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VERIFICATION REPORT
for the
REMEDIATION & PREPARATORY WORKS
of land off
BURTON ROAD, BARNSLEY

prepared for
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85030/REM/013	As-Built Survey
JK05-979-02	Japanese Knotweed Solutions Drawing

Appendix B - Correspondence

From	To	Date	Content
EC	BMBC	12th October 2005	Submission of Remedial Strategy
BMBC	EC	27th October 2005	Approval of Remedial Strategy
EC	BMBC	16th November 2005	Revised PCB testing regime
EC	NHBC	6th January 2006	Submission of Remedial Strategy & Quantitative Risk Assessment
EA	EC	18th April 2005	Approval of Site Specific Working Plan
EC	BMBC	25th May 2006	PCB Testing

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Appendix D - Geotechnical Test Results

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1 INTRODUCTION

1.1 The Commission and Brief

1.1.1 Encia Consulting Limited (EC), have been commissioned by Encia Remediation Limited (ER), acting on behalf of Ben Bailey Homes Limited (BBH) to prepare a Verification Report for land off Burton Road, Barnsley.

1.1.2 The site had formerly been used for a variety of uses, including scrap yards, coal yards, a plant nursery and a vehicle-servicing garage.

1.1.3 Encia Consulting have already issued the following reports:

- Geoenvironmental Appraisal of land off Burton Road, Barnsley. Report No. 5848/1, dated March 2004
- Quantitative Risk Assessment of land at Burton Road, Barnsley. Report No. 5848/2, dated May 2005
- Hazardous Gas Risk Assessment – Areas A, B & C, dated 25th July 2005
- Hazardous Gas Risk Assessment – Area D, dated 25th July 2005
- Remedial Strategy for land at Burton Road, Barnsley. Report No. 5848/3, dated October 2005
- Supplementary Site Investigation letter report reference 5848/JWH dated 2nd November 2005
- Site Specific Working Plan of land at Burton Road, Barnsley. Report No. 5848, dated February 2006

1.1.4 Copies of the above reports were forwarded to Barnsley Metropolitan Borough Council (BMBC), the Environment Agency (EA) and the National House Building Council (NHBC) as appropriate, and their comments were taken into account. Relevant correspondence between EC, BMBC, EA and NHBC is included in Appendix B to this report.

1.1.5 Encia Remediation Limited (ER) carried out remediation and preparatory works, in general accordance with the Remedial Strategy, under the supervision of EC. These works commenced in October 2005 and were completed in July 2006.

1.1.6 The purpose of this document is to:

- *Summarise the background to the works*
- Describe the remedial and ground preparatory works undertaken
- Describe additions and variations to works outlined in the Remedial Strategy
- Confirm that the site has been rendered suitable for the proposed redevelopment
- Provide a summary of recommendations relating to foundations, gas measures etc, that take account of the actual remedial works completed

1.2 The Proposed Development

1.2.1 The proposed development comprises approximately 234 traditional domestic dwellings with associated gardens, POS and adoptable roads and sewers, as shown on Drawing 5848/5/2 in Appendix A.

1.2.2 The proposed development will utilise a combination of standard strip, trench fill and pile foundations (see Section 6.2).

1.2.3 Access to the development will be from Burton Road to the north.

1.2.4 BMBC have agreed planning permission for redevelopment of this site. There are several Conditions associated with remediation, most notably the submission of a report certifying that the site has been satisfactorily remediated and that the development of the site can be safely undertaken and occupied.

1.2.5 This report has been prepared to satisfy the above Condition.

2 BACKGROUND

2.1 Site Description & History

2.1.1 Site details are summarised below:

Detail	Remarks
Location	4 km northeast of Barnsley town centre
NGR	SE 377 084
Area	7.5ha (18.5 acres)

2.1.2 A location plan and current salient features are shown on Drawing Nos 5848/1 and 5848/2 in Appendix A.

2.1.3 For ease of reference the site was divided into five areas (A to E) during site investigation works on the basis of land ownership, as shown on Drawing 5848/2 and summarised below:

Area	Approximate Area (ha)	Former Usage
A	3.4	Derelict nursery, overgrown land, garage (vehicle servicing), vehicle storage yard, landfill site and 2 houses
B	1.8	Open fields / overgrown ground
C	0.2	Garage (car sales & servicing) and house
D	2.1	Scrap yard (cars)
E	1.5	2 coal yards, scrap yard, car storage, skip hire and overgrown land / derelict works

2.1.4 This verification report relates to remedial and ground preparatory works carried out in Areas A to D only.

2.2 Ground Investigation

2.2.1 The main ground investigation works were carried out by EC between November 2003 and January 2004; supplementary investigation works were carried out in Area D in February 2005. The scope of the investigation works is summarised in the table below:

Phase	Technique	Exploratory holes	Final depth(s)	Remarks
1	Trial pitting (machine dug)	TP1 to 32	2.1 to 3.3m	Majority of trial pits terminated in weathered Coal Measures strata (firm/stiff clay or mudstone)
	Window sample boreholes	WS1 to 16 WS101 to 107	0.7 to 3.3m	Monitoring wells installed in WS9, 10, 16, 101 & 108
	Rotary probing	PH1 to 9	10 to 30m	Monitoring wells installed in PH1, 5, 7 & 8
2	*Trial pitting*	*TP101 to 114*	*0.4 to 3.2*	
	Cable percussion boreholes	BH1 to 9	1.45 to 5.0m	Monitoring wells installed in all except BH3

2.2.2 No intrusive ground investigation works were carried out in Area E.

2.2.3 The ground conditions encountered are summarised below

Made Ground

2.2.4 The nature and extent of made ground encountered is summarised in the table below:

Area	Ground Conditions
A	2 distinct areas of made ground identified: **Former landfill site (north)**: sand/demolition rubble fill to maximum 3.0m bgl **Southern area**: ash/demolition rubble fill to maximum 2.7m bgl No made ground was encountered within the field in the east of Area A
B	No made ground encountered
C	Topsoil or tarmac over granular fill to maximum 1.0m bgl
D	Typically concrete hardstand over Ash & Clinker or granular fill, to maximum 2.5m bgl (average 1.2m bgl)

2.2.5 The depths of made ground present are summarised on Drawing 5848/7 in Appendix A.

2.2.6 Field compaction trials indicated that the made ground would not be geotechnically suitable for re-engineering, due primarily to its fine particle size and high moisture content.

Natural Ground

2.2.7 Natural ground (weathered Coal Measures strata) was encountered across the site, and typically comprised firm to stiff brown clay over mudstone. Sandstone was encountered in the north of the site.

2.2.8 Depth to rockhead typically varied from 1.5 to 3m bgl.

Contamination

2.2.9 The site investigation identified 2 out of 4 four areas as containing significant ground contamination, as summarised below:

Area	Contamination Identified	Probable Source of Contamination
A	Made ground within the southwest of this area contains potentially combustible ash and clinker, elevated TPH and metals	Vehicle service yard – spillages of oil, fuel etc
D	Made ground within this area contains elevated TPH, PCBs, metals and combustible materials (ash)	Former vehicle dismantling yard, leakages from vehicle engines, fuel tanks etc

2.2.10 The following remedial options were recommended:

Remedial Area*	Site Areas	Recommendation
1	Southwest of Area A Areas C & D	Treatment / removal of hydrocarbon contamination, to target concentrations derived by QRA Isolation of made ground beneath 1,000mm clean soil cover, incorporating 300mm of clay
2	Northwest of Area A	Redistribute made ground beneath hardstanding, or isolate beneath 500mm clean soil cover
3	Southeast of Area A Area B	No remedial action required

*See also Drawing 5848/7 in Appendix A

2.3 Risk Assessment & Target Concentrations

2.3.1 Quantitative risk assessment (QRA) has been undertaken to derive site-specific clean-up criteria for the contaminants of concern (hydrocarbons associated with leakages/spillages of fuel, PCBs in Area D).

2.3.2 Given the potentially combustible nature of the made ground in Areas A and D, these soils will require isolation beneath a minimum 1,000mm thickness of clean soil cover in all garden/landscaped areas.

2.3.3 The human health QRA indicates that if the site is capped with 1,000mm of clean soil cover, including a 300mm layer of clay, then the TPH and PAH within the made ground pose no risk to human health. However, Encia consider that any soils containing significant free product should be removed or treated, even where the QRA indicates the contaminants do not pose a significant risk. Consequently, a nominal target concentration of 5,000mg/kg was adopted for TPH.

2.3.4 Remedial target concentrations for contaminants of concern in soil are:

Determinant	Site Specific Target Concentration (SSTC) (mg/kg)
TPH (site wide)	5,000
PCB (Area D only)	8.8

2.3.5 Although PCB concentrations in excess of 8.8mg/kg were not recorded during the ground investigation, the QRA recommended that a more rigorous programme of sampling/testing (on a grid network) should be undertaken during remediation.

3 OVERVIEW OF PREPARATORY AND REMEDIATION WORKS

3.1 Aims

3.1.1 The aims of the remediation works were to:

- Remove/treat ground contamination in order to protect environmental receptors, and render the site suitable for the proposed development
- Provide a development platform to facilitate the subsequent construction of roads, installation of drainage and the construction of housing units
- Provide acceptable levels and gradients for adoptable roads, drainage systems and floor slab levels
- Satisfy the requirements of the Local Planning Authority and the NHBC

3.2 Scope of Works

3.2.1 The Remedial Strategy and Site Specific Working Plan detailed the works necessary to enable residential development at the site, most notably:

- General site clearance of surface materials and vegetation
- Removal of below ground obstructions
- Break-up of slabs and hardstand
- Crushing of all suitable artificial hard material (i.e. concrete/brick etc)
- Additional sampling/testing of soils from beneath former buildings & slabs
- Excavation, screening, sampling/testing and treatment of hydrocarbon-impacted soils, as required
- Replacement of acceptable made ground materials, with nominal compaction by tracked excavator
- Re-grade of site to levels specified by BBH (see Section 3.2.2)
- Excavation to natural ground beneath proposed adoptable road footprints and controlled re-engineering of selected materials in layers to approximately 600mm below final road levels
- Provision of appropriate thickness of clean soil cover in garden/landscaped areas underlain by made ground
- Supervision of the works by a suitably qualified consultant, to include detailed records, testing requirements, etc.

3.2.2 BBH specified that the site should be re-graded to the following approximate levels:

- Areas A, C & D: 1,000mm below final levels in gardens/landscaped areas, 1,150mm below finished floor levels
- Area B: 300mm below final levels in gardens/landscaped areas, 450mm below finished floor levels

4 ADDITIONS & VARIATIONS TO THE REMEDIAL STRATEGY

4.1 General

4.1.1 Some additions and variations were made to the anticipated works outlined in the Remedial Strategy / Site Specific Working Plan and agreed with BMBC. These modifications are summarised in the following sections.

4.2 Japanese Knotweed

4.2.1 Two areas of Japanese Knotweed were identified within Area A in the southwest corner of the site, at an early stage in remediation works.

4.2.2 Japanese Knotweed Solutions Limited (JKSL), a specialist Contractor, was employed by Encia to remove and treat the full extent of Japanese Knotweed and impacted soils in accordance with published guidelines.

4.2.3 Following excavation, the Japanese Knotweed and impacted soils were placed in a deposition area within the public open space in thin layers and treated with a residual herbicide (Tordon 22K). This area was lined with Terram 1000 treated with Tordon 22K prior to deposition of the Japanese Knotweed. The deposition area was capped with Terram 1000, which was also treated with Tordon 22K followed by 1.0m of clean soils.

4.2.4 The works carried out by JKSL are summarised on their Drawing Ref. JK05-979-02, which is reproduced in Appendix A.

4.3 Revised PCB Testing Regime

4.3.1 The agreed remedial strategy called for additional PCB testing of made ground beneath Area D, to be carried out on a nominal 20m grid.

4.3.2 In order to avoid delays to the remedial works programme, it was agreed with BMBC to sample/test the stockpiled material following excavation (prior to treatment, if required). Given that the made ground was generally in the order of 1.5m thick, a volumetric sampling/testing rate of 1 sample per 600m^3 was agreed (equivalent to 20m x 20m x 1.5m).

4.3.3 Correspondence relating to this strategy change is included in Appendix B.

4.4 Sub-base within Area D

4.4.1 The presence of a thin (approximately 200mm to 400mm) layer of granular sub-base material was identified beneath the concrete slab in Area D. 3 samples of this material were scheduled for PCB testing, recording a maximum concentration of 0.4mg/kg. Consequently the material was deemed suitable for re-use on site. The laboratory test certificates are presented in Appendix C (i).

4.4.2 Approximately 1,500m^3 of the sub-base was recovered for use during the remedial works.

4.5 Treatment of Well & Boreholes

4.5.1 The Geoenvironmental Appraisal identified the presence of a "*well*", as shown on the 1854 OS plan, in the northwest of the site. Further investigation indicated that this feature comprised a 1.5m^2 square brick structure extending 2.5m below the natural ground level. The structure was grubbed out and infilled with site won crushed product (6F2).

4.5.2 During remedial works, low-pressure artesian water was encountered seeping from two boreholes on site. One of these boreholes was installed with a gas/groundwater monitoring standpipe and dated from the ground investigation works carried out by Encia. This installation was sealed with bentonite at the surface.

4.5.3 The second borehole was a historical feature that had been infilled with gravel. The borehole was drilled to confirm its depth (c. 30m) and sealed with cement/PFA grout.

4.5.4 Grout was injected in 3m stages from the base of the borehole upwards.

4.5.5 The locations of these features are shown on Drawing 5848/5/2 in Appendix A. Daily record sheets relating to drilling and grouting of the historic borehole are presented in Appendix E.

5 DETAILS OF REMEDIATION WORKS

5.1 Site Clearance

5.1.1 The site was cleared of all residual debris, vegetation, shrubs, bushes and unprotected trees, including significant stands of trees and vegetation along the eastern and southern boundaries of Area D.

5.1.2 Topsoil was then stripped from Area B and the southeast corner of Area A and *stockpiled for subsequent assessment (see Section 6.4).*

5.2 Removal of Below Ground Obstructions

5.2.1 All foundations associated with existing buildings and other relict structures were chased out and grubbed-up, in order to remove potential obstructions to new foundations and infrastructure.

5.2.2 Suitable materials derived from grubbing-up were and broken into smaller fragments using a breaker, and then stockpiled prior to processing. Unsuitable materials were removed from site by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations, 1991 and the Landfill (England & Wales) Regulations 2002.

5.3 Processing of Arisings

5.3.1 Oversize material generated by the removal of structures and relict foundations was crushed to produce a Class 6F2 graded material in accordance with the Specification for Highway Works (Series 600).

5.3.2 The crushed product was screened to remove any unsuitable elements and stockpiled for reuse during the subsequent construction works. Approximately 16,500m^3 of crushed product was generated for re-use on site within the footprint of the proposed estate roads.

5.4 Interceptor Removal

5.4.1 A disused fuel/oil interceptor tank was located towards the southeastern boundary of Area D.

5.4.2 The interceptor was carefully emptied of any residual product and safely disposed of from site.

5.4.3 Following removal of the interceptor and excavation of all associated grossly contaminated ground, the Engineer inspected and sampled the resultant excavation. 5 verification samples were taken from the excavation sidewalls and base, in order to demonstrate that the residual materials were below the TPH SSTC derived by QRA (see Section 2.3). The laboratory test certificates are presented in Appendix C (ii).

5.5 Excavation of Contaminated Soils – Area A

5.5.1 As discussed in Section 2.2, made ground within the southwest corner of Area A was identified as containing elevated concentrations of TPH.

5.5.2 All made ground from this areas was excavated, screened to remove oversize materials (concrete, brick, metal, wood etc greater than approximately 75mm) and placed in 2 stockpiles to await further testing and assessment.

5.5.3 In accordance with the Remedial Strategy, the stockpiled soils were tested for TPH at a volumetric rate of 1 sample per 200m^3 of soil.

5.5.4 Each of these samples recorded concentrations of TPH below the SSTC, and consequently the soils were deemed suitable for replacement on site. The laboratory test results are presented in Appendix C (iii).

5.5.5 In addition to the above, a single further area of gross contamination was encountered within the northeastern part of Area A, which is believed to be associated with drainage from the former garage.

5.5.6 Following excavation of this grossly contaminated ground, the Engineer inspected and sampled the resultant excavation. 11 verification samples were taken from the excavation sidewalls and base on a 5m grid, in order to demonstrate that the residual materials were below the TPH SSTC derived by QRA (see Section 2.3). The laboratory test certificates are presented in Appendix C (iv). Drawing 5848/5/1 in Appendix A shows the extent of material removed.

5.6 Excavation of Contaminated Soils – Area D

5.6.1 Made ground within Area D was identified as containing elevated concentrations of TPH and potentially PCBs.

5.6.2 All made ground from this area was excavated and screened to remove oversize materials, prior to placement in stockpiles within Area D to await further testing and assessment of contamination levels (see Section 5.8).

5.7 Verification of Natural Ground – Area D

5.7.1 Following excavation of made ground within Area D, a grid of 29 verification samples were taken from the exposed natural ground.

5.7.2 Each of the verification samples recorded concentrations of TPH below the SSTC; consequently no further excavation was required in this area.

5.7.3 The laboratory test results are presented in Appendix C (v).

5.8 Assessment & Pre-Treatment of Excavated Soils – Area D

5.8.1 Excavated and screened soils were placed in 15 stockpiles, containing between approximately 50m^3 and 900m^3 of material (Stockpiles A to O).

5.8.2 In accordance with the agreed Remedial Strategy and Site Specific Working Plan (SSWP), stockpiled soils were tested for TPH and PCBs at a frequency equal to or in excess of the following agreed volumetric rates:

- TPH: 1 sample per 200m^3
- PCBs: 1 sample per 600m^3

PCB Analysis

5.8.3 Of 23 samples analysed for PCBs, 1 recorded a concentration in excess of the SSTC. However, statistical analysis indicated that all results belonged to the same sample population and that the upper 95th percentile bound (US_{95}) value was below the SSTC.

5.8.4 Further correspondence relating to this analysis is included in Appendix B. The laboratory test results and statistical analysis calculation sheets are included in Appendix C (vi).

TPH Analysis

5.8.5 Of 53 samples analysed for TPH, 7 recorded concentrations in excess of the SSTC.

5.8.6 Where samples recorded TPH concentrations below the relevant SSTC the stockpile (or section thereof) was consigned for backfill.

5.8.7 Where samples recorded TPH concentrations in excess of the SSTC, the stockpile (or section thereof) was designated for on-site ex-situ treatment (bioremediation). On this basis, 9 No. nominal 200m^3 stockpile sections (B3, C3, C4, D3, F3, M1 & M2) were designated for treatment.

5.8.8 For operational reasons, the whole of Stockpile M was designated for treatment, even though samples M3 and M4 recorded TPH concentrations below the SSTC.

5.8.9 The relevant laboratory test certificates are presented in Appendix C (vii).

5.9 Ex-Situ Treatment of Contamination by Bioremediation

5.9.1 Grossly contaminated soil/fill from Area D was considered suitable for treatment by bioremediation. Bioremediation works were carried out in accordance with the SSWP (Report No. 5848, dated February 2006).

5.9.2 At all times during the bioremediation works, best practicable means were employed to minimise dust, odour and VOC generation, and their migration off site.

5.9.3 Monitoring for dust and total volatile organic compounds (VOCs) in air was carried out by the Engineer during bioremediation. This monitoring was undertaken at the up-wind and down-wind site boundaries, no less than three times a day, at approximately 09:00, 12:30 and 17:00 hours.

5.9.4 Total VOC concentrations were monitored using a pocket photo-ionisation detector (PID), calibrated to benzene.

5.9.5 Dust was monitored using a 'real-time' particulate monitor. Neither dust nor VOC concentrations in air exceeded the long-term trigger levels (see Sections 8 & 9 of the SSWP) at the site boundary; consequently no corrective action was required.

5.9.6 Soils designated for treatment were placed in the windrows in the treatment area at the southern end of Area D, which was prepared in accordance with Section 3 of the SSWP.

5.9.7 Sampling of the windrows was carried out at a rate of one sample per 200m^3. Chemical analysis of these samples enabled determination of the initial (T_0), average TPH concentration in each windrow (or section thereof).

5.9.8 Review of the laboratory results enabled optimisation of the treatment process, ensuring the microbial and fungal populations had a sufficient food source to maximise the degradation rate. Nutrient mixtures were added to each windrow at a rate of approximately 0.2% by volume.

5.9.9 The windrows were typically aerated weekly by a 24-tonne Tracked Hydraulic Excavator fitted with an ALLU screening bucket.

5.9.10 TPH concentrations were determined at weekly intervals (T_1 to T_n), until TPH concentrations in all windrows were below the SSTC. As a minimum, the SSWP specified that soils should be sampled on 3 occasions over the treatment phase.

5.9.11 A summary showing initial (T_0) to final (T_3) contaminant concentrations is provided below. Laboratory test certificates, as received from the laboratory, for all windrow samples retrieved during the bioremediation (T_0 to T_3), are presented in Appendix C (viii) to this report.

Windrow	TPH Concentration (mg/kg) (SSTC = 5,000 mg/kg)				
	Initial Assessment	T_0 (03/05/2006)	T_1 (10/05/2006)	T_2 (17/05/2006)	T_3 (24/05/2006)
B3	5,300	1,700	4,100	1,200	2,200
C3	9,800	3,000	2,900	1,500	1,500
C4	5,200	3,500	3,000	2,100	2,300
D3	7,400	2,700	4,900	2,700	2,300
F3	5,800	2,200	6,000	1,900	1,900
M1	5,300	4,200	4,100	1,800	1,800
M2	5,400	3,200	4,400	3,200	1,300
M3		-	5,200	3,300	1,500
M4		4,400	2,600	4,100	2,200

5.9.12 Once treatment was complete, the soils were replaced within Area D on site below the 1,000mm cover layer.

5.10 Verification Testing (Contaminated Soils)

5.10.1 The table on page 11 summarises the remediation undertaken in each area and the verification samples recovered:

Area	Outline of Remediation Undertaken	Remarks	Verification Samples	Acceptable
A	Excavation of hydrocarbon-contaminated made ground from southwestern corner	Stockpiled soils recorded concentrations of TPH below SSTC. No further action required	Area A/013 to 024	Yes
A	Removal of grossly contaminated soil from around french drain	Verification samples taken from natural ground in base & sides of excavation on 5m grid Recorded TPH concentrations below SSTC, therefore no further action required	Area A/ Road3/BP/ V001 to V011	Yes
D	Removal of grossly contaminated made ground	Verification samples taken from underlying natural ground on 25m grid Recorded TPH concentrations below SSTC therefore no further action required	29 grid samples (A to I, 1 to 5)	Yes
D	Removal of interceptor and associated grossly contaminated soils	Verification samples taken from sides & base of excavation Recorded TPH concentrations below SSTC, therefore no further action required	Interceptor N, S, E, W & B	Yes
D	Confirmation of TPH concentrations present in excavated made ground	Samples taken on volumetric rate of 1 sample per 200m^3 of excavated soil Where TPH concentrations below SSTC, materials designated for backfill Where TPH concentrations in excess of SSTC, materials designated for treatment	A1 to 4; B1, 2 & 4; C1, 2 & 5; D1 & 2; E1 to 4; F1; G1 to 4; H1 to 4; I1 to 3; J1 to 4; K1 to 4; L1 to 4; M3 & 4; N1 & 2; O1 & 2 B3, C3, C4, D3, F3, M1 & M2	Yes No (see below)
D	Confirmation of concentrations of PCBs present in excavated made ground	Samples taken on volumetric rate of 1 sample per 600m^3 of excavated soil US$_{95}$ concentration below SSTC, therefore no further action required	23 samples, stockpiles A to O	Yes
D	Ex-situ treatment (bioremediation)	Samples taken, on volumetric rate of 1 sample per 200m^3 of material, at 4 weekly intervals (T_0 to T_3) All TPH concentrations below SSTC, therefore no further treatment required	T_3 (B3, C 3 & 4, D3, F3 & M1 to M4)	Yes

5.11 Preparation of Adoptable Road Footprints

5.11.1 Following removal of made ground, adoptable road footprints were inspected to ensure the absence of soft areas and proof-rolled.

5.11.2 Roads were then raised to formation level, using either Class 6F2 material derived from on-site crushing or site-won sub-base (see Section 4.4), placed and compacted in accordance with Series 600 of the Specification for Highway Works.

5.11.3 Plate bearing tests were carried out on adoptable roads, at road formation level, at approximately 25m centres. The results of these tests have been used to derive California Bearing Ratio (CBR) values, as summarised in the table below:

Test No.	CBR (%)	Material
1	30	Site won crushed concrete / sub-base
2	15	Site won crushed concrete / sub-base
3	11	Site won crushed concrete / sub-base
4	13	Site won crushed concrete / sub-base
5	8	Site won crushed concrete / sub-base
6	7	Site won crushed concrete / sub-base
7	12	Site won crushed concrete / sub-base
8	5	Site won crushed concrete / sub-base
9	8	Site won crushed concrete / sub-base
10	9	Site won crushed concrete / sub-base
11	8	Site won crushed concrete / sub-base
12	7	Site won crushed concrete / sub-base
13	5	Site won crushed concrete / sub-base
14	6	Site won crushed concrete / sub-base
15	> 34	Site won crushed concrete / sub-base
16	14	Site won crushed concrete / sub-base
17	11	Site won crushed concrete / sub-base
18	11	Site won crushed concrete / sub-base
19	13	Site won crushed concrete / sub-base
20	> 34	Site won crushed concrete / sub-base
21	5	Site won crushed concrete / sub-base
22	> 34	Site won crushed concrete / sub-base
23	> 34	Site won crushed concrete / sub-base
24	> 34	Site won crushed concrete / sub-base
25	> 34	Site won crushed concrete / sub-base
26	15	Site won crushed concrete / sub-base
27	> 34	Site won crushed concrete / sub-base
28	> 34	Site won crushed concrete / sub-base
29	> 34	Site won crushed concrete / sub-base
30	> 34	Site won crushed concrete / sub-base
31	15	Site won crushed concrete / sub-base
32	11	Site won crushed concrete / sub-base
33	12	Site won crushed concrete / sub-base
34	14	Site won crushed concrete / sub-base
35	5	Site won crushed concrete / sub-base
36	12	Site won crushed concrete / sub-base
37	> 34	Site won crushed concrete / sub-base

5.11.4 Plate bearing test results and associated CBR calculations are presented in Appendix D. The locations of the plate bearing tests are detailed on Drawing 5848/5/2 in Appendix A.

6 RECOMMENDATIONS for CONSTRUCTION PHASE of REDEVELOPMENT

6.1 General

6.1.1 In light of the actual remedial and preparatory works undertaken, it is now possible to provide specific recommendations with respect to foundation solutions, gas measures etc.

6.1.2 The remediation works have been undertaken in accordance with the Client's layout (Drawing No. 5848/5/2). Encia should be consulted if any layout revisions are proposed.

6.2 Foundations

6.2.1 The proposed development of 234 units comprises detached, semi-detached and mews houses with 5 apartment blocks, as shown on Drawing 5848/5/2 in Appendix A.

6.2.2 A detailed foundation schedule is beyond the scope of this report, and has been issued by Encia Consulting under separate cover.

6.3 Highways

6.3.1 Plate Load Tests have confirmed a CBR value in excess of 5% for the fill engineered within highway footprints.

6.4 Soil Cover for Garden Areas

6.4.1 The Remedial Strategy and Quantitative Risk Assessment have indicated that a minimum 1,000mm thickness of clean soil cover will be required in all garden and landscaped areas in site areas A and D (corresponding to Plots 1 to 57 and 121 to 224). *This cover layer should comprise 150mm of topsoil and 850mm of subsoil,* including a minimum 300mm layer of clay.

6.4.2 *Placement of topsoil and subsoil cover will be undertaken during the construction* phase in accordance with the recommendations of the Report No. 5848/3, dated October 2005. This cover will break potential pollutant linkages between the contaminated fill and future end-users.

Site-won Subsoil

6.4.3 Approximately 4,500m^3 of site won acceptable cohesive subsoil has been tested and stockpiled on site for later placement. 8 samples of this subsoil were obtained for confirmatory testing, and test results are presented in Appendix C (ix).

6.4.4 4 out of the 8 samples recorded concentrations of total nickel slightly in excess of the current UK guidance threshold value for a residential-with-gardens end use (maximum 58mg/kg *cf* SGV of 50mg/kg). Statistical analysis, carried out in accordance with CLR7, indicates that the upper 95th percentile (US_{95}) value (53mg/kg) is also slightly elevated with respect to the Soil Guideline Value.

6.4.5 Given the acknowledged conservatism of soil guideline values and that the highest recorded value on site only slightly exceeds the SGV for Nickel. It is our opinion that, in the absence of any outliers, an exceedance of the US_{95} of 3mg/kg is not significant. *As such we do not recommend any further action in respect to Nickel.*

6.4.6 1 of these samples also recorded a slightly elevated concentration of total zinc (310mg/kg cf guidance value of 300mg/kg). However, statistical analysis indicates that the US_{95} value is below the threshold value, and consequently this single slightly elevated result is not considered significant.

6.4.7 Copies of the statistical analysis calculation sheets are included in Appendix C (ix).

6.4.8 With respect to aliphatic and aromatic TPH fractions (C_{10} to C_{35}), Encia have derived risk based screening values in accordance with the methodology detailed by the TPHCWG, and recently reviewed by a UK workshop of experts in respect to UK adoption of the method.

6.4.9 These "Tier 1" TPH screening concentrations have been derived using the RISC model adapted to reflect current UK scenarios and assumptions. With respect to remediation, a higher "target" concentration might be acceptable, but this would normally be subject to the results of a quantitative risk assessment.

6.4.10 Each of the 8 samples analysed for Speciated TPH recorded concentrations of aliphatic and aromatic TPH fractions below the Encia derived Tier 1 screening criteria; the material is therefore considered suitable for use as near-surface soil in garden areas.

6.4.11 The test results are presented in Appendix C (ix), along with a table showing the Tier 1 screening criteria for topsoil.

Imported Subsoil

6.4.12 A further 3,000m^3 of acceptable cohesive subsoil was imported from a greenfield development site at Dodworth, west of Barnsley. 8 samples of this subsoil were obtained and scheduled for testing, and the test results are presented in Appendix C (x).

6.4.13 2 of the 8 samples recorded a slightly elevated concentration of total nickel (maximum 53mg/kg). However, statistical analysis indicates that the US_{95} value (49mg/kg) is below the threshold value and consequently the material is considered suitable for use in garden areas.

Site-won Topsoil

6.4.14 Approximately 7,500m^3 of site-won acceptable topsoil has been tested and stockpiled on site for later placement. 23 samples of this topsoil were obtained and scheduled for testing, and the test results are presented in Appendix C (xi).

6.4.15 9 of these 23 samples recorded slightly elevated concentrations of arsenic (max. 31mg/kg cf SGV of 20mg/kg), and statistical analysis of the results indicates a US_{95} value of 22mg/kg. In order to determine the true significance of these results, 3 of the samples were scheduled for arsenic bioavailability analysis. The results of this bioavailability analysis have been analysed, using the SNIFFER framework, in order to determine a site specific assessment criterion for total arsenic. This analysis has produced a screening value of 48 mg/kg arsenic for topsoil on this site, based on a bioavailable percentage of 21% after 3 hours. Given that the US_{95} value for arsenic in the topsoil is below this calculated site-specific screening value, the material is considered suitable for use.

6.4.16 The statistical analysis calculation sheets are included in Appendix C (xi), along with the bioavailability test results, SNIFFER analysis sheets and notes on the use of the SNIFFER method.

6.4.17 Although a number of samples recorded slightly elevated concentrations of copper and/or zinc, statistical analysis indicates that the upper 95th percentile (US_{95}) values are below the threshold values; consequently the elevated results are not considered significant.

6.4.18 It is recommended that any additional soils that may be required are imported in accordance with Encia's standard Protocol for Importation and Use of Soil Cover (Capping), which is copied in Appendix F.

6.4.19 Works to place the soil cover will be undertaken on behalf of Ben Bailey Homes Ltd by their groundworker. Encia will provide independent validation, confirming soil quality and placed thickness and issue a Supplementary Verification Report.

6.5 Gas Protection Measures

6.5.1 Gas protection measures in accordance with Characteristic Situation 2 (Wilson & Card, 1999) will be required for new development within Area D (Plots 1 to 57 inclusive).

6.5.2 Basic radon protection measures will be required for all other plots.

6.5.3 The required gas protection measures are summarised in the table below:

Situation	Protective Measures			
	Floor Slab	Sub-floor ventilation	Membrane	
			Type	Product Examples
Characteristic Situation 2 (Wilson & Card, 1999) Plots 1 to 57	Suspended	Min. 200mm clear void Min. ventilation = 2,000 mm^2/m (via air bricks on each of 2 opposite sides) Any sub-floor sleeper walls should be honeycombed	Waterproof DPM Lapped & sealed in accordance with BR 414	2000g polyethylene
Basic Radon Protection Plots 58 to 234	Suspended	To comply with Building Regulations (Part C)	Waterproof DPM	1200g polyethylene

Footnotes:

1. The membrane should always be lapped and sealed in accordance with BRE/Environment Agency Report BR 414 (2001) - "*Protective Measures for housing on gas-contaminated land*". The membrane should be continuous across cavity walls, and there should be a cavity tray in external walls
2. In all cases there should be minimum penetration of floor slab by services; any penetrations should be suitably sealed
3. Integral garages with occupied rooms above, or direct access through a doorway from the garage to the house, should be provided with the same protective measures as the rest of the dwelling
4. Check manufacturer's specification if hydrocarbon vapours are present; hydrocarbons will degrade some membrane materials

6.6 Health & Safety Issues - Construction Workers

6.6.1 The bulk of the made ground has been retained on site. This made ground contains contaminants at concentrations above the guidance threshold values for an end use that includes domestic gardens. Workers involved in excavations for foundations, drainage, utilities etc are likely to come into direct contact with the made ground.

6.6.2 Although workers will only be exposed to the contaminated soil/fill for a relatively short time, the contaminants represent a risk, and simple precautionary measures are required, i.e. good personal hygiene and basic personnel protective equipment.

6.6.3 General guidance on such matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land".

6.6.4 In addition to the above, the atmosphere in shored trenches in excess of 1.2m should be monitored for oxygen and hazardous gas (methane & carbon dioxide), prior to personnel entering such excavations. Monitoring should continue whilst personnel are working in deep excavations.

6.7 New Utilities

6.7.1 It is recommended that trenches for services including site drainage and water supply are cut over size in order to isolate pipe materials from potential contaminants and to enable maintenance to be conducted in "clean" material.

6.7.2 It is strongly recommended that all statutory service bodies are consulted at an early stage with respect to the ground conditions within which they will lay services in order to enable them to assess at an early stage any potential abnormal costs.

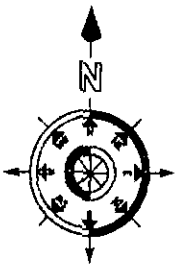
6.7.3 It is likely that the Water Company will request the use of ductile iron mains, with plastic coated copper house connections, given that residual organic contaminants will still be present post-remediation, albeit at trace concentrations.

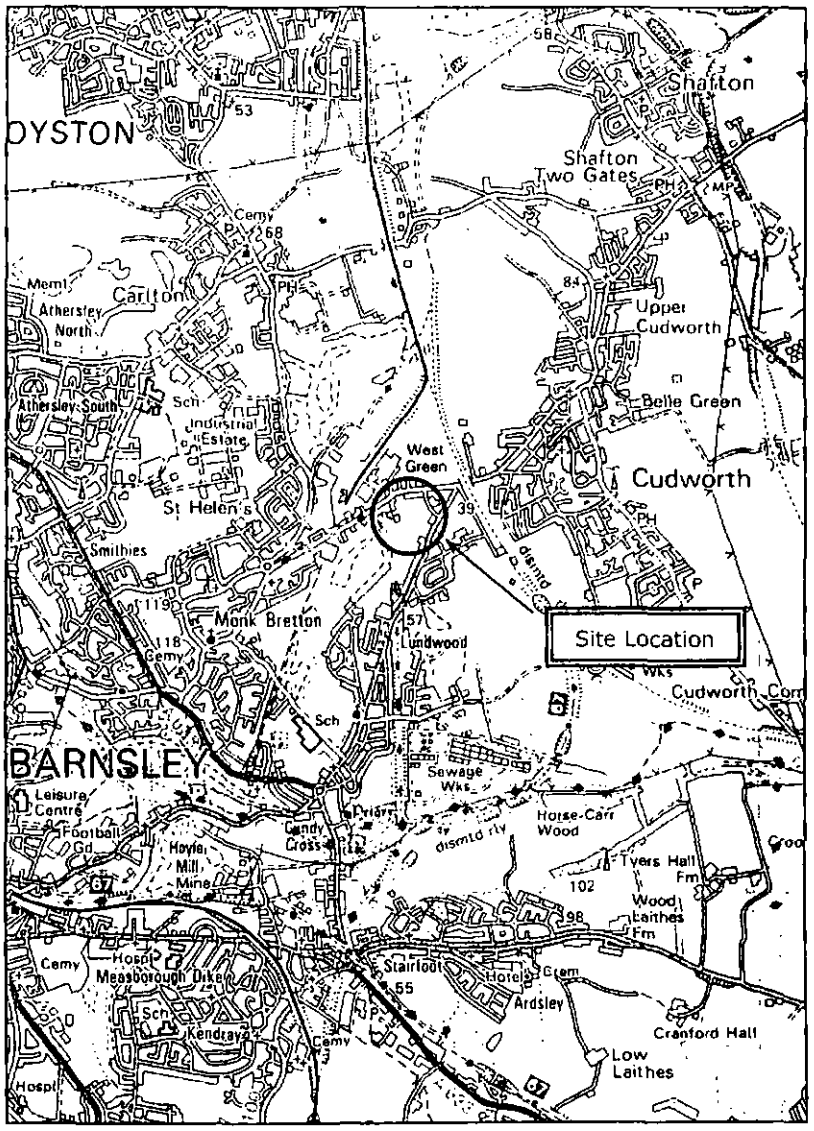
7 CONCLUSIONS

7.1 **The remediation works agreed with BMBC, EA and the National House Building Council have been carried out to date in accordance with Encia's *'Remedial Strategy 5848/3, dated October 2005'* with variations as detailed in this report.**

APPENDIX A
DRAWINGS

ENCIA CONSULTING LTD ENCIA HOUSE AUDBY LANE WETHERBY W.YORSHIRE UNITED KINGDOM LS22 7RD TEL: 01937 589955 FAX: 01937 589944





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ENCIA CONSULTING LIMITED

CLIENT	**BEN BAILEY HOMES LIMITED**
JOB TITLE	**BURTON ROAD, BARNSLEY**
DRAWING TITLE	**SITE LOCATION PLAN**

DRAWN BY	SIGNATURE	DATE	STATUS	
SRJ		**27/09/06**	**Final**	
APPROVED	SIGNATURE	DATE	SCALE	DRG NO.
RJH		**27/09/06**	**1:50,000**	**5848/1**

APPENDIX B
CORRESPONDENCE

ENCIA

5848/JWH

12th October 2005

Please reply to:

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Stone Cross Place,
Stone Cross Lane North, Lowton
WARRINGTON WA3 2SR
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☒ Yorkshire
Unit 1 Thorpe
Audby Lane,
WETHERBY LS22 7RD
01937 589965 01937 589934

☐ North East
7 Eggleston Court,
Riverside Park,
MIDDLESBROUGH TS2 1PL
01642 809078 01642 [illegible]

info@enciagroup.co.uk www.enciagroup.co.uk

Mr J Scott
Environmental Services
Barnsley Metropolitan Borough Council
Central Offices
Kendray Street
Barnsley
S70 2TN

Dear John

Burton Road, Barnsley

Please find enclosed one bound copy of our Remedial Strategy for the above site. We have also copied the report to the Environment Agency for their approval.

The Remedial Strategy outlines the remedial objectives necessary to protect environmental receptors, and render the site suitable for the proposed development.

We trust the above and enclosed satisfies your present requirements, but please contact the undersigned with any queries.

Yours sincerely

John Harrison
Senior Engineer
for and on behalf of
ENCIA CONSULTING LIMITED

cc Jonathan Dalton - Environment Agency
Martin Ingram - Ben Bailey Homes

RECEIVED 31 OCT 2005

BARNSLEY
Metropolitan Borough Council

Regulatory Services
Assistant Director: Ken Eastwood, BSc (Hons), MCIEH
Central Offices, Kendray Street, Barnsley. S70 2TN.

My Ref: JSC109479 Your Ref: 5848/JWH Date: 27 October 2005

Enquiries To: Mr J Scott Johnscott@barnsley.gov.uk Dial Direct: (01226) 772456 Fax: (01226) 775699

Dear John

Re: Burton Road, Barnsley - Planning Application B/04/0769/BA & B/05/0307/BA

Following the submission the Remedial Strategy (Report No. 5848/3) for the above site, highlighting the general principles of the work required to address the contamination issues, I have the subsequent comments to make.

The vast majority of the proposals that have been highlighted within the report are acceptable to the Council; however, with regard the analytical suite for testing soils, I would recommend that Total Petroleum Hydrocarbons (TPH) test is included, as a guide for any organic contamination. The proposed testing frequencies and chemical assessment criteria for the soils are acceptable. Following our conversation regarding the inclusion of a TPH within the analytical suite, and your subsequent confirmation of this matter, I am pleased to confirm our acceptance of the remedial strategy. I shall advise the Planning department that sufficient information has been submitted, and agreed, to satisfy the condition imposed on the application.

Obviously, as highlighted within the remedial strategy, there will be the requirement to submit detailed method statements and validation reports for the proposed works. However, these can be provided later, at an appropriate time for the development work.

Gas Protection Measures
The gas protection measures highlighted within Report are acceptable to us to provide protection against the gas concentrations found on the site. However, could cross sectional plans of the proposed gas protection measures be provided. I understand the housing developer will be responsible for the provision of this information, thus could you ask Ben Bailey to provide this for our file.

Should you wish to discuss this correspondence further, please don't hesitate to contact me; you may also contact my Principal Officer, Mrs Caroline Petty, on (01226) 772482.

Mr J Harrison
ENCIA
Encia House
Audby Lane
Wetherby
LS22 7RD

rom: Marlon Frost [marlon.frost@enciagroup.co.uk]
ent: 16 November 2005 17:14
o: JohnScott@barnsley.gov.uk
c: 'JPB'; 'Jonathan walker'
ubject: BURTON ROAD, BARNSLEY - PCB's

URTON ROAD, BARNSLEY - REMEDIATION STRATEGY

site specific target level of 8.8mg/kg has been calculated for PCBs within the made ground in the former scrap ard (Area D) at the above site.

oil sample results undertaken during the site investigation phase, did not exceed this site specific target level r PCBs. However the Remediation Strategy calls for a more rigorous testing regime with sampling on a 20m id across Area D.

s discussed the contractor is concerned the testing regime may cause delays to the program whilst the results testing are awaited following the removal of the concrete hard standing. The made ground across the area is enerally in the order of 1.5m thick, based upon which a volumetric sampling rate has been agreed.

l made ground is to be excavated and placed in windrows to allow bioremediation. As agreed prior to the eated soils being replaced, in addition to TPH the soils will be screened at a minimum rate of 1 sample per $0m^3$ (equivalent to 20 x 20 x 1.5) for PCB's.

ould you have any queries please contact me.

est Regards

rlon Frost
ncipal Engineer
cia Consulting Ltd, Encia House
dby Lane, Wetherby. LS22 7RD

. 01937 589955 Fax: 01937 589944
bile: 07712 843301

ailto:marlon.frost@enciagroup.co.uk>

w.enciagroup.co.uk

ENCIA

Our ref: 5848/JWW

6th January 2006

Please reply to:

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7 Lyndeston Court
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info@enciagroup.co.uk enciagroup.co.uk

Ms Orna O'Toole
NHBC
Buildmark House
George Cayley Drive
Clifton
York
YO3 4XE

Dear Orna

West Green - Burton Road Barnsley (Ben Bailey Homes)

Please find enclosed reports relating to the remedial strategy and the quantitative risk assessment for the above project.

Yours sincerely

Jonathan Walker
Senior Engineer
For and on behalf of
ENCIA CONSULTING LIMITED

RECEIVED 19 APR 2006

Environment Agency

Mr Marlon Frost
Encia Consulting Ltd
Encia House
Audby Lane
Wetherby
LS22 7RD

Our ref: MJP/EAWML54434
Your ref:

Date: 18 April 2006

Dear Mr Frost

Site Specific Working Plan - Burton Road, Barnsley

Further to my e-mail dated 17 March 2006, I can confirm that the Site Specific Working Plan for the mobile plant licence EAWML 54434, which is to operate at Burton Road, Barnsley, submitted on the 17 March 2006, is agreed in accordance with licence condition 1.3.1.

If you have any queries regarding the above then please contact me on the direct dial number listed below.

Yours sincerely

Michael Plant
Environment Officer

Direct dial 01709 312869
Direct fax 01709 312818

ENCIA

Ref 001/PCB/LJ/lj

25th May 2006

Mr J Scott
Barnsley MBC
Central Offices
Kendray Street
Barnsley
S70 2TN

Please reply to:

☐ North West
Stone Cross Park
Stone Cross Lane North
WARRINGTON WA1 2SX
01925 [illegible] 01925 [illegible]

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WORTHERBY LS22 7LG
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7 Eaglestone Court
Riverside Park
MIDDLESBROUGH TS2 1PU
01642 [illegible] 01642 [illegible]

info-encia@encia.co.uk encia@encia.co.uk

Dear Mr Scott

Burton Road, Monk Bretton, Barnsley

As you are aware polychlorinated biphenyl (PCB) contamination was identified during the site investigation at the above site. A site specific risk assessment was undertaken which included these PCB's. The risk assessment assumed a 1m 'clean' cover across the site and determined a remedial target for PCB's of 8.8mg/kg.

Soils have been excavated from the site during the remedial works. It is intended that, where these yield contaminant values below their remedial targets, it will be recovered and reused in cut and fill operations on site. This material will not however be incorporated within the 1m cover proposed in garden areas.

Sample analysis results for PCB's show that all but one is below the remedial target. As the samples have been taken for the same material type on site it is considered appropriate to treat the material as one averaging area for the purposes of CLR 7 statistical analysis.

The maximum outlier test was applied and confirmed the one elevated value was not an outlier and belonged to the same sample population. The sample population was found to be a normal distribution and therefore it was considered appropriate to compare the US_{95} of the population with the remedial target.

The mean value test was applied and the US_{95} calculated as 4mg/kg. This is below the remedial target of 8.8mg/kg and therefore it is proposed that this material can remain on the site, subject to a 1m 'clean' cover.

The statistical analysis and analytical results are enclosed with this letter for your information. Confirmation of your acceptance to the above would be much appreciated. However, should you require any further information, please contact the undersigned.

Yours sincerely

Elizabeth Jarvis
for and on behalf of
ENCIA CONSULTING LIMITED

APPENDIX C (i)
CHEMICAL LABORATORY TEST RESULTS
SITE-WON SUB-BASE

RECEIVED 18 NOV 2005

Scientific Analysis Laboratories

Report Number:	67896 supplemental
Date of Report:	16/11/05
Client:	Encia Consulting Limited, Encia House, Audby Lane, Wetherby, West Yorkshire. LS22 7RD
Client Contact:	Mr Jonathan Walker
Client Job Reference:	5848
Client Site Reference:	BURTON RD BARNSLEY
Client Purchase Order:	85030-MB2-3680
Date Job Received at SAL:	10/11/05
Date Analysis Started:	10/11/05
Date Analysis Completed:	11/11/05

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Supplemental issued to report ammended sample references

Report written by: Lucy Walsh, Project Manager

Report checked and authorised by: Pam Knott, Project Manager

MCERTS 1549 UKAS TESTING 1549 Group

Report Number: 67896 supplemental
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

SAL Ref.	67896 001	67896 002
Client Ref.	AREA D / 017 / PCB GR / 4-6, A-C	AREA D / 018 / PCB GR / 1-3, A-C
Depth (m)		
Date Sampled	09/11/05	09/11/05
Type	Type 1 Stone *	Type 1 Stone *
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	12	22
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	26	16
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	29	9.3
Pentachloro, BZ#118	GC/MS	µg/kg	0.05	AR	M	26	8.1
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	22	7.0
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	26	7.2
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	3.4	1.9

Non-targeted Isomers

Total trichloro	GC/MS	µg/kg	0.05	AR	U	48	87
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	75	100
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	110	37
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	35	11
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	8.0	4.7

Total PCBs	GC/MS	µg/kg	0.05	AR	U	420	310
Moisture content	Grav	%		AR	N	3	10

Note: Reported results are on a dry weight basis.
AR = As Received
***Samples required dilution prior to analysis, —**
this is therefore reflected in the LOD of 0.5µg/kg.

Report Number: 67896 supplemental
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

67896 003
AREA D / 019 / PCB GR / 1-3, D-F
09/11/05
Type 1 Stone *
Soil

Determinand	Method	Units	LOD	Analysis	
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	7.3
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	4.3
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	1.6
Pentachloro, BZ#118	GC/MS	µg/kg	0.05	AR	1.5
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	1.3
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	1.5
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	0.6

Non-targeted Isomers

Total trichloro	GC/MS	µg/kg	0.05	AR	31
Total tetrachloro	GC/MS	µg/kg	0.05	AR	30
Total pentachloro	GC/MS	µg/kg	0.05	AR	7.1
Total hexachloro	GC/MS	µg/kg	0.05	AR	2.1
Total heptachloro	GC/MS	µg/kg	0.05	AR	1.1

Total PCBs	GC/MS	µg/kg	0.05	AR	90
Moisture content	Grav	%		AR	11

Note: Reported results are on a dry weight basis.
AR = As Received
***Samples required dilution prior to analysis,**
this is therefore reflected in the LOD of 0.5µg/kg.

Report Number: 67896 supplemental
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	09/11/02		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	67896 001	AREA D / 017 /	PCB GR / 4-6, A-C Top Soil
	67896 002	AREA D / 018 /	PCB GR / 1-3, A-C Top Soil
	67896 003	AREA D / 019 /	PCB GR / 1-3, D-F Top Soil
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted		

APPENDIX C (ii)
CHEMICAL LABORATORY TEST RESULTS
VERIFICATION OF INTERCEPTOR REMOVAL

Scientific Analysis Laboratories

Supplement to Report Number:	80908-1
Date of Report:	03-Oct-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Mr Marlon Frost
Client Job Reference:	5848 Burton Road, Barnsley
Date Job Received at SAL:	12-Jul-2006
Date Analysis Started:	17-Jul-2006
Date Analysis Completed:	18-Jul-2006

The results reported relate to samples received at the laboratory

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Supplemental report issued to re format the report at clients request

Report written by: M Ashpool — Helen Ashpool, Senior Project Manager

Report checked and authorised by: D.M.Brown — Donna Brown, Project Manager

MCERTS 1549

UKAS TESTING 1549 Group

Supplement to Report Number: 80908-1

Client Job Reference: 5848 Burton Road, Barnsley

SAL Ref.	80908-001	80908-002	80908-003	80908-004	80908-005
Client Ref.	INTERCEPTOR N	INTERCEPTOR S	INTERCEPTOR E	INTERCEPTOR W	INTERCEPTOR B
Type	Clay	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil

Determinant	Method	Units	LOD	Analysis*	Symbol					
Total TPH	GC/FID	mg/Kg	1	AR	M	<1	<1	<1	<1	<1
Moisture Content	Grav	%	N/A	AR	N	14	16	23	17	16

AR :Analysis carried out on samples 'As Received'.

TPH results are calculated on a 105°C dry weight basis

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	Not supplied		
ON SITE PRESERVATION/STABILISATION:	Not supplied		
SAMPLE CHARACTERISATION:	**80908-001**	**INTERCEPTOR N**	**Clay**
	80908-002	**INTERCEPTOR S**	**Clay**
	80908-003	**INTERCEPTOR E**	**Clay**
	80908-004	**INTERCEPTOR W**	**Clay**
	80908-005	**INTERCEPTOR B**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	None subcontracted.		

APPENDIX C (iii)
CHEMICAL LABORATORY TEST RESULTS
AREA A - MADE GROUND

Scientific Analysis Laboratories

Report Number: 68808 Compiled

RECEIVED - 5 DEC 2005

Date of Report: 02/12/05

Client:
Encia Consulting Limited
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Client Contact: Mr Jonathan Walker
Client Job Reference: 5848
Client Site Reference: Burton Road, Barnsley
Client Purchase Order: 85030/MB2/3811

Date Job Received at SAL: 29/11/05
Date Analysis Started: 29/11/05
Date Analysis Completed: 02/12/05

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: *Analysis was performed at another SAL laboratory*
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: Lucy Walsh
Project Manager

Report checked and authorised by: Pam Knott
Project Manager

1549 1549 Group

Report Number: 68808 Compiled
Client Job Reference: 5848
Project Site: Burton Road, Barnsley

SAL Ref.	68808 001
Client Ref.	Area A/029/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Moisture Content	Grav	%	N/A	AR	N	22

Chloromethane	GC/MS	ug/kg	50	AR	U	<50
Vinyl Chloride	GC/MS	ug/kg	50	AR	M	<50
Bromomethane	GC/MS	ug/kg	50	AR	U	<50
Chloroethane	GC/MS	ug/kg	50	AR	M	<50
Trichlorofluoromethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
trans-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
2,2-Dichloropropane	GC/MS	ug/kg	50	AR	U	<50
cis-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chloroform	GC/MS	ug/kg	50	AR	M	<50
Bromochloromethane	GC/MS	ug/kg	50	AR	M	<50
1,1,1-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
Carbon Tetrachloride	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
Benzene	GC/MS	ug/kg	10	AR	M	<10
Trichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50
Bromodichloromethane	GC/MS	ug/kg	50	AR	M	<50
Dibromomethane	GC/MS	ug/kg	50	AR	M	<50
cis-1,3-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
1,1,2-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50

SAL Ref.	68808 001
Client Ref.	Area A/029/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Tetrachloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chlorodibromomethane	GC/MS	ug/kg	50	AR	M	<50
1,2-Dibromoethane	GC/MS	ug/kg	50	AR	U	<50
Chlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,1,1,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	M	<50
Toluene	GC/MS	ug/kg	10	AR	M	<20
Ethylbenzene	GC/MS	ug/kg	10	AR	M	<10
m/p Xylene	GC/MS	ug/kg	10	AR	M	<10
o Xylene	GC/MS	ug/kg	10	AR	M	<10
Styrene	GC/MS	ug/kg	50	AR	U	<50
Bromoform	GC/MS	ug/kg	50	AR	M	<50
1,1,2,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	U	<50
1,2,3-Trichloropropane	GC/MS	ug/kg	50	AR	U	<50
Bromobenzene	GC/MS	ug/kg	50	AR	M	<50
2-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
4-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
1,2-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,4-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,2,4-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50
1,3,5-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50

VOC LOD's determined by the method blank

Total TPH	GC/FID	mg/kg	1	AR	M	780

Report Number: 68808 Compiled
Client Job Reference: 5848
Project Site: Burton Road, Barnsley

SAL Ref.	68808 001
Client Ref.	Area A/029/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
C8-C10	GC/FID	mg/kg	1	AR	U	<1
C10-C12	GC/FID	mg/kg	1	AR	U	5
C12-C16	GC/FID	mg/kg	1	AR	U	72
C16-C21	GC/FID	mg/kg	1	AR	U	200
C21-C35	GC/FID	mg/kg	1	AR	U	330

Note: Reported results are on a dry weight basis.
AR = As Received

Report Number: 68808 Compiled
Client Job Reference: 5848
***Project Site:* Burton Road, Barnsley**

SAL Ref.	68808 002
Client Ref.	Area A/030/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Moisture Content	Grav	%	N/A	AR	N	20

Chloromethane	GC/MS	ug/kg	50	AR	U	<50
Vinyl Chloride	GC/MS	ug/kg	50	AR	M	<50
Bromomethane	GC/MS	ug/kg	50	AR	U	<50
Chloroethane	GC/MS	ug/kg	50	AR	M	<50
Trichlorofluoromethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
trans-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
2,2-Dichloropropane	GC/MS	ug/kg	50	AR	U	<50
cis-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chloroform	GC/MS	ug/kg	50	AR	M	<50
Bromochloromethane	GC/MS	ug/kg	50	AR	M	<50
1,1,1-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
Carbon Tetrachloride	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
Benzene	GC/MS	ug/kg	10	AR	M	<10
Trichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50
Bromodichloromethane	GC/MS	ug/kg	50	AR	M	<50
Dibromomethane	GC/MS	ug/kg	50	AR	M	<50
cis-1,3-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
1,1,2-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50

Report Number: 68808 Compiled
Client Job Reference: 5848
Project Site: Burton Road, Barnsley

SAL Ref.	68808 002
Client Ref.	Area A/030/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Tetrachloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chlorodibromomethane	GC/MS	ug/kg	50	AR	M	<50
1,2-Dibromoethane	GC/MS	ug/kg	50	AR	U	<50
Chlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,1,1,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	M	<50
Toluene	GC/MS	ug/kg	10	AR	M	26
Ethylbenzene	GC/MS	ug/kg	10	AR	M	<10
m/p Xylene	GC/MS	ug/kg	10	AR	M	<10
o Xylene	GC/MS	ug/kg	10	AR	M	<10
Styrene	GC/MS	ug/kg	50	AR	U	<50
Bromoform	GC/MS	ug/kg	50	AR	M	<50
1,1,2,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	U	<50
1,2,3-Trichloropropane	GC/MS	ug/kg	50	AR	U	<50
Bromobenzene	GC/MS	ug/kg	50	AR	M	<50
2-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
4-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
1,2-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,4-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,2,4-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50
1,3,5-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50

VOC LOD's determined by the method blank

Total TPH	GC/FID	mg/kg	1	AR	M	460

Report Number: 68808 Compiled
Client Job Reference: 5848
Project Site: Burton Road, Barnsley

SAL Ref.	68808 002
Client Ref.	Area A/030/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
C8-C10	GC/FID	mg/kg	1	AR	U	<1
C10-C12	GC/FID	mg/kg	1	AR	U	3
C12-C16	GC/FID	mg/kg	1	AR	U	39
C16-C21	GC/FID	mg/kg	1	AR	U	100
C21-C35	GC/FID	mg/kg	1	AR	U	220

Note: Reported results are on a dry weight basis.
AR = As Received

SAL Ref.	68808 003
Client Ref.	Area A/031/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Moisture Content	Grav	%	N/A	AR	N	21
Chloromethane	GC/MS	ug/kg	50	AR	U	<50
Vinyl Chloride	GC/MS	ug/kg	50	AR	M	<50
Bromomethane	GC/MS	ug/kg	50	AR	U	<50
Chloroethane	GC/MS	ug/kg	50	AR	M	<50
Trichlorofluoromethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
trans-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
2,2-Dichloropropane	GC/MS	ug/kg	50	AR	U	<50
cis-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chloroform	GC/MS	ug/kg	50	AR	M	<50
Bromochloromethane	GC/MS	ug/kg	50	AR	M	<50
1,1,1-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
Carbon Tetrachloride	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
Benzene	GC/MS	ug/kg	10	AR	M	<10
Trichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50
Bromodichloromethane	GC/MS	ug/kg	50	AR	M	<50
Dibromomethane	GC/MS	ug/kg	50	AR	M	<50
cis-1,3-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
1,1,2-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50

SAL Ref.	68808 003
Client Ref.	Area A/031/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Tetrachloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chlorodibromomethane	GC/MS	ug/kg	50	AR	M	<50
1,2-Dibromoethane	GC/MS	ug/kg	50	AR	U	<50
Chlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,1,1,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	M	<50
Toluene	GC/MS	ug/kg	10	AR	M	<20
Ethylbenzene	GC/MS	ug/kg	10	AR	M	<10
m/p Xylene	GC/MS	ug/kg	10	AR	M	<10
o Xylene	GC/MS	ug/kg	10	AR	M	<10
Styrene	GC/MS	ug/kg	50	AR	U	<50
Bromoform	GC/MS	ug/kg	50	AR	M	<50
1,1,2,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	U	<50
1,2,3-Trichloropropane	GC/MS	ug/kg	50	AR	U	<50
Bromobenzene	GC/MS	ug/kg	50	AR	M	<50
2-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
4-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
1,2-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,4-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,2,4-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50
1,3,5-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50

VOC LOD's determined by the method blank

Total TPH	GC/FID	mg/kg	1	AR	M	500

Report Number: 68808 Compiled
***Client Job Reference:* 5848**
Project Site: Burton Road, Barnsley

SAL Ref.	68808 003
Client Ref.	Area A/031/Grid 10
	Brown Made Ground Stockpile
Depth (m)	-
Date Sampled	25/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
C8-C10	GC/FID	mg/kg	1	AR	U	<1
C10-C12	GC/FID	mg/kg	1	AR	U	3
C12-C16	GC/FID	mg/kg	1	AR	U	47
C16-C21	GC/FID	mg/kg	1	AR	U	130
C21-C35	GC/FID	mg/kg	1	AR	U	220

Note: Reported results are on a dry weight basis.
AR = As Received

Report Number: 68808 Compiled
Client Job Reference: 5848
Project Site: Burton Road, Barnsley

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley			
DATE/TIME OF SAMPLING:	25/11/05			
ON SITE PRESERVATION/STABILISATION:	Not supplied.			
SAMPLE CHARACTERISATION:	68808 001	Area A/029/Grid 10	Brown Made Ground Stockpile	Topsoil
	68808 002	Area A/030/Grid 10	Brown Made Ground Stockpile	Topsoil
	68808 003	Area A/031/Grid 10	Brown Made Ground Stockpile	Topsoil
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted			

RECEIVED - 7 DEC 2005 24601

Examined, screened Made ground stockpile from [illegible]

Scientific Analysis Laboratories

Report Number:	68813
Date of Report:	06/12/05
Client:	Encia Consulting Limited, Encia House, Audby Lane, Wetherby, West Yorkshire. LS22 7RD
Client Contact:	Mr Jonathan Walker
Client Job Reference:	5848
Client Site Reference:	BURTON RD BARNSLEY
Client Purchase Order:	850301
Date Job Received at SAL:	29/11/05
Date Analysis Started:	29/11/05
Date Analysis Completed:	06/12/05

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
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Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
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S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: Lucy Walsh, Project Manager

Report checked and authorised by: Pam Knott, Project Manager

MCERTS 1549 UKAS TESTING 1549 Group

Report Number: 68813
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

SAL Ref.	68813-001	68813-002	68813-003
Client Ref.	Area A/032/Grid 10	Area A/033/Grid 10	Area A/034/Grid 10
Depth (m)	Black Ashy Stockpile	Black Ashy Stockpile	Black Ashy Stockpile
Date Sampled	28/11/05	28/11/05	28/11/05
Type	Topsoil	Topsoil	Topsoil
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Moisture Content	Grav	%	-	AR	N	17	20	20
Total TPH	GC/FID	mg/kg	1	AR	M	490	260	1200
C8-C10	GC/FID	mg/kg	1	AR	U	<10*	<10*	<10*
C10-C12	GC/FID	mg/kg	1	AR	U	<10*	<10*	<10*
C12-C16	GC/FID	mg/kg	1	AR	U	<10*	13*	76*
C16-C21	GC/FID	mg/kg	1	AR	U	<10*	49*	150*
C21-C35	GC/FID	mg/kg	1	AR	U	330*	100*	530*

AR : As Received
* Samples were diluted 10-fold, therefore LOD raised x10.
Note: Results are reported on a dry weight basis.

Report Number: 68813
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

SAL Ref.	68813-001	68813-002
Client Ref.	Area A/032/Grid 10	Area A/033/Grid 10
Depth (m)	Black Ashy Stockpile	Black Ashy Stockpile
Date Sampled	28/11/05	28/11/05
Type	Topsoil	Topsoil
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
Chloromethane	GC/MS	ug/kg	50	AR	U	<50	<50
Vinyl Chloride	GC/MS	ug/kg	50	AR	M	<50	<50
Bromomethane	GC/MS	ug/kg	50	AR	U	<50	<50
Chloroethane	GC/MS	ug/kg	50	AR	M	<50	<50
Trichlorofluoromethane	GC/MS	ug/kg	50	AR	M	<50	<50
1,1-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50	<50
trans-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50	<50
1,1-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50	<50
2,2-Dichloropropane	GC/MS	ug/kg	50	AR	U	<50	<50
cis-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50	<50
Chloroform	GC/MS	ug/kg	50	AR	M	<50	<50
Bromochloromethane	GC/MS	ug/kg	50	AR	M	<50	<50
1,1,1-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50	<50
1,1-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50	<50
Carbon Tetrachloride	GC/MS	ug/kg	50	AR	M	<50	<50
1,2-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50	<50
Benzene	GC/MS	ug/kg	10	AR	M	<10	<10
Trichloroethylene	GC/MS	ug/kg	50	AR	M	<50	<50
1,2-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50	<50
Bromodichloromethane	GC/MS	ug/kg	50	AR	M	<50	<50
Dibromomethane	GC/MS	ug/kg	50	AR	M	<50	<50
cis-1,3-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50	<50
1,1,2-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50	<50
1,3-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50	<50
Tetrachloroethylene	GC/MS	ug/kg	50	AR	M	<50	<50
Chlorodibromomethane	GC/MS	ug/kg	50	AR	M	<50	<50
1,2-Dibromoethane	GC/MS	ug/kg	50	AR	U	<50	<50
Chlorobenzene	GC/MS	ug/kg	50	AR	M	<50	<50

Report Number: 68813
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

SAL Ref.	68813-003
Client Ref.	Area A/034/Grid 10
Depth (m)	Black Ashy Stockpile
Date Sampled	28/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Chloromethane	GC/MS	ug/kg	50	AR	U	<50
Vinyl Chloride	GC/MS	ug/kg	50	AR	M	<50
Bromomethane	GC/MS	ug/kg	50	AR	U	<50
Chloroethane	GC/MS	ug/kg	50	AR	M	<50
Trichlorofluoromethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
trans-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
2,2-Dichloropropane	GC/MS	ug/kg	50	AR	U	<50
cis-1,2-Dichloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chloroform	GC/MS	ug/kg	50	AR	M	<50
Bromochloromethane	GC/MS	ug/kg	50	AR	M	<50
1,1,1-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,1-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
Carbon Tetrachloride	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloroethane	GC/MS	ug/kg	50	AR	M	<50
Benzene	GC/MS	ug/kg	10	AR	M	<10
Trichloroethylene	GC/MS	ug/kg	50	AR	M	<50
1,2-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50
Bromodichloromethane	GC/MS	ug/kg	50	AR	M	<50
Dibromomethane	GC/MS	ug/kg	50	AR	M	<50
cis-1,3-Dichloropropene	GC/MS	ug/kg	50	AR	M	<50
1,1,2-Trichloroethane	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichloropropane	GC/MS	ug/kg	50	AR	M	<50
Tetrachloroethylene	GC/MS	ug/kg	50	AR	M	<50
Chlorodibromomethane	GC/MS	ug/kg	50	AR	M	<50
1,2-Dibromoethane	GC/MS	ug/kg	50	AR	U	<50
Chlorobenzene	GC/MS	ug/kg	50	AR	M	<50

Report Number: 68813
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

SAL Ref.	68813-001	68813-002
Client Ref.	Area A/032/Grid 10	Area A/033/Grid 10
Depth (m)	Black Ashy Stockpile	Black Ashy Stockpile
Date Sampled	28/11/05	28/11/05
Type	Topsoil	Topsoil
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
1,1,1,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	M	<50	<50
Toluene	GC/MS	ug/kg	10	AR	M	<10	<10
Ethylbenzene	GC/MS	ug/kg	10	AR	M	29	28
m/p Xylene	GC/MS	ug/kg	10	AR	M	35	40
o Xylene	GC/MS	ug/kg	10	AR	M	24	18
Styrene	GC/MS	ug/kg	50	AR	U	<50	<50
Bromoform	GC/MS	ug/kg	50	AR	M	<50	<50
1,1,2,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	U	<50	<50
1,2,3-Trichloropropane	GC/MS	ug/kg	50	AR	U	<50	<50
Bromobenzene	GC/MS	ug/kg	50	AR	M	<50	<50
2-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50	<50
4-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50	<50
1,2-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50	<50
1,3-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50	<50
1,4-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50	<50
1,2,4-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50	<50
1,3,5-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	<50	<50

AR : As Received
LODs determined by the method blank
Note: Results are reported on a dry weight basis.

Report Number: 68813
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

SAL Ref.	68813-003
Client Ref.	Area A/034/Grid 10
Depth (m)	Black Ashy Stockpile
Date Sampled	28/11/05
Type	Topsoil
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
1,1,1,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	M	<50
Toluene	GC/MS	ug/kg	10	AR	M	<10
Ethylbenzene	GC/MS	ug/kg	10	AR	M	30
m/p Xylene	GC/MS	ug/kg	10	AR	M	55
o Xylene	GC/MS	ug/kg	10	AR	M	26
Styrene	GC/MS	ug/kg	50	AR	U	<50
Bromoform	GC/MS	ug/kg	50	AR	M	<50
1,1,2,2-Tetrachloroethane	GC/MS	ug/kg	50	AR	U	<50
1,2,3-Trichloropropane	GC/MS	ug/kg	50	AR	U	<50
Bromobenzene	GC/MS	ug/kg	50	AR	M	<50
2-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
4-Chlorotoluene	GC/MS	ug/kg	50	AR	U	<50
1,2-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,3-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,4-Dichlorobenzene	GC/MS	ug/kg	50	AR	M	<50
1,2,4-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	64
1,3,5-Trimethylbenzene	GC/MS	ug/kg	50	AR	M	68

AR : As Received
LODs determined by the method blank
Note: Results are reported on a dry weight basis.

Report Number: 68813
Client Job Reference: 5848
Project Site: BURTON RD BARNSLEY

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley			
DATE/TIME OF SAMPLING:	28/11/05			
ON SITE PRESERVATION/STABILISATION:	Not supplied.			
SAMPLE CHARACTERISATION:	68813-001	Area A/032/Grid 10	Black Ashy Stockpile	Topsoil
	68813-002	Area A/033/Grid 10	Black Ashy Stockpile	Topsoil
	68813-003	Area A/034/Grid 10	Black Ashy Stockpile	Topsoil
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted			

APPENDIX C (iv)
CHEMICAL LABORATORY TEST RESULTS
AREA A GROSS CONTAMINATION

RECEIVED 18 JAN 2006
24702

Scientific Analysis Laboratories

Report Number:	70342
Date of Report:	16/01/06
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Jonathan Walker
Client Job Reference:	5848-85030/MB2/4086
Date Job Received at SAL:	06/01/06
Date Analysis Started:	06/01/06
Date Analysis Completed:	16/01/06

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: L.Walsh, Project Manager

Report checked and authorised by: P.Knott, Project Manager

mCERTS 1549

UKAS TESTING 1549

Group

Report Number: 70342
Client Job Reference: 5848-85030/MB2/4086

SAL Ref.	70342-001	70342-002	70342-003	70342-004	70342-005
Client Ref.	AREA A ROAD3BP V001	AREA A ROAD3BP V002	AREA A ROAD3BP V003	AREA A ROAD3BP V004	AREA A ROAD3BP V005
Depth (m)					
Date Sampled	05/01/06	05/01/06	05/01/06	05/01/06	05/01/06
Type	Clay	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol					
Moisture Content	Grav	%	-	AR	N	18	21	14	17	19
Total TPH	GC/FID	mg/kg	1	AR	M	13	25	<1	<1	<1
C8-C10	GC/FID	mg/kg	1	AR	U	<1	<1	<1	<1	<1
C10-C12	GC/FID	mg/kg	1	AR	U	<1	<1	<1	<1	<1
C12-C16	GC/FID	mg/kg	1	AR	U	<1	3	<1	<1	<1
C16-C21	GC/FID	mg/kg	1	AR	U	3	10	<1	<1	<1
C21-C35	GC/FID	mg/kg	1	AR	U	10	12	<1	<1	<1
Fraction Start	GC/FID	Carbon Number	-	AR	U	C14	C12	*	*	*
Fraction End	GC/FID	Carbon Number	-	AR	U	>C35	>C35	*	*	*
Fraction Peaks	GC/FID	Carbon Number	-	AR	U	C28	C20	*	*	*
Boiling Range	GC/FID	-	-	N/A	N	HEAVY MINERAL OIL	MINERAL OIL	*	*	*

*Not a recognisable hydrocarbon pattern.

Note: Reported results are on a dry weight basis.
AR = As Received
N/A = Not Applicable

Report Number: 70342
Client Job Reference: 5848-85030/MB2/4086

SAL Ref.	70342-006	70342-007	70342-008	70342-009
Client Ref.	AREA A ROAD3BP V006	AREA A ROAD3BP V007	AREA A ROAD3BP V008	AREA A ROAD3BP V009
Depth (m)				
Date Sampled	05/01/06	05/01/06	05/01/06	05/01/06
Type	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol				
Moisture Content	Grav	%	-	AR	N	18	17	20	18
Total TPH	GC/FID	mg/kg	1	AR	M	39	980	760	970
C8-C10	GC/FID	mg/kg	1	AR	U	<1	2	3	<1
C10-C12	GC/FID	mg/kg	1	AR	U	<1	42	41	30
C12-C16	GC/FID	mg/kg	1	AR	U	11	400	280	320
C16-C21	GC/FID	mg/kg	1	AR	U	22	630	370	530
C21-C35	GC/FID	mg/kg	1	AR	U	6	120	63	94
Fraction Start	GC/FID	Carbon Number	-	AR	U	C12	C10	C10	C10
Fraction End	GC/FID	Carbon Number	-	AR	U	C28	C28	C28	C28
Fraction Peaks	GC/FID	Carbon Number	-	AR	U	C16	C16	C16	C16
Boiling Range	GC/FID	-	-	N/A	N	DIESEL RANGE FUEL	DIESEL RANGE FUEL	DIESEL RANGE FUEL	DIESEL RANGE FUEL

*Not a recognisable hydrocarbon pattern.

Note: Reported results are on a dry weight basis.
AR = As Received
N/A = Not Applicable

Report Number: 70342
Client Job Reference: 5848-85030/MB2/4086

SAL Ref.	70342-010	70342-011
Client Ref.	AREA A ROAD3BP V010	AREA A ROAD3BP V011
Depth (m)		
Date Sampled	05/01/06	05/01/06
Type	Clay	Clay
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
Moisture Content	Grav	%	-	AR	N	17	17
Total TPH	GC/FID	mg/kg	1	AR	M	991	990
C8-C10	GC/FID	mg/kg	1	AR	U	3	3
C10-C12	GC/FID	mg/kg	1	AR	U	29	30
C12-C16	GC/FID	mg/kg	1	AR	U	320	330
C16-C21	GC/FID	mg/kg	1	AR	U	550	540
C21-C35	GC/FID	mg/kg	1	AR	U	89	90
Fraction Start	GC/FID	Carbon Number	-	AR	U	C10	C10
Fraction End	GC/FID	Carbon Number	-	AR	U	C28	C28
Fraction Peaks	GC/FID	Carbon Number	-	AR	U	C16	C18
Boiling Range	GC/FID	-	-	N/A	N	DIESEL RANGE FUEL	DIESEL RANGE FUEL

*Not a recognisable hydrocarbon pattern.

Note: Reported results are on a dry weight basis.
AR = As Received
N/A = Not Applicable

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	05/01/06		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	70342-001	AREA A ROAD3BP V001	Clay
	70342-002	AREA A ROAD3BP V002	Clay
	70342-003	AREA A ROAD3BP V003	Clay
	70342-004	AREA A ROAD3BP V004	Clay
	70342-005	AREA A ROAD3BP V005	Clay
	70342-006	AREA A ROAD3BP V006	Clay
	70342-007	AREA A ROAD3BP V007	Clay
	70342-008	AREA A ROAD3BP V008	Clay
	70342-009	AREA A ROAD3BP V009	Clay
	70342-010	AREA A ROAD3BP V010	Clay
	70342-011	AREA A ROAD3BP V011	Clay
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

APPENDIX C (v)
CHEMICAL LABORATORY TEST RESULTS
AREA D - NATURAL GROUND

Scientific Analysis Laboratories

RECEIVED 12 APR 2006
24961

Report Number:	75001/TPH
Date of Report:	11-Apr-2006
Client :	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	~~5848~~ 81239 - MB2 - 4848
Date Job Received at SAL:	31-Mar-2006
Date Analysis Started:	10-Mar-2006
Date Analysis Completed:	11-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

U: Analysis is UKAS accredited
N: Analysis is not UKAS accredited
W: Analysis was performed at another SAL laboratory
S: Analysis was sub-contracted
M: Analysis is MCERTS accredited

Report written by: JStephens — Jenny Stephens, Analyst

Report checked and authorised by: — Vanessa Higham, Laboratory Supervisor

mCERTS 1549 UKAS TESTING 1549

Report Number: 75001/TPH
Client Job Reference: 5848
TOTAL TPH

SAL Ref.	75001-001	75001-002	75001-003	75001-004
Client Ref.	V034/AREA D 1H	V035/AREA D 2H	V036/AREA D 3H	V037/AREA D 4H
Type	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis *	Symbol				
Total TPH	GC/FID	mg/kg	1	AR	U	4	<1	4	5
Moisture Content	Grav	%	-	AR	N	28	21	20	20

* AR : 'As Received'.

Note: Reported results are on a dry weight basis.

Report Number: 75001/TPH
Client Job Reference: 5848
Banded TPH

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERAVTION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	**75001-001**	**V034/AREA D 1H**	**Clay**
	75001-002	**V035/AREA D 2H**	**Clay**
	75001-003	**V036/AREA D 3H**	**Clay**
	75001-004	**V037/AREA D 4H**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

RECEIVED 2 2 MAY 2006

25142

Scientific Analysis Laboratories

Report Number:	76846/TPH
Date of Report:	09-May-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	85030 - ABZ - 4984
Date Job Received at SAL:	04-May-2006
Date Analysis Started:	08-May-2006
Date Analysis Completed:	09-May-2006

The results reported relate to samples received at the laboratory

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: Metrey Prak
Analyst

Report checked and authorised by: Vanessa Higham
Laboratory Supervisor

MCERTS 1549

UKAS TESTING 1549

Report Number: 76846/TPH
Client Job Reference:

SAL Ref.	76846 001	76846 002	76846 003	76846 004	76846 005	76846 006	76846 007
Client Ref.	VO38	VO39	VO40	VO41	VO42	VO43	VO44
	AREA D/5A	AREA D/5B	AREA D/5C	AREA D/5D	AREA D/5E	AREA D/5F	AREA D/4A
Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol							
Total TPH	GC/FID	mg/Kg	1	AR	M	<1	<1	<1	<1	1	<1	<1
Moisture Content	Grav	%	N/A	AR	N	16	14	19	15	19	15	16

Note: Reported results are on a dry weight basis.

* AR = `As Received`.

Report Number: 76846/TPH

Client Job Reference:

SAL Ref.	76846 008	76846 009	76846 010	76846 011	76846 012
Client Ref.	VO45	VO46	VO47	VO48	VO49
	AREA D/4B	AREA D/4C	AREA D/4D	AREA D/4E	AREA D/4F
Type	Clay	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol					
Total TPH	GC/FID	mg/Kg	1	AR	M	1	1	1	<1	<1
Moisture Content	Grav	%	N/A	AR	N	16	18	17	19	12

Note: Reported results are on a dry weight basis.

*** AR = 'As Received'.**

Report Number: 76846/TPH
Client Job Reference:

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	76846 001	VO38/AREA D/5A	Clay
	76846 002	VO39/AREA D/5B	Clay
	76846 003	VO40/AREA D/5C	Clay
	76846 004	VO41/AREA D/5D	Clay
	76846 005	VO42/AREA D/5E	Clay
	76846 006	VO43/AREA D/5F	Clay
	76846 007	VO44/AREA D/4A	Clay
	76846 008	VO45/AREA D/4B	Clay
	76846 009	VO46/AREA D/4C	Clay
	76846 010	VO47/AREA D/4D	Clay
	76846 011	VO48/AREA D/4E	Clay
	76846 012	VO49/AREA D/4F	Clay
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

RECEIVED 2 2 MAY 2006
25144.

Scientific Analysis Laboratories

Report Number:	76985/TPH
Date of Report:	11-May-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Marlon Frost
Client Job Reference:	~~5848~~ 85030 - MB2 - 5033
Date Job Received at SAL:	08-May-2006
Date Analysis Started:	10-May-2006
Date Analysis Completed:	11-May-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: Metrey Prak
Analyst

Report checked and authorised by: Vanessa Higham
Laboratory Supervisor

MCERTS 1549 UKAS TESTING 1549

Report Number: 76985/TPH
Client Job Reference: 5848

SAL Ref.	76985 001	76985 002	76985 003	76985 004	76985 005	76985 006	76985 007
Client Ref.	VO50	VO51	VO52	VO53	VO54	VO55	VO56
	AREA D D1	AREA D D2	AREA D D3	AREA D E1	AREA D E2	AREA D E3	AREA D F1
Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol							
Total TPH	GC/FID	mg/Kg	1	AR	M	400	5	68	65	2	<1	32
Moisture Content	Grav	%	N/A	AR	N	18	16	18	25	28	19	23

Note: Reported results are on a dry weight basis.

* AR = 'As Received'.

Report Number: 76985/TPH
Client Job Reference: 5848

SAL Ref.	76985 008	76985 009
Client Ref.	VO57	VO58
	AREA D F2	AREA D F3
Type	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol		
Total TPH	GC/FID	mg/Kg	1	AR	M	<1	78
Moisture Content	Grav	%	N/A	AR	N	21	24

Note: Reported results are on a dry weight basis.

* AR = 'As Received'.

Report Number: 76985/TPH
Client Job Reference: 5848

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	76985 001	VO50 AREA D D1	Clay
	76985 002	VO51 AREA D D2	Clay
	76985 003	VO52 AREA D D3	Clay
	76985 004	VO53 AREA D E1	Clay
	76985 005	VO54 AREA D E2	Clay
	76985 006	VO55 AREA D E3	Clay
	76985 007	VO56 AREA D F1	Clay
	76985 008	VO57 AREA D F2	Clay
	76985 009	VO58 AREA D F3	Clay
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

Scientific Analysis Laboratories

Supplement to Report Number:	80908-2
Date of Report:	03-Oct-2006
Client:	Encia Consulting Limited *Encia House* Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	*Mr Marlon Frost*
Client Job Reference:	*5848 Burton Road,* Barnsley
Date Job Received at SAL:	12-Jul-2006
Date Analysis Started:	17-Jul-2006
Date Analysis Completed:	*18-Jul-2006*

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Supplemental report issued to re format the report at clients request

Report written by: Helen Ashpool
Senior Project Manager

Report checked and authorised by: Donna Brown
Project Manager

1549 1549 Group

Supplement to Report Number: 80908-2

Client Job Reference: 5848 Burton Road, Barnsley

SAL Ref.	80908-007	80908-008	80908-009
Client Ref.	*VO60 I2*	*VO61 I3*	*VO62 I4*
Type	Clay	Clay	Clay
Matrix	Soil	Soil	Soil

Determinant	*Method*	*Units*	*LOD*	*Analysis**	*Symbol*			
Total TPH	GC/FID	mg/Kg	1	AR	M	1700	2400	380
Moisture Content	Grav	%	N/A	AR	N	10	10	11

AR :Analysis carried out on samples 'As Received'.

TPH results are calculated on a 105°C dry weight basis

Supplement to Report Number: 80908-2

Client Job Reference: 5848 Burton Road, Barnsley

SAL Ref.	80908-006
Client Ref.	VO59 I1
Type	Fill#

Determinant	Method	Units	LOD	Analysis*	Symbol	
Total TPH	GC/FID	mg/Kg	1	AR	U	1100

Moisture Content	Grav	%	N/A	AR	N	4

AR :Analysis carried out on samples 'As Received'.

TPH results are calculated on a 105°C dry weight basis

Sample is outside the scope of our MCERTS accreditation. Results are UKAS only.

Supplement to Report Number: 80908-2

Client Job Reference: 5848 Burton Road, Barnsley

APPENDIX

SAMPLE LOCATION:	Not supplied		
DATE/TIME OF SAMPLING:	Not supplied		
ON SITE PRESERVATION/STABILISATION:	Not supplied		
SAMPLE CHARACTERISATION:	**80908-006**	**VO59 I1**	**Fill**
	80908-007	**VO60 I2**	**Clay**
	80908-008	**VO61 I3**	**Clay**
	80908-009	**VO62 I4**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	None subcontracted.		

APPENDIX C (vi)
CHEMICAL LABORATORY TEST RESULTS
AREA D – PRE-TREATMENT STOCKPILES (PCBs)

RECEIVED 2 ? MAY 2006

Scientific Analysis Laboratories

25443

Supplement to report Number:	75293/PCB
Date of Report:	27-Apr-2006
Client :	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	5848 8503C - NB2 - 4865
Date Job Received at SAL:	05-Apr-2006
Date Analysis Started:	09-Apr-2006
Date Analysis Completed:	11-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:
U: Analysis is UKAS accredited
N: Analysis is not UKAS accredited
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
M: Analysis is MCERTS accredited

Report written by: HJ — Hayley Jackson
Analyst

Report checked and authorised by: — Lindsay Collins
Senior Analyst

mCERTS 1549 UKAS TESTING 1549

Supplement to report Number: 75293/PCB
Client Job Reference: 5848

SAL Ref.	75293 001	75293 002	75293 003	75293 004	75293 005	75293 006
Client Ref.	PREBIO	PREBIO	PREBIO	PREBIO	PREBIO	PREBIO
	Stockpile A	Stockpile B	Stockpile C	Stockpile D	Stockpile E	Stockpile F
Matrix	Clay	Clay	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis	Symbol						
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	170	450	330	160	14	100
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	92	270	200	74	8.0	55
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	70	180	190	40	11	42
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	49	130	150	30	7.0	31
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	20	66	64	13	10	14
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	41	110	130	23	11	27
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	9.0	34	32	8.9	7.8	8.7
Non-targeted Isomers											
Total trichloro	GC/MS	µg/kg	0.05	AR	U	860	2000	1800	750	69	510
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	750	1800	1400	630	33	420
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	270	670	740	150	37	150
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	70	200	230	39	15	44
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	24	90	88	23	18	23
Total PCBs	GC/MS	µg/kg	0.05	AR	U	2400	6000	5400	1900	240	1400
Moisture content	Grav	%		AR	N	17	18	16	20	18	16

Supplemental Report issued as client requested Total PCBs and Non-targeted isomers

Note: Reported results are on a dry weight basis.

AR : 'as recieved'

Supplement to report Number: 75293/PCB
Client Job Reference: 5848

SAL Ref.	75293 007	75293 008
Client Ref.	PREBIO	PREBIO
	Stockpile G	Stockpile H
Matrix	Clay	Clay

Determinand	Method	Units	LOD	Analysis	Symbol		
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	**34**	**54**
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	**18**	**27**
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	**14**	**16**
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	**11**	**11**
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	**4.5**	**4.3**
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	**9.3**	**8.4**
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	**2.0**	**2.2**

Non-targeted Isomers

Total trichloro	GC/MS	µg/kg	0.05	AR	U	**160**	**260**
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	**140**	**230**
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	**52**	**57**
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	**17**	**14**
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	**5.6**	**5.3**

Total PCBs	GC/MS	µg/kg	0.05	AR	U	**470**	**690**
Moisture content	Grav	%		AR	N	16	17

Supplemental Report issued as client requested *Total PCBs and Non-targeted isomers*

Note: Reported results are on a dry weight basis.

AR : 'as recieved'

Report Number: 75293/PCB
Client Job Reference: 5848

APPENDIX

SAMPLE LOCATION:			
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERAVTION/STABILISATION:	Not supplied.		
	SAL Ref.	Client Ref.	Matrix
	75293 001	PREBIO Stockpile A	Clay
	75293 002	PREBIO Stockpile B	Clay
	75293 003	PREBIO Stockpile C	Clay
	75293 004	PREBIO Stockpile D	Clay
	75293 005	PREBIO Stockpile E	Clay
	75293 006	PREBIO Stockpile F	Clay
	75293 007	PREBIO Stockpile G	Clay
	75293 008	PREBIO Stockpile H	Clay
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

RECEIVED 2 2 MAY 2006
25140

Scientific Analysis Laboratories

Supplement to Report Number: 76432

Date of Report: 04-May-2006

Client: Encia Consulting Limited
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Client Contact: Steve James/Marlon Frost/James Gray
Client Job Reference: ~~5848—Burton Road, Barnsley—PO/85030~~
85030 - A62 - 4978.

Date Job Received at SAL: 27-Apr-2006
Date Analysis Started: 27-Apr-2006
Date Analysis Completed: 03-May-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Supplement issued due to incorrect client details and sample refs.

Report written by: Waqua Shabir
Project Manager

Report checked and authorised by: Amanda Bailey
Assistant Customer Services Manager

MCERTS 1549
UKAS TESTING 1549 Group

SAL Ref.	76432 001	76432 002	76432 003
Client Ref.	Pre-bio Stockpile O1	Pre-bio Stockpile N1	Pre-bio Stockpile I1
Depth (m)	-	-	-
Date Sampled	-	-	-
Type	*Stones, clayey-soil*	*clay*	*stones, clay*
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	2.9	39	69
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	2.6	21	49
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	2.9	17	37
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	1.5	9.3	20
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	1.1	6.9	11
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	2.0	13	20
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	<0.5	3.8	3.7

Non-targeted Isomers

Total trichloro	GC/MS	µg/kg	0.05	AR	U	13	*180*	*320*
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	16	130	300
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	9.9	61	*140*
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	3.1	21	32
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	0.59	9.2	9.4

Total PCBs	GC/MS	µg/kg	0.05	AR	U	56	510	1000
Moisture content	Grav	%		AR	N	14	13	13

Note: Reported results are on a dry weight basis. All samples were x10 diluted.

AR : 'as received'

Sample matrices containing stones are not accredited for MCERTS

SAL Ref.	76432 004	76432 005	76432 006
Client Ref.	Pre-bio Stockpile I2	Pre-bio Stockpile J1	Pre-bio Stockpile J2
Depth (m)	-	-	-
Date Sampled	-	-	-
Type	stones, sandy soil	stones, soil/clay	stones, clay
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	42	96	25
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	26	58	21
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	18	54	14
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	12	30	13
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	6.6	17	12
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	12	27	24
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	2.6	5.8	5.6
Non-targeted Isomers								
Total trichloro	GC/MS	µg/kg	0.05	AR	U	190	420	130
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	200	370	140
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	67	190	60
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	20	46	33
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	6.7	15	13
Total PCBs	GC/MS	µg/kg	0.05	AR	U	600	1300	490
Moisture content	Grav	%		AR	N	9	11	16

Note: Reported results are on a dry weight basis. All samples were x10 diluted.

AR : 'as received'

Sample matrices containing stones are not accredited for MCERTS

SAL Ref.	76432 007	76432 008
Client Ref.	Pre-bio Stockpile L1	Pre-bio Stockpile M1
Depth (m)	-	-
Date Sampled	-	-
Type	stones, bricks, clay	stones, soil
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	24	110
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	14	64
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	13	55
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	8	36
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	4.5	26
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	8.0	44
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	1.4	13
Non-targeted Isomers							
Total trichloro	GC/MS	µg/kg	0.05	AR	U	110	490
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	99	470
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	47	200
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	14	73
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	3.3	35
Total PCBs	GC/MS	µg/kg	0.05	AR	U	350	1600
Moisture content	Grav	%		AR	N	22	11

Note: Reported results are on a dry weight basis. All samples were x10 diluted.

AR : 'as received'

Sample matrices containing stones are not accredited for MCERTS

SAL Ref.	76432 009	76432 010
Client Ref.	Pre-bio Stockpile M2	Pre-bio Stockpile B2
Depth (m)	-	-
Date Sampled	-	-
Type	stones	stones, soil
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	63	540
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	56	280
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	42	220
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	31	140
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	15	76
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	24	150
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	8.3	26
Non-targeted Isomers							
Total trichloro	GC/MS	µg/kg	0.05	AR	U	260	2500
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	430	2200
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	170	800
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	39	240
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	20	65
Total PCBs	GC/MS	µg/kg	0.05	AR	U	1200	7200
Moisture content	Grav	%		AR	N	12	12

Note: Reported results are on a dry weight basis. All samples were x10 diluted.

AR : 'as received'

Sample matrices containing stones are not accredited for MCERTS

SAL Ref.	76432 011	76432 012	76432 013
Client Ref.	Pre-bio Stockpile C2	Pre-bio Stockpile E2	Pre-bio Stockpile G2
Depth (m)	-	-	-
Date Sampled	-	-	-
Type	stones ,soil	stones, clay	clay
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	940	33	68
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	710	22	36
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	570	23	28
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	370	13	16
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	190	10	7.6
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	330	17	14
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	58	5.4	2.1
Non-targeted Isomers								
Total trichloro	GC/MS	µg/kg	0.05	AR	U	4800	160	310
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	4800	140	270
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	2100	82	110
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	580	42	24
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	160.0	14	5.5
Total PCBs	GC/MS	µg/kg	0.05	AR	U	16000	560	890
Moisture content	Grav	%		AR	N	10	10	12

Note: Reported results are on a dry weight basis. All samples were x10 diluted.

AR : 'as received'

Sample matrices containing stones are not accredited for MCERTS

SAL Ref.	76432 014	76432 015
Client Ref.	Pre-bio Stockpile K1	Pre-bio Stockpile K2
Depth (m)	-	-
Date Sampled	-	-
Type	*stones, clay*	*stones, clayey-soil*
Matrix	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol		
Trichloro, BZ# 28	GC/MS	µg/kg	0.05	AR	M	67	55
Tetrachloro, BZ# 52	GC/MS	µg/kg	0.05	AR	M	29	28
Pentachloro, BZ# 101	GC/MS	µg/kg	0.05	AR	M	17	12
Pentachloro, BZ# 118	GC/MS	µg/kg	0.05	AR	M	10	6.9
Hexachloro, BZ# 153	GC/MS	µg/kg	0.05	AR	M	9	5.1
Hexachloro, BZ# 138	GC/MS	µg/kg	0.05	AR	M	13	8.6
Heptachloro, BZ# 180	GC/MS	µg/kg	0.05	AR	M	7	2.8
Non-targeted Isomers							
Total trichloro	GC/MS	µg/kg	0.05	AR	U	300	270
Total tetrachloro	GC/MS	µg/kg	0.05	AR	U	260	230
Total pentachloro	GC/MS	µg/kg	0.05	AR	U	64	44
Total hexachloro	GC/MS	µg/kg	0.05	AR	U	26	14
Total heptachloro	GC/MS	µg/kg	0.05	AR	U	17	6.4
Total PCBs	GC/MS	µg/kg	0.05	AR	U	820	680
Moisture content	Grav	%		AR	N	11	14

Note: Reported results are on a dry weight basis. All samples were x10 diluted.

AR : 'as received'

Sample matrices containing stones are not accredited for MCERTS

Supplement to Report Number: 76432

Client Job Reference: 5848 – Burton Road, Barnsley

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
	SAL Ref.	Client Ref.	Matrix
	76432 001	**Pre-bio Stockpile O1**	Stones, clayey-soil
	76432 002	**Pre-bio Stockpile N1**	clay
	76432 003	**Pre-bio Stockpile I1**	stones, clay
	76432 004	**Pre-bio Stockpile I2**	stones, sandy soil
	76432 005	**Pre-bio Stockpile J1**	stones, soil/clay
	76432 006	**Pre-bio Stockpile J2**	stones, clay
	76432 007	**Pre-bio Stockpile L1**	stones, bricks, clay
	76432 008	**Pre-bio Stockpile M1**	stones, soil
	76432 009	**Pre-bio Stockpile M2**	stones
	76432 010	**Pre-bio Stockpile B2**	stones, soil
	76432 011	**Pre-bio Stockpile C2**	stones ,soil
	76432 012	**Pre-bio Stockpile E2**	stones, clay
	76432 013	**Pre-bio Stockpile G2**	clay
	76432 014	**Pre-bio Stockpile K1**	stones, clay
	76432 015	**Pre-bio Stockpile K2**	stones, clayey-soil
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted		

Encia Job No. 5848
Site Name Burton Road, Barnsley
Engineer

Analytical Data

Material Type	Data (mg/kg)	Log Data
Made Ground - Area t	0.06	-1.2518
	0.51	-0.2924
	1.00	0.0000
	0.60	-0.2218
	1.30	0.1139
	0.49	-0.3098
	0.35	-0.4559
	1.60	0.2041
	1.20	0.0792
	7.20	0.8573
	16.00	1.2041
	0.56	-0.2518
	0.89	-0.0506
	0.82	-0.0862
	0.68	-0.1675
	2.40	0.3802
	6.00	0.7782
	5.40	0.7324
	1.90	0.2788
	0.24	-0.6198
	1.40	0.1461
	0.47	-0.3279
	0.69	-0.1612

Mean Value Test

n	t	t value
2	6.3138	
3	2.9200	
4	2.3534	
5	2.1318	
6	2.0150	
7	1.9432	
8	1.8946	
9	1.8595	
10	1.8331	
11	1.8125	
12	1.7959	
13	1.7823	
14	1.7709	
15	1.7613	
16	1.7531	
17	1.7459	
18	1.7396	
19	1.7341	
20	1.7291	
21	1.7247	
22	1.7207	
23	1.7171	1.717
24	1.7139	
25	1.7109	
26	1.7081	
27	1.7056	
28	1.7033	
29	1.7011	
30	1.6991	
31	1.6973	
32	1.6955	
33	1.6939	
34	1.6924	
35	1.6909	
36	1.6896	
37	1.6883	
38	1.6871	
39	1.6860	
40	1.6849	
41	1.6839	
42	1.6829	
43	1.6820	
44	1.6811	
45	1.6802	
46	1.6794	
47	1.6787	
48	1.6779	
49	1.6772	
50	1.6766	

Outlier Test

T_{crit} 10%	T_{crit} V
1.425	
1.602	
1.729	
1.828	
1.909	
1.977	
2.036	
2.088	
2.134	
2.176	
2.213	
2.248	
2.279	
2.309	
2.336	
2.361	
2.385	
2.408	
2.429	
2.449	2.449
2.468	
2.486	
2.503	
2.520	
2.536	
2.551	
2.565	
2.579	
2.592	
2.605	
2.618	
2.630	
2.641	
2.652	
2.663	
2.674	
2.684	
2.694	
2.704	
2.713	
2.722	
2.731	
2.739	
2.748	
2.756	
2.764	
2.772	

Determinand:	PCB Total
No. of samples:	23
SSAC from QRA?	9
t value:	1.717
mean (x):	2.25
st.dev (s):	3.56
95% ile:	4

Is the Mean Value Test Higher or Lower than the SSV?

Higher or Lower: Lower

Y max:	1.204
Y mean:	0.025
Y st.dev.:	0.533
T value:	2.214
Comparator:	2.449

Maximum Value Test Result

Outlier Test? Maximum is within a Normal Distribution

Outlier Value/s	Sample Number

APPENDIX C (vii)
CHEMICAL LABORATORY TEST RESULTS
AREA D – PRE-TREATMENT STOCKPILES (TPH)

Scientific Analysis Laboratories

Supplement to Report Number:	74643-3
Date of Report:	05-Oct-06
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Jonathan Walker
Client Job Reference:	5848 Burton Road, Barnsley
Date Job Received at SAL:	24-Mar-2006
Date Analysis Started:	29-Mar-2006
Date Analysis Completed:	03-Mar-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Supplemental report issued to re format the report at clients request

Report written by: Helen Ashpool
Senior Project Manager

Report checked and authorised by: Amanda Bailey
Assistant Customer Service Manager

MCERTS 1549

UKAS TESTING 1549 Group

Supplement to Report Number: 74643-3

Client Job Reference: 5848 Burton Road, Barnsley

SAL Ref.	74643-006	74643-007	74643-008	74643-009
Client Ref.	WINDROW J1	WINDROW J2	WINDROW K1	WINDROW K2
Depth (m)	-	-	-	-
Date Sampled	-	-	-	-
Type	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis *	Symbol				
Total TPH	GC/FID	mg/kg	1	AR	M	1300	2700	1500	2700
Moisture Content	Grav	%	-	AR	N	21	15	20	19

Note: Reported results are on a 105°C dry weight basis.

* AR = `As Received`.

Supplement to Report Number: 74643

Client Job Reference: 5848 Burton Road, Barnsley

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERAVTION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	***74643-006***	**WINDROW J1**	**Clay**
	74643-007	**WINDROW J2**	**Clay**
	74643-008	**WINDROW K1**	**Clay**
	74643-009	**WINDROW K2**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted		

RECEIVED 12 APR 2006 24962

Scientific Analysis Laboratories

Supplemental to Report Number:	74854
Date of Report:	10-Apr-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Jonathan Walker
Client Job Reference:	~~5848~~ 85030-WB2-4805 ?
Date Job Received at SAL:	29-Mar-2006
Date Analysis Started:	03-Apr-2006
Date Analysis Completed:	04-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Supplemental report issued for sample ID amendments at the clients request.

Report written by: Waquar Shabir
Project Manager

Report checked and authorised by: *Amanda Bailey*
Project Manager

mCERTS 1549 UKAS TESTING 1549

	SAL Ref.	74854-001	74854-002	74854-003
	Client Ref.	Pre Bio Stockpile L1	Pre Bio Stockpile L2	Pre Bio Stockpile M1
	Type	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis *	Symbol			
Total TPH	GC/FID	mg/kg	1	AR	M	130	2000	5300
Moisture Content	Grav	%	-	AR	N	19	16	14

Note: Reported results are on a dry weight basis.
* AR = 'As Received'.

SAL Ref.	74854-004
Client Ref.	Pre Bio Stockpile M2
Type	Sand/Gravel

Determinand	Method	Units	LOD	Analysis *	Symbol	
Total TPH	GC/FID	mg/kg	1	AR	M	5400
Moisture Content	Grav	%	-	AR	N	20

Note: Reported results are on a dry weight basis.
* AR = 'As Received'.

Supplemental to Report Number: 74854
Client Job Reference: 5848

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERAVTION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	**74854-001**	**Pre Bio Stockpile L1**	**Clay**
	74854-002	**Pre Bio Stockpile L2**	**Clay**
	74854-003	**Pre Bio Stockpile M1**	**Clay**
	74854-004	**Pre Bio Stockpile M2**	**Sand/Gravel**
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

lysis Laboratories

Report Number:	74999
Date of Report:	07-Apr-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Jonathan Walker
Client Job Reference:	5848
Date Job Received at SAL:	31-Mar-2006
Date Analysis Started:	06-Apr-2006
Date Analysis Completed:	07-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Report written by:	Waquar Shabir Project Manager		
Report checked and authorised by:	Amanda Bailey Project Manager	**1549**	**1549**

Report Number: 74999
Client Job Reference: 5848

SAL Ref.	74999-001	74999-002	74999-003
Client Ref.	Prebio STOCKPILE O1	Prebio STOCKPILE O2	Prebio STOCKPILE I1
Depth (m)	-	-	-
Date Sampled	-	-	-
Type	Clay	Clay	Clay
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Total TPH	GC/FID	mg/kg	1	AR	M	590	210	1000
Moisture Content	Grav	%	-	AR	N	16	17	16

Note: Reported results are on a dry weight basis.
AR – As Received

Report Number: 74999
Client Job Reference: 5848

SAL Ref.	74999-004	74999-005	74999-006
Client Ref.	Prebio STOCKPILE I2	Prebio STOCKPILE I3	Prebio STOCKPILE N1
Depth (m)	-	-	-
Date Sampled	-	-	-
Type	Clay	Clay	Clay
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Total TPH	GC/FID	mg/kg	1	AR	M	1200	800	130
Moisture Content	Grav	%	-	AR	N	20	13	20

Note: Reported results are on a dry weight basis.
AR – As Received

Report Number: 74999
Client Job Reference: 5848

SAL Ref.	74999-007
Client Ref.	Prebio STOCKPILE N2
Depth (m)	-
Date Sampled	-
Type	Clay
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Total TPH	GC/FID	mg/kg	1	AR	M	340
Moisture Content	Grav	%	-	AR	N	35

Note: Reported results are on a dry weight basis.
AR – As Received

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	**74999-001**	**Prebio STOCKPILE O1**	**Clay**
	74999-002	**Prebio STOCKPILE O2**	**Clay**
	74999-003	**Prebio STOCKPILE I1**	**Clay**
	74999-004	**Prebio STOCKPILE I2**	**Clay**
	74999-005	**Prebio STOCKPILE I3**	**Clay**
	74999-006	**Prebio STOCKPILE N1**	**Clay**
	74999-007	**Prebio STOCKPILE N2**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

RECEIVED - 6 OCT 2006

Scientific Analysis Laboratories

Supplement to Report Number: 75301-1

Date of Report: 03-Oct-2006

Client:
Encia Consulting Limited
Encia House
Audby Lane
Wetherby
West Yorkshire
LS22 7RD

Client Contact: James Gray
Client Job Reference: 5848

Date Job Received at SAL: 05-Apr-2006
Date Analysis Started: 07-Apr-2006
Date Analysis Completed: 10-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Supplemental report issued to re format the report at clients request

Report written by:
Helen Ashpool
Senior Project Manager

Report checked and authorised by:
Donna Brown
Project Manager

1549 1549 Group

Supplement to Report Number: 75301
Client Job Reference: 5848

SAL Ref.	75301 002	75301 003	75301 004	75301 005
Client Ref.	PREBIO STOCKPILE J3	PREBIO STOCKPILE J4	PREBIO STOCKPILE K3	PREBIO STOCKPILE K4
Type	Clay	Clay	Clay	Sand/Gravel
Matrix	Soil	Soil	Soil	Soil

Determinant	Method	Units	LOD	Analysis	Symbol				
C8-C10	GC/FID	mg/kg	1	AR	U	<10	<10	<10	<10
C10-C12	GC/FID	mg/kg	1	AR	U	<10	<10	<10	<10
C12-C16	GC/FID	mg/kg	1	AR	U	57	31	98	110
C16-C21	GC/FID	mg/kg	1	AR	U	470	230	810	840
C21-C35	GC/FID	mg/kg	1	AR	U	1500	800	1600	1500
Total TPH	GC/FID	mg/kg	1	AR	M	2000	1100	2500	2500
Moisture Content (105°C)	Grav	%	-	AR	N	15	17	19	17
Fraction Start	GC/FID	Carbon Number	-	-	U	C12	C12	C12	C12
Fraction End	GC/FID	Carbon Number	-	-	U	>C35	>C35	>C35	>C35
Fraction Peaks	GC/FID	Carbon Number	-	-	U	C28	C28	C28	C28
Boiling Range	GC/FID	-	-	-	N	Heavy Mineral Oil	Heavy Mineral Oil	Heavy Mineral Oil	Heavy Mineral Oil

AR :Analysis carried out on samples 'As Received'.
All Samples diluted 10 fold, therefore LOD raised x10.
TPH results are calculated on a 105°C dry weight basis

Supplement to Report Number: 75301
Client Job Reference: *5848*

SAL Ref.	75301 006	75301 007	75301 008	75301 009
Client Ref.	PREBIO STOCKPILE L3	PREBIO STOCKPILE L4	PREBIO STOCKPILE M3	PREBIO STOCKPILE M4
Type	Sand/Gravel	Clay	Clay	Sand/Gravel
Matrix	Soil	Soil	Soil	Soil

Determinant	Method	Units	LOD	Analysis	Symbol				
C8-C10	GC/FID	mg/kg	1	AR	U	<10	<10	<10	<10
C10-C12	GC/FID	mg/kg	1	AR	U	<10	<10	<10	<10
C12-C16	GC/FID	mg/kg	1	AR	U	323	200	120	130
C16-C21	GC/FID	mg/kg	1	AR	U	2200	1600	940	840
C21-C35	GC/FID	mg/kg	1	AR	U	2100	1900	1800	1900
Total TPH	GC/FID	mg/kg	1	AR	M	4600	3700	2900	2900
Moisture Content (105°C)	Grav	%	-	AR	N	18	17	15	16
Fraction Start	GC/FID	Carbon Number	-	-	U	C14	C14	C10	C12
Fraction End	GC/FID	Carbon Number	-	-	U	>C35	>C35	>C28	>C35
Fraction Peaks	GC/FID	Carbon Number	-	-	U	C20	C20	>C28	C28
Boiling Range	GC/FID	-	-	-	N	Mineral Oil	Mineral Oil	Heavy Mineral Oil	Heavy Mineral Oil

AR :Analysis carried out on samples 'As Received'.
All Samples diluted 10 fold, therefore LOD raised x10.
TPH results are calculated on a 105°C dry weight basis

Supplement to Report Number: 75301
Client Job Reference: 5848

Appendix

Sample Location	Prebio Stockpile, Burton Road, Barnsley		
Date of Sampling	Not Supplied		
On-Site preservation/stabilization	Not Supplied		
Sample Characterization	**SAL Ref.**	**Client Ref.**	
	75301 002	**PREBIO STOCKPILE J3**	**Clay**
	75301 003	**PREBIO STOCKPILE J4**	**Clay**
	75301 004	**PREBIO STOCKPILE K3**	**Clay**
	75301 005	**PREBIO STOCKPILE K4**	**Sand/Gravel**
	75301 006	**PREBIO STOCKPILE L3**	**Sand/Gravel**
	75301 007	**PREBIO STOCKPILE L4**	**Clay**
	75301 008	**PREBIO STOCKPILE M3**	**Clay**
	75301 009	**PREBIO STOCKPILE M4**	**Sand/Gravel**
Subcontracted tests were performed by:	None Subcontracted		

RECEIVED 13 APR 2006 24970

Scientific Analysis Laboratories

Report Number:	75394/TPH
Date of Report:	11-Apr-2006
Client :	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Jonathan Walker
Client Job Reference:	5848
Date Job Received at SAL:	06-Apr-2006
Date Analysis Started:	10-Apr-2006
Date Analysis Completed:	11-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

U: Analysis is UKAS accredited
N: Analysis is not UKAS accredited
W: Analysis was performed at another SAL laboratory
S: Analysis was sub-contracted
M: Analysis is MCERTS accredited

Report written by: Jenny Stephens
Analyst

Report checked and authorised by: Clifford Rodger
Laboratory Manager

1549 1549

Report Number: 75394/TPH
Client Job Reference: 5848
TOTAL TPH

SAL Ref.	75394-001	75394-002	75394-003	75394-004
Client Ref.	PREBIO STOCKPILE A3	PREBIO STOCKPILE B3	PREBIO STOCKPILE B4	PREBIO STOCKPILE C3
Type	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis *	Symbol				
Total TPH	GC/FID	mg/kg	1	AR	U	**2600**	5300	**530**	**9800**
Moisture Content	Grav	%	-	AR	N	**17**	**17**	**18**	**16**

** AR : 'As Received'.*

Note: Reported results are on a dry weight basis.

Report Number: 75394/TPH
Client Job Reference: 5848
TOTAL TPH

SAL Ref.	75394-005	75394-006	75394-007	75394-008
Client Ref.	PREBIO STOCKPILE C4	PREBIO STOCKPILE D3	PREBIO STOCKPILE E3	PREBIO STOCKPILE E4
Type	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis *	Symbol				
Total TPH	GC/FID	mg/kg	1	AR	U	5200	7400	2200	2200
Moisture Content	Grav	%	-	AR	N	15	19	19	14

* AR : 'As Received'.

Note: Reported results are on a dry weight basis.

Report Number: 75394/TPH
Client Job Reference: 5848
TOTAL TPH

SAL Ref.	75394-009	75394-010	75394-011	75394-012
Client Ref.	PREBIO STOCKPILE F3	PREBIO STOCKPILE G3	PREBIO STOCKPILE G4	PREBIO STOCKPILE H3
Type	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis *	Symbol				
Total TPH	GC/FID	mg/kg	1	AR	U	**5800**	**1800**	**1700**	**590**
Moisture Content	Grav	%	-	AR	N	**18**	**21**	**18**	**15**

* AR : 'As Received'.

Note: Reported results are on a dry weight basis.

Report Number: 75394/TPH
Client Job Reference: 5848
TOTAL TPH

SAL Ref.	75394-013
Client Ref.	PREBIO STOCKPILE H4
Type	Clay

Determinand	Method	Units	LOD	Analysis *	Symbol	
Total TPH	GC/FID	mg/kg	1	AR	U	86
Moisture Content	Grav	%	-	AR	N	17

* AR : 'As Received'.

Note: Reported results are on a dry weight basis.

Report Number: 75394/TPH
Client Job Reference: 5848
Banded TPH

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERAVTION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	**75394-001**	PREBIO STOCKPILE A3	Clay
	75394-002	PREBIO STOCKPILE B3	Clay
	75394-003	PREBIO STOCKPILE B4	Clay
	75394-004	PREBIO STOCKPILE C3	Clay
	75394-005	PREBIO STOCKPILE C4	Clay
	75394-006	PREBIO STOCKPILE D3	Clay
	75394-007	PREBIO STOCKPILE E3	Clay
	75394-008	PREBIO STOCKPILE E4	Clay
	75394-009	PREBIO STOCKPILE F3	Clay
	75394-010	PREBIO STOCKPILE G3	Clay
	75394-011	PREBIO STOCKPILE G4	Clay
	75394-012	PREBIO STOCKPILE H3	Clay
	75394-013	PREBIO STOCKPILE H4	Clay
SUBCONTRACTED TESTS WERE PERFORMED BY:			

Scientific Analysis Laboratories

Report Number:	75649
Date of Report:	19/04/06
Client:	Encia Consulting Limited, Encia House, Audby Lane, Wetherby, West Yorkshire. LS22 7RD
Client Contact:	Mr James Gray
Client Job Reference:	5848 – 85030/4881
Date Job Received at SAL:	11/04/06
Date Analysis Started:	11/04/06
Date Analysis Completed:	19/04/06

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:

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S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: Waquar Shabir
Project Manager

Report checked and authorised by: Dan Vaughan
Project Manager

MCERTS UKAS TESTING 1549 1549 Group

Report Number: 75649

Client Job Reference: 5848

SAL Ref.	75649-001	75649-002	75649-003	75649-004	75649-005	75649-006
Client Ref.	PREBIO STOCKPILE A1	PREBIO STOCKPILE A2	PREBIO STOCKPILE B1	PREBIO STOCKPILE B2	PREBIO STOCKPILE C1	PREBIO STOCKPILE C2
Depth (m)	-	-	-	-	-	-
Date Sampled	07/04/06	07/04/06	07/04/06	07/04/06	07/04/06	07/04/06
Type	Clay	Clay	Clay	Clay	Sand/Gravel	Clay
Matrix	Soil	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol						
Total TPH	GC/FID	mg/Kg	1	AR	M	1100	1400	1300	1800	920	250
Moisture Content	Grav	%	N/A	AR	N	17	18	16	17	19	17

Note: Reported results are on a dry weight basis.

AR - As Received

Report Number: 75649
Client Job Reference: 5848

SAL Ref.	75649-007	75649-008	75649-009	75649-010	75649-011	75649-012
Client Ref.	PREBIO STOCKPILE C5	PREBIO STOCKPILE D1	PREBIO STOCKPILE D2	PREBIO STOCKPILE E1	PREBIO STOCKPILE E2	PREBIO STOCKPILE F1
Depth (m)	-	-	-	-	-	-
Date Sampled	07/04/06	07/04/06	07/04/06	07/04/06	07/04/06	07/04/06
Type	Clay	Clay	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol						
Total TPH	GC/FID	mg/Kg	1	AR	M	320	2000	60	1700	890	1500
Moisture Content	Grav	%	N/A	AR	N	16	19	16	16	17	18

Note: Reported results are on a dry weight basis.
AR - As Received

Report Number: 75649
Client Job Reference: 5848

SAL Ref.	75649-013	75649-014	75649-015	75649-016	75649-017
Client Ref.	PREBIO STOCKPILE F2	PREBIO STOCKPILE G1	PREBIO STOCKPILE G2	PREBIO STOCKPILE H1	PREBIO STOCKPILE H2
Depth (m)	-	-	-	-	-
Date Sampled	07/04/06	07/04/06	07/04/06	07/04/06	07/04/06
Type	Clay	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol					
Total TPH	GC/FID	mg/Kg	1	AR	M	120	910	230	320	190
Moisture Content	Grav	%	N/A	AR	N	18	16	16	14	15

Note: Reported results are on a dry weight basis.
AR - As Received

APPENDIX

SAMPLE LOCATION:	Not supplied.			
DATE/TIME OF SAMPLING:	Not supplied.			
ON SITE PRESERVATION/STABILISATION:	Not supplied.			
SAMPLE CHARACTERISATION:	**75649-001**	**PREBIO STOCKPILE A1**		**Clay**
	75649-002	**PREBIO STOCKPILE A2**		**Clay**
	75649-003	**PREBIO STOCKPILE B1**		**Clay**
	75649-004	**PREBIO STOCKPILE B2**		**Clay**
	75649-005	**PREBIO STOCKPILE C1**		**Sand/Gravel**
	75649-006	**PREBIO STOCKPILE C2**		**Clay**
	75649-007	**PREBIO STOCKPILE C5**		**Clay**
	75649-008	**PREBIO STOCKPILE D1**		**Clay**
	75649-009	**PREBIO STOCKPILE D2**		**Clay**
	75649-010	**PREBIO STOCKPILE E1**		**Clay**
	75649-011	**PREBIO STOCKPILE E2**		**Clay**
	75649-012	**PREBIO STOCKPILE F1**		**Clay**
	75649-013	**PREBIO STOCKPILE F2**		**Clay**
	75649-014	**PREBIO STOCKPILE G1**		**Clay**
	75649-015	**PREBIO STOCKPILE G2**		**Clay**
	75649-016	**PREBIO STOCKPILE H1**		**Clay**
	75649-017	**PREBIO STOCKPILE H2**		**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted			

APPENDIX C (viii)
CHEMICAL LABORATORY TEST RESULTS
AREA D – BIOREMEDIATION T_0 TO T_3 TPH RESULTS

RECEIVED 2 2 MAY 2006
2514

Scientific Analysis Laboratories

Report Number:	76973/TPH
Date of Report:	11-May-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	~~5848~~ 65036 - MB2 - 5033
Date Job Received at SAL:	08-May-2006
Date Analysis Started:	10-May-2006
Date Analysis Completed:	11-May-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Report written by: J. Damerum
Senior Analyst

Report checked and authorised by: V. Higham
Laboratory Supervisor

MCERTS 1549 UKAS TESTING 1549

Report Number: 76973/TPH
Client Job Reference: 5848

SAL Ref.	76973-001	76973-002	76973-003	76973-004	76973-005	76973-006	76973-007
Client Ref.	To Windrow D3	To Windrow F3	To Windrow B3	To Windrow C3	To Windrow C4	To Windrow M1	To Windrow M2
Type	Clay	Clay	Clay	Clay	Clay	Topsoil	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol							
Total TPH	GC/FID	mg/Kg	1	AR	M	2700	2200	1700	3000	3500	4200	3200
Moisture Content	Grav	%	N/A	AR	N	13	18	19	13	15	15	13

Note: Reported results are on a dry weight basis.

* AR = `As Received`.

Report Number: 76973/TPH
Client Job Reference: 5848

SAL Ref.	76973-009
Client Ref.	To Windrow M4
Type	Topsoil

Determinand	Method	Units	LOD	Analysis*	Symbol	
Total TPH	GC/FID	mg/Kg	1	AR	M	4400
Moisture Content	Grav	%	N/A	AR	N	14

Note: Reported results are on a dry weight basis.
* AR = 'As Received'.

Report Number: 76973/TPH
Client Job Reference: 5848

SAL Ref.	76973-008
Client Ref.	To Windrow M3
Type	Fill

Determinand	Method	Units	LOD	Analysis*	Symbol	
Total TPH	GC/FID	mg/Kg	1	AR	U	3100
Moisture Content	Grav	%	N/A	AR	N	15

Note: Reported results are on a dry weight basis.

* AR = 'As Received'.

Unable to report as mecerts due to non-standard matrix

Report Number: 76846/TPH
Client Job Reference:

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	76973-001	To Windrow D3	Clay
	76973-002	To Windrow F3	Clay
	76973-003	To Windrow B3	Clay
	76973-004	To Windrow C3	Clay
	76973-005	To Windrow C4	Clay
	76973-006	To Windrow M1	Topsoil
	76973-007	To Windrow M2	Clay
	76973-008	To Windrow M3	Fill
	76973-009	To Windrow M4	Topsoil
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

RECEIVED 18 MAY 2006 29132

Scientific Analysis Laboratories

Report Number:	77268/TPH
Date of Report:	16-May-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Mr Marlon Frost
Client Job Reference:	5848
Date Job Received at SAL:	11-May-2006
Date Analysis Started:	15-May-2006
Date Analysis Completed:	16-May-2006

The results reported relate to samples received at the laboratory

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Report written by: J. Damerum
Senior Analyst

Report checked and authorised by: V. Higham
Laboratory Supervisor

MCERTS 1549

UKAS TESTING 1549

Report Number: 77268/TPH
Client Job Reference: 5848

SAL Ref.	77268-001	77268-002	77268-003	77268-004	77268-005	77268-006	77268-007
Client Ref.	T1 Windrow D3	T1 Windrow F3	T1 Windrow B3	T1 Windrow C3	T1 Windrow C4	T1 Windrow M1	T1 Windrow M2
Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol							
Total TPH	GC/FID	mg/Kg	1	AR	M	4900	6000	4100	2900	3000	4100	4400
Moisture Content	Grav	%	N/A	AR	N	13	15	13	13	13	12	11

Note: Reported results are on a dry weight basis.
* AR = 'As Received'.

Report Number: 77268/TPH
Client Job Reference: 5848

SAL Ref.	77268-008	77268-009
Client Ref.	T1 Windrow M3	T1 Windrow M4
Type	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol		
Total TPH	GC/FID	mg/Kg	1	AR	M	5200	2600
Moisture Content	Grav	%	N/A	AR	N	13	11

Note: Reported results are on a dry weight basis.

*** AR = `As Received`.**

Report Number: 76846/TPH
Client Job Reference:

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	**77268-001**	T1 Windrow D3	**Clay**
	77268-002	T1 Windrow F3	**Clay**
	77268-003	T1 Windrow B3	**Clay**
	77268-004	T1 Windrow C3	**Clay**
	77268-005	T1 Windrow C4	**Clay**
	77268-006	T1 Windrow M1	**Clay**
	77268-007	T1 Windrow M2	**Clay**
	77268-008	T1 Windrow M3	**Clay**
	77268-009	T1 Windrow M4	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

RECEIVED 22 JUN 2006 25282.

Scientific Analysis Laboratories

Supplement to Report Number:	77735
Date of Report:	09-June-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	~~5848~~ LS22 - MB2 - 5148
Date Job Received at SAL:	19-May-2006
Date Analysis Started:	22-May-2006
Date Analysis Completed:	23-May-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Supplement issued due to incorrect sample ID at clients request.

Report written by: Waquar Shabir
Project Manager

Report checked and authorised by: Amanada Bailey
Assistant Customer Services Manager

MCERTS 1549

UKAS TESTING 1549 Group

Supplement to Report Number: 77735

Client Job Reference: 5848

SAL Ref.	77735 001	77735 002	77735 003	77735 004
Client Ref.	WINDROW D3 T2	WINDROW F3 T2	WINDROW B3 T2	WINDROW C3 T2
Type	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol				
Total TPH	GC/FID	mg/Kg	1	AR	M	2700	1900	1200	1500
Moisture Content	Grav	%	N/A	AR	N	19	15	17	15

Note: Reported results are on a dry weight basis.

*** AR = 'As Received'.**

Supplement to Report Number: 77735

Client Job Reference: 5848

SAL Ref.	77735 005	77735 006	77735 007	77735 008
Client Ref.	WINDROW C4 T2	WINDROW M1 T2	WINDROW M2 T2	WINDROW M3 T2
Type	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol				
Total TPH	GC/FID	mg/Kg	1	AR	M	2100	1800	3200	3300
Moisture Content	Grav	%	N/A	AR	N	19	12	15	10

Note: Reported results are on a dry weight basis.

* AR = 'As Received'.

Supplement to Report Number: 77735

Client Job Reference: 5848

SAL Ref.	77735 009
Client Ref.	WINDROW M4 T2
Type	Clay

Determinand	Method	Units	LOD	Analysis*	Symbol	
Total TPH	GC/FID	mg/Kg	1	AR	M	4100
Moisture Content	Grav	%	N/A	AR	N	15

Note: Reported results are on a dry weight basis.

*** AR = 'As Received'.**

APPENDIX

SAMPLE LOCATION:	Not supplied.		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	77735 001	WINDROW D3 T2	Clay
	77735 002	WINDROW F3 T2	Clay
	77735 003	WINDROW B3 T2	Clay
	77735 004	WINDROW C3 T2	Clay
	77735 005	WINDROW C4 T2	Clay
	77735 006	WINDROW M1 T2	Clay
	77735 007	WINDROW M2 T2	Clay
	77735 008	WINDROW M3 T2	Clay
	77735 009	WINDROW M4 T2	Clay
SUBCONTRACTED TESTS WERE PERFORMED BY:	Non Subcontracted		

Scientific Analysis Laboratories

Supplement to Report Number:	78170
Date of Report:	09-June-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	5848- L5622 ASL-5109
Date Job Received at SAL:	26-May-2006
Date Analysis Started:	31-May-2006
Date Analysis Completed:	05-Jun-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
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N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	*Analysis is MCERTS accredited*

Supplement issued due to incorrect sample ID and soil type.

Report written by: Waquar Shabir
Project Manager

Report checked and authorised by: Amanda Bailey
Assistant Customer Service Manager

1549 1549 Group

Supplement to Report Number: 78170

Client Job Reference: 5848

SAL Ref.	78170-001	78170-002	78170-003	78170-004	78170-005	78170-006
Client Ref.	Windrow D3 t3	Windrow F3 t3	Windrow B3 t3	Windrow C3 t3	Windrow C4 t3	Windrow M1 t3
Type	Clay	Clay	Clay	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis	Symbol						
Total TPH	GC/FID	mg/Kg	1	AR	M	2300	1900	2200	1500	2300	1800
Moisture Content	Grav	%	N/A	AR	N	17	16	18	16	15	17

Results are calculated on adry weight basis

AR- Analysis carried out on samples As Received

Supplement to Report Number: 78170
Client Job Reference: 5848

SAL Ref.	78170-007	78170-008	78170-009
Client Ref.	Windrow M2 t3	Windrow M3 t3	Windrow M4 t3
Type	Clay	Clay	Clay

Determinand	Method	Units	LOD	Analysis	Symbol			
Total TPH	GC/FID	mg/Kg	1	AR	M	1300	1500	2200
Moisture Content	Grav	%	N/A	AR	N	18	19	18

Results are calculated on adry weight basis
AR- Analysis carried out on samples As Received

APPENDIX

SAMPLE LOCATION:	**Not supplied.**		
DATE/TIME OF SAMPLING:	**Not supplied.**		
ON SITE PRESERVATION/STABILISATION:	**Not supplied.**		
SAMPLE CHARACTERISATION:	**78170-001**	**Windrow D3 t3**	**Topsoil**
	78170-002	**Windrow F3 t3**	**Clay**
	78170-003	**Windrow B3 t3**	**Clay**
	78170-004	**Windrow C3 t3**	**Clay**
	78170-005	**Windrow C4 t3**	**Clay**
	78170-006	**Windrow M1 t3**	**Clay**
	78170-007	**Windrow M2 t3**	**Clay**
	78170-008	**Windrow M3 t3**	**Clay**
	78170-009	**Windrow M4 t3**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	**Non Subcontracted**		

APPENDIX C (ix)
CHEMICAL LABORATORY TEST RESULTS
SITE-WON SUBSOIL

Scientific Analysis Laboratories

Report Number:	82186-1
Date of Report:	09-Aug-2006
Client:	Encia Consulting Limited, Encia House, Audby Lane, Wetherby, West Yorkshire. LS22 7RD
Client Contact:	Mr Simon Hinkins
Client Job Reference:	85030
Client Site Reference:	BURTON RD BARNSLEY
Client Purchase Order:	85030-MB2-5755
Date Job Received at SAL:	02-Aug-2006
Date Analysis Started:	04-Aug-2006
Date Analysis Completed:	09-Aug-2006

The results reported relate to samples received at the laboratory
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Tests covered by this certificate were conducted in accordance with SAL SOPs

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N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report checked and authorised by: Miss Helen Ashpool
Senior Project Manager

UKAS TESTING
1549

Group

Index to caveats used in this report

Value	Description
AR	As Received
-	Not Required

SAL Reference: 82186
Project Site: BURTON RD BARNSLEY
Customer Reference: 85030

Soil Analysed as Soil

ICRCL (Table 3:metals)

					SAL Reference	**82186 001**	**82186 002**	**82186 003**	**82186 004**
					Customer Sample Reference	**SUBSOIL 9D**	**SUBSOIL 10 D**	**SUBSOIL 11 D**	**SUBSOIL 12 D**
					Test Sample	-	-	-	-
Determinant	**Technique**	**LOD**	**Units**	**Symbol**					
Arsenic	ICP/OES	1	mg/kg	U		**12**	**12**	**13**	**8**
Boron (water-soluble)	ICP/OES	1	mg/kg	N		<1	<1	<1	<1
Cadmium	ICP/OES	1	mg/kg	U		<1	<1	<1	<1
Chromium	ICP/OES	1	mg/kg	U		**30**	**31**	**35**	**32**
Copper	ICP/OES	1	mg/kg	U		**36**	**51**	**60**	**42**
Lead	ICP/OES	1	mg/kg	U		**39**	**54**	**77**	**23**
Mercury	ICP/OES	1	mg/kg	U		<1	<1	<1	<1
Nickel	ICP/OES	1	mg/kg	U		**42**	**45**	**49**	**52**
Selenium	ICP/OES	2	mg/kg	U		<2	<2	<2	<2
Zinc	ICP/OES	1	mg/kg	U		**120**	**150**	**180**	**290**

SAL Reference: 82186
Project Site: BURTON RD BARNSLEY
Customer Reference: 85030

Soil Analysed as Soil

ICRCL (Table 3:metals)

					SAL Reference	**82186 005**	**82186 006**	**82186 007**	**82186 008**
					Customer Sample Reference	**SUBSOIL 13 D**	**SUBSOIL 14 D**	**SUBSOIL 15 D**	**SUBSOIL 16 D**
					Test Sample	-	-	-	-
Determinant	**Technique**	**LOD**	**Units**	**Symbol**					
Arsenic	ICP/OES	1	mg/kg	U		**16**	**11**	**10**	**9**
Boron (water-soluble)	ICP/OES	1	mg/kg	N		<1	<1	<1	<1
Cadmium	ICP/OES	1	mg/kg	U		**1**	<1	<1	<1
Chromium	ICP/OES	1	mg/kg	U		**41**	**35**	**33**	**34**
Copper	ICP/OES	1	mg/kg	U		**100**	**64**	**47**	**58**
Lead	ICP/OES	1	mg/kg	U		**160**	**79**	**140**	**35**
Mercury	ICP/OES	1	mg/kg	U		<1	<1	<1	<1
Nickel	ICP/OES	1	mg/kg	U		**58**	**51**	**50**	**54**
Selenium	ICP/OES	2	mg/kg	U		<2	<2	<2	<2
Zinc	ICP/OES	1	mg/kg	U		**310**	**190**	**150**	**140**

SAL Reference: 82186
Project Site: *BURTON RD BARNSLEY*
Customer Reference: 85030

Soil *Analysed as Soil*

Miscellaneous

				SAL Reference	**82186 001**	**82186 002**	**82186 003**	**82186 004**
				Customer Sample Reference	**SUBSOIL 9D**	**SUBSOIL 10 D**	**SUBSOIL 11 D**	**SUBSOIL 12 D**
				Test Sample	-	-	-	-
Determinant	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			U	**7.19**	**7.44**	**7.97**	**7.78**

SAL Reference: 82186
Project Site: *BURTON RD BARNSLEY*
Customer Reference: 85030

Soil *Analysed as Soil*

Miscellaneous

				SAL Reference	**82186 005**	**82186 006**	**82186 007**	**82186 008**
				Customer Sample Reference	**SUBSOIL 13 D**	**SUBSOIL 14 D**	**SUBSOIL 15 D**	**SUBSOIL 16 D**
				Test Sample	-	-	-	-
Determinant	**Technique**	**LOD**	**Units**	**Symbol**				
pH	Probe			U	**7.85**	**7.87**	**7.74**	**7.81**

Encia Job No. 5848
Site Name Burton Road, Barnsley
Engineer SRJ

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t value		T crit 10%	T crit 5%
Site-won subsoil	42	1.6232	2	6.3138			
	45	1.6532	3	2.9200			
	49	1.6902	4	2.3534		1.425	
	52	1.7160	5	2.1318		1.602	
	58	1.7634	6	2.0150		1.729	
	51	1.7076	7	1.9432		1.828	
	50	1.6990	8	1.8946	1.895	1.909	1.909
	54	1.7324	9	1.8595		1.977	
			10	1.8331		2.036	
			11	1.8125		2.088	
			12	1.7959		2.134	
			13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand	Nickel
No. of samples	8
SGV	50
t value:	1.895
Mean (X):	50.13
st.dev (s):	5.00
95% ile:	53
Is the Mean Value Test Higher or Lower	Higher
Ymax:	1.763
Ymean:	1.698
Yst.dev:	0.044
t value:	1.485
Comparator:	1.909
Maximum Value Test Result	
Outlier Test Result	Maximum is within a Normal Distribution

Outlier Value(s)	Sample Number(s)

Encia Job No.	**5848**
Site Name	**Burton Road, Barnsley**
Engineer	**SRJ**

Note SGV is pH dependent; if a given material yields variable pH values, assume worst-case SGV. Eg if pH values are in range 7 to 9 assume SGV=300.

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} 5%
Site-won subsoil	120	2.0792	2	6.3138			
	150	2.1761	3	2.9200			
	180	2.2553	4	2.3534		1.425	
	290	2.4624	5	2.1318		1.602	
	310	2.4914	6	2.0150		1.729	
	190	2.2788	7	1.9432		1.828	
	150	2.1761	8	1.8946	1.895	1.909	1.909
	140	2.1461	9	1.8595		1.977	
			10	1.8331		2.036	
			11	1.8125		2.088	
			12	1.7959		2.134	
			13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	Zinc
No. of samples:	8
SGV:	300
t value:	1.895
mean (x):	191.25
st.dev.(s):	70.80
95% ile:	239
Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Lower
Y max:	2.491
Y mean:	2.258
Y st.dev:	0.149
T value:	1.569
Comparator	1.909
Maximum Value Test Result	
Outlier Test:	Maximum is within a Normal Distribution

Outlier Values	Sample Number

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Scientific Analysis Laboratories

Report Number:	82187-1
Date of Report:	09-Aug-2006
Client:	Encia Consulting Limited, Encia House, Audby Lane, Wetherby, West Yorkshire. LS22 7RD
Client Contact:	Mr Simon Hinkins
Client Job Reference:	*85030*
Client Site Reference:	BURTON RD BARNSLEY
Client Purchase Order:	85030-AB2-5756
Date Job Received at SAL:	*02-Aug-2006*
Date Analysis Started:	04-Aug-2006
Date Analysis Completed:	09-Aug-2006

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Report checked and authorised by: Miss Helen Ashpool
Senior Project Manager

Index to caveats used in this report

Value	Description
AR	As Received
-	Not Required
9	LOD raised due to dilution of sample

SAL Reference: 82187
Project Site: BURTON RD BARNSLEY
Customer Reference: 85030

Soil *Analysed as Soil*

Total Petroleum Hydrocarbons (C6-C35 aliphatic/aromatic)

				SAL Reference	**82187 001**	**82187 002**	**82187 003**	**82187 004**	**82187 005**
				Customer Sample Reference	**SUBSOIL 1J**	**SUBSOIL 2 J**	**SUBSOIL 3 J**	**SUBSOIL 4 J**	**SUBSOIL 5 J**
				Test Sample	-	-	-	-	-
Determinant	**Technique**	**LOD**	**Units**	**Symbol**					
Total Petroleum Hydrocarbons (C6 - C7 aromatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10	<10	<10
Total Petroleum Hydrocarbons (C7-C8 aromatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10	<10	<10
Total Petroleum Hydrocarbons (C8-C10 aromatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10	<10	<10
Total Petroleum Hydrocarbons (C10-C12 aromatic)	GC/FID	1	mg/kg	N	<1	<1	<1	<1	<1
Total Petroleum Hydrocarbons (C12-C16 aromatic)	GC/FID	1	mg/kg	N	<1	<1	**4**	<1	<1
Total Petroleum Hydrocarbons (C16-C21 aromatic)	GC/FID	1	mg/kg	N	**5**	<1	**16**	<1	<1
Total Petroleum Hydrocarbons (C21-C35 aromatic)	GC/FID	1	mg/kg	N	**35**	<1	**58**	<1	<1
Total Petroleum Hydrocarbons (C6-C8 aliphatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10	<10	<10
Total Petroleum Hydrocarbons (C8-C10 aliphatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10	<10	<10
Total Petroleum Hydrocarbons (C10-C12 aliphatic)	GC/FID	1	mg/kg	N	<1	<1	[9]<10	<1	<1
Total Petroleum Hydrocarbons (C12-C16 aliphatic)	GC/FID	1	mg/kg	N	**3**	**4**	**31**	**4**	**4**
Total Petroleum Hydrocarbons (C16-C21 aliphatic)	GC/FID	1	mg/kg	N	**11**	**12**	**200**	**20**	**27**
Total Petroleum Hydrocarbons (C21-C35 aliphatic)	GC/FID	1	mg/kg	N	**39**	**36**	**690**	**72**	**87**

SAL Reference: 82187
Project Site: BURTON RD BARNSLEY
Customer Reference: 85030

Soil *Analysed as Soil*

Total Petroleum Hydrocarbons (C6-C35 aliphatic/aromatic)

					SAL Reference	**82187 006**	**82187 007**	**82187 008**
					Customer Sample Reference	**SUBSOIL 6 J**	**SUBSOIL 7 J**	**SUBSOIL 8 J**
					Test Sample	-	-	-
Determinant	**Technique**	**LOD**	**Units**	**Symbol**			
Total Petroleum Hydrocarbons (C6 - C7 aromatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10
Total Petroleum Hydrocarbons (C7-C8 aromatic)	GC/MS (Headspace)	10	µg/kg	N	<10	**13**	**12**
Total Petroleum Hydrocarbons (C8-C10 aromatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10
Total Petroleum Hydrocarbons (C10-C12 aromatic)	GC/FID	1	mg/kg	N	<1	<1	<1
Total Petroleum Hydrocarbons (C12-C16 aromatic)	GC/FID	1	mg/kg	N	<1	<1	<1
Total Petroleum Hydrocarbons (C16-C21 aromatic)	GC/FID	1	mg/kg	N	<1	**4**	**2**
Total Petroleum Hydrocarbons (C21-C35 aromatic)	GC/FID	1	mg/kg	N	<1	**23**	**15**
Total Petroleum Hydrocarbons (C6-C8 aliphatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10
Total Petroleum Hydrocarbons (C8-C10 aliphatic)	GC/MS (Headspace)	10	µg/kg	N	<10	<10	<10
Total Petroleum Hydrocarbons (C10-C12 aliphatic)	GC/FID	1	mg/kg	N	<1	<1	<1
Total Petroleum Hydrocarbons (C12-C16 aliphatic)	GC/FID	1	mg/kg	N	**4**	**6**	**8**
Total Petroleum Hydrocarbons (C16-C21 aliphatic)	GC/FID	1	mg/kg	N	**17**	**43**	**71**
Total Petroleum Hydrocarbons (C21-C35 aliphatic)	GC/FID	1	mg/kg	N	**47**	**130**	**150**

E: Tier 1 Values for the Assessment of Topsoil for Import onto a Residential Development

Common Inorganic determinands

Contaminant	Source	*Tier 1 Assessment Criteria (mg/kg)*	Comments/Notes
pH	CLEA		Initial assessment only
As	CLEA	20	SGV value
Cd	CLEA	1, 2 & 8	SGV value; pH variable
Cr	CLEA	130	SGV value
Pb	CLEA	450	
Hg	CLEA	8	
Ni	CLEA	50	
Se	CLEA	35	
B	ICRCL	3	
Cu	MAFF	80 to 200	pH variable
Zn	MAFF	200 to 300	pH variable
Water soluble sulphate	BRE SD1	0.5	Units are g/l

Common Organic determinands

Contaminant	Source	Tier 1 Assessment Criteria (mg/kg)	Comments/Notes
Benzene	Encia[1]	1.1	Driven by direct contact
Toluene	CLEA	3	SGV value
Ethyl Benzene	CLEA	9	SGV value
Xylenes	Encia[1]	430	Driven by outdoor inhalation
Phenol	CLEA	78	SGV value
Benzo(a)pyrene	Encia[1]	1.2	This value should also be used for the other most toxic PAHs, namely: Benzo(a)anthracene, benzo(k)fluoranthene & Indeno(1,2,3,c,d)pyrene.
Naphthalene	Encia[1]	26	Risk at surface driven by direct ingestion pathway
Polycyclic Aromatic Hydrocarbons (PAH)	Encia[1]	1.2	Assumes all total PAH is benzo(a)pyrene.
Gasoline Range Organics (GRO) (C_6-C_{10})	Encia[1]	1.1	Assumes all GRO fraction is benzene. If benzene <1.1 mg/kg, adopt 31mg/kg as Tier 1 value, based on lowest derived value for this range of aliphatic and aromatic fractions.
Diesel Range Organics (DRO) (C_{10}-C_{20})	Encia[1]	290	Assumes all DRO fraction is in the aromatic C_{10} to C_{12} *range. If aromatic* C_{10} to C_{12} *range* <290mg/kg, adopt 690mg/kg as Tier 1 value, based on next lowest derived value for this range of aliphatic and aromatic fractions.
Lubricating Range Organics (LRO) (C_{20}-C_{35})	Encia[1]	880	Driven by direct contact

[1] *Encia Consulting have derived Tier 1 screening values for compounds without SGV's, for imported material to be placed in garden areas in a residential development using RISC 4. Values assume a sandy soil with 1% SOM considering direct contact and outdoor inhalation only. Values can be refined further with site specific data.*

APPENDIX C (x)
CHEMICAL LABORATORY TEST RESULTS
IMPORTED SUBSOIL

Scientific Analysis Laboratories

Supplement to Report Number:	77740-2
Date of Report:	04-Oct-2006
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	James Gray
Client Job Reference:	5848 Burton Road, Barnsley
Date Job Received at SAL:	19-May-2006
Date Analysis Started:	22-May-2006
Date Analysis Completed:	30-May-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:

W:	Analysis was performed at another SAL laboratory
S:	Analysis was subcontracted
N:	Analysis is not UKAS accredited
U:	Analysis is UKAS accredited
M:	Analysis is MCERTS accredited

Supplemental report issued to re format the report at clients request

Report written by: Helen Ashpool
Senior Project Manager

Report checked and authorised by: Amanda Bailey
Assistant Customer Service Manager

UKAS TESTING
1549

Group

Supplement to Report Number: 77740-2

Client Job Reference: 5848 Burton Road, Barnsley

SAL Ref.	77740 007	77740 008	77740 009
Client Ref.	Import 1	Import 2	Import 3
Depth (m)	-	-	-
Date Sampled	-	-	-
Type	Fill**	Fill**	Fill**
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Arsenic	ICP/OES	mg/kg	2	DG	U	8	8	9
Boron (water-soluble)	ICP/OES	mg/kg	1	AR	N	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	DG	U	<1	<1	<1
Chromium	ICP/OES	mg/kg	1	DG	U	24	25	24
Copper	ICP/OES	mg/kg	1	DG	U	42	46	37
Mercury	ICP/OES	mg/kg	1	DG	U	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	DG	U	45	52	44
Selenium	ICP/OES	mg/kg	2	DG	U	<2	<2	<2
Zinc	ICP/OES	mg/kg	1	DG	U	100	160	110
Sulphate(2:1)	ICP/OES (SIM)(Water Extract)	mg/l	10	AR	N	90	27	94
pH	Probe			AR	U	7.4	6.6	6.7

Metals results are calculated on a <40°C dry weight basis

AR- Analysis carried out on samples As Received

DG- Analysis carried out on dried and ground samples

****sample is outside the scope of MCERTS accreditation. Results are UKAS only**

Supplement to Report Number: 77740-2

5848 Burton Road,

Client Job Reference: Barnsley

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	Not supplied.		
ON SITE PRESERVATION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	77740 007	Import 1	Fill
	77740 008	Import 2	Fill
	77740 009	Import 3	Fill
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted		

RECEIVED 1 4 JUN 2006 25230

Scientific Analysis Laboratories

Report Number: 78169

Date of Report: 06/06/06

Client: Encia Consulting Limited,
Encia House,
Audby Lane,
Wetherby,
West Yorkshire.
LS22 7RD

Client Contact: Mr James Gray
Client Job Reference: 5848

Date Job Received at SAL: 26/05/06
Date Analysis Started: 30/05/06
Date Analysis Completed: 06/06/06

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
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Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
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N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: Waquar Shabir
Project Manager

Report checked and authorised by: Helen Ashpool
Senior Project Manager

MCERTS 1549 UKAS TESTING 1549 Group

Report Number: 78169

Client Job Reference: *5848*

SAL Ref:	78169 001	78169 002	78169 003	78169 005
Client Ref:	Imported 4	Imported 5	Imported 6	Imported 8
Depth (m)	-	-	-	-
Date Sampled	-	-	-	-
Type	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol				
Total Petroleum Hydrocarbons	*GC/FID*	*mg/kg*	*1*	AR	M	*16*	*27*	*24*	*16*
Moisture	Grav (1 Dec) (105 C)	%	0.1	AR	N	11	12	7	12

Results are calculated on a 105°C dry weight basis

AR- Analysis carried out on samples As Received

Report Number: 78169
Client Job Reference: 5848

SAL Ref:	78169 001	78169 002	78169 003	78169 005
Client Ref:	Imported 4	Imported 5	Imported 6	Imported 8
Depth (m)	-	-	-	-
Date Sampled	-	-	-	-
Type	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol				
Arsenic	ICP/OES	mg/kg	2	DG	M	8	5	8	6
Boron (water-soluble)	ICP/OES	mg/kg	1	AR	N	<1	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	DG	M	<1	<1	<1	<1
Chromium	ICP/OES	mg/kg	1	DG	M	23	21	23	34
Copper	ICP/OES	mg/kg	1	DG	M	38	34	34	42
Mercury	ICP/OES	mg/kg	1	DG	U	<1	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	DG	M	46	40	40	53
Selenium	ICP/OES	mg/kg	2	DG	U	<2	<2	<2	<2
Zinc	ICP/OES	mg/kg	1	DG	M	120	90	94	100
Sulphate(2:1)	ICP/OES (SIM)(Water Extract)	mg/l	10	AR	M	67	78	71	85
pH	Probe			AR	M	7.4	7.4	7.3	7.1

Metals results are calculated on a 30°C dry weight basis

AR- Analysis carried out on samples As Received

DG- Analysis carried out on dried and ground samples

Report Number: 78169

Client Job Reference: 5848

SAL Ref:	78169 004
Client Ref:	Imported 7
Depth (m)	-
Date Sampled	-
Type	Fill#
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Total Petroleum Hydrocarbons	GC/FID	mg/kg	1	AR	U	24
Moisture	Grav (1 Dec) (105 C)	%	0.1	AR	N	10

Results are calculated on a 105°C dry weight basis

AR- Analysis carried out on samples As Received

 # sample is outside the scope of MCERTS accreditation. Results are UKAS only

Report Number: 78169
Client Job Reference: *5848*

SAL Ref:	78169 004
Client Ref:	Imported 7
Depth (m)	-
Date Sampled	-
Type	Fill#
Matrix	Soil

Determinand	Method	Units	LOD	Analysis	Symbol	
Arsenic	ICP/OES	mg/kg	2	DG	U	9
Boron (water-soluble)	ICP/OES	mg/kg	1	AR	N	<1
Cadmium	ICP/OES	mg/kg	1	DG	U	<1
Chromium	ICP/OES	mg/kg	1	DG	U	25
Copper	ICP/OES	mg/kg	1	DG	U	39
Mercury	ICP/OES	mg/kg	1	DG	U	<1
Nickel	ICP/OES	mg/kg	1	DG	U	47
Selenium	ICP/OES	mg/kg	2	DG	U	<2
Zinc	ICP/OES	mg/kg	1	DG	U	98
Sulphate(2:1)	ICP/OES (SIM)(Water Extract)	mg/l	10	AR	U	81
pH	Probe			AR	U	6.8

Metals results are calculated on a 30°C dry weight basis

AR- Analysis carried out on samples As Received

DG- Analysis carried out on dried and ground samples

 # sample is outside the scope of MCERTS accreditation. Results are UKAS only

Report Number: 78169
Client Job Reference: 5848

Appendix

Sample Location	**Burton Road, Barnsley**		
Date of Sampling	**Not Specified**		
On-Site preservation/stabilization	**Not Specified**		
Sample Characterization	*SAL Ref:*	*Client Ref:*	*Type*
	78169 001	Imported 4	Clay
	78169 002	Imported 5	Clay
	78169 003	Imported 6	Clay
	78169 004	Imported 7	Fill
	78169 005	Imported 8	Clay
Subcontracted tests were performed by:	**None Subcontracted**		

APPENDIX C (xi)
CHEMICAL LABORATORY TEST RESULTS
SITE-WON TOPSOIL

RECEIVED 28 FEB 2006 24804

Scientific Analysis Laboratories

Report Number: 72720

Date of Report: 28/02/06

Client: Encia Consulting Limited,
Encia House,
Audby Lane,
Wetherby,
West Yorkshire.
LS22 7RD

Client Contact: Mr James Gray
Client Job Reference: 5848

Date Job Received at SAL: 20/02/06
Date Analysis Started: 21/02/06
Date Analysis Completed: 28/02/06

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS or MCERTS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited
M: Analysis is MCERTS accredited

Report written by: L.Walsh
Project Manager

Report checked and authorised by: P.Knott
Project Manager

1549 1549
Group

Report Number: 72720
Client Job Reference: 5848

SAL Ref.	72720 001	72720 002	72720 003	72720 004	72720 005	72720 006
Client Ref.	TS1	TS2	TS3A	TS3B	TS4A	TS4B
Depth (m)	-	-	-	-	-	-
Date Sampled	14/02/06	14/02/06	14/02/06	14/02/06	14/02/06	14/02/06
Type	Topsoil	Topsoil	Topsoil	Topsoil	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol						
Moisture	Grav	%		AR	N	28.3	18.4	21.9	21.3	29.1	33.6
Arsenic	ICP/OES	mg/kg	2	D/G	M	21	9	20	22	14	16
Boron (water-soluble)	ICP/OES	mg/kg	1	D/G	N	<1	<1	<1	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	D/G	M	<1	<1	<1	<1	<1	<1
Chromium	ICP/OES	mg/kg	1	D/G	M	24	29	26	23	25	24
Copper	ICP/OES	mg/kg	1	D/G	M	52	100	78	85	66	40
Lead	ICP/OES	mg/kg	1	D/G	U	54	110	150	190	79	51
Mercury	ICP/OES	mg/kg	1	D/G	U	<1	<1	<1	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	D/G	M	19	18	30	28	31	32
Selenium	ICP/OES	mg/kg	2	D/G	U	<2	<2	<2	<2	<2	<2
Sulphate(2:1)	ICP/OES	g/l	0.1	D/G	N	0.1	0.4	<0.1	<0.1	0.2	<0.1
Zinc	ICP/OES	mg/kg	1	D/G	M	130	200	250	260	170	100
pH	Probe			D/G	M	7.4	7.7	7.7	7.7	7.4	6.7

AR: As Received
D/G: Dried and Ground
Note: Results reported on a dry weight basis

Report Number: 72720
Client Job Reference: 5848

SAL Ref.	72720 007	72720 008	72720 009	72720 010	72720 011
Client Ref.	TS5A	TS5B	TS5C	TS6	TS7
Depth (m)	-	-	-	-	-
Date Sampled	14/02/06	14/02/06	14/02/06	14/02/06	14/02/06
Type	Clay	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol					
Moisture	Grav	%		AR	N	36.2	37.5	28.3	29.5	28.1
Arsenic	ICP/OES	mg/kg	2	D/G	M	19	24	14	14	13
Boron (water-soluble)	ICP/OES	mg/kg	1	D/G	N	<1	<1	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	D/G	M	<1	<1	<1	<1	<1
Chromium	ICP/OES	mg/kg	1	D/G	M	18	23	23	20	19
Copper	ICP/OES	mg/kg	1	D/G	M	34	56	25	33	33
Lead	ICP/OES	mg/kg	1	D/G	U	63	89	46	50	43
Mercury	ICP/OES	mg/kg	1	D/G	U	<1	<1	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	D/G	M	21	28	30	25	25
Selenium	ICP/OES	mg/kg	2	D/G	U	<2	<2	<2	<2	<2
Sulphate(2:1)	ICP/OES	g/l	0.1	D/G	N	0.1	0.2	<0.1	<0.1	<0.1
Zinc	ICP/OES	mg/kg	1	D/G	M	180	350	87	85	75
pH	Probe			D/G	M	6.8	7.3	6.4	6.2	6.3

AR: As Received
D/G: Dried and Ground
Note: Results reported on a dry weight basis

Report Number: 72720
Client Job Reference: 5848

SAL Ref.	72720 012	72720 013	72720 014	72720 015	72720 016
Client Ref.	TS8A	TS8B	TS8C	TS9A	TS9B
Depth (m)	-	-	-	-	-
Date Sampled	14/02/06	14/02/06	14/02/06	14/02/06	14/02/06
Type	Clay	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol					
Moisture	Grav	%		AR	N	28.3	24.4	29.0	30.3	42.7
Arsenic	ICP/OES	mg/kg	2	D/G	M	16	18	17	25	15
Boron (water-soluble)	ICP/OES	mg/kg	1	D/G	N	<1	<1	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	D/G	M	<1	1	1	<1	<1
Chromium	ICP/OES	mg/kg	1	D/G	M	23	29	29	26	20
Copper	ICP/OES	mg/kg	1	D/G	M	97	160	250	58	34
Lead	ICP/OES	mg/kg	1	D/G	U	120	220	190	93	61
Mercury	ICP/OES	mg/kg	1	D/G	U	<1	<1	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	D/G	M	22	26	27	25	18
Selenium	ICP/OES	mg/kg	2	D/G	U	<2	<2	<2	<2	<2
Sulphate(2:1)	ICP/OES	g/l	0.1	D/G	N	0.3	0.4	0.5	<0.1	<0.1
Zinc	ICP/OES	mg/kg	1	D/G	M	290	370	390	150	78
pH	Probe			D/G	M	7.4	7.5	7.6	7.2	5.8

AR: As Received
D/G: Dried and Ground
Note: Results reported on a dry weight basis

Report Number: 72720
Client Job Reference: 5848

SAL Ref.	72720 017	72720 018	72720 019
Client Ref.	TS10	TS11	TS12
Depth (m)	-	-	-
Date Sampled	14/02/06	14/02/06	14/02/06
Type	Clay	Clay	Clay
Matrix	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis	Symbol			
Moisture	Grav	%		AR	N	41.0	45.9	32.3

Arsenic	ICP/OES	mg/kg	2	D/G	M	31	25	13
Boron (water-soluble)	ICP/OES	mg/kg	1	D/G	N	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	D/G	M	<1	<1	<1
Chromium	ICP/OES	mg/kg	1	D/G	M	27	26	28
Copper	ICP/OES	mg/kg	1	D/G	M	48	45	35
Lead	ICP/OES	mg/kg	1	D/G	U	96	72	45
Mercury	ICP/OES	mg/kg	1	D/G	U	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	D/G	M	23	26	33
Selenium	ICP/OES	mg/kg	2	D/G	U	<2	<2	<2
Sulphate(2:1)	ICP/OES	g/l	0.1	D/G	N	<0.1	<0.1	<0.1
Zinc	ICP/OES	mg/kg	1	D/G	M	100	130	96
pH	Probe			D/G	M	5.3	6.3	6.2

AR: As Received
D/G: Dried and Ground
Note: Results reported on a dry weight basis

Report Number: 72720
Client Job Reference: 5848

Appendix

Sample Location	Burton Road, Barnsley		
Date of Sampling	14/02/06		
On-Site preservation/stabilization	None supplied		
Sample Characterization	72720 001	TS1	Topsoil
	72720 002	TS2	Topsoil
	72720 003	TS3A	Topsoil
	72720 004	TS3B	Topsoil
	72720 005	TS4A	Clay
	72720 006	TS4B	Clay
	72720 007	TS5A	Clay
	72720 008	TS5B	Clay
	72720 009	TS5C	Clay
	72720 010	TS6	Clay
	72720 011	TS7	Clay
	72720 012	TS8A	Clay
	72720 013	TS8B	Clay
	72720 014	TS8C	Clay
	72720 015	TS9A	Clay
	72720 016	TS9B	Clay
	72720 017	TS10	Clay
	72720 018	TS11	Clay
	72720 019	TS12	Clay
Subcontracted tests were performed by:	Not Subcontracted		

Scientific Analysis Laboratories

Supplement to Report Number:	74643-1
Date of Report:	05-Oct-06
Client:	Encia Consulting Limited Encia House Audby Lane Wetherby West Yorkshire LS22 7RD
Client Contact:	Jonathan Walker
Client Job Reference:	5848 Burton Road, Barnsley
Date Job Received at SAL:	24-Mar-2006
Date Analysis Started:	29-Mar-2006
Date Analysis Completed:	03-Mar-2006

The results reported relate to samples received at the laboratory

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with SAL SOPs

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M:	Analysis is MCERTS accredited

Supplemental report issued to re format the report at clients request

Report written by: Helen Ashpool
Senior Project Manager

MCERTS 1549

UKAS TESTING 1549

Group

Report checked and authorised by: Amanda Bailey
Assistant Customer Service Manager

SAL Ref.	74643 001	74643 002	74643 003	74643 004
Client Ref.	TS8C/1	TS8C/2	TS8C/3	TS8C/4
Depth (m)	-	-	-	-
Date Sampled	-	-	-	-
Type	Clay	Clay	Clay	Clay
Matrix	Soil	Soil	Soil	Soil

Determinand	Method	Units	LOD	Analysis *	Symbol				
Arsenic	ICP/OES	mg/kg	2	DG	M	29	30	23	19
Boron (water-soluble)	ICP/OES	mg/kg	1	AR	N	<1	<1	<1	<1
Cadmium	ICP/OES	mg/kg	1	DG	M	<1	<1	<1	<1
Chromium	ICP/OES	mg/kg	1	DG	M	31	27	25	24
Copper	ICP/OES	mg/kg	1	DG	M	78	65	61	37
Mercury	ICP/OES	mg/kg	1	DG	U	<1	<1	<1	<1
Nickel	ICP/OES	mg/kg	1	DG	M	28	24	22	19
Selenium	ICP/OES	mg/kg	2	DG	U	<2	<2	<2	<2
Zinc	ICP/OES	mg/kg	1	DG	M	240	200	200	76

*** AR = `As Received`.**
DG – Dried and Ground
Note: Reported MCERTS results are on a <40°C dry weight basis.

APPENDIX

SAMPLE LOCATION:	Burton Road, Barnsley		
DATE/TIME OF SAMPLING:	*Not supplied.*		
ON SITE PRESERAVTION/STABILISATION:	Not supplied.		
SAMPLE CHARACTERISATION:	**74643 001**	**TS8C/1**	**Clay**
	74643 002	**TS8C/2**	**Clay**
	74643 003	**TS8C/3**	**Clay**
	74643 004	**TS8C/4**	**Clay**
SUBCONTRACTED TESTS WERE PERFORMED BY:	None Subcontracted		

Encia Job No. 5848
Site Name Burton Road, Barnsley
Engineer JW

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
Topsoil	21	[illegible]	2	6.31			
	9	[illegible]	3	2.92			
	20	[illegible]	4	2.35		1.4	
	22	[illegible]	5	2.13		1.6	
	14	[illegible]	6	2.02		1.7	
	16	[illegible]	7	1.94		1.8	
	19	[illegible]	8	1.89		1.9	
	24	[illegible]	9	1.86		2.0	
	14	[illegible]	10	1.83		2.0	
	14	[illegible]	11	1.81		2.1	
	13	[illegible]	12	1.80		2.1	
	16	[illegible]	13	1.78		2.2	
	18	[illegible]	14	1.77		2.2	
	17	[illegible]	15	1.76		2.2	
	25	[illegible]	16	1.75		2.3	
	15	[illegible]	17	1.75		2.3	
	31	[illegible]	18	1.74		2.3	
	25	[illegible]	19	1.73		2.4	
	13	[illegible]	20	1.73		2.4	
		[illegible]	21	1.7247		2.4	
	29	1.4624	22	1.7207		2.429	
	30	1.4771	23	1.7171	1.717	2.449	2.449
	23	1.3617	24	1.7139		2.468	
	19	1.2788	25	1.7109		2.486	
		[illegible]	26	1.7081		2.503	
		[illegible]	27	1.7056		2.520	
		[illegible]	28	1.7033		2.536	
		[illegible]	29	1.7011		2.551	
		[illegible]	30	1.6991		2.565	
		[illegible]	31	1.6973		2.579	
		[illegible]	32	1.6955		2.592	
		[illegible]	33	1.6939		2.605	
		[illegible]	34	1.6924		2.618	
		[illegible]	35	1.6909		2.630	
		[illegible]	36	1.6896		2.641	
		[illegible]	37	1.6883		2.652	
		[illegible]	38	1.6871		2.663	
		[illegible]	39	1.6860		2.674	
		[illegible]	40	1.6849		2.684	
		[illegible]	41	1.6839		2.694	
		[illegible]	42	1.6829		2.704	
		[illegible]	43	1.6820		2.713	
		[illegible]	44	1.6811		2.722	
		[illegible]	45	1.6802		2.731	
		[illegible]	46	1.6794		2.739	
		[illegible]	47	1.6787		2.748	
		[illegible]	48	1.6779		2.756	
		[illegible]	49	1.6772		2.764	
		[illegible]	50	1.6766		2.772	

Determinand:	Arsenic
No. of samples:	23
SGV:	20
t value:	1.7
mean (x):	19.4
st.dev (s):	5.9
95%ile:	22
Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Higher
Y max:	1.491
Y mean:	1.269
Y st.dev:	0.136
T value:	1.640
Comparator:	2.449
Maximum Value Test Result:	
Outlier Test:	Maximum is within a Normal Distribution

Outlier Values	Sample Number

Encia Job No.	**5848**
Site Name	**Burton Road, Barnsley**
Engineer	**JW**

Note SGV is pH dependent; if a given material yields variable pH values, assume worst-case SGV. Eg if pH values are in range *7 to 9 assume SGV=200.*

Analytical Data

Material Type	Data (mg/kg)	Log Data
Topsoil	52	1.7160
	100	2.0000
	78	1.8921
	85	1.9294
	66	1.8195
	40	1.6021
	34	1.5315
	56	1.7482
	25	1.3979
	33	1.5185
	33	1.5185
	97	1.9868
	160	2.2041
	58	1.7634
	34	1.5315
	48	1.6812
	45	1.6532
	36	1.5563
	78	1.8921
	65	1.8129
	61	1.7853
	37	1.5682

Mean Value Test

n	t	t value	
2	6.3138		
3	2.9200		
4	2.3534		
5	2.1318		
6	2.0150		
7	1.9432		
8	1.8946		
9	1.8595		
10	1.8331		
11	1.8125		
12	1.7959		
13	1.7823		
14	1.7709		
15	1.7613		
16	1.7531		
17	1.7459		
18	1.7396		
19	1.7341		
20	1.7291		
21	1.7247		
22	1.7207	1.721	
23	1.7171		
24	1.7139		
25	1.7109		
26	1.7081		
27	1.7056		
28	1.7033		
29	1.7011		
30	1.6991		
31	1.6973		
32	1.6955		
33	1.6939		
34	1.6924		
35	1.6909		
36	1.6896		
37	1.6883		
38	1.6871		
39	1.6860		
40	1.6849		
41	1.6839		
42	1.6829		
43	1.6820		
44	1.6811		
45	1.6802		
46	1.6794		
47	1.6787		
48	1.6779		
49	1.6772		
50	1.6766		

Outlier Test

T_{crit} 10%	T_{crit} V
1.425	
1.602	
1.729	
1.828	
1.909	
1.977	
2.036	
2.088	
2.134	
2.176	
2.213	
2.248	
2.279	
2.309	
2.336	
2.361	
2.385	
2.408	
2.429	2.429
2.449	
2.468	
2.486	
2.503	
2.520	
2.536	
2.551	
2.565	
2.579	
2.592	
2.605	
2.618	
2.630	
2.641	
2.652	
2.663	
2.674	
2.684	
2.694	
2.704	
2.713	
2.722	
2.731	
2.739	
2.748	
2.756	
2.764	
2.772	

Determinand:	Copper
No. of samples:	22
SGV:	135
t value:	1.721
mean (x):	60.05
st.dev (s):	31.09
95% ile:	71
Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Lower
Y max:	2.204
Y mean:	1.732
Y st.dev.:	0.199
T value	2.367
Comparator	2.429
Maximum Value Test Result:	
Outlier Test?	Maximum is within a Normal Distribution

Outlier Values	Sample Number
250	

Encia Job No.	**5848**
Site Name	**Burton Road, Barnsley**
Engineer	**JW**

Note SGV is pH dependent; if a given material yields variable pH values, assume worst-case SGV. Eg if pH values are in range 7 to 9 assume SGV=300.

Analytical Data | **Mean Value Test** | **Outlier Test**

Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} 5%
Topsoil	130	2.1139	2	6.3138			
	200	2.3010	3	2.9200			
	250	2.3979	4	2.3534		1.425	
	260	2.4150	5	2.1318		1.602	
	170	2.2304	6	2.0150		1.729	
	100	2.0000	7	1.9432		1.828	
	180	2.2553	8	1.8946		1.909	
	350	2.5441	9	1.8595		1.977	
	87	1.9395	10	1.8331		2.036	
	85	1.9294	11	1.8125		2.088	
	75	1.8751	12	1.7959		2.134	
	290	2.4624	13	1.7823		2.176	
	370	2.5682	14	1.7709		2.213	
	390	2.5911	15	1.7613		2.248	
	150	2.1761	16	1.7531		2.279	
	78	1.8921	17	1.7459		2.309	
	100	2.0000	18	1.7396		2.336	
	130	2.1139	19	1.7341		2.361	
	96	1.9823	20	1.7291		2.385	
			21	1.7247		2.408	
	240	2.3802	22	1.7207		2.429	
	200	2.3010	23	1.7171	1.717	2.449	2.449
	200	2.3010	24	1.7139		2.468	
	76	1.8808	25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	Zinc
No. of samples:	23
SGV:	300
t value:	1.717
mean (x):	182.91
st.dev (s):	98.37
95% lie:	218

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Lower

Y max:	2.591
Y mean:	2.202
Y st.dev:	0.235
T value	1.655
Comparator	2.449

Maximum Value Test Result:	
Outlier Test:	Maximum is within a Normal Distribution

Outlier Values	Sample Number

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Scientific Analysis Laboratories

Report Number:	75816-1
Date of Report:	28-Apr-2006
Client:	Encia Consulting Limited, Encia House, Audby Lane, Wetherby, West Yorkshire. LS22 7RD
Client Contact:	Mr Marlon Frost
Client Job Reference:	5848
Date Job Received at SAL:	13-Apr-2006
Date Analysis Started:	18-Apr-2006
Date Analysis Completed:	28-Apr-2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used in this report:
W: Analysis was performed at another SAL Laboratory
S: Analysis was sub-contracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited

Report checked and authorised by:

Mr Waqar Shabir
Project Manager

Index to caveats used in this report

Value	Description
AR	As Received

SAL Reference: 75816
Customer Reference: 5848

Soil Analysed as Soil

Soil Suite

					SAL Reference	75816 001	75816 002	75816 003
					Customer Sample Reference	TS8C/1 (74643 001)	TS8C/2 (74643 002)	TS8C/3 (74643 003)
					Test Sample	AR	AR	AR
Determinant	**Technique**	**LOD**	**Units**	**Symbol**				
PBET PBET Arsenic pH 2.5 @ 20 Min	Calc (PBET) pH 2.5 @ 20 Min		%	N		16.00	10.00	12.00
PBET PBET Arsenic pH 2.5 @ 40 Min	Calc (PBET) pH 2.5 @ 40 Min		%	N		18.00	14.00	18.00
PBET PBET Arsenic pH 2.5 @ 60 Minutes	Calc (PBET) pH 2.5 @ 60 Min)		%	N		21	18	25
PBET PBET Arsenic pH 7.0 @ 180 Minutes	Calc (PBET) pH 7.0 @ 180 Min		%	N		15.00	14.00	17.00
PBET PBET Arsenic pH 7.0 @ 60 Minutes	Calc (PBET) pH 7.0 @ 60 Min		%	N		8.00	8.00	8.00
PBET Arsenic pH 2.5 @ 20 Minutes	ICP-OES (pH 2.5 @ 20 Min)	1	mg/kg	N		5	3	3
PBET Arsenic pH 2.5 @ 40 Minutes	ICP-OES (pH 2.5 @ 40 Min)	1	mg/kg	N		5	4	4
PBET Arsenic pH 2.5 @ 60 Minutes	ICP-OES (pH 2.5 @ 60 Minutes)	1	mg/kg	N		6	5	6
PBET Arsenic pH 7.0 @ 180 Minutes	ICP-OES (pH 7.0 @ 180 Min)	1	mg/kg	N		4	4	4
PBET Arsenic pH 7.0 @ 60 Minutes	ICP-OES (pH 7.0 @ 60 Min)	1	mg/kg	N		2	2	2

SNIFFER Method - Metals/Metalloids

Project Ref: 5848 **Run No:** 1

1 This worksheet may be used for metal and metalloid contaminants except for lead (Pb).

2 This worksheet has been completed by LJ on 28/09/2006

and has been checked by _____ on _____

3 It relates to Arsenic found at Burton Road, Barnsley

Toxicology

4 Is the substance a non-threshold substance (Y or N) Y

5 Insert the Relevant Health Criterion value for ingestion 3.00E-04 mg per kg body weight per day
For a non-threshold substance the RHC is the Index Dose (ID).
For threshold substances the RHC is the Tolerable Daily Intake (TDI).

Land Use

6 The Table below lists the default exposure durations and averaging times, used in the method for standard land uses.
Please insert Y to indicate your choice of land use and acceptance of the default assumptions.

Land Use	*Exposure duration (years)*		*Averaging time (days)*	
Residential with plant uptake	0-6	y	2190	y
Residential without plant uptake	0-6		2190	
Allotments	0-6		2190	
Commercial/Industrial	16-59		15695	

Background Exposure

7 *Insert Mean Daily Intake (MDI) from non-soil sources*
(If the contaminant is a non-threshold substance insert zero)

0 mg per day

Is the MDI equal to or greater than 80% of the TDI or is the MDI unknown? (Y or N)

8 Because the MDI for children is lower than that for adults, the MDI will need to be corrected by a Childhood Factor (CF) which depends on exposure duration. Insert the appropriate factor here:

Exposure duration (years)	Childhood Factor ingestion
0-6	0.485
16-59	1

Receptor Body Weight

9 *Insert the Time-Averaged (female) Body Weight (TABW) depending on the chosen exposure duration*

Exposure duration (years)	TABW
0-6	11.15
16-59	46.4

11.5 kg body weight

Reference Intake

10 For non-threshold substances the Reference Intake (RI) for the ingestion pathway is calculated using the formula: RI_{ingest}=ID

0.0003 mg per kg body weight per day

For threshold substances the Reference Intake (RI) for ingestion pathways is calculated using the formula: RI_{ingest}=(TDI-((MDI/70x46.4)xCF)/TABW)[a]

mg per kg body weight per day

[a] Note - The background component is in line with the approach in CLR 9, namely that the MDI is corrected by the relevant adult body weight.

For threshold substances where the background exposure (MDI) is greater than or equal to 80% of the TDI, or the MDI is unknown, the Reference Intake (RI) for ingestion pathways is calculated using the formula: RI_{ingest}=0.2TDI

mg per kg body weight per day

Intake via Soil and Dust Ingestion

11 Select a value for SEI_{dmg} from this table, depending on your choice of land use

Land Use	SEI_{dmg} (kg soil per kg body weight per day)
residential wth plant uptake	9.85319E-06
residential without plant uptake	9.85319E-06
allotment	9.85319E-06
commercial/industrial	5.43222E-07

SEI_{dmg} = 9.85E-06 mg per kg body weight per day

12 *Is site specific data on the bioaccessibility of the contaminant* in soil available? (Y or N) [Y]

if Y insert the representative fraction here (default=1) [0.21]

The amended SEI_{dmg} = SEI_{dmg} * bioaccessibility fraction [2.06917E-06] kg soil per kg body weight per day

13 The nominal assessment sub criterion for intake via soil and dust ingestion using the formula: $ASC_{dmg} = RI_{ingest}/SEI_{dmg}$

ASC = [3.00000E-04] mg per kg body weight per day / [2.06917E-06] kg soil per kg body weight per day [144.9856776] mg per kg soil

Intake via Consumption of Homegrown Vegetables

14 This pathway only applies to two land uses: residential with plant uptake and allotments. For other land uses go directly to paragraph 24. Select the basis for the Concentration Factor from **15 or 16** below. Select **one** option only.

15 *For a number of metal contaminants values of CF are given in CLR10. For the contaminant of concern select the appropriate* SEI_{veg} from the Table below.

Contaminant	SEI_{veg} (kg soil/kg body weight/day)
Arsenic	3.88743E-06
Cadmium	3.1033E-04 [b]
Chromium	1.11838E-05
Nickel	9.62006E-06
Selenium	5.29089E-05
Mercury	2.15968E-05

[b] Note –
For Cadmium the algorithms in CLR10 for calculation of CF are pH sensitive.
SEI_{veg} value given is for pH7. See main document Section 7.1.5 for further detail.

SEI_{veg}= [3.8874E-06] *kg soil per kg body weight per day*

16 *Are measured site specific Concentration Factors for leafy and root* plant uptake of metals available? (Yor N) [ ]

Measured Concentration Factor for leafy vegetables CF_{leafy} = [ ] ug per g (dry or fresh)[c] weight plant per ug per g dry weight soil

Measured Concentration Factor for root vegetables CF_{root} = [ ] ug per g (dry or fresh)[c] weight plant per ug per g dry weight soil

[c] *Note - See 17 below*

17 For calculation of the SEI_{veg} the units for CF_{leafy} and CF_{root} must be ug per g fresh weight plant over ug per g dry weight soil. It may be necessary to use a dry weight conversion factor when using measured CF values. Is a dry weight conversion required? (Y or N) [ ]

The Time Averaged Vegetable Consumption Rate for homegrown vegetables used to calculate the SEI_{veg} is given in the Table below.

Vegetable Type	TAVCR (kg FW/day)	TAVCR*HF* CF *DW	TAVCR*HF* CF
Brussel sprouts	5.04750E-03	calc not required	calc not required
Cabbage	4.86885E-03	calc not required	calc not required
Carrot	7.38094E-03	calc not required	calc not required
Leafy salads	3.25677E-03	calc not required	calc not required
Onion	3.69474E-03	calc not required	calc not required
Potato	4.41616E-02	calc not required	calc not required

Select a value for SEI_{veg} from this table for the contaminant of concern, depending on your choice of land use

Land Use	SEI_{veg} (kg soil/kg body weight/day)
residential with plant uptake	calc not required
allotments	calc not required

SEI_{veg}= [ ] kg soil per kg body weight per day

18 The nominal assessment sub criterion for intake via consumption of homegrown vegetables is calculated using the formula: $ASC_{veg} = RI_{ingest}/SEI_{veg}$

Input SEI_{veg} from question 15 or 17

ASC = [3.00000E-04] mg per kg body weight per day / [3.8874E-06] kg soil per kg body weight per day = [77.1718076] mg per kg soil

Intake via Ingestion of Soil Attached to Vegetables

19 This pathway only applies to two land uses: residential with plant uptake and allotments. For other land uses go directly to paragraph 23.

20 Select a value for $SEI_{indirect}$ from this table, depending on your choice of land use

Land Use	$SEI_{indirect}$ kg soil/kg body weight/day
residential wth plant uptake	1.12723E-06
allotment	1.12723E-06

$SEI_{indirect}$= 1.13E-06 kg soil per kg body weight per day

21 *Is site specific data on the bioaccessibility of the contaminant* in soil available? (Y or N) Y

Insert the representative fraction here (default=1) 0.21

*The amended $SEI_{indirect}$ = $SEI_{indirect}$ * bioaccessibility fraction* 2.36718E-07 *kg soil per kg body weight per day*

22 The nominal assessment sub criterion for intake via indirect soil ingestion using the formula: $ASC_{indirect} = RI_{indirect}/SEI_{indirect}$

$ASC_{indirect}$ = 3.00000E-04 (mg per kg body weight per day) / 2.36718E-07 (kg soil per kg body weight per day) = 1267.329142 mg per kg soil

Integrated Site Specific Assessment Criterion

		Σ(ASC)		SSAC	
23	Residential with plant uptake 1/	0.020644394	=	48.439300	mg per kg soil

24 The appropriate SSAC is automatically selected for the landuse scenario chosen

25 The level 1 Site Specific Assessment Criterion for **Arsenic** in the **Residential with plant uptake** scenario is 48 mg per kg soil

Risk Evaluation

26 Justify your use of the defaults on the worksheet and characterise the risk associated with the site.
Include the following:

	Justification provided (Y or N)
i. *Choice of Relevant Health Criteria value*	Y
ii. Site use (current and intended), comment on compatibility with land use selected	Y
iii. Critical Receptor	Y
iv. Pathways included/omitted (including bioaccessibility if used)	Y
v. Soil Parameters, e.g. pH	N/A

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SNIFFER Method - Metals/Metalloids

Project Ref: 5848 **Run No:** 2

1 This worksheet may be used for metal and metalloid contaminants except for *lead (Pb)*.

2 This worksheet has been completed by LJ on 28/09/2006

and has been checked by _____ on _____

3 It relates to Sensitivity analysis for found at Burton Road, Barnsley

Toxicology

4 Is the substance a non-threshold substance (Y or N) Y

5 *Insert the Relevant Health Criterion value for ingestion* 3.00E-04 *mg per kg body weight per day*
For a non-threshold substance the RHC is the Index Dose (ID).
For threshold substances the RHC is the Tolerable Daily Intake (TDI).

Land Use

6 *The Table below lists the default exposure durations and averaging times, used in the method for standard land uses.*
Please insert Y to indicate your choice of land use and acceptance of the default assumptions.

Land Use	Exposure duration (years)		Averaging time (days)	
Residential with plant uptake	0-6	y	2190	y
Residential without plant uptake	0-6		2190	
Allotments	0-6		2190	
Commercial/Industrial	16-59		15695	

Background Exposure

7 *Insert Mean Daily Intake (MDI) from non-soil sources*
(If the contaminant is a non-threshold substance insert zero)

0 mg per day

Is the MDI equal to or greater than 80% of the TDI or is the MDI unknown? (Y or N)

8 Because the MDI for children is lower than that for adults, the MDI will need to be corrected by a Childhood Factor (CF) which depends on exposure duration. Insert the appropriate factor here:

Exposure duration (years)	Childhood Factor *ingestion*
0-6	0.485
16-59	1

Receptor Body Weight

9 Insert the Time-Averaged (female) Body Weight (TABW) depending on the chosen exposure duration

Exposure duration (years)	*TABW*
0-6	11.15
16-59	46.4

11.5 kg body weight

Reference Intake

10 For non-threshold substances the Reference Intake (RI) for the ingestion pathway is calculated using the formula: RI_{ingest}=iD

0.0003 mg per kg body weight per day

For threshold substances the Reference Intake (RI) for ingestion pathways is calculated using the formula: RI_{ingest}=(TDI-((MDI/70x46.4)xCF)/TABW)[a]

mg per kg body weight per day

[a] Note - The background component is in line with the approach in CLR 9, namely that the MDI is corrected by the relevant adult body weight.

For threshold substances where the background exposure (MDI) is greater than or equal to 80% of the TDI, or the MDI is unknown, the Reference Intake (RI) for ingestion pathways is calculated using the formula: RI_{ingest}=0.2TDI

mg per kg body weight per day

Intake via Soil and Dust Ingestion

11 Select a value for SEI_{dng} from this table, depending on your choice of land use

Land Use	SEI_{dng} (kg *soil* per kg body weight per day)
residential wth plant uptake	9.85319E-06
residential without plant uptake	9.85319E-06
allotment	9.85319E-06
commercial/industrial	5.43222E-07

SEI_{dng} = 9.85E-06 mg per kg body weight per day

12 Is site specific data on the bioaccessibility of the contaminant in soil available? (Y or N) [Y]

if Y insert the representative fraction here (default=1) [0.31]

The amended SEt_{dmg} = SEI_{dmg} * bioaccessibility fraction [3.05449E-06] kg soil per kg body weight per day

13 The nominal assessment sub criterion for intake via soil and dust ingestion *using the formula:* $ASC_{dmg} = RI_{ingest}/SEt_{dmg}$

ASC = [3.00000E-04] mg per kg body weight per day / [3.05449E-06] kg soil per kg body weight per day [98.21610417] mg per kg soil

Intake via Consumption of Homegrown Vegetables

14 This pathway only applies to two land uses: residential with plant uptake and allotments. For other land uses go directly to paragraph 24. Select the basis for the Concentration Factor from **15 or 16** below. Select **one** option only.

15 *For a number of metal contaminants values of CF are given in CLR10. For the contaminant of concern select the appropriate* SEI_{veg} from the Table below.

Contaminant	SEI_{veg} (kg soil/kg body weight/day)
Arsenic	3.88743E-06
Cadmium	3.1033E-04
Chromium	1.11838E-05
Nickel	9.62006E-06
Selenium	5.29089E-05
Mercury	2.15968E-05

[b] Note –
For Cadmium the algorithms in CLR10 for calculation of CF are pH sensitive. SEI_{veg} value given is for pH7. See main document Section 7.1.5 for further detail.

SEI_{veg}= [3.8874E-06] *kg soil per kg body weight per day*

16 Are measured site specific Concentration Factors for leafy and root plant uptake of metals available? (Yor N) [ ]

Measured Concentration Factor for leafy vegetables CF_{leafy} = [ ] ug per g (dry or fresh)[c] weight plant per ug per g dry weight soil

Measured Concentration Factor for root vegetables CF_{root} = [ ] ug per g (dry or fresh)[c] weight plant per ug per g dry weight soil

[c] Note - See 17 below

17 For calculation of the SEI_{veg} the units for CF_{leafy} and CF_{root} must be ug per g fresh weight plant over ug per g dry weight soil. It may be necessary to use a dry weight conversion factor when using measured CF values. Is a dry weight conversion required? (Y or N) [ ]

The Time Averaged Vegetable Consumption Rate for homegrown vegetables used to calculate the SEI_{veg} is given in the Table below.

Vegetable Type	TAVCR (kg FW/day)	TAVCR*HF* CF *DW	TAVCR*HF* CF
Brussel sprouts	*5.04750E-03*	*calc not required*	*calc not required*
Cabbage	4.86885E-03	calc not required	calc not required
Carrot	7.38094E-03	calc not required	calc not required
Leafy salads	*3.25677E-03*	*calc not required*	*calc not required*
Onion	*3.69474E-03*	*calc not required*	*calc not required*
Potato	4.41616E-02	calc not required	calc not required

Select a value for SEI_{veg} from this table for the contaminant of concern, depending on your choice of land use

Land Use	SEI_{veg} (kg soil/kg body weight/day)
residential with plant uptake	calc not required
allotments	*calc not required*

SEI_{veg}= [ ] *kg soil per kg body weight per day*

18 The nominal assessment sub criterion for intake via consumption of homegrown vegetables is calculated using the formula: $ASC_{veg} = RI_{ingest}/SEI_{veg}$

Input SEI_{veg} from question 15 or 17

ASC = [3.00000E-04] mg per kg body weight per day / [3.8874E-06] kg soil per kg body weight per day = [77.1718076] mg per kg soil

Intake via Ingestion of Soil Attached to Vegetables

19 This pathway only applies to two land uses: residential with plant uptake and allotments. For other land uses go directly to paragraph 23.

20 Select a value for $SEI_{indirect}$ from this table, depending on your choice of land use

Land Use	*$SEI_{indirect}$ kg soil/kg body weight/day*
residential wth plant uptake	1.12723E-06
allotment	1.12723E-06

$SEI_{indirect}$= 1.13E-06 kg soil per kg body weight per day

21 Is site specific data on the bioaccessibility of the contaminant in soil available? (Yor N) Y

Insert the representative fraction here (default=1) 0.31

The amended $SEI_{indirect}$ = $SEI_{indirect}$ * bioaccessibility fraction 3.49441E-07 kg soil per kg body weight per day

22 The nominal assessment sub criterion for intake via indirect soil ingestion *using the formula:* $ASC_{indirect} = RI_{indirect}/SEI_{indirect}$

$ASC_{indirect}$ = 3.00000E-04 (mg per kg body weight per day) / 3.49441E-07 (kg soil per kg body weight per day) = 858.5132896 mg per kg soil

Integrated Site Specific Assessment Criterion

		Σ(ASC)		SSAC	
23	Residential with plant uptake 1/	0.024304534	=	41.144586	mg per kg soil

24 The appropriate SSAC is automatically selected for the landuse scenario chosen

25 The level 1 Site Specific Assessment Criterion for Sensitivity analysis for Arsenic in the **Residential with plant uptake** scenario is 41 mg per kg soil

Risk Evaluation

26 Justify your use of the defaults on the worksheet and characterise the risk associated with the site.
Include the following:

	Justification provided (Y or N)
i. Choice of Relevant Health Criteria value	Y
ii. Site use (current and intended), comment on *compatibility* with land use selected	Y
iii. Critical Receptor	Y
iv. Pathways included/omitted (including bioaccessibility if used)	Y
v. Soil Parameters, e.g. pH	N/A

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No promise is made that the spreadsheet will provide any particular facilities or functions. The user must ensure that the worksheet meets their needs and remains solely responsible for the competent use of the spreadsheet. The user is entirely responsible for the consequences of any use of the worksheet and no warranty is provided about the fitness for purpose or performance of any part of the spreadsheet.

General Note Q2

The SNIFFER Framework for Deriving Numeric Targets to Minimise the Adverse Human Health Effects of Long-term Exposure to Contaminants in Soil

Created by: Developed on behalf of the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) by a consortium of consultants and stakeholders.

How it works and general assumptions: The SNIFFER Framework is a paperbased risk assessment tool for deriving site-specific assessment criteria (SSAC). This Framework provides a deterministic methodology for deriving human health assessment criteria for chronic exposure to contaminants in soil, but does not evaluate impacts from contaminated groundwater or surface water receptors. The assessment criteria are defined as contaminant levels in soils that minimise risks to human health.

A set of worksheets containing simplified formulae for generic land uses (e.g. residential, commercial) are provided. There are also worksheets for metals and metalloids, and organic compounds. Lead and cyanide are considered to be special cases due to their toxicological mode of action, and there are separate worksheets for the calculation of numeric targets for these substances.

The Framework provides the majority of the data required for implementation of the equations. The Framework does not provide default values for site conditions, physico-chemical parameters, or toxicological data. Appropriate inputs from site investigation data and reliable information sources, are therefore required to derive site-specific assessment criteria.

The primary Framework output is an integrated "reference target concentration" (RTC) from each worksheet and for each contaminant evaluated. The generated RTC requires explanation, and this should be done during the risk characterisation stage, where justifications for the input parameters are discussed.

Intended uses: The SNIFFER framework can only be used to undertake site-specific assessment. It should only be used where no alternative UK model exists (i.e. while CLEA is in draft; where CLEA does not include the scenario; or where the effects of bioaccessbility need consideration).

Limitations: Pathways of dermal contact and inhalation of fugitive dusts are not included.

Appropriate toxicological and physiochemical parameters must be selected from a hierarchy of data sources and justified by the assessor for each chemical. Different assessors may therefore adopt different values which will result in a wide variation in the calculated RTC.

Additionally, the calculations are sensitive to the number of decimal places used. Variation in rounding up of numbers through out the worksheet can lead to differences in the RTC even when the same toxicological and physiochemical parameters are used.

Site-specific refinements that can be made within the Framework are limited to land use, soil properties, and bioaccessibility. The Framework only considers the impacts on human receptors from soils, within a number of land use scenarios and via a total of four predominant exposure pathways.

This Report: For the purposes of the risk assessment outlined in the main body of text for this Report, Encia have run the SNIFFER Framework using available site-specific data. Details of the input parameters used, including a contaminant inventory, assumptions and uncertainties, are included in the table below.

Parameter	Value	Justification for decision and data source
Threshold substance		
Non Threshold substance	√	
Health criteria value/index dose (mg/kg bw/day)		
Oral	0.0003	EA Tox Report 1
Inhalation	N/A	
Land use selected		
Residential with plant uptake	√	Reclaimed material from site may be used as cover in garden areas
Residential without plant uptake		
Commercial/industrial		
Mean daily intake if appropriate (mg/kg bw/day)		
Oral	N/A	Arsenic is a non threshold substance, therefore has no acceptable background exposure
Inhalation	N/A	
Critical Receptor		
0-6yr female child	√	Most sensitive scenario
16-59yr female adult worker		
Site specific bioaccessibility data available	Y	Aquired through PBET testing. Fraction of 0.31 was also used as a senstivitiy analysis to account for variation in the PBET test.
Bioaccessibility fraction	0.21 (Run1)	Based on average availability for 60min digestion at pH2.5
	0.31 (Run2)	Based on a possible 50% variation in test procedures
Concentration Factors used	N	
Concentration factor leafy vegetable	N/A	
Concentration factor root vegetable	N/A	
Pathways included		
Intake via soil and dust	√	Bioaccessibility only considers direct ingestion in the gut. This is also driving pathway in SGV.
Intake via consumption home grown veg	X	
Intake via soil attached to home grown veg	X	
Intake via inhalation of outdoor air	X	
Intake via inhalation of indoor air	X	
Pathways excluded		
Dermal contact	√	Pathways not included in SNIFFER worksheet. Dermal pathway check has been undertaken and dermal pathway not considered to be significant to calculation of risk. Additionally the direct ingestion pathway accounts for the majority of exposure as stated in the SGV 1 report, as such protection via this pathway will result in minimal exposure via other pathways.
Inhalation of fugitive dust	√	
Soil parameters	N/A	
Soil density		
Foc		
SOM (SOM/0.58=Foc)		
Total soil porosity		

Parameter	Value	Justification for decision and data source
Source area		
Source area width parallel to wind direction	N/A	
Depth to subsurface contamination	N/A	
Chemical properties	N/A	
Kow		
Koc		
Diffusion co-efficient in water		
Diffusion co-efficient in air		
Molecular weight		
Saturated vapour pressure		

APPENDIX D
GEOTECHNICAL TEST RESULTS

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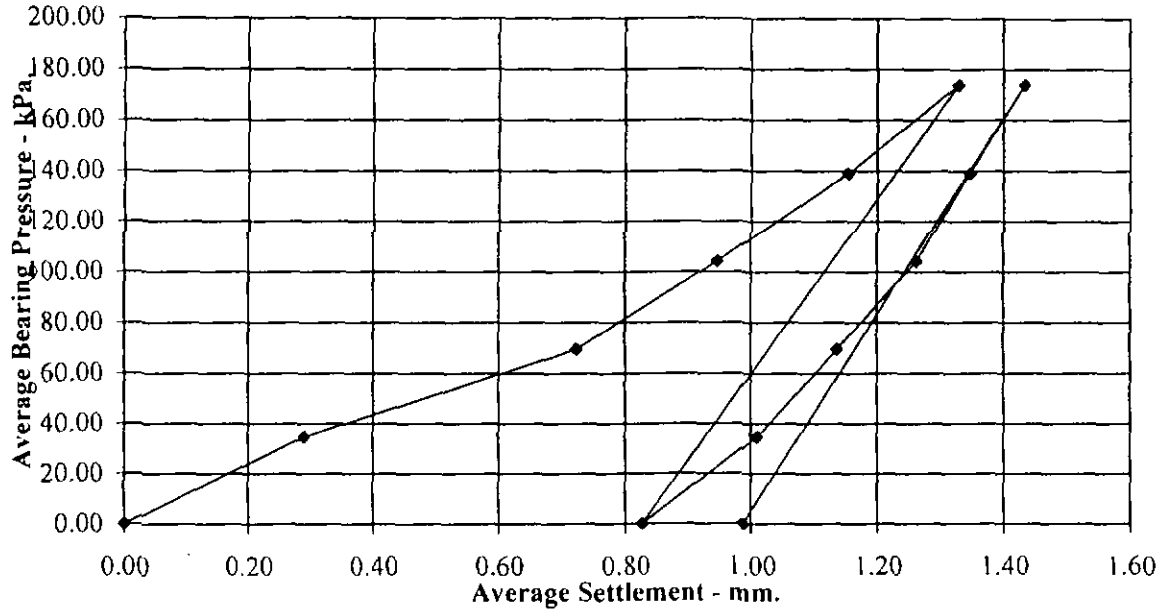
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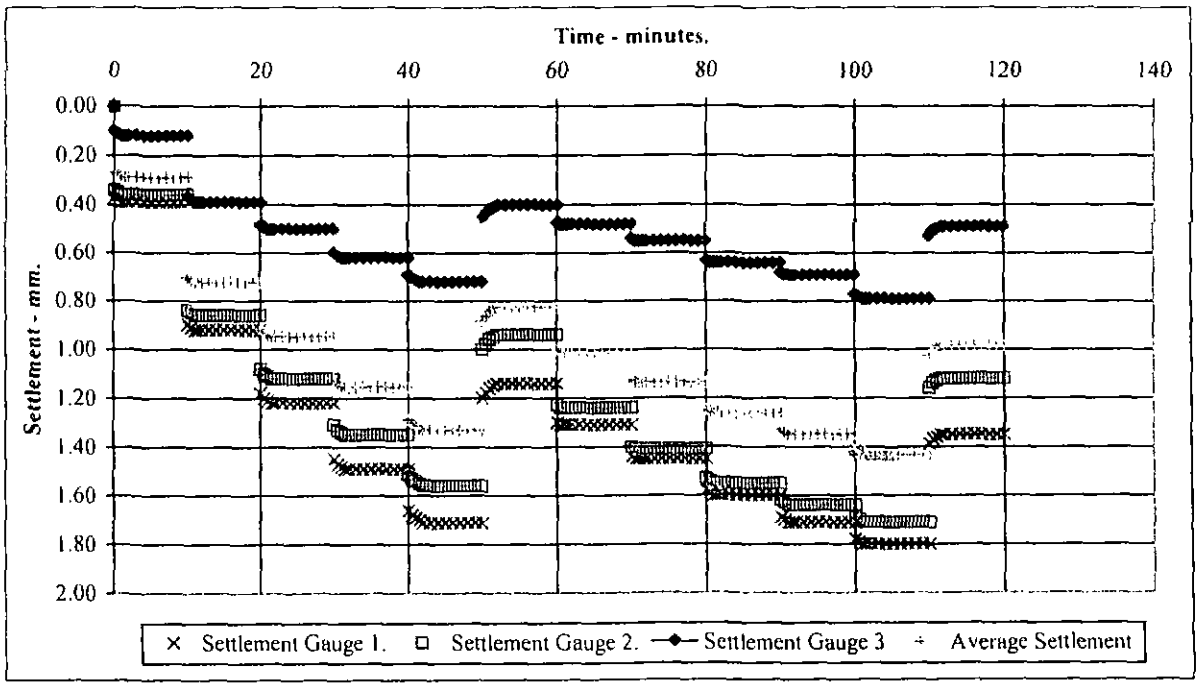
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

RECEIVED 11 JAN 2006 2468

Date of Test:	05-Jan-06		
Test Position:	1	**Depth (m):**	
Plate Area (m2):	0.2827	**Type of Kentledge:**	Wheeled
Maximum Applied Pressure (kPa):		173.76	
Maximum Deformation (mm):		1.43	
Description:		6F2	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **05/01/2006** — Test Number: **1**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**1.33**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**160**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	128000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	102963	$kN/m^2/m$
Subgrade CBR:	**30**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

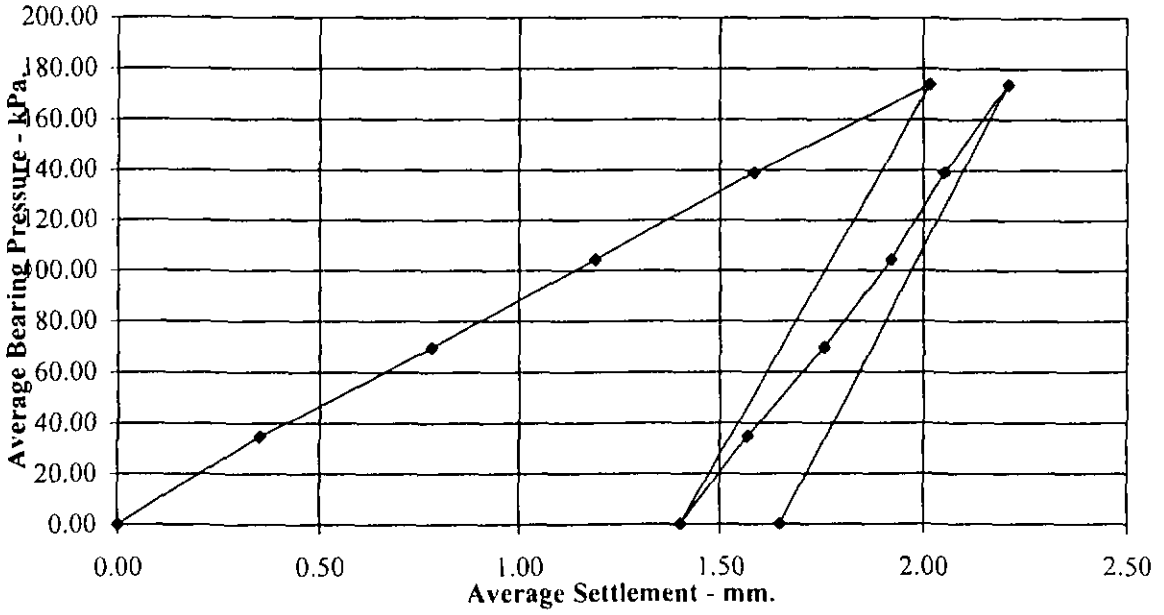
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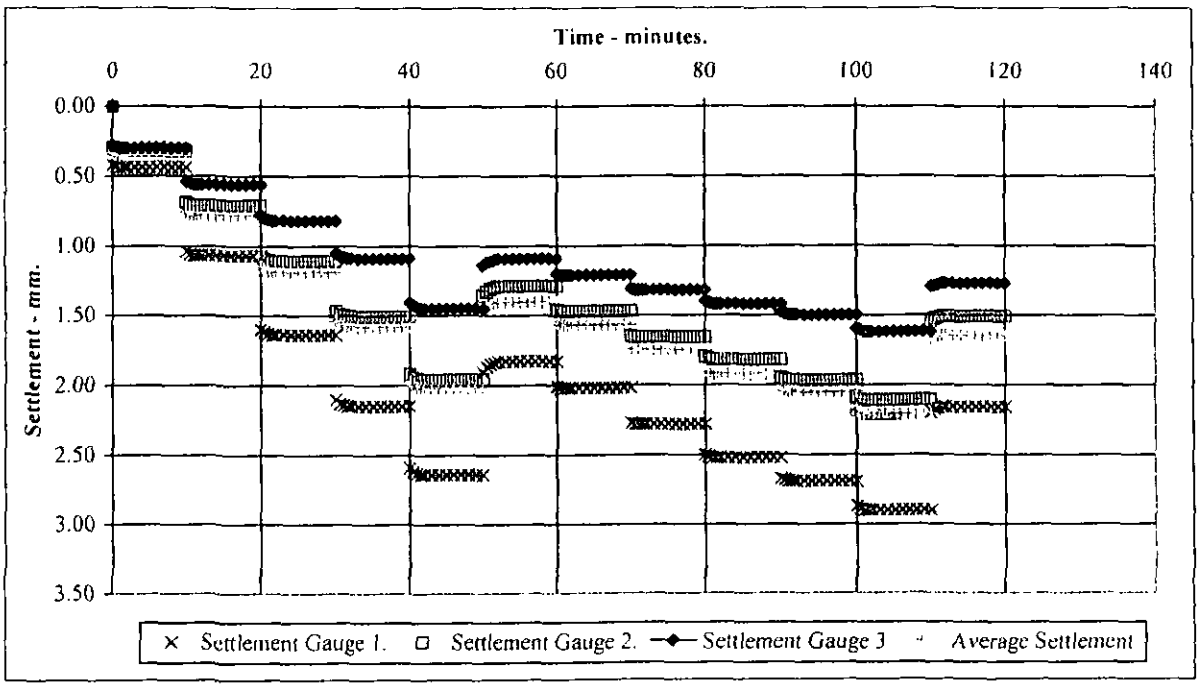
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email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	05-Jan-06		
Test Position:	2	**Depth (m):**	
Plate Area (m2):	0.2827	**Type of Kentledge:**	Wheeled
Maximum Applied Pressure (kPa):	173.76		
Maximum Deformation (mm):	2.21		
Description:	6F2		





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Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **05/01/2006** — Test Number: **2**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.02**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**110**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	88000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	70787	$kN/m^2/m$
Subgrade CBR:	**15**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

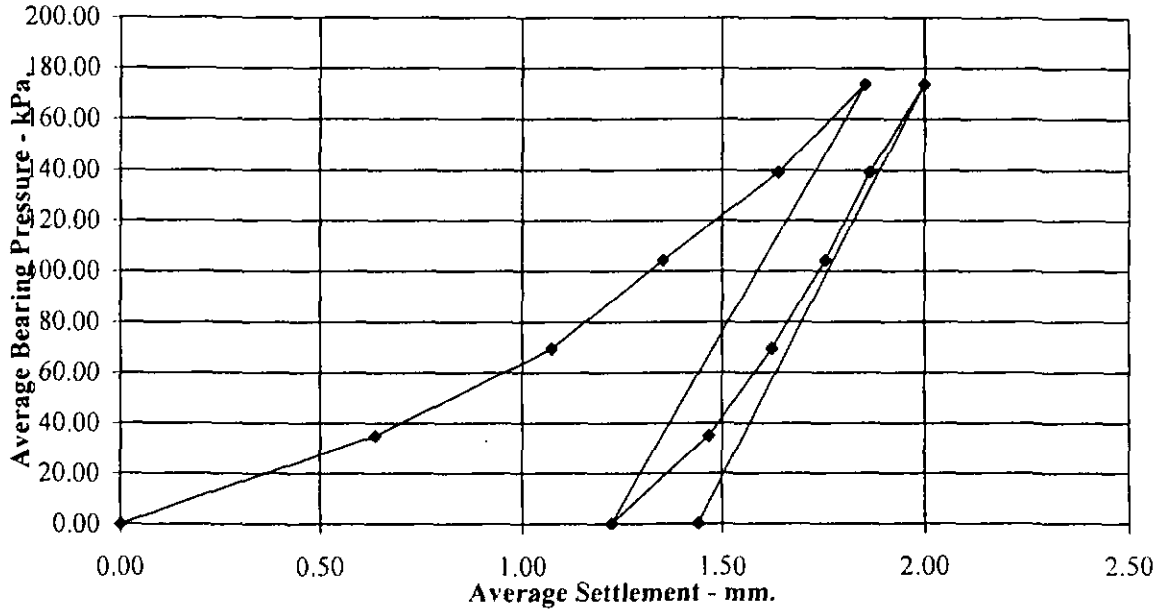
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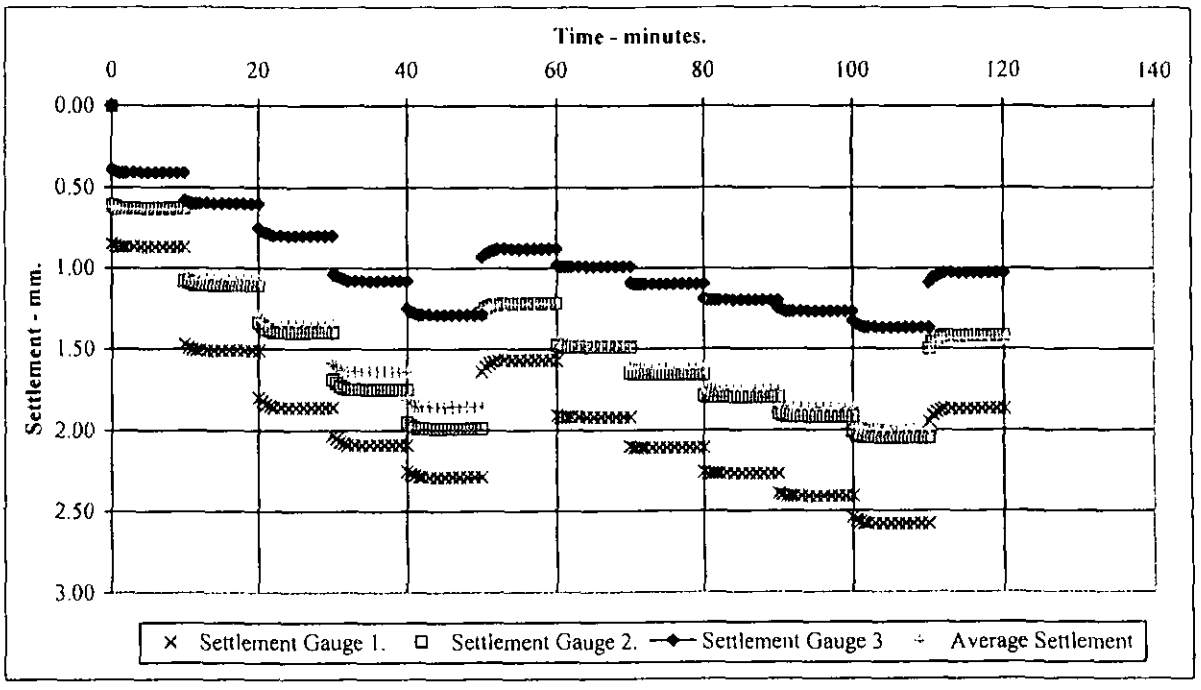
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VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	05-Jan-06		
Test Position:	3	***Depth (m):***	
Plate Area (m2):	0.2827	**Type of Kentledge:**	Wheeled
Maximum Applied Pressure (kPa):		173.76	
Maximum Deformation (mm):		2.00	
Description:		6F2	





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BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: ***05/01/2006*** — *Test Number:* **3**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**1.86**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**90**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	72000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	57917	$kN/m^2/m$
Subgrade CBR:	**11**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

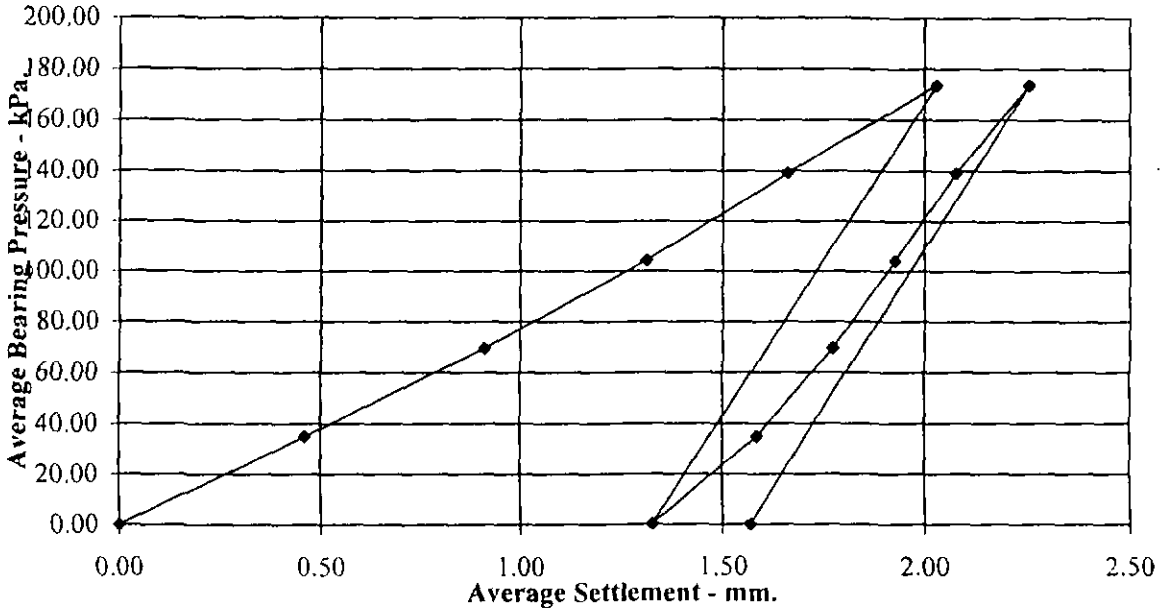
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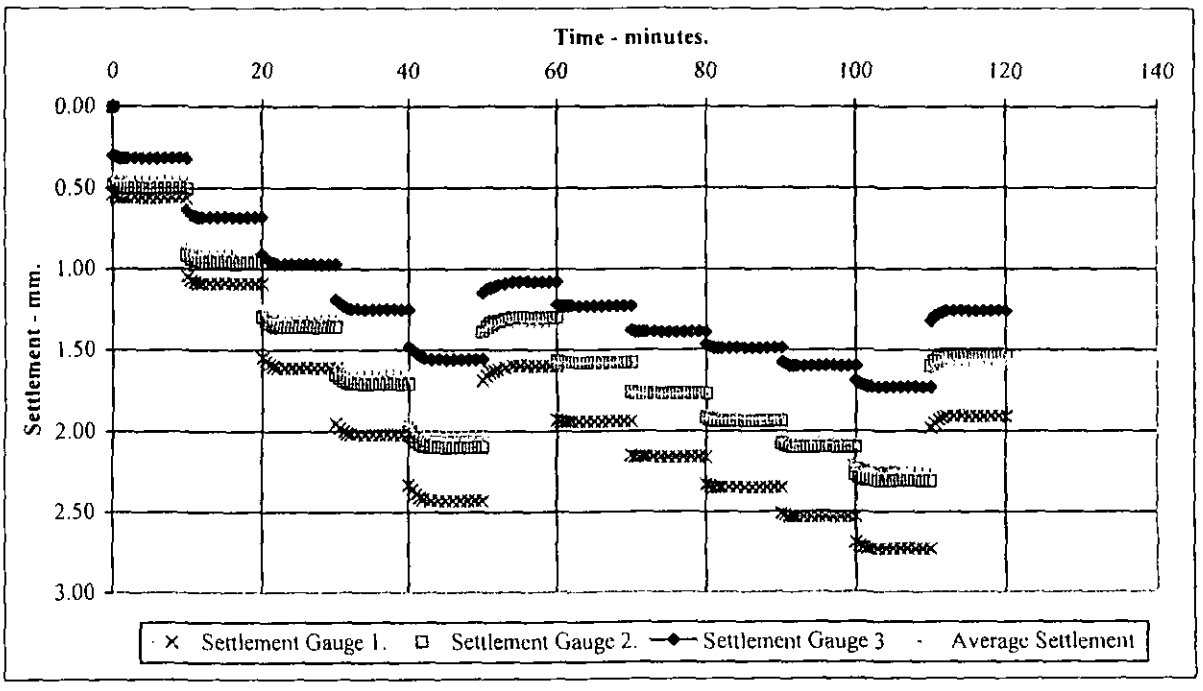
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BS 1377 : Part 9 : 1990.

Date of Test:	*05-Jan-06*		
Test Position:	4	Depth (m):	
Plate Area (m2):	0.2827	Type of Kentledge:	Wheeled
Maximum Applied Pressure (kPa):		*173.76*	
Maximum Deformation (mm):		2.26	
Description:		6F2	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
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Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **05/01/2006** — Test Number: **4**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.03**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**100**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	80000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	64352	$kN/m^2/m$
Subgrade CBR:	**13**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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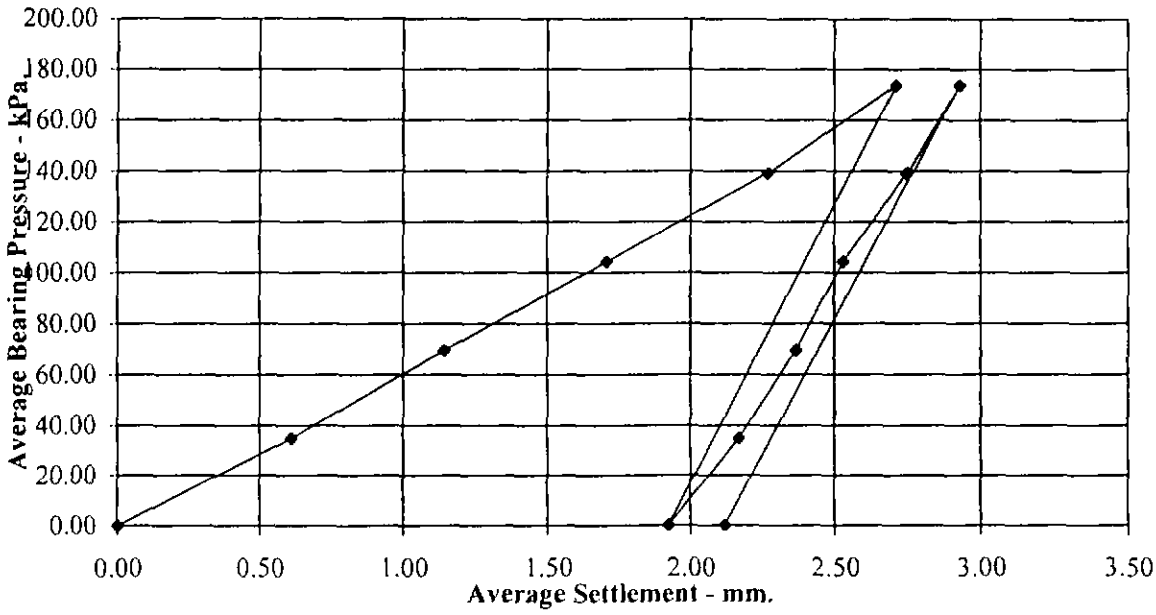
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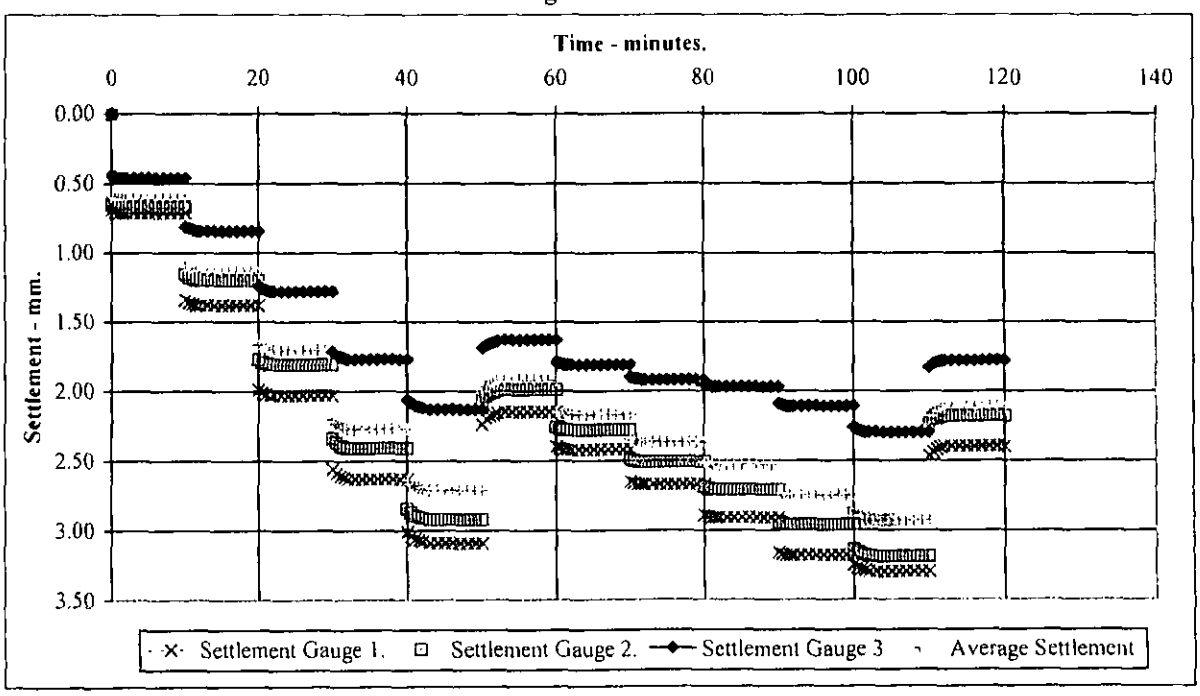
Date of Test: 05-Jan-06

Test Position: 5 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.93
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
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Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **05/01/2006** — Test Number: **5**

Engineer: **SRJ** — *Test Position:*

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.71**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**75**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	60000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	48264	$kN/m^2/m$
Subgrade CBR:	**8**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

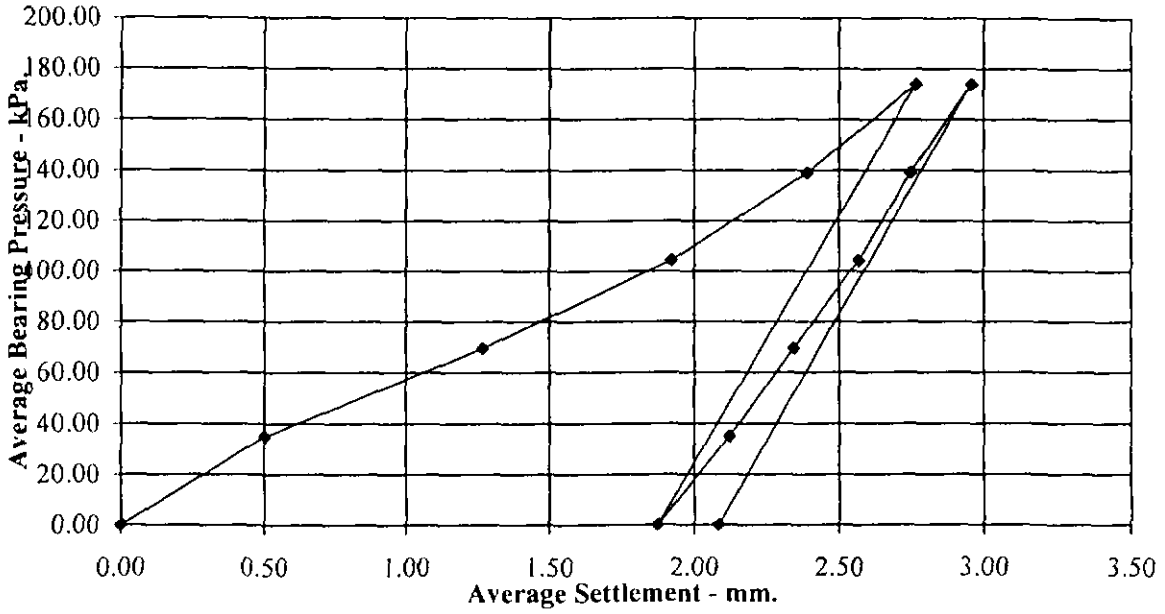
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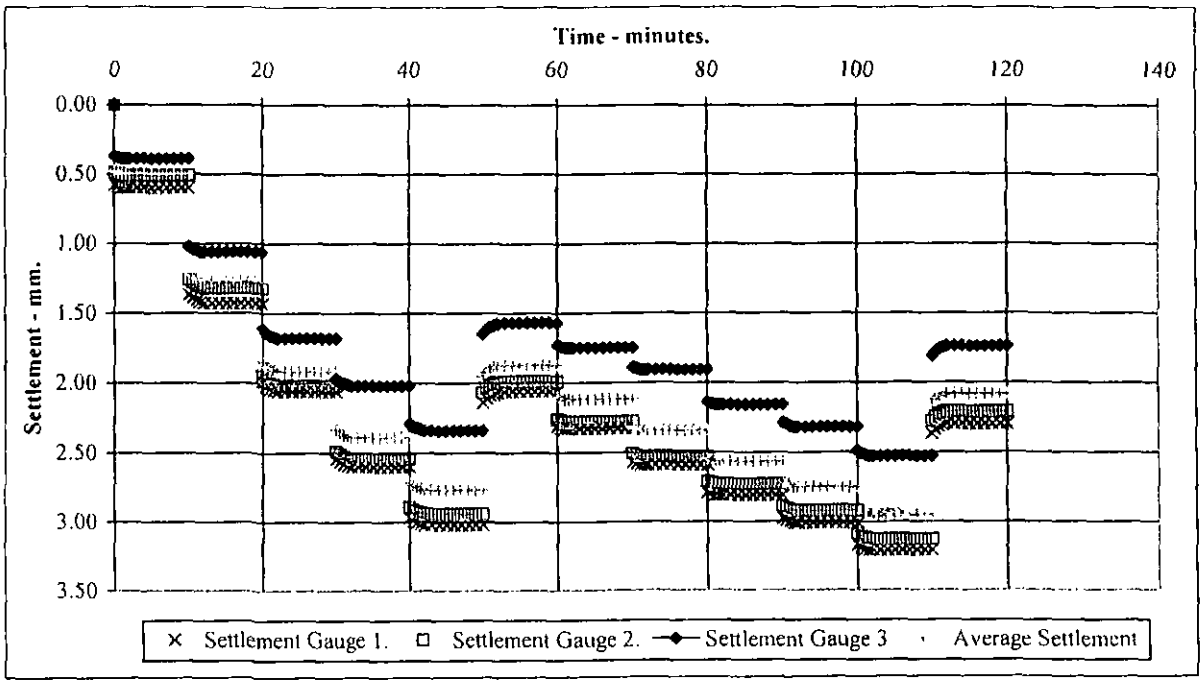
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BS 1377 : Part 9 : 1990.

Date of Test:	*05-Jan-06*		
Test Position:	6	**Depth (m):**	
Plate Area (m2):	0.2827	**Type of Kentledge:**	**Wheeled**
Maximum Applied Pressure (kPa):		173.76	
Maximum Deformation (mm):		2.96	
Description:		6F2	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/06		10/1/06		10/1/06	PSL06/23
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Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **05/01/2006** — Test Number: **6**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.77**	*mm*
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**70**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	56000	$kN/m^2/m$
Plate Correction Factor:	*0.80*	
Modulus of subgrade reaction K_{762}:	45046	$kN/m^2/m$
Subgrade CBR:	**7**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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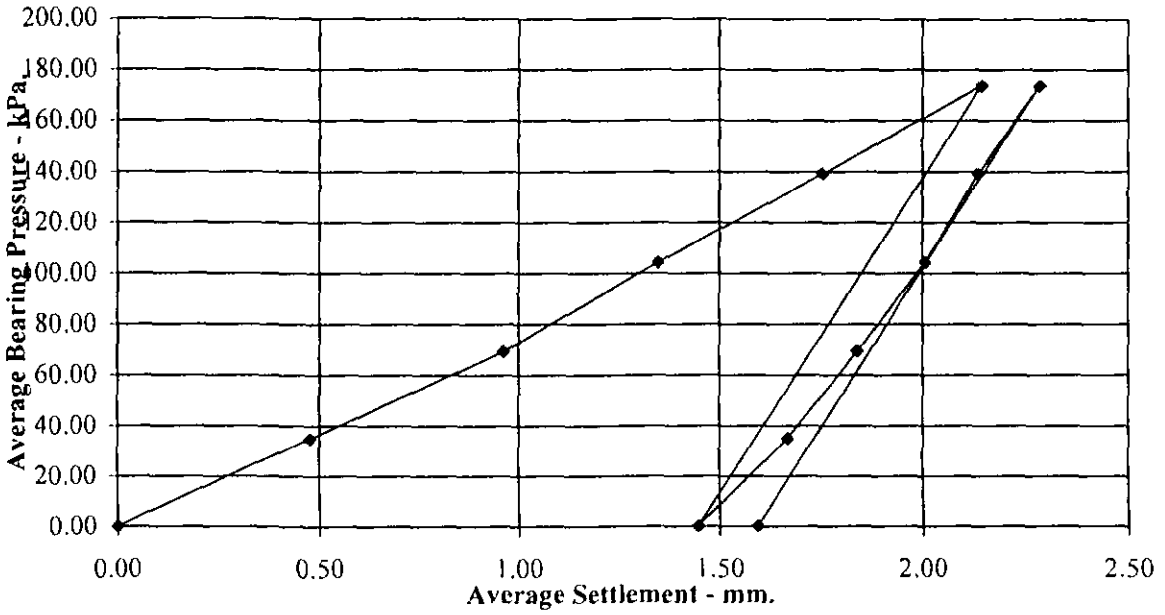
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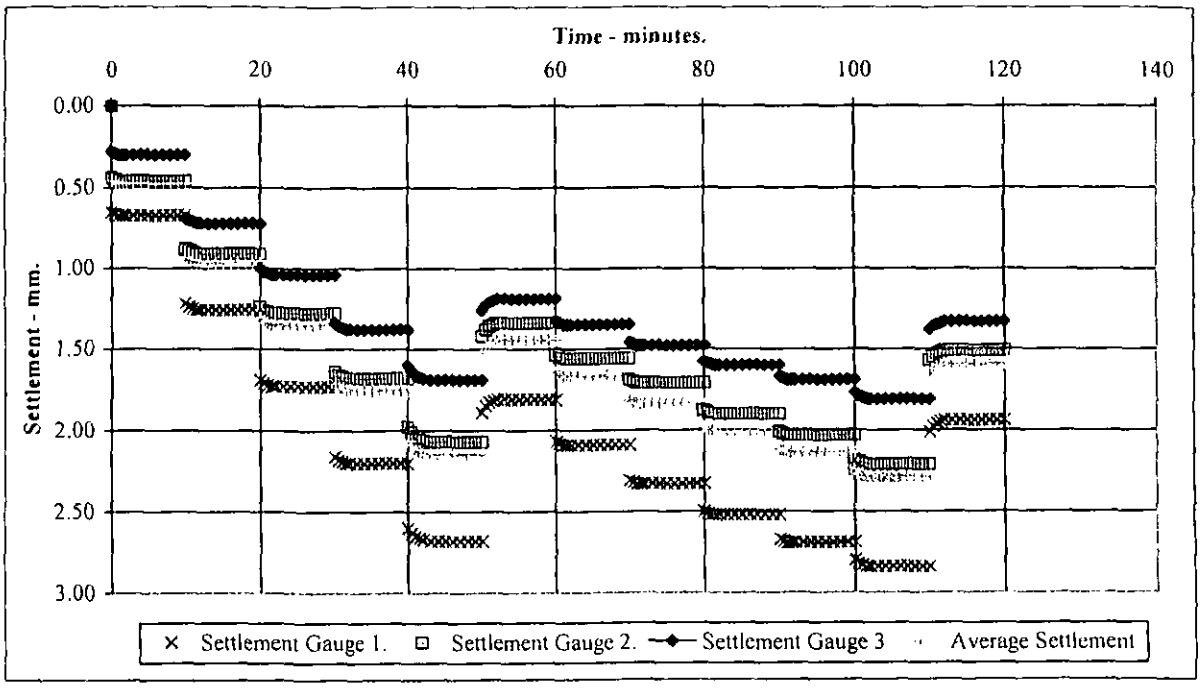
Date of Test: 05-Jan-06

Test Position: 7 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.29
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **05/01/2006** — Test Number: **7**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.15**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**95**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	76000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	61134	$kN/m^2/m$
Subgrade CBR:	**12**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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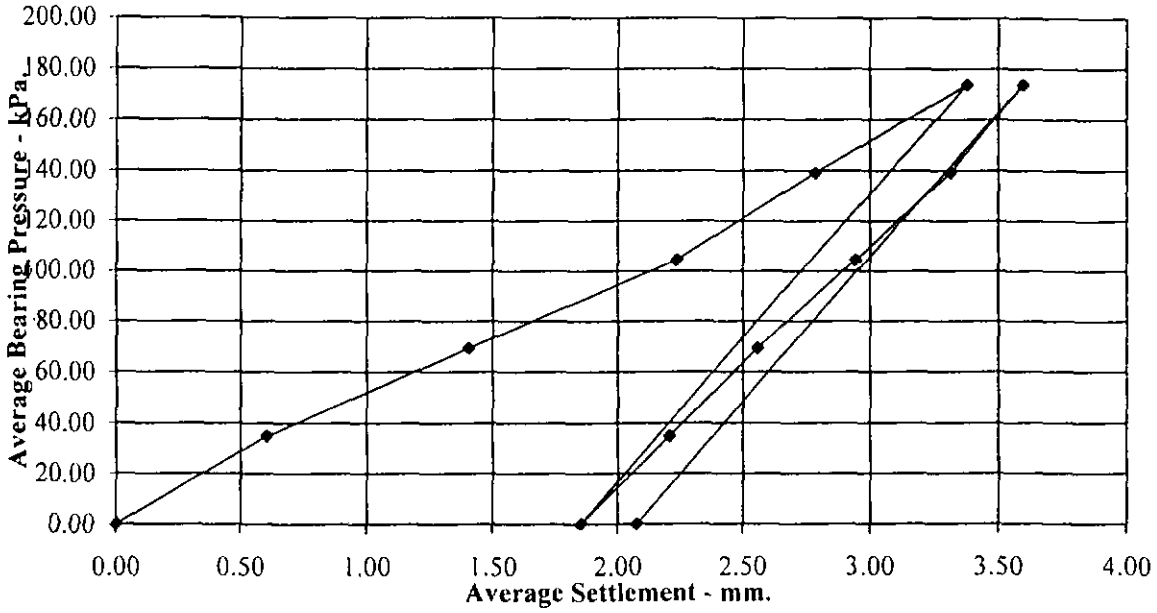
Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster, DN4 0AR
tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

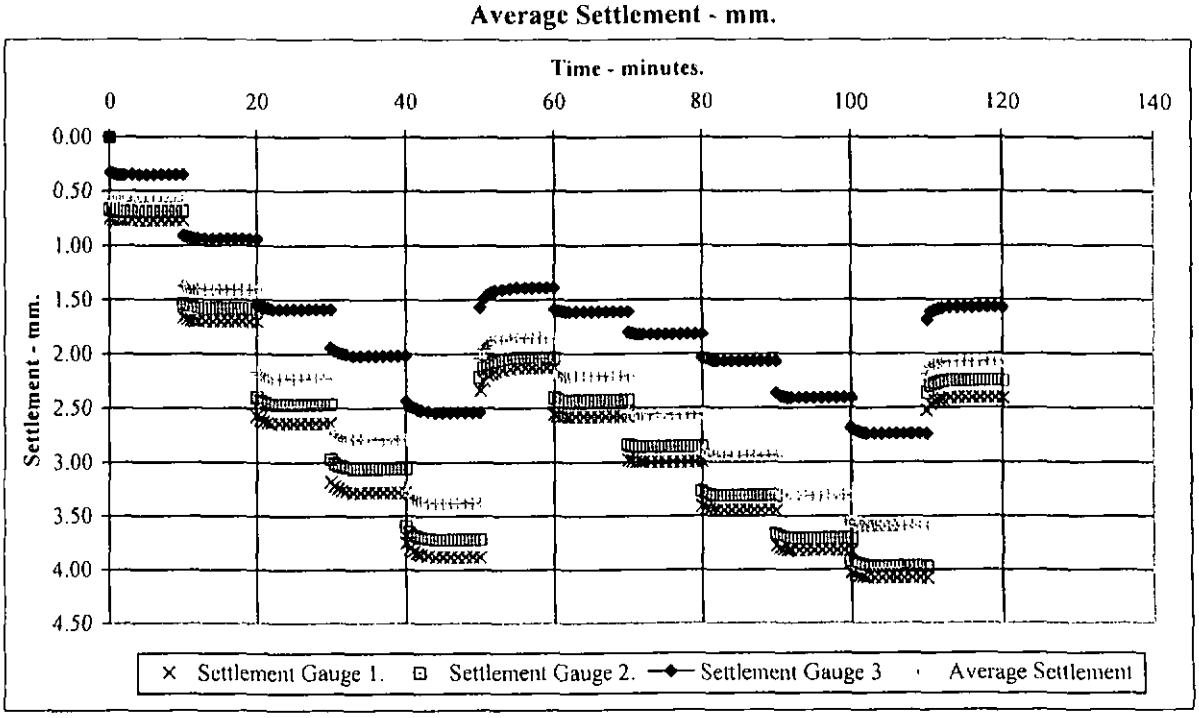
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	06-Jan-06		
Test Position:	8	**Depth (m):**	
Plate Area (m2):	0.2827	**Type of Kentledge:**	Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 3.60
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/06		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **06/01/2006**

Test Number: **8**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.38**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**60**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	48000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	38611	$kN/m^2/m$
Subgrade CBR:	**5**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

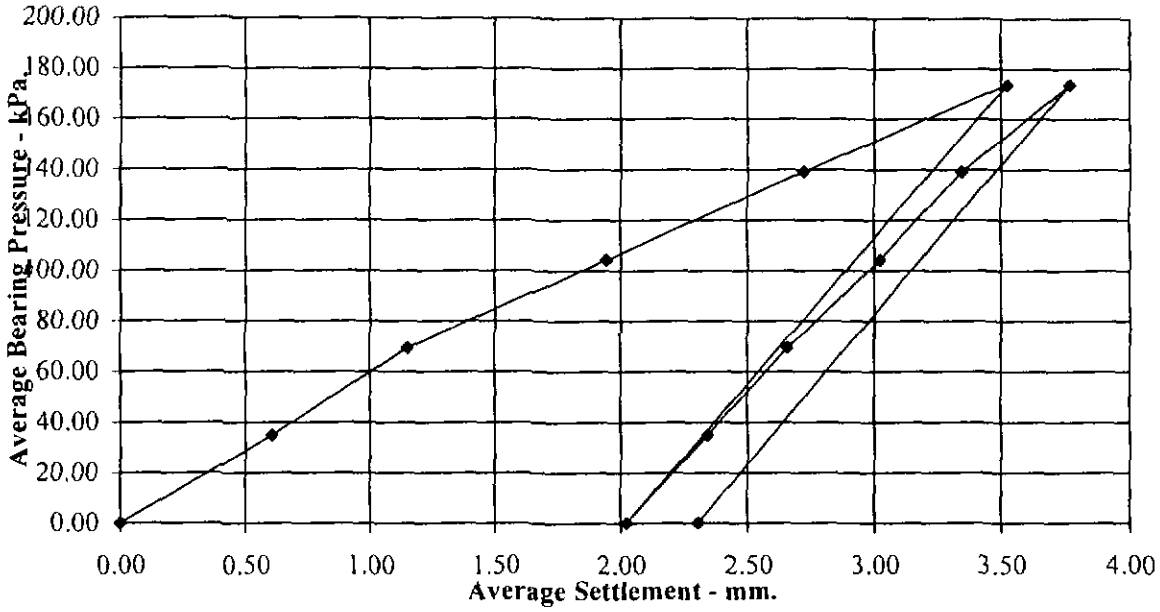
BS 1377 ; Part 9 : 1990.

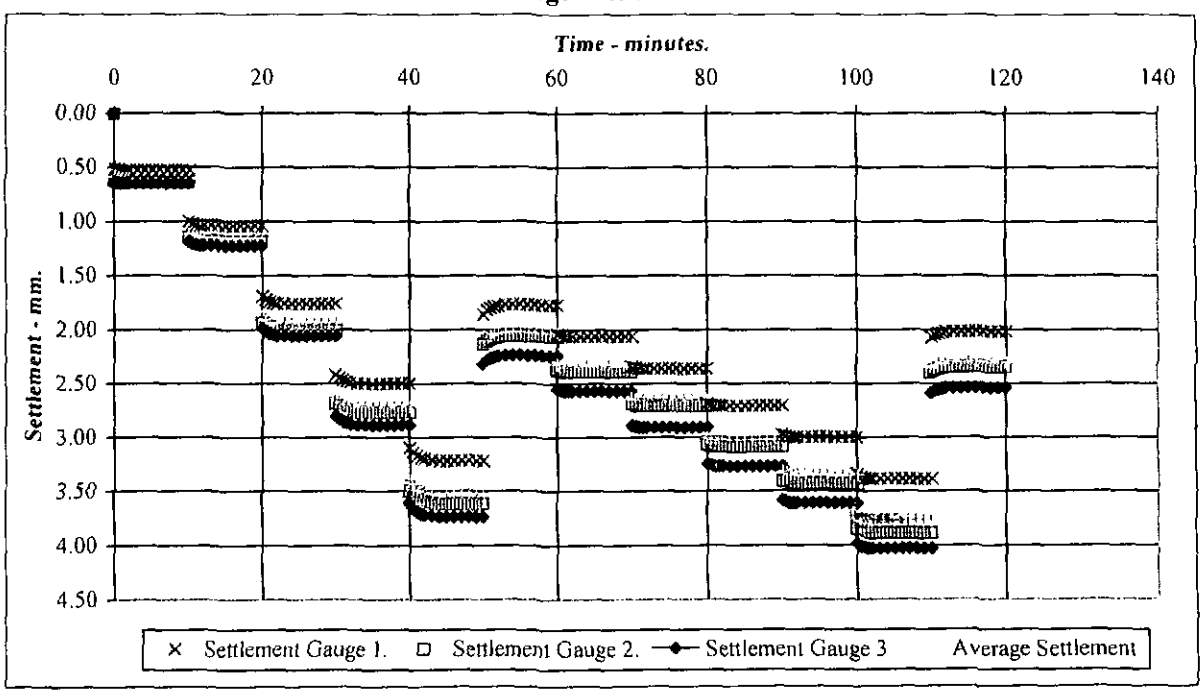
Date of Test: 06-Jan-06

Test Position: 9 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 3.77
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **06/01/2006** — Test Number: **9**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.53**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**75**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	60000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	48264	$kN/m^2/m$
Subgrade CBR:	**8**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

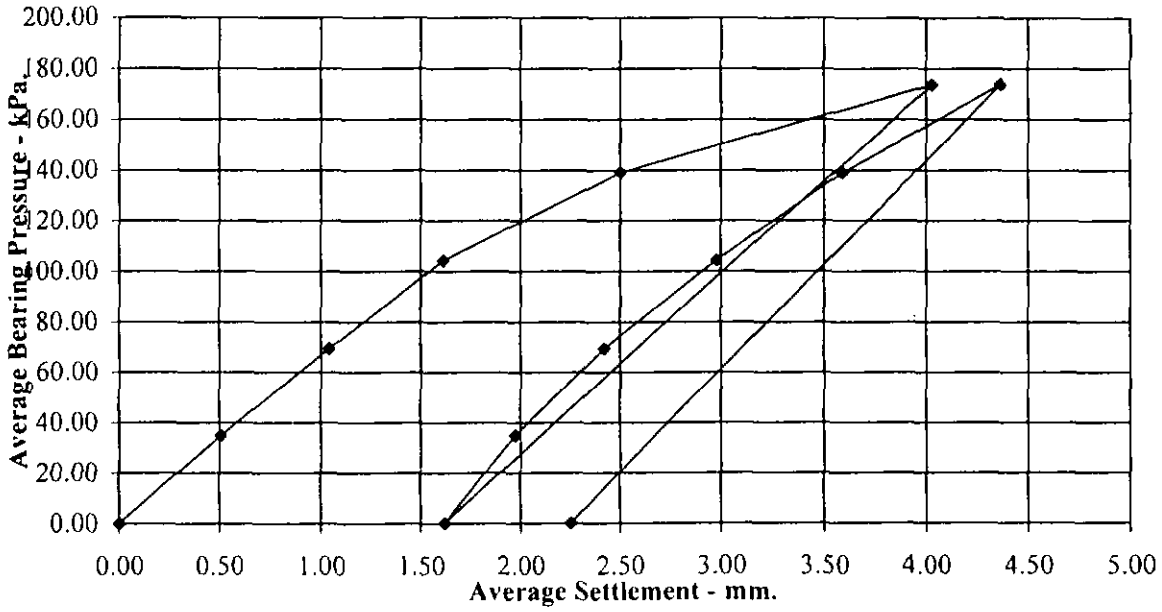
BS 1377 : Part 9 : 1990.

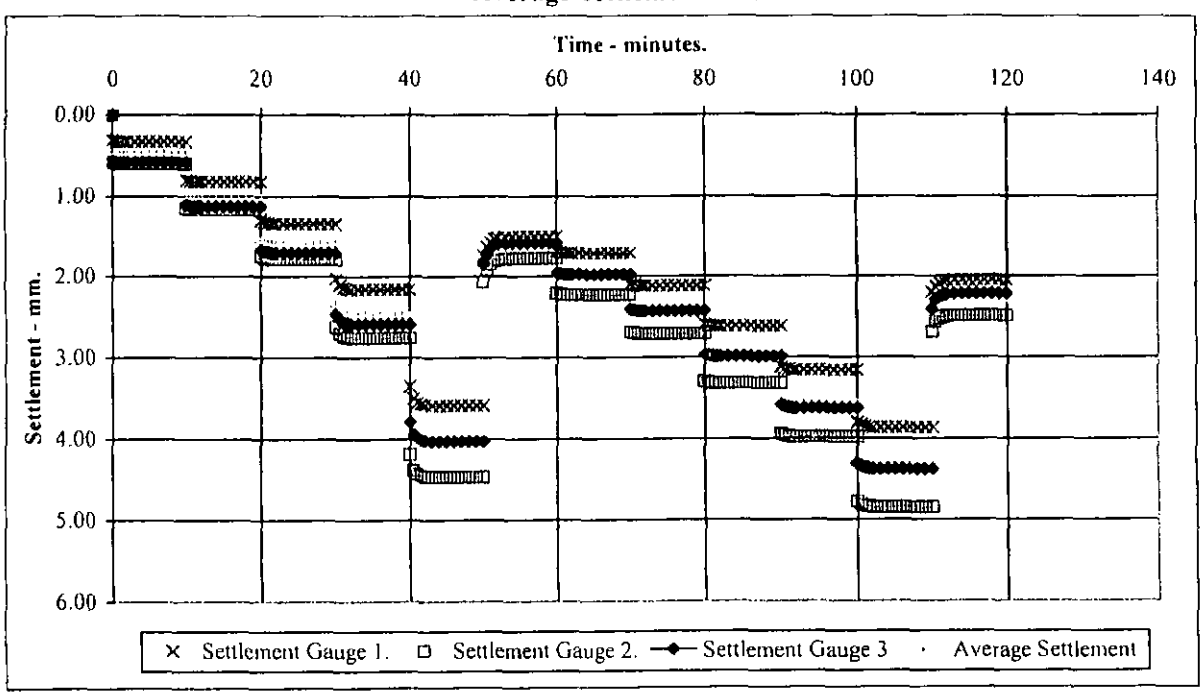
Date of Test: 06-Jan-06

Test Position: 10 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure **(kPa):** 173.76
Maximum Deformation (mm): 4.37
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** Project No: **5848**

Date: **06/01/2006** Test Number: **10**

Engineer: **SRJ** Test Position:

Fill Type: **6F2** Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**4.03**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**80**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	64000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	51482	$kN/m^2/m$
Subgrade CBR:	**9**	%

NB: Project / test data to be entered in shaded cells

Notes

1) *Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)*

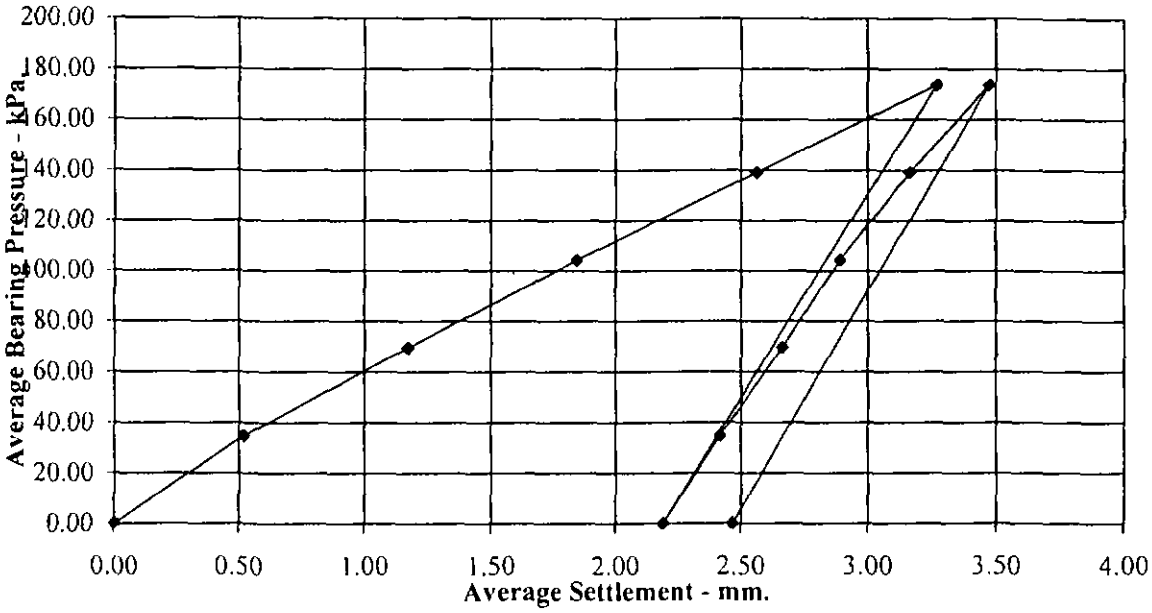
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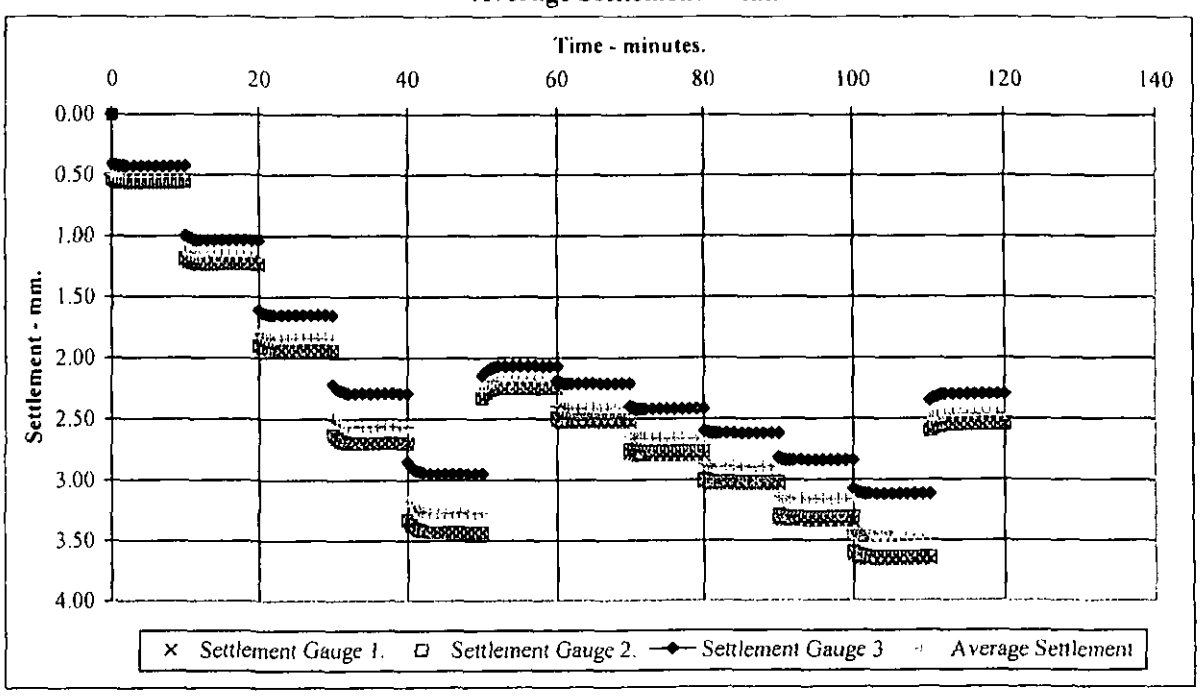
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VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**06-Jan-06**		
Test Position:	**11**	**Depth (m):**	
Plate Area (m2):	**0.2827**	**Type of Kentledge:**	**Tracked**
Maximum Applied Pressure (kPa):		**173.76**	
Maximum Deformation (mm):		**3.47**	
Description:		**6F2**	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **06/01/2006**

Test Number: **11**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.27**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**75**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	60000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	48264	$kN/m^2/m$
Subgrade CBR:	**8**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

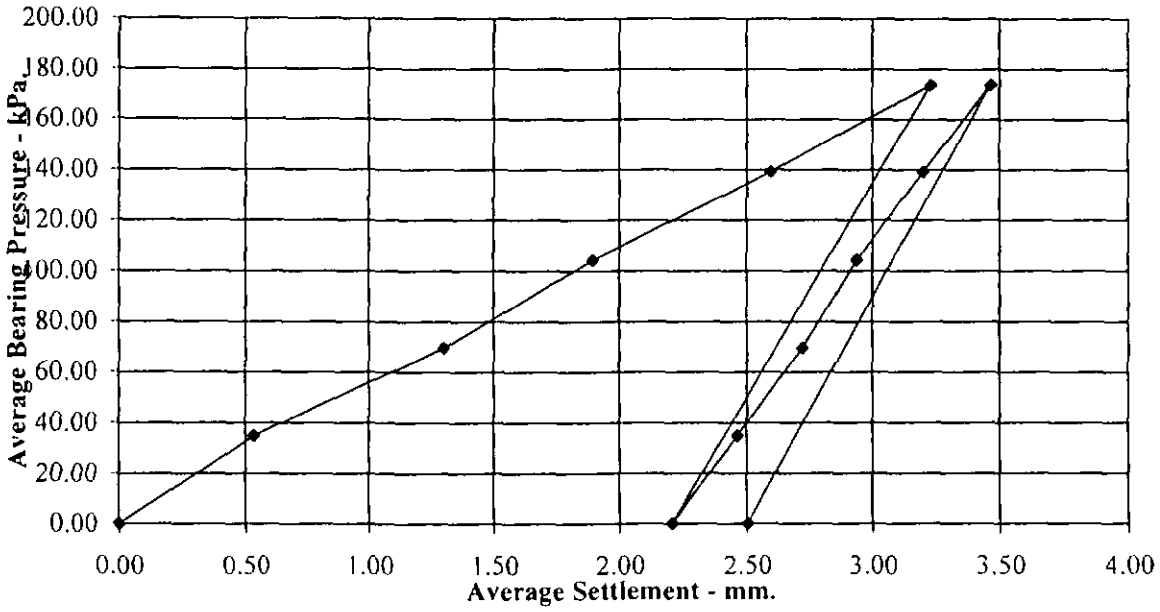
BS 1377 : Part 9 : 1990.

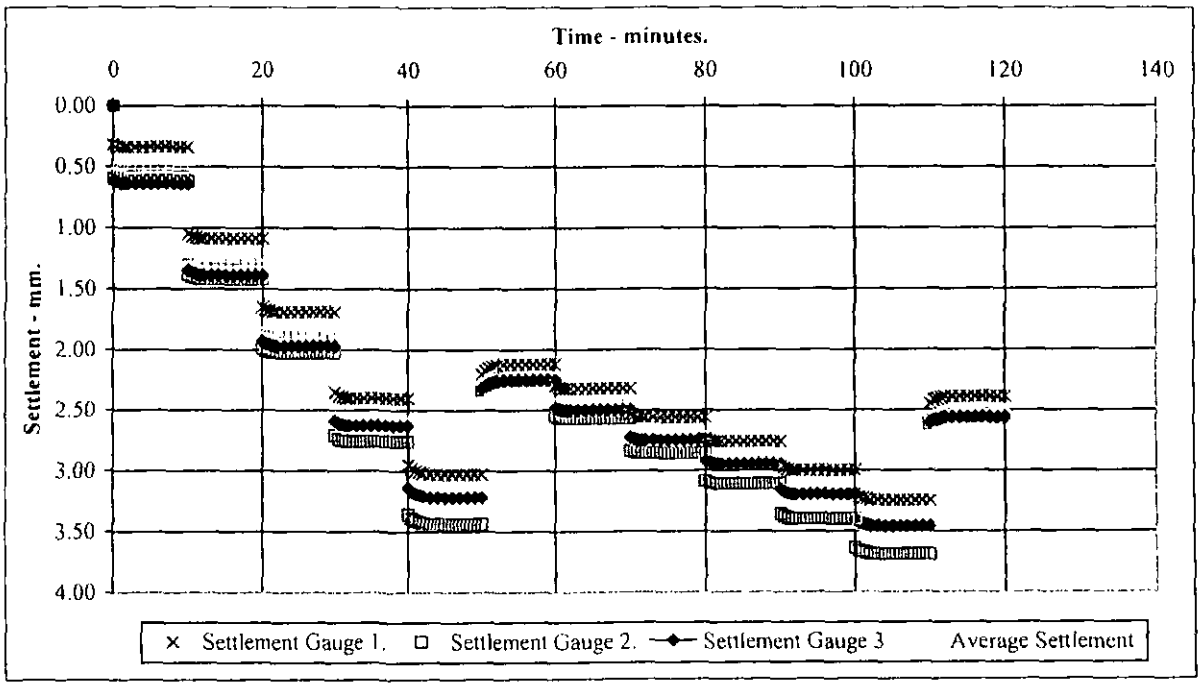
Date of Test: 06-Jan-06

Test Position: 12 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 3.47
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **06/01/2006** — Test Number: **12**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.23**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**70**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	56000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	45046	$kN/m^2/m$
Subgrade CBR:	**7**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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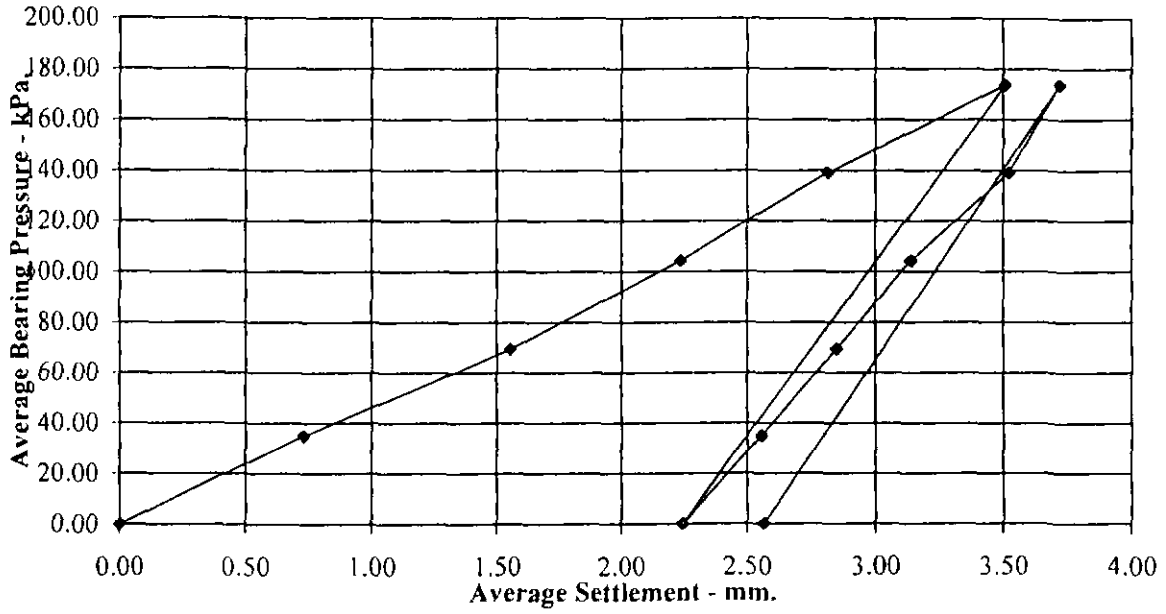
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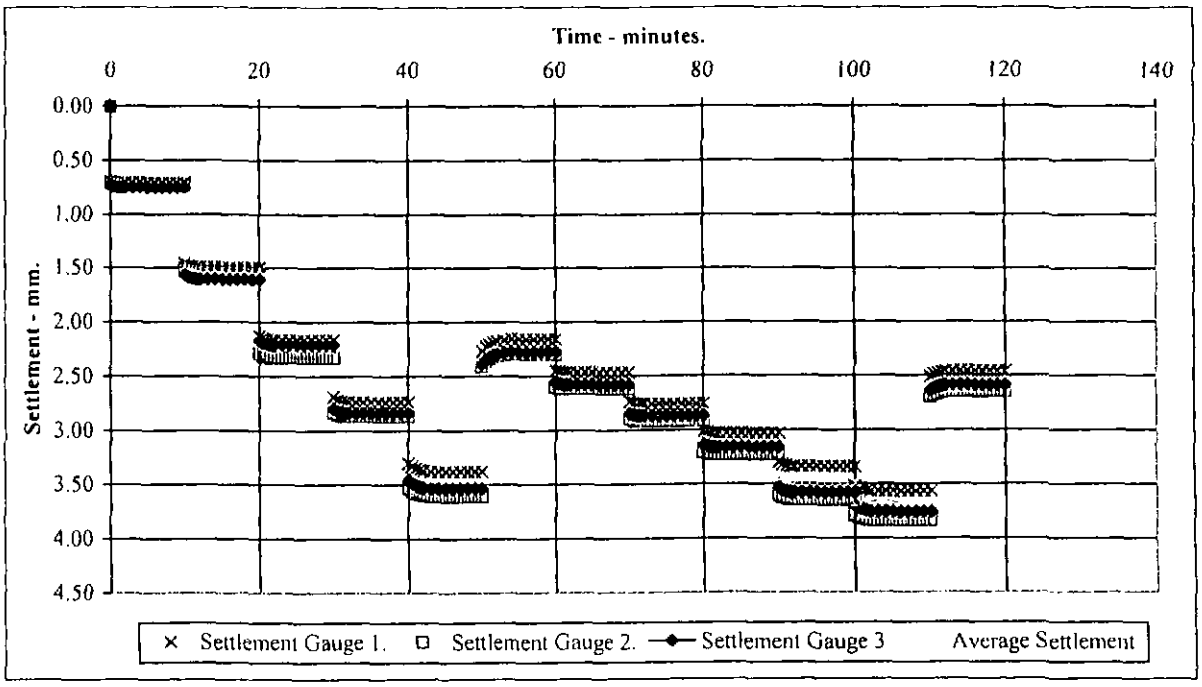
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	*06-Jan-06*		
Test Position:	13	Depth (m):	
Plate Area (m2):	0.2827	Type of Kentledge:	Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 3.72
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/6		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **06/01/2006** — Test Number: **13**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.51**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**55**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	*44000*	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	35394	$kN/m^2/m$
Subgrade CBR:	**5**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

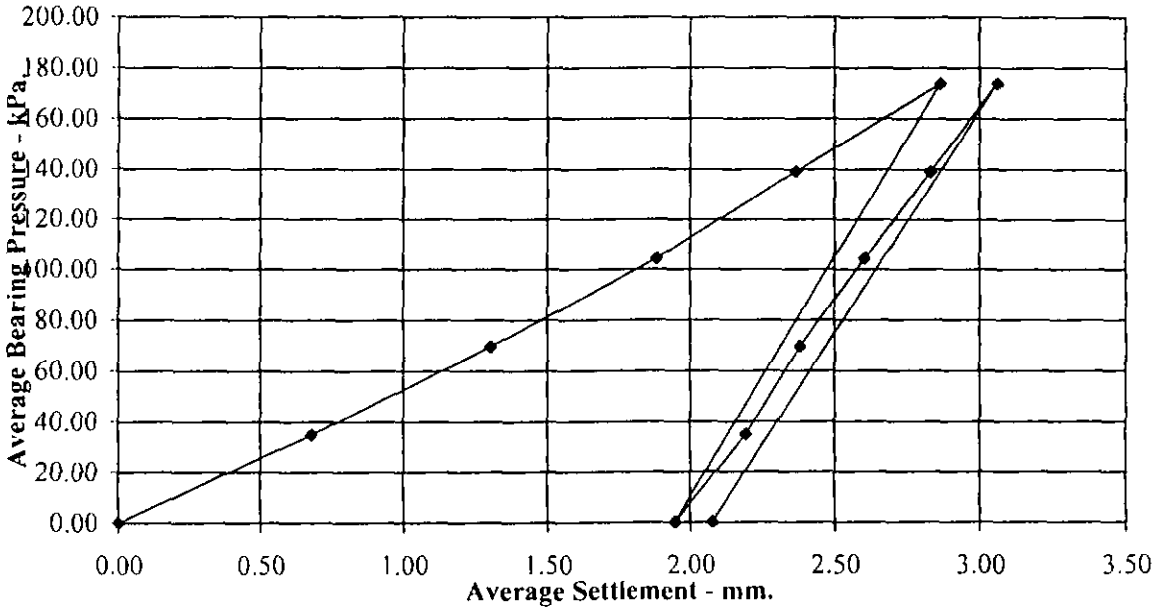
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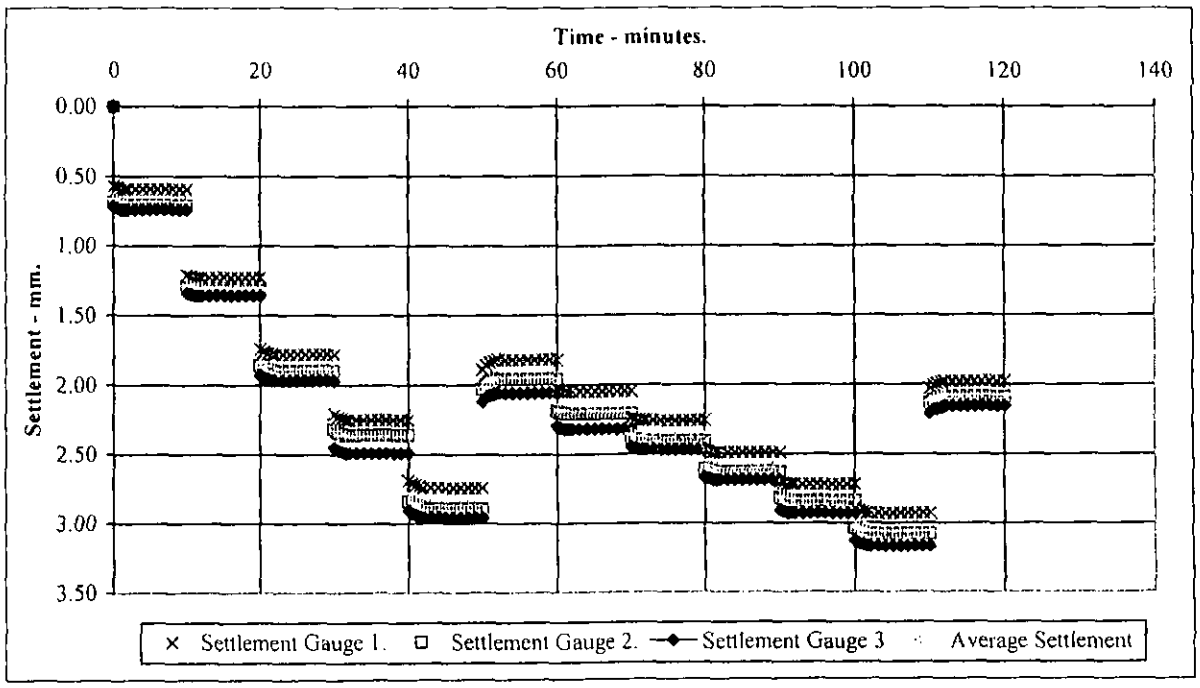
Date of Test: 06-Jan-06

Test Position: 14 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 3.06
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	10/1/06		10/1/06		10/1/06	PSL06/23
BURTON ROAD BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **06/01/2006** — Test Number: **14**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.86**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**65**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	52000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	41829	$kN/m^2/m$
Subgrade CBR:	**6**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

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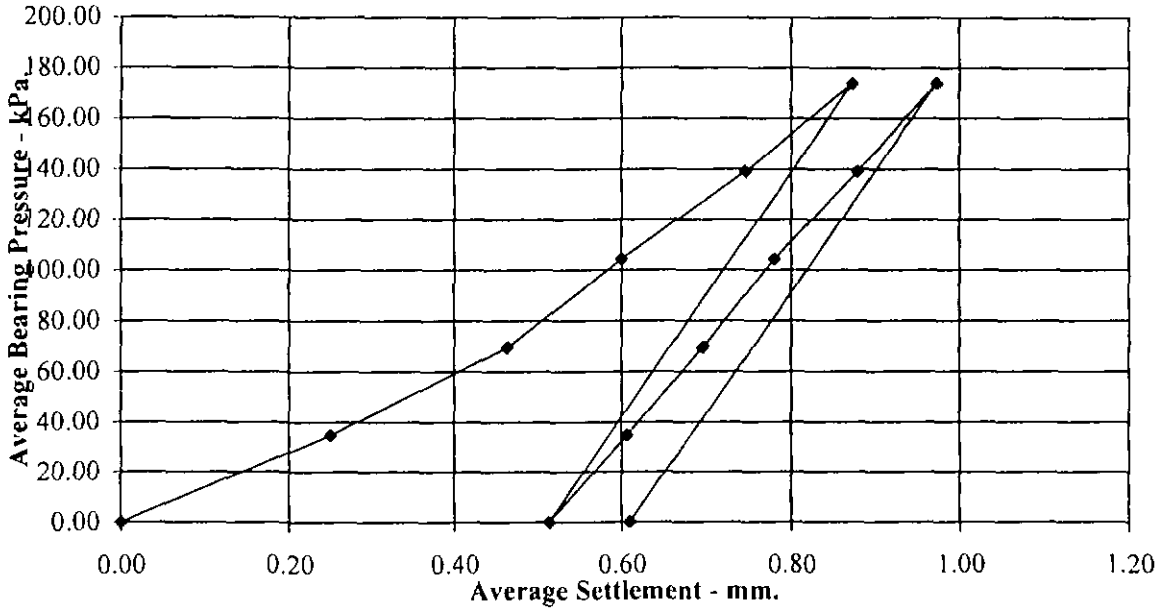
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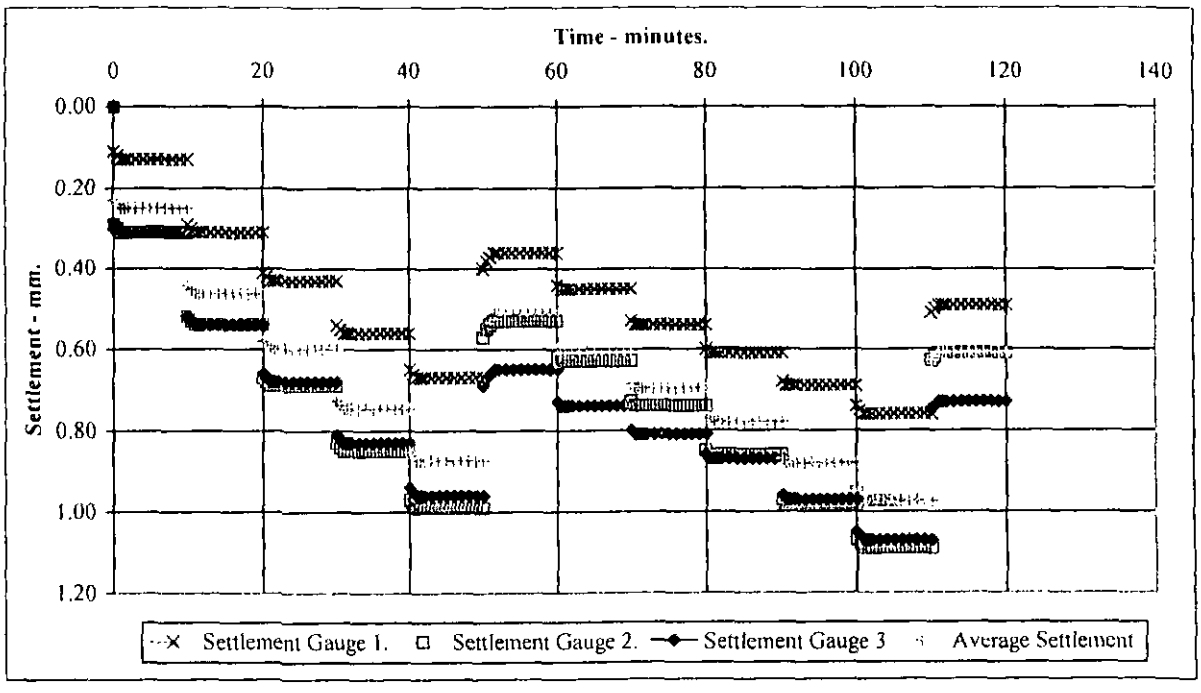
Date of Test: 10-Jan-06

Test Position: 15 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 0.97
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/1/6		11/1/06		11/1/06	PSL06/49
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **10/01/2006**

Test Number: **15**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.87**	*mm*
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

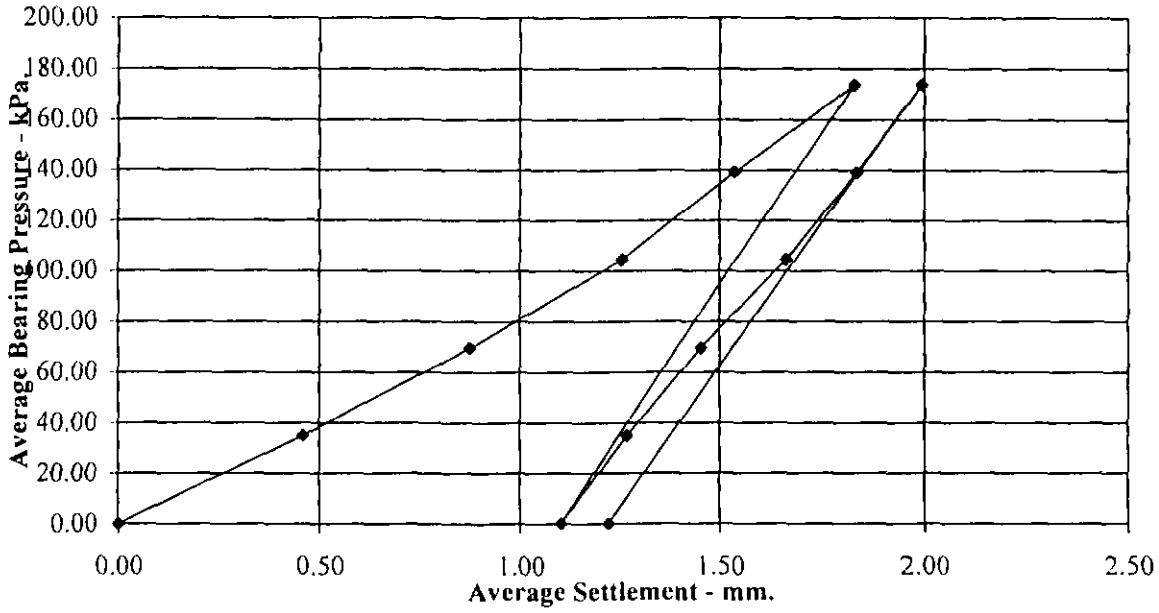
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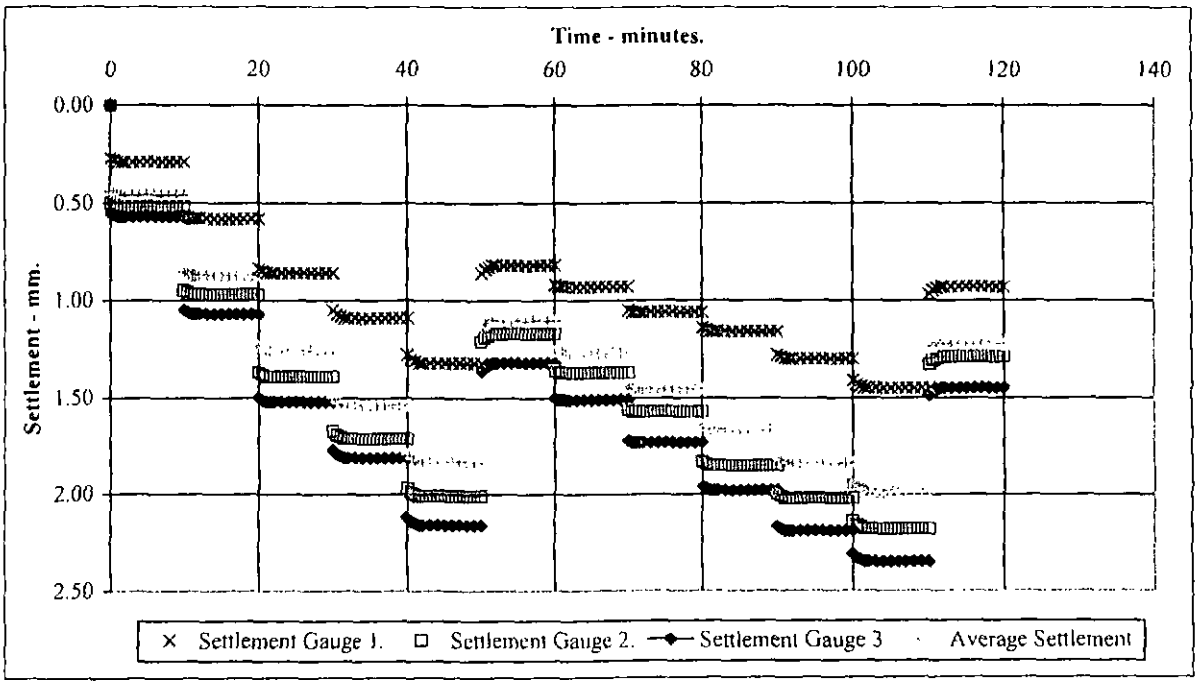
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email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**10-Jan-06**		
Test Position:	**16**	**Depth (m):**	
Plate Area (m2):	**0.2827**	**Type of Kentledge:**	**Wheeled**
***Maximum Applied Pressure* (kPa):**		**173.76**	
Maximum Deformation (mm):		**1.99**	
Description:		**6F2.**	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/1/06		11/1/06		11/1/06	PSL06/49
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **10/01/2006**

Test Number: **16**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**1.83**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**105**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	84000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	67570	$kN/m^2/m$
Subgrade CBR:	**14**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

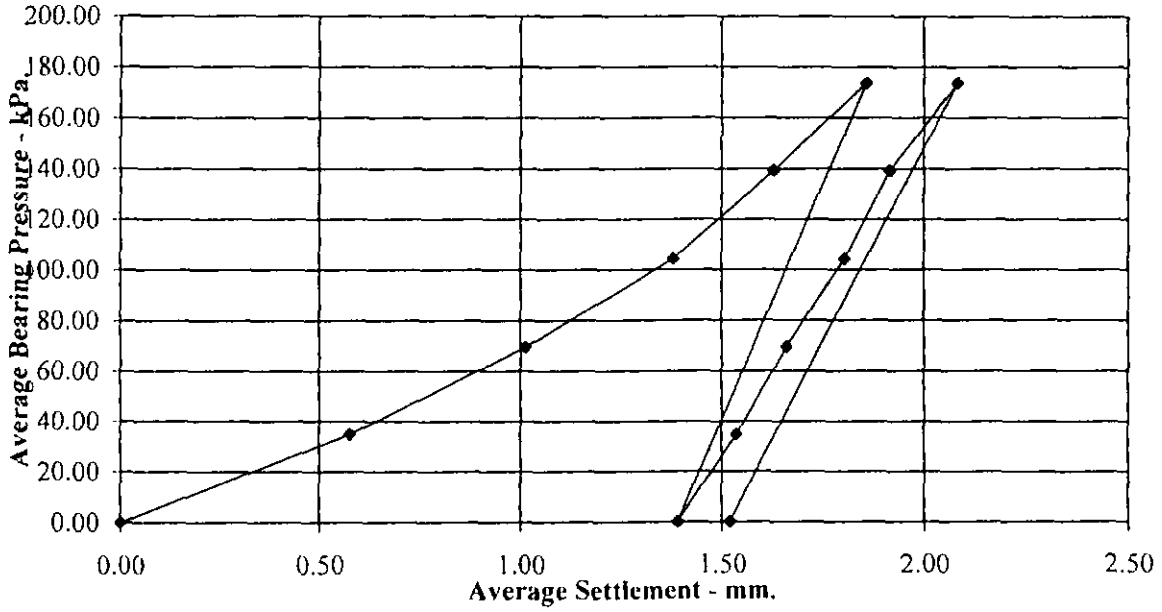
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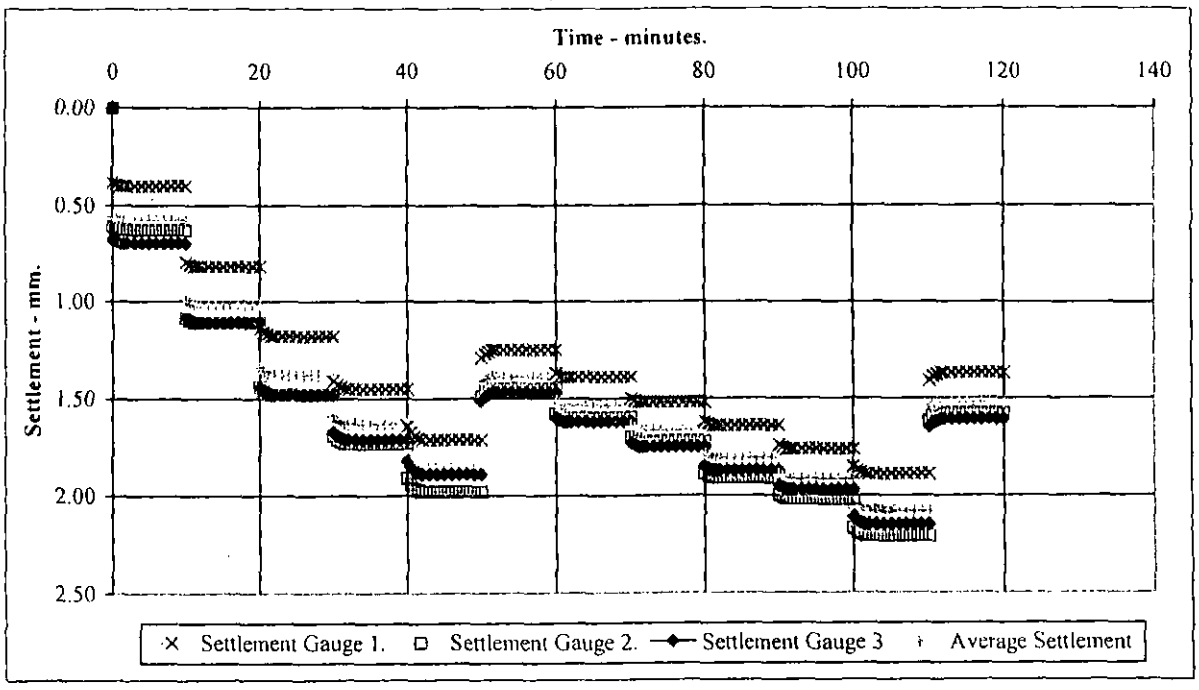
Date of Test: 10-Jan-06

Test Position: 17 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.08
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/1/06		11/1/06		11/1/06	PSL06/49
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **10/01/2006**

Test Number: **17**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**1.86**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**90**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	72000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	57917	$kN/m^2/m$
Subgrade CBR:	**11**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

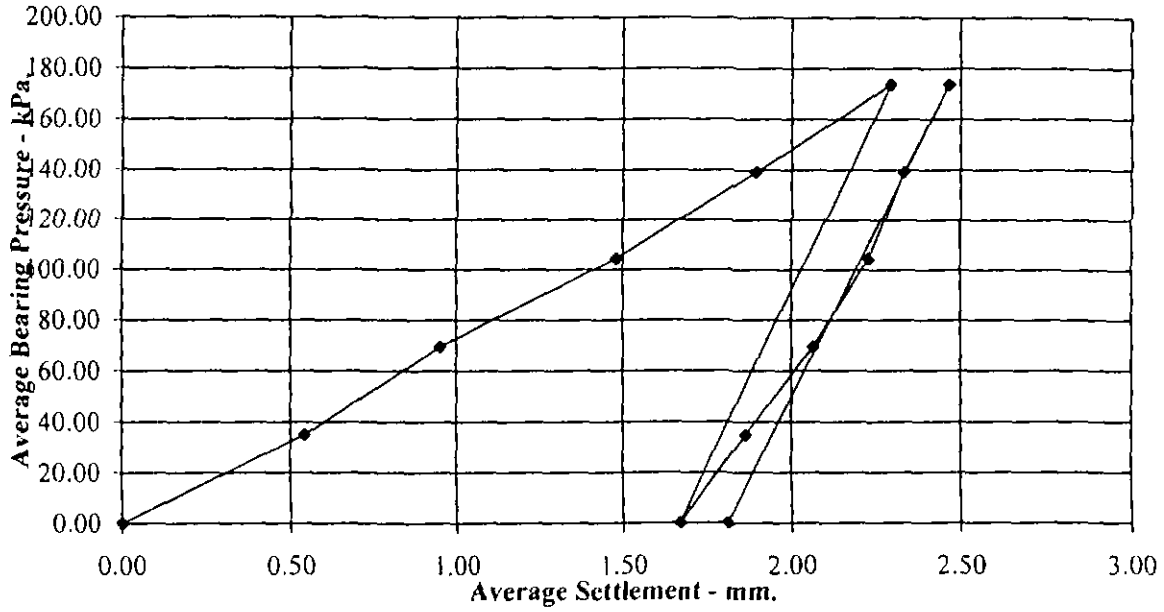
BS 1377 : Part 9 : 1990.

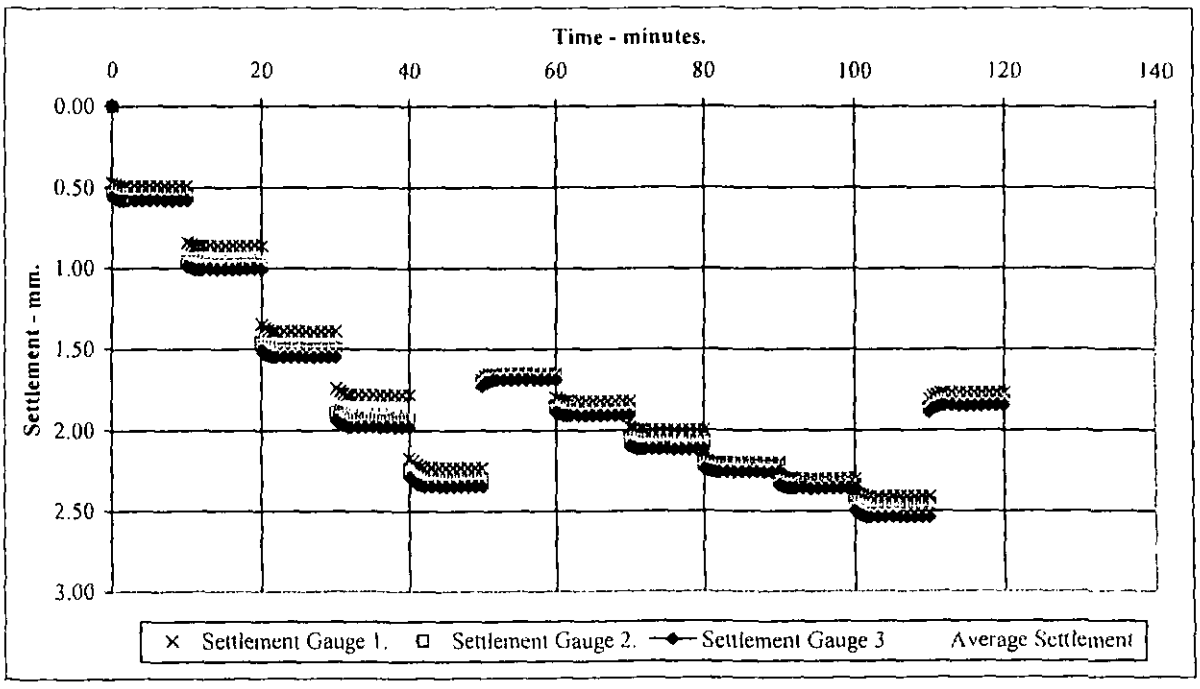
Date of Test: 10-Jan-06

Test Position: 18 **Depth (m):**

Plate Area (m2): 0.2827 **Type of Kentledge:** Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.47
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/1/06		11/1/06		11/1/06	PSL06/49
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** Project No: **5848**

Date: **10/01/2006** Test Number: **18**

Engineer: **SRJ** Test Position:

Fill Type: **6F2** Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.29**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**90**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	72000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	57917	$kN/m^2/m$
Subgrade CBR:	**11**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

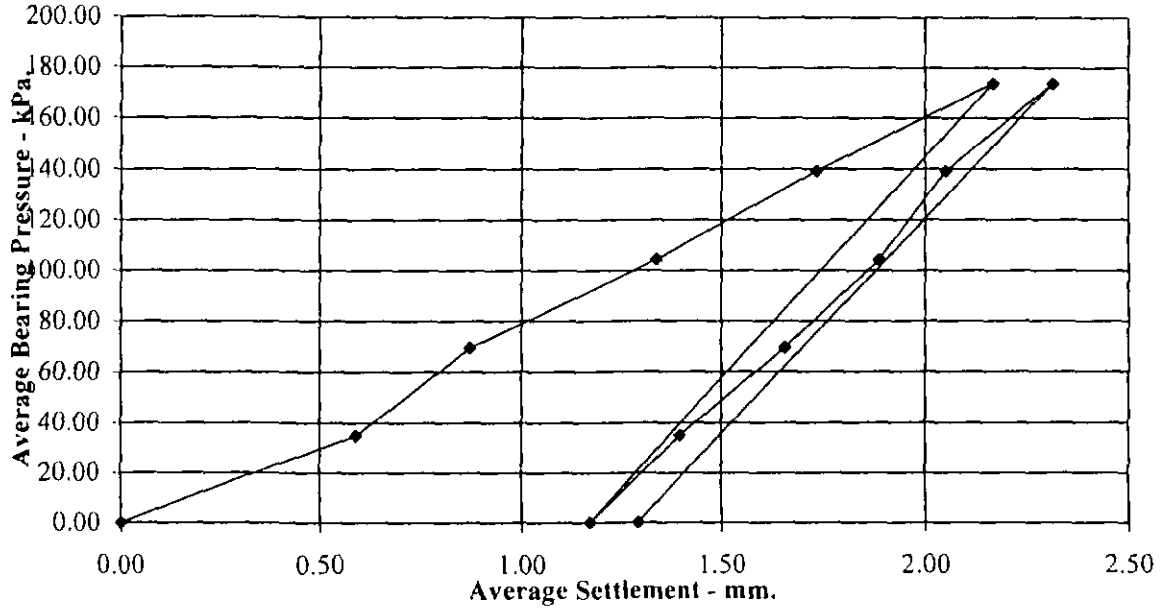
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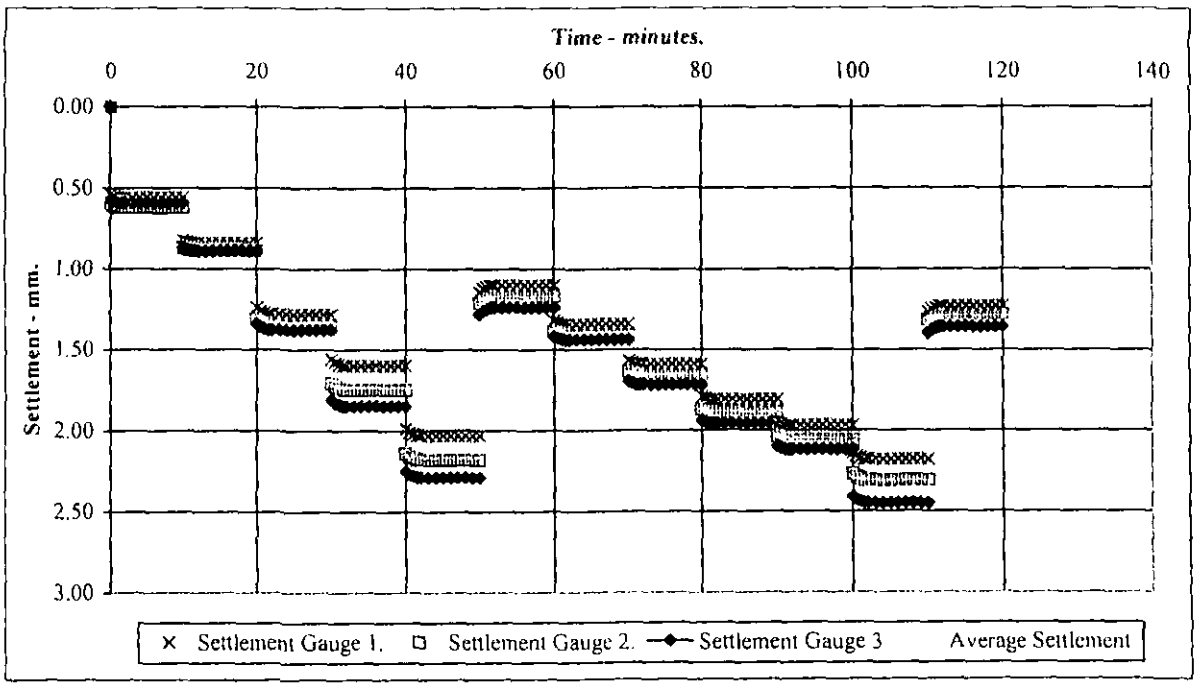
Professional Soils Laboratory
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email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**10-Jan-06**		
Test Position:	**19**	**Depth (m):**	
Plate Area (m2):	**0.2827**	**Type of Kentledge:**	**Wheeled**
Maximum Applied Pressure (kPa):		**173.76**	
Maximum Deformation (mm):		**2.31**	
Description:		**6F2.**	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/1/06		11/1/06		11/1/06	PSL06/49
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: ***Burton Road, Barnsley***

Project No: **5848**

Date: **10/01/2006**

Test Number: **19**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.17**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**100**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	80000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	64352	$kN/m^2/m$
Subgrade CBR:	**13**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

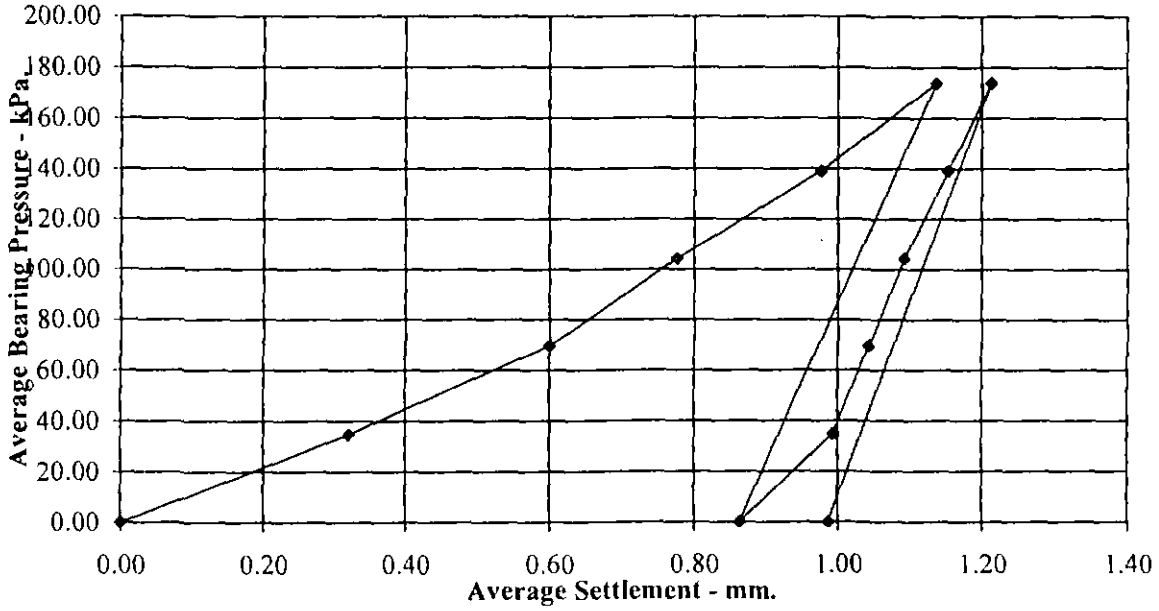
BS 1377 : Part 9 : 1990.

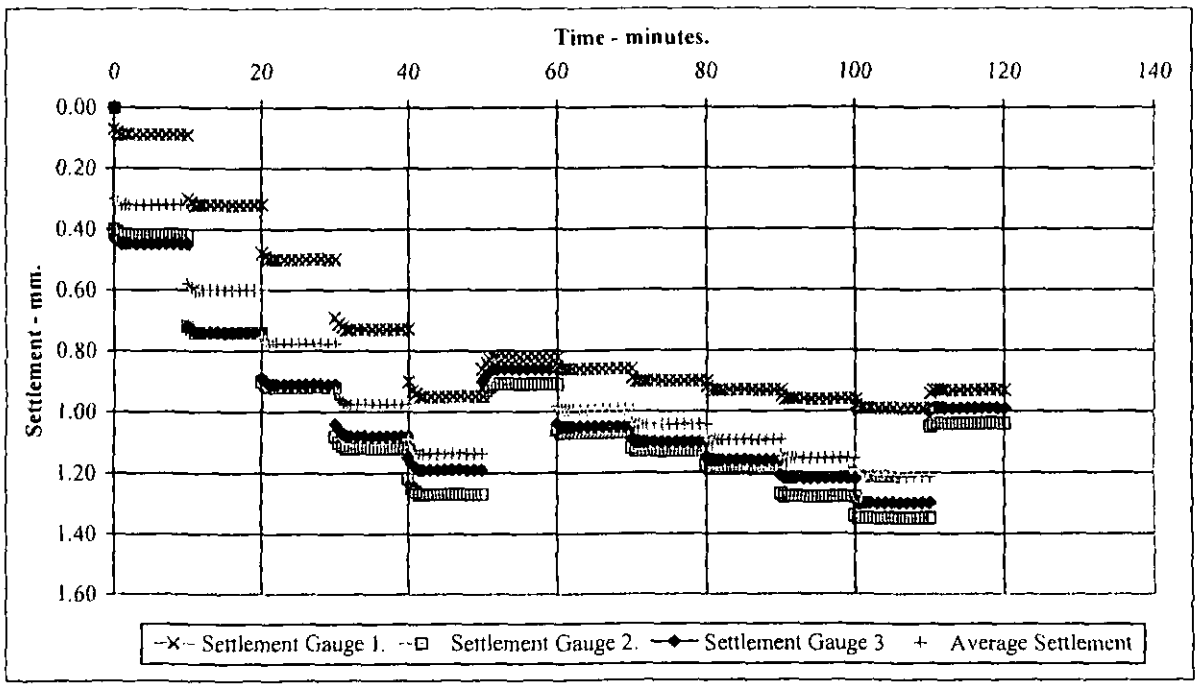
Date of Test: 18-Apr-06

Test Position: 20 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 1.21
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	19/4/06		19/4/06		19/4/06	PSL06/673
BURTON ROAD, BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **18/04/2006** — Test Number: **20**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**1.14**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

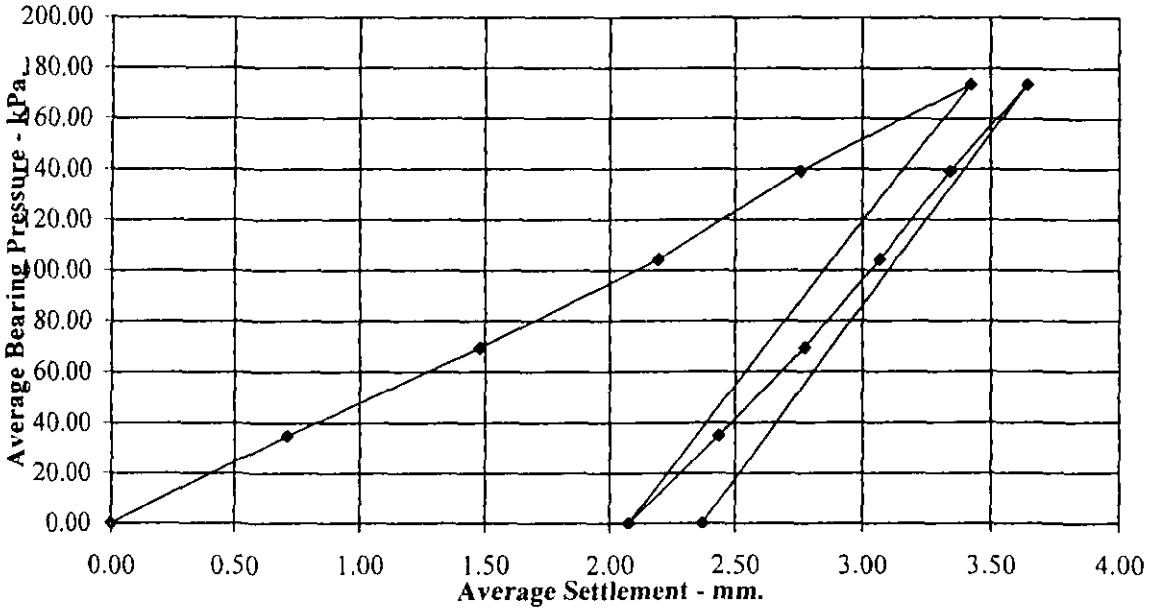
BS 1377 : Part 9 : 1990.

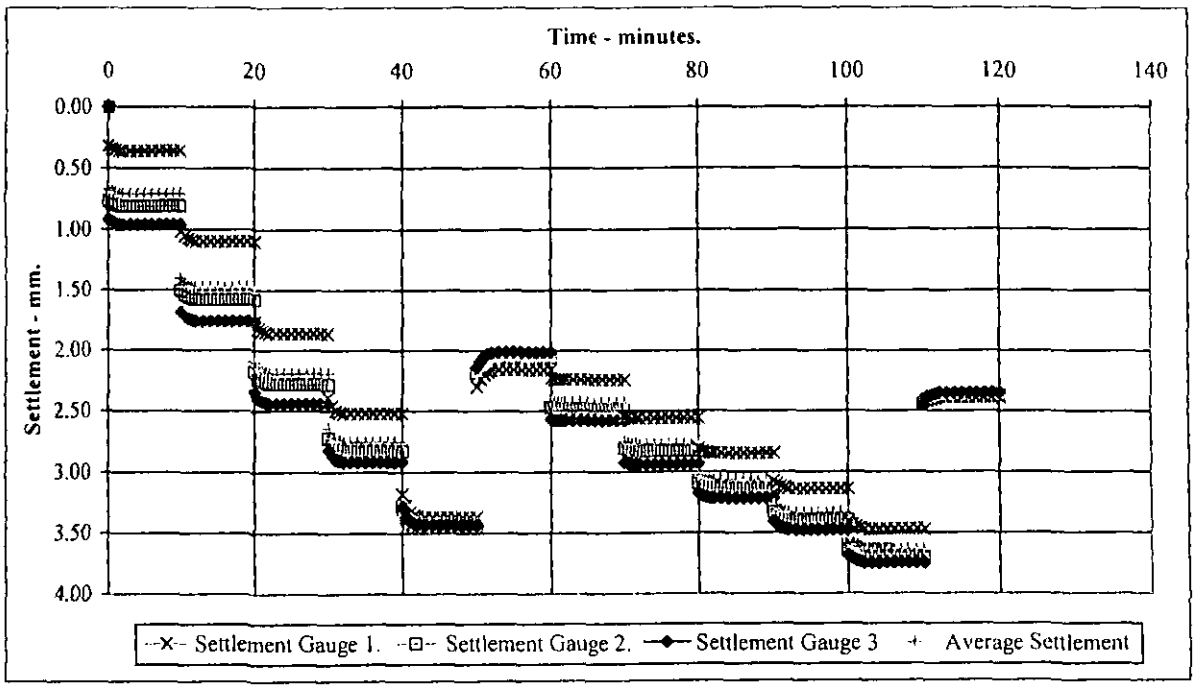
Date of Test: 18-Apr-06

Test Position: 21 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 3.64
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	19/4/06		19/4/06		19/4/06	PSL06/673
BURTON ROAD, BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

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Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **18/04/2006** — Test Number: **21**

Engineer: **SRJ** — *Test Position:*

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.42**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**60**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	48000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	38611	$kN/m^2/m$
Subgrade CBR:	**5**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

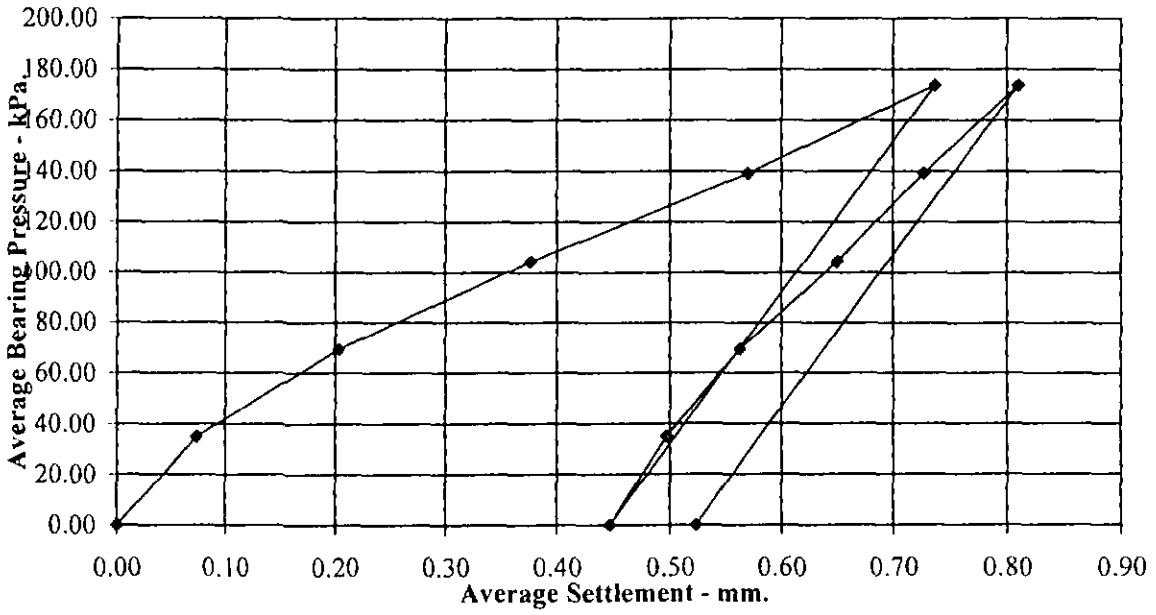
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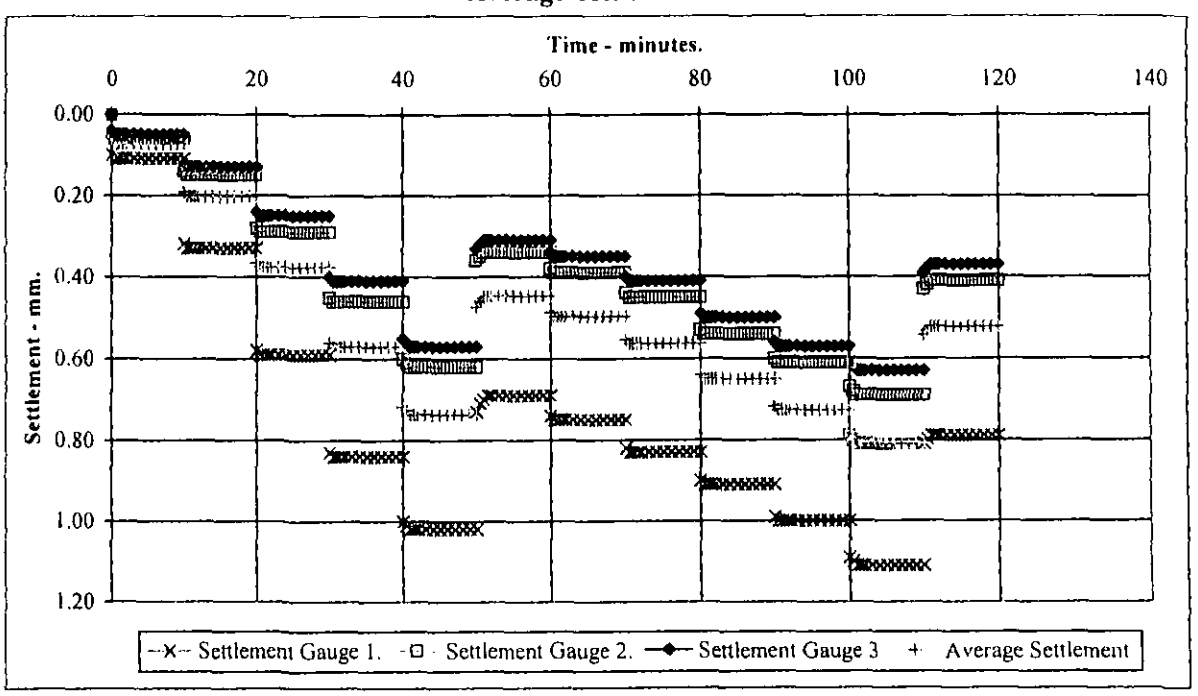
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tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	18-Apr-06		
Test Position:	22	**Depth (m):**	Finished Level
Plate Area (m2):	0.2827	**Type of Kentledge:**	Tracked
Maximum Applied Pressure (kPa):		173.76	
Maximum Deformation (mm):		0.81	
Description:		6F2	





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	19/4/06		5/4/06		5/4/06	PSL06/673
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Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **18/04/2006** — Test Number: **22**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.74**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

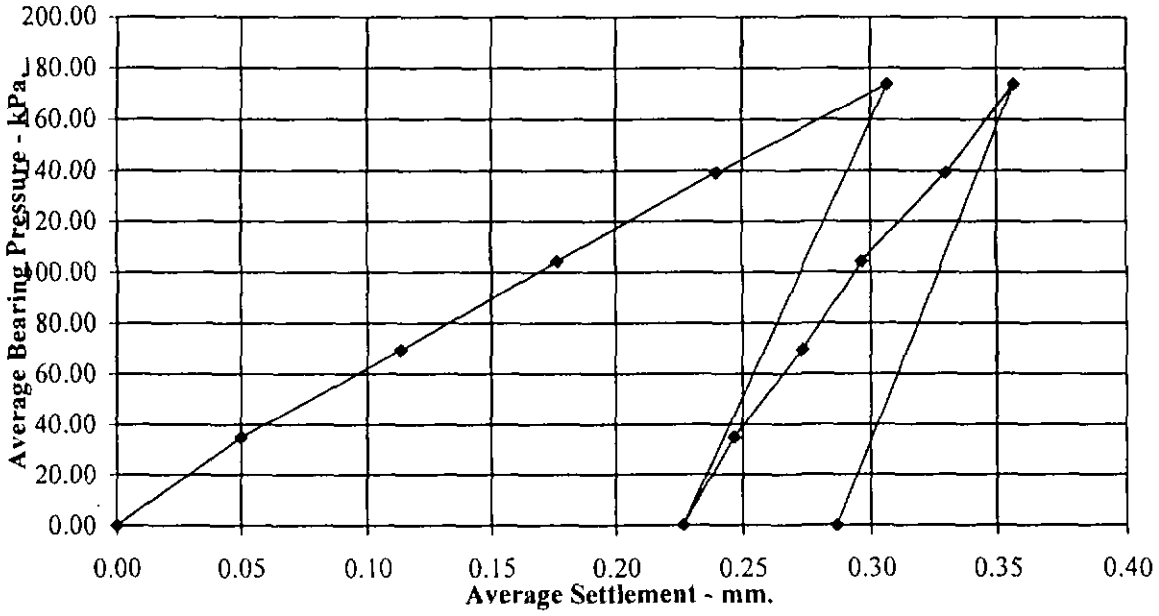
BS 1377 : Part 9 : 1990.

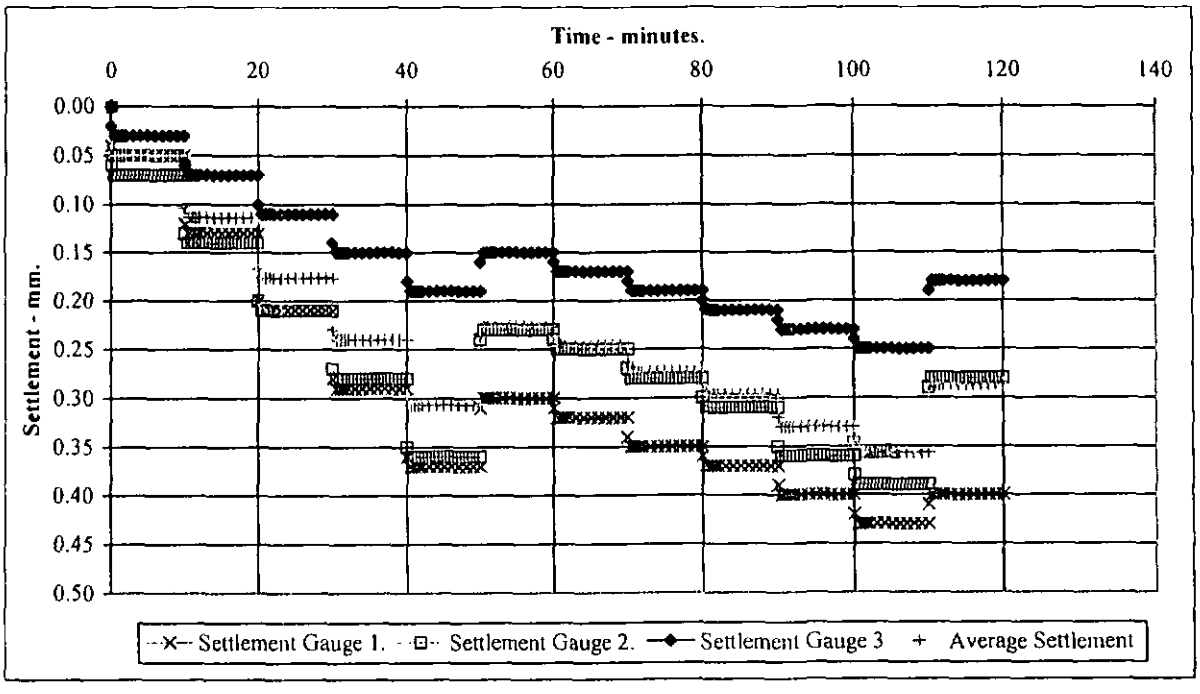
Date of Test: 18-Apr-06

Test Position: 23 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 0.36
Description: 6F2





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	19/4/06		19/4/06		19/4/06	PSL06/673
BURTON ROAD, BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **18/04/2006**

Test Number: **23**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.31**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

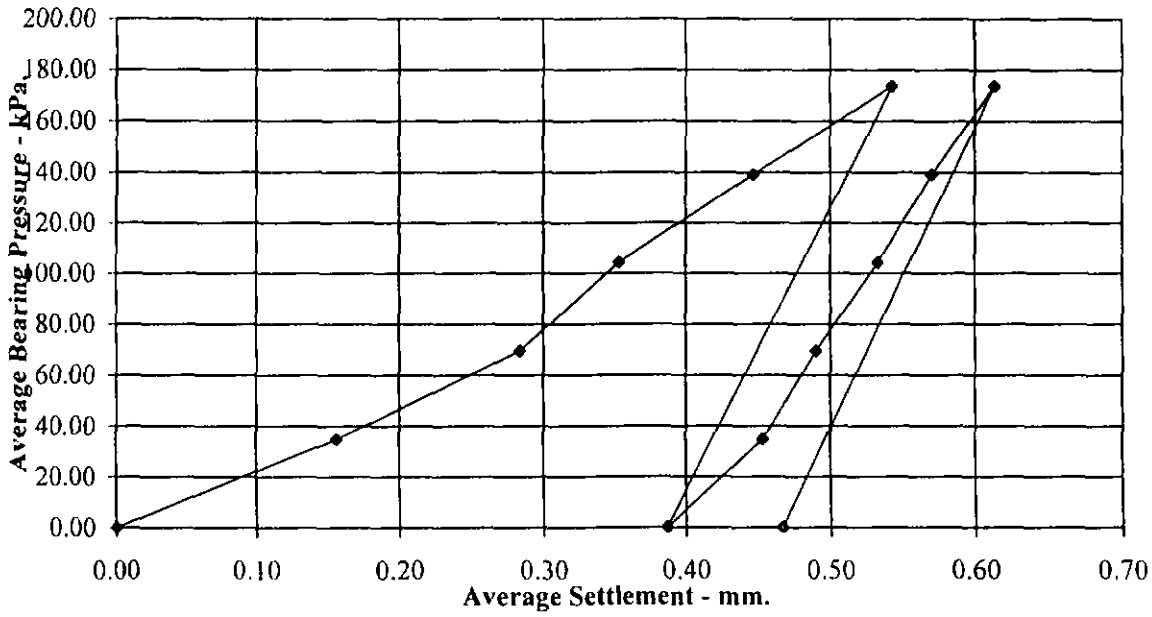
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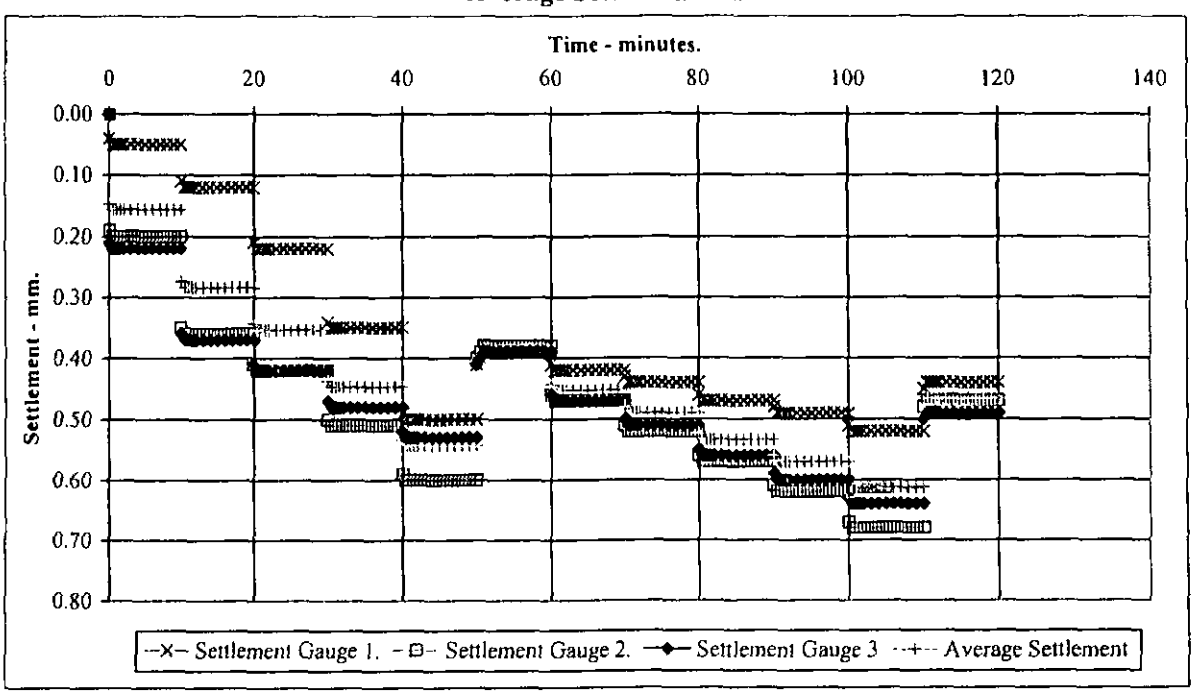
Professional Soils Laboratory
5/7 Hexthorpe Road
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Doncaster, DN4 0AG
tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	18-Apr-06		
Test Position:	24	*Depth (m):*	*Finished Level*
Plate Area (m2):	0.2827	*Type of Kentledge:*	*Tracked*
Maximum Applied Pressure (kPa):	173.76		
Maximum Deformation (mm):	0.61		
Description:	6F2		





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	19/4/06		19/4/06		19/4/06	PSL06/673
BURTON ROAD, BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

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Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: ***18/04/2006***

Test Number: **24**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.54**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

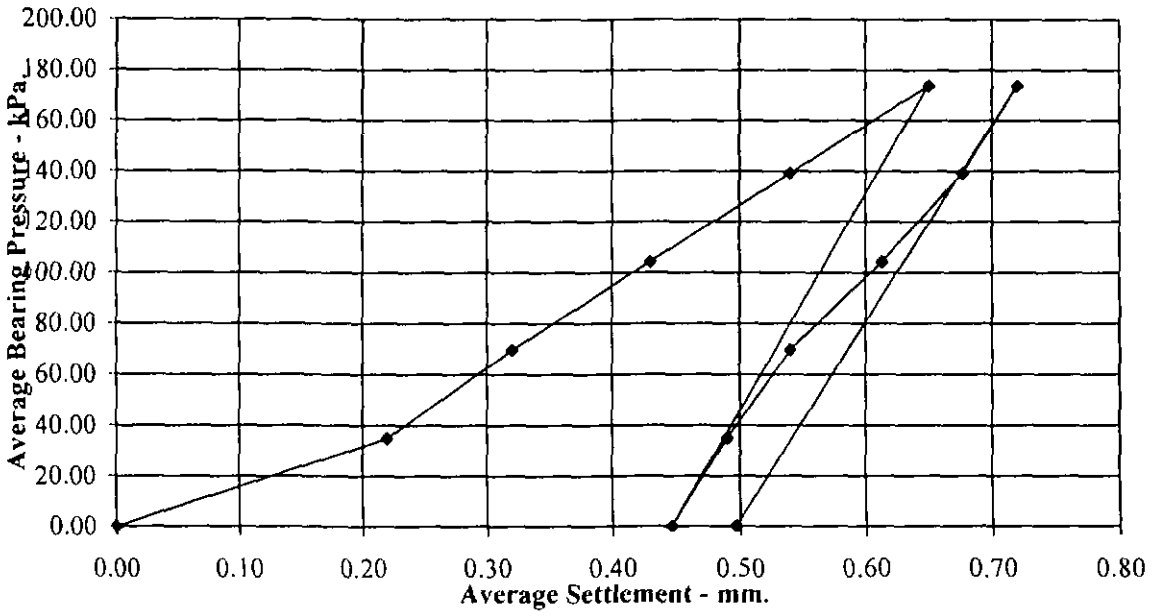
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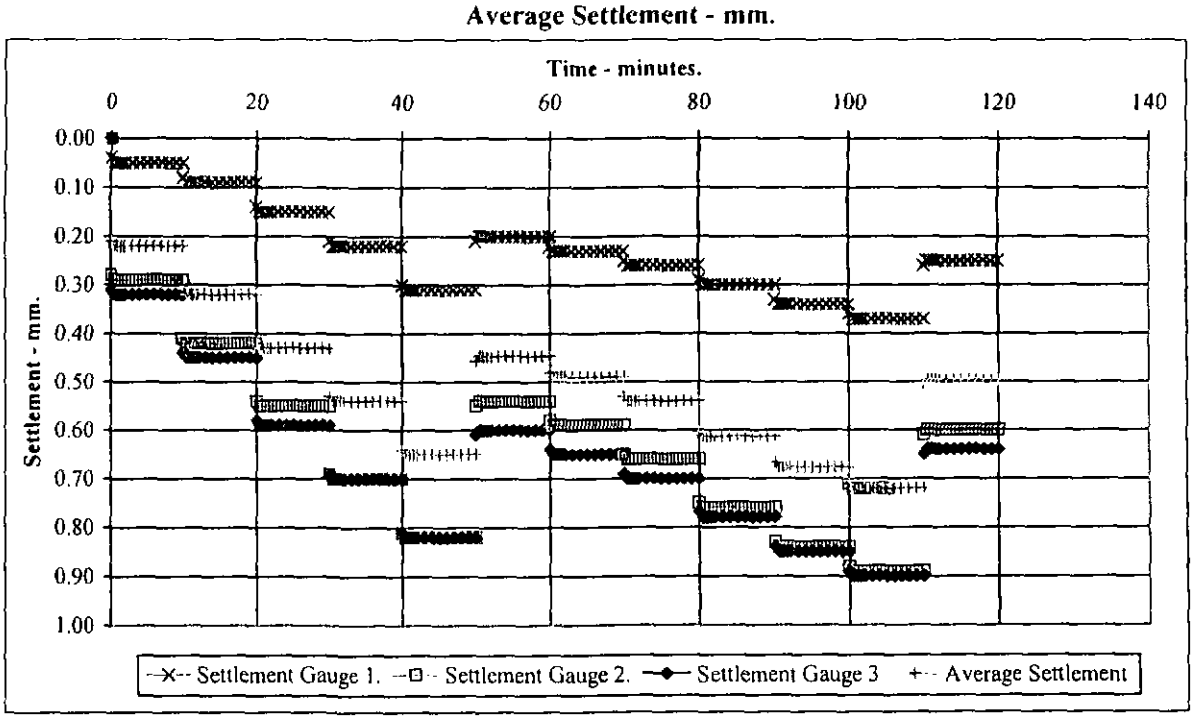
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VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	*18-Apr-06*		
Test Position:	**25**	**Depth (m):**	**Finished Level**
Plate Area (m2):	**0.2827**	**Type of Kentledge:**	**Tracked**
Maximum Applied Pressure (kPa):		**173.76**	
Maximum Deformation (mm):		**0.72**	
Description:		**6F2**	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	19/4/06		19/4/06		19/4/06	PSL06/673
BURTON ROAD, BARNSLEY						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **18/04/2006** — Test Number: **25**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.65**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

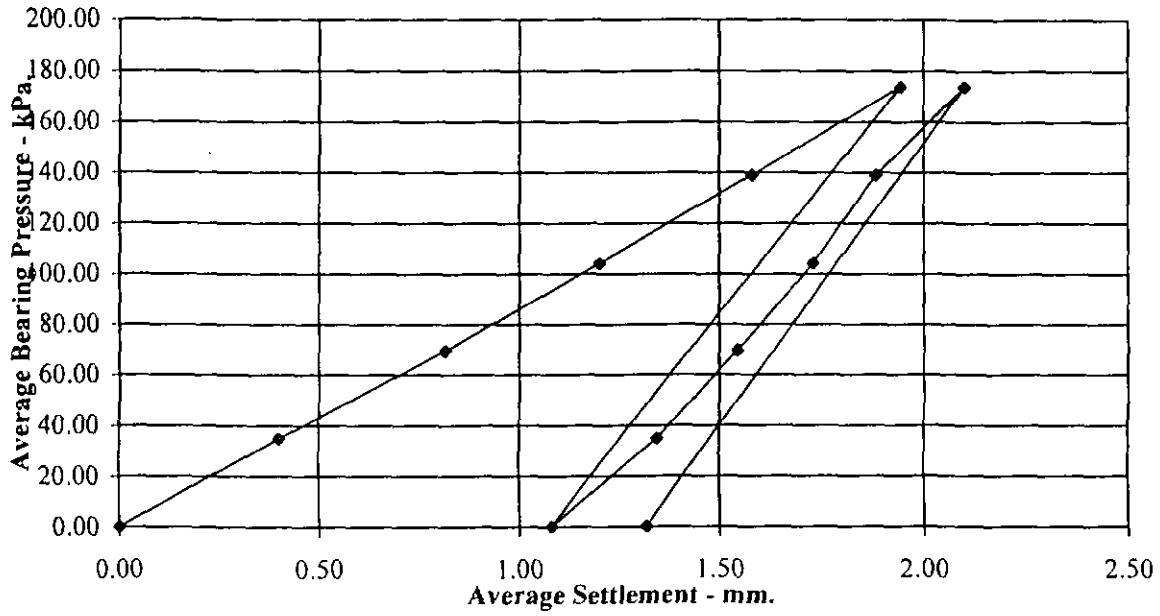
BS 1377 : Part 9 : 1990.

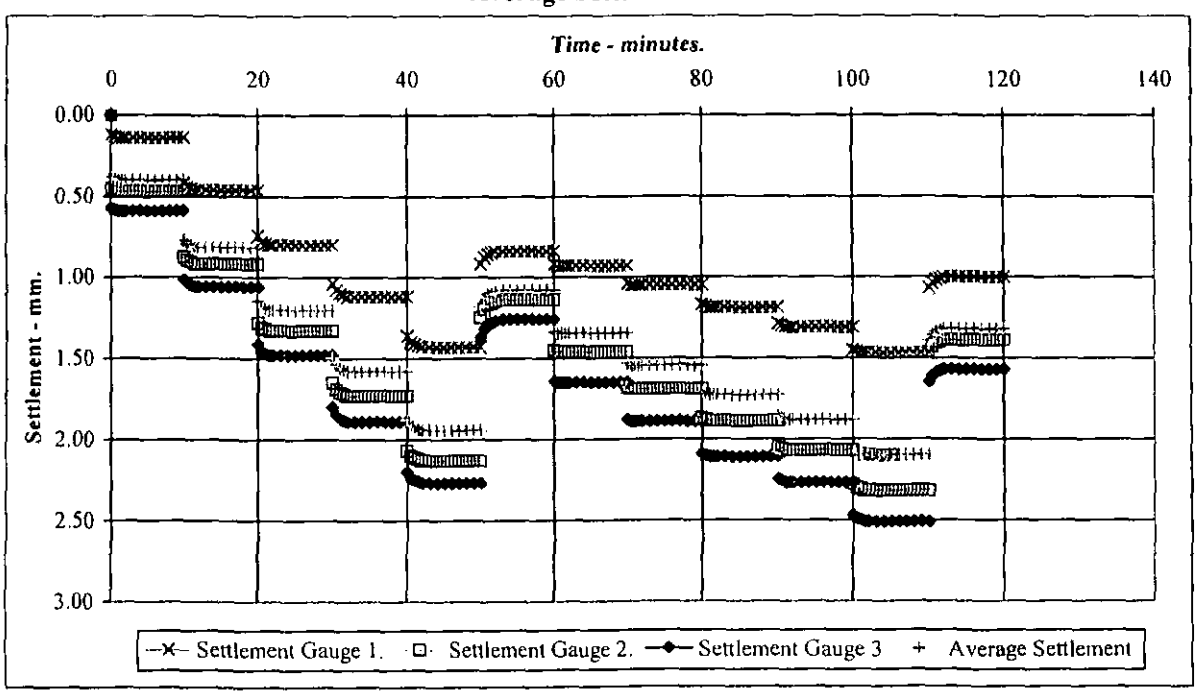
Date of Test: 02-May-06

Test Position: 26 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.10
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	3/5/06		3/5/06		3/5/06	PSL06/755
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** Project No: **5848**

Date: **02/05/2006** Test Number: **26**

Engineer: **SRJ** Test Position:

Fill Type: **6F2** Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**1.94**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**110**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	88000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	70787	$kN/m^2/m$
Subgrade CBR:	**15**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

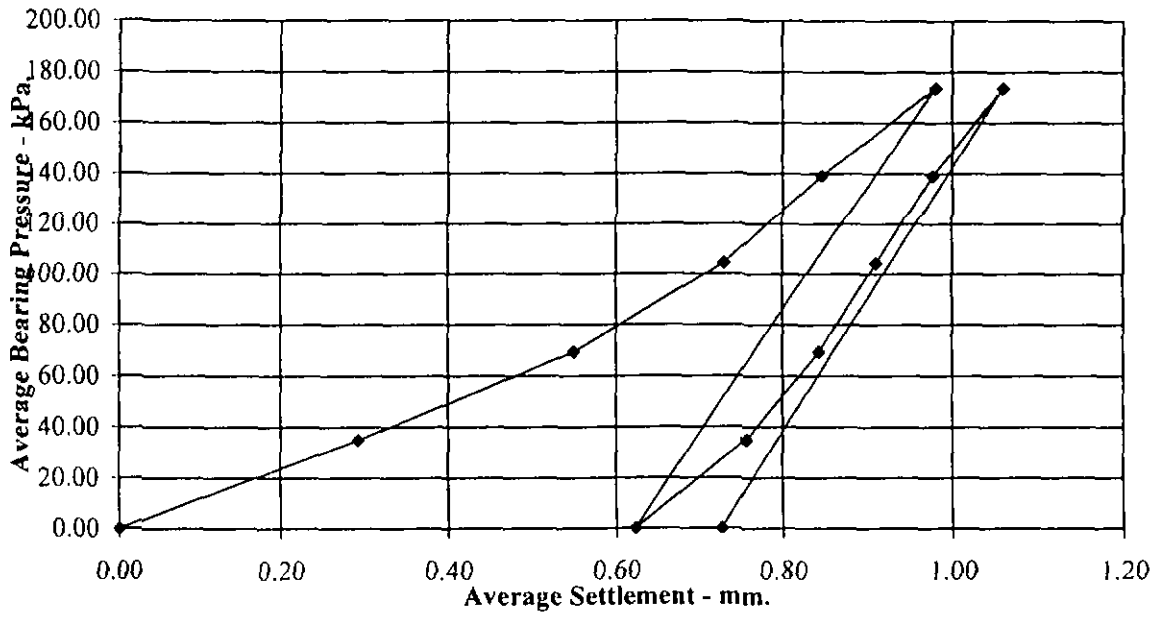
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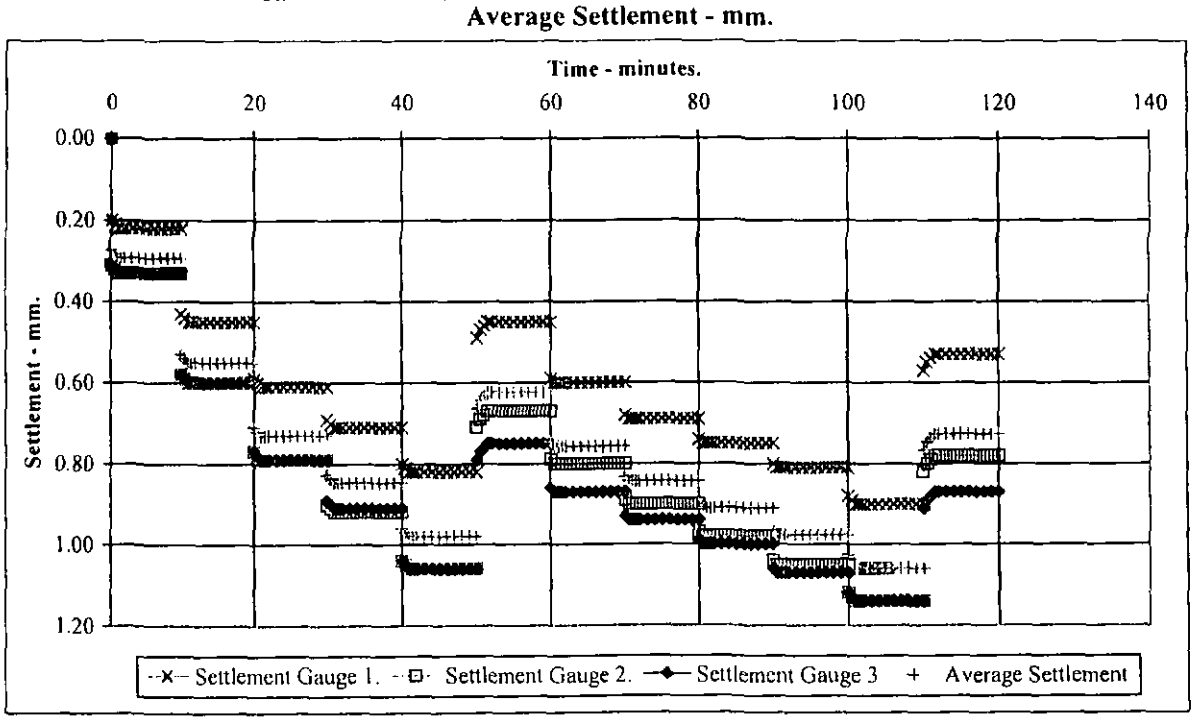
Date of Test: 02-May-06

Test Position: 27 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 1.06
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
[illegible]	3/5/06	[illegible]	3/5/06	[illegible]	3/5/06	PSL06/755
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

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Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **02/05/2006**

Test Number: **27**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.98**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

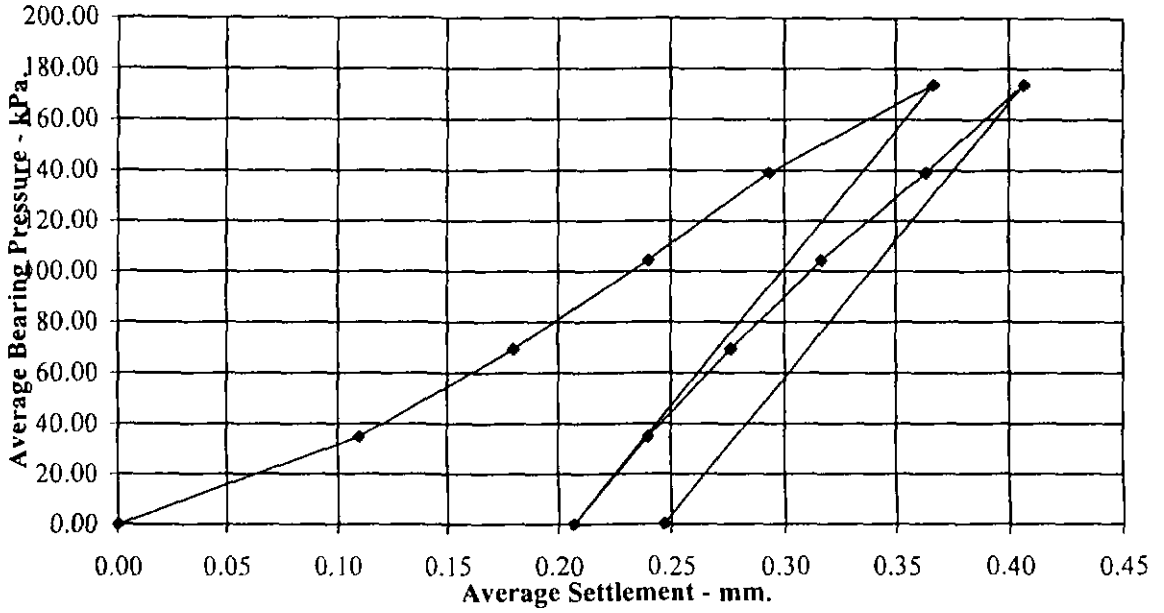
BS 1377 : Part 9 : 1990.

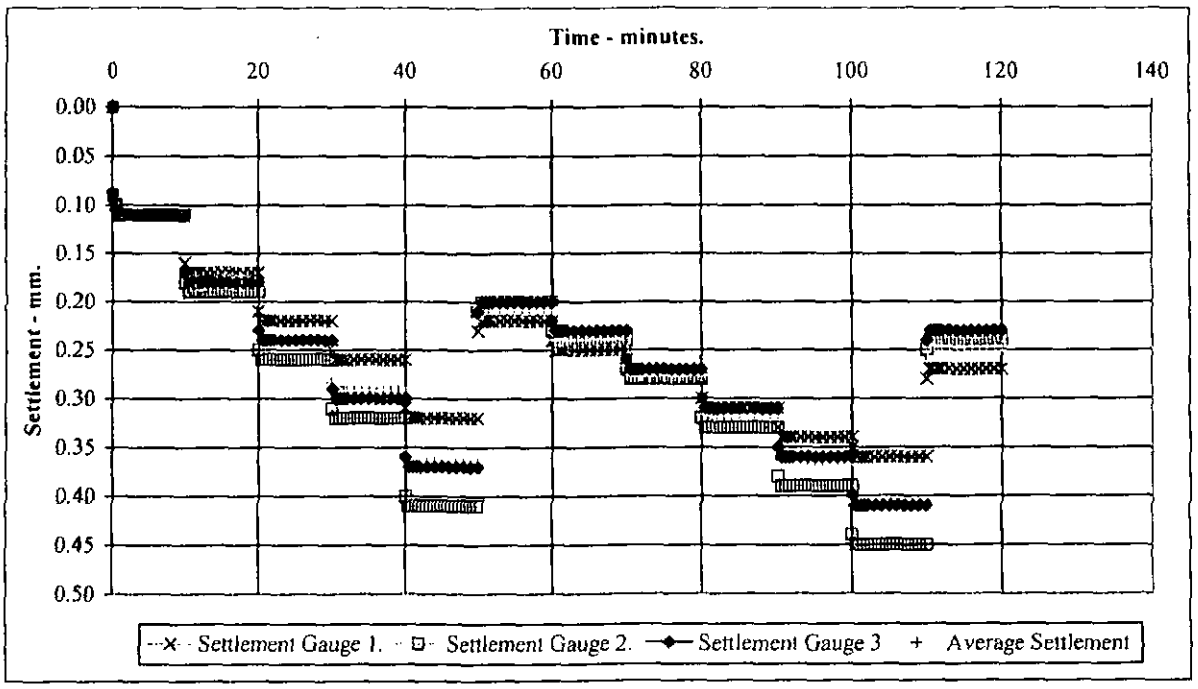
Date of Test: 02-May-06

Test Position: 28 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 0.41
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
DOOG	3/5/06		3/5/06		3/5/06	PSL06/755
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **02/05/2006**

Test Number: **28**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.37**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

PSL
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email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

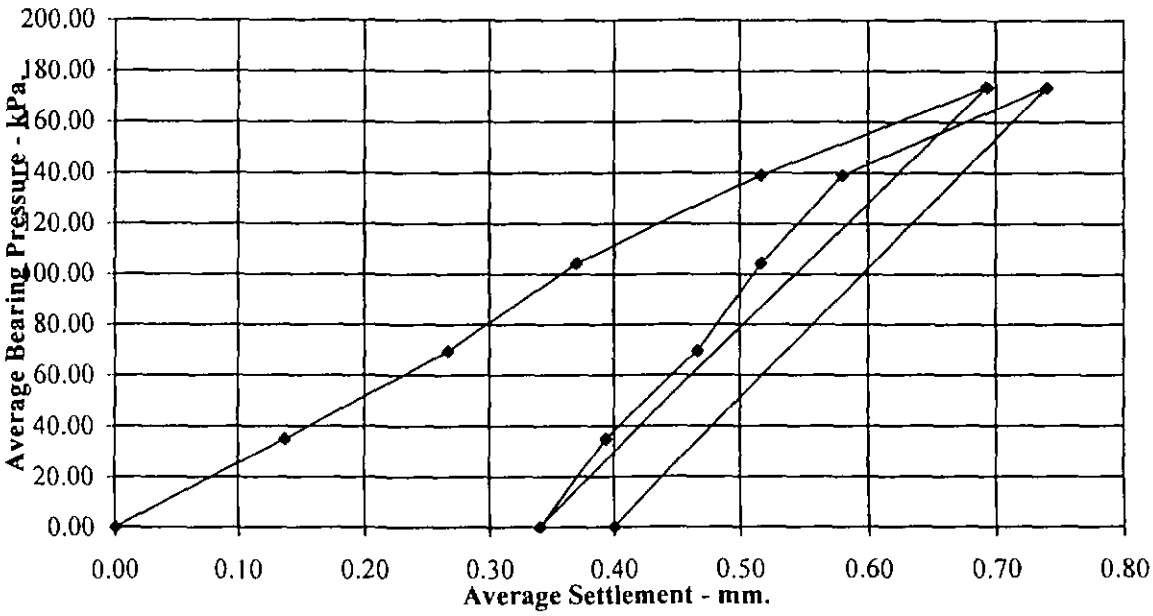
BS 1377 : Part 9 : 1990.

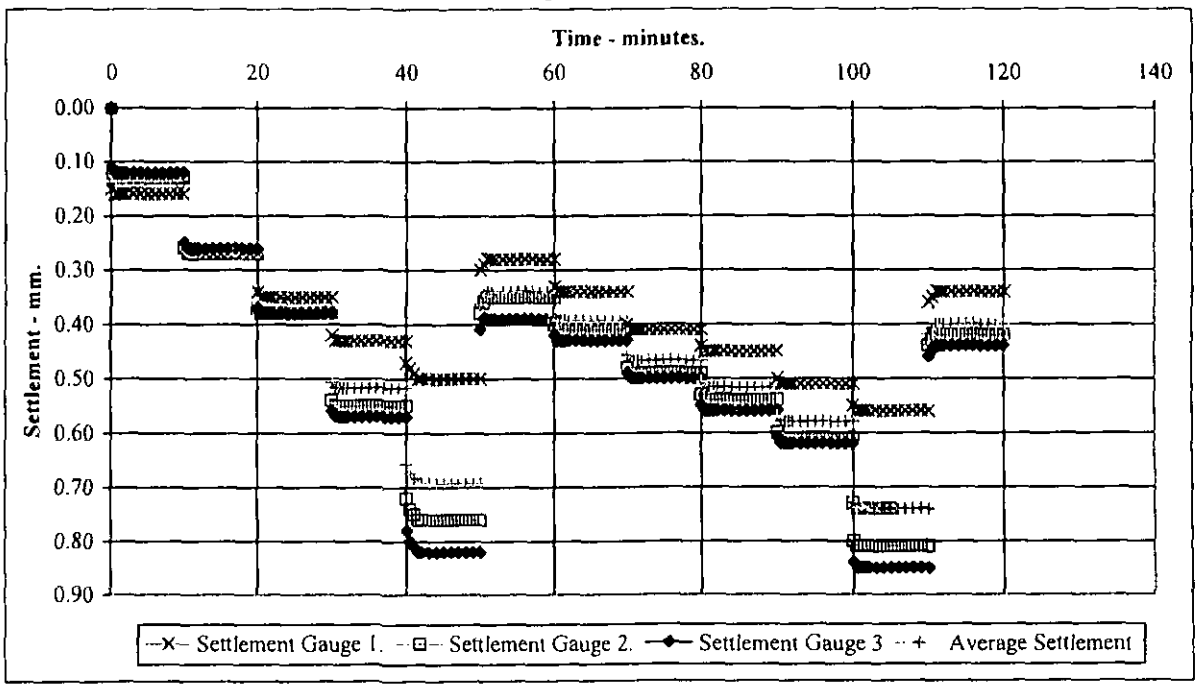
Date of Test: 02-May-06

Test Position: 29 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 0.74
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	3/5/06		3/5/06		3/5/06	PSL06/755
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** Project No: **5848**

Date: **02/05/2006** Test Number: **29**

Engineer: **SRJ** Test Position:

Fill Type: **6F2** Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.69**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	*139004*	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

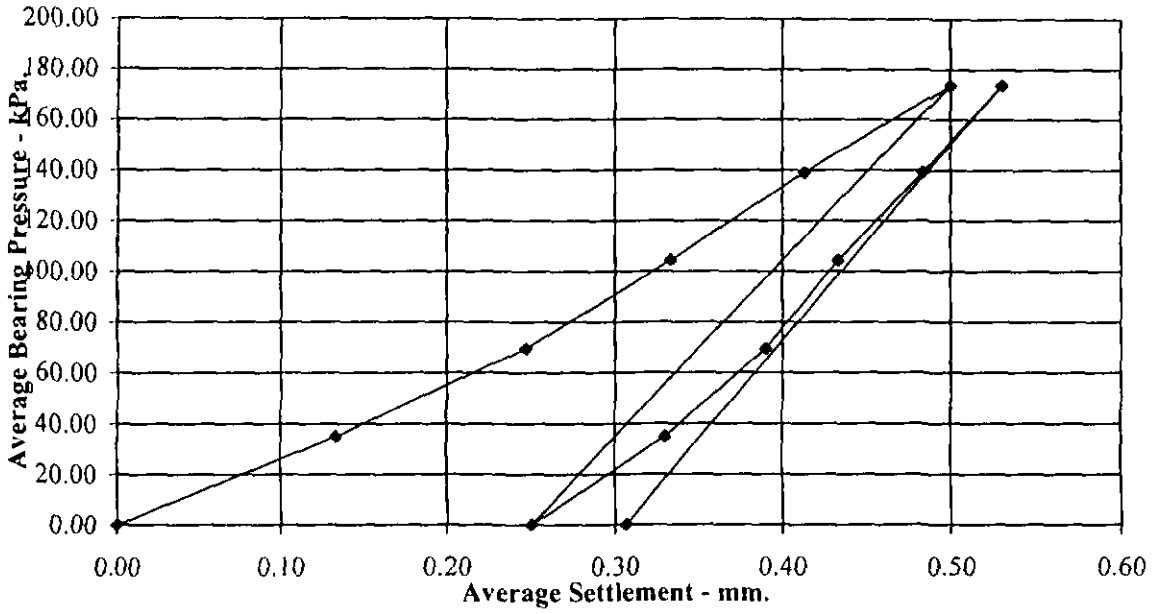
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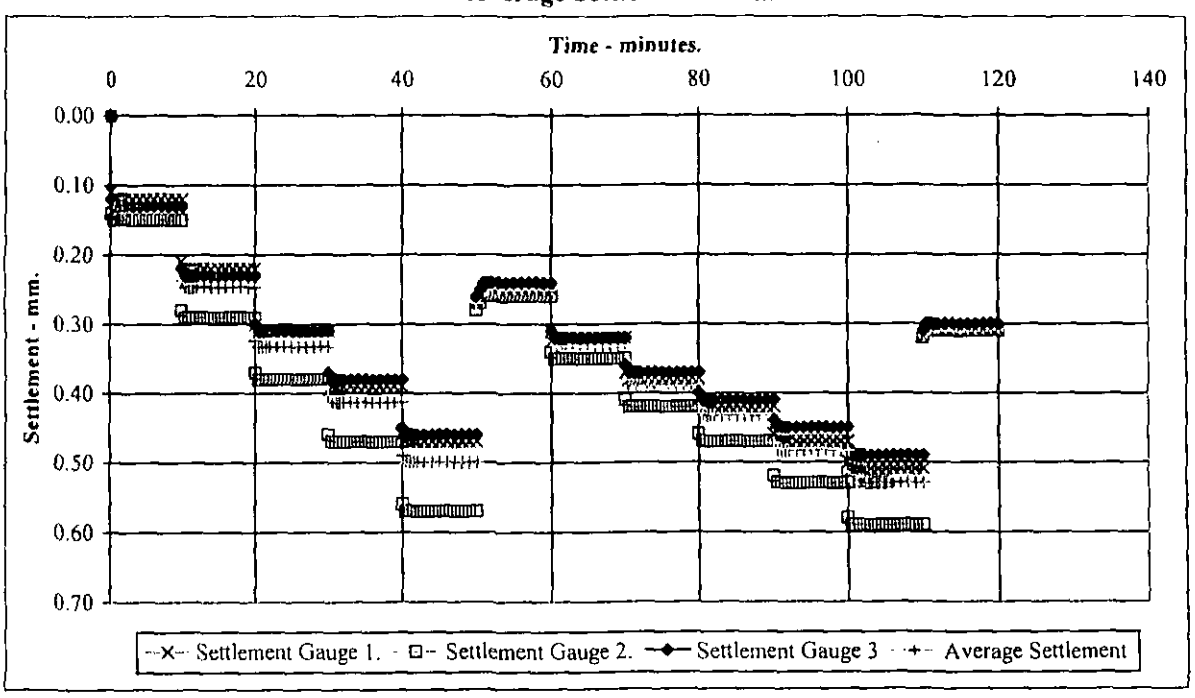
Date of Test: 02-May-06

Test Position: *30* **Depth (m):** ***Finished Level***

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 0.53
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
DDDD	3/5/06	[illegible]	3/5/06	[illegible]	3/5/06	PSL06/755
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **02/05/2006** — Test Number: **30**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**0.50**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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VERTICAL DEFORMATION TESTS.

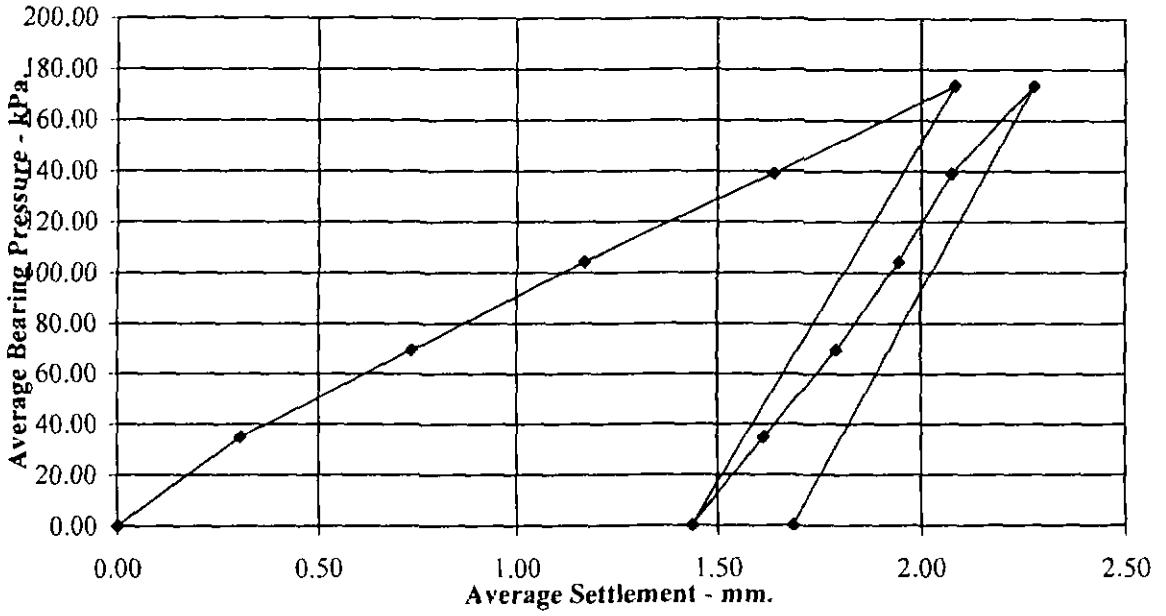
BS 1377 : Part 9 : 1990.

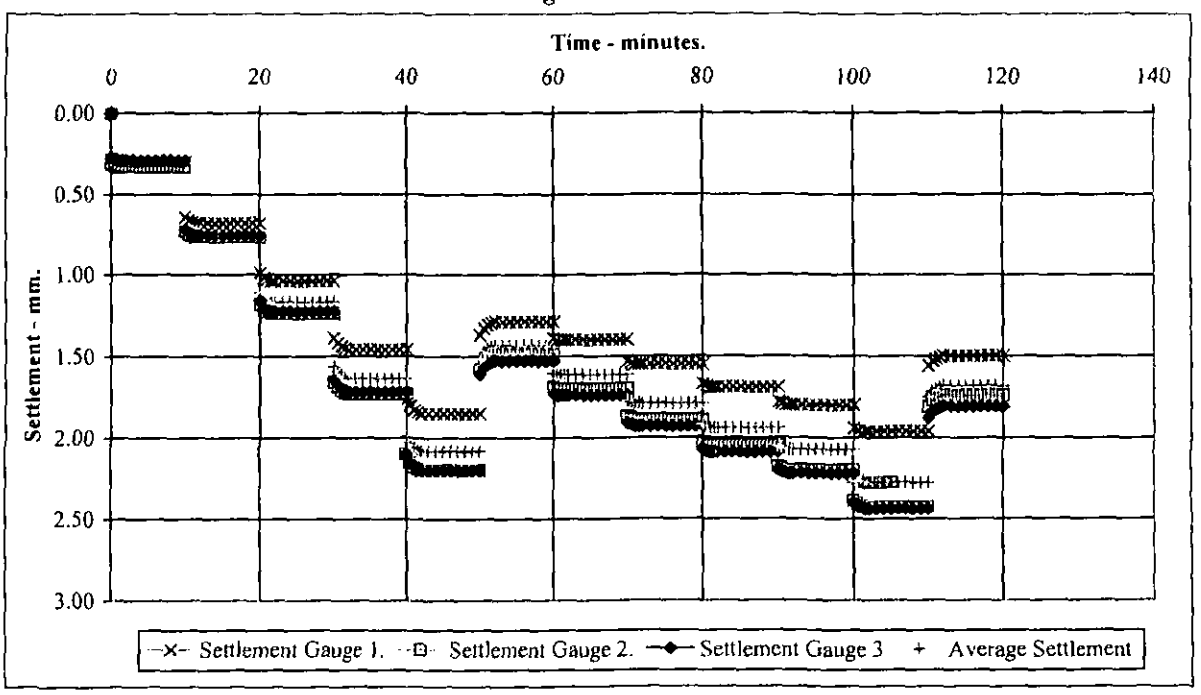
Date of Test: 02-May-06

Test Position: 31 **Depth (m):** Finished Level

Plate Area (m2): 0.2827 **Type of Kentledge:** Tracked

Maximum Applied Pressure (kPa): *173.76*
Maximum Deformation (mm): 2.28
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	3/5/06		30/5/06		30/5/06	PSL06/755
BURTON ROAD, BARNSLEY.						*Client Ref.*

Calculation of CBR value from Plate Bearing Test results

ENCIA

Project Data

Site: **Burton Road, Barnsley** Project No: **5848**

Date: **02/05/2006** Test Number: **31**

Engineer: **SRJ** Test Position:

Fill Type: **6F2** Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.08**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**110**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	88000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	70787	$kN/m^2/m$
Subgrade CBR:	**15**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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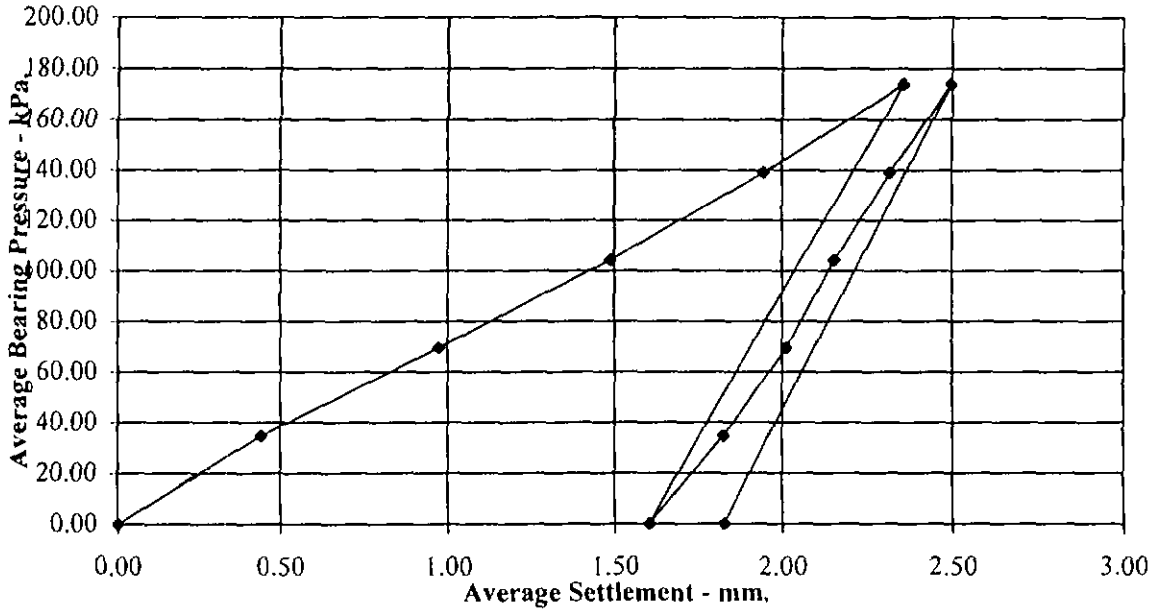
Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster, DN4 0AG
tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

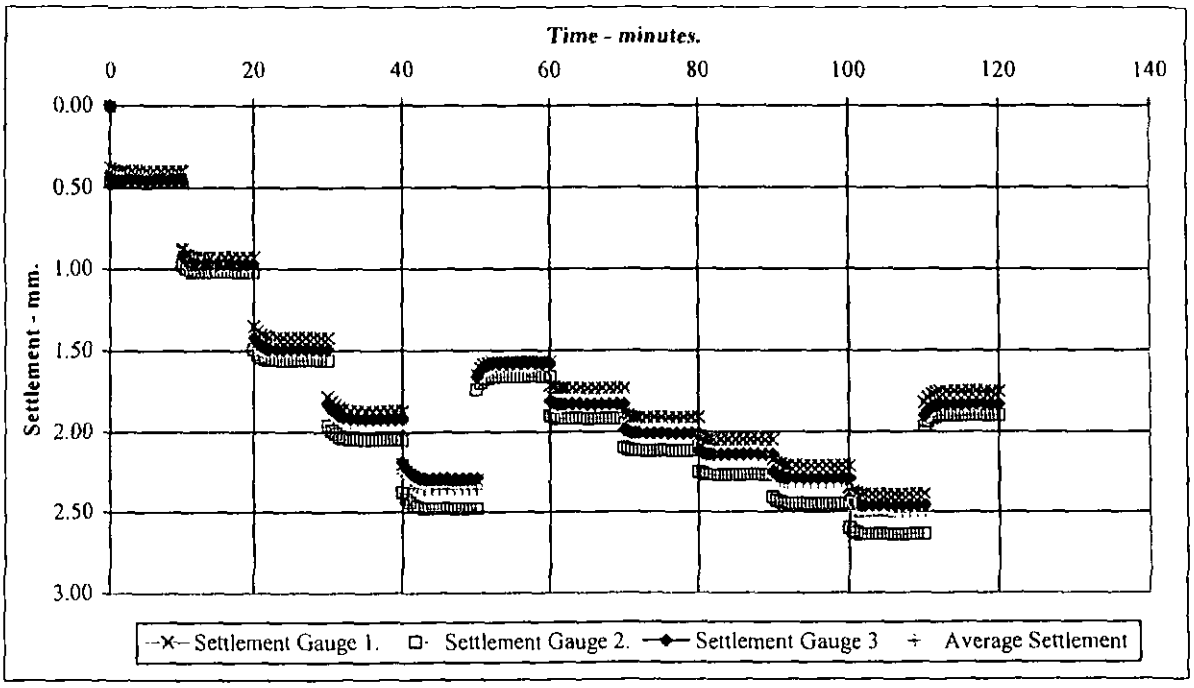
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	10-May-06		
Test Position:	32	**Depth (m):**	Finished Level
Plate Area (m2):	0.2827	**Type of Kentledge:**	Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.50
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/5/06		11/5/06		11/5/06	PSL06/820
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **10/05/2006**

Test Number: **32**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.36**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**90**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	72000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	57917	$kN/m^2/m$
Subgrade CBR:	11	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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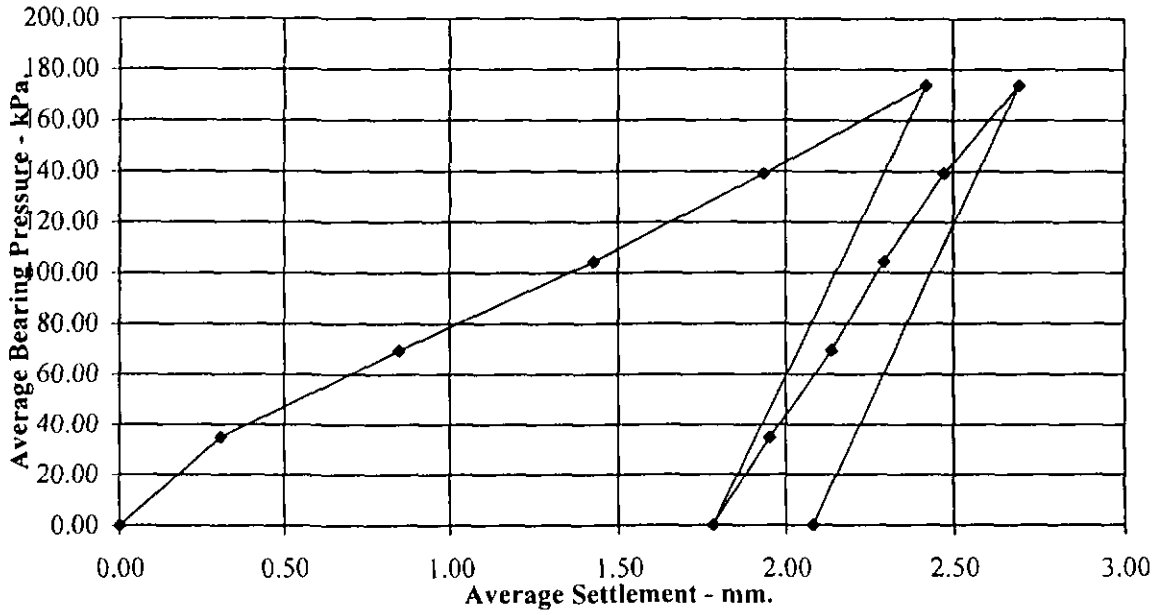
Professional Soils Laboratory
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Doncaster, DN4 0AG
tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

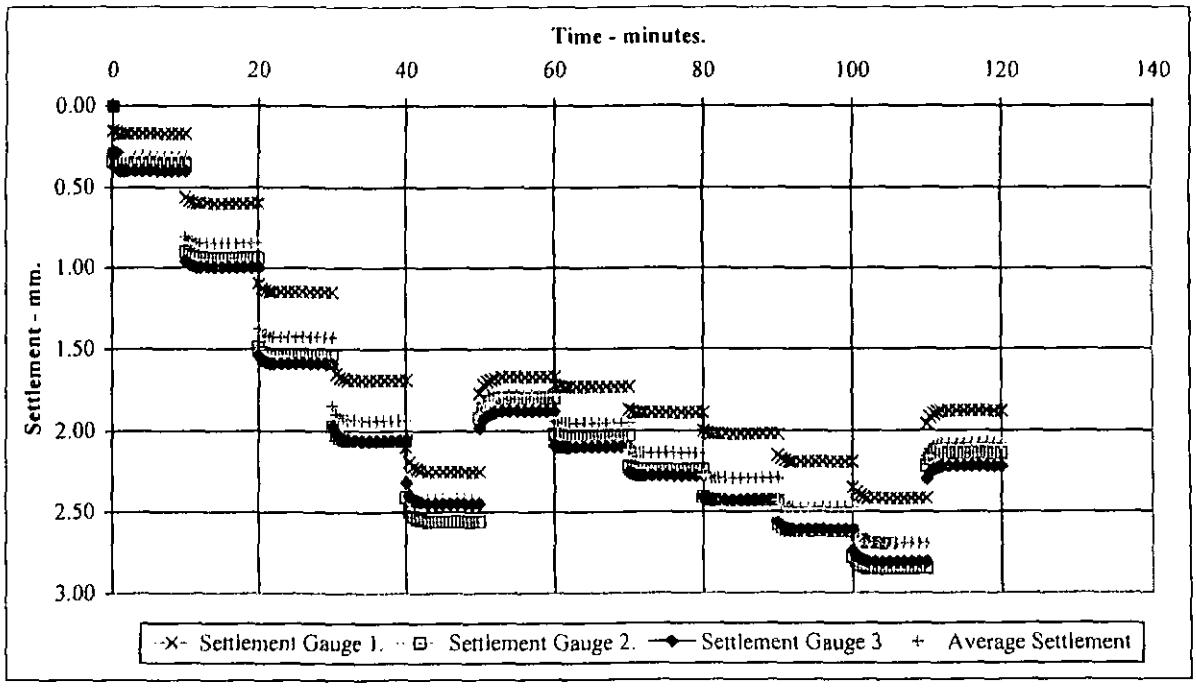
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	10-May-06		
Test Position:	33	Depth (m):	Finished Level
Plate Area (m2):	0.2827	Type of Kentledge:	Tracked

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.69
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/5/06		11/5/06		11/5/06	PSL06/820
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **10/05/2006**

Test Number: **33**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.42**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**95**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	76000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	61134	$kN/m^2/m$
Subgrade CBR:	**12**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

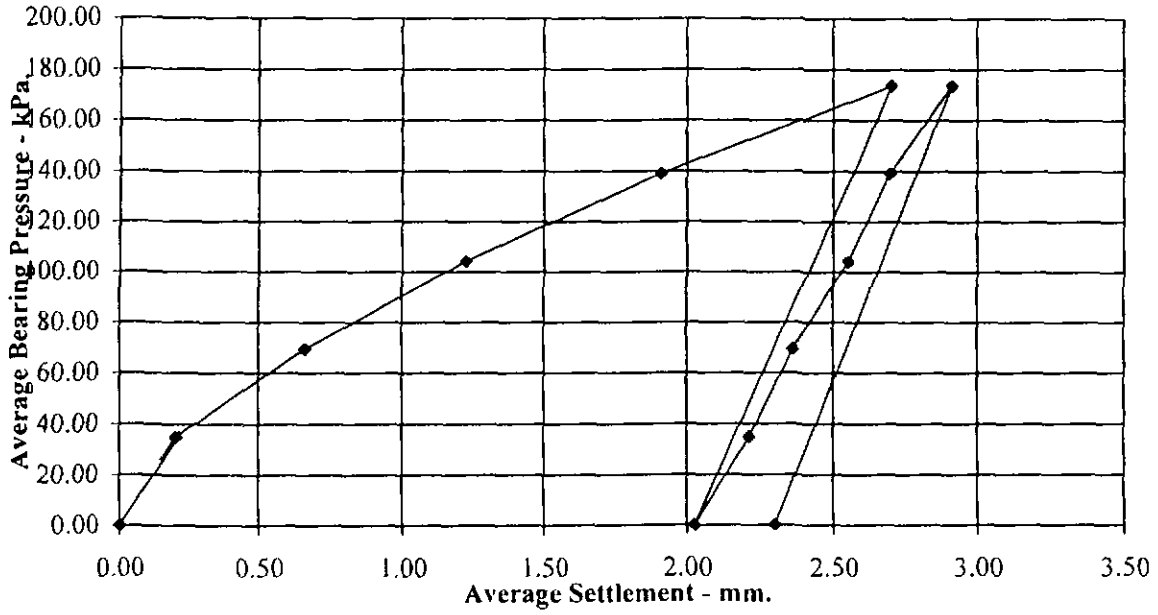
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Independent Laboratory Testing Services.

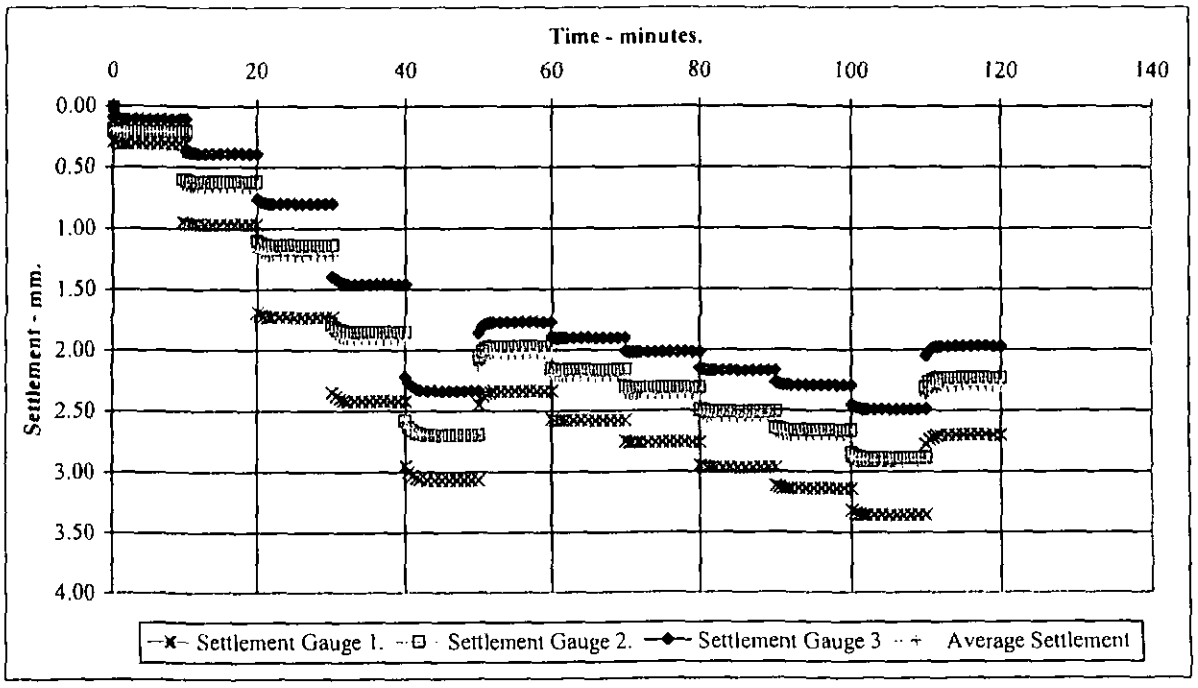
Professional Soils Laboratory
5/7 Hexthorpe Road
Hexthorpe
Doncaster, DN4 0AG
tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	10-May-06		
Test Position:	34	*Depth (m):*	Finished Level
Plate Area (m2):	0.2827	Type of Kentledge:	Tracked
Maximum Applied Pressure (kPa):		173.76	
Maximum Deformation (mm):		2.91	
Description:		6F2.	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	11/5/06.		11/5/06		11/5/06	PSL06/820
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

ENCIA

Project Data

Site: **Burton Road, Barnsley** Project No: **5848**

Date: **10/05/2006** Test Number: **34**

Engineer: **SRJ** Test Position:

Fill Type: **6F2** Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.70**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**105**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	84000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	67570	$kN/m^2/m$
Subgrade CBR:	**14**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

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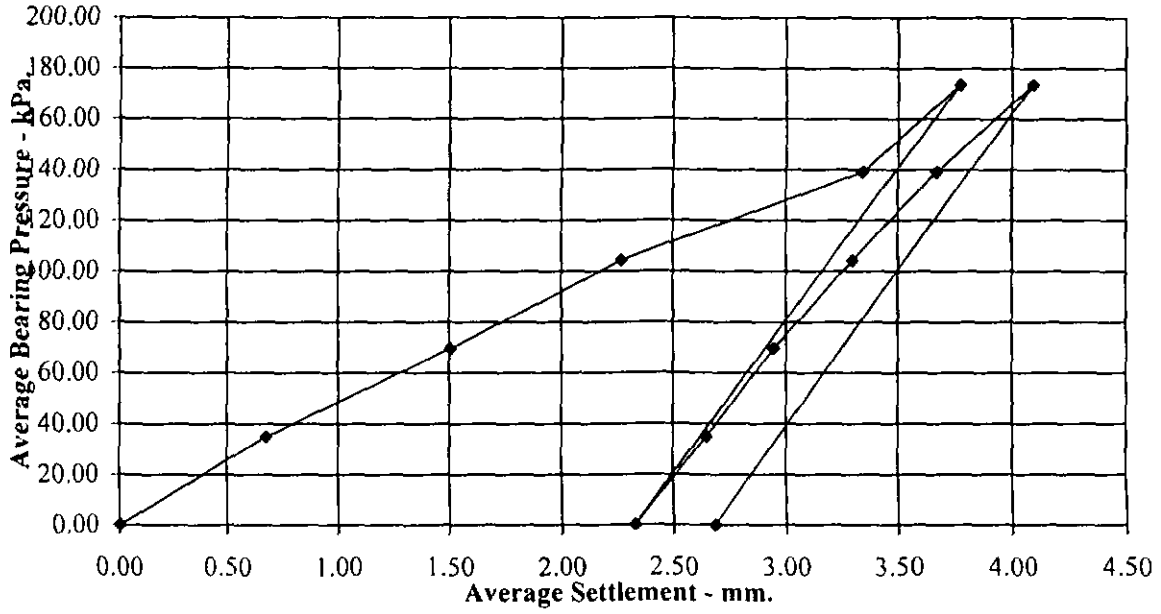
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Doncaster, DN4 0AG
tel:0870 2401964 . fax: 0870 2401965
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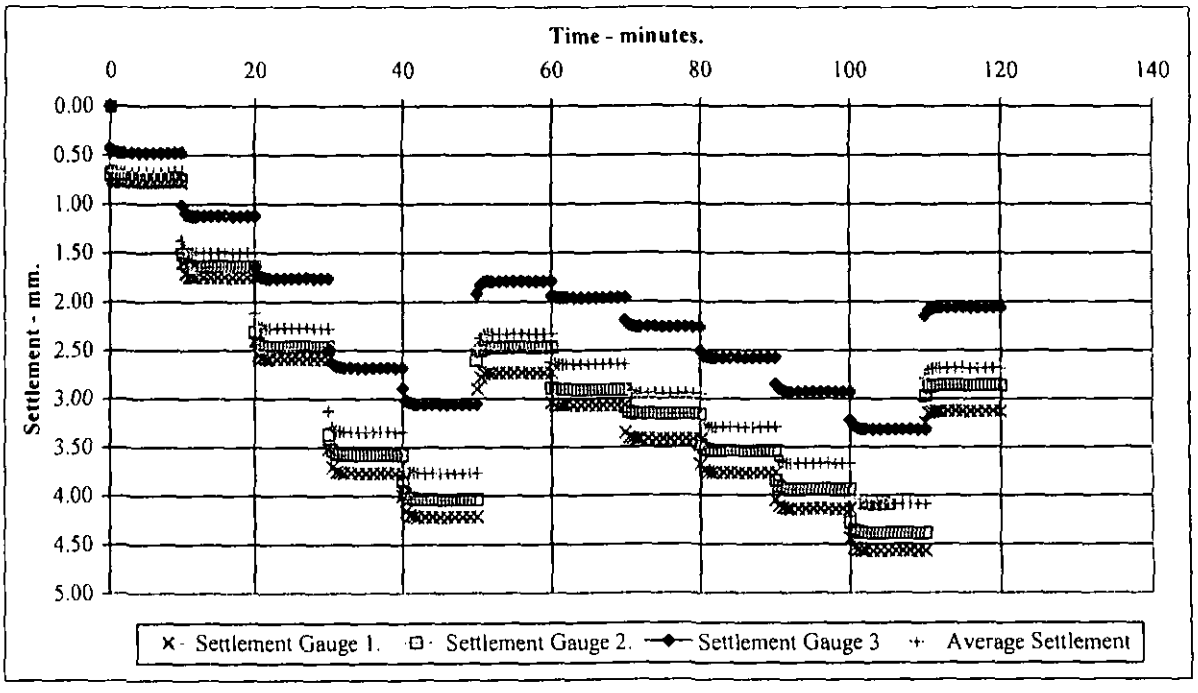
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	07-Jun-06		
Test Position:	35	**Depth (m):**	Finished Level
Plate Area (m2):	0.2827	**Type of Kentledge:**	Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 4.09
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	8/6/06		8/6/06		8/6/06	PSL06/1031
BURTON ROAD, BARNSLEY.						Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: **07/06/2006**

Test Number: **35**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**3.77**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**60**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	48000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	38611	$kN/m^2/m$
Subgrade CBR:	**5**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Dratt HD25 superseding HD25/94)

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Independent Laboratory Testing Services.

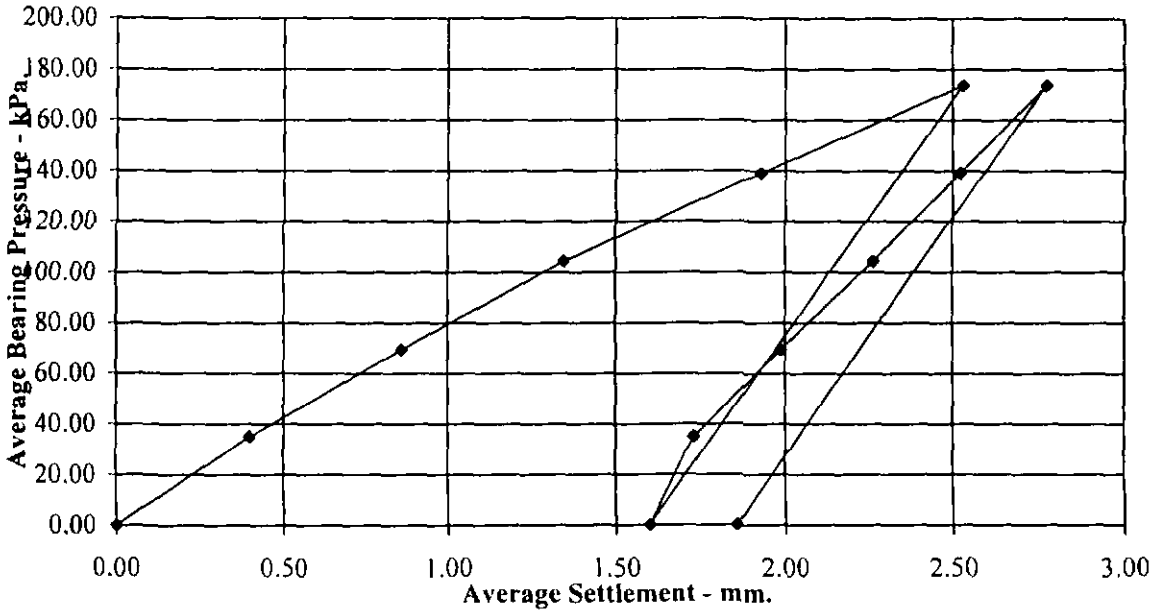
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tel:0870 2401964 . fax: 0870 2401965
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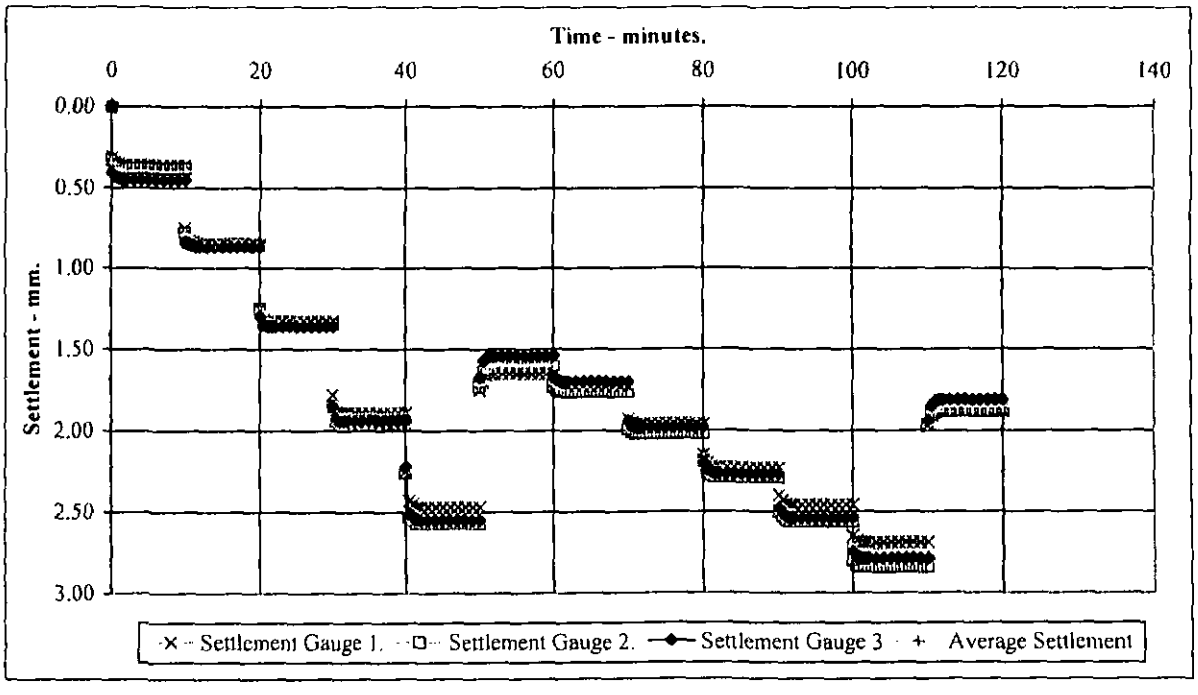
VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	07-Jun-06		
Test Position:	36	Depth (m):	Finished Level
Plate Area (m2):	0.2827	Type of Kentledge:	Wheeled

Maximum Applied Pressure (kPa): 173.76
Maximum Deformation (mm): 2.77
Description: 6F2.





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	8/6/06		8/6/06		8/6/06	PSL06/1031

BURTON ROAD, BARNSLEY. | Client Ref.

Calculation of CBR value from Plate Bearing Test results

Project Data

Site: **Burton Road, Barnsley** — Project No: **5848**

Date: **07/06/2006** — Test Number: **36**

Engineer: **SRJ** — Test Position:

Fill Type: **6F2** — Depth: **Formation level**

Test Data

Plate diameter:	**600**	mm
Average plate settlement at end of 1st load cycle:	**2.53**	mm
Maximum test pressure:	**174**	kPa
Pressure (p) corresponding to settlement of 1.25mm:	**95**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	76000	$kN/m^2/m$
Plate Correction Factor:	0.80	
Modulus of subgrade reaction K_{762}:	61134	$kN/m^2/m$
Subgrade CBR:	**12**	%

NB: Project / test data to be entered in shaded cells

Notes

1) Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)

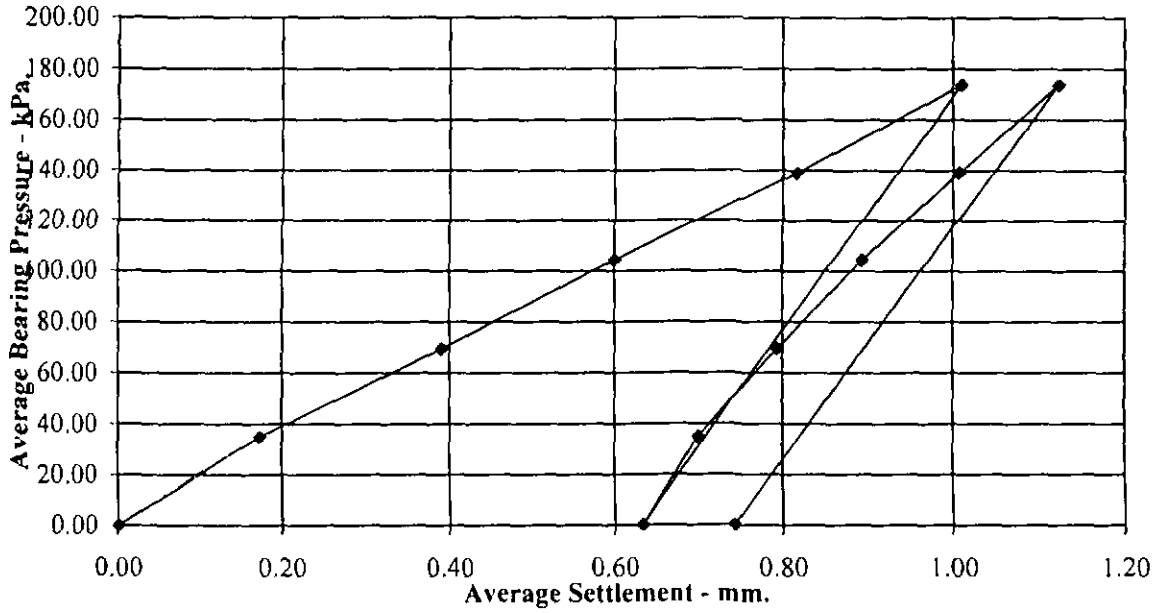
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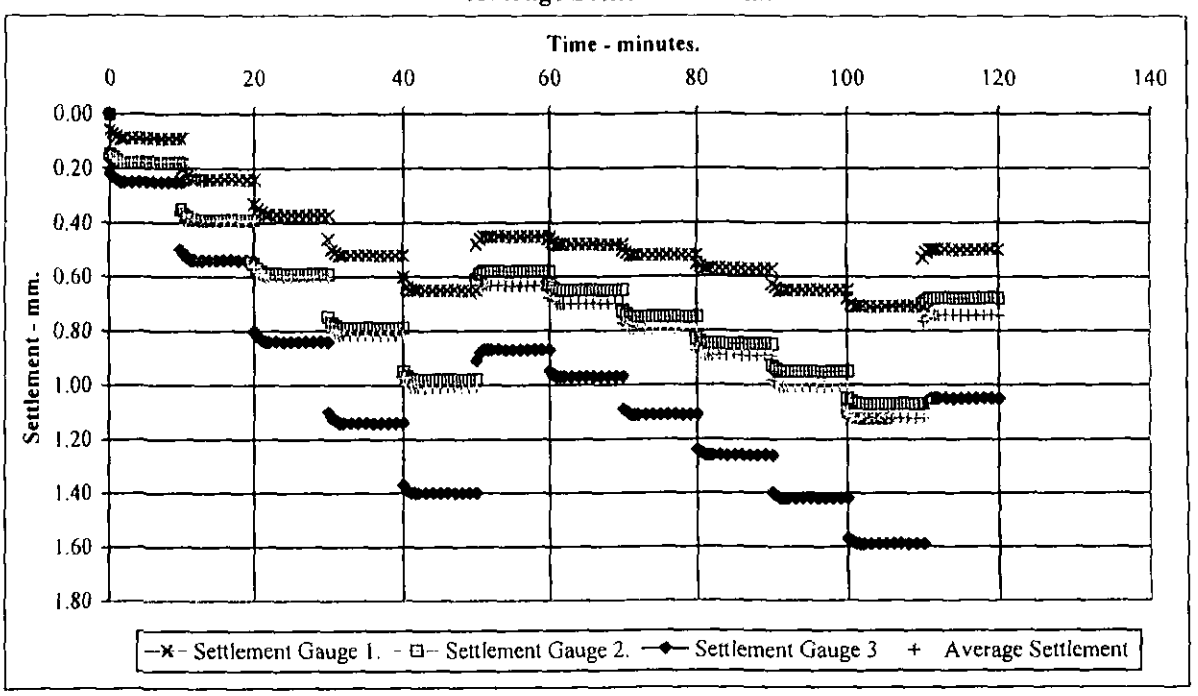
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5/7 Hexthorpe Road
Hexthorpe
Doncaster, DN4 0AG
tel:0870 2401964 . fax: 0870 2401965
email:awatkins@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	07-Jun-06		
Test Position:	37	**Depth (m):**	Finished Level
Plate Area (m2):	0.2827	**Type of Kentledge:**	Tracked
Maximum Applied Pressure (kPa):		173.76	
Maximum Deformation (mm):		1.12	
Description:		6F2.	





Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	8/6/06		8/6/06		8/6/06	PSL06/1031

BURTON ROAD, BARNSLEY. | *Client Ref.*

Calculation of CBR value from Plate Bearing Test results

ENCIA

Project Data

Site: **Burton Road, Barnsley**

Project No: **5848**

Date: ***07/06/2006***

Test Number: **37**

Engineer: **SRJ**

Test Position:

Fill Type: **6F2**

Depth: **Formation level**

Test Data

Plate diameter:	**600**	*mm*
Average plate settlement at end of 1st load cycle:	**1.01**	mm
Maximum test pressure:	**174**	kPa

Calculation

Basic Modulus of Subgrade Reaction:	>	139004	$kN/m^2/m$
Plate Correction Factor:		0.80	
Modulus of subgrade reaction K_{762}:	>	111815	$kN/m^2/m$
Subgrade CBR:	>	**34**	%

NB: Project / test data to be entered in shaded cells

Notes

1) *Calculation of CBR based on Section7.10 of IAN 73/06 (Draft HD25 superseding HD25/94)*

APPENDIX E
DRILLING & GROUTING DAILY RECORDS

DAILY RETURN
(Drilling)

Drilling Contracting & Environmental Limited

Sheet No.	1
Date	15/05/2006
Contract Name	ENCIA, BURTON ROAD.
Contract No.	5315
Working Day No.	1

Hole No.	Depth	Casing	Dia	Angle	From	To	Description
		Mobilised Rig and Grouting equipment to Site					
Set up Rig onto Borehole producing water, and commenced reaming out to find depth.							
1	30.00		6 1/4"	v	GL	30.00	Backfilled Drill arisings
	Commenced Stage Grouting from 30.00m @ 3.00m intervals						
1	30.00	0.00	**Sheet Total**	**Crew**		**Plant**	
0	0.00	0.00	**Previous Sheet Total**	D Edwards		Casagrande C6 Rig	
1	30.00	0.00	**Cummulative Total**	R Horsefield		600 Compressor	

Signed By D.C.E. Eric Gaylor 15.05.06

Signed By Client ____________ Date ________

[illegible]AIM CAN BE ACCEPTED UNLESS REPORTED IN WRITING WITHIN 14 DAYS OF THIS RETURN

DAILY RETURN
(Grouting)

Drilling Contracting & Environmental Limited

Sheet No.	1
Date	Monday 15.05.06
Contract Name	ENCIA, BURTON ROAD
Contract No.	5315
Working Day No.	1

Hole No.	Press P.S.I	Depth	O.P.C.	P.F.A.	Grave	Total Grout	Remarks
		Set up Grouting equipment					
		Commenced Stage Grouting with neat Cement Grout					
1	45	30	0.140			0.14	Pressured
	40	27	0.140			0.14	Pressured
	35	24	0.140			0.14	Pressured
	30	21	0.140			0.14	Pressured
	25	18	0.140			0.14	Pressured
	20	15	0.140			0.14	Pressured
	15	12	0.140			0.14	Pressured
	15	9	0.140			0.14	Pressured
	15	6	0.140			0.14	Pressured
	15	3	0.140			0.14	Pressured
		0	0.10			0.10	Top up
	Borehole Grouting Completed, Water stopped running.						

Materials Received During the Day

Delivery Ticket No.	Quantity	Item
Ex Stock	1.50	OPC

Crew	Plant
N Leadbeater	Mixer
D Edwards	600 Compressor
R Horsefield	2x2" Grout Pumps

	Materials Delivered A	Materials Delivered B	A+B	(A+B) -C
	B/F from Previous Sheet	During day	Running Total	Stock on Site at end of day
CEMENT	0.00	1.50	1.50	0.00
P.F.A	0.00	0.00	0.00	0.00
Aggregates	0.00		0.00	0.00

TOTAL USED	1.50	0.00	0.00	1.50
PREVIOUS TOTAL	0.00	0.00	0.00	0.00
TOTAL TO DATE	1.50	0.00	0.00	1.50

Signed By D.C.E. Eric Gaylor Date **15.05.06**

Signed By CLIENT _____ Date _____

CAN BE ACCEPTED UNLESS REPORTED IN WRITING WITHIN 14 DAYS OF THIS RETURN

APPENDIX F
ENCIA STANDARD PROTOCOL FOR SOIL IMPORTATION

Protocol for Importation & Use of Soil Cover (Capping)

Introduction.

Isolation of made ground in garden and landscaped areas beneath a cover of "clean" subsoil, and topsoil is often recommended on residential developments where made ground is left in-situ. Most notably when the made ground contains some inorganic contaminants at concentrations above guidance threshold values for an end use that includes domestic gardens. A cover solution is not generally appropriate for organic contamination (fuels, solvents etc); removal or treatment will probably be required.

The cover blocks potential linkages between the contaminated fill and future residents. Such a cover is only required in proposed garden and landscaped areas underlain by made ground (i.e. not beneath plots or hardstand).

The thickness of cover is dependant on the nature and degree of contamination (and often the Local Authority whose area the site lies within), but typically between 600mm and 1,000mm is required. However, if the made ground is essentially "clean", but contains materials generally considered undesirable as a near-surface material in garden areas (colliery spoil, construction\demolition rubble etc) then a 300mm thick cover, in accordance with NHBC Standards, Chapter 9.2, should be adequate. If the made ground is essentially "clean" and comprises reworked natural soil, the only cover likely to be required is topsoil.

The **CML initiative,** which came into force on 1st April 2003, requires house builders to submit to NHBC (or other warranty providers) a validation report confirming the thickness and quality (ie contaminant-free) of the soil cover. Validation reports are normally prepared by independent geoenvironmental consultants.

Soil **quality** is best determined by sampling of the **source** at least 6 working days before importation to the development site. Further, on-site (post-placement) quality testing should not usually be necessary.

Soil **thickness** can only be checked after placement, but should be done before turfing, fencing etc. Thickness could be checked via the excavation of an appropriate number of inspection pits (say every 5th garden) or by survey carried out prior to and immediately after the placement of cover material.

Soil cover is usually placed towards the end of the construction phase, usually many weeks after completion of the preparatory\remedial works, and issue of the associated Validation\Completion Report. Consequently, site visits to generate supplementary letter reports are typically required immediately after soil cover is placed in the gardens of each plot, or set of plots.

Failure to submit cover validation reports (a **RED** item) promptly will delay NHBC finalling plots – this will delay the release of mortgage funds and hence legal completion – ie the financial implications are very significant.

Cover material can sometimes be sourced on-site from foundation\drainage excavations in natural in-situ strata. However, it is often necessary to import cover material and where this is necessary, the following protocol is recommended.

Protocol (Testing at Source)

The materials should be inspected by a suitably qualified Geoenvironmental Engineer at source.

Soil material should:

- be clean and free of foreign debris, building waste materials or contaminants;
- not have a stone content of greater than 20% by dry weight and
- have a maximum stone size of 150mm in any one direction.
- not have been sourced from an area within 7m laterally, or 3m vertically, of Japanese Knotweed plants, and not contain any Japanese Knotweed fragments (rhizomes, leaves, stems etc).

The Geoenvironmental Engineer should take representative samples of the subsoil material from the proposed source. The number of samples taken will be dependant on the nature of the source and the quantity of material to be imported. However, as a guide, a **minimum** of 6 samples of each subsoil type should be tested, with a further sample for each 300m^3 where the quantity exceeds 1,800m^3.

A less frequent sampling rate may be appropriate for soils from a greenfield source or where large volumes (say > 5,000m^3) of soil are imported from a single, relatively homogenous source.

Each sample taken should be forwarded to an analytical laboratory for testing in accordance with the following schedule:

pH, total metals (copper, nickel, zinc, chromium, arsenic, mercury, selenium, cadmium, and lead), water soluble boron and water-soluble sulphate.

Additional determinands could be scheduled, although if considered necessary, would probably suggest the material is unlikely to be suitable for use as clean cover in gardens.

The analytical testing should be undertaken on a 3 or 5-day turnaround and the Client\Contractor should be notified of the soil's suitability (or otherwise) immediately after receipt of the results. Chemical assessment (Tier 1) criteria for imported soils are tabulated on page iv.

On receipt of written confirmation from the Geoenvironmental Engineer, the Client should instruct his Contractor to commence importation. It will probably be necessary to stockpile the cover prior to placement in garden\landscaped areas. The Geoenvironmental Engineer should inspect the stockpiled material prior to placement, to confirm that it is the same material as previously tested, or the Contractor should provide the Client with appropriate haulage notes. Further, on-site quality testing should not normally be necessary.

Validation letter reports should be issued by the Geoenvironmental Engineer as each plot, or set of plots, is completed.

Imported **topsoil** should be subject to the above protocol, wherever it is *not* being sourced from an approved supplier. In addition, some analysis in accordance with BS3882 may be appropriate.

Protocol (Testing after Placement)

Clearly, if soil cover is imported and placed before confirmation of its suitability, we cannot guarantee that our validation work will yield the desired results. In which case, it may be necessary to excavate and export the placed soil cover and\or import further "clean" soil.

The materials should be inspected by a suitably qualified Geoenvironmental Engineer via inspection pits excavated through the entire thickness of placed cover material. Pits should be excavated at an interval of approximately one pit per $300m^3$ of soil cover placed. For a standard residential garden comprising a total area of $100m^2$ (front and rear), with a soil cover thickness of 600mm, one pit per 5 plots is required.

Soil material should:

- be clean and free of foreign debris, building waste materials or contaminants;
- not have a stone content of greater than 20% by dry weight and
- have a maximum stone size of 150mm in any one direction.
- not have been sourced from an area within 7m laterally, or 3m vertically, of Japanese Knotweed plants, and not contain any Japanese Knotweed fragments (rhizomes, leaves, stems etc).

The Geoenvironmental Engineer should take representative samples of the subsoil material from each pit.

Each sample taken should be forwarded to an analytical laboratory for testing in accordance with the following schedule:

pH, total metals (copper, nickel, zinc, boron, chromium, arsenic, mercury, selenium, cadmium, and lead), and water-soluble sulphate.

Additional determinands could be scheduled, although if considered necessary, would probably suggest the material is unlikely to be suitable for use as clean cover in gardens.

The analytical testing should be undertaken on a 3 or 5-day turnaround and the Client/Contractor should be notified of the soil's suitability (or otherwise) immediately after receipt of the results. Chemical assessment (Tier 1) criteria for imported soils are tabulated on page iv.

Validation letter reports should be issued by the Geoenvironmental Engineer as each plot, or set of plots, is completed.

Placed **topsoil** should be subject to the above protocol, wherever it is *not* being sourced from a reputable supplier able to provide analytical certificates, in accordance with BS3882.

Chemical assessment criteria for imported soils to the above site to create the soil cover system

Contaminant	Source	Tier 1 Assessment Criteria (mg/kg) *Resi with gdns*	Comments/Notes
pH	CLEA		Initial assessment only
As	CLEA	20	-
Cd	CLEA	1, 2 & 8	pH variable
Cr	CLEA	130	-
Pb	CLEA	450	-
Hg	CLEA	8	-
Ni	CLEA	50	Assessment of human health risk only
Se	CLEA	35	-
B	ICRCL	3	-
Cu	MAFF	80 to 200	pH variable
Zn	MAFF	200 to 300	pH variable
Water soluble sulphate	BRE SD1	0.5	Units are g/l