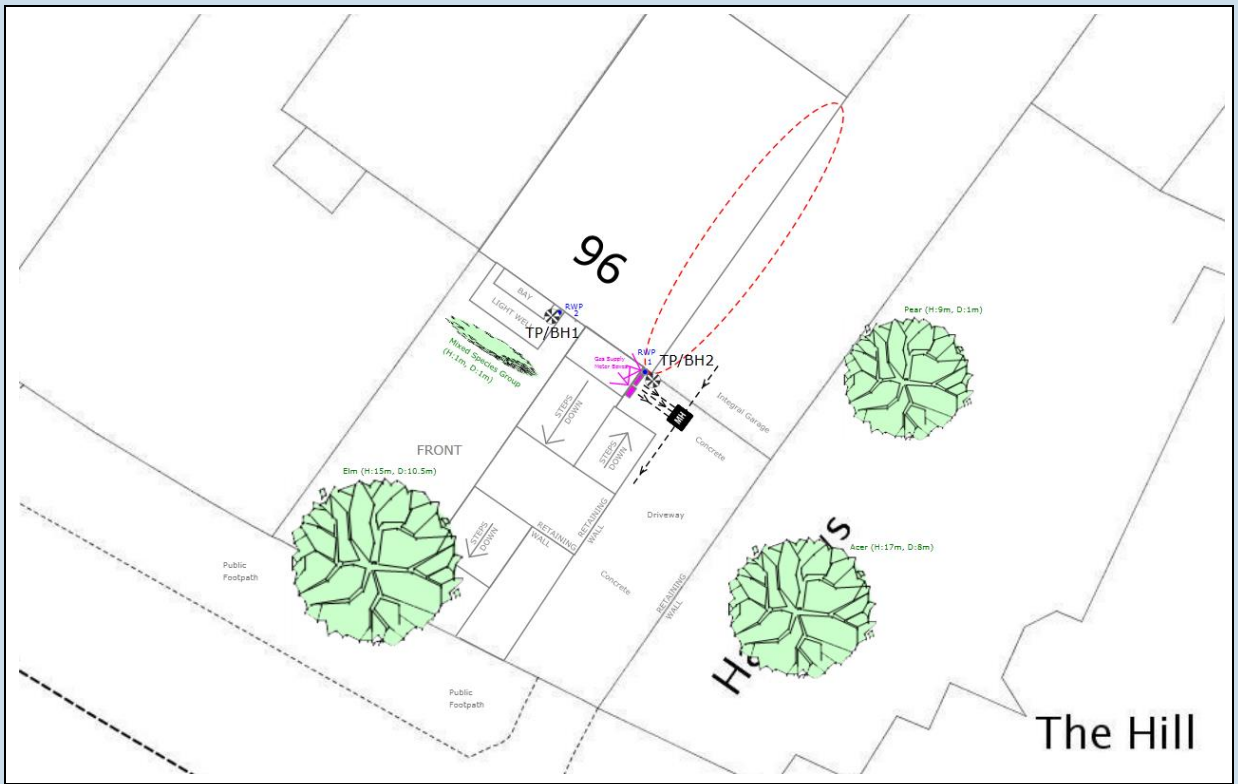
GEOTECHNICAL

for Subsidence Management Services

96 Haverstock Hill, Lower Belsize Park, London, NW3 2BD

Client:	Subsidence Management Services
Client Contact:	Raymond Borrow
Client Ref:	IFS-AVI-SUB-14-0052426
Policy Holder:	Haverstock Hill Limited
Report Date:	03 November 2014
Our Ref:	C18151G7214

Site Plan



⊕	Borehole	▶	Foul Water Drain	FMH	Foul Manhole	○	Foul Rodding Point	●	Foul Vent Pipe
⊗	Trial Pit / Borehole	▶	Surface Water Drain	RMH	Rain Water Manhole	○	Surface Rodding Point	●	Rain Water Gully
⊗	Trial Pit	▶	Combined Drain	MH	Combined Manhole				

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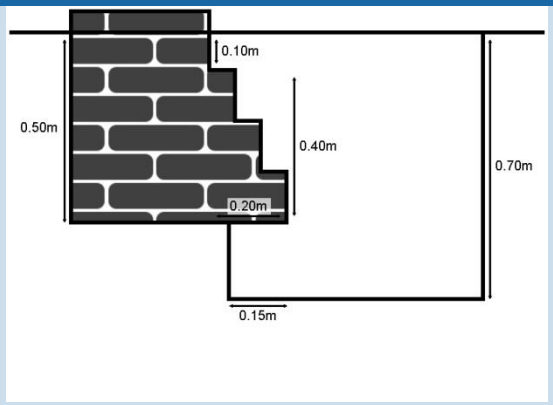
TP/BH1 Foundation Detail and Borehole Log

Foundation Detail

Bay foundation comprised of brick wall to 100mm bgl, bearing on stepped brickwork to 500mm bgl with a total projection of 200mm from the brick wall. Underside of foundation (USF) was exposed to 150mm back from the face of the foundation.



WS	Samples Type	Samples Depth (m)	Tests Type	Tests Depth (m)	Tests Results	Legend	Stratum Description and Observations
						0	PAVING SLAB.
							CONCRETE.
							MADE GROUND: Stiff brown CLAY with occasional fine to coarse brick.
							...at 0.10m to 0.50m bgl occasional roots of live appearance encountered.
							Stiff brown CLAY.
	R	0.50 - 1.50	SV	0.50	Above 120kPa	0.5	...at 0.50m to 1.50m bgl occasional roots of live appearance encountered and sampled.
	D	0.50 - 0.70					...at 0.50m bgl UNDERSIDE OF BAY FOUNDATION.
							...at 0.70m bgl base of hand excavated trial pit.
	D	1.00 - 1.20	SV	1.00	Above 120kPa	1.0	
							...at 1.40m bgl becoming mottled grey.
	D	1.50 - 1.70	SV	1.50	Above 120kPa	1.5	
	D	1.90	MP	1.90	Refusal (>50/,,,) for 5mm		...at 1.90m bgl borehole terminated due to Hand Auger refusal.

-- End of borehole at 1.90m --
Borehole completed by hand auger. Roots encountered to 1.50m bgl. Groundwater strikes not encountered.

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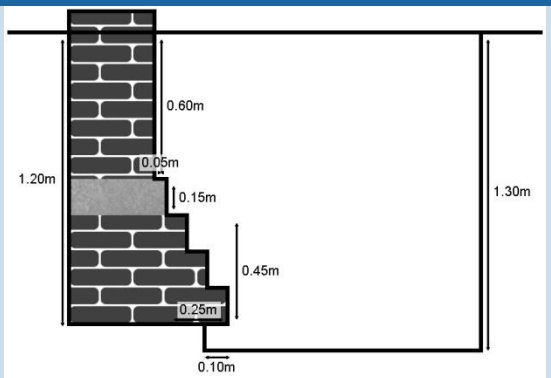
TP/BH2 Foundation Detail and Borehole Log

Foundation Detail

House foundation comprised of brick wall to 600mm bgl, bearing on concrete to 750mm bgl with a total projection of 50mm from the brick wall. In turn, bearing on stepped brickwork to 1200mm bgl with a total projection of 300mm from the brick wall. Underside of foundation (USF) was exposed to 100mm back from the face of the foundation.



WS	Samples Type	Samples Depth (m)	Tests Type	Tests Depth (m)	Tests Results	Legend	Stratum Description and Observations
						0	PAVING SLAB.
							CONCRETE (unreinforced).
							MADE GROUND: Stiff brown orange veined slightly sandy CLAY with occasional fine to coarse brick.
							...at 0.10m to 1.20m bgl occasional roots of live appearance encountered.
						0.5	
						1.0	
	R D	1.20 - 1.90 1.20 - 1.40	SV	1.20	Above 120kPa		Stiff brown CLAY.
							...at 1.20m bgl UNDERSIDE OF HOUSE FOUNDATION.
							...at 1.20m to 1.90m bgl occasional roots of live appearance encountered and sampled.
							...at 1.30m bgl base of hand excavated trial pit.
							...at 1.40m bgl becoming mottled grey.
						1.5	
	D	1.70 - 1.90	SV	1.70	Above 120kPa		
			MP	1.90	Refusal (>50,/,,,) for 10mm		...at 1.90m bgl borehole terminated due to Hand Auger refusal.

-- End of borehole at 1.90m --
Borehole completed by hand auger. Roots encountered to 1.90m bgl. Groundwater strikes not encountered.

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Site Observations

GENERAL:
Site Investigation works undertaken on 22 October 2014 during dry weather (i.e. no rain).

HEALTH AND SAFETY:
Negative signal obtained in Power and Radio mode on the Cable Avoidance Tool (CAT) at TP/BH 1 and TP/BH 2.

DRAINAGE:
The rain water downpipe (RWP 2) was encountered not connected to the sub-surface drainage system and discharging to ground surface.

Unknown responsibility, unknown duty water drainage runs from manhole (MH 1) upstream and downstream. The CCTV inspection was abandonned due to water level in the pipework due to a suspected blockage within the downstream pipework. In order to complete the CCTV inspection it will be necessary for high pressure water jetting (HPWJ).

FOUNDATIONS:
Bay foundations were exposed and the underside of foundation (USF) confirmed to be 0.50m bgl in TP/BH 1.

House foundations were exposed and the underside of foundation (USF) confirmed to be 1.20m bgl in TP/BH 2.

BOREHOLE:
Hand Auger and Mackintosh Probe (MP) refusal at 1.90m bgl due to soil density/ stiffness within the clay in TP/BH 1 and TP/BH 2. Borehole terminated.

ROOTS:
Roots encountered to 1.50m bgl and 1.90m bgl in TP/BH 1 and TP/BH 2 respectively.

INSITU TESTING:
Hand Shear Vane (SV) test undertaken at the underside of foundation (USF) level of 0.50m bgl and 1.20m bgl within the hand excavated trial pit and thereafter in the hand auger borehole at maximum 0.50m intervals in TP/BH 1 and TP/BH 2 respectively.

WATER STRIKES:
No water strike/s (NWS) encountered in TP/BH 1 and TP/BH 2.

The groundwater observations do not necessarily indicate equilibrium conditions. It should be appreciated that groundwater levels are subject to both seasonal and weather induced variations. Other effects such as construction activities may also change groundwater levels.

ROOT IDENTIFICATION

for Subsidence Management Services

96 Haverstock Hill, London, NW3 2BD

Client:	Subsidence Management Services
Client Contact:	Raymond Borrow
Claim Number:	14C600459
Client Reference:	IFS-AVI-SUB-14-0052426
Policy Holder:	Haverstock Hill Limited
Report Date:	24 October 2014
Our Ref:	R6951

Intec
Parc Menai, Bangor,
Gwynedd, North Wales
LL57 4FG
Tel: 01248 672652

Sub Sample	Species Identified		Root Diameter	Starch
TP/BH1:				
0.5-1.5m	*Ulmus* spp.	1	3 mm	Abundant
TP/BH2:				
1.2-1.9m	*Ulmus* spp.	2	1 mm	Abundant

Comments:

1 - Plus 3 others also identified as *Ulmus* spp.
2 - Plus 2 others also identified as *Ulmus* spp.

Ulmus spp. are elms.

Signed: M D Mitchell

Unless we are otherwise instructed in writing, the above sample material will normally be disposed of 6 years after the date of this report.

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SOIL ANALYSIS

for Subsidence Management Services

96 Haverstock Hill, Lower Belsize Park, London, NW3 2BD

Client:	Subsidence Management Services
Client Contact:	Raymond Borrow
Claim Number:	14C600459
Policy Holder:	Haverstock Hill Limited
Report Date:	3 November 2014
Our Ref:	C4916S18151
Compiled By:	
Checked By:	

SubsNetUK

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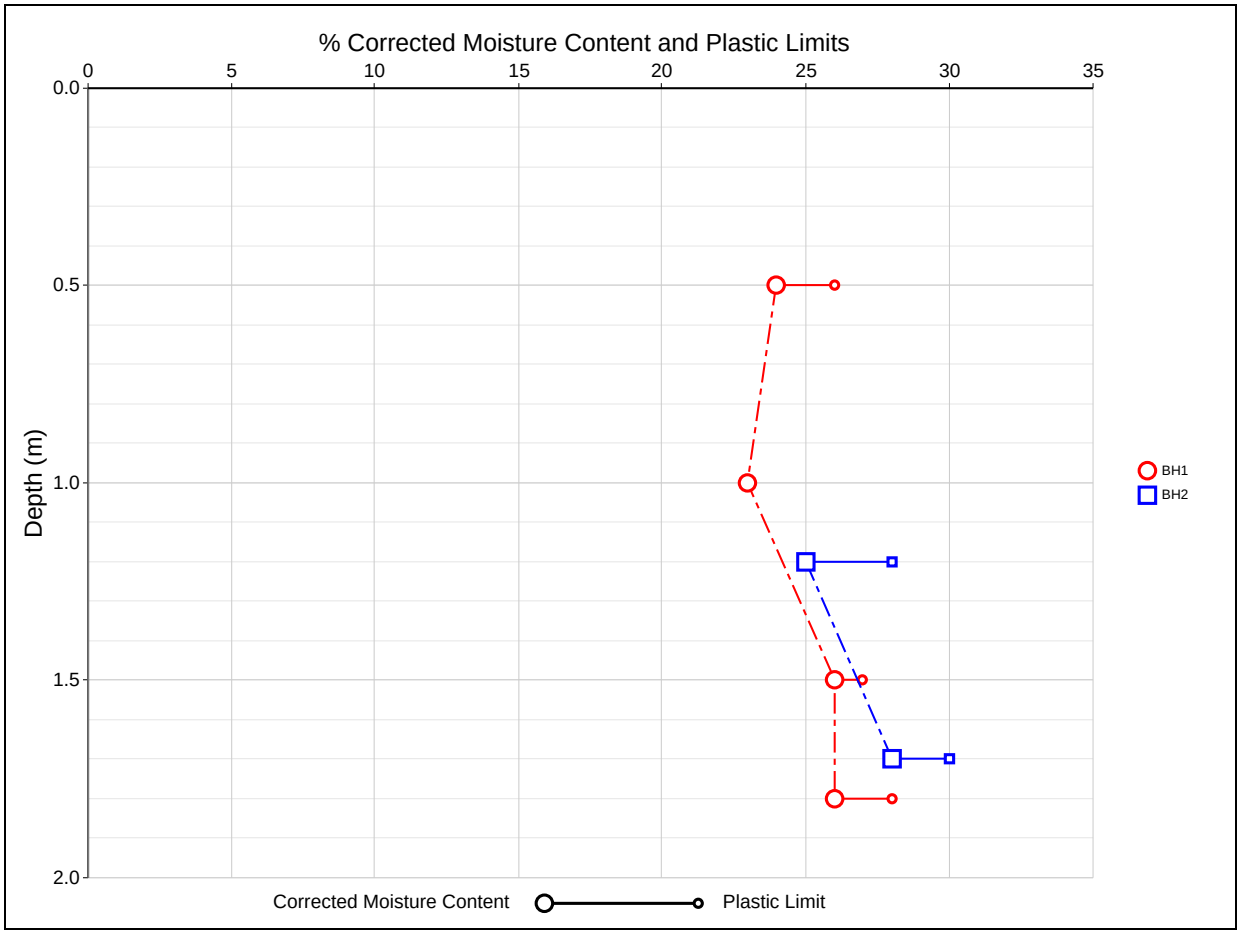
Note

Where appropriate moisture contents have been corrected to demonstrate the equivalent moisture content following the sample being passed through a .425 mm sieve for comparison with the Liquid & Plastic Limit. Where this is not available, uncorrected moisture contents have been used in the graph on the following page.

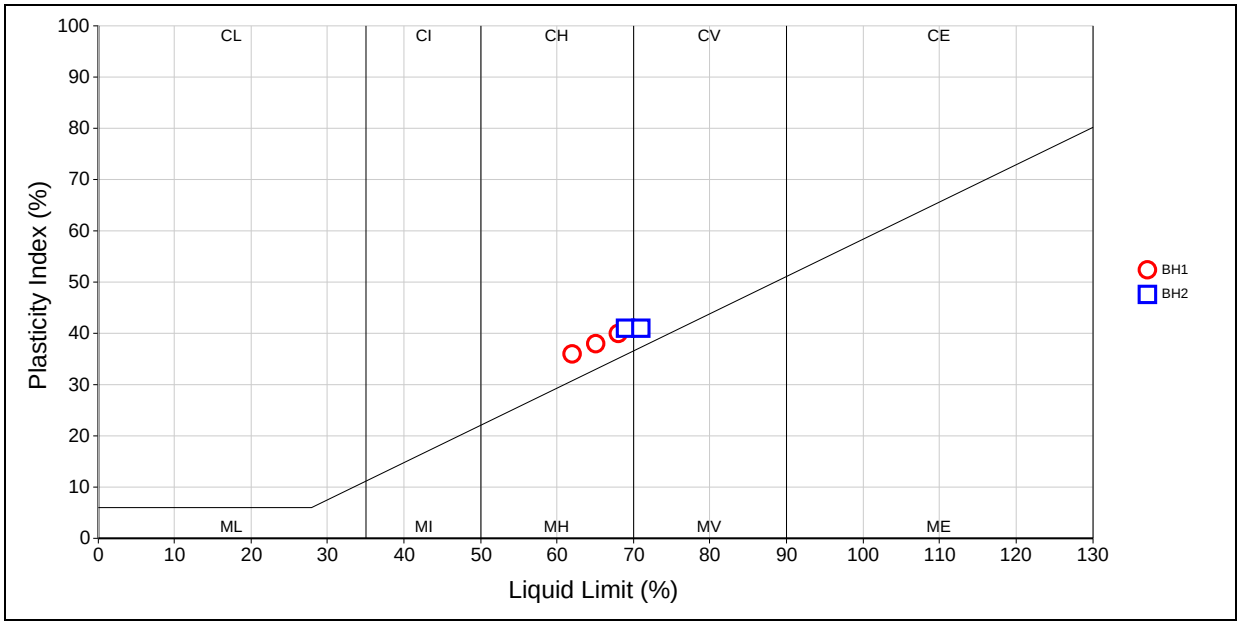
Lab Ref	Depth (m)	MC (%)	Corr MC (%)	LL (%)	PL (%)	PI (%)	% Passing .425mm
Samples from BH1							
001	0.50	24	24	62	26	36	100
002	1.00	23					
003	1.50	26	26	65	27	38	100
004	1.80	26	26	68	28	40	100
Samples from BH2							
005	1.20	25	25	69	28	41	100
006	1.70	28	28	71	30	41	100

Corrected Moisture Content and Plastic Limits Graph



Lab Ref	Depth (m)	Description	BS:5930	NHBC Chapter 4.2
Samples from BH1				
001	0.50	Brown slightly sandy CLAY.	CH	Medium
002	1.00	Brown slightly sandy CLAY.		
003	1.50	Brown slightly sandy CLAY.	CH	Medium
004	1.80	Brown slightly sandy CLAY.	CH	High
Samples from BH2				
005	1.20	Brown slightly sandy CLAY.	CH	High
006	1.70	Brown slightly sandy CLAY.	CV	High

Plasticity Chart for Casagrande Classification



References and Interpretation

The following provides a brief interpretation of the test results by comparison of the results to published classifications. The Atterberg Limit test may be used to classify the plasticity of soils; the plasticity classes defined in BS5930:1999 "Code of Practice for Site Investigations" are as follows.

CL (ML)	CLAY and CLAY/SILT of Low plasticity
CI (MI)	CLAY and CLAY/SILT of Intermediate plasticity
CH (MH)	CLAY and CLAY/SILT of High plasticity
CV (MV)	CLAY and CLAY/SILT of Very High plasticity
CE (ME)	CLAY and CLAY/SILT of Extremely High plasticity
O	The letter O is added to prefixes to symbolise a significant proportion of organic matter.
NP	Non-plastic

The Plasticity Index (PI) Result obtained from the Atterberg Limit tests may also be used to classify the potential for volume change of fine soils, in accordance with the National House Building Council's standards - Chapter 4.2 (2003) "Building Near Trees", as summarised below.

Modified PI < 10	Non Classified.
Modified PI = 10 to <20	Low volume change potential.
Modified PI = 20 to <40	Medium volume change potential.
Modified PI = 40 or greater	High volume change potential.

The 2003 edition of Chapter 4.2 also permits use of the Plasticity Index without modification. The classifications for this are grouped by soil type (soils with similar visual soils description and using unmodified Plasticity Indices.

SUCTION TESTING

for Subsidence Management Services

96 Haverstock Hill, Lower Belsize Park, London, NW3 2BD

Client:	Subsidence Management Services
Client Contact:	Raymond Borrow
Claim Number:	14C600459
Policy Holder:	Haverstock Hill Limited
Report Date:	3 November 2014
Our Ref:	C4916S18151

Compiled By:

Checked By:

Test Commenced:	29 October 2014
Test Completed:	3 November 2014
Days in Contact:	5

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UKAS TESTING
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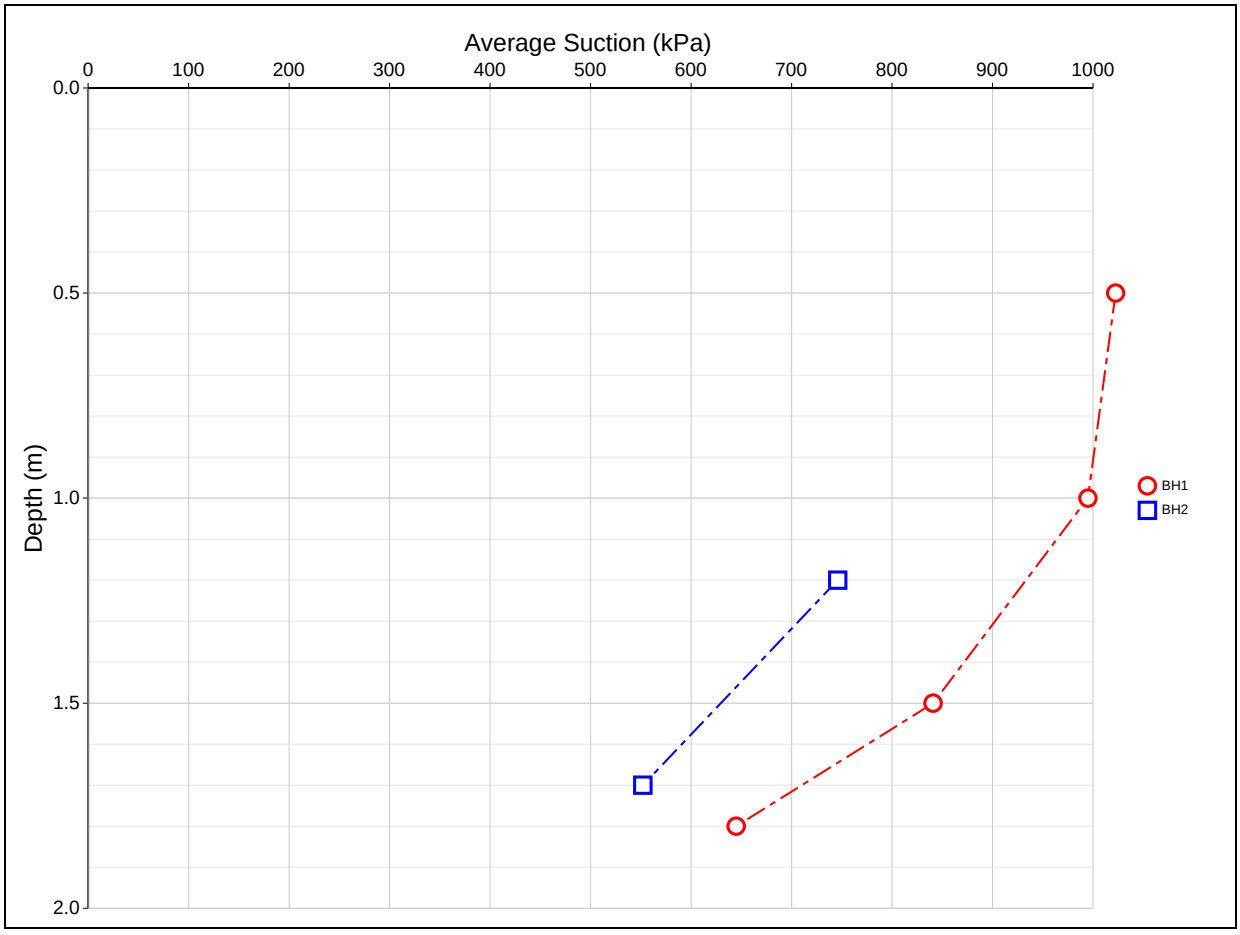
PSL

Lab Ref	Depth (m)	Filter Paper	Bag Weight (g)	Bag + Wet Filter (g)	Bag + Dry Filter (g)	Oven Dry Filter (g)	Water Content (%)	Suction (kPa)	Average (kPa)
Samples from BH1									
001	0.50	Top	1.308	1.789	1.679	0.372	29.610	996.041	1022.905
		Middle	1.298	1.777	1.669	0.371	29.118	1068.656	
		Bottom	1.302	1.784	1.674	0.372	29.554	1004.017	
002	1.00	Top	1.298	1.777	1.666	0.369	30.122	925.559	995.576
		Middle	1.295	1.770	1.664	0.370	28.687	1136.692	
		Bottom	1.301	1.780	1.669	0.368	30.130	924.476	
003	1.50	Top	1.293	1.780	1.666	0.373	30.579	866.885	841.326
		Middle	1.292	1.778	1.663	0.371	30.997	816.522	
		Bottom	1.294	1.770	1.658	0.364	30.795	840.573	
004	1.80	Top	1.303	1.802	1.679	0.376	32.739	636.270	645.715
		Middle	1.305	1.788	1.669	0.364	32.710	638.882	
		Bottom	1.299	1.780	1.662	0.364	32.462	661.992	
Samples from BH2									
005	1.20	Top	1.295	1.774	1.658	0.363	31.938	713.569	746.576
		Middle	1.299	1.785	1.669	0.370	31.360	775.209	
		Bottom	1.308	1.791	1.675	0.367	31.582	750.950	
006	1.70	Top	1.303	1.800	1.675	0.373	33.557	565.916	552.081
		Middle	1.296	1.801	1.672	0.376	34.318	507.508	
		Bottom	1.301	1.789	1.667	0.366	33.352	582.818	

Average Suction



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Average Water Content