HERTS & ESSEX SITE INVESTIGATIONS

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

Telephone : Ware (01920) 822233
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FILE COPY

26th October 2005

Our Ref : MRS/6137

Centenary Homes Ltd
Centenary Estate
Jeffreys Road
Enfield
EN3 7US

PLANS APPROVED
2007/0868/P

For the attention of M.Rowan Esq.

Dear Sir,

Re: 26 - 30 Cubit Street, London WC1 : Site Investigation

1.0 Introduction

1.01 In accordance with your instructions, we visited the above site during October 2005.

1.02 The purpose of our visit was to carry out an investigation into the subsoil conditions with a view to piled foundation design and take additional samples for chemical analysis.

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 26 - 30 Cubit Street, London WC1.

2.02 At the time of our visit the site was generally flat and occupied by buildings.

3.0 Fieldwork

3.01 Two boreholes were sunk to a maximum depth of 20.45m by means of a restricted access shell and Auger 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 a nominal layer of Reinforced concrete to between 0.20 - 0.30m where A Loose Black Clayey Gravel FILL to between 5.70 - 6.20m where Firm To Stiff becoming stiffer with depth grey brown CLAY which is encountered and present to the base of the boreholes.

5.02 Water was encountered upon excavation of the borehole one only as a steady inflow at 4.00m.

5.03 No significant roots were encountered in the boreholes.

5.04 Laboratory testing proved the clays to be of very high plasticity (PI=44 - 48%) which indicates a high susceptibility to movement associated with moisture content change.

5.05 Triaxial testing proved the CLAYS to have cohesion values between 50 - 134 Kn/m² these values are generally seen to increase with depth.

5.06 Standard Penetration Tests in the upper FILL material gave N values between 1 - 7 indicating the Loose nature of the FILL material.

5.07 Therefore when considering the information available we are of the opinion that piles and ground beams would form the optimum foundation solution.

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

5.09 As the site contains more than 0.50 g/L of soluble sulphate it can be categorised as a class 2 site in accordance with BRE Digest 363, and as such any concrete in contact with the subsoil needs special precautions.

5.10 The presence of unexploded bombs was researched and no evidence of unexploded bombs was found, see enclosed correspondence.

5.11 The possibility of soakaway testing in the boreholes was considered but as the boreholes encountered CLAY beneath the loose fill no testing was carried out.

5.12 The old maps within the desk top study show no evidence of watercourses in the area.

5.13 The boreholes were tested for the presence of gases, no elevated levels were encountered. See monitoring sheet.

5.14 Chemical testing shows contamination in all the samples tested generally by Arsenic, Copper, Lead and in some samples Zinc and Poly Aromatic Hydrocarbons, all Fill materials removed from site will need to be classes as contaminated waste and treated accordingly.

H & E SI

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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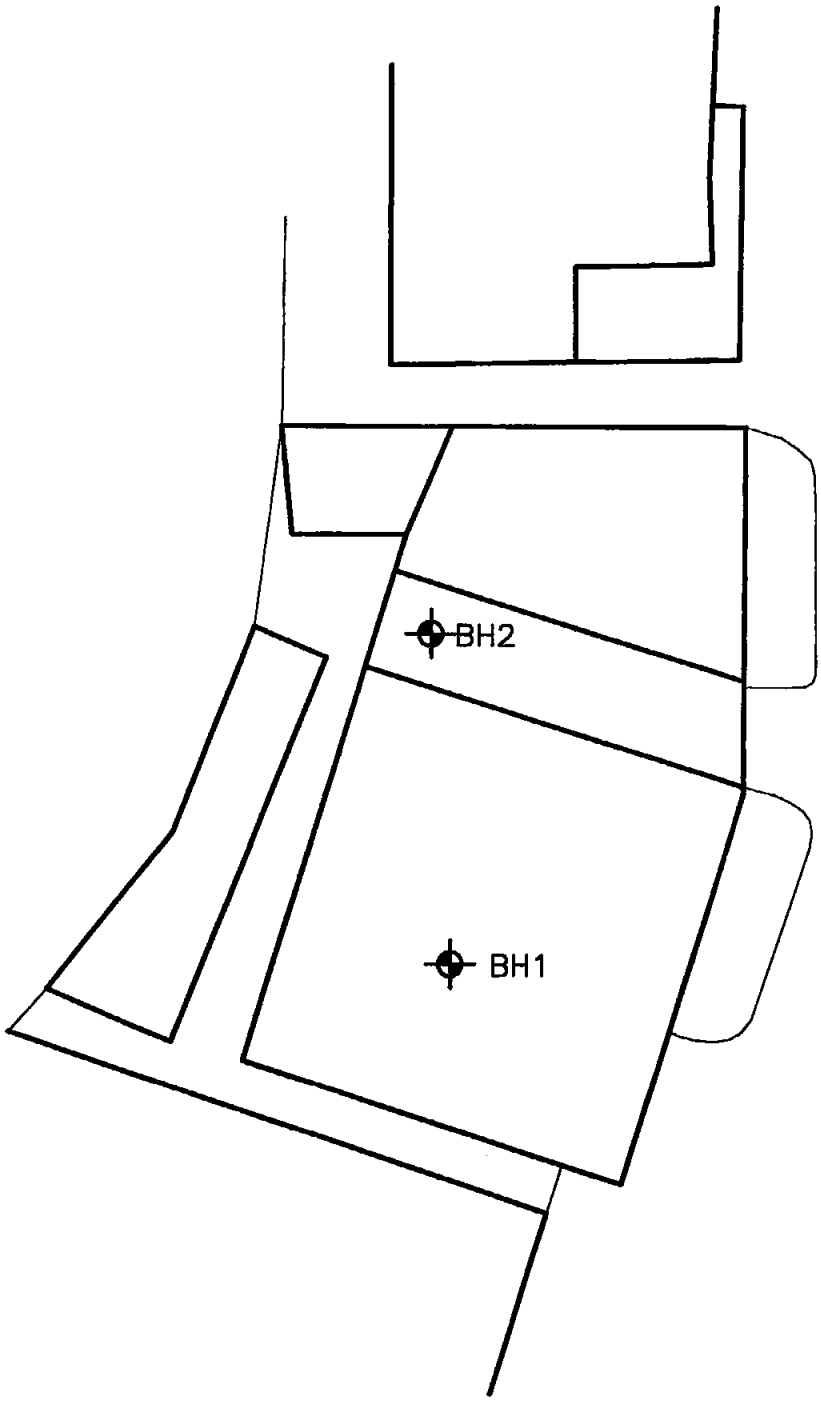
Appendix No.	1
Sheet No.	1
Job No.	6137
Date	Oct 200

Site at 26–30 Cubitts Street, London WC1

Site Plan



Not To Scale

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Appendix No. 2
Sheet No. 1
Job No. 6137
Date Aug 05

26 – 30 Cubit Street, London WC1

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)
Reinforced Concrete	0.30			0.30	Steady Inflow at 4.00m Rising to stand at 3.95m					
Loose Brick Clayey Gravel FILL						1	B	1.00	N=6	
						2	B	2.00	N=5	
				5.90		3	B	3.00	N=7	
						4	B	4.00	N=4	
						5	B	5.00	N=1	
	6.20									
Firm To Stiff Grey CLAY						1	U	6.50		6.40
						2	U	8.00		
				10.80		3	U	9.50		

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▽Z–Water Struck D –Disturbed Sample SZ–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. 2
Sheet No. 2
Job No. 6137
Date Aug 05

26 – 30 Cubit Street, London WC1

Borehole One ..... Continued

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)
Firm To Stiff Grey CLAY				10.80	Steady Inflow at 4.00m Rising to stand at 3.95m	4	U	11.00		
						5	U	12.50		
						6	U	14.00		
						7	U	15.50		
	17.00					8	U	17.00		
Very Stiff Reddish Brown Mottled Green CLAY				3.45		6	B	18.50	N=55	
						7	B	20.00	N=59	

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. 2
Sheet No. 3
Job No. 6137
Date Aug 05

26 – 30 Cubit Street, London WC1

Borehole One ..... Continued

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)
Very Stiff Reddish Brown Mottled Green CLAY	20.45			3.45	Steady Inflow at 4.00m Rising to stand at 3.95m	7	B	20.00	N=59	
Borehole Complete At 20.45m										

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. 2
Sheet No. 4
Job No. 6137
Date Aug 05

26 – 30 Cubit Street, London WC1

Borehole Two

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)
Reinforced Concrete	0.20			0.20						
Loose Brick Clayey Gravel FILL Locally Very Silty at base						1	B	1.00	N=7	
						2	B	2.00	N=6	
				5.50		3	B	3.00	N=7	
						4	B	4.00	N=5	
						5	B	5.00	N=6	
	5.70				DRY					
Firm To Stiff Brown CLAY				0.50						5.80
	6.20									
Firm To Stiff Grey CLAY						1	U	6.50		
						2	U	8.00		
				8.80		3	U	9.50		

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. 2
Sheet No. 5
Job No. 6137
Date Aug 05

26 – 30 Cubit Street, London WC1

Borehole Two ..... Continued

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)
Firm To Stiff Grey CLAY						4	U	11.00		
				8.80	DRY	5	U	12.75		
						5	U	14.55		
	15.00									
Borehole Complete At 15.00m										

Remarks:

Scale 1:50

Key : U–Undisturbed Sample (100mm diameter) B –Bulk Sample ▽ –Water Struck D –Disturbed Sample ▽Z –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. 6137
Date Oct 05

LOCATION **26 – 30 Cubit Street, London WC1**

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	8. 00	U	24	71	25	46	CV		0
1	12. 50	U	23	68	24	44	CV		0
1	17. 00	U	25	72	26	46	CV		0
2	6. 50	U	32	75	28	47	CV		0
2	9. 50	U	27	74	26	48	CV		0

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Appendix No. 3
Sheet No. 2
Job No. 6137
Date Oct 05

LOCATION 26 – 30 Cubit Street, London WC1

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	6. 50	U	30	1. 94	130	143	72		
1	8. 00	U	24	1. 97	160	178	89		
1	9. 50	U	23	1. 99	190	192	96		
1	11. 00	U	24	2. 00	220	178	89		
1	12. 50	U	23	2. 03	250	192	96		
1	14. 00	U	24	2. 04	280	242	121		
1	15. 50	U	25	2. 00	310	257	128		
1	17. 00	U	25	2. 02	340	268	134		
2	6. 50	U	32	1. 97	130	99	50		
2	8. 00	U	31	1. 98	160	123	62		
2	9. 50	U	27	1. 99	190	168	84		
2	11. 00	U	28	2. 00	220	178	89		
2	12. 75	U	28	2. 00	255	202	101		
2	14. 75	U	28	2. 02	295	227	114		

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Appendix No. 3
Sheet No. 3
Job No. 6137
Date Oct 05

LOCATION 26 – 30 Cubit Street, London WC1

SULPHATE ANALYSIS TEST RESULTS

Borehole	Depth (m)	Sample	Concentrations of Soluble Sulphate			Classification	pH
			Soil		Groundwater		
			Total SO_4 (%)	SO_4 in 2:1 water:soil (g/l)			
1	8.00	U		0.68		2	7.11
2	12.75	U		0.55		2	7.04

Gas Monitoring Sheet

Address ***26 - 30 Cubit Street, WC1***

BH		06/10/2005	10/10/2005	
	Atm Pressure mb	1003	1007	
1	Methane	0	0	
	Oxygen	21.4	21	
	Carbon Dioxide	0.02	0.01	
2	Methane	0	0	
	Oxygen	21.5	21.3	
	Carbon Dioxide	0.01	0.02	
	Methane			
	Oxygen			
	Carbon Dioxide			
	Methane			
	Oxygen			
	Carbon Dioxide			
	Methane			
	Oxygen			
	Carbon Dioxide			
	Methane			
	Oxygen			
	Carbon Dioxide			
	Methane			
	Oxygen			
	Carbon Dioxide			
	Methane			
	Oxygen			
	Carbon Dioxide			