HERTS & ESSEX SITE INVESTIGATIONS

The Old Post Office, Wellpond Green, Standon,
Ware, Herts, SG11 1NJ

Telephone : Ware (01920) 822233
Fax: Ware (01920) 822200

16th June 2015

Our Ref : MRS/12812

PBS Ltd
28 Brookside Road,
London
NW11 9NE

Dear Sirs,

Re: 2a The Grove, London, NW11 9SH : Site Investigation

1.0 Introduction

1.01 In accordance with your instructions, we visited the above site during June 2015 .

1.02 The purpose of our visit was to carry out an investigation into the subsoil conditions with a view to foundation design.

1.03 The comments and opinions expressed are based purely on the conditions encountered and the subsequent laboratory testing.

1.04 Therefore, it is possible that some special conditions prevailing on site have not been encountered or taken into account.

1.05 All ground water recordings or their absence relate to short term observations and do not allow for fluctuations due to seasonal or other effects.

2.0 Description of Site

2.01 The site is situated at 2a The Grove, London, NW11 9SH

2.02 At the time of our visit the site was gently sloping and basement construction had already started.

3.0 Fieldwork

3.01 One borehole was sunk to a maximum depth of 8.00m by means of a window sampler drilling rig.

3.02 The location of the works is indicated on the site plan forming appendix one.

3.03 The various strata and details encountered were noted and are recorded on the borehole logs forming appendix two.

3.04 Insitu strength tests were carried out in the boreholes, the results of which can be seen on the aforementioned logs.

3.05 A full range of samples were recovered as noted and retained for subsequent laboratory testing.

3.06 The location, type and height of any trees should be taken from a survey for later use with NHBC Chapter 4.20, if required.

4.0 Laboratory Testing

4.01 All samples were tested in accordance with BS:1377:1990 Methods of Test for Soils for Civil Engineering purposes.

4.02 Selected samples were tested to determine their atterberg limits, triaxial strength, soluble sulphate content and pH value.

4.03 The results of all laboratory testing are summarised in appendix three.

5.0 Conclusions and Recommendations

5.01 By inspection of the borehole logs it can be seen that the subsoil consists of Concrete over a Claybound Gravely Brick FILL to 1.20m where a Soft To Firm Brown CLAY overlies at 3.00m a Firm To Stiff Grey Brown CLAY which is encountered and present to the base of the excavation.

5.02 No water was encountered upon excavation of the borehole as described on the borehole logs, a standpipe was installed at 6m for further monitoring as required.

5.03 No significant roots were encountered in the boreholes beyond 1.10m.

5.04 Laboratory testing proved the clays to be of Intermediate to very high plasticity (PI=31 - 47%) which indicates a high susceptibility to movement associated with moisture content change.

5.05 Triaxial testing proved the CLAYS to have cohesion values between 71 - 160 Kn/m² these values are generally seen to increase with depth.

5.06 Therefore when considering the information available we are of the opinion that a the basement can take the form of a reinforced raft with walls designed to take the pressure of the retained soil.

Consideration into the heave associated with the basement dig should be included.

5.07 Further investigation may be required in order to locate existing foundations within the area of the site which may restrict any future works.

5.08 As the site contains less than 0.50g/L of soluble sulphate it can be categorised as a class 1 site in accordance with BRE Digest, and as such any concrete in contact with the subsoil needs no special precautions.

5.09 Chemical Testing is enclosed to allow material to be taken to the tip, no elevated levels were encountered in the lower natural materials however the upper fill was contaminated by oils.

We hope that this is satisfactory, however if you should require any further information, please do not hesitate to contact us.

Yours faithfully,

M. R. Smith M.Sc
Principal Engineer

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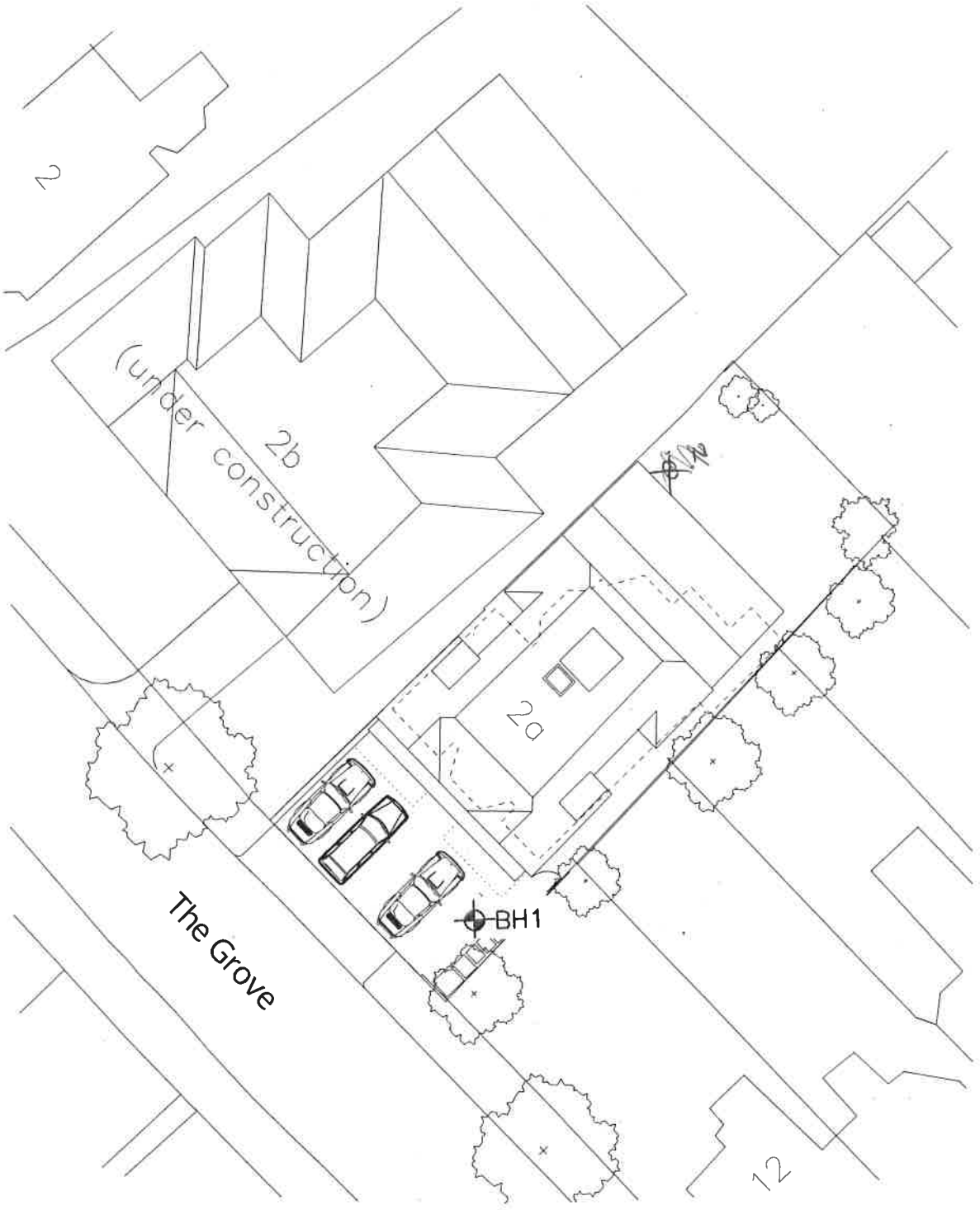
Appendix No.	1
Sheet No.	1
Job No.	12812
Date	June 2015

2a The Grove, London, NW11 9SH

Site Plan



Not to Scale

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Appendix No. 2
Sheet No. 1
Job No. 12812
Date June 2015

2a The Grove, London, NW11 9SH

Borehole One

Description of Strata	Depth	Reduced Level	Legend	Thickness (m)	Water Level	Samples No.	Samples Type	Samples Depth (m)	S.P.T N-Value or Vane Strength	Casing Depth (m)
Concrete	0.15			0.15	DRY	1	U	0.00		
Claybound Gravely Brick FILL	1.20			1.05		2	U	1.00		1.00
Soft To Firm Brown CLAY	3.00			1.80		3	U	2.00		
						4	U	3.00		
Firm To Stiff Grey Brown CLAY	8.00			5.00		5	U	4.00		
						6	U	5.00		
						7	U	6.00		
						8	U	7.00		
						9	U	8.00		
Borehole Complete At 8.00m Standpipe Installed at 6.00m										

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▽ –Water Struck D –Disturbed Sample ▽ –Water Standing W–Water Sample P–Piston Sample N–S.P.T. N–Value V–Vane Strength (kN/m²)

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Appendix No. 3
Sheet No. 1
Job No. 12812
Date June 2015

LOCATION 2a The Grove, London NW11

LIQUID AND PLASTIC LIMIT TEST RESULTS

Borehole	Depth (m)	Sample	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Group Symbol	Desiccation Profile	Percentage Retained 425 Micron Sieve (%)
1	1.00	U	27	46	15	31	CI		8
1	2.00	U	29	71	25	46	CV		0
1	4.00	U	31	72	26	46	CV		0
1	6.00	U	32	73	26	47	CV		0

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Appendix No. 3
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LOCATION 2a The Grove, London NW11

UNDRAINED COMPRESSION TEST RESULTS

Borehole	Depth (m)	Sample	Natural Moisture Content (%)	Bulk Density (Mg/m^3)	Lateral Pressure (kN/m^2)	Deviator Stress (kN/m^2)	Apparent Cohesion (kN/m^2)	Angle of Shearing Resistance	Remarks
1	1.00	U	27	1.96	20	142	71		
1	2.00	U	29	1.99	40	180	90		
1	3.00	U	30	1.99	60	172	86		
1	4.00	U	31	1.99	80	186	93		
1	5.00	U	30	2.00	100	232	116		
1	6.00	U	32	2.03	120	248	124		
1	7.00	U	29	2.03	140	302	151		
1	8.00	U	29	2.04	160	320	160		

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SULPHATE ANALYSIS TEST RESULTS

Window Sampler	Depth (m)	Sample	Concentrations of Soluble Sulphate			Classification	pH
			Soil		Groundwater		
			Total SO_4 (%)	SO_4 in 2:1 water:soil (g/l)			
1	2.00	U		0.23			7.29
1	4.00	U		0.18			8.05
1	6.00	U		0.15			7.98

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING 2183

mCERTS

Final Report

Report Number:	15-13492 Issue-1
Initial Date of Issue:	16-Jun-2015
Client:	Herts & Essex Site Investigations
Client Address:	The Old Post Office Wellpond Green Standon Ware Hertfordshire SG11 1NJ
Contact(s):	Martyn Smith
Project:	12812 2a The Grove, London

Quotation No.:		**Date Received:**	11-Jun-2015
Order No.:		**Date Instructed:**	11-Jun-2015
No. of Samples:	2	**Target Due Date:**	15-Jun-2015
Turnaround: (Wkdays)	5	**Results Due Date:**	17-Jun-2015
Date Approved:	16-Jun-2015		

Approved By:

Details: Keith Jones, Technical Manager

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Results Summary - Soil

Project: 12812 2a The Grove, London

Client: Herts & Essex Site Investigations			Chemtest Job No.:		15-13492	15-13492
Quotation No.:			Chemtest Sample ID.:		151910	151911
Order No.:			Client Sample Ref.:			
			Client Sample ID.:		WS1	WS1
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.30	1.50
			Bottom Depth(m):			
			Date Sampled:		08-Jun-15	08-Jun-15
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192			-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.02	12	17
Stones	N	2030	%	0.02	< 0.020	< 0.020
Soil Colour	N				brown	brown
Other Material	N				stones	none
Soil Texture	N				sand	clay
pH	M	2010			7.9	8.3
Electrical Conductivity (2:1)	N	2020	µS/cm	1	1800	610
Boron (Hot Water Soluble)	M	2120	mg/kg	0.4	2.6	< 0.40
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.01	1.2	0.032
Cyanide (Free)	M	2300	mg/kg	0.5	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.5	< 0.50	< 0.50
Sulphate (Total)	M	2430	%	0.01	0.59	0.086
Arsenic	M	2450	mg/kg	1	20	23
Cadmium	M	2450	mg/kg	0.1	< 0.10	< 0.10
Copper	M	2450	mg/kg	0.5	40	21
Mercury	M	2450	mg/kg	0.1	0.14	< 0.10
Nickel	M	2450	mg/kg	0.5	29	39
Lead	M	2450	mg/kg	0.5	160	22
Zinc	M	2450	mg/kg	0.5	54	48
Chromium (Trivalent)	N	2490	mg/kg	5	21	47
Chromium (Hexavalent)	N	2490	mg/kg	0.5	< 0.50	< 0.50
Organic Matter	M	2625	%	0.4	15	0.74
Naphthalene	M	2700	mg/kg	0.1	0.55	< 0.10
Acenaphthylene	M	2700	mg/kg	0.1	1.5	< 0.10
Acenaphthene	M	2700	mg/kg	0.1	0.70	< 0.10
Fluorene	M	2700	mg/kg	0.1	1.9	< 0.10
Phenanthrene	M	2700	mg/kg	0.1	20	< 0.10
Anthracene	M	2700	mg/kg	0.1	3.2	< 0.10
Fluoranthene	M	2700	mg/kg	0.1	33	0.44
Pyrene	M	2700	mg/kg	0.1	29	0.34

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Results Summary - Soil

Project: 12812 2a The Grove, London

Client: Herts & Essex Site Investigations					Chemtest Job No.:	15-13492	15-13492
Quotation No.:					Chemtest Sample ID.:	151910	151911
Order No.:					Client Sample Ref.:		
					Client Sample ID.:	WS1	WS1
					Sample Type:	SOIL	SOIL
					Top Depth (m):	0.30	1.50
					Bottom Depth(m):		
					Date Sampled:	08-Jun-15	08-Jun-15
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Benzo[a]anthracene	M	2700	mg/kg	0.1		13	< 0.10
Chrysene	M	2700	mg/kg	0.1		18	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.1		16	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.1		7.2	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.1		12	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.1		7.3	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.1		2.2	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.1		6.4	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2		170	< 2.0
Total Phenols	M	2920	mg/kg	0.3		< 0.30	< 0.30

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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVCOs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at our Coventry laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 60 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk