

Cockburn, Claire

From: Owen, Megan
Sent: 23 July 2012 13:28
To: Cockburn, Claire
Cc: Neveu, Denise
Subject: FW: 12.0849 - Emsworth Infant School, Victoria Road, Emsworth, P010 7LX

Sent on behalf of Rebecca Coneybeer

Ref P09163

Dear Clare,

I have conducted a desk-top study of Emsworth Infant School and the surrounding area to assess any potential for ecological importance that may be impacted by the proposed extension to the east of the school for two new classrooms.

The proposed extension will be built from the eastern elevation of the school building over an existing area of hardstanding with wooden benches. Two trees are situated at northern and southern ends of the proposed site; a small area of shrubs on a raised bed is located adjacent to the tree at the southern end. These trees and shrubs are likely to be removed to make way for the new classrooms, however I do not believe the trees or shrubs offer any potential for roosting bats or nesting birds due to the size of the trees and their location on the playground.

Several photos of the site have been provided of the existing school building. The school appears to be constructed of a combination of brick wall, what appears to be plastic boarding, and flat felted roofs. The building appears to be in good condition, which indicates to me a limited potential for roosting bats.

The database of protected and notable habitats and species show no records within any distance of the school where there may be likely potential impacts.

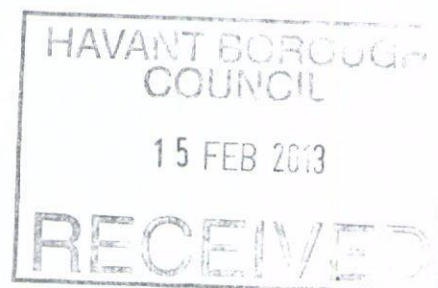
Overall, the potential impact of the proposals on roosting bats, nesting birds, and other protected or notable species is low, and therefore I do not believe a preliminary survey is required to inform the planning application.

If you need to discuss this further please do not hesitate to contact Megan Owen.

Many thanks,
Rebecca

Rebecca Coneybeer
Ecologist

Hampshire Biodiversity Information Centre
Economy, Transport & the Environment Department
Hampshire County Council
Elizabeth II Court West - 1st Floor
The Castle
Winchester. SO23 8UD
direct line: 01962 832321
email: rebecca.coneybeer@hants.gov.uk
web address: www.hants.gov.uk/biodiversity/hbic



Cockburn, Claire

From: Fluck, Hannah
Sent: 02 March 2011 09:02
To: Cockburn, Claire
Subject: Emsworth & Bramley Primary Schools. Archaeological advice

Dear Claire,

I have checked our records and am happy to advise that there are no archaeological issues I would wish to raise with either of these school developments.

Should you have any further questions please do not hesitate to contact me.

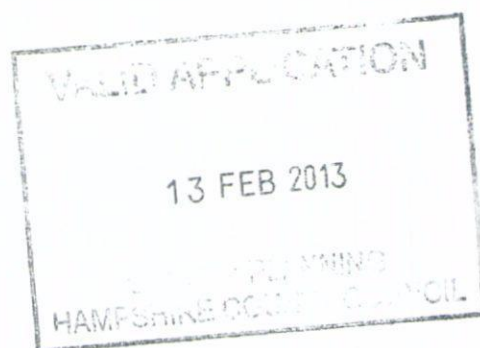
Kind regards

Hannah

Hannah Fluck
Senior Archaeologist

Landscape Planning & Heritage
 Environment Department
 Hampshire County Council
 Capital House,
 48-52 Andover Road,
 Winchester SO23 7BH

Tel. 01962 832337 Fax. 01962 832312
 Email: hannah.fluck@hants.gov.uk



 Please consider the environment before printing this email.

From: Cockburn, Claire
Sent: 23 February 2011 10:24
To: Fluck, Hannah
Subject: Emsworth & Bramley Primary Schools.

Dear Hannah,

I am undertaking feasibility studies for 1 & 2 classroom extensions at the above schools. Are you aware of any archeological issues at either site ?

Adresses for both are ;
 Emsworth Primary School,
 Victoria Road,
 Emsworth.
 P010 7LX

Bramley CoE Primary School,
 Bramley Lane,
 Bramley,
 Tadley.
 RG26 5AH.

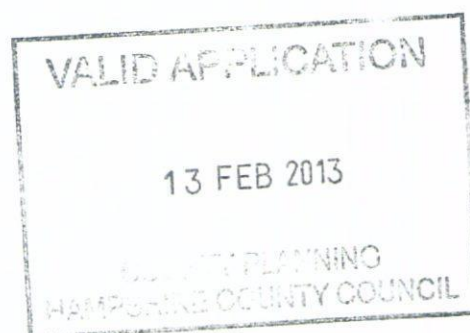
Many thnaks, Claire.



Emsworth Primary School

Ground Investigation Report

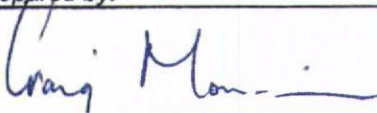
Hampshire County Council



Hampshire
County Council

thinking beyond construction

**GROUND INVESTIGATION REPORT
OF THE SITE AT
EMSWORTH PRIMARY SCHOOL
FOR
HAMPSHIRE COUNTY COUNCIL**

Reference: REPORT/E4077/PWE/FEB04/GIR/V2		
Issue	Prepared by:	Verified by:
V1 Jan 04		
V2 Feb 04		
	pp PAUL EDWARDS Engineer BSc	pp JON VENN Associate BSc, PhD, FGS
File Ref: Q:\PROJECTS\E4077\pe26Jan04rV2.doc		
White Young Green Environmental Yeoman House 63 Croydon Road London SE20 7TS Telephone: 020 8659 9959 Facsimile: 020 8676 9968 Email: enviro.london@wyg.com		

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0.0 EXECUTIVE SUMMARY

Clients Instruction	Instructions to proceed with the investigation were contained in HCC Project Initiation Report dated 24 November 2003 ref: G499.
Clients Brief	The investigation was undertaken to provide foundation guidance for the construction of a proposed single-storey extension to the existing school building.
Site Description	The site currently comprises a single storey school of brick construction with associated car parking, play ground, playing fields and internal infrastructure.
Site History	Historical records indicate that the site remained undeveloped until the construction of the existing school after 1943.
Geology	The geology of the site is indicated to comprise Brickearth overlying London Clay Formation.
Hydrogeology	The site is indicated to be underlain by a minor aquifer with soils of unknown but assumed high leaching potential.
Hydrology	The nearest identified watercourse is the River Ems.
Summary of Scope of Investigation	Ground Investigation works, undertaken by WYGE on 12 November 2003 comprised the following: ◆ Two hand-excavated trial pits. ◆ Three window sample positions. ◆ Laboratory geotechnical testing.
Encountered Ground Conditions	Ground conditions comprised Topsoil over Made Ground overlying Brickearth over the London Clay Formation to the full depth of the investigation. Groundwater was encountered at depths varying between 2.4 and 2.5mbgl. Existing foundations appear to be shallow conventional spread-type bearing at between 0.8 and 0.9mbgl onto the Brickearth.
Geotechnical Considerations	Due to the proximity of a moderate water demand tree (Maple) within 5m of the face of the proposed foundation it should be noted NHBC guidance recommends a minimum founding depth of 1.4mbgl for clay-like soils of intermediate volume change potential. As such, discussion of conventional spread foundations are based on this depth. Nett allowable bearing pressures of the order of 100kN/m ² could be obtained for conventional spread foundations bearing at depths of a minimum of 1.4mbgl within the London Clay Formation, with a maximum settlement of the order of 25mm. Floor slabs should be suspended with the sides and base of slabs protected with a suitable void forming material. It is recommended that excavations for man entry, or where excavations are required to be deeper than 1.20mbgl, shoring is utilised or that the sides of excavations are battered to a safe angle of repose. Although groundwater was only encountered at deep levels during the recent ground investigation, provision for dewatering, albeit minimal, should be made. Any removal and disposal of sub-soil arisings and/or groundwater from the site, should be undertaken in a controlled manner to a licensed facility, with due regard to Duty of Care responsibilities.
Ground Contamination and Health and Safety	Visual and/ or offactory evidence of contamination was not encountered during site works.

1.0 INTRODUCTION

1.1 Instructions

The Engineering Geotechnics Section of Hampshire County Council (HCC), instructed White Young Green Environmental to carry out a site investigation at Emsworth Primary School. Instructions to proceed were contained in HCC Project Initiation Report reference G499, dated 24 October 2003.

1.2 Clients Brief

It is understood that the proposed development is to consist of a single storey extension to the extant school building, of brick and flat roof construction in keeping with the existing structure.

The ground investigation was undertaken in order to obtain data on ground conditions and provide recommendations on geotechnical considerations for the proposed development. Particular consideration was to be given to potential soil desiccation arising from the presence of a 20m tall maple tree in the immediate vicinity of the new build; it is understood that this tree is to be removed as part of the proposed development. The investigation, scoped by HCC, was intended to consist of two window sampled boreholes and two hand-excavated trial pits. Regular sampling was to be carried out in all excavations and borings, for descriptive purposes and to allow basic laboratory testing.

1.3 Information Provided by the Client

WYGE have been provided with the following information by HCC:-

- Letter from Evans Grant, project Consulting Engineers, to HCC Geotechnics Section outlining site investigation requirements, ref. 3693.1/JWH/RCD dated 20 October 2003.
- Hand-drawn sketch plan of the proposed development including proposed trial pit locations, ref Sk01 dated October 2003.
- Specialist soil investigation request form from Evans Grant to HCC.
- A4 copy of a digital photograph of the area of the site to be investigated.
- 1:1,250 County Building Record Plan produced 14 December 2001.
- 1:200 Site Layout plan, ref. E.2333.20.B1 dated 29/11/77.
- 1:50 Site Detailed Layout plan, ref. E.233.20.C2.
- Site Foundation and Drains layout plan. Scale and reference not legible.
- Ordnance Survey site location plan dated 2003.
- Four Historical Ordnance Survey site plans (1843 to 1943).
- Present day Site Layout plan.
- HCC Geological Database Extracts (Solid and Drift).
- Extract of previous Norwest Holst ground investigation report at Emsworth House NHS site, dated 7/1/03.

1.4 Limitations

This report presents a full factual record of all site work carried out on 12 November 2003 and a record of the borings and excavations and laboratory test values. In addition, a limited study of the history of the site development and the underlying geology has been undertaken and is included within the

report. All data collected has been used to provide an interpretation of the geotechnical conditions pertaining to the site and recommendations on the foundations etc for the proposed development.

The recommendations and opinions expressed in this report are based on the strata observed in the borings and the trial pits, together with the results of the laboratory tests. In addition, recommendations have also used data obtained from two previous ground investigation reports of works undertaken by Norwest Holst and WYGE at the nearby Emsworth House site between October 2002 and April 2003. White Young Green Environmental take no responsibility for conditions which have not been revealed by either the borings or the trial pits, or which occur between them. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative and liability cannot be accepted for its accuracy.

The information contained in this report is intended for the use of Hampshire County Council and their consultant partners. White Young Green Environmental can take no responsibility for the use of this information by any third party for uses other than that described in this report.

It should be noted that in particular groundwater levels are likely to vary with time. The results obtained may therefore only be representative of the conditions at the time of the site investigation. Where we consider such conditions may apply we have indicated such reservations in the text.

This report has been prepared in line with the HCC Site Investigation Term Contract, 2002-2005, the agreed proposal ref. BL1895, dated 19 December 2003 and the associated Terms and Conditions of Engagement. It is subject to the report conditions contained within Appendix A.

2.0 SITE DESCRIPTION

2.1 Situation and Key Features

2.1.1 Location

The site, Emsworth Primary School, is located on Victoria Road, Emsworth, Hampshire, approximately 0.5km west of the town centre at Ordnance Grid Reference SU741062 (see Figure SK01). The site was generally level and flat.

2.1.2 Current Site Usage

At the time of the investigation the site was used as a primary school.

2.1.3 Site Layout and Key Features

The site is approximately 130m by 80m in plan, and in its entirety covers an area of approximately 1Ha. The site is bound to the north by a railway track, and to the south, east and west by residential properties.

The school consists of an irregularly shaped single storey brick building with a flat roof. The site is accessed from the west via an asphalt surfaced driveway, which runs into the car park along the southern side of the school which in turn leads to the playground towards the east and southeast of the building. Grassed play and garden areas are located to the west and north of the building, and beyond the playground to the east.

The area of the site under investigation consists of a paved and grassed plot adjacent to the south-eastern corner of the school. A plastic canopy extends from the building over a paved patio, which is linked via a footpath to the school drive, and it is understood that the proposed new build will be located in the area of this canopy. A maple tree (approximately 20m in height) is present on the site about 5m from the south-eastern edge of the proposed development, and two 6-8m tall unidentified deciduous trees are located either side of the path approximately 3m away.

2.1.4 Underground Services

Service drawings provided by HCC and site observations indicate drainage runs to be the only services present in the area of the proposed development. It should be noted that this information was current at the time of the investigation but may not have been fully comprehensive. As such caution should be taken if further intrusive works are proposed and it is recommended that new service searches be undertaken.

2.2 Site History

An examination of old plans and Ordnance Survey maps dating back to 1843 along with a recent site layout plan, provided by HCC, was undertaken in

order to determine the history of site development. Copies of the maps examined are presented in Appendix E and a description of the principal features provided below:

Epoch 1 (1843-1893)	This map indicates the site and surrounding area to comprise undeveloped open fields. A railway line is marked running east-west to the north of the site in its present day location, with a marker post suggesting a distance of 36 miles to Brighton.
Epoch 2 (1891-1912)	No changes to the site or surrounding area are shown on this sheet.
Epoch 3 (1904-1939)	No changes to the site or surrounding area are shown on this sheet.
Epoch 4 (1919-1943)	A path is marked on this map running east-west across the eastern side of the site; other than this no changes are indicated since the previous Epochs.
Present Day Plan	A recent (2003) OS plan of the site shows the site in its present day location and layout, with residential property to the south and west and a railway track along the northern boundary.

2.3 Geology

2.3.1 Published Geological Sheets and Literature

The geology of the site area is covered by BGS 1:50,000 Sheet No. 316 'Fareham' and is indicated to consist of Aeolian Deposits, more commonly known as Brickearth, overlying the London Clay Formation. HCC geological database extracts are consistent with this sequence, indicating the drift geology to comprise Brickearth and the solid geology to comprise London Clay Formation.

The Brickearth is described on the BGS sheet as mainly fine sandy silt, locally contaminated with gravel. The London Clay Formation is indicated to comprise silty clay and sand.

2.3.2 Previous Ground Investigations

Conditions encountered during previous ground investigations carried out at the nearby Emsworth House site, an elderly peoples home (EPH) located approximately 200m south of Emsworth Primary School, compare well with conditions identified in the published literature.

In summary, the Norwest Holst, October 2002 – January 2003 investigation encountered Topsoil or Made Ground over sandy gravelly clay (not referred to but classified hereafter as Brickearth), underlain by silty fine sand and locally sandy clay (not referred to but

classified hereafter as London Clay Formation). The WYGE, April 2003 investigation encountered a similar sequence. Details of the investigations are given in Sections 2.3.3 and 2.3.4 below.

2.3.3 Norwest Holst Investigation, October 2002 – January 2003

A site investigation was carried out at Emsworth House EPH by Norwest Holst Soil Engineering Limited between October 2002 and January 2003. The works consisted of nine machine excavated trial pits (TP1 to TP9) to depths varying between 1.0 and 4.0mbgl, and laboratory geotechnical testing.

Topsoil was encountered in TP1 – TP7 to a depth of between 0.1 and 0.4mbgl, consisting predominantly of brown sandy clay with roots and rootlets.

Made Ground was encountered from ground level in TP8 and TP9, or below the Topsoil elsewhere, to a maximum depth of 0.6mbgl (TP8). The Made Ground consisted of brown sandy gravelly clay, the gravel comprising flint, chalk and brick fragments and occasional glass and concrete fragments. In TP5 and TP6, a concrete foundation footing was encountered at 1.0mbgl, resulting in termination of these trial pits at this depth.

Below the Made Ground, **Brickearth** was encountered generally consisting of firm to very stiff orange-brown sandy slightly gravelly clay to depths of between 0.5 (TP3) and 1.3mbgl (TP7, 8 and 9); below this the soil becomes slightly sandy gravelly and very gravelly clay, to depths of between 1.3 (TP3) and 2.2mbgl (TP2, 7 and 8). The gravel comprised angular to sub-angular fine to coarse flint.

Below the gravelly clay Brickearth, orange and grey mottled very silty fine sand was encountered, to depths of between 3.15 (TP1) and 3.5mbgl (TP4), however the final depth of the stratum was not proven in all locations.

The **London Clay Formation** was the deepest stratum encountered, consisting of very stiff fissured slightly sandy clay, proven to a maximum depth of 4.0mbgl, though its final thickness was not proven in any of the trial pits.

Groundwater seepages were noted within several of the trial pits as tabulated below:

Location	Depth of ingress (mbgl)	Static water level during SI (mbgl)	Observations and Strike strata
TP2	3.3	3.3	Slight seepage from London Clay
TP7	2.0	2.0	Seepage from Brickearth
TP8	2.2	2.2	Seepage from Brickearth
TP9	1.3	1.3	Seepage from Brickearth

Table 3.2.1 Summary of Groundwater Observations during Norwest Holst Investigation.

2.3.4 WYGE Investigation – April 2003

White Young Green Environmental carried out a site investigation at the Emsworth House site on 17 April 2003. The works consisted of two machine excavated trial pits (SA1 and SA2) to depths of 3.1 and 1.95m respectively, with soil infiltration testing carried out in each pit.

Topsoil, comprising soft brown clayey and sandy silt with some flint gravel, was encountered in both investigation positions and ranged in thickness between 0.5m and 0.6m.

Brickearth was encountered in both investigation positions immediately underlying the Topsoil and was variable in composition. The material immediately below the Topsoil consisted of soft to firm orange-brown silty clay and was encountered to 1.5 and 1.05mbgl in SA1 and SA2 respectively. Below this, the stratum comprised soft to firm orange-brown and light grey very silty very gravelly sandy clay.

The **London Clay Formation** was the deepest stratum encountered, to a maximum depth of 3.1mbgl, but its base depth was not proven in either of the trial pits. The stratum was uniform in composition and consisted of loose to medium dense orange brown and grey silty fine sand.

Groundwater was not encountered in either trial pit.

A negligible soil infiltration rate was recorded for the London Clay Formation, and a rate of 2.119×10^{-6} was recorded within the Brickearth indicating the stratum to be of low permeability.

2.4 Hydrogeology

The hydrogeology of the site area is detailed in Environment Agency 1:100,000 Sheet 45, Groundwater Vulnerability of West Sussex and Surrey. It indicates the site to be underlain by a minor aquifer with soils of unknown but assumed high leaching potential.

2.5 Hydrology

The nearest identified watercourse is the River Ems, located approximately 500m southeast of the site. Reference to the Environment Agency website (Ref. 1) indicates the water quality to be 'fairly good' for chemistry.

3.0 FIELDWORK

3.1 Rationale and Summary of Scope

Site investigation works were undertaken by White Young Green Environmental on 12 November 2003. The rationale for the investigation is presented below in Table 3.1.

Location	Rationale	Depth (mbgl)
WS1	Investigate ground conditions adjacent to Maple tree, with particular reference to potential soil desiccation.	5.0
WS2	Investigate conditions adjacent to proposed new build and provide 'control' soil moisture content data.	3.3
WS3	As WS2. (Not part of the original scope, WS3 was drilled in agreement with HCC due to termination of WS2 at 3.3mbgl as a result of no sample recovery.)	3.5
TP1	Investigate nature of existing school foundation.	0.85
TP2	Investigate nature of existing school foundation.	1.0

Table 3.1 Rationale for the Ground Investigation

The layout of the exploratory positions, as presented in Figure SK.02, was based on the proposed development layout plan provided by HCC (see Appendix G).

3.1.1 Site Investigation Standards

Methods employed during the investigation were undertaken in accordance with BS5930 (Ref. 2).

3.1.2 Site Investigation Methods

Window sampling was carried out at three locations (WS1 to WS3) as indicated above. The excavations were sunk using a Terrier drilling rig, enabling access to all proposed locations and regular sampling and in situ SPTs (standard penetration tests) to be carried out at the depths required.

Further details of the investigative methods employed during this site investigation are presented in Appendix F.

4.0 GROUND CONDITIONS ENCOUNTERED

4.1 Soil Conditions

Ground conditions encountered during the recent investigation were consistent with those identified in the published literature and previous ground investigations. In summary ground conditions comprised Topsoil overlying Brickearth, in turn overlying the London Clay Formation to the full depth of the investigation. Variations in strata thicknesses are summarised in Table 4.1 below.

Location	Topsoil		Made Ground		Brickearth		London Clay	
	From (m)	Thickness (m)	From (m)	Thickness (m)	From (m)	Thickness (m)	From (m)	Thickness (m)
WS1	GL	0.25	0.25	0.25	0.50	1.10	1.60	>3.40
WS2	GL	0.15	0.15	0.10	0.25	1.05	1.30	>2.00
WS3	GL	0.20	0.20	0.20	0.40	0.90	1.30	>2.20
TP1	GL	0.25	N/P	N/P	0.20	>0.65	N/E	N/E
TP2	GL	0.25	N/P	N/P	0.25	>0.75	N/E	N/E

N/P = Not present

N/E = Not encountered

Table 4.1 Summary of Encountered Ground Conditions.

Topsoil was encountered in all investigation positions with a maximum thickness of 0.25m. The stratum was uniform in composition and consisted primarily of brown clayey silt with occasional flint gravel.

Made Ground was encountered in all window sampled investigation positions but not in the trial pits, to a maximum depth of 0.5mbgl (WS1). The stratum was uniform in composition and consisted primarily of orange-brown silt/clay with occasional brick fragments.

Brickearth was encountered in all investigation positions to a maximum depth of 1.6mbgl (WS1) with an average thickness of 1.0m. The stratum was generally uniform in composition and consisted primarily of orange-brown sandy locally gravelly silt/clay.

The **London Clay Formation** was encountered in all window sampled positions to a maximum proven depth of 5.0mbgl, though its base depth was not proven in any location. The London Clay was variable in composition, the upper-most part of the stratum consisting of orange clayey silty sand. WS2 and WS3 terminated within this unit due to non-recovery of sample below 3.3 and 3.5mbgl respectively, however in WS1 the stratum became grey-brown very sandy gravelly silty clay below the sand at 4.5mbgl to a final depth of 5.0mbgl, but the final depth of the clay unit was not proven.

4.2 Groundwater Conditions

Groundwater was encountered during the recent investigation as summarised in Table 4.2 below.

Location	Depth of ingress (mbgl)	Static water level during SI (mbgl)	Strike strata and Notes
WS1	2.4	2.4	London Clay Fmn
WS2	2.5	2.5	London Clay Fmn
WS3	2.5	2.5	London Clay Fmn

Table 4.2 Summary of Groundwater Observations

4.3 Visual / Olfactory Evidence of Contamination

No visual or olfactory evidence of contamination was identified during the recent site investigation.

4.4 Obstructions and Existing Foundations

Obstructions were not encountered during drilling of the window samples. Trial pits TP1 and TP2 indicate existing foundations to comprise shallow conventional spread-type bearing at between 0.8 and 0.9mbgl onto the firm Brickearth. This is consistent with the depth to the base of the school foundations indicated on the foundation and drainage layout plan provided by HCC (see Appendix H), which shows the school building to be founded upon strip footings 450mm wide with a founding depth of 900mm.

Sketch plans of conditions encountered within the trial pits are presented in Appendix B.

5.0 LABORATORY TESTING

5.1 Geotechnical Tests

A programme of laboratory testing, scheduled by WYGE, was carried out on representative samples taken from the various strata. The results of the tests are presented in Appendix C.

The test procedures used were generally in accordance with the methods described in BS1377:1990 (Ref. 3). Details of the specific tests used in each case are presented in Table 5.1.

Type of Test	Standard	No.
Classification		
Moisture Content	BS1377 : Part 2 : Clause 3.2 : 1990	15
Liquid and Plastic Limits of soil 1 point cone penetrometer method	BS1377 : Part 2 : Clauses 4.4, 5.3 & 5.4 1990	7
Chemical Tests		
Sulfate content (2:1 Water:Soil extract as SO ₄)	BS1377:Part 3:1990, Clause 5.5	3
Determination of the pH value	BS1377:Part 3:1990, Clause 9.0	3

Table 5.1 Summary of Laboratory Geotechnical Testing

5.2 Contamination Tests

The environmental chemistry of the ground was not investigated during this investigation. Visual and olfactory means were used on site, during the field works, to identify potential soil contamination. Areas of visual or olfactory (smell) contamination were not identified during the investigation and the historical plans, supplied by HCC, indicate that there is no history of potentially contaminating practices being carried out on or near to the site.

It is possible however, that pollutants may exist on the site in areas outside of the scope of the completed exploratory holes.

6.0 DISCUSSION

6.1 Ground Conditions

6.1.1 *Geology and Geotechnical Parameters*

Ground conditions encountered during the recent site investigation compared well with those in published literature and the previous investigations at the Emsworth House site. Details of the various soils encountered during the recent investigation are presented in section 4.1 and in summary comprised Topsoil, over Made Ground over Brickearth over the London Clay Formation.

This section discusses the key geotechnical characteristics of each encountered strata as determined from field observations and field and laboratory geotechnical testing.

Topsoil

Topsoil was encountered from ground level to an average of 0.2mbgl and comprised silty clay with occasional flint gravel. Field and laboratory testing was not carried out on samples from this stratum and field estimates indicate consistencies to be soft.

Made Ground

Made Ground was encountered below the Topsoil in the three window sampled locations and comprised orange-brown silt/clay with occasional brick and concrete fragments. The stratum was noted to be friable in WS1. Field and laboratory testing was not carried out on samples from this stratum and field estimates indicate consistencies to be soft.

Brickearth

Brickearth was encountered in all investigation locations and comprised friable orange-brown locally gravelly sandy silt/clay. Standard Penetration Tests (SPTs) carried out within the stratum at 1.0mbgl in WS1 and WS2 yielded 'N' values of 13 and 11 respectively; using the relationship $C_u = 4.5 \times \text{SPT N value}$, undrained shear strengths of 59 and 50kN/m² can be determined, corresponding to firm soils.

Determination of index properties (Atterberg Limits) on five representative samples of Brickearth indicated liquid limits in the range of 38 to 49%, plastic limits in the range of 16 to 23% and corresponding plasticity indices in the range of 15 to 32%, indicative of intermediate plasticity clay soils of low to medium volume change potential. Corresponding natural moisture contents occurred in the range of 13 to 29%.

Determination of sulfate content (2:1 Water:Soil extract as SO₄) from two soil samples from the Brickearth (WS1 at 0.5m and WS2 at 1.0m) indicated concentrations of 0.01 and 0.02g/l with corresponding pH

values of 7.2. These values are indicative of a design sulfate classification of DS-1 in accordance with BRE SD1, "Concrete in Aggressive Ground".

Assessment of desiccation of fine-grained soils can be determined by evaluation of the liquidity index of comparable samples. This is calculated by the equation:

$$I_L = \frac{W - W_p}{I_p}$$

Where

I_L = liquidity index

W = moisture content

W_p = plastic limit

I_p = plasticity index

A negative liquidity index indicates the soil is drier than the plastic limit, and the more negative the value the drier the sample. Samples of Brickearth from WS2 (the 'control' location) at 0.5 and 1.0mbgl both gave I_L values of 0.13, compared with -0.67, -0.12 and 0.04 from samples at 0.5, 1.0 and 1.5mbgl in WS1, located adjacent to the Maple. These values indicate drier conditions within the Brickearth in WS1, attributable to the water demand of the Maple tree.

Comparison of soil moisture content profiles at both locations confirms this assessment, with lower moisture contents in all samples of Brickearth in WS1 compared to WS2. Plots of the moisture content profiles are presented in Appendix C.

BRE 412 suggests that if plasticity values between samples being compared differ by more than 5% then variation in soil constituents rather than desiccation may account for moisture content differences. The two comparable plasticity indices at 0.5 and 1.0m differ by 8% and 7% respectively, and reference to detailed soil descriptions (Appendix C) indicates a gravel component within those samples from WS1; this difference in composition may contribute to the PI, and therefore I_L , variations. Thus there is potential that desiccation may not be the only influence upon moisture content variations within the Brickearth.

London Clay Formation

The London Clay Formation comprised a coarse-grained unit of orange clayey silty sand grading into a fine-grained unit of sandy gravelly silt/clay. The relative density of the coarse grained material has been assessed through use of SPT N values; these tests indicate values of between 7 and 20, i.e. loose to medium dense. Similarly, a single SPT carried out within the fine-grained London Clay (WS1 at 5.0mbgl) gave an N value of 15 indicating a shear strength of approximately 68kN/m², indicative of firm clay.

Determination of index properties (Atterberg Limits) on two samples of fine-grained London Clay (WS1 at 4.5 and 5.0mbgl) indicated liquid

limits of 28 and 63%, plastic limits of 18 and 23% and corresponding plasticity indices of 10 and 40%, indicative of low and high plasticity clay soils of low and medium volume change potential respectively. Corresponding natural moisture contents of 16 and 18% were recorded.

Determination of sulfate content (2:1 Water:Soil extract as SO_4) from one sample from the coarse grained London Clay Formation indicated a concentration of <0.01g/l with a corresponding pH value 7.3. This value is indicative of a design sulfate classification of DS-1 in accordance with BRE SD1, "Concrete in Aggressive Ground".

6.1.2 *Groundwater*

Groundwater was encountered during the recent investigation in all three window sampled locations at depths of between 2.4 and 2.5mbgl. All water strikes occurred within the coarse grained London Clay Formation as slow ingresses and levels remained static during the observation period.

7.0 ENGINEERING CONSIDERATIONS

7.1 Introduction

At the time of writing it was understood that the proposed development would comprise a single-storey extension to the existing school building. Information regarding the development, provided by HCC, indicates anticipated wall line loads to be 30kN/m.

The purpose of the investigation was to identify general ground conditions, with particular reference to potential soil desiccation, and to provide indicative guidance on foundation options.

Given that ground conditions were investigated to a maximum depth of 5.0mbgl, discussion of foundation options has been limited to conventional spread footings. Although piled foundations and other specialised techniques may be considered, no comment has been included on inferred ground conditions at depths greater than those reached during the investigation.

7.2 Spread Foundations

Due to the proximity of a moderate water demand tree (Maple) within 5m of the face of the proposed foundation it should be noted that NHBC guidance recommends a minimum founding depth of 1.4mbgl for fine grained soils of intermediate volume change potential, as encountered during the recent investigation. Consequently, discussion of allowable bearing pressures for conventional spread foundations is based on soils occurring below this depth.

Assuming a groundwater level of 2.5mbgl nett allowable bearing pressures of the order of 100kN/m² could be obtained for conventional spread foundations bearing at depths of a minimum of 1.4mbgl within the loose London Clay Formation, with a maximum settlement of the order of 25mm. Although coarse-grained London Clay Formation deposits were encountered at depths shallower than 1.4mbgl, it is recommended that spread foundations be progressed to 1.6mbgl (the maximum depth to which the Brickearth was encountered) to decrease the potential effects of differential settlement. A nett allowable bearing pressure of the order of 100kN/m² could be obtained for conventional spread foundations at this depth.

Assessment of moisture contents and liquidity index relationships of the near-surface fine-grained Brickearth indicates that drier conditions are prevalent within the stratum in the vicinity of the Maple. Although this cannot be exclusively attributed to soil desiccation (see Section 6.1.1) it is suggested that some desiccation is likely to have occurred. Therefore, where foundations pass through the fine grained Brickearth and bear onto the coarse grained London Clay below, it is recommended that the sides of such footings be lined with proprietary void former to make allowance for the potential effects of soil heave within the Brickearth following removal of the tree.

7.3 Floor Slabs

Due to the coexistence of potentially shrinkable and desiccated soils of the Brickearth occurring below anticipated formation levels and the extant Maple

tree, ground bearing floor slabs are not considered suitable for the proposed development, and it is recommended that suspended floor slabs be adopted. Given the potential for soil heave within the Brickearth, the underside of floor slabs should be protected with a proprietary void former.

7.4 Concrete

Sulfate tests indicated that maximum determined levels correspond to Design Sulfate Class 1 (DS-1) in accordance with BRE Special Digest 1, 'Concrete in Aggressive Ground' (Ref. 4). As mainly natural ground conditions persist and groundwater is assumed to be relatively mobile the Aggressive Chemical Environment for Concrete (ACEC) is considered to be AC-1 in accordance with the aforementioned document. We would advise that all cements used for sub-surface concrete constructions should conform to the advice given within this publication unless otherwise specified or required.

7.5 Temporary Works

It is considered that at this stage any temporary works will comprise foundation excavations and trench excavations for service construction through Topsoil and Made Ground and into the underlying Brickearth or London Clay.

It is recommended that where man-entry into excavations deeper than 1.20mbgl is required, excavations are either shored or the sides are battered to a safe angle of repose. It is suggested that an angle of 30 degrees from horizontal is not exceeded.

Given a groundwater depth of 2.4 to 2.5mbgl during the recent investigation it is not anticipated that de-watering within excavations will be required. Nevertheless some allowance for de-watering should be made given possible seasonal variation in groundwater levels.

7.6 Contamination

Any removal and disposal of sub-soil arisings and/or groundwater from the site, should be undertaken in a controlled manner to a licensed facility, with due regard to Duty of Care responsibilities. In addition, an appropriate degree of precautionary health and safety provision should be incorporated to protect both the site workers and the general public alike.

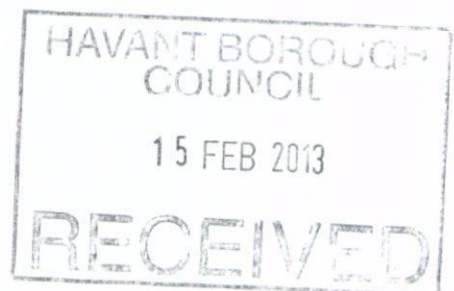
During any ground works, it is recommended that skin contact with soils be kept to a minimum in accordance with good working practice and the HSE guidance document 'Protection of Workers and the General Public During the Development of Contaminated Land', 1991 (Ref. 5).

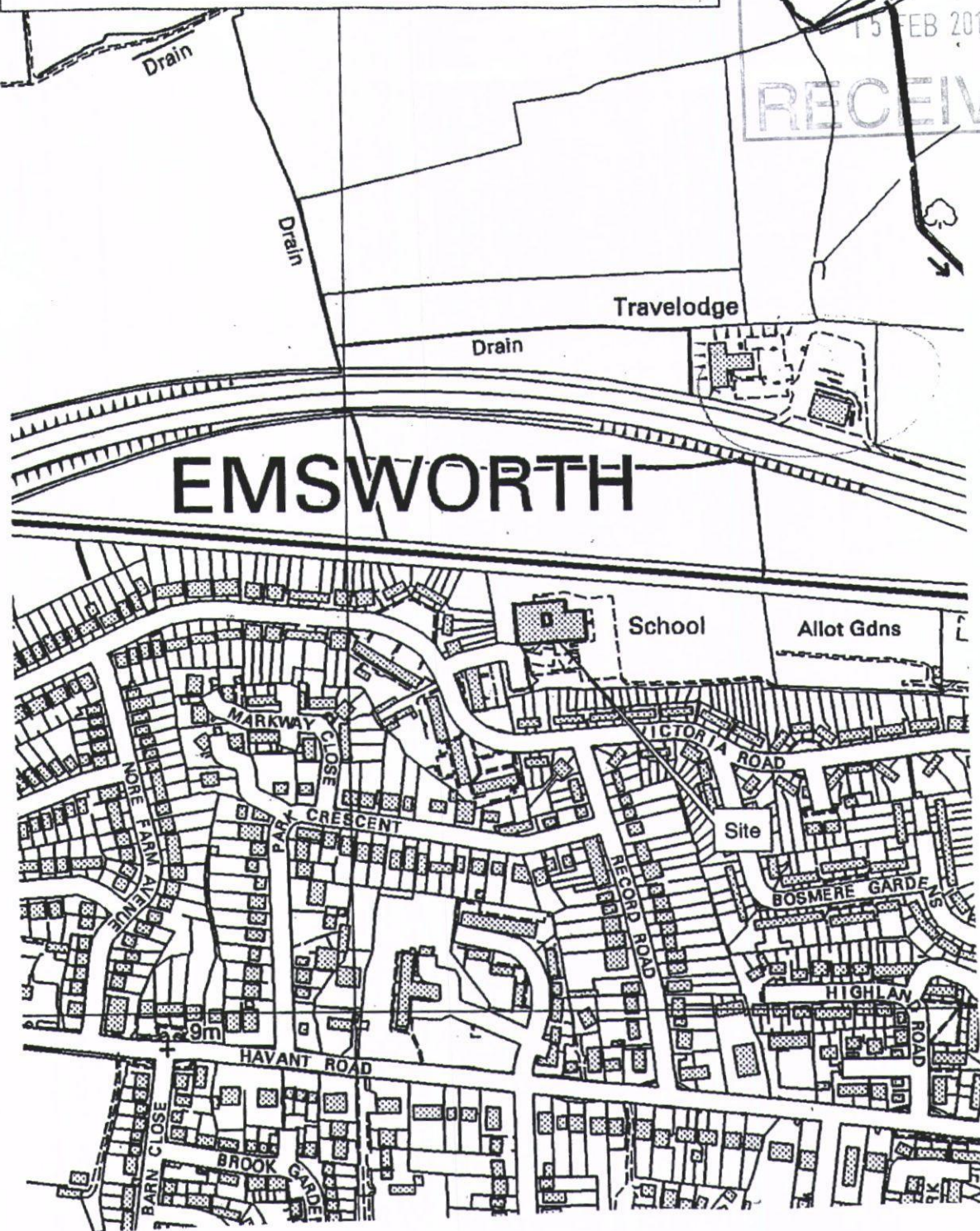
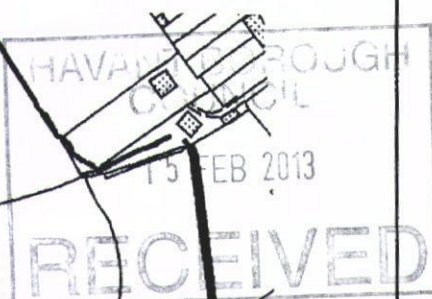
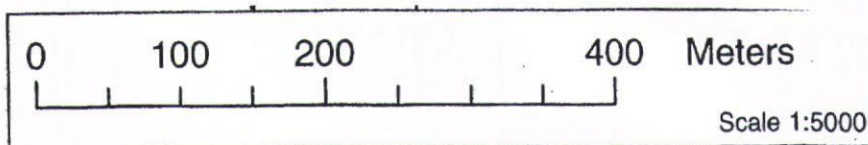
8.0 REFERENCES

- 1) www.environment-agency.gov.uk
- 2) BS5930: 1999 - Code of Practice for Site Investigation.
- 3) BS1377: 1990 - Methods of testing for soils for civil engineering purposes.
- 4) BRE SD1: 1993 Table 2. Aggressive Chemical Environment for Concrete (ACEC) site classification.
- 5) HSG 66 'Protection of Workers and the General Public during the Development of Contaminated Land'.

FIGURE SK.01

Site Location Plan





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London SE20 7TS
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Fax: 020 8676 9966
e-mail: enviro.london@wyg.com



Project:
EMSWORTH PRIMARY SCHOOL

Client:
HAMPSHIRE COUNTY COUNCIL

Rev	Description	By	Chk	App	Date
Drawing Title:					
SITE LOCATION PLAN					
Scale of A4:					
Office	Type	Drawn By	Date	Checked By	Date
40	ENV	P.R.	JAN 2004	J.V.	JAN 2004
		Project No.	Unwilling No.		
		E04077	SK 01		

Environmental Consultancy

CM Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

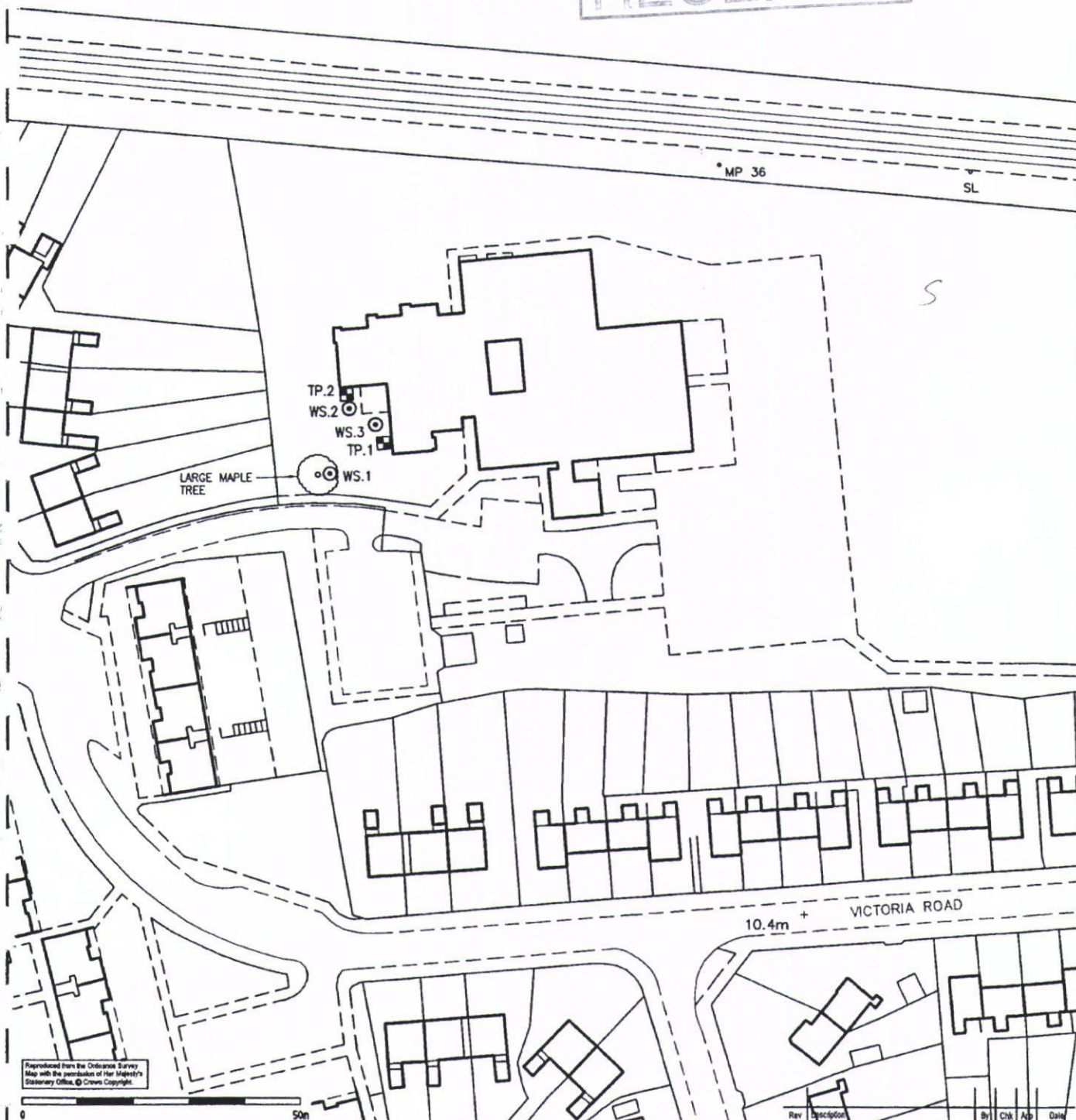


FIGURE SK.02

Site Investigation Layout Plan

REFERENCE

- TP.1 TRIAL PIT LOCATIONS - WYGE NOV. 2003
- WS.1 WINDOW SAMPLING LOCATIONS - WYGE NOV. 2003



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Environmental Consultancy

Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
EMSWORTH PRIMARY SCHOOL

Client:
HAMPSHIRE COUNTY COUNCIL

Rev Description By Chk App Date
Drawing Title:
SITE INVESTIGATION LOCATION PLAN

Scale of A4 1:1000	Drawn By D. J. B.	Date JAN. 2004	Checked By P. E.	Date JAN. 2004	Approved By J. V.	Date JAN. 2004
Office 40	Type ENV	Project No. E04077	Drawing No. SK. 02	Revision		



APPENDIX A

REPORT CONDITIONS

WHITE YOUNG GREEN ENVIRONMENTAL

APPENDIX A - REPORT CONDITIONS (STAGE 2)

GROUND INVESTIGATION

This report is produced solely for the benefit of Hampshire County Council and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site as characteristics, especially liquid and gaseous materials, are likely to vary with time.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development requires evaluation by other involved parties.

Whilst confident in the findings detailed within this report because ground conditions is not an exact science, subject to risk analysis, we are unable to give categoric assurances that they will be accepted by others as they may have differing objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tested for some of the more common chemicals generally expected, including any highlighted in the client's instructions. Other concentrations or types of chemicals may exist. Factual results are presented initially compared to commonly adopted guidelines which are not definitive in the UK and should be further assessed for actual risk.

APPENDIX B

Engineering Logs



WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole
Number **WS1**

Sheet 1 of 1
1:50

Project **Emsworth Primary School**

Client **Hampshire County Council**

Method **Terrier Rig**

Ground Level

Start Date **12/11/03**
Finish Date **12/11/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test		Notes
							Depth (m)	Type	
Grass over soft brown clayey silty TOPSOIL with occasional flint gravel. (TOPSOIL)			0.25						
Firm very friable orange-brown silt/clay with occasional brick and concrete fragments. (MADE GROUND)			0.50				0.50	D	
Firm friable orange-brown gravelly sandy SILT/CLAY with some roots and rootlets. (BRICK EARTH)			1.60				1.00	D	N=13 (2,2,3,2,4,4)
							1.50	D	
Loose to medium dense orange clayey silty SAND. (LONDON CLAY FORMATION)							2.00	D	N=7 (1,1,1,1,2,3)
							2.50	D	
							3.00	D	N=8 (1,1,1,3,2,2)
							3.50	D	
							4.00	D	N=20 (1,2,4,6,5,5)
			4.50				4.50	D	
Firm grey-brown very gravelly sandy SILT / CLAY. Gravel is fine to coarse sub-angular to angular of flint. (LONDON CLAY FORMATION)			5.00				4.90	D	
							5.00	D	N=15 (2,2,2,4,4,5)
Borehole completed at 5.00mbgl									

Remarks:

Chiselling:

Installation / Backfill: Backfilled with arisings.

Groundwater: Groundwater ingress at 2.4mbgl. Steady after 20 minutes.
Other Observations:

JOB NUMBERS **E4077/01**

Logged By **PE**

Checked By **cm**

FIG. NO.

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation
Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole
Number **WS2**

Sheet 1 of 1
1:50

Project **Emsworth Primary School**

Client **Hampshire County Council**

Method **Terrier Rig**

Ground Level

Start Date **12/11/03**
Finish Date **12/11/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test		Notes
							Depth (m)	Type	
Soft brown clayey silty TOPSOIL with occasional flint gravel. (TOPSOIL)			0.15						
Firm orange/brown silt/clay with occasional brick fragments. (MADE GROUND)			0.25				0.50	D	
Firm orange-brown sandy SILT / CLAY with occasional black staining. Dry and friable. (BRICEARTH)			1.30				1.00	D	N=11 (1,2,2,3,3,3)
Loose orange silty / clayey fine SAND. (LONDON CLAY FORMATION)							1.50	D	
							2.00	D	N=6 (1,1,1,1,2,2)
							2.50	D	
							3.00	D	N=10 (0,1,1,2,3,4)
... below 3.0m medium dense.									
Borehole completed at 3.30mbgl			3.30						

Remarks:

Chiselling:
Installation / Backfill: Backfilled with arisings.

Groundwater: Slow groundwater ingress at 2.5mbgl. Static level 2.5mbgl on completion of borehole.
Other Observations: No recovery below 3.3mbgl. Window sample terminated.

JOB NUMBBER4077/01

Logged By **PE**
Checked By **CM**

FIG. NO.

WHITE YOUNG GREEN ENVIRONMENTAL

Ground Technologies and Investigation

Yeoman House, 63 Croydon Road, London. SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Borehole
Number **WS3**

Sheet 1 of 1
1:50

Project **Emsworth Primary School**

Client **Hampshire County Council**

Method **Terrier Rig**

Ground Level

Start Date **12/11/03**
Finish Date **12/11/03**

Description	Legend	Reduced Level (mOD)	Depth (m)	Casing (m)	Water Strike (m)	Installation / Backfill	Sample Test		Notes
							Depth (m)	Type	
Soft brown clayey silty TOPSOIL with occasional flint gravel. (TOPSOIL)			0.20						
Firm orange-brown silt/clay with occasional brick fragments. (MADE GROUND)			0.40						
Firm orange-brown sandy SILT/ CLAY. Dry and friable. (BRICEARTH)			1.30						
Loose orange clayey / silty SAND. (LONDON CLAY FORMATION)			3.50		2.50				
Borehole completed at 3.50mbgl									

Remarks:

Chiselling:

Installation / Backfill: Backfilled with arisings.

Groundwater: Slow groundwater ingress at 2.5mbgl.

Other Observations: No recovery below 3.6mbgl. Window sample terminated.

JOB NUMBERE4077/01

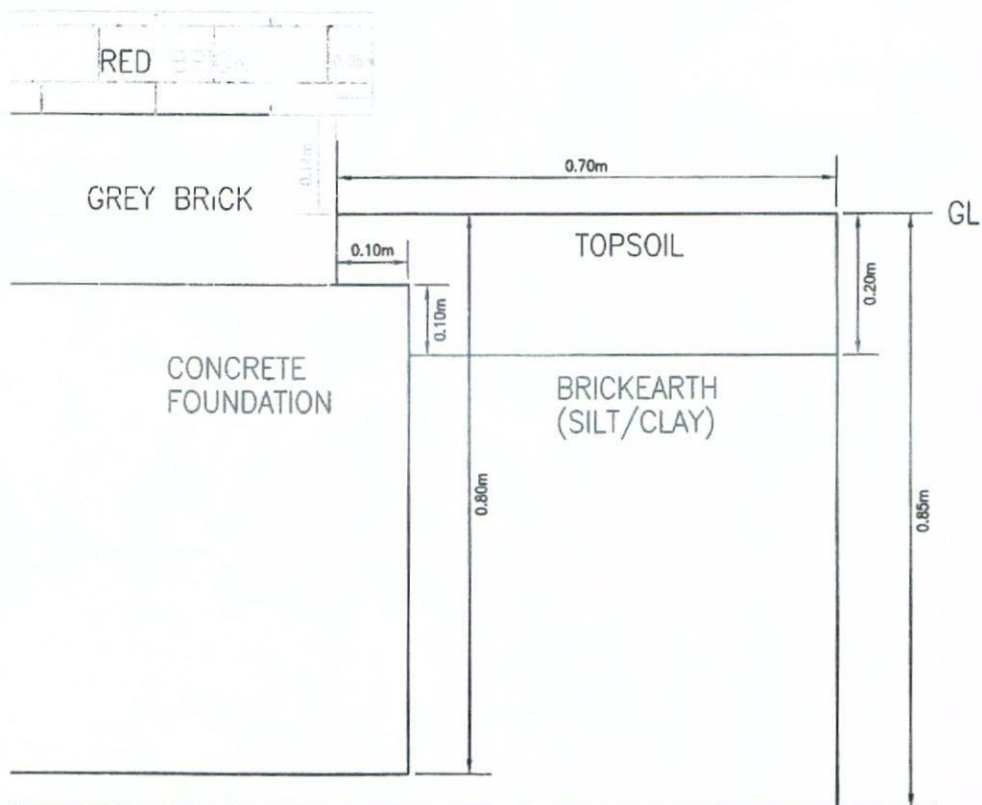
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Checked By **cm**

FIG. NO.

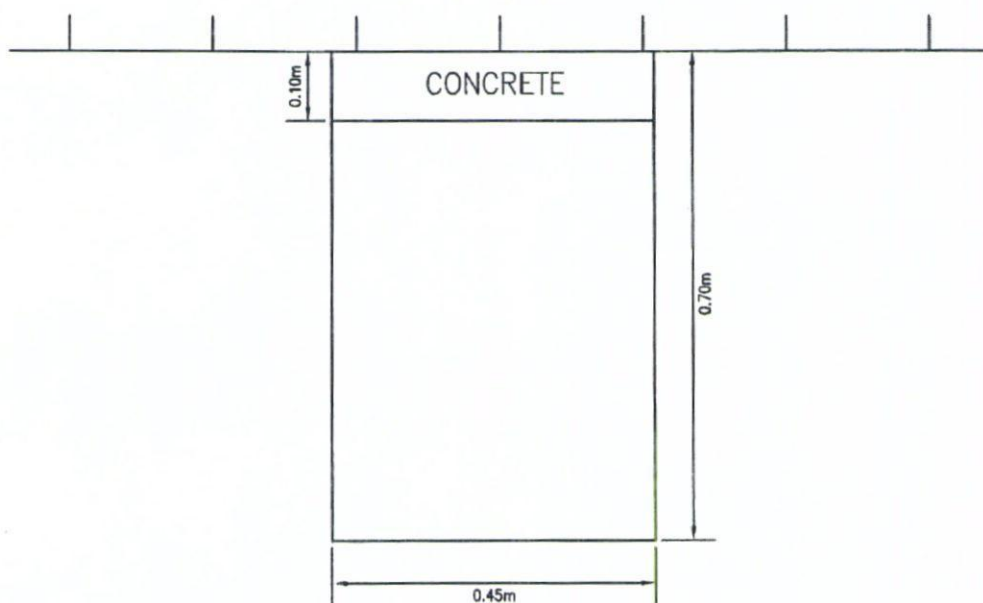
TP1

SECTION



PLAN

BRICK WALL



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Environmental Consultancy

Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

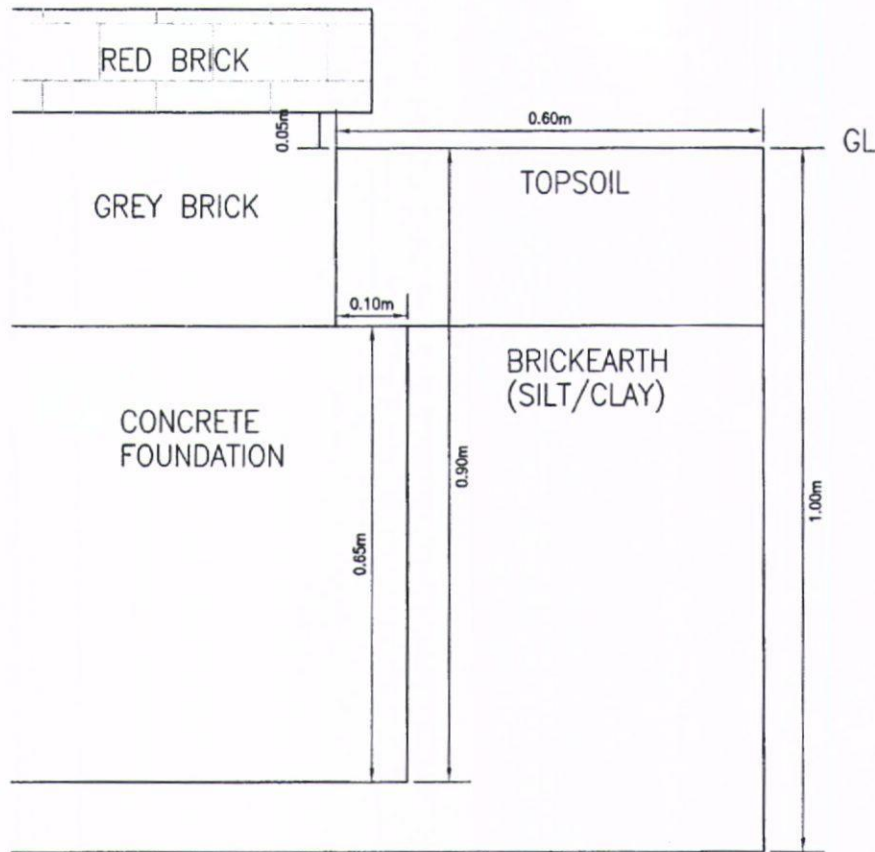
Project:
EMSWORTH PRIMARY SCHOOL

Client:
HAMPSHIRE COUNTY COUNCIL

Rev	Description	By	Chk	App	Date
Drawing Title: TP1 SECTION					
Scale as A4	Drawn By JSA	Date FEB 2004	Checked By PE	Date FEB 2004	Approved By [Signature]
Office 40	Type ENV	Project No. E4077	Drawing No. SK03	Revised	

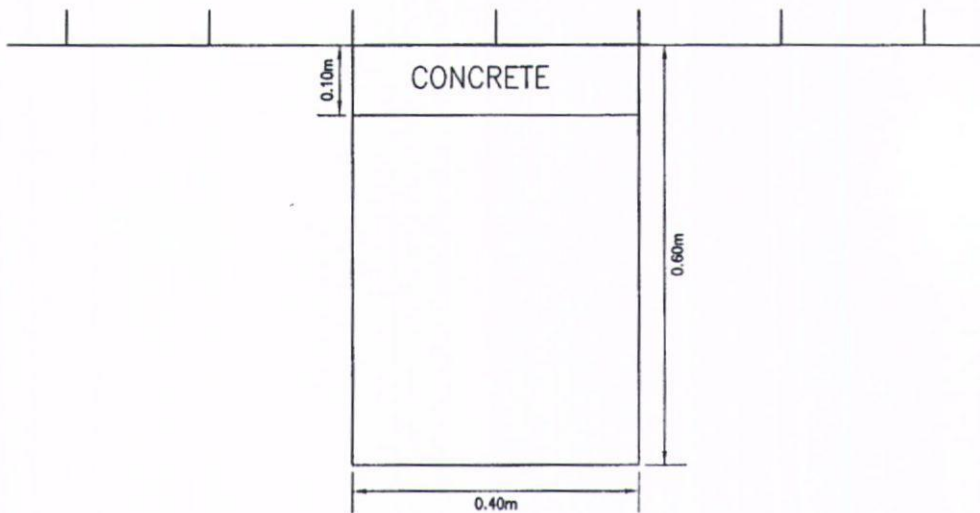
TP2

SECTION



PLAN

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Environmental Consultancy

Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project
EMSWORTH PRIMARY SCHOOL

Client
HAMPSHIRE COUNTY COUNCIL

Rev	Description	By	CHK	App	Date
	TP2 SECTION				
Drawing Title					
Scale: A4	Drawn By	Date	Checked By	Date	Approved By
1:10	RM	FEB 2004	PE	FEB 2004	22/02/04
Office	Type	Project No.	Drawing No.	Revision	
40	ENV	E4077	SK04		



APPENDIX C

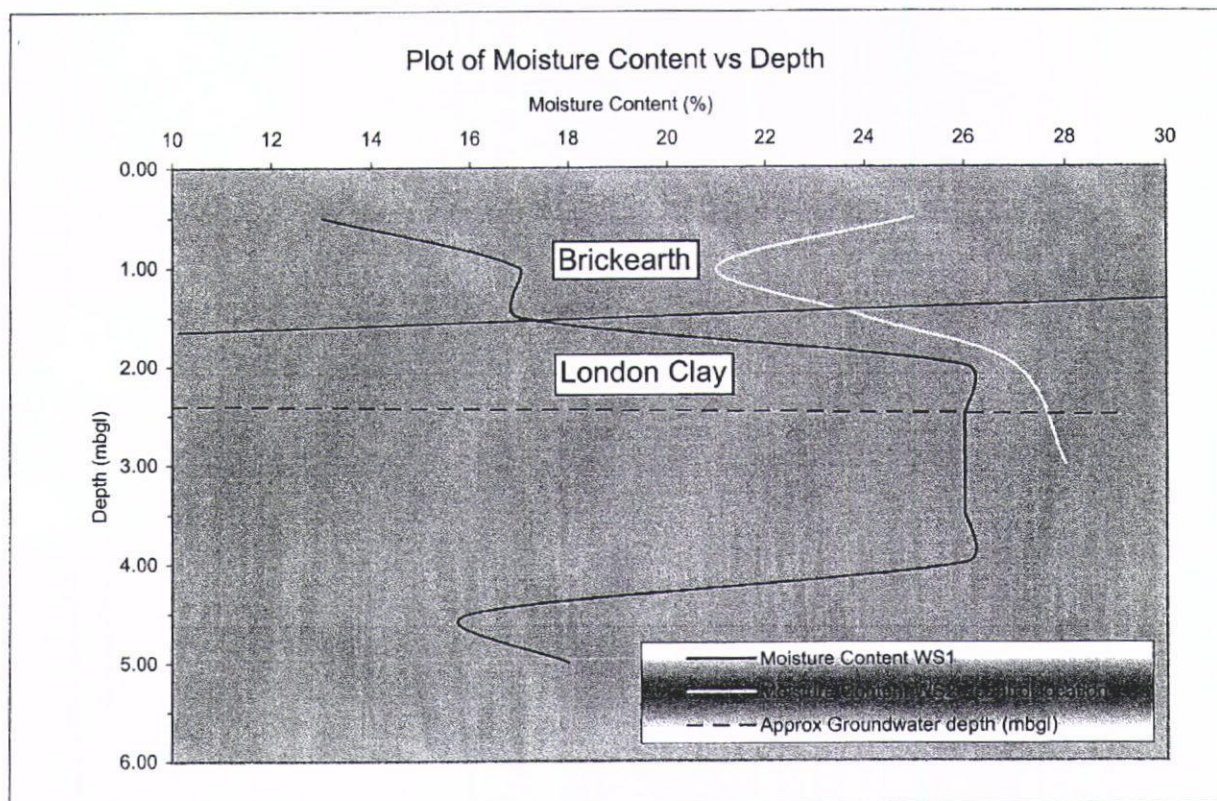
Geotechnical Testing Results

Project name: Emsworth Primary School
Project number: E4077/01

White
Young
Green

Analysis of Geotechnical Data

Location	Depth (mbgl)	Stratum	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Liquid Limit * 0.4	Plasticity Index (%)	Liquidity Index
WS1	0.50	BE	13	38	23	15.2	15	-0.67
WS1	1.00	BE	17	45	20	18	25	-0.12
WS1	1.50	BE	17	39	16	15.6	23	0.04
WS1	2.00	LCF	26	-	-	-	-	-
WS1	2.50	LCF	26	-	-	-	-	-
WS1	3.00	LCF	26	-	-	-	-	-
WS1	3.50	LCF	26	-	-	-	-	-
WS1	4.00	LCF	26	-	-	-	-	-
WS1	4.50	LCF	16	28	18	11.2	10	-0.20
WS1	5.00	LCF	18	63	23	25.2	40	-0.13
WS2	0.50	BE	25	45	22	18	23	0.13
WS2	1.00	BE	21	49	17	19.6	32	0.13
WS2	1.50	LCF	24	-	-	-	-	-
WS2	2.00	LCF	27	-	-	-	-	-
WS2	3.00	LCF	28	-	-	-	-	-





APPENDIX D

Previous Ground Investigation Data at Emsworth House EPH



Denotes Site Location



Reproduced from Ordnance Survey's 1:50 000 map with the permission of the Controller of Her Majesty's Stationery Office, Crown copyright reserved Licence Number: AL52185A0001.

SITE: EMSWORTH HOUSE, EMSWORTH

CONTRACT No:
F12572SCALE:
NTS

TITLE: SITE LOCATION PLAN

DATE: 07/01/2003

FIGURE:
01

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Borehole Number	Sample Number	Depth m	Description of Sample
WS1		0.50	Brown mottled orange gravelly sandy silty CLAY.
WS1		1.00	Brown mottled grey and orange slightly gravelly sandy silty CLAY.
WS1		1.50	Orangish brown slightly gravelly sandy silty CLAY.
WS1		2.00	Orangish brown slightly clayey very silty SAND.
WS1		2.50	Orangish brown slightly clayey very silty SAND.
WS1		3.00	Orangish brown slightly clayey very silty SAND.
WS1		3.50	Orangish brown slightly clayey very silty SAND.
WS1		4.00	Orangish brown slightly clayey very silty SAND.
WS1		4.50	Brown very gravelly very sandy very silty CLAY.
WS1		5.00	Grey slightly gravelly slightly sandy silty CLAY.
WS2		0.50	Brown mottled orange and grey sandy silty CLAY.
WS2		1.00	Brown mottled grey and orange sandy silty CLAY.
WS2		1.50	Orangish brown very silty SAND.
WS2		2.00	Pale brown slightly clayey very silty SAND.
WS2		3.00	Pale brown slightly clayey very silty SAND.



**THYSSEN
GEOTECHNICAL**

Compiled by	Date	Checked by	Date	Approved by	Date
<i>[Signature]</i>	16/12/03	<i>[Signature]</i>	16/12/03	<i>[Signature]</i>	16/12/03
EMSWORTH PRIMARY SCHOOL.					Contract No NL240115
					Client Ref: E4077

SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

Borehole Number	Sample Number	Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m ³ Clause 7.2	Dry Density Mg/m ³ Clause 7.2	Particle Density Mg/m ³ Clause 8.	Liquid Limit % Clause 4.3/4.4	Plastic Limit % Clause 5.	Plasticity Index % Clause 6.	% Passing .425mm	Remarks
WS1		0.50	13				38	23	15	82	Intermediate plasticity CL.
WS1		1.00	17				45	20	25	95	Intermediate plasticity CL.
WS1		1.50	17				39	16	23	90	Intermediate plasticity CL.
WS1		2.00	26								
WS1		2.50	26								
WS1		3.00	26								
WS1		3.50	26								
WS1		4.00	26								
WS1		4.50	16				28	18	10	50	Low plasticity CL.
WS1		5.00	18				63	23	40	92	High plasticity CH.
WS2		0.50	25				45	22	23	100	Intermediate plasticity CL.
WS2		1.00	21				49	17	32	100	Intermediate plasticity CL.
WS2		1.50	24								
WS2		2.00	27								
WS2		3.00	28								

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

Sheet 1 of 2.

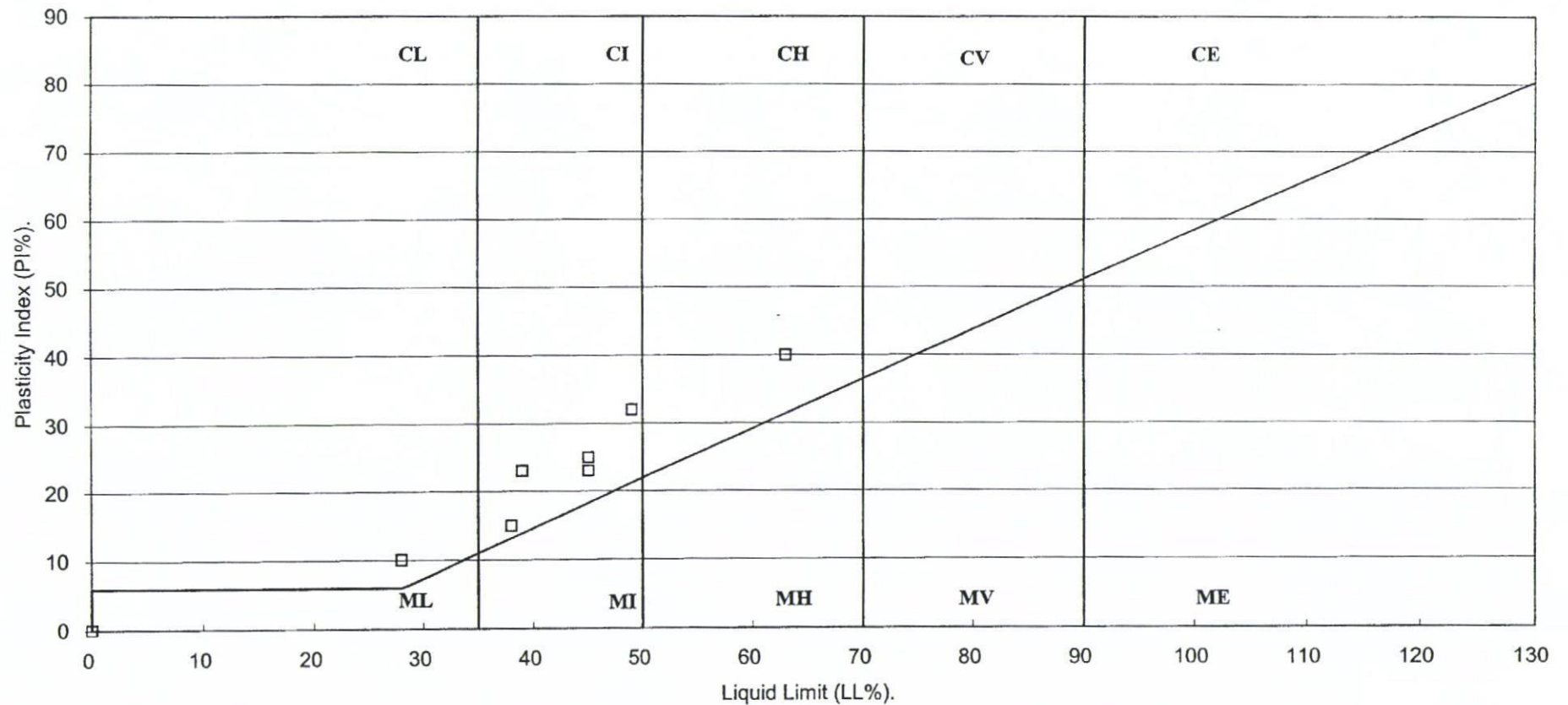


**THYSSEN
GEOTECHNICAL**

Compiled by	Date	Checked by	Date	Approved by	Date
<i>[Signature]</i>	16/12/03	<i>[Signature]</i>	16/12/03	<i>[Signature]</i>	16/12/03
EMSWORTH PRIMARY SCHOOL.					Contract No NL240115
					Client Ref: E4077

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



**THYSSEN
GEOTECHNICAL**

Compiled by	Date	Checked by	Date	Approved by	Date
<i>[Signature]</i>	16/12/03	<i>[Signature]</i>	16/12/03	<i>[Signature]</i>	16/12/03
EMSWORTH PRIMARY SCHOOL.					Contract No N240115
					Client Ref: E4077

EMSWORTH PRIMARY SCHOOL

Summary of Chemical Analyses

Borehole or Trial Pit	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Sulphate Content Soil SO ₃ (SO ₄) % Dry mass DETS 004	Sulphate Content * 2:1 Water:Soil Extract SO ₃ (SO ₄) g/l DETS 055	Sulphate Content Groundwater SO ₃ (SO ₄) g/l DETS 004	Total Sulphur * (S) %Dry mass	Chloride Content * 2:1 Water/Soil Extract (Cl) g/l DETS 055	Magnesium * 2:1 Water/Soil Extract (Mg) g/l DETS 042	Nitrate 2:1 Water/Soil Extract (NO ₃) g/l DETS 055	pH Value DETS 008
WS 1	0.50		D	10688/1		0.01 (0.01)			<0.01	<0.01	<0.01	7.2
WS 2	1.00		D	10688/2		0.02 (0.02)			<0.01	<0.01	<0.01	7.2
WS 2	1.50		D	10688/3		<0.01 (<0.01)			<0.01	<0.01	<0.01	7.3

Approved By:

Date:

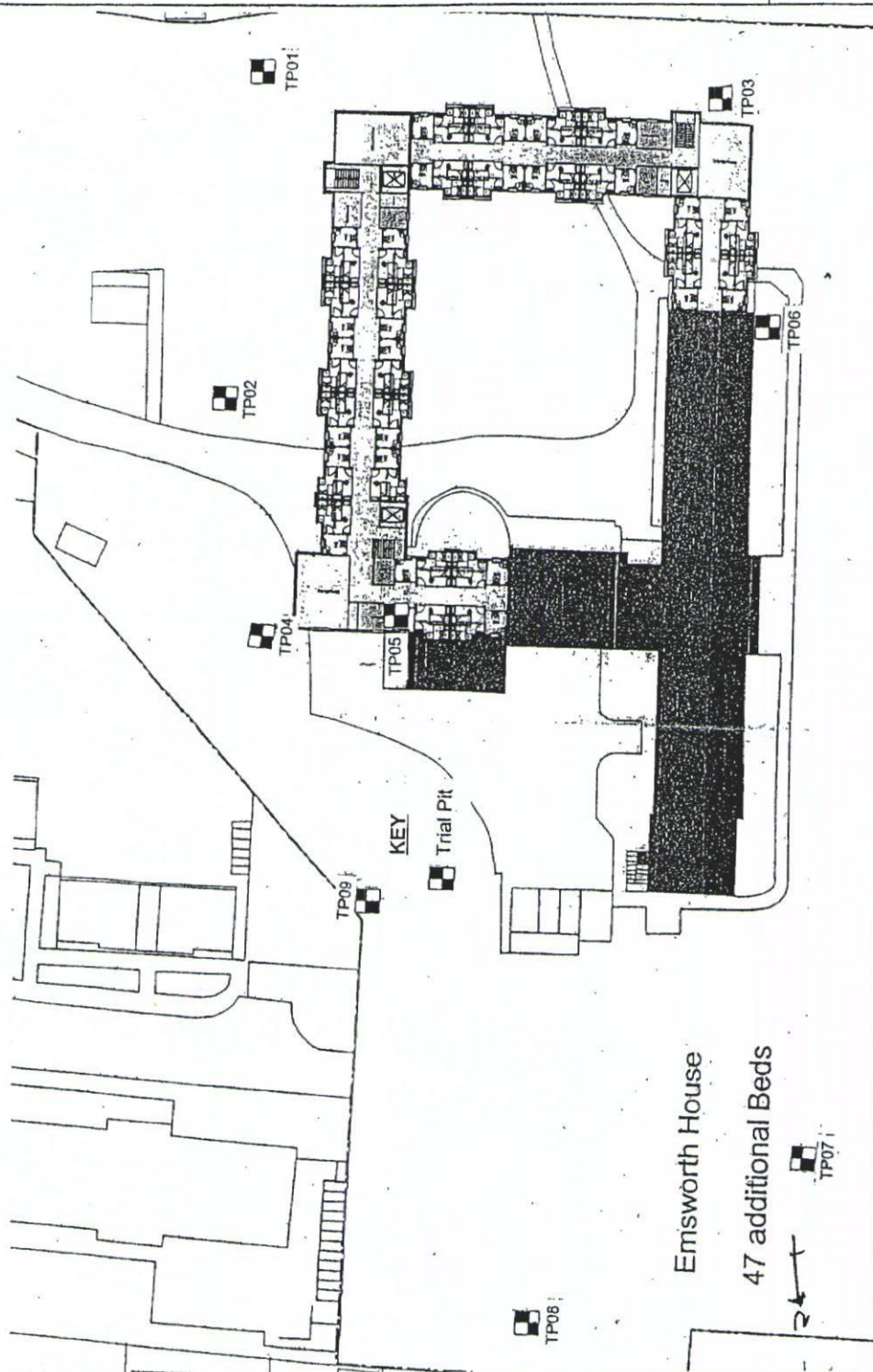

17/12/07

Client Reference: NL240115

Laboratory Reference: 10688

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

Page 2 of 3 Pages



SITE: EMSWORTH HOUSE, EMSWORTH

CONTRACT No:
F12572

SCALE:
NTS

TITLE: EXPLORATORY HOLE LOCATION PLAN

DATE: 07/01/2003

FIGURE:
02

Contract No.	F12572	Method	Machine Excavated	Coordinates	-
Project	Emsworth House	Equipment	JCB 3CX	Ground Level	-
Client	Hampshire County Council	Logged by	AR	Date Started	25/10/2002
Consultant	NHSEL			Date Completed	25/10/2002

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
TOPSOIL: Grass over brown sandy CLAY with abundant roots and rootlets. Sand is fine to coarse.		0.10 0.30		B1 D2 U3 0.50 - 0.60 0.50	
MADE GROUND: Brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to sub angular fine to coarse flint, with occasional brick.		0.95		B4 D5 1.00 - 1.10 1.00	
Stiff orange brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub rounded fine to coarse flint and chalk. Occasional flint cobbles. Occasional wood fragments.		1.80		B6 D7 2.00 - 2.10 2.00	
Firm to stiff orange brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub angular fine to medium flint. Abundant spots of black carbonaceous material. —1.70-1.80m Becomes pale brown very gravelly CLAY. gravel is rounded fine chalk with some flint.		3.15		B8 D9 3.00 - 3.10 3.00	
Orange and grey mottled very silty fine SAND. Occasional rounded fine gravel of flint.		3.60		B10 D11 3.50 - 3.60 3.60	
Very stiff extremely closely fissured grey slightly sandy CLAY. Fissures are randomly orientated, rough and undulating. Trial pit complete at 3.60 m.					

Stability Collapse below 2.00m

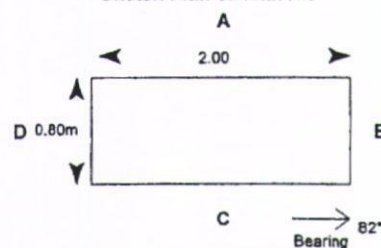
Shoring None used

Groundwater None encountered

Remarks

1. Location CAT scanned prior to pitting.
2. Hole abandoned at 3.60m, due to collapse.
3. No hand vane tests carried out at 1.00, strata too gravelly.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks
0.50	75.0	NR	
0.90	56.0	NR	
0.50	80.0	NR	

NOTES: All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic North

Form ARIAL TP LOG

Version 3.0

Revised 29/05/2002

Contract No.	F12572	Method	Machine Excavated	Coordinates	-
Project	Emsworth House				-
		Equipment	JCB 3CX	Ground Level	-
Client	Hampshire County Council			Date Started	25/10/2002
		Logged by	AR	Date Completed	25/10/2002
Consultant	NHSEL				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
TOPSOIL: Grass over dark brown sandy CLAY with some angular medium flint gravel. Sand is fine to coarse. Abundant roots and rootlets.		0.10			
MADE GROUND: Brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to sub angular fine to coarse brick, flint, slag and glass.		0.47	B1 D2 U3	0.50 - 0.60 0.50	
Firm orange brown occasionally mottled dark brown sandy CLAY. Sand is fine to coarse. Occasional gravel of angular to sub rounded fine to coarse flint and chalk.		0.90	B4 D5 U6	1.00 - 1.10 1.00	
Firm to stiff orange slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular fine to coarse of flint.		1.70	B7 D8	2.00 - 2.10 2.00	
Orange and grey mottled very silty fine SAND. Possibly showing some wide spaced fissures. ---2.90m Becomes grey with orange sandy lenses - possibly bedding. Occasionally shell fragments.		3.50	B9 D10	3.00 - 3.10 3.00	
Very stiff closely spaced fissured grey slightly sandy CLAY. Sand is fine. Fissures are rough and generally sub horizontal. Occasional shell fragments. ---3.50-3.70m Sub angular coarse gravel to cobble size fragments of ironstone and flint ---3.70m Fissures become randomly orientated Trial pit complete at 4.00 m.		4.00	B11 D12	3.90 - 4.00 4.00	

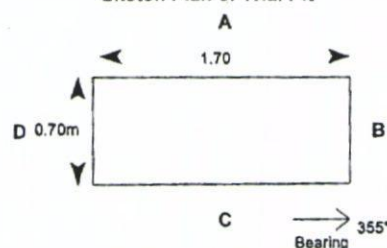
Stability Collapsing below 1.50m

Shoring None used

Groundwater None encountered

Remarks
1. Location CAT scanned prior to excavation.
2. Trial pit stopped at 4.00m due to collapse from above.
3. No hand vane tests at 1.00m due to gravelly strata.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks
0.50	68.0	NR	
0.50	62.0	NR	
0.50	58.0	NR	

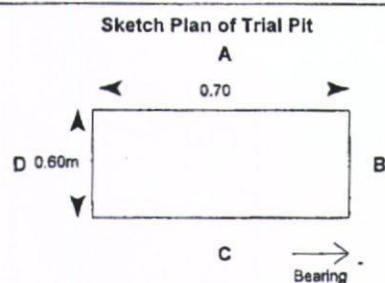
NOTES: All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic North

Form ARIAL TP LOG
Version 3.0
Revised 29/05/2002

Contract No.	F12572	Method	Hand Excavated	Coordinates	-
Project	Emsworth House				-
		Equipment	Hand Tools	Ground Level	-
Client	Hampshire County Council			Date Started	06/11/2002
		Logged by	AR	Date Completed	06/11/2002
Consultant	NHSEL				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
TOPSOIL: Dark brown slightly sandy CLAY with abundant roots and rootlets. Sand is fine to medium. MADE GROUND: Light brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub angular fine to coarse of red and yellow brick, flint, chalk and glass. Trial pit complete at 1.00 m.		0.20 1.00		D1 0.50	

Stability	Good
Shoring	None used
Groundwater	None encountered



Remarks	1. Location CAT scanned prior to excavation. 2. Concrete footing located at 1.00m below ground level. Base of footing not located.
---------	---

Hand Vane Test Readings			
Depth	HV Peak	HV Remoulded	Remarks

NOTES: All depths in metres, all soil strengths in KPa,
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic North

Form	ARIAL TP LOG
Version	3.0
Revised	29/05/2002

Contract No.	F12572	Method	Hand Excavated	Coordinates	-
Project	Emsworth House				-
		Equipment	Hand Tools	Ground Level	-
Client	Hampshire County Council			Date Started	06/11/2002
		Logged by	AR	Date Completed	06/11/2002
Consultant	NHSEL				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
MADE GROUND: Brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to sub angular fine to coarse flint, brick, glass, concrete and chalk. Occasional cobbles of brick and concrete with reinforcement bars. Some roots and rootlets.		1.00		D1 0.50	
Trial pit complete at 1.00 m.					

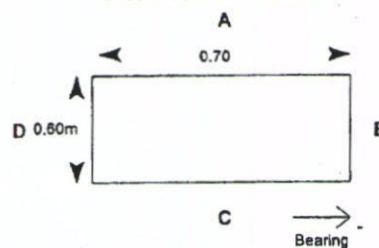
Stability Good

Shoring None used

Groundwater None encountered

 Remarks
 1. Location CAT scanned prior to excavation.
 2. Footing located at 1.00m below ground level. Base of footing not located.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks

NOTES: All depths in metres, all soil strengths in KPa.
 See legend sheet for key to symbols and abbreviations.
 All bearings given relate to magnetic North

Form	ARIAL TP LOG
Version	3.0
Revised	29/05/2002

Contract No.	F12572	Method	Machine excavation	Coordinates	-
Project	Emsworth House				
		Equipment	JCB 3CX	Ground Level	-
Client	Hampshire County Council			Date Started	09/01/2003
		Logged by	BC	Date Completed	09/01/2003
Consultant	NHSEL				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
TOPSOIL: Friable Brown slightly gravelly sandy CLAY. Gravel is fine to medium occasionally coarse angular to subrounded flint and chalk. Frequent rootlets.		0.40		D1 0.20	
Friable firm brown to light brown slightly gravelly sandy to very sandy CLAY. Occasional relict roots.		0.70		D2 0.50	
Firm to stiff brown to orange brown mottled slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded flint.		1.30		D3 B4 1.00 1.00 - 1.20	
Orange brown slightly sandy gravelly to very gravelly CLAY. Gravel is fine to coarse angular to subrounded flint.		2.20		D5 B5 1.50 1.50 - 1.80	
— At 2.00m: With light grey clay.					
Brown to orange brown very silty fine SAND.		3.20		D7 B8 2.50 2.50 - 2.80	
Trial pit complete at 3.20 m.					

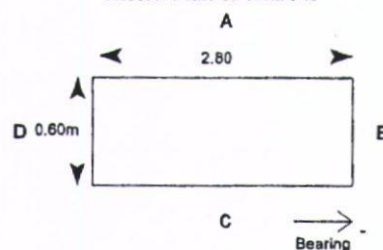
Stability Spalling from 1.70m

Shoring None used

Groundwater Seepage from 2.00m.

Remarks 1. Severe collapsing and undermining from 1.70m to 3.20m, trial pit abandoned.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks
0.50	44.0	22.00	
0.50	40.0	22.00	
0.50	46.0	20.00	
1.00	80.0	30.00	
1.00	88.0	50.00	
1.00	96.0	35.00	

NOTES: All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic North

Form ARIAL TP LOG
Version 3.0
Revised 29/05/2002

Contract No.	F12572	Method	Machine excavation	Coordinates	-
Project	Emsworth House				-
		Equipment	JCB 3CX	Ground Level	-
Client	Hampshire County Council	Logged by	BC	Date Started	09/01/2003
				Date Completed	09/01/2003
Consultant	NHSEL				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
MADE GROUND: Dark brown to grey slightly gravelly very sandy CLAY. Sand is coarse. Gravel is fine to coarse angular to subrounded flint. With occasional to frequent in places brick and concrete fragments. Rare slate noted. Occasional rootlets.		0.60 0.80		D1 0.50 D2 0.70	
Friable soft light brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular to subrounded flint. Rare roots.		1.30		D3 1.00 B4 1.00 - 1.20	
Firm orange brown slightly gravelly sandy CLAY. Frequent orange pockets of sand. Gravel is fine to medium angular to subrounded flint. Rare roots.		2.20		B5 1.50 - 1.80 D6 1.80	
Orange brown very gravelly CLAY. Gravel is angular to subrounded flint. From 1.95m: With light grey clay.				D7 2.20 B8 2.20 - 2.50	
Slightly orange brown very silty fine SAND.		3.20			
Trial pit complete at 3.20 m.					

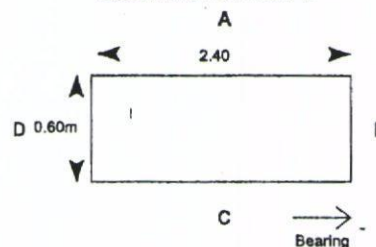
Stability Spalling from 2.00m

Shoring None used

Groundwater Seepage from 2.20m

Remarks 1. Severe collapsing and undermining of pit from 2.00m top 3.20m, trial pit abandoned.

Sketch Plan of Trial Pit



Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks
0.70	44.0	24.00	
0.70	54.0	30.00	
0.70	54.0	32.00	
1.00	72.0	46.00	
1.00	78.0	44.00	
1.00	70.0	38.00	

NOTES: All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic North

Form ARIAL TP LOG

Version 3.0

Revised 29/05/2002

Contract No.	F12572	Method	Machine excavation	Coordinates	-
Project	Emsworth House				-
		Equipment	JCB 3CX	Ground Level	-
Client	Hampshire County Council			Date Started	09/01/2003
		Logged by	BC	Date Completed	09/01/2003
Consultant	NHSEL				

Description of Strata	Legend	Depth Below G.L.	O.D. Level	Sampling	Remarks
MADE GROUND: Brown slightly gravelly very sandy CLAY. Frequent roots. Gravel is fine to coarse subangular flint with rare brick fragments.		0.30		D1 0.20 D2 0.50	
Firm light brown speckled grey CLAY. Occasional rootlets.		0.90		D3 1.00 B4 1.10 - 1.30	
Stiff brown to orange brown slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded flint.		1.30		D5 1.50 B6 1.50 - 1.80	
Orange brown slightly sandy very gravelly CLAY. Gravel is fine to coarse angular occasionally subrounded flint.		2.00		D7 2.20 B8 2.30 - 2.50	
Brown slightly orange silty fine SAND.					
— From 3.00m: Becoming pale grey.					
Trial pit complete at 3.40 m.		3.40		B10 3.20 - 3.40 D9 3.40	

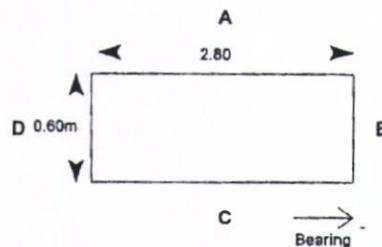
Stability Spalling from 2.00m.

Shoring None used

Groundwater Seepage from 1.30m.

Remarks 1. Excessive collapse from 2.0m. Trial pit abandoned at 3.40m.

Sketch Plan of Trial Pit

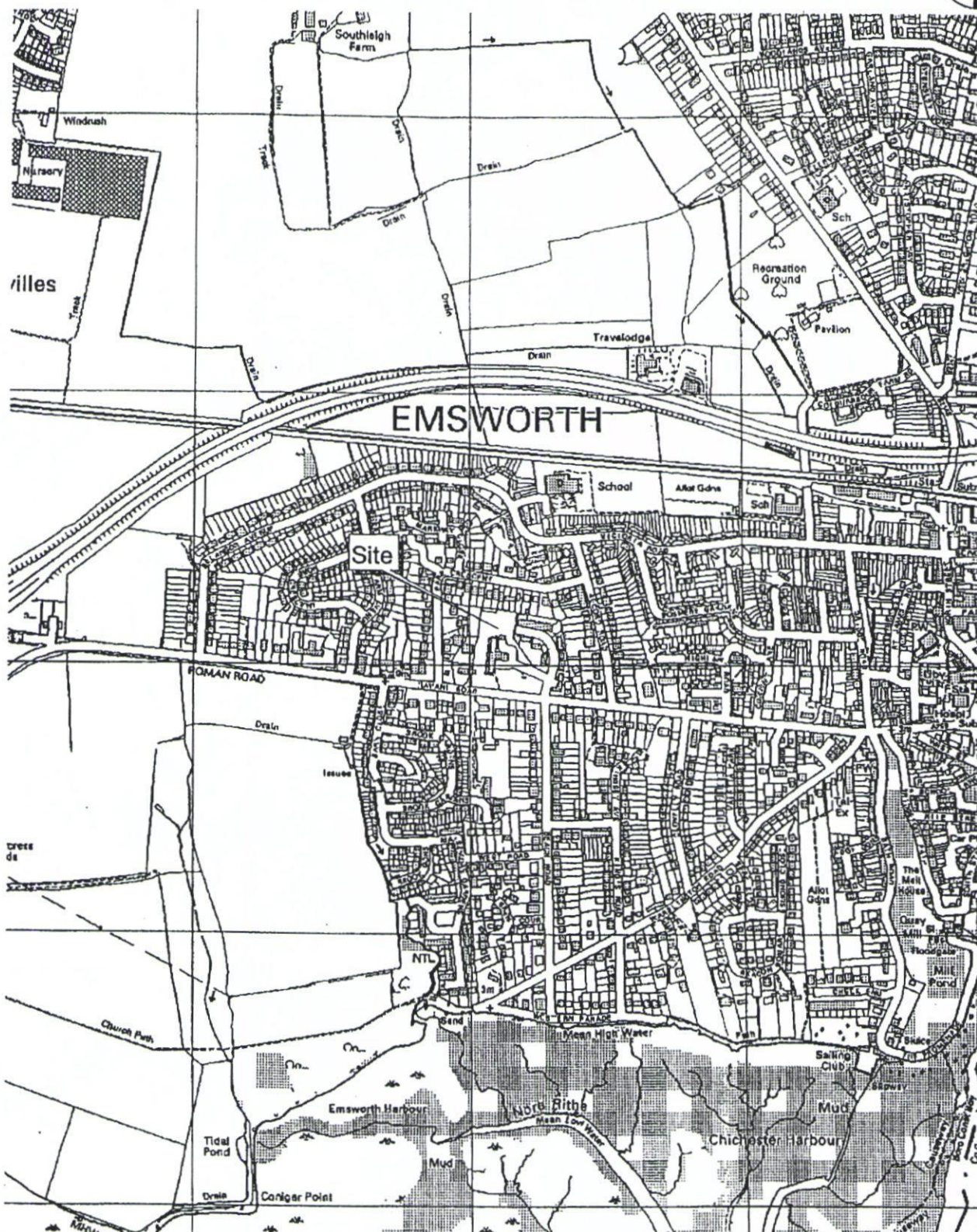


Hand Vane Test Readings

Depth	HV Peak	HV Remoulded	Remarks
0.50	42.0	20.00	
0.50	46.0	30.00	
0.50	80.0	32.00	
1.00	84.0	46.00	
1.00	80.0	30.00	
1.00	82.0	42.00	

NOTES: All depths in metres, all soil strengths in KPa.
See legend sheet for key to symbols and abbreviations.
All bearings given relate to magnetic North

Form ARIAL TP LOG
Version 3.0
Revised 29/05/2002



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e-mail: emw@wys.com



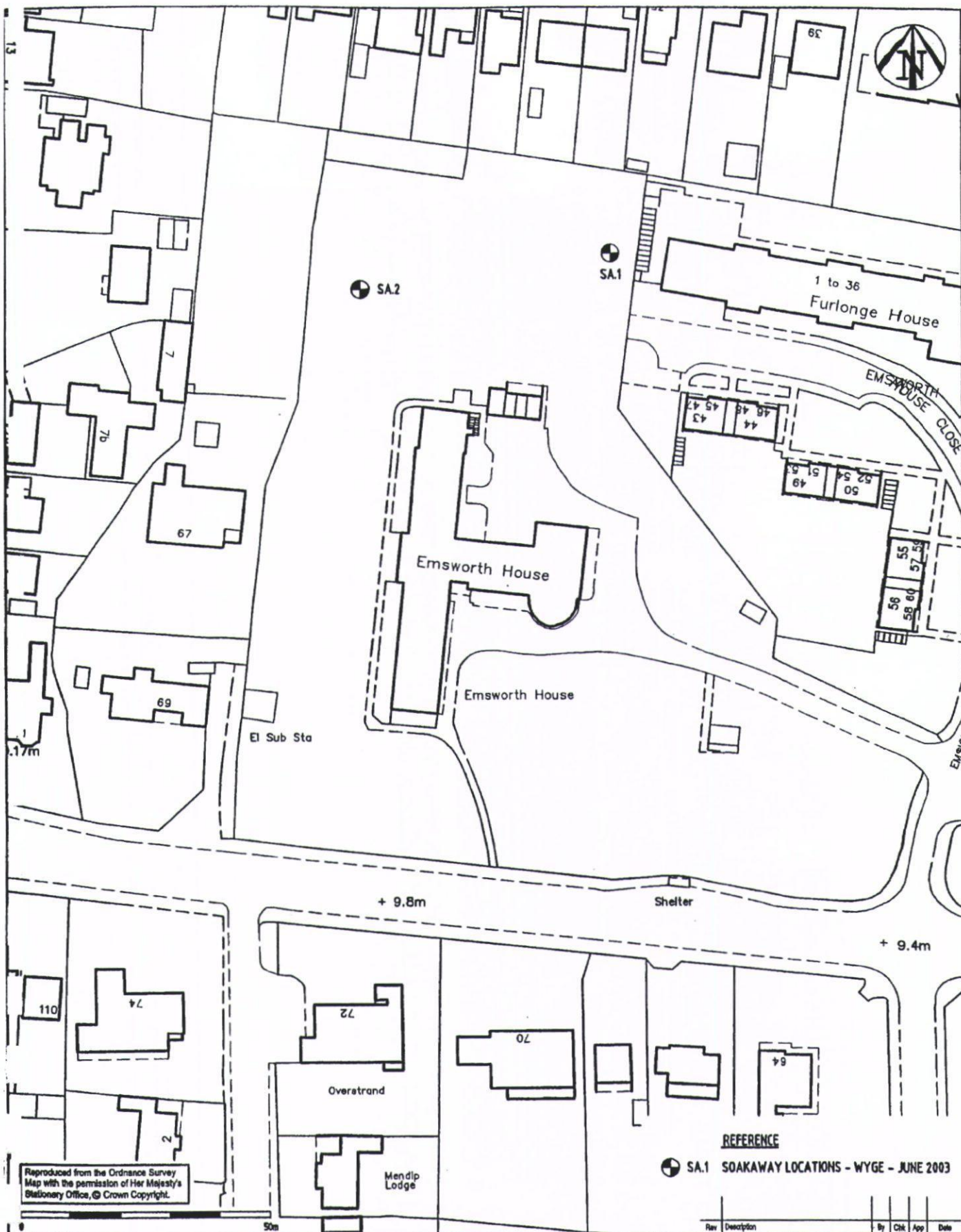
Project
EMSWORTH HOUSE EPH

Client
HAMPSHIRE COUNTY COUNCIL

Rev	Description	By	Chk	App	Date
Drawing Title					
SITE LOCATION PLAN					
Scale at A1	Drawn By	Date	Checked By	Date	Approved By
40	ENV	E3353	SK.01		

Environmental Consultancy

3rd Structural Mechanical Electrical Process Rail Traffic Environmental Project Management



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Project: EMSWORTH HOUSE EPH

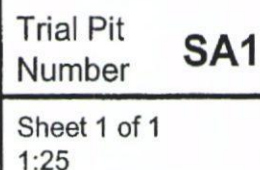
Client: HAMPSHIRE COUNTY COUNCIL

Environmental Consultancy

Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Drawing Title: SITE INVESTIGATION LOCATION PLAN

Scale at A4	Drawn By	Date	Checked By	Date	Approved By	Date
1:100	M.J.C.	JULY 2003				
Office	Type	Project No.	Drawing No.	Revision		
40	ENV	E3353	SK.02			



JOB NUMBERS 3353/01
 Logged By PE
 Checked By
 FIG. NO.

**WHITE YOUNG GREEN
ENVIRONMENTAL**

Ground Technologies and Investigation
Yeoman House, 63 Croydon Road, London SE20 7TS
Tel. 020 8659 9959 Fax. 020 8676 9968

Trial Pit
Number **SA2**

Sheet 1 of 1
1:25

Project Emsworth House EPH		Client Hampshire County Council						
Method Mechanical Backhoe Excavator		Ground Level				Start Date 17/04/03		
Description	Legend	Reduced Level (mOD)	Depth (m)	Water Strike (m)	Installation / Backfill	Sample Test		Notes
						Depth (m)	Type	
Soft/ loose brown sandy silt TOPSOIL.			0.50					
Soft orange-brown silty CLAY. (BRICEARTH)			1.05					
Firm orange-brown very gravelly SILT/ CLAY with occasional black carbonised flecks. Gravel is fine to coarse subrounded to angular flint. (BRICEARTH)			1.90			1.50	B	
Orange-brown and grey silty fine SAND. (LONDON CLAY).			1.95					
Trial Pit Completed at 1.95 mbgl								
Remarks: Stability: Stable throughout. Groundwater: No groundwater encountered. Installation Details: Backfilled with arisings. Other Observations: Pit Dimensions: Length: 2.40m Width: 0.70m Bearing: _____ of Long Side: degrees JOB NUMBER E3353/01 Logged By PE Checked By _____ FIG. NO.								

Soakaway Calculations



Soakaway Test No.

SA1

Contract:

Emsworth House EPH

Contract No.

E3353/01

Field Test

Depth of Pit
Width of Pit
Length of Pit
Depth of Pit Soaked

3.10	m
0.70	m
2.60	m
1.02	m

Trial Pit Log (include details of groundwater):

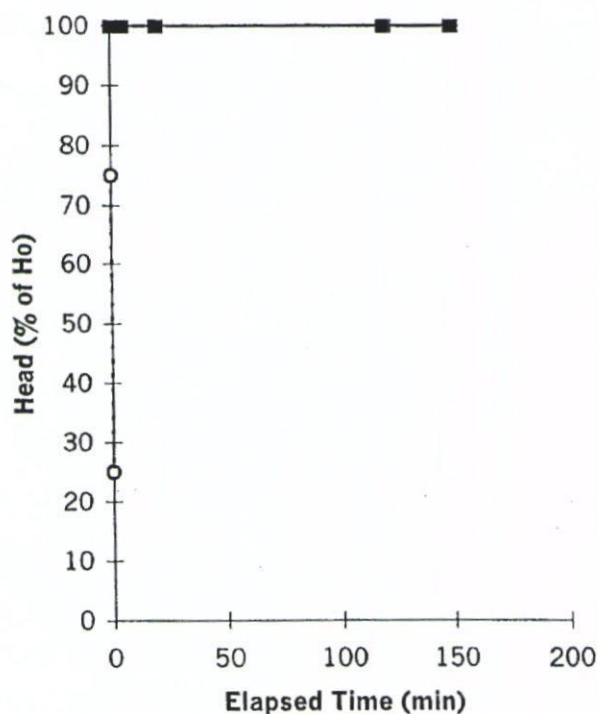
See trial Pit record

ap50 5.186 m2
Vp75-25 0.9282 m3
t75-25 0.0 min
water used 1.8564 m3
f 0.000E+00 m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
2.08	0	100	1.02
2.08	0.5	100	1.02
2.08	1	100	1.02
2.08	2	100	1.02
2.08	3	100	1.02
2.08	5	100	1.02
2.08	20	100	1.02
2.08	120	100	1.02
2.08	150	100	1.02

T75	0.000	75
T25	0.000	25
T75-25	0.000	Derived from Best Fit



Comments

Test terminated after 150 minutes. Water level unchanged.

WHITE YOUNG GREEN ENVIRONMENTAL

Yeoman House, 63 Croydon Road
London SE20 7TS

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Soakaway Calculations



Soakaway Test No.

SA2

Contract:

Emsworth House EPH

Contract No.

E3353/01

Field Test

Depth of Pit 1.95 m
Width of Pit 0.70 m
Length of Pit 2.40 m
Depth of Pit Soaked 0.90 m

ap50 4.47 m²
Vp75-25 0.756 m³
t75-25 1330.2 min
water used 1.5120 m³
f 2.119E-06 m/sec.

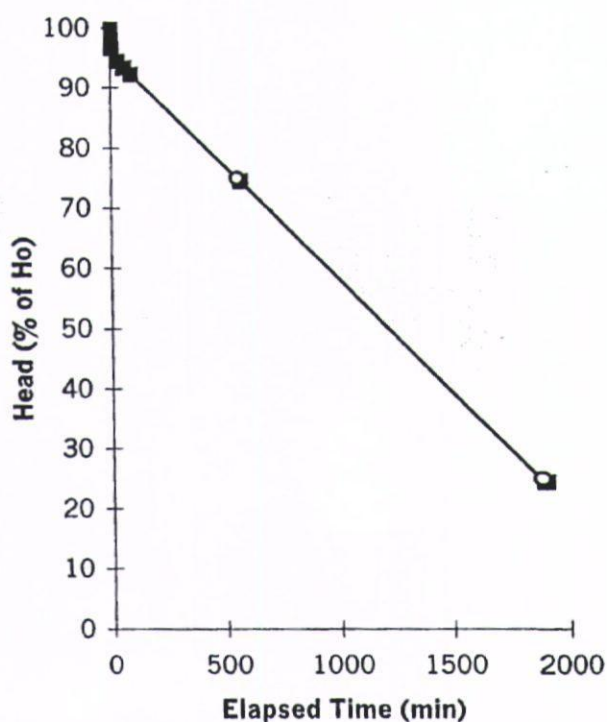
Trial Pit Log (include details of groundwater):

See trial Pit record

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
1.05	0	100	0.90
1.06	1	99	0.89
1.07	3	98	0.88
1.08	5	97	0.87
1.10	30	94	0.85
1.11	60	93	0.84
1.12	90	92	0.83
1.28	570	74	0.67
1.73	1900	24	0.22

T75 555.000 75
T25 1885.222 25
T75-25 1330.222 Derived from Best Fit



Comments

Extrapolated data after 90 minutes.

WHITE YOUNG GREEN ENVIRONMENTAL

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London SE20 7TS

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APPENDIX E

Historical Epoch Maps and Recent OS Map

0 20 40 80 Meters

Scale 1:1000

343

A S T R A I L W A Y

M. P. Brighton..36

344

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Emsworth Primary School
Epoch 1 1843-1893

 Hampshire
County Council

0 20 40 80 Meters

Scale 1:1000

35

5.762

M.P

336

11.438

337

5.242

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Emsworth Primary School
Epoch 2 1891-1912



Hampshire
County Council

0 20 40 80 Meters

Scale 1:1000

M.P

299

5.242

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Emsworth Primary School
Epoch 3 1904-1939

 Hampshire
County Council

0 20 40 80 Meters

Scale 1:1000

219^a
4.221

S O U T H E R

M.P

298 }
12.343 }

299
5.138 A

30
5.94

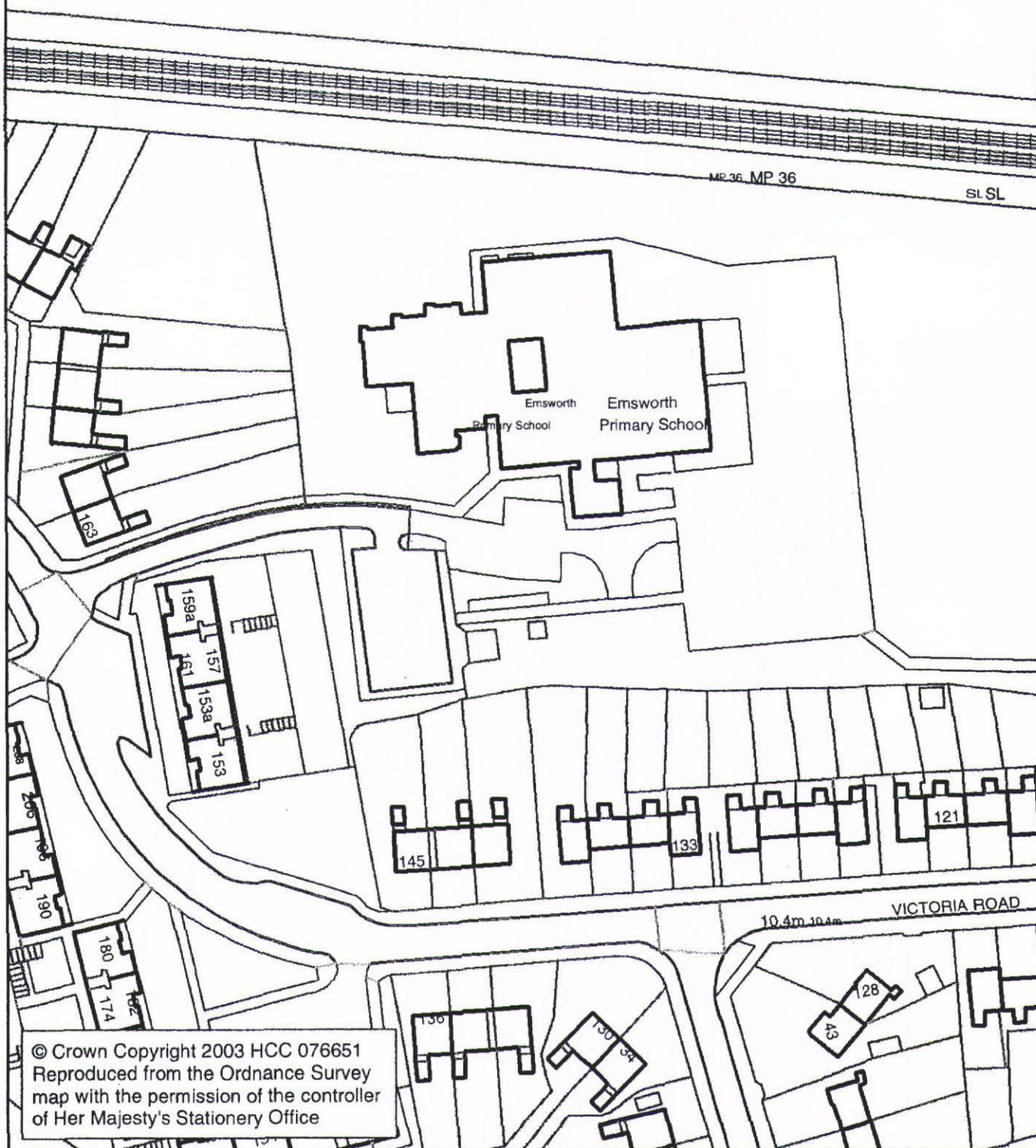
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Emsworth Primary School
Epoch 4 1919-1943

 Hampshire
County Council

0 20 40 80 Meters

Scale 1:1000



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Emsworth Primary School

Emsworth



APPENDIX F

Site Investigation Methods

Window Sampling

Window sampling was carried out at a total of three positions on 12 November 2003 using a Terrier drilling rig. In situ SPT tests were carried out at 1m centres at locations WS1 and WS2, and samples taken at the depths shown on the records. Window sampled locations are indicated in Figure SK.02 and logs of the encountered conditions in Appendix B.

Trial Pitting

A total of two trial pits were excavated using hand tools on 12 November 2003. Trial pit locations are indicated in Figure SK.02 and logs of the encountered conditions in Appendix B.

Sampling

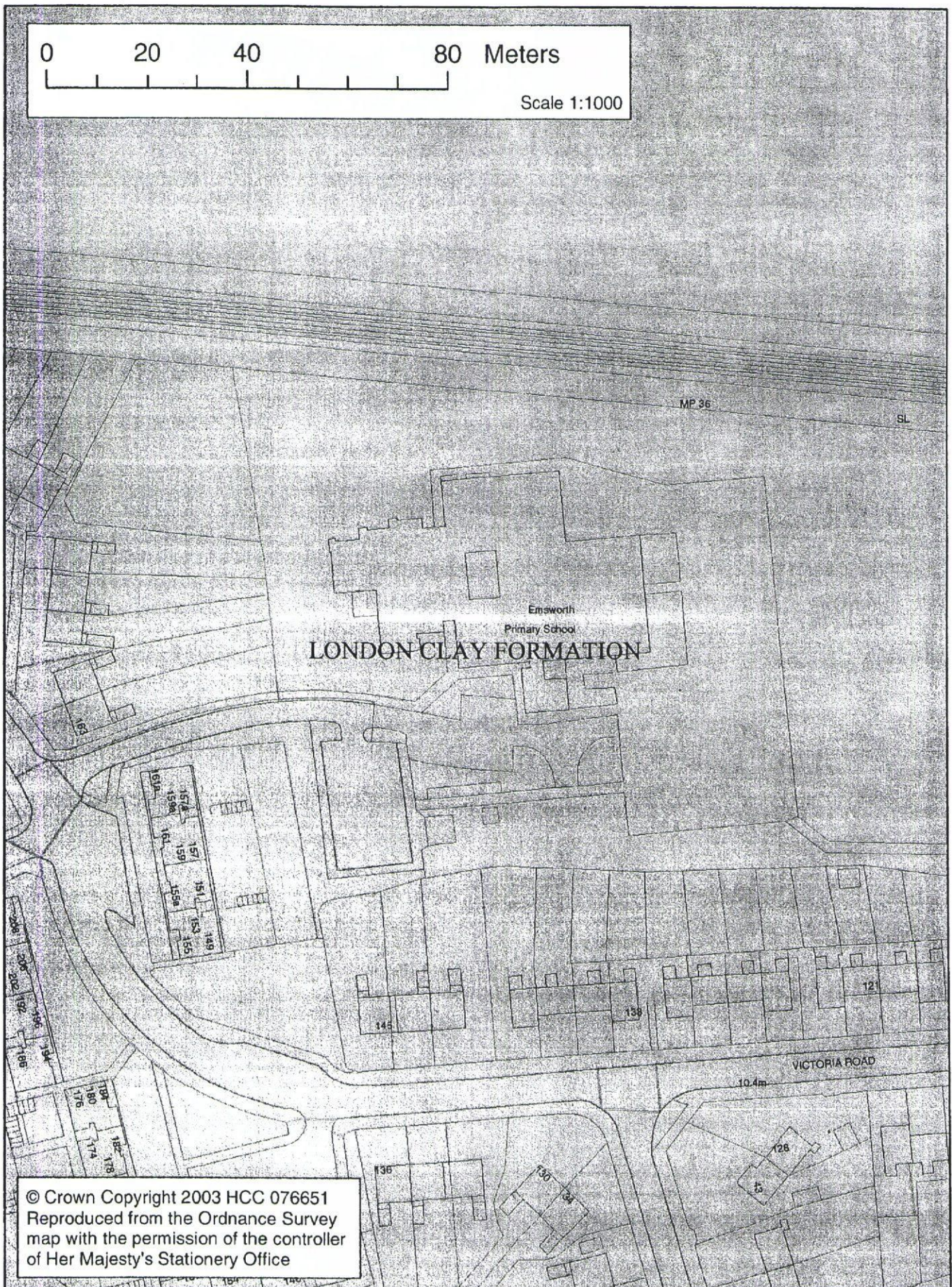
Disturbed were taken from the exploratory holes at the depths shown on the records. Small disturbed samples were obtained from throughout the window sampled locations for identification and laboratory testing purposes.

Appendix G

Proposed Development Plan

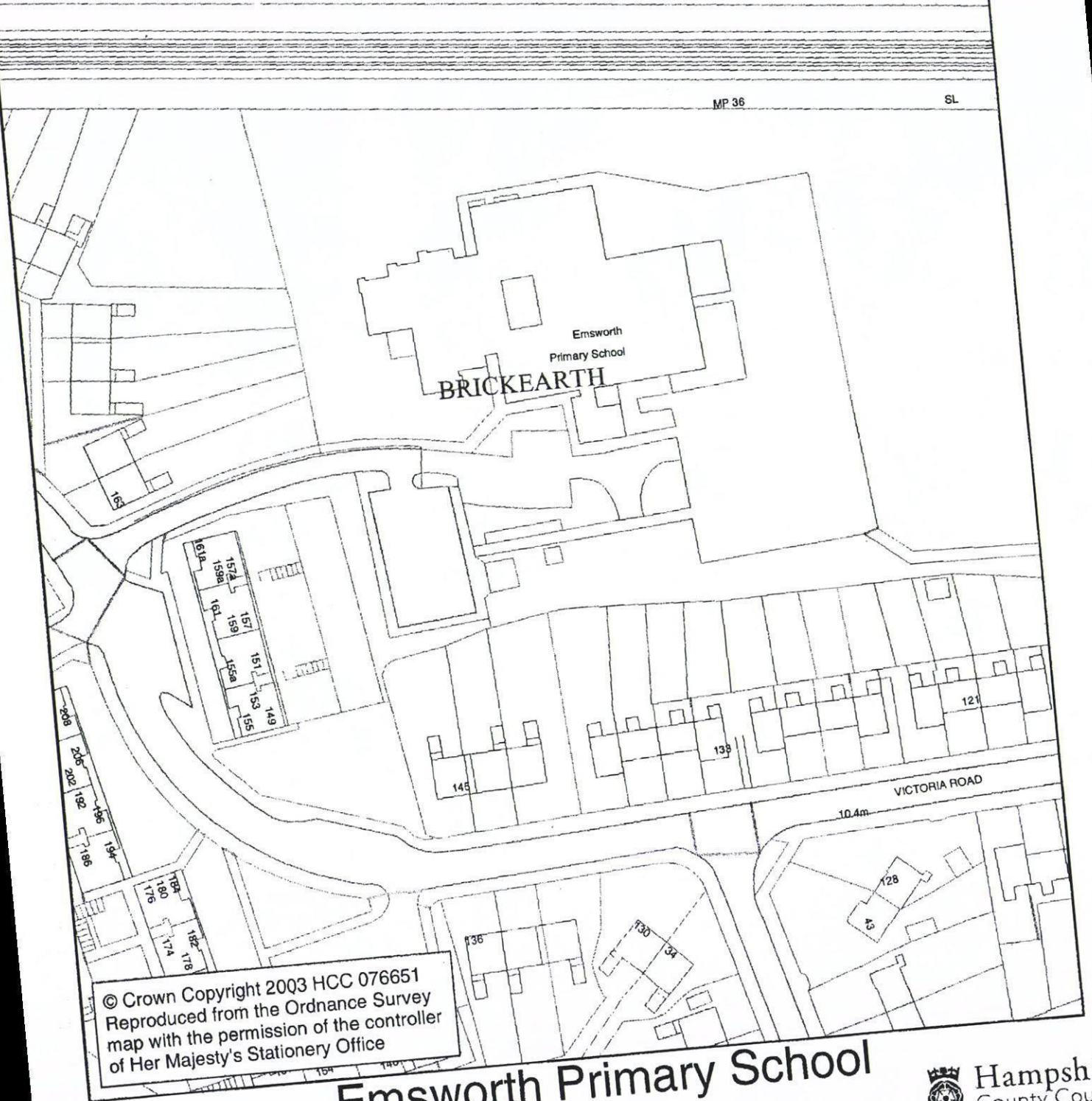
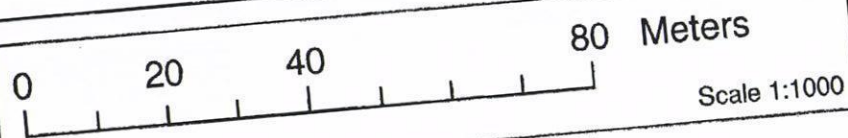
Appendix H

Additional Information Provided By HCC



Emsworth Primary School

Solid Geology



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Emsworth Primary School Drift Geology



Hampshire
County Council

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