Road
Alton
Hampshire
GU34 3NB

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-48409

Site Reference:	28 Maresfield Gardens, South Hampstead, London NW3
Project / Job Ref:	GWPR1761
Order No:	None Supplied
Sample Receipt Date:	24/08/2016
Sample Scheduled Date:	24/08/2016
Report Issue Number:	1
Reporting Date:	31/08/2016

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate								
QTS Environmental Report No: 16-48409	Date Sampled	05/08/16	05/08/16					
Ground & Water Ltd	Time Sampled	None Supplied	None Supplied					
Site Reference: 28 Maresfield Gardens, South Hampstead, London NW3	TP / BH No	BH1	WS2					
Project / Job Ref: GWPR1761	Additional Refs	None Supplied	None Supplied					
Order No: None Supplied	Depth (m)	2.50	1.50					
Reporting Date: 31/08/2016	QTSE Sample No	224463	224464					

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.1	7.2			
Total Sulphate as SO_4	mg/kg	< 200	NONE	1449	359			
Total Sulphate as SO_4	%	< 0.02	NONE	0.14	0.04			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	412	411			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.41	0.41			
Total Sulphur	%	< 0.02	NONE	0.05	< 0.02			
Ammonium as NH_4	mg/kg	< 0.5	NONE	4.9	5.5			
Ammonium as NH_4	mg/l	< 0.05	NONE	0.49	0.55			
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	15	16			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	7.5	7.9			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	< 3	< 3			
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS	< 1.5	< 1.5			
W/S Magnesium	mg/l	< 0.1	NONE	16	2.9			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30^{O}C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis $^{(S)}$

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 16-48409	
Ground & Water Ltd	
Site Reference: 28 Maresfield Gardens, South Hampstead, London NW3	
Project / Job Ref: GWPR1761	
Order No: None Supplied	
Reporting Date: 31/08/2016	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
$ 224463	BH1	None Supplied	2.50	23.2	Light brown clay
$ 224464	WS2	None Supplied	1.50	19.4	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample I/S

Unsuitable Sample U/S

$ samples exceeded recommended holding times

QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 16-48409
Ground & Water Ltd
Site Reference: 28 Maresfield Gardens, South Hampstead, London NW3
Project / Job Ref: GWPR1761
Order No: None Supplied
Reporting Date: 31/08/2016

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10 C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received