Site & Location:	**277A Gray's Inn Road, London WC1X 8QF**	Borehole No:	**BH103**
Client:	**Regal Homes Ltd**	Coordinates: 530478E, 182807N	Sheet 3 of 3
Engineer:	**Pringuer-James Consulting Engineers Ltd**	Ground Level: +19.10mOD	Report No: 9708/MC

Progress & Observations	Samples & Tests Type	Samples & Tests Depth (m)	Field Test Results	Strata Depth (m)	Strata Level (m)	Legend	Strata Descriptions	Backfill / Installation
	D	20.25					Very stiff, sparsely fissured, dark grey-brown, slightly sandy CLAY, with occasional small pockets of silt, rare pyrite nodules and rare carbonaceous matter.	
	U	21.00						
	D	21.50		21.50	-2.40		Very stiff, very closely fissured, locally slickensided, variegated red-brown, orange-brown, brown and blue-grey, CLAY. Locally thinly laminated, locally bioturbated.	
	D SPT/S	22.50 22.50	N=48 N∞=61					
	D	23.25						
	U	23.50						
	D	24.00						
BH complete: 28/02/2015 BH depth: 25.00m Casing depth: 2.00m Water depth: Dry	D SPT/S	24.50 24.50	N=54 N∞=68					
				25.00	-5.90		End of borehole at 25.00m	

Key: U = Undisturbed B = Bulk D = Small disturbed W = Water ES = glass jar & plastic tub E = glass jar SPT/S = split spoon SPT/C = solid cone HV = Hand Vane [kPa] PP = Pocket Penetrometer [kg/cm²] PID = Photo Ionisation Detector [ppmv] * = full SPT penetration not achieved - see summary sheet

Borehole type: Cable Percussion

Remarks: Approximate coordinates interpolated from public domain data.
Approximate Ground Level interpolated from Pringuer-James drawing (ref. L1706-03_01, dated May 2014).

Borehole No: **BH103**

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Site & Location	**227A Grays Inn Road, London WC1X 8QF**	Report No: **9708/MC**

STANDARD PENETRATION TEST SUMMARY

BH ID	Depth [m]	Test type	'N' value and blow-counts [Seating blows/Test blows]	N_{60}	N_{60} - ext	Casing depth [m]	Water depth [m]	Remarks
BH101	16.50	S	N = 30 :5 6/ 7 7 8 8	38		2.50	Dry	
	19.50	S	N = 33 :5 5/ 7 8 9 9	42		2.50	Dry	
	22.50	S	N = 50 :6 8/ 11 12 14 13	63		2.50	Dry	
	24.50	S	50 :7 9/ 10 13 16 11 for 30mm	>63*	75**	2.50	Dry	
BH102	4.00	S	N = 17 :2 2/ 3 4 5 5	22		2.00	Dry	
	6.50	S	N = 17 :2 3/ 3 4 5 5	22		2.00	Dry	
	9.50	S	N = 23 :3 3/ 5 5 6 7	29		2.00	Dry	
	12.50	S	N = 26 :3 4/ 5 6 7 8	33		2.00	Dry	
	15.50	S	N = 27 :4 5/ 5 6 7 9	34		2.00	Dry	
	18.50	S	N = 35 :5 6/ 7 9 9 10	44		2.00	Dry	
	21.50	S	N = 44 :6 8/ 9 11 12 12	56		2.00	Dry	
	24.50	S	50 :8 10/ 12 13 15 10 for 60mm	>63*	70**	2.00	Dry	
BH103	16.50	S	N = 27 :3 5/ 6 6 7 8	34		2.00	Dry	
	19.50	S	N = 29 :4 6/ 6 8 7 8	37		2.00	Dry	
	22.50	S	N = 48 :6 7/ 9 10 12 17	61		2.00	Dry	
	24.50	S	N = 54 :7 8/ 10 12 15 17	68		2.00	Dry	

Standard Penetration Test : BS EN ISO 22476:2005 Part 3 Hammer Energy Ratio, Er = 76%

* where full penetration not achieved, the reported N_{60} is based on maximum uncorrected blow-counts of 50

** extrapolated N_{60} value where full penetration not achieved - this is indicative only and should be used with caution [SPT Sheet 1 of 1]

Soil Consultants

Southern Testing
Environmental & Geotechnical

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

SPT Hammer Ref:	DW1
Test Date:	25/09/2014
Report Date:	25/09/2014
File Name:	DW1.spt
Test Operator:	NPB

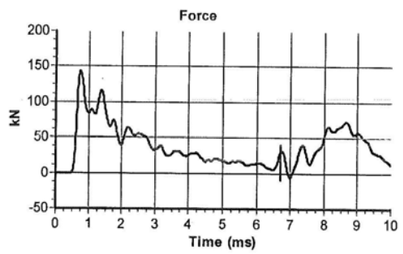
Instrumented Rod Data

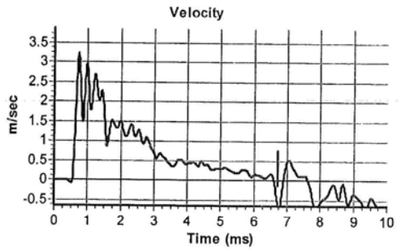
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.6
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	6458
Accelerometer No.2:	6459

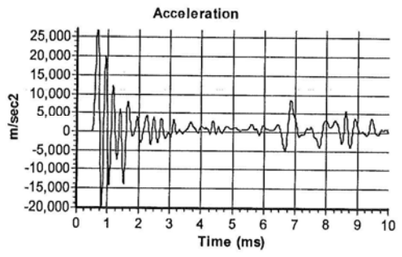
SPT Hammer Information

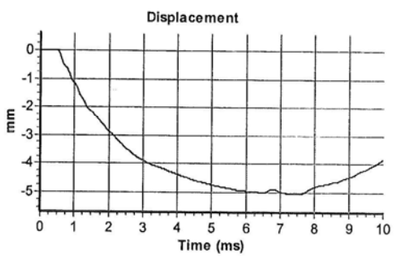
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.5

Comments / Location
Charlwoods Road









Calculations

Area of Rod A (mm2):	983
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	360

Energy Ratio E_r (%): **76**

The recommended calibration interval is 12 months

N P Burrows

Signed: N P Burrows
Title: Field Operations Manager

Site	**277A Gray's Inn Road**	Report No:	**9708/MC**
Location	**London WC1X 8QF**		

SUMMARY OF GROUND-WATER/GAS MONITORING RESULTS

Date:	25/03/15	Ambient air temperature [0C]:	8
Time:	AM	Barometric pressure [mB]:	1016
Equipment:	GA2000 Plus MC08/0126/00	Barometric trend:	Rising
Recorded by:	MR	Weather conditions:	Damp and overcast

Ground-water monitoring

Hole ID	Ground level [mOD/SD]	Water depth [m]	Water level [mOD/SD]	Depth of pipe base [m]	Remarks
BHD		dry		11.00	
BHE		dry		11.00	

Gas monitoring

Hole ID	CH4 [%]		CO2 [%]		O2 [%]		Peak [ppmv]		Flow	Emission rate	Remarks
	Max	Steady	Max	Steady	Min	Steady	CO	H_2S	[l/min]	[l/hr]	
BHD	0.1	0.1	0.1	0.1	20.6	20.6	0.0	0.0	0.0	0.0	
BHE	0.1	0.1	0.9	0.9	19.6	19.6	0.0	0.0	0.0	0.0	

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Site & Location: **277A Grays Inn Road, London WC1X 8QF** | Report No: **9708/MC**

SUMMARY OF CLASSIFICATION TEST RESULTS

BH ID	Depth (m)	Type	w (%)	wL (%)	wP (%)	Pass 425 (%)	IP (%)	Mod IP (%)	IL (%)	LOI (%)	Description
BH101	15.00	U	21								Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	18.00	U	23	75	29	>95	46		-0.14		Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	21.00	U	19								Variegated red-brown, orange-brown, brown and blue-grey, CLAY.
	23.50	U	20	59	27	>95	32		-0.23		Variegated red-brown, orange-brown, brown and blue-grey, CLAY.
BH102	3.00	U	28	71	25	>95	46		0.07		Brown and orange-brown, thinly veined blue-grey, slightly micaceous CLAY, with occasional selenite.
	5.00	U	28								Brown and orange-brown, thinly veined blue-grey, slightly micaceous CLAY, with occasional selenite.
	8.00	U	27								Dark grey-brown CLAY.
	11.00	U	23	81	30	>95	51		-0.14		Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	14.00	U	26								Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	17.00	U	27	76	30	>95	46		-0.07		Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	20.00	U	20	46	18	>95	28		0.09		Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	23.00	U	19								Variegated red-brown, orange-brown, brown and blue-grey, CLAY.
BH103	15.00	U	25	74	26	>95	48		-0.02		Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	18.00	U	18	66	28	>95	38		-0.26		Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	21.00	U	21								Dark grey-brown, slightly sandy, slightly micaceous, CLAY.
	23.50	U	18	57	24	>95	33		-0.18		Variegated red-brown, orange-brown, brown and blue-grey, CLAY.

Testing in accordance with BS EN ISO 17892 unless specified otherwise — Date: 24 Mar 15

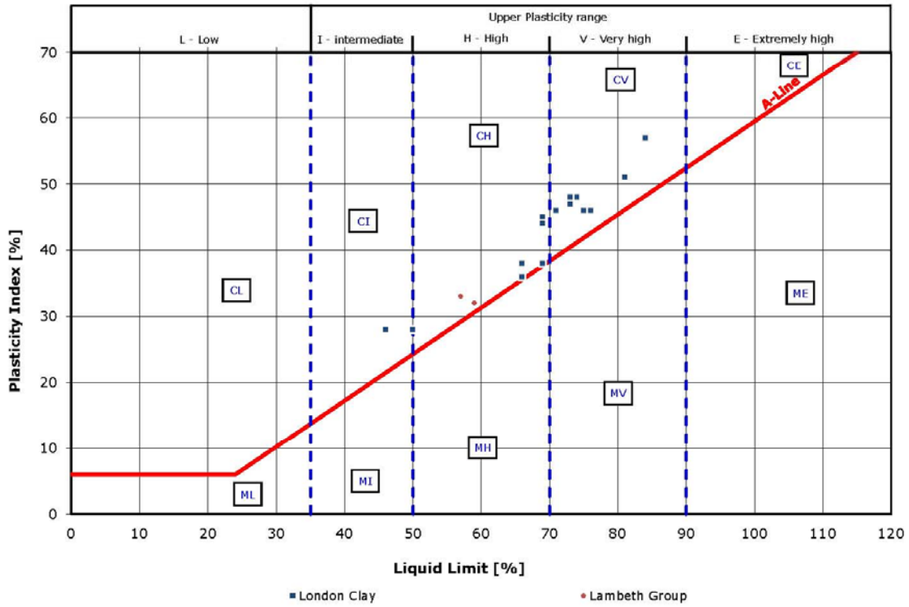
Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)

Percent passing 425µm: by estimation, by hand* or by sieving**

(Classification Sheet 1 of 1)

Site & Location: **227A Grays Inn Road, London WC1X 8QF** | Report No: **9708/MC**

Plasticity Chart

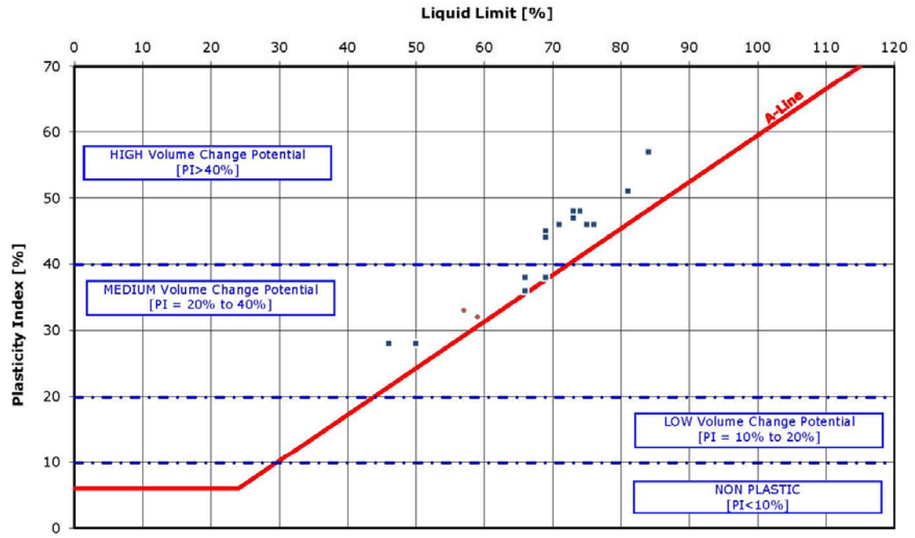


M - SILT [plots below the A-Line]
C - CLAY [plots above the A-Line]

Classification in accordance with BS5930:1999+A2:2010 "Code of practice for site investigations"

Site & Location	227A Grays Inn Road, London WC1X 8QF	Report No:	9708/MC

Plasticity Chart



Modified Plasticity Index, I'p:

$$I'p = \frac{Ip \times (\%\ \text{passing 425mm})}{100\%}$$ [where Ip = Plasticity Index]

Classification in accordance with NHBC Standards, Part 4 'Foundations', Chapter 4.2 'Building near trees'

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Site Location	227A Grays Inn Road, London WC1X 8QF	Report No:	9708/MC

SUMMARY OF UNDRAINED SHEAR STRENGTH TEST RESULTS

BH ID	Depth [m]	Moisture content [%]	Bulk density [Mg/m³]	Dry density [Mg/m³]	Cell pressure [kPa]	$(\sigma_1-\sigma_3)_f$ [kPa]	Failure strain [%]	Failure mode	Undrained cohesion [kPa]	Remarks
BH101	15.00	21	2.03	1.68	300	483	4.50	I	242	
	18.00	23	2.04	1.66	360	640	4.50	B	320	
	21.00	19	2.08	1.74	420	804	3.00	B	402	
	23.50	20	2.07	1.73	470	475	3.00	B	238	
BH102	3.00	28	1.88	1.47	100	130	4.00	I	65	
	5.00	28	1.95	1.52	100	218	2.00	B	109	
	8.00	27	1.95	1.54	160	273	3.00	B	137	
	11.00	23	1.99	1.61	220	385	3.00	B	193	
	14.00	26	1.99	1.57	280	301	3.00	B	151	
	17.00	27	1.99	1.57	340	364	3.00	B	182	
	20.00	20	2.04	1.69	400	510	5.50	I	255	
	23.00	19	2.10	1.77	460	733	2.50	B	367	
BH103	15.00	25	2.00	1.60	300	432	4.00	B	216	
	18.00	18	2.06	1.74	360	620	5.00	I	310	
	21.00	21	2.05	1.70	420	784	5.00	B	392	
	23.50	18	2.04	1.73	470	545	5.50	B	273	

Testing in accordance with BS EN ISO 17892 UU = unconsolidated, undrained; MUU = multistage, unconsolidated, ur Date: 24 March 15

Unless stated otherwise: Rate of strain = 2mm/min, Standard latex membrame used with thickness = 0.5mm

Failure modes: B = brittle, I = intermediate, P = plastic [Triaxial Sheet 1 of 1]

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