MBP **Michael Barclay Partnership**
consulting engineers
105–109 Strand London WC2R 0AA
T 020 7240 1191 **F** 020 7240 2241
E london@mbp-uk.com
www.mbp-uk.com

WITANHURST, HIGHGATE, LONDON N6

Structural Report In Connection with Planning Application for Proposed Orangery

30th June 2009

1. Introduction

Michael Barclay Partnership LLP has been commissioned to report on the structural aspects of the proposed Orangery addition to 41 Highgate West Hill (Witanhurst). The structural works broadly comprise the removal of the service wing and construction of a new Orangery with curved link to the existing house. The new Orangery will be a 3-storey building comprising Lower Ground (part basement), Ground and First Floor levels.

This report is based upon the Planning drawings prepared by Robert Adam Architects and Witanhurst Construction Management.

2. The Site

Witanhurst is a Grade II* Listed Building set in extensive grounds (5.5 acres) on the north side of Highgate West Hill, close to the junction with South Grove. The house was in use as a single family dwelling until the 1960s and has been largely unoccupied ever since. Vehicular and pedestrian access is currently via a gatehouse located close to the junction of Highgate West Hill and South Grove.

The site is located within the Highgate Conservation Area and the Hampstead and Highgate Ridge Area of Special Character and the garden is designated as Private Open Space. The enclosed space to the front of the house is within the Highgate Village Archaeological Priority Area.

The site comprises an imposing mansion house and incorporates parts of Parkfield (an early 18th century house), and was substantially extended and refurbished in 1913-20, by George Hubbard for Sir Arthur Crossfield MP. The house is of red brick with stone dressings and has a tiled roof with dormer windows and tall brick chimney stacks. The main, central, part of the house is three storeys plus a part-basement and attic space. The southern end of the building is two storeys plus basements and attics, as is the service wing, set at right angles to the main block.

3. Description of Existing Structure

The fabric of the building comprises load bearing masonry walls supporting timber floors which are typically divided by steel beams. The ground floor rooms are dimensionally larger than those on the upper storeys such that many of the walls at the upper levels are supported by steel transfer beams. The roof is of cut-timber construction and is supported by internal partition walls.

There is an existing basement throughout most of the property. However, the findings of a number of trial pits around the building strongly suggest that the basement does in fact cover the entire building footprint although it has been back-filled in a number of areas.

In general the strength of the structural materials and state of preservation is good. However, there is evidence of rot in several areas of the roof where it has leaked and the roof finishes themselves are in poor condition. The condition of the roof finishes is described in a separate MBP report.

4. Desk Study

A geological desk study has been undertaken using the Landmark online search facility in order to obtain information about the site geology, hydrology, potential for contamination etc.

The desk study indicates that the site is underlain by the Bagshot Sand Formation overlying the Claygate Beds and the hydrological data confirms the possibility of encountering groundwater within deep basement excavations.

No potentially contaminative industrial uses are recorded within the site.

The desk study information is contained in a separate report although a summary of the information is contained within Appendix A of this report.

5. Archaeology

An archaeological desk study has been undertaken by MoLAS and is contained in their separate report. MoLAS have also drawn transects across the site and reported accordingly.

6. Site Investigation

A site investigation was undertaken by Albury SI during 1999 in relation to a previous planning application for the conversion of the building into a conference centre. This investigation comprised a single bore-hole to a depth of 20m, six window samples to 5m depth and a number of trial pits. The proposed Orangery addition to the building is similar in extent and nature to the alterations proposed previously and therefore the 1999 site investigation is relevant to this planning application. The site investigation report is contained in Appendix B.

Recently (2009) a much more extensive site investigation was undertaken by Ground Engineering Limited in connection with a separate planning application to be submitted for a new deep basement extension. This site investigation comprised three bore-holes to 25m depth and a number of trial pits. Standpipes have been installed in the bore-holes to measure static water levels and transducers have been installed in order to continuously measure fluctuations in groundwater levels over time. This site investigation report is contained in Appendix C.

A detailed interpretive geotechnical report has been prepared by the Geotechnical Consulting Group (GCG) with specific reference to the planning application for the new deep basement extension. However, the soil property data and design parameters are equally relevant to the structural design of the Orangery and therefore the GCG report is contained in Appendix D.

The ground conditions encountered in the site investigations were broadly as expected from the geological records, topography and site history. The site is covered by a variable but generally thin layer of "made ground" and this is underlain by the Bagshot Sand Formation overlying the Claygate Beds. Design parameters for the soil strata are contained in the SI reports.

Contamination testing has also been undertaken to verify the findings of the desk study.

10. Proposed Alterations

The proposed structural works broadly comprise the removal of the service wing and construction of a new Orangery with a curved link to the existing house. Additionally, two much smaller structures (Forecourt Loggias) will be constructed to the south-east of the house. The façade of the main house will be re-modelled where the service wing is removed.

Removal of Service Wing and Re-modelling of Facade

A temporary roof is to be erected over the building ahead in order to afford weather-protection to the retained building.

The service wing is to be carefully dismantled using hand-tools both to minimise the risk of damage to the retained building and in order that salvaged materials can be set-aside for re-use as required. The existing basement beneath the service wing is to be back-filled.

The new façade will be constructed in load bearing masonry on the line of the existing wall that divides the Main House from the Service Wing. The façade will be constructed on top of the existing basement wall and since the new foundations loads will be similar in magnitude to those previously imposed, differential settlement is not considered to be of concern.

Orangery and Curved Link Building

The new Orangery / Link Building will be a 3-storey structure comprising Lower Ground (part basement), Ground and First Floor levels. Excavations for the new structures are sited sufficiently far from Witanhurst and its neighbouring properties, that the effects of any heave on these structures is considered to be insignificant. Groundwater is unlikely to be a factor in the design or construction of the Orangery since the proposed formation level of approximately 120mAOD is significantly higher than the groundwater levels encountered during the site investigations.

The Lower Ground Floor structure will comprise a "reinforced concrete box" supported on piled foundations in order to minimise the effects of ground movement on the new building. Areas of the building with and without a basement will be supported on piled foundations in order to minimise the effects of differential settlements.

Along the boundary wall to The Grove, the retaining wall of the Lower Ground Floor will be constructed using contiguous bored piles in order to temporarily retain the boundary during the basement excavation. Beyond the Orangery, the contiguous piled wall will continue in order to retain the gardens in the permanent condition. This new retaining structure will be located at sufficient distance from the existing boundary walls such that its installation will have little impact on them. Lateral deflections of the piled wall will be carefully monitored during the works.

The superstructure of the Orangery is to be a steel frame and clad with masonry. The footprint of superstructure is smaller than that of the Lower Ground Floor and consequently the ground floor slab will be designed as a "transfer structure." The upper floor will be reinforced concrete.

Forecourt Loggias

The new Forecourt Loggias are minor structures that will be founded on deep strip foundations. The fabric of these structures will be load bearing masonry.

11. Additional loading and Settlement

It is considered that the proposed alterations are unlikely to cause settlement of the existing building since there is no significant increase in building loading or redistribution of loading at foundation level.

12. Conclusion

The building is Grade II* Listed and consequently the works must be carried out without risk of unacceptable movements to the existing building.

Using current good practice in executing the structural works, it is considered that the proposed development can be realised without significant deleterious effect on the structure of the property.

Detailed specifications will be prepared and method statements procured to ensure that good practice is followed and that adequate supervision and monitoring is provided throughout the works.

MBP

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Report Prepared by:

Name Julian Birch
For Michael Barclay Partnership LLP

Report Approved by:

Name (Principal) Julian Birch
Date: 29 May 2009

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APPENDIX A

Geological and Hydrological Desk study - Landmark Search

Summary Only – Full Report contained in Separate Document

1.0 INTRODUCTION

Michael Barclay Partnership LLP (MBP) instructed Landmark to undertake a "search" for historic technical data within a 500m radius of Witanhurst, focusing particularly on the geology of the area given the planned basement extension. This report summarise the findings of the search.

This report refers, where relevant, to the boreholes and window sample logs dating from 1999 and 2009. The complete pack of information obtained from Landmark is contained within a separate document.

2.0 ENVIROCHECK DATA

2.1 GEOLOGY

Bedrock Geology – The geological maps confirm the findings of the existing borehole report for the site; that the house, courtyard and higher levels of the gardens are situated on a Bagshot Formation of sands and clays. This soil overlies the Claygate Beds, consisting primarily of silts and clays with subordinate sands, and which should be evident immediately beneath the lower levels of the gardens. Below the Claygate Beds the soil becomes London Clay. The variable permeability of the soil makes it difficult to predict the level of perched or standing groundwater across the site and consequently bore-holes and standpipes were installed across the site (Refer Appendix B & C). A hydrological study carried out by GCG is contained in Appendix E.

Artificial Ground – An area of ground 100m to the south of the site astride Holly Lodge Gardens has been marked as Worked Ground, indicating that the ground here has at some point been cut away, perhaps during the development of the Holly Lodge grounds for residential use carried out in the 1920s. No artificial ground is recorded within the site. Existing borehole and window sampler logs do however suggest a layer of made ground in the region of 1.5m - 2.1m deep immediately to the north, south and west of the house. The trial pits and boreholes provided a profile of the thickness of the made ground.

2.2 AGENCY AND HYDROLOGICAL

Ground Water Vulnerability - The ground at the site has been geologically classed as a minor aquifer (variably permeable) with a soil class of HU. The soil class HU is characterised by soils of high leaching potential, with little ability to attenuate diffuse source pollutants and in which non-absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater. The runoff potential of the soil is low.

Boreholes – Data exists for a BGS borehole to less than 10m depth roughly 450m to the southwest of the site and for BGS boreholes in excess of 650m from the site to the northwest and east. Due to the distance from the site and the level of these boreholes below the site, data from these boreholes is not thought to be sufficiently accurate to be of value. Data from the new boreholes and trial pits in conjunction with the existing borehole and window sampler data provides a sufficiently detailed soil profile of the site for the purposes of structural design.

Source Protection Zones – None present within or in the vicinity of the site.

Flood – The data suggests little risk of flooding within the site or within 1km of the site.

2.3 SENSITIVE LAND USES

No sensitive land uses are recorded within or in the vicinity of the site.

2.4 MINING AND GROUND STABILITY DATA

Potential for shrinking or swelling clay within the site is classed as moderate in the Claygate Beds layer of the soil profile, but very low in the Bagshot Formation layer. The results of the new borehole and trial pit investigations allow an assessment of the likely impact of clay shrinkage or swelling upon the design of the proposed basement. The design of all below ground works near trees will need to recognise the shrinkability of the local soil although the implications for the proposed deep basement are minor. Extensive testing and analysis of the soils has been undertaken and the findings reported in Appendices B, C and D.

Potential for running sand is classed as low on the Envirocheck maps but the presence of sands and gravels in the soil suggests a possible risk of localised running sand. Design of new structures within the depth of the water tables will take the nature of the ground into account as appropriate and as described elsewhere within this report.

Potential for landslide is classed as very low.

2.5 HISTORICAL DATA REPORT

Historical Land Use – No potentially contaminative industrial uses are shown within the site. Highgate Cemetery, 100m to the southeast of the site, shows a record of potentially contaminative industrial use under 'Cemetery or Graveyard' use, which has been mapped from 1876 – 1996. A distance of 250m to the northwest of the site, an area of land also shows as record of potentially contaminative industrial use, listed as Hospital use and was mapped in 1996. The reservoir 150m to the north of the site shows a record of potentially contaminative extractive industries activity and is listed under reservoir use. According to the historical maps the reservoir predates 1870.

No historical tanks or energy facilities as shown within the site.

The contamination testing which is to be carried out within the site as part of the new soil investigations will provide further information on possible land contamination.

2.6 EXISTING SERVICES

BT – Records suggest that the telephone line enters the site to the southeast from Highgate West Hill, travelling to the southeast corner of the house before running along the front wall of the house (Refer plans).

Drainage – Record drawings suggest that an existing land drain runs from the northwest corner of the house and in an arc to the northwest to fall into a combined sewer below Highfields Grove (Refer plans in Appended Document). The design of the proposed landscaping and new structures

within the grounds will need to take account of the all existing land drainage and supplement it as necessary.

A full record of the existing drainage within the site is to be determined by CCTV. This is of particular importance in all areas in which proposed excavation work will occur, particularly to the front of the house below the courtyard and to the north of the house. Where necessary, existing drainage may need to be isolated, removed and adequately replaced in order to accommodate the proposed basement works.

Gas – The gas main enters the site to the southeast of the house from Highgate West Hill and the supply then runs to the southeast corner of the house where it enters the building (Refer plans in Appended document).

EDF Energy – The electricity supply enters the site to the southeast of the house from Highgate West Hill and the supply then runs to the southeast corner of the house where it enters the building. It appears that the 'gate house' has its own supply from outside of the site. This should be confirmed by trial pit or CAT scan to ensure that supply for the 'gate house' does not run across the courtyard from the main house, which could of course impact upon the basement construction. An electricity cable exists below the pavement on the north side of Highgate West Hill adjacent the 'gate house' (refer plans).

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FOREWORD

The following notes should be read in conjunction with the report. Any variations on the general procedures outlined below are indicated in the text.

General

The recommendations made and opinions expressed in the report are based on the strata conditions revealed by the fieldworks as indicated on the boring and trialpit records, together with an assessment of the data from insitu and laboratory tests. No responsibility can be accepted for conditions which have not been revealed by the fieldworks, for example, between borehole and/or trialpit positions. While the report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy.

Boring Technique

Unless otherwise stated, the light cable percussion technique of soft ground boring has been used. This method generally enables the maximum information to be obtained in respect of strata conditions, but a degree of mixing of some layered soils, for example, thin bands of coarse and fine granular soils, is inevitable. Specific attention is drawn to this occurrence where evidence of such a condition is available.

Insitu Dynamic Penetration Tests

The penetration resistances quoted on the boring records have been determined generally in accordance with the procedure given in BS1377:1990. The suffix '+' denotes that the result has been extrapolated from less than 0.3m penetration into undisturbed soil.

Routine Sampling

During the construction of boreholes, relatively undisturbed samples of predominantly cohesive soils are obtained in 100mm diameter open drive tube samplers, complying with the requirements of BS5930:1981. Large disturbed samples of granular soils, or of soils in which undisturbed sampling is impractical or inappropriate, are taken from boring tools and sealed in polythene bags. Small disturbed samples are taken at frequent intervals of depth and placed in sealed containers; similarly, where encountered in sufficient quantity, samples of groundwater are taken as indicated above.

Groundwater

The groundwater observations entered on boring and trialpit records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. Moreover, groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The table on each boring record shows the groundwater level at the quoted borehole and casing depths usually at the start and finish of a day's work. The word 'none' indicates that groundwater was sealed off by the borehole casing, or that no water was observed in the borehole.

Trialpits

The method of construction employed to form the trialpits is entered on their records. In general, it is not possible to extend machine excavated trialpits to depths significantly below the water table, especially in predominantly granular soils. Except for manually excavated pits, and unless otherwise stated, the trialpits have not been provided with temporary side support during their construction, hence personnel have not entered them and examined insitu the strata so exposed.

Laboratory Testing

Unless stated in the text, all laboratory tests have been performed in accordance with the requirements detailed in BS1377:Part 9:1990, or other standards or specifications that may be appropriate.

REPORT ON A GEOTECHNICAL INVESTIGATION

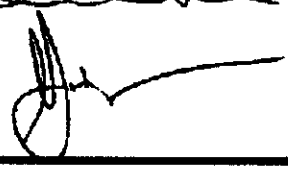
at

41 HIGHGATE WESTHILL, HIGHGATE, LONDON N6

for

PROMITE LIMITED

CONSULTING ENGINEERS:
MESSRS MICHAEL BARCLAY PARTNERSHIP

Prepared by	**K J Clark BSc Hons** **Geotechnical Engineer**	
Reviewed by	**C V Sweby CEng MICE** **Technical Director**	

I SYNOPSIS

This investigation has demonstrated that made ground overlies soils associated with the Bagshot Formation Sand of late Eocene age. The groundwater observations noted at the time of the fieldworks suggest that problems with respect to shallow depth excavations are unlikely.

It is considered that foundations located within the Bagshot Formation Sand can be designed to apply a maximum increase in load of 150kPa. Alternatively, consideration could be given to the use of a piled foundation system.

The results of laboratory testing suggest that no significant contamination of this site has occurred as a result of previous usage of the site.

II INTRODUCTION

Promite Limited propose to convert the existing four storey mansion into a hotel and leisure facility. Consequently, a site investigation has been undertaken in order to ascertain the nature and engineering properties of the soils underlying this site, and to obtain data which will assist in the formulation of a safe and economical foundation solution.

The programme of this investigation included the construction of one borehole using light cable percussion boring techniques. In addition, six window sample probeholes and ten manually excavated trialpits were completed to identify the existing foundations. During this work, samples were taken for further examination and laboratory testing and a number of insitu standard penetration and hand shear vane tests were performed during construction of the borehole and probeholes.

III FIELDWORKS

The borehole was constructed on the 21st and 22nd June, 1999, the window sample probeholes and trialpits subsequently being constructed during the period 29th and 30th June. The locations at which the work was completed are shown on the site plans, drawing nos 99/4169/11 and 99/4169/12. The salient details of these drawings were extracted from site layout plans supplied by the Consulting Engineer.

The depths and descriptions of the strata encountered in the borehole and window sample probeholes are given on their respective records in Appendix I to this report. These records note the depths at which samples were taken, the results of standard penetration and insitu hand shear vane tests and any groundwater observations noted at the time of the fieldworks. Upon completion of the shell and

auger borehole, a piezometric standpipe was installed in order to monitor the long-term groundwater profile at this site.

The foundation details as revealed in the trialpits constructed at basement level are presented as drawing nos 99/4169/1 to 99/4169/10 and are presented in Appendix II.

IV GEOLOGY AND STRATA CONDITIONS

An examination of the 1: 50 000 Geological Survey Map of the area, together with the relevant Handbook of Regional Geology, suggests that the site is underlain by the Bagshot Sand formation of late Eocene age.

A study of the borehole and window sample probeholes indicates that made ground comprising topsoil over subsoil was noted at the investigatory locations and was proved to depths of between 0.1m and 0.4m. Further fill materials varying in composition from brown sandy clay with brick fragments to grey clayey sand with gravel and brick and ash were revealed beneath the surface cappings and were shown to extend to depths of between 0.7m and 2.1m.

Orange-brown/grey silty clay with occasional gravel was exposed upon penetration of the made ground at all the investigatory locations with the exception of window sample probehole no 6 where this cohesive soil was not encountered. The clay was proved to depths of between 1.5m and 4.8m.

Fine-grained soils varying in composition from orange-brown/grey very clayey sand to orange-brown/buff sand were noted upon penetration of the made ground in window sample probehole no 6 and the orange-brown/grey silty clay at the other locations. These soils were proved to the concluding depth of the window sample probeholes, the maximum depth achieved being 20m in borehole no 1. It is considered that the soils as described above are collectively associated with the Bagshot Sand.

b) Index Property

The liquid and plastic limit of selected samples of the soils occurring at this site have been determined. The results of this work indicate that the samples tested can generally be described as inorganic clays of intermediate plasticity and of medium shrinkage potential.

c) Particle Size Distribution

Samples of the soils occurring at this site have been subjected to sieve and sedimentation analysis in order to determine the soils particle size distribution. The results of this work are presented in the form of grading curves.

d) Triaxial Compression

The undrained shear strength characteristics of samples of the more cohesive soils encountered at this site have been determined by testing specimens in the triaxial compression apparatus. Under the conditions of this work, cohesions of 100kPa and 160kPa have been recorded which are representative of a stiff to very stiff condition insitu for a purely cohesive soil.

e) Chemical Analysis

Selected samples of the soils occurring at this site have been subjected to chemical analyses in order to determine their soluble sulphate content and pH values. Under the conditions of this work, low concentrations of soluble sulphate content have been recorded in association with near neutral pH values.

f) Contamination

A number of samples of the near surface soils have been analysed for the presence of contamination in accordance with ICRCL 59/83 Tables 3 and 4.

VI DISCUSSION ON GROUND CONDITIONS

It is understood that it is proposed to turn the existing four storey mansion into a hotel and leisure facility. The works will include the construction of new four storey high lift and stair shafts, formation of new basement areas and the possible reduction in level of some existing areas of the basement floor. In addition, and a new four storey building will be inserted into the sloping ground at the western face of the house. The above works may result in a 30% increase in some existing foundation loads. At the time of preparation of this report, no precise information was available with regard to the structural loads generated by the four storey house.

It cannot be recommended that new foundations be located within the made ground revealed by this investigation. Soils of this origin are frequently present in a weak and variable condition, such that unacceptable settlement could occur, even under the action of light loading intensities. Where basements are not present all foundations should be located at a minimum depth of 1m below final ground level in order to ensure that problems with seasonal variation in soil moisture do not occur.

The works associated with extension of existing basement and construction of new basement areas will probably expose the stiff orange-brown silty clay which could form the foundation medium. Interpretation of the site and laboratory data indicates that strip or spread foundations placed within this soil can be designed to apply a maximum increase in load of 150kPa. Foundations operating at this loading will incorporate a factor of safety of 3 against general shear failure. Settlements are anticipated to be less than 20mm. However, there will be variation in magnitude of settlement in view of the proposal to underpin existing foundation walls and complete new works. In these circumstances, therefore, it may be prudent to incorporate joints in order to reduce the effect of differential settlement.

It cannot be recommended that groundfloor slabs be cast directly upon any made ground, otherwise unacceptable settlement is likely to occur. However, in view of the proposal to incorporate a basement it is evident that the floor slab will be cast directly upon the naturally occurring Bagshot Formation Sand soils and no problems are envisaged in this respect. With regard to the detached house, it may be prudent to adopt a suspended floor slab construction.

It is thought that satisfactory foundation solution can be formulated on the basis of the foregoing discussions. However, if the above recommendations are considered unsuitable, then an alternative foundation system will be required in order to transmit the structural loads to the more competent soils encountered at greater depth. Therefore, should further consideration be given to the use of a piled foundation system, then the advise of a suitably experienced piling contractor should be sought in order to arrive at a satisfactory solution to the problem. The information given in Appendices I and II of this report may be used in pile design.

VII CONTAMINATION

The Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL), have produced Guidance Note 59/83 (Second Edition, July 1987) entitled, "Guidance on the Assessment and Redevelopment of Contaminated Land". This document proposes the concept of trigger concentrations for different contaminants, depending on the end usage of the site and whether plants are to be grown.

Values for threshold trigger concentrations have been suggested for the various contaminants, these being a function of proposed end use. Where the laboratory test results fall below the value for threshold trigger concentrations, there is demonstrably no contamination. It follows, therefore, that laboratory results which are consistently above the threshold values, imply that contamination is present. Some contaminants have been provided with an "action" level. Concentrations recorded above this level require remedial measures to be

undertaken as part of development. It should be noted that not every contaminant has an "action" level quoted. Should contamination values lie between the threshold and action concentrations, then an engineering assessment should be made as to the degree of remedial measures required.

A summary of Tables 3 and 4 of Guidance Note 59/83, presenting the threshold and action concentrations is presented in Appendix III to this report. The threshold concentrations are given below the individual contaminants on the test results sheets for an assumed end use of hard cover or recreational areas. It should be noted that the ICRCL 59/83 guidelines are the generally accepted criteria against which sites are assessed. It should be appreciated, however, that not all contaminants are covered by these guidelines. In these circumstances, it may be possible to consider the proposals made on a similar basis by the Dutch authorities, these being particularly useful with regard to other contaminants, for example, pesticides and aromatic compounds.

Consideration of the results of the laboratory analysis has not noted any test results above the threshold trigger concentrations proposed by ICRCL 59/83 in respect of landscaped areas. Therefore, the site can be regarded as being uncontaminated.

VIII EFFECT OF SULPHATES

A Classification and Recommendations for Sulphates and Acid Resistance in Soils and Groundwaters is included with the results of the chemical analyses in Appendix II to this report. A comparison of the results obtained in the laboratory with this Classification indicates that the concentrations recorded lie within Class 1, where no special precautions are required in order to avoid the deterioration of buried concrete.

APPENDIX I

BORING AND TRIALPIT RECORDS

ALBURY S.I. LTD Petworth Road, Witley, Surrey GU8 5LH	Borehole No 1
CONTRACT Highgate West Hill, Highgate	REPORT No 99/4169/KIC
Client Promite Ltd	Ground Level mOD
Site Address 41 Highgate West Hill, Highgate, London N6	Boring Commenced 21/6/99 Boring Completed 22/6/99

Type and Diameter of Boring : Light cable percussion (shell and auger) ; 150 mm diameter

Water Strikes, m	Water Levels Recorded During Boring, m							
1	Date							
2	Hole Depth							
3	Casing Depth							
4	Water Level							

Remarks Standpipe installed to 6m depth

Samples or Tests		S P T	Scale 20mm - 1m		Strata Descriptions
Type	Depth, m	N	Depth	Legend	
J	0.20		0.20		Made ground (topsoil/subsoil)
J	0.50				Made ground (brown very silty clay with brick)
J	0.80		0.80		
D	1.00-1.50	11			Made ground (brown sand with brick fragments and gravel)
J	1.80		1.70		
U	2.00-2.50				Stiff orange-brown very silty clay with traces of sand
J	2.80				
J	3.00-3.50	14			
U	4.00-4.50		4.00		
J	4.50				Very stiff orange-brown/buff very silty clay with seams of sand
J	5.00-5.50	25	4.80		Medium dense light brown clayey sand with clay seams
J	5.80				
J	6.00-6.50	26			
J	7.00				
U	7.50-8.00				
J	8.50		8.50		Light-grey/buff silty sand

Sampling Code U Undisturbed D Large disturbed J Jar W Water (1/1) Non recovery of U Sample