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SOUTH WEST BICESTER

OXFORDSHIRE

GROUND INVESTIGATION

FACTUAL AND INTERPRETATIVE REPORT

Revision Record

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EXECUTIVE SUMMARY

Pell Frischmann was instructed by A D Woodley and Sons to carry out a Site Investigation for the proposed development of the land surrounding Whitelands Farm. The purpose of the report is to highlight the geotechnical and environmental considerations that should be addressed as part of the proposed scheme.

The superficial deposits comprise localised deposits of alluvium made ground and the completely weathered upper surface of the solid geology. The underlying solid geology comprises Kellaways Clay, Cornbrash and Forest Marble Formations.

A total of 11 percussive boreholes and 110 trial pits were undertaken as part of this investigation. The exploratory holes confirmed the anticipated ground conditions, together with some additional areas of made ground.

It will be possible to construct shallow foundations on the majority of the site. Only limited areas of made ground, peat or soft clay are deemed unsuitable. Sulphate tests on a limited number of samples show that the soils fall into Class 1 of the BRE Digest, with the exception of a limited number of made ground samples.

With respect to contamination, the majority of the site did not contain any significant levels of contaminants. The backfilled quarry in the north west corner of the site did show elevated levels of some metals, but these were proved to be immobile.

Other than the provision of a clean break layer for landscaping areas or cover by hardstanding in limited areas, we do not consider the contaminants present a significant hazard on site, although disposal off site may attract additional costs. This is with the proviso that two anomalous results towards the eastern site boundary are investigated further, with a limited programme of testing.

The majority of soils encountered beneath the site will in general be acceptable for reuse as earthworks materials. Excavation sides within the soils will generally be stable, although excavation depth is likely to be restricted over much of the site due to shallow rockhead. Limited groundwater control measures may be required where perched water is encountered.

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1. INTRODUCTION

A D Woodley and Sons Ltd has commissioned Pell Frischmann Consultants to carry out a Site Investigation at the site of Whitelands Farm at Bicester Oxfordshire. The proposal is to develop the land surrounding the farm for a variety of end uses, including residential and light industrial. The site investigation is required to ascertain whether the site is suitable for the proposed use and any remedial works that may be required.

This Report gives an assessment of the underlying ground conditions together with the possible problems that may occur as a result of the proposed scheme. This includes recommendations on foundation design, the potential for material re-use and an assessment of potential contamination of the site.

2. EXISTING INFORMATION

Information on sub-surface data has been obtained from the British Geological Survey Sheet SP52SE Geological Map [1]. Reference has also been made to the Pell Frischmann Desk Study [7] with respect to records of previous land use and potential contamination from sources either on or adjacent to the site.

3. SITE DESCRIPTION

The site is of generally low relief with a gradual fall to the Southeast. Land use was seen to be wholly agricultural, with fields surrounding the buildings of Whitelands Farm. Small stands of trees occurred across the site. Two main open drainage ditches were noted. One in the south eastern area of the site appeared to originate within the site boundary and exited the site in a south east direction. The other entered the site on the northern boundary and exited in an approximately east south east direction. At the time of the survey, the majority of the site was being used for crop production, with minor areas in the north eastern corner and immediately north west of Whitelands Farm being given over to livestock.

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The backfilled quarry in the north western corner of the site did not show any significant surface features other than a slightly darker topsoil with occasional ash and clinker fragments compared to the surrounding areas.

An area of obviously disturbed ground in the north western corner of the site was noted during the ground investigation, forming shallow depressions and low rounded mounds. Exploratory boreholes were undertaken to investigate these features.

4. SITE HISTORY AND DEVELOPMENT

Based on current and historical Ordnance Survey maps obtained for the Desk Study and dating from 1884/1885, it was considered that the site was unlikely to be affected by a legacy of industry. Only two areas of potentially significant contaminating activities were identified either on or in the vicinity of the site.

In the north west corner of the site there is an infilled quarry which covers an approximate area of 500 square metres. From discussions with the Farmer for the site, Mr Alan Woodley, it is understood that the material disposed of, originated from nearby military premises and comprised mainly ash from burnt waste, with scrap vehicle parts. This quarry was accurately delineated during the ground investigation.

To the north east of the site there is an existing petrol filling station. Historical and current maps identified that the remainder of the site has comprised agricultural land throughout the period between 1884/1885 and the present.

During the ground investigation it became clear that there had been a further unrecorded area of quarrying activity in the north eastern area of the site. From the exploratory hole data, it appears that this activity comprised the shallow excavation of the weathered upper surface of the Forest Marble limestone, with larger blocks of stone being removed and the finer granular materials forming discard. These small spoil mounds gave a gently undulating surface to the area. There was also a suggestion of lime burning activity in one of the excavations, with some white calcined limestone noted within the generally fine grained granular material.

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5. GEOLOGY AND HYDROGEOLOGY

5.1 Geology

Published geological information [1] indicates this area to be underlain by rocks of the Jurassic Period with limited overlying superficial deposits.

The superficial deposits, in the vicinity of the site, are recorded as Quaternary in age and comprise localised deposits of Alluvium, which generally follow the route of the local streams.

Based on the geological map of the area, the solid rocks under the site comprise the following (youngest first):

- Kellaways Clay
- Cornbrash
- Forest Marble Formations.

The Cornbrash Formation generally covers the northern areas of the site, with other smaller outcrops towards the south eastern boundary and typically comprises grey and yellow brown rubbly limestones. The Forest Marble Formation is present as a small outcrop in the north east corner of the site and generally comprises interbedded grey flaggy mudstone and sandy limestones. The Kellaways Clay Members present in the southern of the site comprises dark grey mudstones.

The ground investigation was able to penetrate the weathered upper surfaces of these formations, the Cornbrash being recovered as a sandy silty gravel, the Forest Marble Formations as either a coarse gravel (where limestone) or a stiff to very stiff clay (where mudstone) and the Kellaways Clays as a firm to very stiff clay.

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5.2 Hydrogeology

The Environment Agency classifies inland waterways (rivers and canals) according to the General Quality Assessment scheme (GQA). The GQA scheme is designed to provide an accurate and consistent assessment of the state of water quality changes over time. The chemistry GQA describes quality in terms of three chemical measurements, which detect the most common types of organic pollution.

The nearest surface watercourse to the site is Gagle Brook, which lies approximately 50 to 100m south of the site. There are also two on-site streams or drainage ditches, which drain into an off-site drain lying approximately 350m east of the site. Gagle Brook and the on-site drains are not classified, however the unnamed off-site drain to the east has a GQA of Grade D (Fair).

The Environment Agency (EA) Groundwater Vulnerability Map and Regional Appendices, which make up part of the published 'Policy and Practice for the Protection of Groundwater', divide the underlying strata in England and Wales into major, minor and non aquifers dependent upon their potential for potable water supply.

The underlying Combrash and Forest Marble Formations are classified as a minor aquifer with the Kellaways Clay Formation classified as a non-aquifer.

There are four licensed groundwater or surface abstractions located within 500m of the site, one being on the site adjacent to Whitelands Farm. Three of the abstractions are to provide water for general agricultural use in adjacent farms whilst the fourth is the water supply for the adjacent caravan site.

There are two consents to discharge, one in the north east corner of the site and the second approximately 750m east of the site adjacent to the sewage treatment works.

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6. FIELDWORK

6.1 General

The ground conditions were determined by drilling cable percussion boreholes and excavating trial pits. Selected samples taken from the exploratory holes were subsequently used to undertake geotechnical and chemical laboratory testing.

The fieldwork was carried out between 7th and 22nd August 2001.

The ground investigation was carried out in general accordance with BS5930: 1981 "Code of Practice for Site Investigations" and was supervised by technical staff from Pell Frischmann Consultants Ltd. Pell Frischmann Consultants Ltd originally specified the locations and depths of the exploratory holes and pits. These were modified during the site works due to harvesting activities leading to access restrictions at various times across the site. The exploratory hole and pit locations are indicated in **Figure 1**.

6.2 Cable Percussion Boreholes

A total of eleven boreholes with a nominal diameter of 150mm were drilled by light cable percussion techniques to depths of between 1.5 metres and 5 metres below existing ground levels.

During the course of cable percussion boring, small (jar), large disturbed (bulk) and water samples were obtained for identification and classification purposes. In addition, 100mm nominal diameter undisturbed samples were obtained in cohesive soils using standard open drive sampling equipment.

In granular soils, cohesive soils and weathered bedrock, in situ Standard Penetration Tests (SPT's) were performed in accordance with BS 1377: Part 9 to provide an indication of the relative density and shear strength of the materials. The results, uncorrected for the effects of overburden pressure, are presented on the Borehole Records in **Appendix 1**.

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A water-monitoring standpipe was installed in one borehole, BH9. The boreholes did not encounter groundwater during drilling operations.

The remainder of the boreholes were backfilled with arisings on completion.

6.3 Trial Pits

A total of 110 trial pits were dug using a Komatsu backactor excavator. The pits were taken to a maximum depth of 3m below the existing ground level.

During the course of trial pitting, both soil and water samples were obtained for identification, classification and chemical testing purposes. In addition in-situ CBR and vane shear tests were carried out where applicable. The trial pits were then backfilled with the arisings.

6.4 Exploratory Hole Records

The depths and descriptive details of all strata encountered, together with details of all samples recovered are presented on the Exploratory Hole Records in **Appendix 1**. The strata descriptions are based upon in-situ observations and examination of the samples by an Engineering Geologist and take into account the results of laboratory testing.

The descriptions are in general accordance with the requirements of BS 5930:1999[3].

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7. GROUND CONDITIONS

7.1 Strata Encountered

A summary of approximate areas of the different soils and rocks encountered is given in **Figure 2**. These broadly follow the arrangement of the geological map for the area, although it should be noted that our site investigation does not represent a detailed mapping exercise and that a degree of simplification has been adopted, with conditions being considered primarily in engineering terms.

The boundaries given in **Figure 2** are generally estimated between widely spaced exploratory holes and should thus be regarded as only indicative. Further detailed investigation of individual plots would be required to confirm this initial estimate.

(i) Made Ground

The strata encountered generally confirmed the published geology of an area of made ground in the north west of the site, with the addition of made ground in the north eastern area of the site and other probably localised areas of fill in the central eastern area of the site.

Between 1.65m and 2.45m of granular made ground was identified in the north west of the site, predominantly comprising ash fill with much glass and metal fragments. Some larger pieces of metal were identifiably vehicle engine parts. The glass, including some intact bottles, showed some evidence of melting, indicating high temperature combustion in the past.

Made ground in the north eastern area of the site was largely a fine sandy silty clayey gravel, although a 1.3m thick layer of soft to firm cohesive material with plant remains was encountered in one trial pit, TP84.

Probable localised areas of fill were identified in the central eastern area of the site in Trial Pits 76 and 76B, comprised largely cohesive materials between 2.1m and 2.5m deep. Trial pit 76B was extended in a north east to south west direction and appeared to show a shallow channel in the underlying limestone, infilled by clay. This could represent either an infilled drainage ditch or formally unrecorded shallow limestone quarry, similar to those identified elsewhere on the site.

(ii) Alluvial Deposits

Alluvial deposits were encountered in the south eastern area of the site comprising predominantly sand between 1m and 1.8m thick, and in the north eastern corner as a thin layer of soft clay and peat to less than 1m depth below ground level.

(iii) Kellaways Clay

Kellaways Clay was encountered in much of the southern and south western area of the site. This comprised predominantly stiff clay (highly to completely weathered mudstone) between 0.5m and 2.5m thick, and either gradually becoming a weak to very weak mudstone with increasing depth or was underlain by limestone (the Cornbrash).

(iv) Cornbrash

Cornbrash was encountered in the much of the northern area of the site. This comprised predominantly coarse granular material (highly to completely weathered limestone) between 0.5m and 2.5m thick, and either was underlain by generally moderately weak to moderately strong limestone or a stiff to very stiff clay, this representing completely weathered mudstone of the Forest Marble Formation. Grading results for the Cornbrash identified a range from a silty sandy gravel to a very clayey very silty sandy gravel.

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(v) Forest Marble

Forest Marble Formation was encountered in the north eastern area of the site and underlying the Cornbrash where the base of this layer was penetrated. The Forest Marble Formation comprised either a moderately strong light grey limestone, (weathered to a granular material on the upper surface) or a predominantly stiff to very stiff clay (highly to completely weathered mudstone). The clay was found to be between 0.5m and 2.5m thick, becoming a weak mudstone with increasing depth, with occasional beds of moderately weak siltstone. Grading results for the Cornbrash identified a range from a silty sandy gravel to a very clayey very silty sandy gravel.

7.2 Groundwater

Groundwater was encountered in a number of trial pits across the site, but its occurrence was intermittent, being present in some pits but absent in adjacent ones. Water inflow was generally restricted to a seepage and a delay of up to an hour was often required to allow sufficient water to collect to enable a sample to be obtained.

A very minor seepage (reported as the borehole becoming damp) was noted in made ground in Borehole 1. The majority of groundwater encountered was as seepages either within the Cornbrash or at the interface between this and the underlying Forest Marble mudstones.

Water in the form of both a seepage and a moderate inflow was encountered at the interface between the suspected clay fill and Cornbrash, in trial pits TP 76 and TP 76B

Both seepages and moderate inflows were noted in the weathered upper surface of the Forest Marble in the north east corner of the site, although this is considered to be a local feature, attributable to the proximity of drainage ditches in this area.

The water strikes are considered to represent perched water, generally within the Cornbrash.

It should be noted that groundwater levels may be subject to seasonal and other variation.

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A summary of groundwater strikes is tabulated below in Table 1:

Exploratory Hole	Depth Water Encountered (m)	Depth Water Rise (m)	Comments
BH1	1.3	None	Very minor seepage in made ground
BH2	3.0	None	Very minor seepage at interface Cornbrash and underlying Forest Marble clay
BH11	1.0	None	Seepage from Cornbrash
TP14A	1.8	None	Seepage at interface Cornbrash and underlying Forest Marble clay
TP15A	1.0	None	Seepage from Cornbrash
TP16	1.5	None	Seepage from sandy lenses in Forest Marble clay
TP17	1.1	None	Seepage at interface Cornbrash and underlying Forest Marble clay
TP36	0.5	None	Seepage from Cornbrash
TP47	1.0	None	Seepage from Cornbrash
TP52	2.0	None	Seepage from Cornbrash
TP59	1.8	None	Seepage from Cornbrash
TP71	0.9	None	Seepage from Cornbrash
TP76	2.5	1.7 after30 mins.	Moderate inflow at interface clay fill and underlying Cornbrash
TP76B	2.1	2.0 after 20 mins.	Seepage at interface clay fill and underlying Cornbrash
TP83	0.8	0.6 after 20 mins.	Moderate inflow close to interface of gravel and underlying Forest Marble limestone
TP89A	0.9	None	Seepage at interface clayey gravel and underlying Forest Marble limestone
TP89B	0.9	0.45m in 30 mins.	Moderate inflow close to interface of gravel and underlying Forest Marble limestone

Table 1 Groundwater Encountered by Exploratory Holes

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8. LABORATORY TESTING

A programme of laboratory testing was prepared by Pell Frischmann Consultants. Engineering tests were carried out by Thyssen Geotechnical and chemical tests by ECOS Ltd. All engineering test results and chemical test data are presented in **Appendix 2**.

8.1 Engineering Tests

A programme of geotechnical testing was undertaken on selected bulk, small disturbed and undisturbed soil samples recovered from the exploratory holes. Testing was carried out in general accordance with BS 1377:1990[4] and comprised:

- Natural Moisture Content
- Atterberg Limits
- Particle Size Analysis
- Quick Undrained Triaxial Test on Undisturbed Samples
- Quick Undrained Triaxial Test on Remoulded Samples
- One Dimensional Consolidation Test
- pH Value
- Sulphate Content
- 2.5kgCompaction Tests (Dry Density/Moisture Content Relationship)
- 4.5kgCompaction Tests (Dry Density/Moisture Content Relationship)
- California Bearing Ratio Tests at Natural Moisture Content
- California Bearing Ratio Tests at Each Compaction Point

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8.2 Chemical Testing

A programme of chemical testing was undertaken on 58 selected soil samples recovered from the exploratory holes. Leachate tests were also undertaken on 11 of the soil samples to determine the potential mobility of any contaminants identified.

Soil samples obtained were analysed for the following determinants:

Arsenic	Lead	Cyanide
Boron	Mercury	Thiocyanate
Cadmium	Nickel	Selenium
Chromium	DRO	Zinc
Copper	pH	Phenol
Sulphate	Sulphide	Sulphur
PAH	Pesticide Suite	Leachate

A programme of chemical testing was undertaken on 11 selected water samples recovered from the exploratory holes to assist in identifying any potentially mobile contaminants.

Water samples obtained were analysed for the following determinants:

Arsenic	Lead	Cyanide
Boron	Mercury	Thiocyanate
Cadmium	Nickel	Selenium
Chromium	DRO	Zinc
Copper	pH	Phenol
Sulphate	Sulphide	Sulphur
PAH	Chloride	PCB
Ammoniacal Nitrogen	Total Organic Carbon	

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9. ENGINEERING CONSIDERATIONS

9.1 Ground Conditions

(i) General

The investigation has identified that the site is underlain by Cornbrash, Kellaways Clay and Forest Marble, with limited areas of alluvium and made ground, as detailed in Section 7 of this report. An indicative plan showing their possible distribution is given in **Figure 2**. The engineering properties of these groups are considered below.

(ii) Made Ground

Between 1.65m and 2.45m of granular made ground was identified in the north west of the site, predominantly comprising ash fill with SPT 'N' values ranging from 1 to 20 (very loose to medium dense). The higher values are probably due to larger obstructions within the fine ash material and thus should be treated with caution. It is recommended that the lower bound 'N' value is assumed for the purposes of design and that the whole deposit is assumed to be very loose.

Made ground in the north eastern area of the site was largely a fine sandy silty clayey gravel, although a 1.3m thick layer of soft to firm cohesive material with plant remains was encountered in one trial pit, TP84. From observations during excavation, the granular material should be assumed to be very loose and the cohesive fill treated as a soft organic clay.

Probable localised areas of fill were identified in the central eastern area of the site and comprised largely cohesive materials. A single test on a sample of clay from TP76 has a low plasticity (CL on the Casagrande Plasticity Chart). Although described as a stiff clay in the trial pits, this type of material can be subject to considerable lateral variation, therefore conservative assumptions are recommended for design.

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(iii) Alluvial Deposits

Alluvial deposits were encountered in the south eastern area of the site predominantly as a thin layer of sand, and in the north eastern corner as a thin layer of soft clay and peat.

The cohesive soils were found to have a high to extremely high plasticity (H to EH on the Casagrande Plasticity Chart). Shear strength values of 30 kN/m^2 were obtained from vane tests. The shear strength from a remoulded triaxial test (Cu_{rem}) was found to be only 9 kN/m^2.

(iv) Kellaways Clay

Kellaways Clay was encountered in much of the southern and south western area of the site. This comprised predominantly stiff clay (highly to completely weathered mudstone) and either gradually becoming a weak to very weak mudstone with increasing depth or was underlain by limestone (the Cornbrash).

The cohesive soils were found to have a high to very high plasticity (CH to CVH on the Casagrande Plasticity Chart). Shear strength values of in excess of 130 kN/m^2 were obtained from vane tests. The shear strength from a triaxial test (Cu) was 71kN/m^2. The shear strength from a remoulded triaxial test (Cu_{rem}) was found to be 227kN/m^2.

(v) Cornbrash

Cornbrash was encountered in much of the northern area of the site. This comprised predominantly coarse granular material (highly to completely weathered limestone) and was either underlain by generally moderately weak to moderately strong limestone or a stiff to very stiff clay, this representing completely weathered mudstone of the Forest marble Formation. This clay gradually became a weak mudstone with increasing depth, with occasional beds of moderately weak siltstone.

SPT 'N' values of between 20 and 60 were obtained in the weathered Combrash (medium dense to very dense).

(vi) Forest Marble

Forest Marble Formation was encountered in the north eastern area of the site and underlying the Combrash where the base of this layer was penetrated. The Forest Marble Formation comprised either a moderately strong light grey limestone, (weathered to a granular material on the upper surface) or a predominantly stiff to very stiff clay (highly to completely weathered mudstone, becoming a weak mudstone with increasing depth, with occasional beds of moderately weak siltstone).

The granular weathered surface of the limestone was generally less than 1m in thickness and assessed as dense to very dense from observations during excavation.

The cohesive materials were found to have an intermediate to high plasticity (CI to CH on the Casagrande Plasticity Chart). Shear strength values of in excess of 130 kN/m^2 were obtained from vane tests. The shear strength from triaxial tests (Cu) varied between $96kN/m^2$ and $173kN/m^2$.

9.2 Foundation Assessment

Foundation design has at this stage been limited to a general assessment, identifying the suitable foundation types that can be adopted, an allowable bearing pressure for a pad footing and general advice. Individual structures should be reassessed when final locations, loadings and settlement requirements are known.

The made ground in the back-filled quarry area would not be suitable as a founding medium for pad footings, however, it is understood that this area is currently identified for a roundabout and access road. This is discussed further in Section 9.3 of this report.

For the area of made ground associated with shallow working of the weathered limestone in the north eastern area of the site, the material was predominantly granular, with intact

limestone beneath. Individual footing loads should be taken through the made ground layer and onto the limestone beneath. Proof rolling of the made ground and removal of any soft spots or cohesive fill should be sufficient for most types of ground bearing slabs, although this recommendation should be reviewed if a low settlement tolerance or high slab loads are required (such as occurs with large distribution warehouses).

The alluvial deposits encountered in the extreme north eastern corner of the site include soft clays, peat and organic clay. These will not be suitable as a founding medium and should be removed from beneath building footprints and in the case of the peat, also from beneath areas of hardstanding. The limited thickness of these materials means that significant excavation is unlikely, although provision for groundwater control in the base of excavations may be required.

For the remainder of the site the weathered Combrash, Forest Marble Formation and Kellaways Clays should be suitable for shallow foundations for residential and most light industrial or similar structures.

For the Kellaways Clay, an assessment of the bearing capacity has been made using the shear strength data. An allowable bearing pressure of at least 180kN/m^2 has been calculated for a 2m x 2m plan area footing, for a settlement of less than 25mm.

For the Combrash and granular Forest Marble, an assessment of the bearing capacity of the weathered upper surface of the limestone has been made, modelling the material as a granular soil. An allowable bearing pressure of at least 450kN/m^2 has been calculated for a 2m x 2m plan area footing, for a settlement of less than 25mm.

For foundations taken down into the unweathered limestone beneath, An allowable bearing pressure of at least 600kN/m^2 can be adopted for a 2m x 2m plan area footing, for a settlement of less than 25mm.

For the cohesive Forest Marble, an assessment of the bearing capacity has been made using the shear strength data. An allowable bearing pressure of at least 240kN/m^2 has been calculated for a 2m x 2m plan area footing, for a settlement of less than 25mm.

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9.3 Pavement Assessment

The subgrade will generally consist of the weathered upper surface of the Kellaways Clay, Cornbrash and to a lesser extent, the Forest Marble. Localised areas of made ground are also identified.

(i) Made Ground

The loose granular ash fill in the backfilled quarry at the north western edge of the site should respond well to proof rolling, with the removal of any soft spots. A CBR up to approximately 5% is advised, hence a sub-base thickness of 225mm or a 250mm capping with 150mm sub-base is recommended for this type of material.

It is strongly recommended that these materials are not trafficked during periods of wet weather as they could rapidly break down to a slurry. It should be noted that there is still a potential for differential settlement or reflective cracking at the quarry 'high walls' therefore it is recommended that any roads or hardstanding incorporate a geogrid reinforcement beneath the sub-base.

For the area of made ground associated with shallow working of the weathered limestone in the north eastern area of the site, the material was predominantly granular, with intact limestone beneath. Proof rolling of the made ground and removal of any soft spots or cohesive fill should be sufficient to ensure a CBR of 15%. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 150mm is recommended for this type of material.

With respect to the localised cohesive fill materials encountered in TP68, TP76 and TP76B, a CBR of 3% is recommended based on in-situ CBR testing and a conservative assessment, given the nature of the material. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 300mm or a 350mm capping with 150mm sub-base is recommended for this type of material.

(ii) Alluvium

The alluvial deposits encountered in the extreme north eastern corner of the site include soft clays, peat and organic clay. The soft clays should either be removed or replaced, or a design for a CBR of 1% be adopted. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a 600mm capping with 150mm sub-base is recommended for this type of material.

Should this latter option be considered, the use of geogrid reinforcement is likely. Any peat should still be removed from beneath proposed roads and areas of hardstanding.

The soils in the south eastern area of the site were identified predominantly as sands. Subject to proof rolling, with the removal of any soft spots, a CBR of at least 10% should be achieved. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 175mm or a 190mm capping with 150mm sub-base is recommended for this type of material. Due regard nevertheless should be given to the relatively high fines content of this material and potential frost susceptibility with respect to final construction thickness.

(iii) Kellaways Clay

With respect to the Kellaways Clay in the southern half of the site, laboratory CBR tests and in-situ CBR tests by Mexe Probe indicated a CBR of 5% should be adopted for design purposes. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 225mm or a 250mm capping with 150mm sub-base is recommended for this type of material.

(iv) Cornbrash

With reference to the laboratory CBR tests, a CBR of greater than 15% should be achieved on Cornbrash, this occurring predominantly in the northern half of the site. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 150mm is recommended for this type of material. Due regard nevertheless should be given to the relatively high fines content of this material and potential frost susceptibility with respect to final construction thickness.

Given the relatively high fines content of some of this material, it is recommended that exposure to rainfall or surface water is minimised. A moisture content increase could lead to deterioration of the subgrade and an attendant reduction in CBR. Similarly, tracking of the subgrade should be avoided in periods of wet weather. Provision should also be made for the removal of localised 'soft spots' and replacement by suitable granular fill.

(v) Forest Marble

With reference to the laboratory CBR tests, a CBR of greater than 15% should be achieved on the granular Forest Marble, this occurring predominantly in the north eastern corner of the site. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 150mm is recommended for this type of material. Due regard nevertheless should be given to

the relatively high fines content of this material and potential frost susceptibility with respect to final construction thickness.

As with the Cornbrash, given the relatively high fines content of some of this material, it is recommended that exposure to rainfall or surface water is minimised. A moisture content increase could again lead to deterioration of the subgrade and an attendant reduction in CBR. Similarly, tracking of the subgrade should be avoided in periods of wet weather. Provision should also be made for the removal of localised 'soft spots' and replacement by suitable granular fill.

With respect to the cohesive Forest Marble, this generally underlies the Cornbrash in the northern half of the site, laboratory CBR tests indicated a CBR of 8% chould be adopted for design purposes. This is supported by in-situ CBR tests by Mexe Probe. Based on Figure 3.1 of the Department of Transport HD25/94[5] Design Manual for Roads and Bridges, a sub-base thickness of 190mm or a 210mm capping with 150mm sub-base is recommended for this type of material.

This material is generally below a layer of Cornbrash and thus may not in the majority of cases form the subgrade. However, if road levels are required to be deeper than the existing ground levels, the reduction in CBR compared to the overlying Cornbrash should be borne in mind.

9.4 Excavations and Material Re-use

From observations during the trial pitting exercise, it is considered that excavations in most conditions will generally be stable, and the presence of hard strata at shallow levels will limit the depth of excavation over much of the site. Therefore a requirement for provision of temporary support or battering back of excavation sides is unlikely for the majority of development.

An assessment of the suitability of the various material groups is given below for use as general fill materials. It should be noted that the gradings obtained means that much of the granular material will be unlikely to achieve the relatively high specifications required for specialist fills, such as those required for drainage media or fill behind structures.

(i) Made Ground

The vast majority of made ground is unlikely to be able to be re-used as an engineered fill, other than as a Class 4 Landscaping Fill in accordance with the Department of Transport Specification[6]. It may be possible to re-use the stiff clays encountered in TP76 and TP76B as a Class 2B general fill, although with the potential for variation within such materials, further testing would be required before such an assumption could be adopted for design. Due regard should also be given to the recommendations given in Section 10 of this report with respect to contamination.

(ii) Alluvium

The majority of alluvial materials are also unlikely to be able to be re-used as an engineered fill, other than as a Class 4 Landscaping Fill in accordance with the Department of Transport Specification[6].

The thin layers of alluvial sand in the south eastern area of the site may prove to be usable as a Class 1 fill, but the majority of this area is currently in the area identified as 'open space'.

(iii) Kellaways Clay

For the cohesive weathered Kellaways Clay materials, it is estimated that approximately 70% of this material should be suitable as a Class 2A or 2B general fill material in accordance with the Department of Transport Specification[6], the majority of the remainder being too wet of the soils plastic limit.

(iv) Combrash

For the weathered Combrash materials, it is estimated that approximately 55% of this material should be suitable as a Class 1A or 1B general fill material in accordance with the Department of Transport Specification[6], the remainder again having too high a fines (silt and clay) content. Although failing the criteria for this specification, as for the granular Forest Marble, we are of the opinion that a greater proportion of the material may be re-usable as an engineered fill, subject to a field trial. This would involve the laying of a test panel, followed by measurement of in-situ dry density and moisture content by Nuclear Density Gauge. Dependent on end –use requirements, the test panel could also be subjected to plate bearing tests to confirm acceptable compaction and performance.

(v) Forest Marble

For the cohesive weathered Forest Marble Formation materials, it is estimated that approximately 75% of this material should be suitable as a Class 2A or 2B general fill material in accordance with the Department of Transport Specification[6], the majority of the remainder being too wet of the soils plastic limit.

For the granular weathered Forest Marble Formation materials, it is estimated that approximately 60% of this material should be suitable as a Class 1A or 1B general fill material in accordance with the Department of Transport Specification[6], the remainder having too high a fines (silt and clay) content. Although failing the criteria for this specification, we are of the opinion that a greater proportion of the material may be re-usable as an engineered fill, subject to a field trial. This would involve the laying of a test panel, followed by measurement of in-situ dry density and moisture content by Nuclear Density Gauge. Dependent on end –use requirements, the test panel could also be subjected to plate bearing tests to confirm acceptable compaction and performance.

Particular care is needed in using the cohesive materials identified for earthworks, in both the Kellaways Clays and the cohesive Forest Marble. Their sensitivity to increase in moisture content is demonstrated by the CBR test results, where a rapid decline in CBR % is shown for only a slight increase in moisture. Delays following exposure and working during wet weather should both be expressly avoided.

For the granular materials, heavy compaction plant is likely to ensure sufficiently low air voids. The use of vibrating rollers is not recommended given the relatively high silt content, particularly if the more marginal materials are intended for re-use.

9.5 Shrinkage and Swelling

The test data indicates that the cohesive deposits are generally intermediate to high plasticity. It is recommended that a high shrinkability classification be adopted (NHBC Standard Building Near Trees Chapter 4.2). If foundations are to be placed on this material the guidelines of this standard should be followed with regard to foundation depths and the planting of trees.

9.6 Sulphate Assessment

As part of the site screen potential for contaminants, tests included for total sulphate content. Results show the total soil sulphate content to be below 0.24% SO_4, except within the ash fill materials encountered in the backfilled quarry at the north western corner of the site and one anomalous result at TP68. The pH results varied between 6.3 and 8.4 but were generally in excess of 7.

Tests on 11 groundwater samples showed sulphate levels to be well below 0.4 g/l SO_4 and pH to be between 7.2 and 7.9.

A total of 14 soil samples of near surface deposits were tested for 2:1 water/soil extract sulphate content and pH. Results show the 2:1 water/soil extract sulphate content to be below 0.4 g/l SO_4 except again within the ash fill materials encountered in the backfilled quarry at the north western corner of the site. The pH varies between 7.2 and 8.5.

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For the ash fill material, the sulphate results fall into Class 2 of BRE Digest 363, 1996 [2]. As discussed further in Section 10, the anomalous data from TP68 should be subjected to an additional limited site investigation. For the remainder of the site, the sulphate results fall into Class 1 of BRE Digest 363 in terms of soil and groundwater results.

9.7 Drainage

With respect to the excavation for site drains and other services, due regard should be given to the difficulties experienced by the excavator during the trial pitting exercise. Design should take account of the final levels identified in each of the logs. Attempting to dig below these levels may require the breaking out of rock.

It is understood that soak-away drainage is being considered for the site. To this end the permeability of the Cornbrash has been investigated using the laboratory grading data and a limited programme of soak-away tests in trial pits.

From the grading curves, a range of permeability has been calculated. For Cornbrash this varies from $1x10^{-5}$mm/s (typical of a silt) to $9x10^{-3}$mm/s (typical of a fine sand/coarse silt). This material would not be considered ideal for a soak-away drainage design, both in terms of performance and because of the risk of a loss of fines leading to silting up of the pit and even possible local subsidence.

The soakaway tests in trial pits are summarised overleaf in Table 2 with an average of the volume of water lost from each pit per minute:

0,0.0.0.1 mm/s - 0.00? mm/s

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Exploratory Hole	Average Water Loss m^3/min.	Average Water Loss Litres/min (Approx.)
TP45	0.010	10
TP46	0.115	115
TP56	0.050	50
TP64	0.005	5
TP65	0.012	12
TP73A	0.010	10

Table 2 Summary of Soak-away Tests

We have reservations with regard to adopting soak-aways as the main method of drainage on the site.

Firstly, the layer for drainage to occur in is likely to be restricted to the relatively thin Cornbrash layer, this at least in part being bounded above and below by weathered mudstones, giving an essentially impermeable cap and base to this layer. The capacity of this layer could thus be severely restricted.

Secondly, it is understood that high groundwater levels can occur during the winter, based on discussions with the Farmer for the site, Mr Alan Woodley, who has observed water levels within approximately 0.5m below ground level during new drainage ditch excavation. This could in effect turn soak-aways into ponds during the period of maximum demand on the drainage system.

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10.0 CONTAMINATION ASSESSMENT

10.1 General

Initial desk study information indicated no previous potentially contaminative use on or immediately adjacent to the site, other than a small quarry in the north west corner and a petrol station on the eastern boundary. The selection of samples for contamination testing was based on concentrating tests on these areas and any other suspected made ground, together with a general screen across the site.

The chemical analysis was undertaken by ECOS Ltd, a UKAS accredited laboratory with specialised testing expertise.

In order to interpret analytical results it is common practice to compare them with the various guidelines published across the UK and within Europe. These guidelines act as an aid and are by no means definitive and any judgement must be based on a source - pathway - target analysis. These guidelines include the UK Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) published in Guidance Note 59/83, UK Water Supply (Water Quality) Regulations (1989) and the soil and groundwater guidelines published by the Dutch authorities as the Dutch Intervention Levels.

The ICRCL values provide the most appropriate guidance in the UK and are primarily intended as a guide to site re-development. They were first published in 1983 and use the concept of 'trigger' and 'action' concentrations of contaminants in soil, which are related to the intended end use of the site. The concentrations are related to the sensitivity of the site. However ICRCL values relate to soil only and cover a limited range of contaminants.

Therefore, it is common practice to use either the Dutch value, or where there are threshold concentrations specified, the Department of the Environment concentrations (set out in Waste Management Paper 4 for the 'completion of landfill sites') for the assessment of groundwater contamination. The Dutch value may also be adopted for assessing soil contaminants for which there are no ICRCL guidelines.

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The Dutch Intervention Levels are based on a framework comprising two threshold values of increasing concentration, the 'desired/target' level and the 'action/intervention' level. These are defined as follows:

- **The Target Level** - Not considered as hazardous or posing significant risk when concentrations occur below this level.
- **The Intervention Level** - A threshold value above which remediation should be considered.

10.2 Analysis of Results

The following sections subdivide the findings of the chemical testing programme into heavy metals potentially hazardous to health, phytotoxins and a range of other organic and inorganic contaminants. Only those results considered significant are given in the following sections.

10.2.1 Heavy Metals

Selected samples from the trial pits and boreholes were submitted for analysis to establish the concentrations of Heavy Metals. Where results exceeded the Dutch Intervention values the samples are identified in Table 3, with the relevant metals highlighted.

>55mg/kg >530mg/kg

Trial Pit No.	Depth (m)	Arsenic mg/kg	Cadmium mg/kg	Lead mg/kg	Mercury mg/kg	Chromium mg/kg
TT1	0.5	68.5	3.1	701	<1	87.7
TT2	0.5	122.8	2.2	1227	1.5	55.8
TT2	1.0	77.8	2.7	749.5	<1	58.5
TT3	1.0	87.7	5.2	1332.5	2.8	55.5
TP68	1.5	231	<0.2	6.6	<1	62.5
TP75	0.3	103.6	0.4	8.3	<1	39.2
% of Total Samples		10%	-	7%	-	-

TABLE 3: Heavy Metals potentially hazardous to health

Shaded boxes indicate concentrations in excess of Dutch Intervention Values

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Six arsenic concentrations exceeded the intervention value of 55mg/kg, with four of the samples being ash from the landfill site on the north western corner of the site, the other two occurring towards the central eastern boundary.

Four lead concentrations exceeded the intervention value of 530mg/kg the samples again being ash from the landfill site on the north western corner of the site.

The high results for arsenic and lead represent contaminants within the ash materials, which was anticipated, elevated metals being common in ash fills. The elevated levels of arsenic in the two other locations are somewhat more problematic.

Trial Pit 68 did include a thin clinker like layer of material at the interface between limestone and overlying clay, which on initial examination appeared to be the upper surface of limestone having been subject to leaching out of carbonate. Having considered further these observations, together with an assessment of the test data, we consider that this material is made ground, although it is not clear at this stage as to the origins of these materials.

There was no evidence of unusual conditions at the second of these two sampling points, TP75. Tests in similar materials in the surrounding area and groundwater samples did not identify any significant levels of contamination.

These high arsenic results may only represent isolated 'hot spots' of contamination, but we would strongly recommend a further limited investigation of both these areas.

10.2.2 Phytotoxic Metals

Soil samples were also submitted for analysis to establish the concentrations of phytotoxic metals, which can be detrimental to plants (namely copper, zinc and nickel). Where results exceeded ICRCL levels for phytotoxins or the Dutch Intervention values, the samples are identified in Table 4 overleaf, with the relevant metals highlighted.

Trial Pit No.	Depth (m)	Copper mg/kg	Nickel mg/kg	Zinc mg/kg
TT1	0.5	363.3	106	2967
TT2	0.5	420.6	169.8	1660.7
TT2	1.0	363.5	131.7	1737.5
TT3	1.0	327.2	173.0	1679.7
TP68	1.5	57.8	161.7	271.4
% of Total Samples		7%	9%	7%

Key: Exceeding ICRCL Levels

Exceeding ICRCL Levels and Dutch Intervention Values

TABLE 4: Metals detrimental to plant growth

The results indicated that copper, nickel and zinc occurs at elevated levels only within the ash fill materials at the north western corner of the site, with a single elevated level at TP68 adjacent to the eastern boundary. Due regard should be given to the results if it is intended to use these materials in landscaping, by for example the use of a 500mm break layer of clean material between the fill and overlying topsoil. It is interesting to note however that the north western quarry area has been successfully used for crop growing, although this may reflect dilution of contaminants by ploughing and mixing with topsoil.

10.2.4 Other Organic and Inorganic Contaminants

Soil samples were also submitted for analysis to establish the concentrations of the following organic and inorganic contaminants: polyaromatic hydrocarbons, phenols, cyanide (total, free and complex), thiocyanate, sulphate, sulphide, sulphur and total petroleum hydrocarbons. Tests were also undertaken on selected samples for pesticides, PCBs and Diesel Range Organics. Only one result for one analyte from the entire site exceeded Dutch Intervention Values or ICRCL Action Limits, namely the sample from TP 68 at 1.5m depth, which gave an unusually elevated sulphate result of 14,027 mg/kg. This represents 3% of all samples tested and again may reflect a 'hot spot' of contamination.

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10.2.5 Leaching Tests

Leaching tests were undertaken on 15 soil samples. All samples were analysed for 16 determinands comprising ammonia, arsenic, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, pH, total phenols, selenium, and zinc. No significant concentrations of contaminants were reported in these samples.

10.2.5 Water Testing

Chemical tests were undertaken on 11 water samples. All samples were analysed for determinands comprising arsenic, cadmium, chromium, lead, mercury, selenium, boron, copper, nickel, zinc, PAH (total and 16 EPA1), total phenols, cyanide, thiocyanate, sulphate, sulphide and sulphur.

Selected samples were also tested for chloride, ammoniacal nitrogen, total organic carbon, diesel range organics and PCBs. These concentrated on the areas adjacent to the quarry waste in the north western corner of the site and also the suspected made ground area towards the eastern boundary of the site. Other tests were undertaken as a general site screen.

A single sample was also recovered from the water bore at Whitelands Farm to test the water table at depth. It is understood that this water is abstracted from approximately 40m below existing ground levels, within the Great Oolite.

No significant concentrations of contaminants were reported in these samples, indicating that mobile contaminants were not present either from an on site source or from one originating off site.

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10.2.6 Material Disposal

With regard to the disposal of the material off-site, reference has been made to the Environment Agency publication 'Guidance on the Disposal of Contaminated Soils'. Under the disposal option identification flowchart in this publication, the majority of material from this site will require disposal in a suitably licensed or permitted site.

This is based primarily on levels of arsenic across the site. Although these are below the Dutch Intervention Values, the Environment Agency upper threshold value and do not exceed the leachability lower threshold values, they do exceed the Environment Agency lower threshold value of 10 mg/kg for the majority of samples recovered.

Reference has also been made to the contamination classes used by the Greater Manchester Waste Regulation Authority. This is used by a number of Local Authorities in the UK. The soil samples identified in Table 3 have been classified in accordance with this document. The results are summarised below in Table 5:

Trial Pit No.	Depth (m)	Arsenic mg/kg	Cadmium mg/kg	Lead mg/kg	Mercury mg/kg	Chromium mg/kg
TT1	0.5	C	B	B	A	A
TT2	0.5	D	B	C	B	A
TT2	1.0	C	B	B	A	A
TT3	1.0	C	B	C	B	A
TP68	1.5	D	A	A	A	A
TP75	0.3	D	A	A	A	A

Class A: Uncontaminated
Class B: Slightly Contaminated
Class C: Contaminated
Class D: Heavily Contaminated
Class E: Unusually Highly Contaminated

TABLE 5: Heavy Metals potentially hazardous to health GMWRA Classification

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The soil samples identified in Table 4 have also been classified in accordance with this document. The results are summarised below in Table 6:

Trial Pit No.	Depth (m)	Copper mg/kg	Nickel mg/kg	Zinc mg/kg
TT1	0.5	C	C	D
TT2	0.5	C	C	D
TT2	1.0	C	C	D
TT3	1.0	C	C	D
TP68	1.5	A	C	B

Class A: Uncontaminated
Class B: Slightly Contaminated
Class C: Contaminated
Class D: Heavily Contaminated
Class E: Unusually Highly Contaminated

TABLE 6: Metals detrimental to plant growth GMWRA Classification

Under the contamination classes used by the Greater Manchester Waste Regulation Authority, the materials sampled from the backfilled quarry would classify as either contaminated or heavily contaminated for arsenic, lead, copper and nickel, and slightly contaminated for mercury and cadmium. It is understood at present that the material is unlikely to be removed given the proposed construction of a roundabout over the area. We strongly recommend that this remains the case during the development of design.

The sample from TP75 at 0.3m depth classes as Class D Heavily Contaminated for arsenic.

The sample from TP 68 at 1.5m depth also classes as Class B Slightly Contaminated for zinc and Class D Heavily Contaminated for both arsenic and sulphate.

As stated previously, it is recommended that the areas these last two samples were taken from be investigated further, to delineate the suspected 'hot-spots' they represent.

Therefore, although not necessarily presenting a hazard whilst remaining on site, there is a strong possibility that the disposal of the materials identified above off-site may attract elevated rates and restrictions as to the suitable waste sites available. Should significant quantities of material need to be taken off-site, it is advised that the relevant waste regulatory authority is contacted in the first instance to ascertain the nearest suitable sites and the premiums charged on these materials.

10.2.7 General Comments for Construction Works

In general, good working practice should be sufficient to protect the workforce and public from the risk of hazards of contamination. In the event that any anomalous or suspect materials, water or odours are encountered, suspect material should be reported and professional advice sought.

These recommendations are subject to the findings of the limited additional investigation of the areas surrounding trial pits TP68 and TP75.

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11.0 RECOMMENDATIONS AND CONCLUSIONS

It is proposed to develop the site for a variety of end-uses including residential, leisure, business and light industrial.

The investigation has identified that the site is underlain by Cornbrash, Kellaways Clay and Forest Marble, with limited areas of alluvium and made ground. An indicative plan showing their possible distribution is given in **Figure 2**.

A preliminary assessment of foundation types has been given for the anticipated ground conditions. Shallow footings are considered suitable for the site, only limited areas of made ground and peat with soft clays may require excavation from beneath foundation footprints and replacement by suitable granular fill.

Assessment of the sulphate content of the near surface in situ deposits shows that they fall into Class 1 of Table 1 of BRE 363, 1996[2].

Soak-aways are considered unlikely to be a viable option as the main means of drainage for the site.

The majority of materials over the site are regarded as likely to be acceptable for re-use as general fill, with regard to the DTP Specification for Highway Works. Care will be needed to ensure moisture control is strictly adopted for the fill however, due to sensitivity to moisture content change.

For pavement design, a CBR of at least 15% is considered reasonable for the areas of the site underlain by Cornbrash and granular weathered Forest Marble, assuming proposed road levels remain close to existing. For areas underlain by Kellaways Clay, a CBR of 5% should be adopted for design.

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With respect to contamination, we do not consider that the site presents a significant hazard to the proposed end-uses. Other than the provision of a clean break layer for landscaping or cover by hardstanding in limited areas, we do not consider special measures will be required, although disposal off site may attract additional costs. Should significant quantities of material need to be taken off-site, it is advised that the relevant waste regulatory authority is contacted to ascertain the nearest suitable site and the premiums charged on these materials.

High results for arsenic, lead and phytotoxins within the quarry backfill were anticipated, elevated metals being common in ash fills.

The elevated levels of arsenic and sulphate in TP68 and of arsenic in TP75 are somewhat more problematic. These high results may only represent isolated 'hot spots' of contamination, but we would strongly recommend a further limited investigation of both these areas.

No significant contamination was noted throughout the remainder of the site.

There is no evidence of any significant concentrations of mobile contaminants on the site or from any off site source.

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12.0 REFERENCES

1. Geological Survey of Great Britain 1:10,000 Scale Geological Map. Sheet No SP52SE (Solid and Drift Edition).
2. Building Research Establishment, 1996. Sulphate and Acid Resistance of Concrete in the Ground. BRE Digest 363.
3. BS 5930:1999 Code of Practice for Site Investigation
4. BS1377:1990 Soils for Engineering Purposes
5. Department of Transport Design Manual For Roads and Bridges HD25/94
6. Department of Transport Specification For Highway Works Series 600
7. Pell Frischmann Consultants 2001. Phase 1 Desk Study for South West Bicester.

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FIGURES

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APPENDIX 1

EXPLORATORY HOLE LOGS

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH1

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 13/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.50						
MADE GROUND grey brown ash and clinker fill with much glass bottles, some metal and occasional pottery fragments. Glass showing signs of melting due to high temperatures in the past				1.00	D		19	
		2.00		2.00	D			
Soft to firm brown sandy CLAY		2.50		2.50	D			
Stiff light brown grey sandy CLAY				3.00	D		45	
		3.45		3.50	D			
Moderately weak light brown LIMESTONE		3.50						
Weak grey MUDSTONE (Chiselling 3.45m to 3.6m 1Hr)		3.60						
End of Borehole at 3.60 m								

3.00 dup

Lead 17mg/kg ok
Zinc 61mg/kg ok
Sulphide 1mg/kg ok
Sulphur 248 mg/kg

Logged by | Checked by

Remarks

TEST RESULTS ARE SPT N VALUES

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

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BOREHOLE RECORD

Borehole Number: BH2

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 13/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00 0.30		0.00	B			
MADE GROUND grey brown ash and clinker fill with much glass bottles, some metal and occasional pottery fragments. Glass showing signs of melting due to high temperatures in the past				1.00	D		1	
				2.00	D		20	
		2.45						
Soft light grey CLAY		2.60		2.60	D			
Gravelly COBBLES of limestones		2.80		2.80	D			
Stiff grey CLAY				3.00	D			
		3.50		3.50	D			
Dark grey weak MUDSTONE (Chiselling 4.4m to 4.6m 1 Hr)				4.00	D		81	
		4.60						
End of Borehole at 4.60 m								

2-6m depth

Arsenic 19 mg/kg OK

Lead 65 " OK

Zinc 253 " OK

Cadmium 1.4.1 " OK

Sulphur 533 "

Remarks

TEST RESULTS ARE SPT N VALUES

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

BH2

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH3

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 14/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00 0.30		0.00	B			
Yellow brown gravelly COBBLES (Chiselling 3.5m to 3.7m 1 Hr)				1.00	D			
							60	
				2.00	D			
							20	
				2.80	D			
				3.00	U			
				3.50	D			
		3.70						
End of Borehole at 3.70 m								

Remarks

TEST RESULTS ARE SPT N VALUES

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

BH3

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH4

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 14/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.30						
Gravelly COBBLES of limestone				1.00	D			
							29	
				2.00	D			
							31	
		2.90		3.00	U			
Stiff grey CLAY								
		3.50		3.50	D			
Weak grey MUDSTONE (Chiselling 4.8m to 4.9m 1 Hr)				4.00	D			
							47	
		4.90						
End of Borehole at 4.90 m								

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Remarks

TEST RESULTS ARE SPT N VALUES

Notes:
Materials are described in accordance with BS 5930:1999.
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

BH4

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: **BH5**

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 14/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.00	B			
		0.50						
Firm stiff grey mottled yellow CLAY				1.00	U			
				1.50	D			
				2.00	D			
							20	
		2.90		2.90	D			
				3.00	D			
Stiff blue grey CLAY				3.00	U			
		3.30		3.00	D			
Weak dark grey (Chiselling 3.5m to 3.5m 1 Hr)		3.50					26	
End of Borehole at 3.50 m								

Remarks

TEST RESULTS ARE SPT N VALUES

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

BH5

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number **BH6**

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 15/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.40						
Firm grey brown sandy CLAY				1.00	D		13	
		1.70		1.70	D			
Firm to stiff grey CLAY				2.00	U			
		2.50		2.50	D			
Light grey MUDSTONE (CHISELLING 2.5m TO 3.2m 1.5 hrs)				3.00	D			
				3.00	U			
				3.60	D			
				3.60	D		78	
		3.60						
End of Borehole at 3.60 m								

Remarks

TEST RESULTS ARE SPT N VALUES

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH7

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 15/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.40						
Moderately strong yellow brown LIMESTONE (Chiselling 0,5m to 0.75m 1 Hr)		0.75						
End of Borehole at 0.75 m								

Remarks

spt at 78 seating blows only

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number

BH8

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A D Woodley

GROUND LEVEL 0.000

COORDINATES E: 0.00 N: 0.00

DATE 15/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.80	B			
TOPSOIL		0.30						
Moderately strong yellow brown LIMESTONE (Chiselling 0.3m to 0.8m 1 Hr)		0.80						
End of Borehole at 0.80 m								

Logged by | Checked by

Remarks

spt at 78 sealing blows only

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH9

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 16/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.30						
Moderately strong yellow brown LIMESTONE (Chiselling 1m to 1.45m 1Hr)								
		1.45						
End of Borehole at 1.45 m								

Remarks

spt at 78 seating blows only

Logged by | Checked by

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
Depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH10

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 16/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.30						
Firm becoming stiff with depth brown grey sandy CLAY				1.00	U			
				1.50	D			
				2.00	D		80	
		2.45						
Weak grey MUDSTONE (Chiselling 2.45m to 3m 1 Hr)								
		3.00						
End of Borehole at 3.00 m								

Logged by | Checked by

Remarks

spt at 78 seating blows only

Scale 1:50 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.

PELL FRISCHMANN CONSULTANTS LTD

BOREHOLE RECORD

Borehole Number: BH11

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A D Woodley

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 16/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.00	B			
TOPSOIL		0.40						
Stiff brown CLAY with much coarse limestone gravel				1.00	D		56	
		1.45						
Moderately strong yellow brown LIMESTONE (Chiselling 1.45m to 1.8m 1 Hr)		1.80						
End of Borehole at 1.80 m								

Remarks

spt at 78 seating blows only

Logged by	Checked by
Scale 1:50	Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP1

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456334.00N: 22650.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		0.30						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)				0.50	B			
		0.90						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		1.00						
End of Borehole at 1.00 m								

0.1m depth

Arsenic	16 mg/kg	OK
Chromium	32 "	OK
Lead	49 "	OK
Zinc	109 "	OK
Sulphate	972 "	OK
Sulphide	487 "	

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 1m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP1A

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456218.00N: 222456.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.25						
Orange brown very clayey fine to medium SAND with much angular and subangular gravel of light grey limestone, assessed from pit walls as dense (highly to completely weathered limestone)				0.50	B			
		0.60						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)								
		1.10						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		1.25						
End of Borehole at 1.25 m								

Remarks

No groundwater encountered, trial pit walls stable throughout, unable to progress below 1.25m

Logged by | Checked by

Scale 1.25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP2

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456200.00N: 222348.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		0.25		0.30	D			
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow fine grained SAND with much coarse angular gravel of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.90						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong strong LIMESTONE		1.20						
End of Borehole at 1.20 m								

0.3m depth

Organic 12 mg/kg OK

Sulphate 1134 " OK

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 1.2m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP3

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456266.00N: 222263.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.10	D			
TOPSOIL		0.20						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE, with bedding dipping at 20 degrees to the south		0.90						
End of Borehole at 0.90 m								

Remarks

No groundwater encountered, trial pit walls stable throughout, unable to progress below 0.9m

Logged by	Checked by
Scale 1:25	Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP4

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456242.00N: 222013.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL		0.20		0.30	D			
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.60						
End of Borehole at 0.60 m								

0.3m depth

Arsenic 16mg/kg ok

Lead 15mg/kg ok

Sulphate 1228 mg/kg ok

Logged by | Checked by

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 0.6m, cobbles and boulders of pale grey limestone (possible bedrock)

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

AP 4

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP5

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456182.00N: 221895.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.25						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Stiff to very stiff grey CLAY becoming hard and friable at base (possible mudstone bedrock)								
		2.30						
End of Borehole at 2.30 m								

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 2.3m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP6

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456241.00N: 221784.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.10	D			
TOPSOIL		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.90						
Stiff yellow and grey mottled CLAY becoming very stiff with depth and hard and friable at the base of the pit (possible mudstone bedrock)		2.40						
End of Borehole at 2.40 m								

0.1m depth

Arsenic	18 mg/kg	OK
Lead	22 "	OK
Zinc	106 "	OK
Sulphate	1197 "	OK

Logged by | Checked by

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 2.4m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres. Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP7

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456350.00N: 222501.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.40						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)				0.70	B			
		0.90						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)								
		1.30						
End of Borehole at 1.30 m								

Logged by | Checked by

Remarks

No groundwater encountered, some localised collapse of pit walls 0.4-0.9m, stable below this depth

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP8

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456317.00N: 222142.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.40						
		0.65		0.70	D			
Yellow brown very snady clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)		0.80						
Stiff yellow brown very sandy CLAY with much angular medium to coarse gravel of limestone								
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		1.30						
End of Borehole at 1.30 m								

057m depth
Soil side sampling OK

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 1.3m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP9

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456351.00N: 222052.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL		0.25						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		0.60						
End of Borehole at 0.60 m								

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 0.6m

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP10

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456354.00N: 221897.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow brown very snady clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)		1.00						
End of Borehole at 1.00 m								

Remarks

No groundwater encountered. trial pit stable throughout, unable to progress below 1m due to limestone cobbles and boulders in pit base (possible limestone bedrock)

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
All dimensions and reduced levels are in metres.Thicknessess given in brackets in depth column.
Materials are described in accordance with BS 5930:1999.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP11

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456347.00N: 221740.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL-Mid brown soft fiberous silty clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel.		0.00						
		0.25						
Mid brown and orange mottled moderately firm cohesive silty CLAY with grey moderately weak medium to coarse grained highly weathered LIMESTONE gravel.		0.35						
Yellow grey moderately strong medium to coarse grained broken moderately weathered LIMESTONE in a yellow moderately coarse damp sndy clayey matrix (CORNBRASH)		0.56						
End of Borehole at 0.56 m								

Remarks

Trial pit terminated at 0.56m in Cornbrash, as no further progress could be made

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP12

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456347.00N: 221600.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL-Mid brown soft fiberous silty clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel.		0.28						
Mid brown and orange mottled moderately firm cohesive silty CLAY		0.39						
Yellow grey moderately strong medium to coarse grained broken moderately weathered LIMESTONE in a yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		0.55						
End of Borehole at 0.55 m								

Remarks

Trial pit terminated at 0.55m in Cornbrash, as no further progress could be made

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP13

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456397.00N: 221451.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL-Mid brown soft fiberous silty clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel.		0.00						
		0.20		0.20	D			
Mid brown and orange mottled moderately firm cohesive silty CLAY with grey moderately weak medium to coarse grained highly weathered LIMESTONE gravel.		0.34						
Yellow grey moderately strong medium to coarse grained broken moderately weathered LIMESTONE in a yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		0.40						
End of Borehole at 0.40 m								

0.2m depth

Arsenic	14 mg/kg	OK
Chromium total	43 mg/kg	OK
Lead	154 mg/kg	OK
Copper	24	OK
Nickel	30	OK
Zinc	98	OK
Sulphate	710	OK

Remarks

Trial pit terminated at 0.40m in Combrash, as no further progress could be made. Samples: TP13 S1 0.5kg Pot

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP14

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456500.00N: 222651.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50		0.60	D			
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE, becoming damp at base of pit		0.80						
End of Borehole at 0.80 m								

0.1 m depth

Arsenic	18 mg/kg	OK
Chromium total	32 "	OK
Lead	45 "	OK
Copper	60 "	OK
Nickel	34 "	OK
Zinc	85 "	OK
Sulphate	1087 "	OK

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 0.8m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: **TP14A**

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456481.00N: 222578.00

DATE: 09/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.30		0.40	D			
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)								
		1.80		1.80 1.80 1.80 2.00 2.00	D W W B D			
Stiff light grey CLAY with much coarse angular limestone gravel, becoming v. stiff below 2.4m								
		2.60						
End of Borehole at 2.60 m								

water 1.8m

0.1m depth

CLEA * Arsenic 32 mg/kg >20

Copper 28 " OK

Nickel 49 " OK

Zinc 49 " OK

Sulphate 486 " OK 457mg/l

Remarks

No groundwater encountered. Some minor instability 0.3-1.8m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP15

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456449.00N: 222449.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		(0.30) 0.30						
Orange brown very sandy clayey medium to coarse angular GRAVEL and COBBLES of limestone (highly to completely weathered limestone)				0.50	D			
		(0.40) 0.70						
Light grey thinly bedded LIMESTONE moderately strong, bedding horizontal and approx. 200mm thick								
End of Borehole at 0.70 m								

Logged by | Checked by

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 0.7m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP15A

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 0.00 N: 0.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL		0.30		0.40	D			
Orange brown very sandy clayey medium to coarse angular GRAVEL and COBBLES of limestone (highly to completely weathered limestone)		0.85		1.00	W			
Very stiff grey sandy Clay with much angular medium to coarse angular gravel of limestone.		1.75						
End of Borehole at 1.75 m								

Water 1.0m

0.4 m depth

CLEA Arsenic 0.2 mg/kg > 20

Chromium 20 " OK

Nickel 46 " OK

Zinc 56 " OK

Sulphate 687 " OK 19mg/l

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Remarks

Groundwater seepage at 1.6m, pit stable throughout, unable to progress below 1.75m due to limestone cobbles and boulders in pit base

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP16

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456527.00N: 222314.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.10	D			
TOPSOIL		0.30						
Red brown very clayey sandy coarse GRAVEL and COBBLES of moderately strong limestone, boulder of light grey limestone noticed in pit face 500 x 500 x 100mm, assessed as dense in pit walls		0.50						
Yellow brown clayey sandy coarse angular GRAVEL and COBBLES of moderately strong limestone, assessed as dense in pit walls, (highly to completly weathered limestone)				1.50	W			
		2.60		2.60	B			
Very stiff grey mottled yellow sandy CLAY with much coarse angular limestone gravel.								
		3.10						
End of Borehole at 3.10 m								

Logged by | Checked by

Remarks

Groundwater seepage at 2.6m. Slight spalling of pit walls 0.5-2.6m, hand vane tests on 2.6m-3.1m Cu= 120+,120+,120+ kN/m2

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP16A

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456411.00N: 222286.00

DATE: 08/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		0.30						
Orange brown very sandy clayey medium to coarse angular GRAVEL and COBBLES of limestone (highly to completely weathered limestone)				0.50	D			
		0.60						
Light grey thinly bedded LIMESTONE moderately strong, bedding horizontal and approx. 10mm thick								
		1.00						
End of Borehole at 1.00 m								

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 1m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP17

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456500.00N: 222197.00

DATE: 09/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.20	D			
		0.30		0.20	B			
Red brown very sandy clayey medium to coarse angular GRAVEL and COBBLES of limestone (highly to completely weathered limestone)				0.50	B			
		0.80						
Light grey slightly sandy course angular GRAVEL of limestone (highly to completely weathered limestone)		1.10		1.10	W			
Very stiff grey mottled yellow sandy CLAY with some to much coarse angular limestone gravel.								
		2.60						
End of Borehole at 2.60 m								

Water 1.1m

0.2m depth

CLEA Arsenic 25mg/kg >20
Chromium 34 " OK
Lead 30 " OK
Copper 27 " OK
Nickel 41 " OK
Zinc 106 " OK
Sulphate 1905 " OK 48 mg/l

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 2.6m onto light grey strong limestone, hand vane on 1.1m-2.6m Cu= 120, 120+, 120+ kN/m2

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP18

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456492.00N: 222000.00

DATE: 09/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		0.30						
Stiff orange brown sandy CLAY with some to much subangular limestone gravel		0.60						
Yellow brown clayey sandy coarse angular GRAVEL and COBBLES of moderately strong limestone, assessed as dense in pit walls, (highly to completely weathered limestone)		1.15						
End of Borehole at 1.15 m								

Remarks

Trial pit stable throughout, unable to progress below 1.15m due to boulder of limestone (estimated at 500mm x 500mm)

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP19

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456477.00N: 221808.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown soft fiberous sndy clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.25		0.25	D			
Orange brown moderately firm cohesive silty sandy CLAY		0.52						
Yellow grey moderately strong medium to coarse grained broken moderately weathered LIMESTONE in a yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		0.62						
End of Borehole at 0.62 m								

0.25m depth

CLEA

Arsenic	33 mg/kg	> 20	
Chromium	44 "	OK	
Lead	40 "	OK	
Copper	27 "	OK	
Nickel	44 "	OK	
Zinc	102 "	OK	
Sulphate	981 "	OK	

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Remarks

Trial pit terminated at 0.62m in Cornbrash, as no further progress could be made. Samples: TP19 S1 0.5kg Pot

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP19A

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456501.00N: 221600.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown moderately cohesive silty clayey TOPSOIL with rootlets and organics (5%)		0.00 0.18						
Mid brown mottled grey stiff to firm cohesive silty CLAY with occasional grey moderately weak medium to coarse grained highly weathered limestone gravel. Becoming more competent with depth		0.50						
Blue grey occasionally orange mottled very stiff cohesive fissured silty CLAY with occasional orange moderately coarse sndy fissures at increasing depths. Becomes more competent with depth, to resemble a dark blue grey occasionally orange mottled very stiff fissured slightly weathered silty MUDSTONE at 2.80m				1.20	B			
End of Borehole at 2.80 m		2.80						

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Remarks

Trial pit terminated at 2.80m in Mudstone, as no further progress could be made. Samples: TP29 S1 1.2-1.6m

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP20

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456501.00N: 221451.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown fiberous sandy silty TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.25		0.25	D			
Yellow and grey white weak coarse grained very loose medium dense silty SAND and light grey and yellow very weak coarse grained angular highly weathered limestone gravel		1.00						
Dark blue grey mottled orange brown very stiff cohesive silty clay with orange moderately coarse sandy fissures at increasing depth and occasional angular limestone gravel. More competent with depth, resembling a dark blue grey occasionally orange mottled very stiff fissured damp slightly weathered silty MUDSTONE at 2.00m		2.50						
Dark blue grey very stiff damp fissured silty MUDSTONE with occasional orange mottling		3.00						
End of Borehole at 3.00 m								

Remarks

Trial pit terminated at 3.00m in Mustone, as no further progress could be made. Samples: TP20 0.5kg Pot, TP20 S1 1.0-2.5m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP21

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456501.00N: 221300.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown fiberous sandy silty TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.25		0.25	B			
MADE GROUND Orange and blue grey mottled firm to stiff cohesive silty clay with grey moderately weak medium to coarse grained highly weathered limestone and very occasional rounded flint gravel. 2" Clay pipe encountered at 0.90m		0.90						
Blue grey moderately strong medium to coarse grained broken moderately weathered LIMESTONE in a grey and yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		1.00						
End of Borehole at 1.00 m								

Logged by | Checked by

Remarks

Trial pit terminated at 1.0m in Cornbrash, as no further progress could be made. Samples: TP21 S1A, TP21 S1B (2 bags) 0.25-0.90m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP22

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456667.00N: 222636.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.10	D			
TOPSOIL		0.20						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.60						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		0.80						
End of Borehole at 0.80 m								

0.1m depth

CLEA Arsenic 21 mg/kg >20

Chromium 26 " OK

Lead 24 " OK

Nickel 36 " OK

Zinc 65 " OK

Sulphate 907 " OK

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 0.8m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP22A

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456615.00N: 222514.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00		0.10	D			
TOPSOIL		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.60						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		1.00						
tiff to very stiff light grey and brown mottled v. sandy fissured CLAY with cobbles in the upper surface				2.00	D			
		2.40						
Light blue grey very thinly bedded moderately weathered moderately weak MUDSTONE		2.50						
End of Borehole at 2.50 m								

Logged by | Checked by

Remarks

Very minor groundwater seepage, trial pit stable throughout, unable to progress below 2.5m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP23

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456649.00N: 222336.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)		0.80						
Very stiff light grey mottled brown fissured friable CLAY with much medium coarse angular limestone gravel				2.00	D			
				2.50	D			
		2.65						
Dark blue grey very thinly bedded moderately weathered moderately strong to strong LIMESTONE		2.75						
End of Borehole at 2.75 m								

Remarks

No groundwater encountered, trial pit walls stable throughout, unable to progress below 2.75m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All dimensions and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP24

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456647.00N: 222200.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.60		0.70	B			
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)		0.85						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		1.10						
End of Borehole at 1.10 m								

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 1.1m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

TP24

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP25

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456681.00N: 222087.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00						
		0.25		0.30	D			
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)		0.50						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)		0.75						
End of Borehole at 0.75 m								

Remarks

No groundwater encountered, slight instability 0.25-0.75m, permeability test undertaken

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All dimensions and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP26

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456591.00N: 221979.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown soft fibrous sandy clayey TOPSOIL with rootlets and orgsnics (5%) and occasional flint and limestone gravel		0.00						
		0.36		0.36	D			
Orange brown moderately firm cohesive sandy CLAY		0.80						
Yellow grey moderately strong medium to coarse grained broken moderately weathered LIMESTONE in a yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		0.90						
End of Borehole at 0.90 m								

Remarks

Trial pit terminated at 0.9m in Cornbrash, as no further progress could be made. Samples: TP26 S1 0.36m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP27

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456615.00N: 221792.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown soft fibrous sandy clayey TOPSOIL with rootlets and orgsnics (5%) and occasional flint and limestone gravel		0.30		0.30 0.30	B D			
Grey brown mottled very stiff cohesive silty sandy CLAY		0.72						
Orange brown and grey mottled stiff friable silty clay with light grey coarse grained angular LIMESTONE gravel and cobbles		1.00						
Yellow grey moderately strong medium to coarse grained very loose broken moderately weathered LIMESTONE in a yellow moderately coarse damp sandy clayey matrix (CORNBRASH). Becomes more competent and difficult to excavate with depth		1.80						
End of Borehole at 1.80 m								

Logged by | Checked by

Remarks

Trial pit terminated at 1.80m in Cornbrash, as no further progress could be made. Samples: TP27 S1 0.5kg Pot, TP27 S1 0.3-0.7m, TP27 S2

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP28

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456656.00N: 221600.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown soft fibrous sandy clayey TOPSOIL with rootlets and orgsnics (5%) and occasional flint and limestone gravel		0.23		0.23	D			
Mid brown stiff to firm cohesive silty CLAY with grey moderately weak medium to coarse highly weathered limestone gravel		0.33		0.33	B			
Yellow brown and grey weak coarse grained very loose silty sandy GRAVEL of light grey and yellow very weak coarse grained highly weathered limestone		1.50						
Dark blue occasionally brown and yellow mottled very stiff cohesive fissured silty CLAY with occasional orange moderately coarse sandy fissures at increasing depths. Becomes more competent with depth, resembling a dark blue grey occasionally orange mottled very stiff fissured slightly weathered silty mudstone at3.40m		3.40						
End of Borehole at 3.40 m								

0.03m depth

Chromium 42 mg/kg OK

Copper 16 " OK

Zinc 87 " OK

Sulphate 773 " OK

Remarks

Trial pit terminated at 3.40m in Mudstone, as no further progress could be made. Samples: TP28 0.5kg Pot, TP28 S1 1.50-3.40m, TP28 S2 0.33-1.50m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

TP28

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP29

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456651.00N: 221451.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown soft fibrous sandy silty TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel.		0.00						
		0.30						
Mid brown stiff to firm cohesive silty CLAY with grey moderately weak medium to coarse grained highly weathered limestone gravel				1.00 1.20	D B			
		1.20						
Yellow and grey weak coarse grained very loose silty SAND with much light grey and yellow very weak coarse grained highly weathered limestone gravel								
		1.60						
Dark blue grey occasionally orange mottled very stiff cohesive fissured silty CLAY with occasional orange moderately coarse sandy fissures at increasing depths. Becomes more competent with depth, resembling a dark blue grey occasionally orange mottled very stiff fissured slightly weathered silty MUDSTONE at 2.70m								
		2.70						
End of Borehole at 2.70 m								

Remarks

Trial pit terminated at 2.70m in Mudstone, as no further progress could be made. Samples: TP29 S1 1.2 - 1.6m TP29 S2

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP30

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456651.00N: 221299.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown fibrous sandy silty TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.20		0.20	D			
Mid brown and orange moderately firm friable silty sandy sandy CLAY with occasional orange moderately coarse sandy fissures and grey moderately weak medium to coarse grained highly weathered LIMESTONE gravel		0.50						
Yellow and grey weak coarse grained loose silty SAND with light grey and yellow very weak coarse grained highly weathered LIMESTONE gravel				1.80	B			
		2.00						
Dark blue grey occasionally orange mottled very stiff cohesive fissured silty CLAY with occasional orange moderately coarse sandy fissures. Becomes more competent with depth, resembling a dark blue grey occasionally orange mottled very stiff fissured slightly weathered silty MUDSTONE at 3.0m								
		3.00						
End of Borehole at 3.00 m								

2.0m depth

Chromium	30 mg/kg	OK
Nickel	16 "	OK
Zinc	71 "	OK
Sulphate	418 "	OK

Logged by | Checked by

Remarks

Trial pit terminated at 3.0m in Mudstone, as no further progress could be made. Samples: TP30 0.5kg Pot, TP30 S1 A, B, C, TP30 S2 1.8-3.0m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres. Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP31

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456651.00N: 221151.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown moderately cohesive clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.26		0.26	D			
Mid brown and orange soft becoming firm moderately cohesive sandy becoming firm moderately cohesive sandy becoming silty with depth CLAY		0.70						
Blue grey occasionally orange mottled very stiff cohesive fissured silty CLAY with occasional orange moderately coarse sandy fissures and grey moderately weak medium to coarse grained highly weathered limestone gravel		0.87						
at 0.870: Brown and orange moderately weak medium to coarse grained broken weathered LIMESTONE in a grey and yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		0.87						
End of Borehole at 0.87 m								

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Remarks

Trial pit terminated at 0.87m in Combrash, as further progress could be made. Samples: TP31 0.5kg Pot, TP31 S1 0.87m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP32

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456798.00N: 222591.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.25						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)				0.50	D			
		0.60						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		0.80						
End of Borehole at 0.80 m								

0.5m depth

Arsenic 18 mg/kg OK

Nickel 29 " OK

Zinc 32 " OK

Sulphate 887 " OK

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 0.8m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres. Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP33

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456749.00N: 222473.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.25						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)				0.50 0.50	B D			
		0.70						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE								
		1.00						
End of Borehole at 1.00 m								

0.5m depth

Arsenic 17 mg/kg OK
Chromium 18 " OK
Nickel 27 " OK
Zinc 33 " OK
Sulphate 782 " OK

Remarks

No groundwater encountered, trial pit stable throughout, unable to progress below 1m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP34

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456775.00N: 222286.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)				0.50	D			
		0.80						
Yellow brown very sandy clayey course angular GRAVEL and COBBLES (up to 150mm x 150mm x 10mm) of limestone, assessed from pit walls as dense (highly to completely weathered limestone)		1.30						
Yellow and light grey very thinly bedded moderately to highly weathered moderately strong to strong LIMESTONE		1.40						
End of Borehole at 1.40 m								

0.1m depth

CLEA
Arsenic 23 mg/kg >20
Chromium 38 mg/kg OK
Lead 19 " OK
Copper 16 " OK
Nickel 37 " OK
Zinc 83 " OK
Sulphate 753 " OK

Remarks

No groundwater encountered, trial pit unstable, unable to progress below 1.4m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

TP34

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP35

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456799.00N: 222200.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL				0.20	D			
		0.30						
Red brown very sandy clayey coarse angular GRAVEL and COBBLES of limestone, assessed from the pit walls as dense (highly to completely weathered limestone)				0.50	B			
		0.70						
End of Borehole at 0.70 m								

Remarks

No groundwater encountered, trial pit unstable, unable to progress below 0.7m due to boulders of limestone

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP36

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456771.00N: 221932.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown soft fibrous silt clayey TOPSOIL with rootlets and organics (5%)		0.00 0.20						
Light orange and brown weak loose friable silty CLAY with grey moderately weak medium to coarse grained highly weathered limestone gravel		0.50		0.50	W			
Yellow grey strong hard medium to coarse grained broken moderately weathered LIMESTONE in a yellow/tan moderately coarse damp sandy calyey matrix (CORNBRASH)		1.00						
End of Borehole at 1.00 m								

Water 0.5m depth

Sulphate 46 mg/l ~~mg/kg~~

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Remarks

0.5m water sample remoned from base of pit after approx. 5 mins. Trial pit terminated at 1.0m in Cornbrash, as no further progress could be made. Samples: TP36 1L ~~water~~

Notes:
Materials are described in accordance with BS 5930:1999.
All RLs are reduced levels are in metres Thicknessess given in brackets in depth column

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP37

EQUIPMENT AND METHODS:

SITE: Bicester

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456800.00N: 221754.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown soft clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.25		0.25	D			
Light/mid brown soft damp moderately cohesive silty sandy CLAY becoming wetter with depth		0.85						
Yellow and grey hard medium to coarse grained broken rubbly weathered LIMESTONE in a brown and yellow moderately coarse wet sandy clayey matrix (CORNBRASH)		1.60						
End of Borehole at 1.60 m								

0.25m depth

Arsenic	15	mg/kg	OK
Chromium	50	"	OK
Copper	21	"	OK
Nickel	22	"	OK
Zinc	91	"	OK
Sulphate	564	"	OK

Remarks

Water encountered at 1.60m insufficient for sample. Trial pit terminated at 1.60m in Cornbrash, as no further progress could be made. Samples: TP37 0.5kg Pot

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

TP37

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP38

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456803.00N: 221584.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
		0.00						
TOPSOIL: Mid brown fibrous sandy silty TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.25		0.30	D			
Mid brown and occasionally mottled orange weak loose sandy CLAy with weak medium to coarse grained highly weathered limestone gravel		0.90						
Grey and brown mottled firm to stiff cohesive silty CLAY with medium to coarse grained highly weathered limestone gravel		2.30		2.30	B			
Lens of yellow weak coarse grained loose silty SAND and angular clayey GRAVEL of very weak coarse grained highly weathered limestone		3.10						
Blue grey mottled yellow and orange stiff to firm cohesive fissured silty CLAY with occasional orange moderately coarse sandy fissures. Becoming more competent with depth, to resemble a blue grey occasionally orange and yellow mottled very stiff fissured slightly weathered silty MUDSTONE at 3.30m		3.30						
End of Borehole at 3.30 m								

Logged by | Checked by

Remarks

Trial pit terminated at 3.30m in mudstone, as no further progress could be made. Samples: TP38 0.5kg Pot, TP38 S1 2.30-3.10m

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP39

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456796.00N: 221445.00

DATE: 20/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown fibrous sandy silty TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.00 0.25						
Mid brown and orange moderately firm damp silty clayey GRAVEL of weak medium to coarse grained highly weathered limestone		1.00						
Yellow orange weak coarse grained loose silty SAND and angular GRAVEL of very weak coarse grained highly weathered limestone		1.50		1.50	B			
Blue grey mottled yellow and orange stiff to firm cohesive fissured silty CLAY with occasional orange moderately coarse sandy fissures. Becoming more competent with depth, to resemble a blue grey occasionally orange and yellow mottled very stiff fissured slightly weathered silty MUDSTONE at 2.90m		2.90						
End of Borehole at 2.90 m								

Remarks

Trial pit terminated at 2.90m in Mudstone, as no further progress could be made. Samples: TP39 S1 1.50-2.90m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP40

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456800.00N: 221299.00

DATE: 21/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown moderately cohesive clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.00		0.29	D			
Mid brown and orange soft becoming firm moderately cohesive silty slightly sandy CLAY with occasional fine angular limestone gravel		0.29						
Blue grey occasionally yellow mottled stiff to firm cohesive fissured damp silty CLAY with occasional orange and yellow moderately coarse sandy fissures, and small (<1m) dark brown and red very coarse damp iron rich sand lenses		0.40						
At 2.30m: Yellow and grey hard to very hard medium to coarse grained broken well cemented weathered oolitic LIMESTONE in a brown and yellow moderately coarse damp sandy clayey matrix (CORNBRASH)		2.30						
End of Borehole at 2.30 m		2.30						

Logged by | Checked by

Remarks

Trial pit terminated at 2.30m in Combrashm, as no further progress could be made. Samples: TP40 0.5kg Pot

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP41

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456800.00N: 221299.00

DATE: 21/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL: Mid brown soft loose slightly clayey TOPSOIL with rootlets and organics (5%) with very occasional fine flint and limestone gravel		0.00		0.30	D			
Mid brown and yellow soft loose damp sandy CLAY		0.30						
Blue grey occasionally yellow mottled stiff to very stiff cohesive silty CLAY		0.53						
Yellow and grey hard medium to coarse grained broken rubbly weathered LIMESTONE in a brown and yellow moderately coarse damp iron rich sandy matrix (CORNBRASH)		1.33						
End of Borehole at 1.74 m		1.74						

0.3m depth

Chromium 39 mg/kg OK

Zinc 68 " OK

Sulphate 457 " OK

Remarks

Land drain encountered at 0.80m. Trial pit terminated at 1.80m in Cornbrash, as no further progress could be made. Samples: TP541 0.5kg Pot

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres.Thicknessess given in brackets in depth column.

AP4

PELL FRISCHMANN CONSULTANTS LTD

TRIAL PIT RECORD

Trial Pit Number: TP42

SITE: Bicester

EQUIPMENT AND METHODS:

CLIENT: A.D Woodly

GROUND LEVEL: 0.000

COORDINATES: E: 456961.00N: 222534.00

DATE: 07/08/2001

STRATA DESCRIPTION	KEY	DEPTH (Thick)	LEVEL (mAOD)	SAMPLES/TESTS Depth	Type	No	Test	INSTALLATIONS/ BACKFILL
TOPSOIL		0.00		0.10	D			
		0.25						
Yellow brown very clayey slightly sandy coarse angular GRAVEL and COBBLES of limestone, assessed as dense in pit walls (highly to completely weathered limestone)				0.50	D			
		0.90						
Light grey thinly bedded moderately strong to strong LIMESTONE		0.95						
End of Borehole at 0.95 m								

0-1m depth 0.5m depth

CLEA

Arsenic	23mg/kg	>20
Chromium	33 "	OK
Lead	20 "	OK
Nickel	34 "	OK
Zinc	68 "	OK
Sulphate	887 "	OK

≈ 895

Remarks

No groundwater encountered, trial pit showing some minor instability 0.25-0.9m, unable to progress pit below 0.95m

Logged by | Checked by

Scale 1:25 | Sheet 1 of 1

Figure

Notes:
Materials are described in accordance with BS 5930:1999.
All depths and reduced levels are in metres. Thicknessess given in brackets in depth column.