appendix a

Field Work

Site Plan
Borehole Records

appendix a

GEA

Geotechnical & Environmental Associates

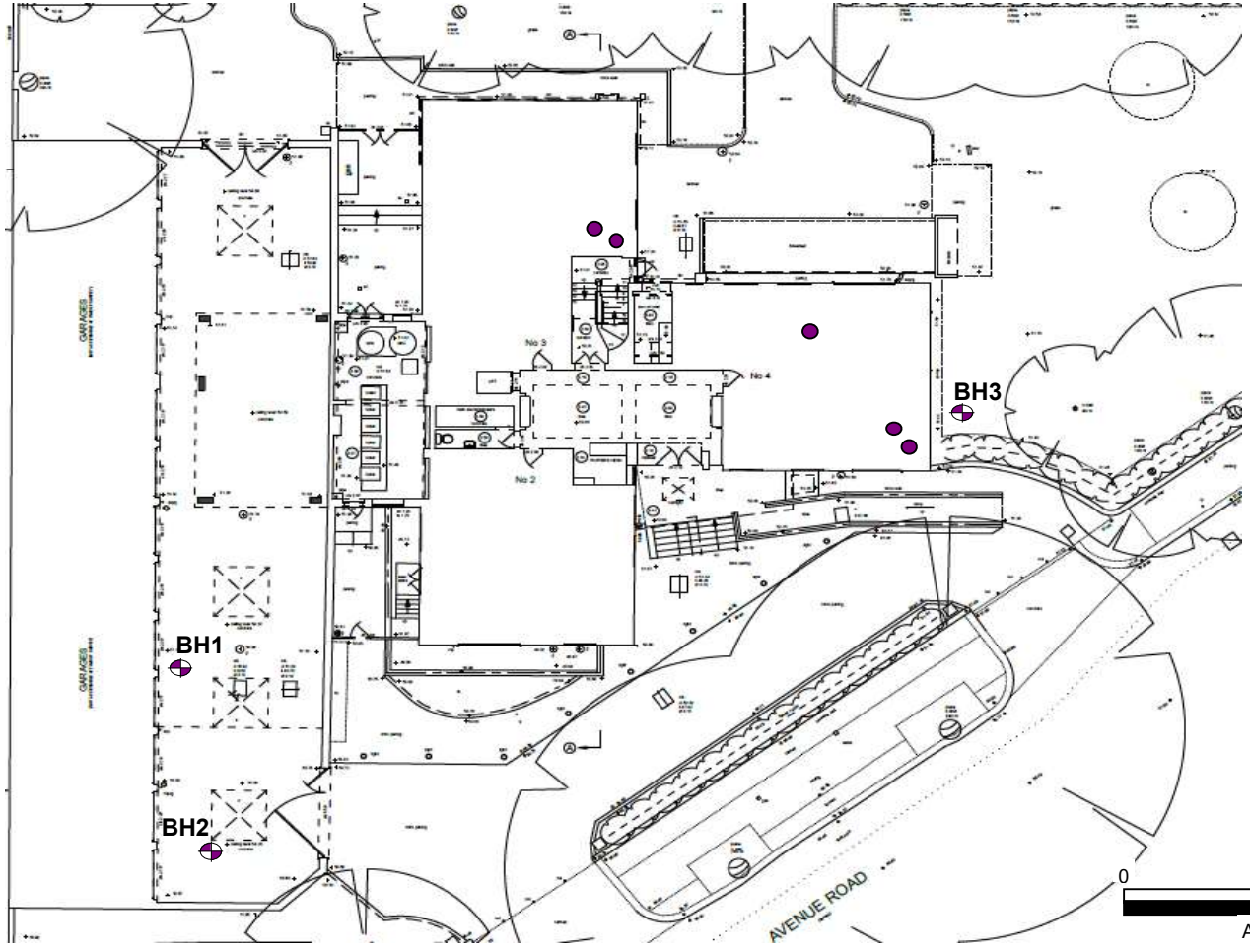
www.gea-ltd.co.uk

Site Plan

Site	95 Avenue Road, London NW8 6HY
Client	95 Avenue Road (Freehold) Limited
Engineer	Michael Barclay Partnership

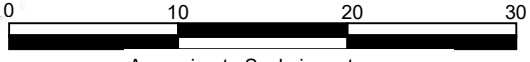
Job Number J22086

Sheet 1 / 1



Position of borehole

Position of pilot hole (concrete proved to be in excess of 800 mm thick)



Approximate Scale in metres

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
95 Avenue Road, London NW8 6HY				**BH1**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J22086	10-06-22	51.10		
Client		Engineer		Sheet
95 Avenue Road (Freehold) Limited		Michael Barclay Partnership		1 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
				50.90		0.20	Reinforced concrete slab	
0.30	D						MADE GROUND (brick and concrete rubble)	
0.50	B					(1.30)		
1.20	D	3,2/5,2,2,4 N60 = 15		49.60		1.50		
1.75	D						Firm becoming stiff medium strength brown slightly sandy occasionally gravelly CLAY with fine rootlets and sandy pockets	
2.00-2.45	U	18 blows				(1.60)		
2.75	D							
3.00	D	3,4/4,4,4,5 N60 = 19		48.00		3.10		
							Stiff high strength fissured brown mottled grey silty CLAY with mica occasional fine partings of fine sand	
3.75	D							
4.00-4.45	U	22 blows						
4.75	D							

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth
0.00	10-06-22	08.30	0.00	150	
1.50	10-06-22	11.00	1.50	150	DRY

GENERAL REMARKS

1 hour spent mobilising onto position
Inspection pit dug to 1.20 m
Groundwater not encountered
Groundwater monitoring standpipe installed to 5.00 m
1 hour spent demobilising off position
Subsequent groundwater monitoring visit recorded the standpipe to be dry

All dimensions in metres Scale 1:31.25	Method/ Plant Used Dismantlable cable percussion rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J22086 - 95 AVENUE ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 17 February 2023

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
95 Avenue Road, London NW8 6HY				**BH1**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J22086	10-06-22	51.10		
Client		Engineer		Sheet
95 Avenue Road (Freehold) Limited		Michael Barclay Partnership		2 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
5.00	D	3,4/4,5,5,5 N60 = 21					Stiff high strength fissured brown mottled grey silty CLAY with mica occasional fine partings of fine sand(continued)	
6.00	D							
6.50-6.95	U	24 blows				(6.90)		
7.50	D							
8.00	D	4,4/4,5,4,5 N60 = 20						
9.00	D							
9.55-10.00	U	27 blows					9.70 ... becoming dark greyish brown	
				41.10		10.00		

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth
10.00	10-06-22	16.00	1.50	150	DRY

GENERAL REMARKS

1 hour spent mobilising onto position
Inspection pit dug to 1.20 m
Groundwater not encountered
Groundwater monitoring standpipe installed to 5.00 m
1 hour spent demobilising off position
Subsequent groundwater monitoring visit recorded the standpipe to be dry

All dimensions in metres Scale 1:31.25	Method/ Plant Used Dismantlable cable percussion rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J22086 - 95 AVENUE ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 17 February 2023

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
95 Avenue Road, London NW8 6HY				**BH2**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J22086	10-06-22	50.85		
Client		Engineer		Sheet
95 Avenue Road (Freehold) Limited		Michael Barclay Partnership		1 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
				50.55		(0.30) 0.30	Reinforced concrete slab	
0.50	D						MADE GROUND (dark brown sandy gravelly clay with fragments of brick, concrete, flint and clinker)	
		2,2/2,3,3,3 N60 = 12		49.65		(0.90) 1.20		
1.20	D						Stiff brown slightly sandy occasionally gravelly CLAY with fine rootlets and sandy pockets	
							1.50 - 2.00 Poor recovery	
		3,4/4,5,4,5 N60 = 20				(1.90)		
2.20	D							
2.70	D							
		4,5/5,5,5,5 N60 = 23		47.75		3.10		
3.20	D						Stiff fissured brown mottled grey silty CLAY with occasional sandy partings	
3.70	D							
		5,6/6,6,5,6 N60 = 26				(2.35)		
4.20	D							
4.70	D							

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Inspection pit dug to 1.20 m
Groundwater not encountered
Groundwater monitoring standpipe installed to 4.50 m
Subsequent groundwater monitoring visit recorded the standpipe to be dry

All dimensions in metres Scale 1:31.25	Method/ Plant Used Opendrive sampling rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J22086 - 95 AVENUE ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 17 February 2023

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
95 Avenue Road, London NW8 6HY				**BH2**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J22086	10-06-22	50.85		
Client		Engineer		Sheet
95 Avenue Road (Freehold) Limited		Michael Barclay Partnership		2 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
		7,8/6,6,6,7 N60 = 28					Stiff fissured brown mottled grey silty CLAY with occasional sandy partings(continued)	
				45.40		5.45		

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Inspection pit dug to 1.20 m
Groundwater not encountered
Groundwater monitoring standpipe installed to 4.50 m
Subsequent groundwater monitoring visit recorded the standpipe to be dry

All dimensions in metres Scale 1:31.25	Method/ Plant Used Opendrive sampling rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J22086 - 95 AVENUE ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 17 February 2023

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
95 Avenue Road, London NW8 6HY				**BH3**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J22086	10-06-22	51.43		
Client		Engineer		Sheet
95 Avenue Road (Freehold) Limited		Michael Barclay Partnership		1 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
				51.23		0.20	Topsoil	
1.00	D	1,1/2,2,2,2 N60 = 9				(2.00)	MADE GROUND (brown gravelly sand with bricks and fragments of brick, concrete, flint and clinker with roots up to 5 mm diameter and rootlets)	
		5,6/3,3,3,3 N60 = 14		49.23		2.20		
				48.93		(0.30) 2.50	MADE GROUND (brown gravelly sand)	
2.80	D			48.43		(0.50) 3.00	MADE GROUND (brown gravelly clay with fragments of wood) 2.80 ... stained black and diesel odour	
3.00	D	3,4/4,5,5,5 N60 = 22	1	47.93		(0.50) 3.50	Firm orange brown mottled grey slightly sandy slightly gravelly CLAY (samples damp)	
3.50	D						Stiff fissured brown mottled grey silty CLAY with sandy lenses	
4.00	D						4.00 - 4.50 Poor recovery	
4.60	D					(1.95)		

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Inspection pit dug to 1.20 m
Groundwater seepage at 3.50 m
Borehole backfilled to 1.50 m

All dimensions in metres Scale 1:31.25	Method/ Plant Used Opendrive sampling rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J22086 - 95 AVENUE ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 17 February 2023

GEA

Geotechnical & Environmental Associates

Project				BOREHOLE No
95 Avenue Road, London NW8 6HY				**BH3**
Job No	Date	Ground Level (m OD)	Co-Ordinates ()	
J22086	10-06-22	51.43		
Client		Engineer		Sheet
95 Avenue Road (Freehold) Limited		Michael Barclay Partnership		2 of 2

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
5.00	D			45.98		5.45	Stiff fissured brown mottled grey silty CLAY with sandy lenses(continued)	

Boring Progress and Water Observations

Depth	Date	Time	Casing Depth	Casing Dia. mm	Water Depth

GENERAL REMARKS

Inspection pit dug to 1.20 m
Groundwater seepage at 3.50 m
Borehole backfilled to 1.50 m

All dimensions in metres Scale 1:31.25	Method/ Plant Used Opendrive sampling rig	Logged By GC

Report ID: CABLE PERCUSSION || Project: J22086 - 95 AVENUE ROAD.GPJ || Library: GEA LIBRARY.GLB || Date: 17 February 2023

appendix b

Lab Testing

Geotechnical Test Results
Chemical Test Results
Generic Risk Based Screening Values

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
BH1	1.75		D	Brown mottled grey slightly sandy CLAY with rare gypsum. Sand is fine.	25.5	64	24	40	100										
BH1	2.00		U	Stiff brown mottled grey CLAY.	27.8					2.00	1.56	Undisturbed	40	133	67				
BH1	2.75		D	Brown mottled grey slightly sandy CLAY with rare gypsum. Sand is fine.	30.1														
BH1	3.00		D	Brown mottled grey slightly sandy CLAY with rare gypsum. Sand is fine.	28.7											7.8	1.6		
BH1	3.75		D	Brown mottled grey slightly sandy CLAY with rare gypsum. Sand is fine.	30.4														
BH1	4.00		U	Stiff brown mottled grey CLAY.	27.4					2.01	1.58	Undisturbed	80	210	105				
BH1	6.50		U	Very stiff fissured brown mottled grey CLAY.	26.7					2.00	1.58	Undisturbed	130	221	111				
BH1	8.00		D	Brown mottled grey slightly sandy CLAY with rare gypsum. Sand is fine.	26.6	73	24	49	100										
BH2	1.20		D	Brown mottled grey sandy gravelly CLAY. Sand is fine. Gravel is fine to medium.	24.9											8.0	0.33		
BH2	2.20		D	Brown slightly gravelly sandy CLAY with rare gypsum. Sand is fine. Gravel is fine to medium.	20.9	56	21	35	99										

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
12/07/2022

Project Number:

GEO / 35734

Project Name:

95 AVENUE ROAD
J22086

GEOLABS®

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				Chemical Tests			Other tests and comments
Location	Depth (m)	Sample Ref	Type	Description	WC %	LL %	PL %	PI %	<425 µm %	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	pH	2:1 W/S SO4 g/L	W/S Mg mg/L	
BH2	2.70		D	Brown slightly gravelly sandy CLAY with rare gypsum. Sand is fine. Gravel is fine to medium.	25.0														
BH2	3.20		D	Brown slightly grey mottled sandy CLAY. Sand is fine.	26.5														
BH2	3.70		D	Brown slightly grey mottled sandy CLAY. Sand is fine.	28.8														
BH3	3.00		D	Brown gravelly sandy CLAY. Sand is fine. Gravel is fine to medium.	17.5	44	18	26	99										
BH3	5.00		D	Brown sandy CLAY. Sand is fine.	27.4														

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by

S Burke

S Burke - Senior Technician
12/07/2022

Project Number:

GEO / 35734

Project Name:

95 AVENUE ROAD
J22086

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BS EN ISO 17892-8 : 2018

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

Location	BH1
Depth (m)	2.00
Sample Type	U

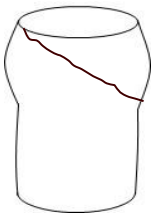
Description:

Stiff brown mottled grey CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	201.7
Diameter	(mm)	100.6
Moisture content	(%)	27.8
Bulk density	(Mg/m³)	2.00
Dry density	(Mg/m³)	1.56
Test Details		
Latex membrane thickness	(mm)	0.3
Specimen height prior to shearing	(mm)	201.7
Membrane correction	(kPa)	0.7
Mean rate of shear	(%/min)	2.0
Cell pressure	(kPa)	40
Strain at failure	(%)	10.4
Maximum deviator stress	(kPa)	133
Shear Stress Cu	(kPa)	67

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	65

Tested by SB
Checked and Approved by

S Burke - Senior Technician
12/07/2022

Project Number:

GEO / 35734

Project Name:

95 AVENUE ROAD
J22086

GEOLABS® UKAS TESTING 1982

BS EN ISO 17892-8 : 2018

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

Location	BH1
Depth (m)	4.00
Sample Type	U

Description:

Stiff brown mottled grey CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	201.7
Diameter	(mm)	101.2
Moisture content	(%)	27.4
Bulk density	(Mg/m³)	2.01
Dry density	(Mg/m³)	1.58
Test Details		
Latex membrane thickness	(mm)	0.3
Specimen height prior to shearing	(mm)	201.7
Membrane correction	(kPa)	1.1
Mean rate of shear	(%/min)	2.0
Cell pressure	(kPa)	80
Strain at failure	(%)	19.8
Maximum deviator stress	(kPa)	210
Shear Stress Cu	(kPa)	105

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	70

Tested by SB
Checked and Approved by

S Burke

S Burke - Senior Technician
12/07/2022

Project Number:

GEO / 35734

Project Name:

95 AVENUE ROAD
J22086

GEOLABS® UKAS TESTING 1982

BS EN ISO 17892-8 : 2018

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

Location	BH1
Depth (m)	6.50
Sample Type	U

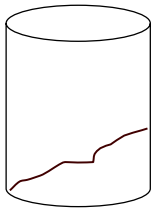
Description:

Very stiff fissured brown mottled grey CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	201.0
Diameter	(mm)	101.2
Moisture content	(%)	26.7
Bulk density	(Mg/m³)	2.00
Dry density	(Mg/m³)	1.58
Test Details		
Latex membrane thickness	(mm)	0.3
Specimen height prior to shearing	(mm)	201.0
Membrane correction	(kPa)	0.6
Mean rate of shear	(%/min)	2.0
Cell pressure	(kPa)	130
Strain at failure	(%)	8.5
Maximum deviator stress	(kPa)	221
Shear Stress Cu	(kPa)	111

Mode of failure



Orientation of the sample	Vertical
Distance from top of tube mm	90

Tested by SB
Checked and Approved by

S Burke - Senior Technician
12/07/2022

Project Number:

GEO / 35734

Project Name:

95 AVENUE ROAD
J22086

GEOLABS® UKAS TESTING 1982

GEOLABS®

Client	Geotechnical & Environmental Associates Limited
Project No.	35734
Project Name	**95 AVENUE ROAD**

TEST RESTRICTION

The following tests have been scheduled on the above project and **CANNOT** be performed for the reason stated. If alternative samples are available for the restricted tests, please supply details.

Laboratory ID	BH / TP No.	Sample Ref.	Depth (m)		Type	Test(s) Scheduled			Reason for Restriction	Description
444867	BH1		9.55		U		UU TXL		Sample broken into three pieces none suitable for testing.	Very stiff fissured brown mottled orange CLAY with rare fine gypsum.

Comments / remarks

Test restriction raised by

S Burke

Ref. WS 04 - TERE - Issue 1B (12/18)

George Clifton
Geotechnical & Environmental Associates
Widbury Barn
Widbury Hill
Ware
Hertfordshire
SG127QE

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i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 22-64466

Project / Site name:	95 Avenue Road	**Samples received on:**	13/06/2022
Your job number:	J22086	**Samples instructed on/ Analysis started on:**	13/06/2022
Your order number:		**Analysis completed by:**	21/06/2022
Report Issue Number:	1	**Report issued on:**	21/06/2022
Samples Analysed:	6 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-64466
Project / Site name: 95 Avenue Road

Lab Sample Number				2310953	2310954	2310955	2310956	2310957
Sample Reference				TP1	BH2	BH3	BH3	BH1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.40	1.00	2.80	0.50
Date Sampled				10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	21	< 0.1	-	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.5	13	-	19	12
Total mass of sample received	kg	0.001	NONE	0.8	0.8	-	0.4	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite & Crocidolite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.455	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.455	-	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	N/A	SCA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.7	6.7	-	8.7	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	8.8	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	25000	2000	-	1300	2500
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.1	0.83	-	0.58	0.75
Sulphide	mg/kg	1	MCERTS	6.7	4.1	-	180	1.4
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	70	71	-	46	23
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.4	1.7	-	0.4	1.7

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	1.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.57	0.81	-	< 0.05	2.1
Pyrene	mg/kg	0.05	MCERTS	0.48	0.74	-	< 0.05	1.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.46	-	< 0.05	1.2
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.51	-	< 0.05	0.73
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.63	-	< 0.05	1.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.34	-	< 0.05	0.63
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.56	-	< 0.05	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.28	-	< 0.05	0.56
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.34	-	< 0.05	0.67

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	1.05	4.67	-	< 0.80	11.5

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	22	-	18	22
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	36	-	45	34
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	62	-	24	150
Lead (aqua regia extractable)	mg/kg	1	MCERTS	81	460	-	110	1100
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1	-	< 0.3	1.1
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	23	-	36	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	78	110	-	90	150

Analytical Report Number: 22-64466
Project / Site name: 95 Avenue Road

Lab Sample Number				2310953	2310954	2310955	2310956	2310957
Sample Reference				TP1	BH2	BH3	BH3	BH1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.40	1.00	2.80	0.50
Date Sampled				10/06/2022	10/06/2022	10/06/2022	10/06/2022	10/06/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	17	-	33	27
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	-	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	-	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	4.9	-	10	8
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1.0	12	-	19	17
TPH Total C8 - C35 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	< 10	17	-	30	25

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-64466
Project / Site name: 95 Avenue Road

Lab Sample Number				2310958
Sample Reference				TP2
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				10/06/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	27
Moisture Content	%	0.01	NONE	8.7
Total mass of sample received	kg	0.001	NONE	0.8

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-
Asbestos Quantification Total	%	0.001	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	3400
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.29
Sulphide	mg/kg	1	MCERTS	17
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	38
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	85
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82

Analytical Report Number: 22-64466
Project / Site name: 95 Avenue Road

Lab Sample Number				2310958
Sample Reference				TP2
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				10/06/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Petroleum Hydrocarbons				
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	16
TPH (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	8.9
TPH (C21 - C35) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	6.5
TPH Total C8 - C35 EH_CU+HS_1D_TOTAL	mg/kg	10	MCERTS	15

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-64466
Project / Site name: 95 Avenue Road
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2310955	BH3	1.00	126	Loose Fibrous Debris & Loose Fibres	**Amosite & Crocidolite**	0.455	**0.455**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 22-64466
Project / Site name: 95 Avenue Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2310953	TP1	None Supplied	0.5	Brown gravelly sand with brick and stones.
2310954	BH2	None Supplied	0.4	Brown clay and loam with gravel and brick.
2310956	BH3	None Supplied	2.8	Brown clay with gravel and vegetation.
2310957	BH1	None Supplied	0.5	Brown clay and loam with gravel and vegetation.
2310958	TP2	None Supplied	0.5	Brown gravelly sand with rubble and stones.

Analytical Report Number : 22-64466
Project / Site name: 95 Avenue Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 22-64466
Project / Site name: 95 Avenue Road

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

GEA

Geotechnical & Environmental Associates

www.gea-ltd.co.uk

Generic Risk-Based Soil Screening Values

Site	95 Avenue Road, London NW8 6HY
Client	95 Avenue Road (Freehold) Limited
Engineer	Michael Barclay Partnersship

Job Number J22086

Sheet 1 / 1

Proposed End Use Residential without plant uptake

Soil Organic Matter content % 2.5

Contaminant	Screening Value mg/kg	Data Source
Metals		
Arsenic	40	C4SL
Cadmium	149	C4SL
Chromium (III)	910	S4UL
Chromium (VI)	21	C4SL
Copper	7,100	S4UL
Lead	310	C4SL
Elemental Mercury	1.2	S4UL
Inorganic Mercury	56	S4UL
Nickel	180	S4UL
Selenium	595	SGV
Zinc	40,000	S4UL
Anions		
Soluble Sulphate	500 mg/l	Structures
Sulphide	50	Structures
Chloride	400	Structures
Others		
Organic Carbon (%)	6	Methanogenic potential
Total Cyanide	140	WRAS
Total Mono Phenols	420	SGV
PAH		
Naphthalene	5.60	S4UL
Acenaphthylene	4,600	S4UL
Acenaphthene	4,700	S4UL
Fluorene	3,800	S4UL
Phenanthrene	1,500	S4UL
Anthracene	35,000	S4UL
Fluoranthene	1,600	S4UL
Pyrene	3,800	S4UL
Benzo(a)anthracene	14.0	S4UL
Chrysene	31	S4UL
Benzo(b)fluoranthene	4.0	S4UL
Benzo(k)fluoranthene	110.0	S4UL
Benzo(a)pyrene	4.70	C4SL
Indeno(1 2 3 cd)pyrene	46.0	S4UL
Dibenz(a h)anthracene	0.32	S4UL
Benzo (g h i)perylene	360	S4UL
Total PAH Screen	**67.1**	B(a)P / 0.15

Contaminant	Screening Value mg/kg	Data Source
Hydrocarbons		
Banded TPH (8-10)	169	Calc1
Banded TPH (10-12)	908	Calc1
Banded TPH (12-16)	3538	Calc1
Banded TPH (16-21)	2923	Calc1
Banded TPH (21-35)	2923	Calc1
Benzene	1.4	C4SL
Toluene	320	SGV
Ethyl Benzene	180	SGV
Xylene	120	SGV
Aliphatic C5-C6	78	S4UL
Aliphatic C6-C8	230	S4UL
Aliphatic C8-C10	65	S4UL
Aliphatic C10-C12	330	S4UL
Aliphatic C12-C16	2400	S4UL
Aliphatic C16-C35	92,000	S4UL
Aromatic C6-C7	See Benzene	S4UL
Aromatic C7-C8	See Toluene	S4UL
Aromatic C8-C10	110	S4UL
Aromatic C10-C12	590	S4UL
Aromatic C12-C16	2300	S4UL
Aromatic C16-C21	1900	S4UL
Aromatic C21-C35	1900	S4UL
PRO (C_5 –C_{10})	804	Calc2
DRO (C_{12} –C_{28})	98,600	Calc2
Lube Oil (C_{28} –C_{44})	93,900	Calc2
TPH	**500**	Trigger to consider speciated testing
Chlorinated Solvents		
1,1,1 trichloroethane (TCA)	18	S4UL
tetrachloroethane (PCA)	3.5	S4UL
tetrachloroethene (PCE)	0.71	C4SL
trichloroethene (TCE)	0.02	C4SL
1,2-dichloroethane (DCA)	0.24	C4SL
vinyl chloride (Chloroethene)	0.019	C4SL
tetrachloromethane (Carbon tetra	0.056	S4UL
trichloromethane (Chloroform)	2.1	S4UL

Notes

Concentrations measured below these screening values may be considered to represent 'uncontaminated conditions' which pose a 'LOW' risk to human health. Concentrations measured in excess of these values indicate a potential risk which require further, site specific risk assessment.

C4SL - Defra Category 4 Screening value based on Low Level of Toxicological Risk

SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009 - where not superseded by C4SL

S4UL - LQM/CIEH Suitable for use Level (2015) based on 'minimal' level of risk

Calc1 - sum of thresholds for Ali & Aro fractions - assuming a 35% Aro:65% Ali ratio as is commonly encountered in the soil

Calc2 - sum of nearest available carbon range specified including BTEX for PRO fraction

Total PAH based on B(a)P / 0.15 - GEA experience indicates that Benzo(a) pyrene rarely exceeds 15% of the total PAH concentration