Your Ref:

Our Ref: DRS/DRS/232095.20061687

1 March 2007

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INTERIM VALIDATION REPORT For BEN BAILEY HOMES LIMITED At FORMER FOUNDRY OFF HOUGH LANE, WOMBWELL, BARNSLEY.

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EXECUTIVE SUMMARY

Introduction

This report summarises the works undertaken to date and should be read in conjunction with the following documents;

- Consolidated Geo-Environmental Investigation Report (DRS/RMB/232095.20051540 dated 02 February 2006)
- Specification for Remediation Works Report (DRS/DRS/232095.20060450)

Location and Description

Former Wombwell Foundry off Hough Lane south west of Wombwell.

The site was a former foundry with a landfill on the southern part. At the time of reclamation the site consisted of a number of concrete areas with scrub land on the southern extent.

Ground Conditions

MADE GROUND consisting of concrete, foundry sand, ash, clinker and slag.

NATURAL consisting of clay and subsequently natural bedrock of mudstone and sandstone. The ground conditions are discussed in more detail later in the report.

Site Works

In summary the following site works have been carried out;

- All hardstanding and underground features broken out to 2.0m below the base of capping.
- 2.0m turnover and re-engineering of material below proposed base of capping.
- Continued testing of imported materials.
- Plate load tests of re-engineered material.
- Remediation of areas highlighted in previous reports.
- Asbestos survey of buildings existing on site.
- Turnover to 5.0m or natural ground, whichever is the lesser, below capping in the landfill area.

Further Work Required

- Final geotechnical testing of apartment block area and plot 86.
- Removal of the oil interceptor from site.
- Treatment of Japanese Knotweed.
- Placement of capping system along with appropriate testing.

1.0 INTRODUCTION

1.1 General

1.1.1 This validation report describes the reclamation ground works carried out by JAKTO Limited on behalf of Ben Bailey Homes Limited, under full time supervision by Joynes Pike and Associates Limited at the former foundry off Hough Lane, Wombwell, Barnsley, South Yorkshire.

1.1.2 It describes work undertaken to date and should be read in conjunction with the approved Specification for Remediation Works ref: DRS/DRS/232095. 20060450 dated 19 April 2006, which is enclosed as Appendix A.

1.1.3 The earthworks were carried out to create a stable platform for a proposed housing development, consisting of low rise houses and apartments with associated garden areas, service roads and public open space.

1.2 Objectives

1.2.1 The objectives of this document are to;

I. Describe in summary the reclamation works undertaken by JAKTO Limited. This includes the demolition of existing structures, associated foundations, hardstanding, and the placement of re-engineered fill.

II. The removal of previously identified contaminated areas.

III. Validate the turnover and earthworks in order to determine that the minimum 2.00m turnover (beneath formation and capping level) has been attained.

IV. Demonstrate that suitable materials have been placed and engineered accordance with the Highways Agency Specification for Highways Works: Series 600 and the Reclamation And Remediation Method Statement ref: DRS/DRS/232095.20060450 dated 19 April 2006.

1.3 Site Description

1.3.1 The site is located off Hough Lane, Wombwell in Barnsley South Yorkshire.

1.3.2 The site is bound to the north by Hough Lane beyond which is an existing Ben Bailey Homes Limited development. To the east the site is partially bound by existing industrial premises and partially by open fields, to the south are open fields and to the west is an operational railway.

1.3.3 The site was formerly a foundry with a landfill on the southern part. The landfill known to be present on the site has subsequently had its waste management license successfully handed back to the Environment Agency after a consultation and monitoring period, this has been previously reported and approved under separate cover by Johnson, Poole and Bloomer Consulting Engineers.

1.3.4 The site's description at the time of site reclamation was as follows;

- Approximately one third to one half of the site comprised several flat concrete areas with pits (the former foundry building bases and floor slabs) with the rest of the site being scrub land and areas of semi-mature to mature trees.

1.3.5 The nature of the works carried out on site (both recently and historically) include;

- Manufacturing of steel and steel products
- Landfilling of by products from the above process including foundry sand and slag.

1.4 Site Works

1.4.1 The site has been remediated in accordance with the Specification for Remediation Works (DRS/DRS/232095.2006045 Dated 19th April 2006) for the purpose of a housing development as an end-use. This was facilitated by the removal of concrete bases, pits, stanchions etc. and excavation of the made ground to 2.00m below formation level beneath the former foundry buildings and operational area. Where the former landfill was located a turnover to natural ground or 5.0m below proposed formation level, whichever is the lesser, was carried out. All re-compaction was in accordance with the Highways Agency Specification for Highways Works Series 600 document. Approvals were received from Barnsley Metropolitan Borough Council and NHBC prior to site works commencing.

1.4.2 The works were designed to be carried out in a cost effective and environmentally sustainable manner as well as reducing the overall environmental impact on the site. The site works were undertaken by JAKTO Limited and were supervised full time by Joynes Pike & Associates Ltd resident engineers. This included the services of a Geo-Environmental Engineer present on site full time along with the support of office based senior staff (at Senior, Principal and Associate level) as necessary.

1.4.3 The philosophy for the reclamation of the site was the removal of the contamination hotspots and turnover of the site to provide a re-engineered and remediated fill platform for housing development.

2.0 RECLAMATION, REMEDIATION AND VALIDATION WORKS

2.1 General

2.1.1 Initially the concrete bases, stanchions and pits were broken out with the resulting material being screened and crushed before being stockpiled on site.

2.1.2 The turnover of the site started from the southern end with foundry sand MADE GROUND being excavated to a depth of 2.00m below the base of capping by a Daewoo 360° tracked excavator. The made ground was then immediately compacted using a Caterpillar tracked dozer towing a self powered tamping vibratory roller. Any previously unidentified brick, metal, concrete and other such obstructions were broken out to their full extent and stockpiled for further processing or off site disposal as necessary.

2.1.3 The work continued towards Hough Lane and across the width of the site until natural ground was encountered at a lesser depth than the minimum 2.0m at which point the base of the excavation was graded and the resulting material re-engineered to the base of capping.

2.1.4 Where natural ground was known to lie within a given depth of proposed finished ground level for the development no engineered turnover was carried out. Where made ground was still present in rear garden areas levels were reduced to below the base of proposed capping. Where natural ground was encountered within the proposed capping no further excavation took place.

2.1.5 All acceptable demolition material and excavated obstructions were processed on site by means of a screening crusher.

2.1.6 Where possible during the demolition works materials were recovered for off site recycling, for example;

- Sheet metal
- Transformers
- Steel slag boulders
- Scrap metal including girders.

2.1.7 Where obstructions or unexpected features such as buried tanks were encountered, these were excavated to their full extent, with the resultant void being suitably backfilled in an engineered manner in accordance with Highways Agency -- Series 600 – "Specification for Highway Works" using site won materials.

2.2 Imported Materials

2.2.1 Due to the loss of volume balance on site following demolition and compaction of the made ground and the fact that site levels have been raised in sections of the site to form the development platform, additional materials were required on site.

2.2.2 As excavated, chemically acceptable materials in accordance with our Reclamation and Remediation Method Statement were imported from the following sites;

- Ben Bailey Homes Limited sites in Grimethorpe, Mexborough and Bramley.
- Sheffield Ring Road.

2.2.3 The majority of the material imported was from Sheffield Ring Road with the PSD's showing the material to be Class 6F2 in accordance with Highways Agency Series NG 600 Earthworks.

2.2.4 This material was certified clean at source and subsequently tested throughout importation at the rate of 1 test per 250m^3 or as deemed necessary. All material imported was sampled by Joynes Pike and Associates Ltd and submitted to ECoS Environmental, a UKAS / MCERTS accredited Laboratory for suitable testing. Please find the chemical test results enclosed as Appendix B along with the statistical analysis in accordance with the framework set out in CLR 7.

2.2.5 Further to this, at the time of writing natural as excavated material is currently being imported from a Greenfield site at the RSPB site of Bolton Ings, Barnsley. This material is proposed to facilitate the capping system to be deployed on site. Ben Bailey Homes Ltd. have estimated 7,000m^3 of topsoil and 10,000m^3 of subsoil will be required for the development.

2.2.6 Currently Jakto Excavations Ltd. have imported the full requirement of topsoil and approximately 5000m^3 of subsoil to site. The material has been tested in accordance with our Reclamation and Remediation Method Statement.

2.3 Dust Monitoring

2.3.1 On the request of the Environmental Health Officer at Barnsley Metropolitan Borough Council dust monitoring was carried out throughout the remediation works.

2.3.2 The dust monitoring stations installed were directional gauges, constructed in accordance with BS 1747 'Methods for the Measurement of Air Pollution. Deposit Gauges'. The gauges were

positioned to allow assessment of the dust created on site in relation to background levels from the adjacent railway line, commercial units and Hough Lane.

2.3.3 Further to this, during periods of dry, warm weather and high wind velocities, a dust suppression unit was deployed to site to prevent the creation of excessive dust emissions.

2.3.4 The results of the dust monitoring and subsequent chemical analysis are included as Appendix C. The determinants tested for were: Aluminium, Cadmium, Chromium, Copper, Iron, Manganese, Nickel, Lead, Tin, Zinc and speciated PAH.

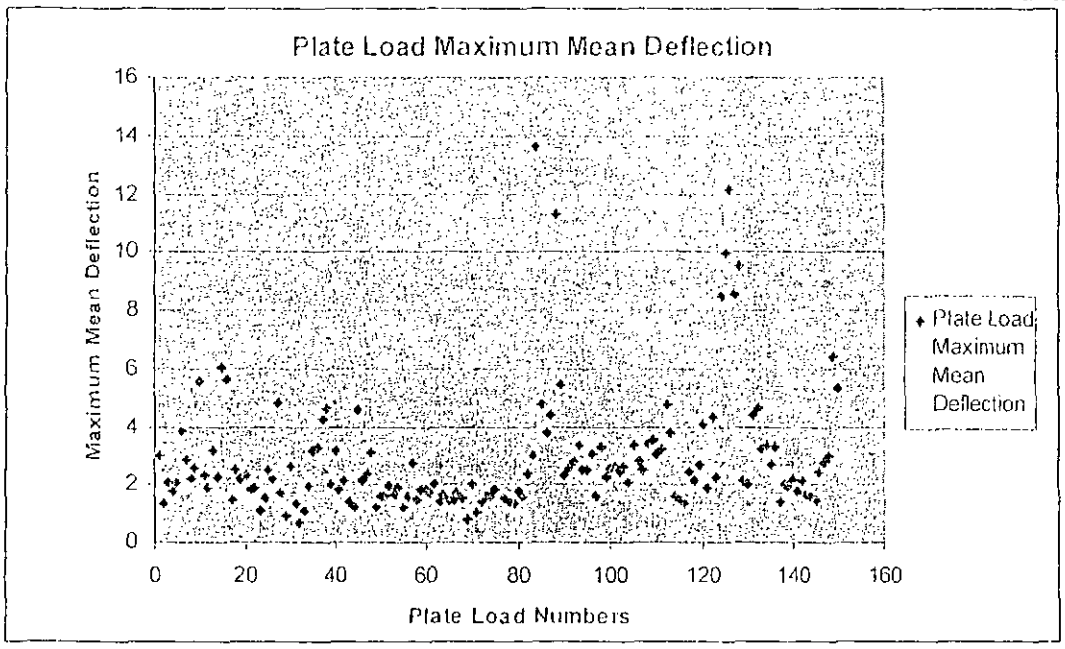
2.3.5 Considering the results of the dust monitoring it would appear that at certain times there has been an increase of dust generated from the site, however equally at times dust has been created from off site sources.

2.3.6 The dust concentration and contaminant levels are not considered to have posed any long term detrimental effect to health or inconvenience to local residents.

2.4 Plate Load Tests

2.4.1 To date 140 plate load tests have been carried out on the re-engineered material on site to prove its suitability as a bearing stratum for raft foundations, in accordance with our Reclamation and Remediation Method Statement. The results of all the plate load tests carried out on the site are included as Appendix D.

2.4.2 The aforementioned Reclamation Method Statement set an allowable limit for the maximum amount of settlement as 10 mm for an applied load of 150kN/m^2. The plate load tests were carried out on a 35m grid. The graph below shows the maximum settlement for the plate load tests;



2.4.3 Three plate load tests (PL84, PL88 and PL124) failed, having a maximum settlement of 13.63, 11.3 and 12.16 mm respectively.

2.4.4 The area around these tests was re-excavated to the top of the previous test or natural ground, whichever was the deeper with the material being re-engineered and the area retested. The resulting plate load test (PL84A, PL88A and PL124 retested) had maximum settlements of 2.3, 2.59 and 8.55 mm respectively.

2.4.5 The average maximum mean deflection for the passed tests was 2.65mm. Considering this and that a factor of safety is incorporated within the foundation designs, the bearing capacity for the re-engineered material was increased to 75kN/m^2.

2.4.6 Please see drawing number 232095/22 for plate load test locations. These were generally carried out on a 35m grid at 1.0m intervals during backfilling of the turnover.

2.5 Classification of Materials

3.5.1 Materials were classified in accordance with the Highways Agency Specification For Highways Work: Series 600, 1998. Please see Appendix E for geotechnical test results.

3.5.2 The method of compaction used was a BOMAG 6WB vibratory roller. The roller had a mass per metre of 3440kg.

3.5.3 The particle size distribution graphs were assessed in accordance with the Highways Agency Specification For Highways Works Series 600, dated November 2005 and utilising table 6/4 the thickness of layers and number of passes was specified.

2.6 Trial Pit 1

2.6.1 During the initial approval process the Environmental Health Officer (EHO) at Barnsley Metropolitan Council raised concerns with the level of polycyclic aromatic hydrocarbons (PAH) within a sample taken from trial pit TP1 in Johnson, Poole and Bloomers site investigation. The EHO required the removal of material within this area and validation samples to be taken.

2.6.2 A suitably qualified engineer from Joynes Pike and Associates supervised the removal of the area surrounding trial pit TP1 to an appropriate distance of 5.0m beyond the trial pit location and to 0.5m below the depth of the previous trial pit. Five samples including samples of the sides and base were taken and submitted to ECoS Environmental a UKAS / MCERTS accredited laboratory for a suitable suite of tests including speciated PAH's.

2.6.3 The PAH level was reduced considerably and all the determinant results were agreed as acceptable with the EHO, the approval letter for the works is enclosed as Appendix F.

2.7 Internal Asbestos Inspection of Electric Sub-Station

2.7.1 During the initial appraisal of the site undertaken by Johnson, Poole and Bloomer Consulting Engineers a full Type 3 Asbestos Survey of the foundry buildings was undertaken. However due to the operational nature of the sub-station an internal inspection was not undertaken for Health and Safety reasons.

2.7.2 Once the sub-station had been decommissioned a Type 3 Asbestos survey was undertaken by Joynes Pike and Associates Ltd. This found low to moderate quantities of asbestos containing materials.

2.7.3 The materials found included; flash pads, pipe lagging and cable protectors. The original Johnson Poole and Bloomer external asbestos report noted asbestos cement rainwater goods to the building.

2.7.4 The findings of the investigations were issued to Ben Bailey Homes to forward to their contractor for removal prior to demolition.

2.8 PCB Validation of Sub-Station Decommissioning

2.8.1 The substation in the North West corner of the site was decommissioned by YEDL. The demolition was carried out by JAKTO Ltd following asbestos removal and the strata directly underlying the footprint of the substation was sampled for possible PCB contamination to satisfy our approved Specification for Remediation Works (ref:232095.20060450).

2.8.2 Joynes Pike and Associates took 5 No. samples (D1 – D5) in a "Domino 5" pattern of the clay directly underlying the floor slab of the former substation footprint on 12 January 2007. These samples were submitted to ECoS a UKAS / MCERTS accredited laboratory in appropriate sterile containers for a general PCB screening test.

2.8.3 Four of the five samples taken (D1 – D4) had PCB levels below the limits of detection as carried out in the laboratory. However, the remaining sample D5 was found to contain traces of PCB's. The results of the analysis are shown below with the official results included as Appendix G:

Sample Location	PCB # 101	PCB # 118	PCB # 138	PCB # 153	PCB # 180	PCB # 28	PCB # 52
D1	*	*	*	*	*	*	*
D2	*	*	*	*	*	*	*
D3	*	*	*	*	*	*	*
D4	*	*	*	*	*	*	*
D5	0.05	*	0.06	0.07	0.05	*	*

** (ug/kg) = Below detection limit*

2.8.4 In view of Ben Bailey Homes' Ltd proposal to increase levels by at least 2 metres in the area of the former substation, and the fate and transport characteristics of PCB's, it is considered that the recorded concentrations within sample D5 are unlikely to pose a significant potential risk to human health or controlled waters. PCB's are stable in the environment, being relatively insoluble and non volatile substances. Human exposure is therefore only via direct ingestion, inhalation of dust or dermal contact with contaminated soils, which are pathways which will effectively be removed by the placement of engineered fill to achieve required levels and the construction of the carpark surfacing. No remedial measures are therefore required.

2.8.5 Further to this, under full time supervision by Joynes Pike and Associates Ltd, Jakto Excavations Ltd placed foundry sand in an engineered manner to the underside of the car park formation level.

2.9 Landfill Turnover

2.9.1 During the reclamation and remediation works it was agreed with the Local Authority, Environment Agency and NHBC that the area of the site known to be formerly used as a landfill could be re-engineered to natural ground at a maximum depth of 5.0m below finished formation layer. This equates to a maximum depth of 5.6m below finished ground levels.

2.9.2 The landfill area was excavated from the south eastern corner of the site into the landfill down to natural ground. This was continued until the maximum depth of 5.0m below formation layer was reached. During excavation, all metal and deleterious material was removed

from the made ground, with the resulting granular material being re-engineered utilising the method stated in previous sections of this report. Drawing 232095-23 shows the landfill area with levels of the natural ground and the plate load test locations as surveyed by APS Surveying Ltd. Due to the gradient of the natural ground the plate load tests were carried out on a closer grid and on 1.0m layers of fill.

2.9.3 The predominant landfill material was foundry sand with occasional metal, wood and fabric. At the request of the NHBC the natural ground was continually surveyed to prove the full depth of the excavation. The backfill had plate load tests carried out every metre under constant supervision by an engineer from Joynes Pike and Associates Ltd.

3.3 Further Validation Works Required

3.3.1 The made ground across the site will have a capping system deployed involving 600mm of clean materials including 225mm of topsoil and a 150mm hard to dig layer over the former landfill. Drawing 232095/21 shows the capping system to be used within garden areas over both the landfill and the remainder of the site. All further imported capping materials will be validated as per our Remediation Method Statement.

3.3.2 During the remediation works a small number of Japanese Knotweed stands were noted locally around a historical manhole towards the south of the site. It is proposed to eradicate this area using spraying and cultivation techniques. The treatment and validation of this shall be carried out by the appointed contractor.

3.3.3 Validation and removal of the oil interceptor to the south west of the site.

3.3.4 Plate load testing of the apartments and plot 86.

4.0 CONCLUSIONS

4.1 The site has been reclaimed in accordance with the Reclamation Method Statement, which was agreed by Barnsley Metropolitan Borough Council.

4.2 In summary the MADE GROUND has been fully re-engineered to a minimum of 2.00m below formation level beneath the residential developable area. All concrete, obstructions and oversized materials were removed, processed on site and where possible re used within the hard to dig layer.

4.3 Within the area of the former landfill the MADE GROUND has been removed to natural ground to a maximum depth of 5.0m below formation level.

4.4 All re-engineered material was validated through plate load testing on an approximate 35m grid and at 1.0m intervals utilising a 600mm plate load to a maximum of 150kN/m^2.

4.5 The site works have been undertaken to facilitate subsequent construction of low rise housing and apartments.

We trust this is satisfactory for you current requirements, however please do not hesitate in contacting any of the undersigned for any further information you may require.

For and on Behalf of Joynes Pike & Associates Limited

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DRAWINGS

APPENDIX B

Chemical Test Results and Assessment

Client: Joynes Pike & Associates Ltd.
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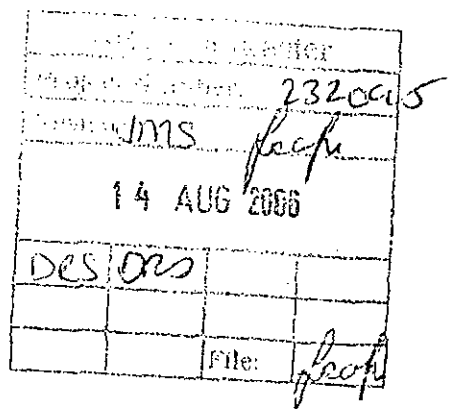
South Yorkshire
DN4 5NL

FAO: Mr D Sykes



Analytical Report Number: R06/1227

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	21715
Order Receipt Date:	27/07/06
Reporting Date:	Thursday 10 August 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECöS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 10 August 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the compelency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECõS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 10 August 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	02/08/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	02/08/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	02/08/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	02/08/06
rcury	ICP-OES	D	0.1 mg/kg	17025	No	02/08/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	02/08/06
ron (water soluble)	Colorimetry	D	0.5 mg/kg	17025	No	03/08/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	02/08/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	02/08/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	02/08/06
PAH (total)	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	01/08/06
pH	pH-meter	D	N/A	17025	No	01/08/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
sene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
nzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
ndeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	04/08/06
raction Organic Carbon	Titration	D	0.001 N/A	None	No	01/08/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	03/08/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 10 August 2006

	BH/TP				
	Top Depth / m				
	Bottom Depth / m				
	Customer ID	D1	D2	D3	D4
	Sample Type				
	Date Sampled				
	Receipt Date	27/07/06	27/07/06	27/07/06	27/07/06
	ECõS Sample ID	S0609683	S0609684	S0609685	S0609686
	Matrix Type	Soil	Soil	Soil	Soil
Determinand	Units				
Arsenic	mg/kg	3.9	6.4	6.3	6.2
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	13.1	15.2	12.7	14.6
Lead	mg/kg	19.3	29.2	22.5	35.1
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	0.5	0.5	<0.5
Copper	mg/kg	16.6	21.3	17.0	22.3
Nickel	mg/kg	24.9	27.4	21.1	26.9
Zinc	mg/kg	126.3	122.4	82.9	115.3
PAH (total)	mg/kg	<0.1	2.5	12.4	1.5
Sulphide	mg/kg	<2.0	<2.0	<2.0	<2.0
pH	N/A	7.7	8.0	8.3	8.1
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	1.6	0.1
Anthracene	mg/kg	<0.1	<0.1	0.6	<0.1
Fluoranthene	mg/kg	<0.1	0.6	2.8	0.5
Pyrene	mg/kg	<0.1	0.6	2.3	0.5
Benzo(a)anthracene	mg/kg	<0.1	0.3	0.9	0.2
Chrysene	mg/kg	<0.1	0.3	1.0	0.3
Benzo(b)fluoranthene	mg/kg	<0.1	0.3	1.0	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	0.2	0.7	<0.1
Benzo(a)pyrene	mg/kg	<0.1	0.2	0.9	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	0.6	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fraction Organic Carbon	N/A	0.002	#	#	#
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

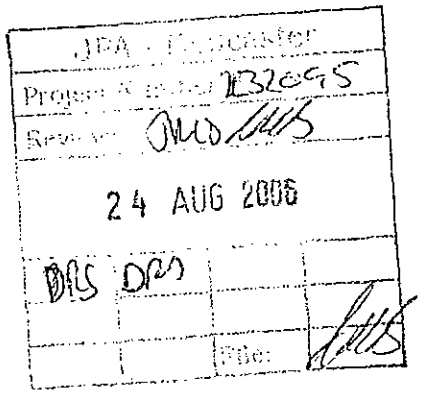
Reporting Date: Thursday 10 August 2006

Notes and Preservation Details

None

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes



Analytical Report Number: R06/8236

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	21723
Order Receipt Date:	07/08/06
Reporting Date:	Monday 21 August 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECōS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Monday 21 August 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

il Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, esults have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed sing UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

ccreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

ample Pretreatment (Appended to Method of Detection)

Dried @ 40°C

R = As Received

ample Type

= Bulk disturbed sample
= Core Sample
= Small disturbed sample

P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECõS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Monday 21 August 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	15/08/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	15/08/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	15/08/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	15/08/06
cury	ICP-OES	D	0.1 mg/kg	17025	No	15/08/06
lenium	ICP-OES	D	1.0 mg/kg	17025	No	15/08/06
Boron (water soluble)	Colorimetry	D	0.5 mg/kg	17025	No	14/08/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	15/08/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	15/08/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	15/08/06
PAH (total)	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	09/08/06
pH	pH-meter	D	N/A	17025	No	10/08/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
sene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
nzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
enzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
enzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
ideno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
ibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
enzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	18/08/06
hromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	21/08/06
raction Organic Carbon	Titration	D	0.001 N/A	None	No	10/08/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Monday 21 August 2006

	BH/TP				
	Top Depth / m				
	Bottom Depth / m				
	Customer ID	D5	D6	D7	D8
	Sample Type	Sand	Sand	Sand	Sand
	Date Sampled				
	Receipt Date	07/08/06	07/08/06	07/08/06	07/08/06
	ECõS Sample ID	S0681979	S0681980	S0681981	S0681982
	Matrix Type	Soil	Soil	Soil	Soil
Determinand	Units				
Arsenic	mg/kg	7.0	7.9	11.2	9.1
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	17.3	14.9	14.2	16.4
Lead	mg/kg	38.0	31.9	40.5	46.4
Mercury	mg/kg	0.1	<0.1	0.1	<0.1
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5	0.5	0.7
Copper	mg/kg	22.5	26.1	29.5	24.7
Nickel	mg/kg	29.1	24.6	22.6	23.4
Zinc	mg/kg	156.3	119.9	99.0	121.0
PAH (total)	mg/kg	1.0	<0.1	17.0	5.9
Sulphide	mg/kg	<2.0	16.1	3.0	2.3
pH	N/A	7.2	7.9	8.4	7.7
Naphthalene	mg/kg	<0.1	<0.1	0.4	0.2
Acenaphthylene	mg/kg	<0.1	<0.1	0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	0.2	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.3	<0.1
Phenanthrene	mg/kg	0.1	<0.1	2.1	0.7
Anthracene	mg/kg	<0.1	<0.1	0.5	0.2
Fluoranthene	mg/kg	0.2	<0.1	3.2	1.0
Pyrene	mg/kg	0.2	<0.1	2.8	0.9
Benzo(a)anthracene	mg/kg	0.1	<0.1	1.3	0.5
Chrysene	mg/kg	0.1	<0.1	1.4	0.5
Benzo(b)fluoranthene	mg/kg	0.2	<0.1	1.4	0.5
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.7	0.3
Benzo(a)pyrene	mg/kg	<0.1	<0.1	1.1	0.4
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	0.7	0.3
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.8	0.3
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0
Fraction Organic Carbon	N/A	0.004	#	#	#

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Monday 21 August 2006

Notes and Preservation Details

None

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes

Analytical Report Number: R06/8304

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	21740
Order Receipt Date:	16/08/06
Reporting Date:	Thursday 31 August 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECôS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Client: Joynes Pike & Associates Ltd.

Project Number: 232095

Reporting Date: Thursday 31 August 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

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Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed Please see notes on last page

Signed: _____

For and on behalf of ECōS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 31 August 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	30/08/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	30/08/06
Mercury	ICP-OES	D	0.1 mg/kg	17025	No	30/08/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	30/08/06
Boron (water soluble)	Colorimetry	D	0.5 mg/kg	17025	No	24/08/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
PAH (total)	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	18/08/06
pH	pH-meter	D	N/A	17025	No	21/08/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	30/08/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	23/08/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	29/08/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 31 August 2006

	BH/TP				
	Top Depth / m				
	Bottom Depth / m				
	Customer ID	D9	D10	D11	D12
	Sample Type				
	Date Sampled				
	Receipt Date	16/08/06	16/08/06	16/08/06	16/08/06
	ECõS Sample ID	S0682646	S0682647	S0682648	S0682649
	Matrix Type	Soil	Soil	Soil	Soil
Determinand	Units				
Arsenic	mg/kg	6.4	7.1	8.3	7.2
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	15.4	14.9	16.2	15.6
Lead	mg/kg	45.0	61.1	136.4	121.7
Mercury	mg/kg	2.3	2.0	1.9	1.5
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	1.0	1.0	1.0	<0.5
Copper	mg/kg	21.7	23.6	26.7	23.3
Nickel	mg/kg	25.5	25.6	26.3	24.6
Zinc	mg/kg	114.4	119.6	138.2	133.9
PAH (total)	mg/kg	0.5	0.5	7.5	5.3
Sulphide	mg/kg	<2.0	22.4	6.6	<2.0
pH	N/A	8.6	8.2	8.4	8.3
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	1.3	0.5
Anthracene	mg/kg	<0.1	<0.1	0.5	0.2
Fluoranthene	mg/kg	0.3	0.3	1.5	1.0
Pyrene	mg/kg	0.2	0.2	1.3	1.0
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.6	0.6
Chrysene	mg/kg	<0.1	<0.1	0.8	0.6
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	0.5	0.4
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	0.3	0.3
Benzo(a)pyrene	mg/kg	<0.1	<0.1	0.4	0.3
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.3	0.3
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0
Fraction Organic Carbon	N/A	0.003	#	#	#

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

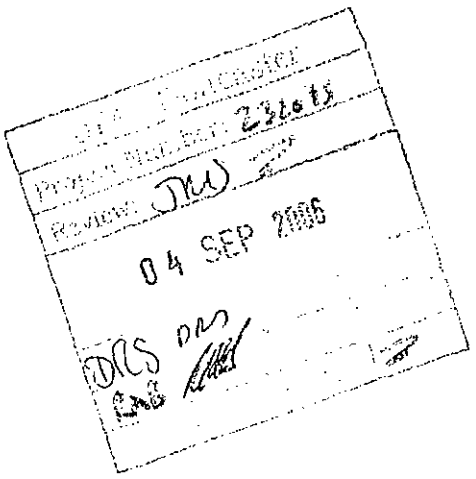
Reporting Date: Thursday 31 August 2006

Notes and Preservation Details

None

Client: *Joynes Pike & Associates Ltd.*
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes



Analytical Report Number: R06/8315

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	21741
Order Receipt Date:	17/08/06
Reporting Date:	*Friday 1 September 2006*

If you have any queries regarding this report please contact our Customer Services Manager

ECōS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 1 September 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

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Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

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MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECOS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 1 September 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	30/08/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	30/08/06
Mercury	ICP-OES	D	0.1 mg/kg	17025	No	30/08/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	30/08/06
Boron (water soluble)	Colorimetry	D	0.5 mg/kg	17025	No	24/08/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	30/08/06
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	18/08/06
pH	pH-meter	D	N/A	17025	No	22/08/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	31/08/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	23/08/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	30/08/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 1 September 2006

	BH/TP				
	Top Depth / m				
	Bottom Depth / m				
	Customer ID	D13	D14	D15	D16
	Sample Type				
	Date Sampled				
	Receipt Date	17/08/06	17/08/06	17/08/06	17/08/06
	ECOS Sample ID	S0682691	S0682692	S0682693	S0682694
	Matrix Type	Soil	Soil	Soil	Soil
Determinand	Units				
Arsenic	mg/kg	9.6	10.3	9.2	11.1
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	14.5	12.5	16.0	13.2
Lead	mg/kg	45.9	50.1	52.8	63.9
Mercury	mg/kg	1.3	1.1	0.8	0.8
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5	<0.5	<0.5
Copper	mg/kg	33.5	37.4	38.7	45.7
Nickel	mg/kg	20.6	20.9	21.9	21.5
Zinc	mg/kg	87.6	88.9	86.4	97.8
PAH (sum of EPA 16)	mg/kg	1.7	2.4	1.4	3.9
Sulphide	mg/kg	<2.0	7.2	<2.0	2.6
pH	N/A	8.5	8.4	8.6	8.5
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	0.6	0.3	0.7
Anthracene	mg/kg	0.2	0.2	0.2	0.5
Fluoranthene	mg/kg	0.3	0.5	0.4	0.8
Pyrene	mg/kg	0.3	0.5	0.3	0.7
Benzo(a)anthracene	mg/kg	0.2	0.3	<0.1	0.3
Chrysene	mg/kg	0.2	0.2	0.2	0.3
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.2
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1
Benzo(a)pyrene	mg/kg	0.1	0.1	<0.1	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0
Fraction Organic Carbon	N/A	0.006	#	#	#

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

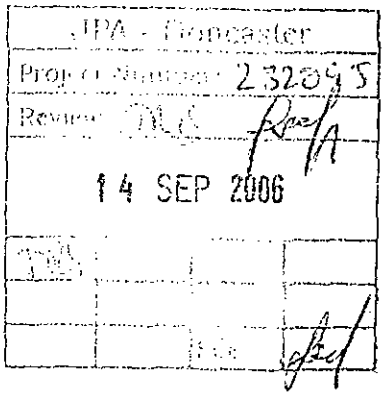
Reporting Date: Friday 1 September 2006

Notes and Preservation Details

None

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes



Analytical Report Number: R06/8401

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	21749
Order Receipt Date:	29/08/06
Reporting Date:	Tuesday 12 September 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECõS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 12 September 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECōS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 12 September 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	04/09/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	04/09/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	04/09/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	04/09/06
Mercury	ICP-OES	D	0.1 mg/kg	17025	No	04/09/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	04/09/06
Iron (water soluble)	ICP-OES	D	0.5 mg/kg	17025	No	09/09/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	04/09/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	04/09/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	04/09/06
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	01/09/06
pH	pH-meter	D	N/A	17025	No	04/09/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	08/09/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	07/09/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	04/09/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 12 September 2006

	BH/TP				
	Top Depth / m				
	Bottom Depth / m				
	Customer ID	D17	D18	D19	D20
	Sample Type	Sand	Sand	Sand	Sand
	Date Sampled				
	Receipt Date	30/08/06	30/08/06	30/08/06	30/08/06
	ECõS Sample ID	S0683247	S0683248	S0683249	S0683250
	Matrix Type	Soil	Soil	Soil	Soil
Determinand	Units				
Arsenic	mg/kg	6.3	6.4	7.5	5.7
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	17.4	15.4	16.3	17.0
Lead	mg/kg	25.2	27.1	46.0	24.8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	1.8	2.2	1.8	1.8
Copper	mg/kg	21.1	17.6	21.3	18.5
Nickel	mg/kg	34.1	30.0	32.5	30.0
Zinc	mg/kg	119.7	119.9	149.8	120.2
PAH (sum of EPA 16)	mg/kg	<0.1	<0.1	<0.1	<0.1
Sulphide	mg/kg	<2.0	<2.0	<2.0	<2.0
pH	N/A	8.0	8.2	8.0	7.9
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
A[illegible]aphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
[illegible]enanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0
Fraction Organic Carbon	*N/A*	*0.004*	#	#	#

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 12 September 2006

Notes and Preservation Details

None

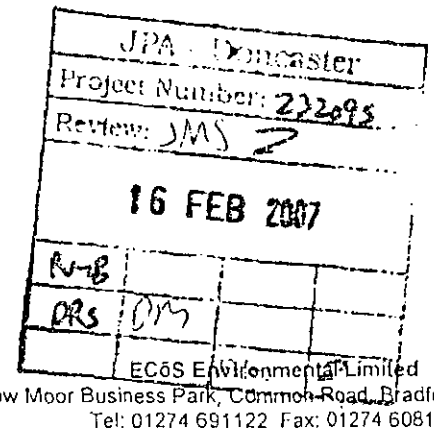
Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes

Analytical Report Number: R06/1393s

Client Project Name:	**Hough Lane, Wombwell**
Client Project Number:	**232095**
Your Order Number:	**23308**
Order Receipt Date:	**04/09/06**
Reporting Date:	**Thursday 15 February 2007**

If you have any queries regarding this report please contact our Customer Services Manager



ECOS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Client: Joynes Pike & Associates Ltd.

Project Number: 232095

Reporting Date: Thursday 15 February 2007

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

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Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECõS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Client: Joynes Pike & Associates Ltd.

Project Number: 232095

Reporting Date: Thursday 15 February 2007

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	07/09/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	07/09/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	07/09/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	07/09/06
Mercury	ICP-OES	D	0.1 mg/kg	17025	No	07/09/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	07/09/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	07/09/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	07/09/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	07/09/06
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	08/09/06
pH	pH-meter	D	N/A	17025	No	07/09/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	14/09/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	07/09/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	08/09/06
Boron (water soluble)	ICP-OES	D	0.5 mg/kg	17025	No	11/09/06

ECõS

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 15 February 2007

	BH/TP					
	Top Depth / m					
	Bottom Depth / m					
	Customer ID	D21	D22	D23	D24	D25
	Sample Type	Sand	Sand	Sand	Sand	Sand
	Date Sampled					
	Receipt Date	04/09/06	04/09/06	04/09/06	04/09/06	04/09/06
	ECõS Sample ID	S0610735	S0610736	S0610737	S0610738	S0610739
	Matrix Type	Soil	Soil	Soil	Soil	Soil
Determinand	Units					
Arsenic	mg/kg	10.6	10.8	10.6	13.5	17.9
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	13.5	14.6	14.6	17.4	17.1
Lead	mg/kg	37.1	34.8	71.2	40.4	37.5
Mercury	mg/kg	0.5	0.5	0.5	0.4	0.4
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Copper	mg/kg	23.4	24.1	25.7	40.3	41.3
Nickel	mg/kg	22.8	24.2	24.5	29.5	29.1
Zinc	mg/kg	81.8	84.0	79.7	115.6	105.0
PAH (sum of EPA 16)	mg/kg	0.1	0.2	<0.1	2.9	4.3
Sulphide	mg/kg	<2.0	4.1	<2.0	6.2	<2.0
pH	N/A	8.1	7.7	7.7	8.0	8.2
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	0.6	0.6
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.2	0.1
Fluoranthene	mg/kg	<0.1	0.1	<0.1	0.7	1.0
Pyrene	mg/kg	<0.1	0.1	<0.1	0.5	0.8
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.3	0.3
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.3	0.3
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Fraction Organic Carbon	N/A	0.005	#	#	#	#
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	0.6	0.5	0.6	1.4	1.7

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 15 February 2007

BH/TP				
Top Depth / m				
Bottom Depth / m				
Customer ID		D26	D27	D28
Sample Type		Sand	Sand	Sand
Date Sampled				
Receipt Date		04/09/06	04/09/06	04/09/06
ECõS Sample ID		S0610740	S0610741	S0610742
Matrix Type		Soil	Soil	Soil
Determinand	*Units*			
Arsenic	mg/kg	12.6	11.6	11.5
Cadmium	mg/kg	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	20.0	14.2	14.6
Lead	mg/kg	38.4	32.0	33.0
Mercury	mg/kg	0.4	0.3	0.3
Selenium	mg/kg	<1.0	<1.0	<1.0
Copper	mg/kg	37.2	23.0	23.6
Nickel	mg/kg	28.5	23.5	24.2
Zinc	mg/kg	114.2	83.2	84.8
PAH (sum of EPA 16)	mg/kg	2.4	<0.1	<0.1
Sulphide	mg/kg	<2.0	<2.0	<2.0
pH	N/A	7.9	8.0	8.1
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.5	<0.1	<0.1
Anthracene	mg/kg	0.2	<0.1	<0.1
Fluoranthene	mg/kg	0.5	<0.1	<0.1
Pyrene	mg/kg	0.4	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.3	<0.1	<0.1
Chrysene	mg/kg	0.3	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	0.3	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	2.1	0.9	0.8

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Thursday 15 February 2007

Notes and Preservation Details

None

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes

JPA - Doncaster
Project Number: 232095
Review: JMS
28 SEP 2006
DS
RMG
File:

Analytical Report Number: R06/1464

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	23313
Order Receipt Date:	13/09/06
Reporting Date:	Wednesday 27 September 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECôS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Wednesday 27 September 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report relate only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a party or for the compelency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECõS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

ECOS

lient Project Name: Hough Lane, Wombwell

roject Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Wednesday 27 September 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	18/09/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	18/09/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	18/09/06
[illegible]	ICP-OES	D	0.5 mg/kg	17025	No	18/09/06
Mercury	ICP-OES	D	0.1 mg/kg	17025	No	18/09/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	18/09/06
Boron (water soluble)	ICP-OES	D	0.5 mg/kg	17025	No	27/09/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	18/09/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	18/09/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	18/09/06
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	18/09/06
pH	pH-meter	D	N/A	17025	No	19/09/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
[illegible]o(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	25/09/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	18/09/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	20/09/06

ECõS

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Wednesday 27 September 2006

	BH/TP					
	Top Depth / m					
	Bottom Depth / m					
	Customer ID	D29	D30	D31	D32	D33
	Sample Type					
	Date Sampled					
	Receipt Date	13/09/06	13/09/06	13/09/06	13/09/06	13/09/06
	ECõS Sample ID	S0611288	S0611289	S0611290	S0611291	S0611292
	Matrix Type	Soil	Soil	Soil	Soil	Soil
Determinand	Units					
Arsenic	mg/kg	11.8	11.1	12.6	15.6	9.1
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	20.3	16.5	19.6	26.8	17.2
Lead	mg/kg	43.8	26.7	45.6	125.2	32.6
Mercury	mg/kg	0.5	0.4	0.3	0.4	0.2
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	1.8	1.4	0.6	0.8	1.6
Copper	mg/kg	28.1	22.3	28.6	48.4	22.6
Nickel	mg/kg	23.6	28.2	26.7	18.7	27.6
Zinc	mg/kg	103.0	89.2	96.3	140.3	78.6
PAH (sum of EPA 16)	mg/kg	29.4	1.8	7.6	82.6	1.1
Sulphide	mg/kg	4.1	<2.0	<2.0	25.8	<2.0
pH	N/A	8.2	7.6	8.3	9.1	8.4
Naphthalene	mg/kg	1.6	<0.1	<0.1	0.5	<0.1
Acenaphthylene	mg/kg	0.5	<0.1	<0.1	0.2	<0.1
Acenaphthene	mg/kg	0.3	<0.1	<0.1	1.3	<0.1
Fluorene	mg/kg	0.9	<0.1	<0.1	1.2	<0.1
Phenanthrene	mg/kg	4.8	0.3	1.2	11.5	0.3
Anthracene	mg/kg	1.2	<0.1	0.3	2.6	<0.1
Fluoranthene	mg/kg	5.3	0.5	1.8	16.9	0.5
Pyrene	mg/kg	4.4	0.5	1.6	13.8	0.3
Benzo(a)anthracene	mg/kg	2.1	0.2	0.5	6.1	<0.1
Chrysene	mg/kg	2.1	0.2	0.7	6.4	<0.1
Benzo(b)fluoranthene	mg/kg	1.8	0.1	0.3	6.0	<0.1
Benzo(k)fluoranthene	mg/kg	0.9	0.1	0.3	3.0	<0.1
Benzo(a)pyrene	mg/kg	1.9	<0.1	0.5	5.8	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.8	<0.1	<0.1	3.2	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.7	<0.1
Benzo(g,h,i)perylene	mg/kg	0.9	<0.1	0.3	3.7	<0.1
Fraction Organic Carbon	N/A	0.020	#	#	#	#
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

ECõS

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Wednesday 27 September 2006

	BH/TP					
	Top Depth / m					
	Bottom Depth / m					
	Customer ID	D34	D35	D36	D37	D38
	Sample Type					
	Date Sampled					
	Receipt Date	13/09/06	13/09/06	13/09/06	13/09/06	13/09/06
	ECõS Sample ID	S0611293	S0611294	S0611295	S0611296	S0611297
	Matrix Type	Soil	Soil	Soil	Soil	Soil
Determinand	Units					
Arsenic	mg/kg	12.9	6.2	6.8	10.7	12.4
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	18.6	15.3	14.9	14.8	17.6
Lead	mg/kg	34.5	17.8	23.5	26.0	30.7
Mercury	mg/kg	0.2	0.1	0.1	0.2	0.2
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	3.3	1.5	0.7	1.2	1.6
Copper	mg/kg	26.4	18.0	18.3	20.4	23.5
Nickel	mg/kg	28.6	26.6	25.3	22.0	24.5
Zinc	mg/kg	91.1	91.0	89.3	71.3	75.8
PAH (sum of EPA 16)	mg/kg	1.8	<0.1	0.2	6.8	6.9
Sulphide	mg/kg	4.8	<2.0	<2.0	<2.0	<2.0
pH	N/A	8.2	8.2	8.1	8.4	8.3
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	<0.1	<0.1	1.0	1.0
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.5	0.4
Fluoranthene	mg/kg	0.6	<0.1	0.2	1.8	1.8
Pyrene	mg/kg	0.4	<0.1	<0.1	1.5	1.5
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.5	0.3
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.6	0.6
Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.3	0.4
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.3	0.3
Benzo(a)pyrene	mg/kg	0.2	<0.1	<0.1	0.3	0.3
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.2	0.2
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

ECõS

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Wednesday 27 September 2006

	BH/TP		
	Top Depth / m		
	Bottom Depth / m		
	Customer ID	D39	D40
	Sample Type		
	Date Sampled		
	Receipt Date	13/09/06	13/09/06
	ECõS Sample ID	S0611298	S0611299
	Matrix Type	Soil	Soil
Determinand	Units		
Arsenic	mg/kg	5.5	6.0
Cadmium	mg/kg	<0.2	<0.2
Chromium (total)	mg/kg	14.7	17.4
Lead	mg/kg	17.4	35.9
Mercury	mg/kg	0.1	0.1
Selenium	mg/kg	<1.0	<1.0
Boron (water soluble)	mg/kg	1.3	1.0
Copper	mg/kg	16.2	17.8
Nickel	mg/kg	24.8	31.6
Zinc	mg/kg	79.0	105.9
PAH (sum of EPA 16)	mg/kg	<0.1	<0.1
Sulphide	mg/kg	<2.0	<2.0
pH	N/A	8.0	8.0
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1
Benzo(a)pyrene	mg/kg	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0

lient Project Name: Hough Lane, Wombwell

roject Number: 232095

Client: Joynes Pike & Associates Ltd.

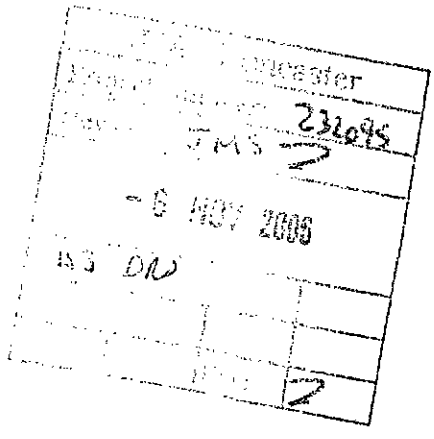
Reporting Date: Wednesday 27 September 2006

lotes and Preservation Details

lone

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes



Analytical Report Number: R06/1799

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	22767
Order Receipt Date:	20/10/06
Reporting Date:	Friday 3 November 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECōS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Client: Joynes Pike & Associates Ltd.

Project Number: 232095

Reporting Date: Friday 3 November 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

mple Pretreatment (Appended to Method of Detection)

= Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECōS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 3 November 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	1.0 mg/kg	17025	No	26/10/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	26/10/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	26/10/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	26/10/06
Mercury	ICP-OES	D	0.1 mg/kg	17025	No	02/11/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	26/10/06
Boron (water soluble)	ICP-OES	D	0.5 mg/kg	17025	No	02/11/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	26/10/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	26/10/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	26/10/06
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	27/10/06
pH	pH-meter	D	N/A	17025	No	25/10/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	01/11/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	26/10/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	26/10/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 3 November 2006

	Hole No./Sample ID					
	Top Depth / m					
	Bottom Depth / m					
	Sample No.	Sample D41	Sample D42	Sample D43	Sample D44	Sample D45
	Sample Type					
	Date Sampled					
	Receipt Date	20/10/06	20/10/06	20/10/06	20/10/06	20/10/06
	ECõS Sample ID	S0613514	S0613515	S0613516	S0613517	S0613518
	Matrix Type	Soil	Soil	Soil	Soil	Soil
Determinand	Units					
Arsenic	mg/kg	8.0	7.9	8.1	7.2	7.4
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	15.5	14.0	15.9	15.4	14.9
Lead	mg/kg	37.0	40.9	34.7	38.6	37.2
Mercury	mg/kg	0.5	0.3	0.3	0.2	0.3
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Copper	mg/kg	21.9	25.6	24.0	22.8	23.1
Nickel	mg/kg	24.7	24.6	24.6	22.9	24.2
Zinc	mg/kg	122.9	109.8	112.3	108.1	118.4
PAH (sum of EPA 16)	mg/kg	14.4	3.4	4.4	14.2	4.5
Sulphide	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
pH	N/A	8.5	9.5	8.0	8.8	8.2
Naphthalene	mg/kg	0.9	0.8	0.8	1.1	0.9
naphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.9	0.4	0.5	1.4	0.5
Anthracene	mg/kg	0.3	<0.1	<0.1	0.4	<0.1
Fluoranthene	mg/kg	2.7	0.6	0.9	2.8	0.9
Pyrene	mg/kg	2.2	0.5	0.8	2.4	0.6
Benzo(a)anthracene	mg/kg	1.3	0.2	0.3	1.3	0.3
Chrysene	mg/kg	1.1	0.3	0.3	1.2	0.3
Benzo(b)fluoranthene	mg/kg	1.3	0.2	0.3	1.3	0.3
Benzo(k)fluoranthene	mg/kg	0.5	0.1	0.2	0.4	0.2
Benzo(a)pyrene	mg/kg	1.1	0.2	0.2	1.0	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.6	0.2	0.2	0.6	0.3
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.5	0.1	0.1	0.5	0.2
Fraction Organic Carbon	N/A	0.006	#	#	#	#
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 3 November 2006

Hole No./Sample ID						
Top Depth / m						
Bottom Depth / m						
Sample No.		Sample D46	Sample D47	Sample D48	Sample D49	Sample D50
Sample Type						
Date Sampled						
Receipt Date		20/10/06	20/10/06	20/10/06	20/10/06	20/10/06
ECõS Sample ID		S0613519	S0613520	S0613521	S0613522	S0613523
Matrix Type		Soil	Soil	Soil	Soil	Soil
Determinand	*Units*					
Arsenic	mg/kg	8.4	8.0	7.4	8.3	7.7
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	14.5	13.3	15.0	15.3	14.4
Lead	mg/kg	31.2	35.6	32.2	32.7	28.6
Mercury	mg/kg	0.1	<0.1	0.1	<0.1	<0.1
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Copper	mg/kg	22.7	22.0	24.2	22.9	19.5
Nickel	mg/kg	22.2	23.1	26.1	23.7	23.1
Zinc	mg/kg	107.8	108.5	118.5	106.8	97.3
PAH (sum of EPA 16)	mg/kg	13.5	2.0	5.7	6.0	11.7
Sulphide	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
pH	N/A	8.2	8.1	8.5	8.4	8.4
Naphthalene	mg/kg	0.9	0.8	0.7	0.9	0.6
naphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
enaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.5	0.3	0.6	0.5	0.9
Anthracene	mg/kg	0.4	<0.1	0.2	<0.1	0.3
Fluoranthene	mg/kg	3.0	0.4	1.3	1.4	2.6
Pyrene	mg/kg	2.5	0.3	1.1	1.2	2.2
Benzo(a)anthracene	mg/kg	1.3	<0.1	0.3	0.5	1.1
Chrysene	mg/kg	1.1	<0.1	0.3	0.5	1.1
Benzo(b)fluoranthene	mg/kg	1.1	<0.1	0.4	0.4	1.0
Benzo(k)fluoranthene	mg/kg	0.3	<0.1	0.2	0.2	0.3
Benzo(a)pyrene	mg/kg	0.6	0.1	0.3	0.3	0.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.4	<0.1	0.2	0.3	0.5
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	<0.1	0.2	0.2	0.4
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 3 November 2006

	Hole No./Sample ID					
	Top Depth / m					
	Bottom Depth / m					
	Sample No.	Sample D51	Sample D52	Sample D53	Sample D54	Sample D55
	Sample Type					
	Date Sampled					
	Receipt Date	20/10/06	20/10/06	20/10/06	20/10/06	20/10/06
	ECõS Sample ID	S0613524	S0613525	S0613526	S0613527	S0613528
	Matrix Type	Soil	Soil	Soil	Soil	Soil
Determinand	Units					
Arsenic	mg/kg	7.4	8.5	7.9	7.1	9.0
Cadmium	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	15.0	15.6	15.6	13.9	16.1
Lead	mg/kg	31.8	37.7	33.9	31.6	36.9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Copper	mg/kg	22.4	24.5	23.4	22.7	25.0
Nickel	mg/kg	22.8	24.1	25.2	24.1	25.0
Zinc	mg/kg	102.5	111.7	117.5	105.4	114.7
PAH (sum of EPA 16)	mg/kg	8.8	4.8	3.7	1.8	4.0
Sulphide	mg/kg	<2.0	12.9	3.9	<2.0	<2.0
pH	N/A	8.7	8.1	8.4	8.6	8.1
Naphthalene	mg/kg	0.8	0.8	0.7	0.6	0.9
/naphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
cenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.8	0.6	0.5	0.3	0.4
Anthracene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	1.7	1.0	0.9	0.3	0.9
Pyrene	mg/kg	1.5	0.9	0.6	0.3	0.6
Benzo(a)anthracene	mg/kg	0.8	0.3	0.3	0.2	0.3
Chrysene	mg/kg	0.6	0.3	0.3	<0.1	0.3
Benzo(b)fluoranthene	mg/kg	1.0	0.3	0.3	0.2	0.2
Benzo(k)fluoranthene	mg/kg	0.2	0.2	0.2	<0.1	0.2
Benzo(a)pyrene	mg/kg	0.6	0.3	0.2	<0.1	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	0.3	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	0.2	<0.1	<0.1	0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Friday 3 November 2006

	Hole No./Sample ID		
	Top Depth / m		
	Bottom Depth / m		
	Sample No.	Sample D56	Sample D57
	Sample Type		
	Date Sampled		
	Receipt Date	20/10/06	20/10/06
	ECõS Sample ID	S0613529	S0613530
	Matrix Type	Soil	Soil
Determinand	Units		
Arsenic	mg/kg	8.1	<0.1
Cadmium	mg/kg	<0.2	<0.2
Chromium (total)	mg/kg	16.1	16.0
Lead	mg/kg	44.1	52.3
Mercury	mg/kg	<0.1	<0.1
Selenium	mg/kg	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5
Copper	mg/kg	26.4	22.9
Nickel	mg/kg	28.0	25.0
Zinc	mg/kg	121.0	120.4
PAH (sum of EPA 16)	mg/kg	4.5	2.0
Sulphide	mg/kg	<2.0	<2.0
pH	N/A	8.5	9.5
Naphthalene	mg/kg	0.7	0.8
enaphthylene	mg/kg	<0.1	<0.1
cenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	0.6	0.3
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	0.9	0.3
Pyrene	mg/kg	0.8	0.3
Benzo(a)anthracene	mg/kg	0.3	0.2
Chrysene	mg/kg	0.3	0.1
Benzo(b)fluoranthene	mg/kg	0.3	0.1
Benzo(k)fluoranthene	mg/kg	0.2	<0.1
Benzo(a)pyrene	mg/kg	0.2	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

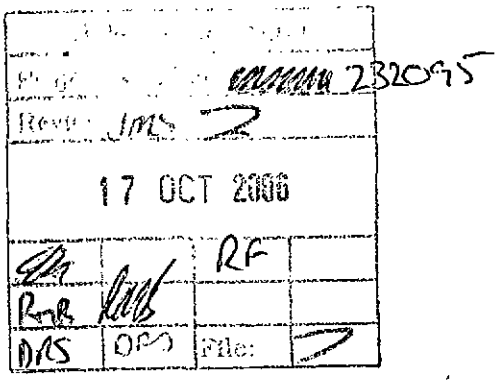
Reporting Date: Friday 3 November 2006

Notes and Preservation Details

None

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr J Fox



Analytical Report Number: R06/1682

Client Project Name:	Land at Fitzwilliam Fields, Manvers Way
Client Project Number:	222133
Your Order Number:	23349
Order Receipt Date:	10/10/06
Reporting Date:	Monday 16 October 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECōS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Land at Fitzwilliam Fields, Manvers Way

Project Number: 222133

Client: Joynes Pike & Associates Ltd.

Reporting Date: Monday 16 October 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed:

For and on behalf of ECOS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart ✓	Technical Manager

Client Project Name: Land at Fitzwilliam Fields, Manvers Way

Client: Joynes Pike & Associates Ltd.

Project Number: 222133

Reporting Date: Monday 16 October 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Arsenic	ICP-OES	D	0.1 mg/kg	17025	No	13/10/06
Cadmium	ICP-OES	D	0.2 mg/kg	17025	No	13/10/06
Chromium (total)	ICP-OES	D	0.2 mg/kg	17025	No	13/10/06
Lead	ICP-OES	D	0.5 mg/kg	17025	No	13/10/06
[illegible]ury	ICP-OES	D	0.1 mg/kg	17025	No	13/10/06
Selenium	ICP-OES	D	1.0 mg/kg	17025	No	13/10/06
Boron (water soluble)	ICP-OES	D	0.5 mg/kg	17025	No	13/10/06
Copper	ICP-OES	D	0.2 mg/kg	17025	No	13/10/06
Nickel	ICP-OES	D	0.2 mg/kg	17025	No	13/10/06
Zinc	ICP-OES	D	0.2 mg/kg	17025	No	13/10/06
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Sulphide	Colorimetry	R	2.0 mg/kg	17025	No	10/10/06
pH	pH-meter	D	N/A	17025	No	12/10/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Fluorene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
[illegible]ene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	13/10/06
Chromium (hexavalent)	ICP-OES	D	1.0 mg/kg	17025	No	13/10/06
Fraction Organic Carbon	Titration	D	0.001 N/A	None	No	12/10/06

Client Project Name: Land at Fitzwilliam Fields, Manvers Way

Client: Joynes Pike & Associates Ltd.

Project Number: 222133

Reporting Date: Monday 16 October 2006

BH/TP				
Top Depth / m				
Bottom Depth / m				
Customer ID		Mexborough SPO1	Mexborough SPO2	Mexborough SPO3
Sample Type		Clay	Clay	Clay
Date Sampled				
Receipt Date		10/10/06	10/10/06	10/10/06
ECõS Sample ID		S0612698	S0612699	S0612700
Matrix Type		Soil	Soil	Soil
Determinand	Units			
Arsenic	mg/kg	9.9	8.9	10.0
Cadmium	mg/kg	<0.2	<0.2	<0.2
Chromium (total)	mg/kg	17.6	19.5	18.4
Lead	mg/kg	24.0	21.5	23.3
Mercury	mg/kg	<0.1	<0.1	<0.1
Selenium	mg/kg	<1.0	<1.0	<1.0
Boron (water soluble)	mg/kg	<0.5	<0.5	<0.5
Copper	mg/kg	20.0	20.3	19.5
Nickel	mg/kg	24.4	26.9	24.6
Zinc	mg/kg	69.9	74.4	73.8
PAH (sum of EPA 16)	mg/kg	0.3	<0.1	<0.1
Sulphide	mg/kg	<2.0	<2.0	<2.0
pH	N/A	7.4	7.5	7.4
Naphthalene	mg/kg	<0.1	<0.1	<0.1
ıphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	<0.1	<0.1	<0.1
ndeno(1,2,3-cd)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Chromium (hexavalent)	mg/kg	<1.0	<1.0	<1.0
raction Organic Carbon	N/A	#	0.013	#

Client Project Name: Land at Fitzwilliam Fields, Manvers Way

Client: Joynes Pike & Associates Ltd.

Project Number: 222133

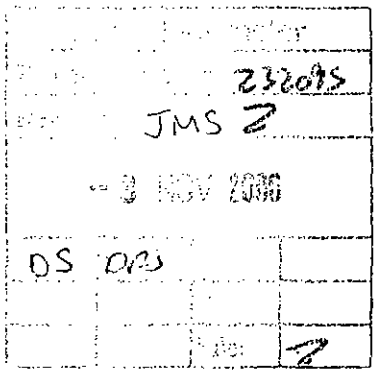
Reporting Date: Monday 16 October 2006

Notes and Preservation Details

None

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr D Sykes



Analytical Report Number: R06/1868

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	22782
Order Receipt Date:	26/10/06
Reporting Date:	Tuesday 31 October 2006

If you have any queries regarding this report please contact our Customer Services Manager

ECōS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 31 October 2006

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2000.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECōS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 31 October 2006

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
PAH (sum of EPA 16)	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Naphthalene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Acenaphthylene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Acenaphthene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
F[illegible]ene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Phenanthrene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Anthracene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Pyrene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Benzo(a)anthracene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Chrysene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Benzo(b)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Benzo(k)fluoranthene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Benzo(a)pyrene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Indeno(1,2,3-cd)pyrene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Dibenz(a,h)anthracene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Benzo(g,h,i)perylene	GC-MS	D	0.1 mg/kg	17025	No	31/10/06
Fraction Organic Carbon	Titration	D	0.001	None	No	30/10/06

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 31 October 2006

	BH/TP					
	Top Depth / m					
	Bottom Depth / m					
	Customer ID	Bramley D1	Bramley D2	Bramley D3	Bramley D4	Bramley D5
	Sample Type					
	Date Sampled					
	Receipt Date	26/10/06	26/10/06	26/10/06	26/10/06	26/10/06
	ECõS Sample ID	S0613881	S0613882	S0613883	S0613884	S0613885
	Matrix Type	Soil	Soil	Soil	Soil	Soil
Determinand	Units					
PAH (sum of EPA 16)	mg/kg	1.3	6.3	1.4	0.7	1.2
Naphthalene	mg/kg	0.2	0.3	0.3	0.3	0.3
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	0.7	0.2	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.3	1.6	0.3	0.2	0.3
Pyrene	mg/kg	0.3	1.4	0.3	0.2	0.3
Benzo(a)anthracene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	mg/kg	0.2	0.6	0.2	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.2	0.4	<0.1	<0.1	0.1
Indeno(1,2,3-cd)pyrene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Di[illegible]z(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Fraction Organic Carbon	N/A	0.003	#	#	#	#

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 31 October 2006

Notes and Preservation Details

None

ALcontrol Geochem

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LS22 7RD

ATTN: Simon Hinkins

CERTIFICATE OF ANALYSIS

Date:	08 August, 2006
Our Reference:	06/08539/02/08
Your Reference:	85086
Location:	STONEGATE/BRAMLEY

A total of 86 samples was received for analysis between Tuesday, 23 May 2006 and Friday, 09 June 2006 and completed on Wednesday, 28 June 2006. Accredited laboratory tests are defined in the log sheet, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association. This report contains results for samples TP213 to TP225.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Signed

Diane Whittlestone, Customer Services
Jane Seymour, Customer Services
David O'Hare, Customer Services
Caroline Suttie, Customer Services

Valid if signed by any of the above signatories.

MCERTS

1291
GROUP

Compiled By

Paul Armitage

ALcontrol Geochem is a trading division of ALcontrol UK Limited.
Registered Office: Templeborough House, Mill Close, Rotherham, S60 1BZ. Registered in England and Wales No. 4057291

ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 06/3539/02
CLIENT : Encia Consulting
CONTACT : Simon Hinkins
DATE OF RECEIPT : 02/06/06
LOCATION : STONEGATE/BRAMLEY

BATCH NUMBER : 3
CLIENT REF/CODE : 85086
ORDER NUMBER : 85086-AB2-5270
TURNAROUND : 5 days

Numeric values indicate additional scheduling

* indicates test subcontracted

Sample Number	Sample Identity	P / V	Depth	Sample Type	Metals ICP, 9 (S)	Boron Water Soluble (S)	pH (S)	Sulphate Soluble Kone 2:1 (S)
		UKAS Accredited ?			✓	✓	✓	✓
43	TP213 J1	JAR	1.00	SOIL	X	X	X	X
44	TP214 J1	JAR	0.80	SOIL	X	X	X	X
45	TP215 J1	JAR	1.00	SOIL	X	X	X	X
46	TP216 J1	JAR	0.40	SOIL	X	X	X	X
47	TP217 J1	JAR	0.60	SOIL	X	X	X	X
48	TP218 J1	JAR	0.50	SOIL				
49	TP219 J1	JAR	0.30	SOIL	X	X	X	X
50	TP220 J1	JAR	0.50	SOIL	X	X	X	X
51	TP222 J1	JAR	0.50	SOIL	X	X	X	X
52	TP223 J1	JAR	0.50	SOIL	X	X	X	X
53	TP224 J1	JAR	0.30	SOIL				
54	TP225 J1	JAR	0.50	SOIL	X	X	X	X
		Total Number of Tests			10	10	10	10

Printed : 08/06/06 11:34:25

0/OCT/2006/FRI 14:29

ALcontrol Geochem Analytical Services
Sample Descriptions

Job Number: 06/08539/02/08
Client: Encia Consulting
Client Ref : 85086

Grain sizes

<0.063mm	Very Fine
0.1mm - 0.063mm	Fine
0.1mm - 2mm	Medium
2mm - 10mm	Coarse
>10mm	Very Coarse

Sample Identity	Depth (m)	Colour	Grain Size	Description	Batch
TP213 J1	1.0	Brown	0.1mm - 0.063mm	Silty Clay with some Stones	3
TP214 J1	0.8	Brown	0.1mm - 0.063mm	Silty Clay	3
TP215 J1	1.0	Brown	0.1mm - 0.063mm	Silty Clay with some Stones	3
TP216 J1	0.4	Brown	0.1mm - 0.063mm	Silty Clay with some Stones	3
TP217 J1	0.6	Brown	0.1mm - 0.063mm	Silty Clay with some Stones	3
TP219 J1	0.3	Light Grey	0.1mm - 0.063mm	Silt with some Stones	3
TP220 J1	0.5	Brown	0.1mm - 0.063mm	Sand	3
TP222 J1	0.5	Brown	0.1mm - 0.063mm	Silty Clay with some Stones	3
TP223 J1	0.5	Brown	0.1mm - 0.063mm	Silty Clay	3
TP225 J1	0.5	Brown	0.1mm - 0.063mm	Clay	3

* These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials-whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.
Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
[1] *Sample Description supplied by client*

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

* ISO 17025 accredited
M MCERTS accredited
\# Subcontracted test
» Shown on prev. report

Job Number: 06/08539/02/08 **Matrix:** SOLID
Client: Encia Consulting **Location:** STONEGATE/BRAMLEY
Client Ref. No.: 85086 **Client Contact:** Simon Hinkins

Sample Identity	TP213 J1	TP214 J1	TP215 J1	TP216 J1	TP217 J1	TP219 J1	TP220 J1	TP222 J1	TP223 J1	Method Code	LoD/Units
Depth (m)	1.0	0.8	1.0	0.4	0.6	0.3	0.5	0.5	0.5		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	31.05.06	31.05.06	31.05.06	31.05.06	31.05.06	31.05.06	31.05.06	31.05.06	31.05.06		
Sample Received Date	02.06.06	02.06.06	02.06.06	02.06.06	02.06.06	02.06.06	02.06.06	02.06.06	02.06.06		
Batch	3	3	3	3	3	3	3	3	3		
Sample Number(s)	43	44	45	46	47	49	50	51	52		
Boron Water Soluble	<1	<1	<1	<1	<1	<1	<1	1	<1	TM129$^{*}_{M}$	<1 mg/kg
Arsenic	1	<1	2	<1	<1	<1	<1	2	12	TM129$^{*}_{M}$	<1 mg/kg
Cadmium	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM129$^{*}_{M}$	<1 mg/kg
Chromium	8	11	7	20	7	4	8	9	10	TM129$^{*}_{M}$	<1 mg/kg
Copper	<1	<1	7	3	3	6	<1	3	4	TM129$^{*}_{M}$	<1 mg/kg
Lead	21	27	67	25	18	6	26	36	50	TM129$^{*}_{M}$	<1 mg/kg
Mercury	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	TM129$^{*}_{M}$	<1.2 mg/kg
Nickel	11	16	9	8	10	<1	12	12	13	TM129$^{*}_{M}$	<1 mg/kg
Selenium	<3	<3	<3	<3	<3	<3	<3	<3	<3	TM129$^{*}_{M}$	<3 mg/kg
Zinc	31	74	163	44	31	160	61	63	62	TM129$^{*}_{M}$	<1 mg/kg
Water Soluble Sulphate as SO4 2:1 Extract	0.013	0.012	0.007	0.046	0.015	0.036	0.038	0.013	0.026	TM098$^{\#}_{M}$	<0.003 g/l
pH Value	8.12	7.90	7.86	8.39	8.18	8.84	7.53	7.75	8.00	TM133$^{*}_{M}$	<1.00 pH Units

All results expressed on a dry weight basis.

Date 08.08.2006

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 06/08539/02/08 **Matrix:** SOLID
Client: Encia Consulting **Location:** STONEGATE/BRAMLEY
Client Ref. No.: 85086 **Client Contact:** Simon Hinkins

Sample Identity	TP225 J1									Method Code	LoD/Units
Depth (m)	0.5										
Sample Type	SOIL										
Sampled Date	31.05.06										
Sample Received Date	02.06.06										
Batch	3										
Sample Number(s)	54										
Boron Water Soluble	<1									TM129#M	<1 mg/kg
Arsenic	2									TM129#M	<1 mg/kg
Cadmium	<1									TM129#M	<1 mg/kg
Chromium	10									TM129#M	<1 mg/kg
Copper	<1									TM129#M	<1 mg/kg
Lead	30									TM129#M	<1 mg/kg
Mercury	<1.2									TM129#M	<1.2 mg/kg
Nickel	11									TM129#M	<1 mg/kg
Selenium	<3									TM129#M	<3 mg/kg
Zinc	38									TM129#M	<1 mg/kg
Water Soluble Sulphate as SO4 2:1 Extract	0.021									TM098#M	<0.003 g/l
pH Value	7.79									TM133#M	<1.00 pH Units

All results expressed on a dry weight basis.

Date 08.08.2006

ALcontrol Geochem Analytical Services
Table Of Results - Appendix

Job Number: 06/08539/02/08
Client: Encia Consulting
Client Ref. No.: 85086

Report Key :

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03×10^{-7}

NDP	No Determination Possible	*	Subcontracted test
NFD	No Fibres Detected	»	Result previously reported (Incremental reports only)
#	ISO 17025 accredited	M	MCERTS Accredited
PFD	Possible Fibres Detected	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control.

Summary of Method Codes contained within report :

Method No.	Reference	Description	ISO 17025 Accredited	MCERTS Accredited	Wet/Dry Sample[1]	Surrogate Corrected
TM098	Method 4500E, AWWA/APHA, 20th Ed., 1999	Determination of Sulphate using the Kone Analyser	✓	✓	DRY	
TM129	Method 3120B, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 3050B	Determination of Metal Cations by IRIS Emission Spectrometer	✓	✓	DRY	
TM133	BS 1377: Part 3 1990	Determination of pH in Soil and Water using the GLpH pH Meter	✓	✓	WET	

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

ALcontrol Geochem Analytical Services
Table Of Results - Appendix

Job Number: 06/08539/02/08
Client: Encia Consulting
Client Ref. No.: 85086

Summary of Coolbox temperatures

Batch No.	Coolbox Temperature (°C)
3	13

Mean Value Test

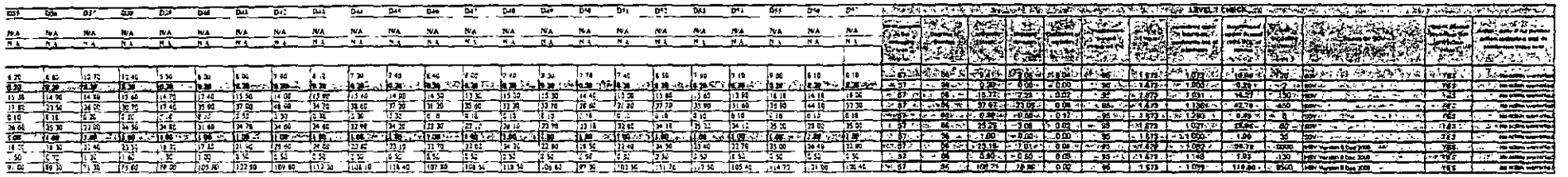
[illegible]	[illegible]
[illegible]	Exceeds screen and is potential outlier
	Does not exceed screen but may be outlier
	Exceeds screen but is not an outlier

[illegible]

[illegible]

Former Foundry, Hough Lane, Wombwell
Ben Bailey Homes Ltd
Ongoing Bulk Fill Analysis 08/13/08

CAS No.	Determinand	Units	*Screening Value	*Source of screening value	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34
					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Arsenic	mg/kg	20	SGV	3.90	4.40	4.20	6.20	7.00	7.90	11.20	9.10	6.40	7.10	8.30	7.20	8.60	10.30	8.20	13.10	8.30	6.40	7.30	5.70	10.60	10.30	10.60	13.50	17.90	12.60	11.60	11.50	11.80	11.10	12.60	15.60	9.10	12.90
	Cadmium	mg/kg	2	SGV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Chromium	mg/kg	130	SGV	13.10	15.20	13.70	14.60	17.30	14.90	14.20	14.40	15.60	14.90	16.20	15.60	14.50	12.50	16.60	13.20	17.40	15.40	16.30	17.00	13.50	14.60	14.60	17.40	17.10	20.00	14.20	14.60	20.30	19.50	19.60	20.80	17.20	18.50
	Lead	mg/kg	450	SGV	19.30	20.20	22.50	35.10	38.80	31.90	40.50	46.40	45.00	41.10	136.40	121.70	45.90	50.10	52.80	63.90	25.20	27.10	44.00	24.80	37.10	34.80	71.20	46.40	37.50	38.40	33.00	33.80	43.80	26.70	45.60	125.20	32.50	34.50
	Mercury	mg/kg	8	SGV	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	2.30	2.00	1.90	1.50	1.30	1.10	0.80	0.80	0.10	0.10	0.10	0.10	0.50	0.50	0.50	0.40	0.40	0.40	0.30	0.30	0.50	0.40	0.70	0.40	0.20	0.70
	Nickel	mg/kg	50	SGV	24.90	27.40	31.10	36.90	29.10	24.60	32.80	33.40	25.50	25.60	26.30	26.60	28.00	28.90	31.80	21.50	34.10	30.00	33.50	30.00	22.80	34.20	34.50	29.50	29.10	28.30	33.50	24.20	33.60	28.20	26.70	18.70	27.60	28.60
	Selenium	mg/kg	35	SGV	1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Copper	mg/kg	8000	USGV Residential Dec 2008	16.60	21.30	17.00	22.30	22.50	24.10	28.50	24.70	21.70	23.60	26.70	22.50	33.50	37.40	38.70	45.70	31.10	17.60	21.30	18.50	23.40	24.10	25.70	40.30	41.30	37.20	33.00	23.60	28.10	32.30	28.60	46.40	22.60	23.40
	Boron	mg/kg	150	USGV Residential Dec 2008	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.70	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	1.00	1.20	1.40	1.20	0.60	0.50	0.60	1.40	1.70	2.10	0.90	0.50	1.00	1.40	0.60	0.80	1.60	3.30
	Zinc	mg/kg	3500	USGV Residential Dec 2008	124.30	122.40	82.90	115.30	156.30	119.90	84.00	122.00	134.40	119.60	138.20	133.00	87.60	88.90	86.40	97.80	119.70	119.90	149.80	120.30	81.80	84.00	79.70	115.60	185.00	114.30	85.20	84.80	103.00	80.20	96.30	140.30	78.65	91.10



Maximum Value Test

232885
Former Foundry, Hough Lane, Wombwell
Ben Bailey Homes Ltd.
Ongoing Bulk Fill Analysis 08/11/06

Log 10 concentrations

Key

may be an outlier

Insert extra columns using the button as with the Mean Value sheet. Then copy across the formulas from column E.

CAS REG	Determinand	Units	Sample Ref	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35
			trial pit / borehole ref	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Depth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0	Arsenic	mg/kg		0.5911	0.8062	0.7993	0.7924	0.8451	0.8576	1.0492	0.959	0.8062	0.8513	0.8191	0.8573	0.9823	1.0128	0.9638	1.0483	0.7993	0.8062	0.8781	0.7558	1.0253	1.0334	1.0263	1.1303	1.2829	1.1004	1.0645	1.0607	1.0719	1.0453	1.1004	1.1931	0.959	1.1706	0.7924
0	Cadmium	mg/kg		[illegible]																																		
0	Chromium	mg/kg		1.1173	1.1818	1.1038	1.1644	1.238	1.1733	1.1523	1.2148	1.1875	1.1732	1.2095	1.1931	1.1614	1.0969	1.2041	1.1206	1.2405	1.1875	1.2122	1.2304	1.1303	1.1644	1.1644	1.2405	1.233	1.301	1.1523	1.1644	1.3075	1.2175	1.2933	[illegible]	1.2355	1.2695	1.1847
0	Lead	mg/kg		1.2856	1.4454	1.3522	1.5453	1.5798	1.5038	1.6075	1.6665	1.6532	1.786	[illegible]		1.6618	1.6998	1.7226	1.6055	1.4014	1.433	1.6628	1.3945	1.5694	1.5416	1.8525	1.6064	1.574	1.5843	1.5051	1.5185	1.6416	1.4266	1.659	[illegible]	1.5132	1.5376	[illegible]
0	Mercury	mg/kg		-1	-1	-1	-1	-1	-1	-1	-1	0.3617	0.301	0.2788	0.1761	0.1139	0.0414	-0.097	-0.097	-1	-1	-1	-1	-0.301	-0.301	-0.301	-0.398	-0.398	-0.398	-0.523	-0.523	-0.301	-0.398	-0.523	-0.398	-0.699	-0.699	-1
0	Nickel	mg/kg		1.3962	1.4378	1.3243	1.4298	1.4638	1.3909	1.3841	1.3692	1.4065	1.4082	1.42	1.3909	1.3139	1.3201	1.3404	1.3324	1.5328	1.4771	1.5119	1.4771	1.3579	1.3838	1.3892	1.4898	1.4639	1.4548	[illegible]	[illegible]	1.3729	1.4502	1.4265	1.3718	1.4408	1.4564	1.4249
0	Selenium	mg/kg		[illegible]																																		
0	Copper	mg/kg		1.2201	1.3284	1.2304	1.3493	1.3522	1.4166	1.4698	1.3927	1.3365	1.3729	1.4266	1.3674	1.525	1.5729	1.5877	1.6599	1.3243	1.3456	1.3284	1.2672	1.3692	1.382	1.4089	1.6053	1.616	1.5705	1.3617	1.3729	1.4667	1.3483	1.4564	1.6848	1.3541	1.4216	1.2553
0	Boron	mg/kg		-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.155	0	0	0	-0.301	-0.301	-0.301	-0.301	-0.301	0.2553	0.3424	0.2553	0.2553	-0.222	-0.301	-0.222	0.1461	0.2304	0.3222	-0.046	-0.097	0.2553	0.1461	-0.222	-0.097	0.2041	0.5185	0.1761
0	Zinc	mg/kg		2.1014	2.0878	1.9186	2.0618	2.194	2.0788	1.9956	2.0829	2.0584	2.0777	2.1405	2.1268	1.9426	1.9489	1.9365	1.9803	2.0781	2.0788	2.1755	2.0789	1.9128	1.9243	1.9015	2.063	2.0212	2.0577	1.9201	1.9284	2.0126	1.9504	1.9836	2.1471	1.8954	1.9595	1.959

D36	D37	D38	D39	D40	D41	D42	D43	D44	D45	D46	D47	D48	D49	D50	D51	D52	D53	D54	D55	D56	D57
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0.8326	1.0294	1.0934	0.7404	0.7782	0.9031	0.8976	0.9085	0.8573	0.8692	0.9243	0.9031	0.8692	0.9191	0.8865	0.8692	0.9294	0.8976	0.8513	0.9542	0.9085	-1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.1732	1.1703	1.2455	1.1673	1.2405	1.1903	1.1461	1.2014	1.1875	1.1732	1.1614	1.1239	1.1761	1.1847	1.1584	1.1761	1.1931	1.1931	1.143	1.2068	1.2068	1.2041
1.3711	1.415	1.4871	1.2405	1.5551	1.5682	1.6117	1.5403	1.5866	1.5705	1.4942	1.6614	1.5079	1.5145	1.4564	1.5024	1.5763	1.5302	1.4997	1.567	1.6444	1.7185
-1	-0.699	-0.699	-1	-1	-0.301	-0.523	-0.523	-0.699	-0.523	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
1.4031	1.3424	1.3892	1.3945	1.4997	1.3927	1.3909	1.3909	1.3598	1.3838	1.3464	1.3636	1.4166	1.3747	1.3636	1.3579	1.382	1.4014	1.382	1.3979	1.4472	1.3979
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.2625	1.3096	1.3711	1.2095	1.2504	1.3404	1.4082	1.3802	1.3579	1.3636	1.356	1.3424	1.3838	1.3598	1.29	1.3502	1.3892	1.3692	1.356	1.3979	1.4216	1.3598
-0.155	0.0792	0.2041	0.1139	0	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301	-0.301
1.9509	1.8531	1.8797	1.8976	2.0249	2.0896	2.0406	2.0504	2.0338	2.0734	2.0326	2.0364	2.0737	2.0286	1.9881	2.0107	2.0481	2.07	2.0228	2.0596	2.0828	2.0806

[illegible] LEVEL 1 TEST [illegible]									
Mean of Log10 of values	Unbiased standard deviation of log10 values	Outlier T stat	critical value required	[illegible]	value Test	Max Value	maximum value less than selected critical value	[illegible]	Approx Value of Outlier @ T = Test
0.898	0.284	1.247	10	67	2.818	17.90	YES	Assume maximum value is not an outlier	60.09
0.699	0.000	#DIV/0!	10	57	2.818	0.20	#DIV/0!	#DIV/0!	0.20
1.194	0.065	4.26	10	87	2.818	26.80	[illegible]	Maximum value may be an outlier	22.35
1.576	0.178	3.174	10	67	2.818	136.40	[illegible]	Maximum value may be an outlier	118.09
-0.650	0.414	2.442	10	57	2.818	2.30	YES	Assume maximum value is not an outlier	3.29
1.400	0.061	2.889	10	57	2.818	34.10	YES	Assume maximum value is not an outlier	35.04
0.000	0.000	#DIV/0!	10	57	2.818	1.00	#DIV/0!	#DIV/0!	1.00
1.387	0.106	2.611	10	67	2.818	48.40	YES	Assume maximum value is not an outlier	48.48
-0.118	0.238	2.699	10	57	2.818	3.20	YES	Assume maximum value is not an outlier	3.62
2.021	0.078	2.212	10	57	2.818	156.30	YES	Assume maximum value is not an outlier	174.26

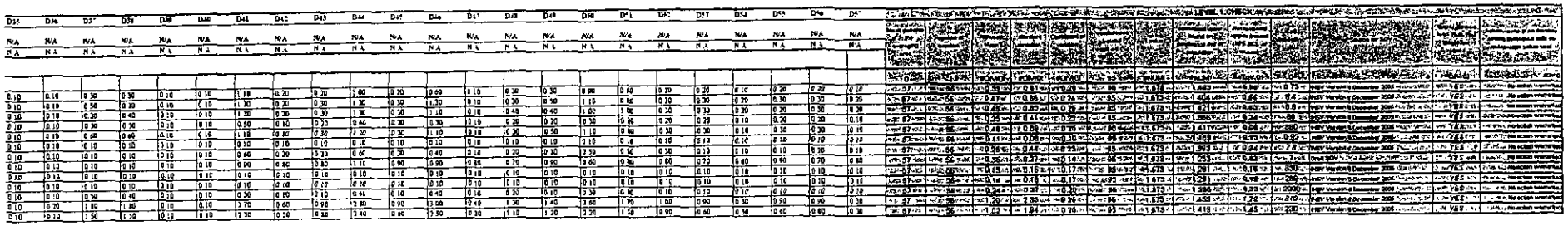
Mean Value Test

222060
Former Foundry, Hough Lane, Wombwell
Ben Bailey Homes Ltd.
Ongoing Base Fail Analysis 26/08/08

Key	EXCEEDS screen and IS DEEMED SUSPECT
	Does not exceed screen but may be SUSPECT
	EXCEEDS screen but IS NOT SO SUSPECT

To enter results into this table, click on column (if any) and click the Import Columns button, entering the number of columns required. Then either type in the results, or paste them in. Do NOT try the Import Copied Cells option, as this loses the formatting info.

CAS No.	Determinand	Units	Screening Value	Source of screening value	Sample No.	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34
					and pit / borehole ref	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
					Depth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Benzo (a) pyrene	mg/kg	4.73	LQM Version 4 December 2015		0.10	0.20	0.90	0.10	0.10	0.10	1.10	0.40	0.10	0.10	0.60	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	1.90	0.10	0.50	[illegible]	0.10	0.20
	benz (a) anthracene	mg/kg	0.2	LQM Version 4 December 2015		0.10	0.30	0.90	0.20	0.10	0.10	1.30	0.50	0.10	0.10	0.60	0.10	0.10	0.30	0.10	0.30	0.10	0.10	0.10	0.10	0.10	0.30	0.10	0.10	0.30	0.10	0.10	0.10	1.70	0.20	0.50	[illegible]	0.10	0.10
	benz (b) fluoranthene	mg/kg	5.4	LQM Version 4 December 2015		0.10	0.30	1.00	0.10	0.20	0.10	1.40	0.50	0.10	0.10	0.50	0.10	0.10	0.10	0.10	0.30	0.10	0.10	0.10	0.10	0.10	0.30	0.10	0.10	0.40	0.10	0.10	0.10	1.80	0.10	0.50	[illegible]	0.10	0.10
	benz (k) fluoranthene	mg/kg	68	LQM Version 4 December 2015		0.10	0.20	0.70	0.10	0.10	0.10	0.70	0.30	0.10	0.10	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.90	0.10	0.50	[illegible]	0.10	0.10
	chrysene	mg/kg	350	LQM Version 4 December 2015		0.10	0.30	1.00	0.30	0.10	0.10	1.40	0.50	0.10	0.10	0.80	0.10	0.10	0.30	0.10	0.30	0.10	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.30	0.10	0.10	0.10	0.90	0.10	0.50	[illegible]	0.10	0.10
	dibenz (a,h) anthracene	mg/kg	0.42	LQM Version 4 December 2015		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	[illegible]	0.10	0.10
	indeno (1,2,3-c,d) pyrene	mg/kg	7.8	LQM Version 4 December 2015		0.10	0.20	0.60	0.10	0.10	0.10	0.70	0.30	0.10	0.10	0.40	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.80	0.10	0.10	[illegible]	0.10	0.10
	naphthalene	mg/kg	2.3	Draft 2007		0.10	0.10	0.10	0.10	0.10	0.10	0.40	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	[illegible]	0.10	0.10
	Acenaphthene	mg/kg	220	LQM Version 4 December 2015		0.10	0.10	0.10	0.10	0.10	0.10	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.30	0.10	0.10	[illegible]	0.10	0.10
	Fluorene	mg/kg	250	LQM Version 4 December 2015		0.10	0.10	0.10	0.10	0.10	0.10	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	[illegible]	0.10	0.10
	Anthracene	mg/kg	2000	LQM Version 4 December 2015		0.10	0.10	0.60	0.10	0.10	0.10	0.50	0.20	0.10	0.10	0.50	0.20	0.20	0.20	0.20	0.20	0.20	0.50	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	[illegible]	0.10	0.10
	Fluoranthene	mg/kg	310	LQM Version 4 December 2015		0.10	0.60	2.30	0.50	0.20	0.10	3.20	1.00	0.30	0.30	1.90	1.00	0.70	0.50	0.40	0.80	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.70	0.10	0.10	0.10	5.30	0.50	1.40	1.90	0.50	0.40
	Pyrene	mg/kg	330	LQM Version 4 December 2015		0.10	0.60	2.80	0.50	0.20	0.10	2.40	0.90	0.20	0.20	1.30	1.00	0.30	0.30	0.50	0.50	0.30	0.70	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.10	0.10	0.10	4.40	0.50	1.60	1.80	0.50	0.40



Maximum Value Test

232003
Former Foundry, Haugh Lane, Wombwell
Ben Bailey Homes Ltd.
Ongoing Bulk Fill Analysis 26/09/06

Log 10 concentrations

Key: [illegible]

[illegible] may be an outlier

Insert extra columns using the button as with the *Mean Value sheet*. Then copy across the *formulae from column E*.

CAS REG	Determinand	Units		Sample Ref	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	D29	D30	D31	D32	D33	D34	D35
				trial pit / borehole ref	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
				Depth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0		0	0		#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
0	Benzo (a) pyrene	mg/kg			-1	-0.699	-0.046	-1	-1	-1	0.0414	-0.398	-1	-1	-0.222	-1	-1	-1	-1	-0.699	-1	-1	-1	-1	-1	-1	-1	-0.699	-0.699	-1	-1	-1	0.2788	-1	-0.301	[illegible]	-1	-0.699	-1
0	benz (a) anthracene	mg/kg			-1	-0.523	-0.046	-0.699	-1	-1	0.1139	-0.301	-1	-1	-0.222	-0.222	-0.699	-0.523	-1	-0.523	-1	-1	-1	-1	-1	-1	-1	-0.523	-0.523	-0.523	-1	-1	-0.222	-0.699	-0.301	[illegible]	-1	-1	-1
0	benz (b) fluoranthene	mg/kg			-1	-0.523	0	-1	-0.699	-1	0.1461	-0.301	-1	-1	-0.301	-0.398	-1	-1	-1	-0.699	-1	-1	-1	-1	-1	-1	-1	-1	-0.398	-0.523	-1	-1	0.2553	-1	-0.523	[illegible]	-1	-1	-1
0	benz (k) fluoranthene	mg/kg			-1	-0.699	-0.155	-1	-1	-1	-0.155	-0.523	-1	-1	-0.523	-0.523	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.699	-1	-1	-1	-0.046	-1	-0.523	[illegible]	-1	-1	-1
0	chrysene	mg/kg			-1	-0.523	0	-0.523	-1	-1	0.1461	-0.301	-1	-1	-0.097	-0.222	-0.699	-0.699	-0.699	-0.699	-1	-1	-1	-1	-1	-1	-1	-0.523	-0.523	-0.523	-1	-1	0.2222	-0.699	-0.155	[illegible]	-1	-1	-1
0	dibenz (a,h) anthracene	mg/kg			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]	-1	-1	-1
0	indeno (1,2,3-c,d) pyrene	mg/kg			-1	-1	-0.222	-1	-1	-1	-0.155	-0.523	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.699	-1	-1	-1	-0.097	-1	-1	[illegible]	-1	-1	-1
0	Naphthalene	mg/kg			-1	-1	-1	-1	-1	-1	-0.398	-0.699	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0.2041	-1	-1	-0.301	-1	-1	-1
0	Acenaphthene	mg/kg			-1	-1	-1	-1	-1	-1	-0.523	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-0.523	-1	-1	[illegible]	-1	-1	-1
0	Fluorene	mg/kg			-1	-1	-1	-1	-1	-1	-0.523	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	[illegible]	-1	-1	[illegible]	-1	-1	-1
0	Anthracene	mg/kg			-1	-1	-0.222	-1	-1	-1	-0.301	-0.699	-1	-1	-0.301	-0.699	-0.699	-0.699	-0.699	-0.699	-0.301	-1	-1	-1	-1	-1	-1	-1	-0.699	-1	-0.699	-1	-1	0.0792	-1	-0.523	[illegible]	-1	-1	-1
0	Fluoranthene	mg/kg			-1	-0.222	0.3617	-0.301	-0.699	-1	0.5051	0	-0.523	-0.523	0.1761	0	-0.523	-0.301	-0.398	-0.097	-1	-1	-1	-1	-1	-1	-1	-0.155	0	-0.301	-1	-1	0.7243	-0.301	0.2553	1.2278	-0.301	-0.222	-1
0	Pyrene	mg/kg			-1	-0.222	0.4472	-0.301	-0.699	-1	0.4472	-0.046	-0.699	-0.699	0.1139	0	-0.523	-0.301	-0.523	-0.155	-1	-1	-1	-1	-1	-1	-1	-0.301	-0.097	-0.398	-1	-1	0.6435	-0.301	0.2041	1.1399	-0.523	-0.398	-1

D36	D37	D38	D39	D40	D41	D42	D43	D44	D45	D46	D47	D48	D49	D50	D51	D52	D53	D54	D55	D56	D57
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
-1	-0.523	-0.523	-1	-1	0.0414	-0.699	-0.699	0	-0.699	-0.222	-1	-0.523	-0.523	-0.046	-0.222	-0.523	-0.699	-1	-0.699	-0.699	-1
-1	-0.301	-0.523	-1	-1	0.1139	-0.699	-0.523	0.1139	-0.523	0.1139	-1	-0.523	-0.301	0.0414	-0.097	-0.523	-0.523	-0.699	-0.523	-0.523	-0.699
-1	-0.523	-0.398	-1	-1	0.1139	-0.699	-0.523	0.1139	-0.523	0.0414	-1	-0.398	-0.398	0	0	-0.523	-0.523	-0.699	-0.699	-0.523	-0.699
-1	-0.523	-0.523	-1	-1	-0.301	-1	-0.699	-0.398	-0.699	-0.523	-1	-0.699	-0.699	-0.523	-0.699	-0.699	-0.699	-1	-0.699	-0.699	-1
-1	-0.222	-0.222	-1	-1	0.0414	-0.523	-0.523	0.0792	-0.523	0.0414	-1	-0.523	-0.301	0.0414	-0.222	-0.523	-0.523	-1	-0.523	-0.523	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-0.222	-0.699	-0.699	-0.222	-0.523	-0.398	-1	-0.699	-0.523	-0.301	-0.301	-0.523	-1	-1	-1	-0.699	-1
-1	-1	-1	-1	-1	-0.046	-0.097	-0.097	0.0414	-0.046	-0.046	-0.097	-0.155	-0.046	-0.222	-0.097	-0.097	-0.155	-0.222	-0.046	-0.155	-0.097
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-1	-0.301	-0.398	-1	-1	-0.523	-1	-1	-0.398	-1	-0.398	-1	-0.699	-1	-0.523	-0.523	-1	1	-1	-1	-1	-1
-0.699	0.2553	0.2553	-1	-1	0.4314	-0.222	-0.046	0.4472	-0.046	0.4771	-0.398	0.1139	0.1461	0.415	0.3054	0	-0.046	-0.523	-0.046	-0.046	-0.523
-1	0.1761	0.1761	-1	-1	0.3424	-0.301	-0.097	0.3802	-0.222	0.3979	-0.523	0.0414	0.0792	0.3424	0.1761	-0.046	-0.222	-0.523	-0.222	-0.097	-0.523

Mean Value Test

Key:	
Shaded	exceeds screen and is potential outlier
	Does not exceed screen but may be outlier
	Exceeds screen but is not an outlier

To enter results into this table, click on column G and click the Insert Columns button, entering the number of columns needed. Then either type in the results, or paste them in. DO NOT try the 'Insert Copied Cells' option, as this loses the formatting links.

232095
Bulk Fill
Mexborough
Former Foundry off Hough Lane, Wombwell

CAS REG No	Determinand	Units	*Screening Value	*Source of screening value	Sample Ref	SP01	SP02	SP03	LEVEL 1 CHECK											
					trial pit / borehole ref	N/A	N/A	N/A	No. of samples from the average and	Number of Degrees of freedom	Arithmetic Mean	Standard deviation	Coefficient of variation	95% confidence bound required	t Value	Normalised Lower bound 95% UCL of mean	Normalised Upper bound 95% UCL of mean	95% Upper confidence limit of population	Source for SGV	Data Source test: Does the 95% value	Action: note if no further action indicated will do a maximum value test
					Depth	N/A	N/A	N/A													
	Arsenic	mg/kg	20	SGV	9.90	8.90	10.00		3	2	9.60	0.61	0.04	95	2.920	9.107	10.63	20	SGV	YES	No action warranted
	Cadmium	mg/kg	2	SGV	0.20	0.20	0.20		3	2	0.20	0.00	0.00	95	2.920	0.200	0.20	2	SGV	YES	No action warranted
	Chromium	mg/kg	130	SGV	17.60	19.50	18.40		3	2	18.50	0.95	0.03	95	2.920	1.087	20.11	130	SGV	YES	No action warranted
	Lead	mg/kg	450	SGV	24.00	21.50	23.30		3	2	22.91	1.29	0.03	95	2.920	1.095	25.09	450	SGV	YES	No action warranted
	Mercury	mg/kg	8	SGV	0.10	0.10	0.10		3	2	0.10	0.00	0.00	95	2.920	1.000	0.10	8	SGV	YES	No action warranted
	Nickel	mg/kg	50	SGV	24.40	26.90	24.60		3	2	25.30	1.39	0.03	95	2.920	1.093	27.64	50	SGV Dat	YES	No action warranted
	Selenium	mg/kg	35	SGV	1.00	1.00	1.00		3	2	1.00	0.00	0.00	95	2.920	1.000	1.00	35	SGV	YES	No action warranted
	Copper	mg/kg	8000	IHSV Version 6 Dec 2008	20.00	20.30	19.50		3	2	19.93	0.40	0.01	95	2.920	1.034	20.61	8000	IHSV Version 6 Dec 2008	YES	No action warranted
	Boron	mg/kg	130	IHSV Version 6 Dec 2008	0.50	0.50	0.50		3	2	0.50	0.00	0.00	95	2.920	1.000	0.50	130	IHSV Version 6 Dec 2008	YES	No action warranted
	Zinc	mg/kg	8500	IHSV Version 6 Dec 2008	69.90	74.40	73.80		3	2	72.70	2.44	0.02	95	2.920	1.057	76.82	8500	IHSV Version 6 Dec 2008	YES	No action warranted

Maximum Value Test

232095
Bulk Fill
Mexborough
Former Foundry off Hough Lane, Wombwell

Log 10 concentrations

Key	
	may be an outlier

Insert extra columns using the button as with the Mean Value sheet. Then copy across the formulas from column E.

			Sample Ref	SP01	SP02	SP03	LEVEL 1 TEST									
			trial pit / borehole ref	N/A	N/A	N/A	Mean of Log10 of values	Unbiased standard deviation of log 10 values	Outlier Test T	% critical value required	n	Critical value Tcrit	Max Value	Is maximum value less than selected critical value		Approx Value of Outlier @ T = Tcrit
			Depth	N/A	N/A	N/A										
CAS REG	Determinand	Units														
0	Arsenic	mg/kg		0.9956	0.9494	1	0.982	0.028	10.653	10	3	1.148	10.00	YES	Assume maximum value is not an outlier	10.32
0	Cadmium	mg/kg		-0.699	-0.699	-0.699	-0.699	0.000	0.000	10	3	1.148	0.20	YES	Assume maximum value is not an outlier	0.20
0	Chromium	mg/kg		1.2455	1.29	1.2648	1.267	0.022	1.041	10	3	1.148	19.50	YES	Assume maximum value is not an outlier	19.61
0	Lead	mg/kg		1.3802	1.3324	1.3674	1.360	0.025	0.818	10	3	1.148	24.00	YES	Assume maximum value is not an outlier	24.46
0	Mercury	mg/kg		[illegible]	[illegible]	[illegible]	1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Nickel	mg/kg		1.3874	[illegible]	1.3909	1.403	0.024	1.151	10	3	1.148	26.90	[illegible]	Maximum value may be an outlier	26.90
0	Selenium	mg/kg		[illegible]	[illegible]	[illegible]	0.000	0.000	#DIV/0!	10	3	1.148	1.00	#DIV/0!	#DIV/0!	1.00
0	Copper	mg/kg		1.301	1.3075	1.29	1.300	0.009	0.903	10	3	1.148	20.30	YES	Assume maximum value is not an outlier	20.40
0	Boron	mg/kg		-0.301	-0.301	-0.301	-0.301	0.000	0.000	10	3	1.148	0.50	YES	Assume maximum value is not an outlier	0.50
0	Zinc	mg/kg		1.8445	1.8716	1.8681	1.861	0.015	0.693	10	3	1.148	74.40	YES	Assume maximum value is not an outlier	75.56

Mean Value Test

Key:
exceeds screen and is potential outlier
Does not exceed screen but may be outlier
Exceeds screen but is not an outlier

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232095
Bulk Fill
Mexborough
Former Foundry off Hough Lane, Wombwell

CAS REG No	Determinand	Units	*Screening Value	*Source of screening value	Sample Ref	SP01	SP02	SP03	LEVEL 1 CHECK
					Trial pit / borehole ref	N/A	N/A	N/A	
					Depth	N/A	N/A	N/A	
	Benzo (a) pyrene	mg/kg	0.75	BSV Version 6 December 2005					
	benz (a) anthracene	mg/kg	8.4	BSV Version 6 December 2005					
	benz (b) fluoranthene	mg/kg	8.8	BSV Version 6 December 2005					
	benz (k) fluoranthene	mg/kg	88	BSV Version 6 December 2005					
	chrysene	mg/kg	880	BSV Version 6 December 2005					
	dibenz (a,h) anthracene	mg/kg	0.92	BSV Version 6 December 2005					
	indeno (1,2,3-c,d) pyrene	mg/kg	7.8	BSV Version 6 December 2005					
	Naphthalene	mg/kg	5	Draft SGV					
	Acenaphthene	mg/kg	340	BSV Version 6 December 2005					
	Fluorene	mg/kg	250	BSV Version 6 December 2005					
	Anthracene	mg/kg	2000	BSV Version 6 December 2005					
	Fluoranthene	mg/kg	310	BSV Version 6 December 2005					
	Pyrene	mg/kg	230	BSV Version 6 December 2005					

Maximum Value Test

232095
Bulk Fill
Mexborough
Former Foundry off Hough Lane, Wombwell

Log 10 concentrations

Key	
	may be an outlier

Insert extra columns using the button as with the Mean Value sheet. Then copy across the *formulas from column E.*

			Sample Ref	SP01	SP02	SP03	LEVEL 1 TEST									
			trial pit / borehole ref	N/A	N/A	N/A	Mean of Log10 of values	Unbiased standard deviation of log 10 values	Outlier Test T	% critical value required	n	Critical Value Tcrit	Max Value	Is maximum value less than selected critical value		Approx Value of Outlier @ T = Tcrit
			Depth	N/A	N/A	N/A										
CAS REG	Determinand	Units														
0	Benzo (a)pyrene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	benz (a) anthracene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	benz (b) fluoranthene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	benz (k) fluoranthene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	chrysene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	dibenz (a,h) anthracene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	indeno (1,2,2,c,d) pyrene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Naphthalene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Acenapthene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Fluorene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Anthracene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Flouranthene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10
0	Pyrene	mg/kg					1.000	0.000	#DIV/0!	10	3	1.148	0.10	#DIV/0!	#DIV/0!	0.10

Mean Value Test

Key:	
	exceeds screen and is potential outlier
	Does not exceed screen but may be outlier
	Exceeds screen but is not an outlier

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232096
SANG
Stonegate Foods, Bramley
Former Foundry off Hough Lane, Wombwell

CAS Reg No	Determinand	Units	*Screening Value	*Source of screening value	Sample No	43	44	45	46	47	48	50	51	52	53	LEVEL 1 CHECK													
					Trial pit / Borehole ref	TP213	TP214	TP215	TP216	TP217	TP219	TP220	TP222	TP223	TP223														
					Depth		0.8	1	0.4	0.6	0.3	0.5	0.5	0.5	0.5														
	Arsenic	mg/kg	20	SGV		1.00	1.00	2.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	10	9	2.40	2.41	0.45	95	1.833	1,823	4.37	20	SGV	YES	No action warranted
	Cadmium	mg/kg	2	SGV		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10	9	1.00	0.00	1.00	95	1.833	1,000,000	1.00	2	SGV	YES	No action warranted
	Chromium	mg/kg	130	SGV		8.00	11.00	7.00	20.00	7.00	4.00	9.00	9.00	10.00	10.00	10	9	9.40	4.72	0.14	95	1.833	1,260	11.88	230	SGV	YES	No action warranted
	Lead	mg/kg	450	SGV		21.00	27.00	67.00	25.00	18.00	6.00	26.00	36.00	30.00	30.00	10	9	26.00	11.47	0.21	95	1.833	4,382	36.00	450	SGV	YES	No action warranted
	Mercury	mg/kg	8	SGV		1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	10	9	1.20	0.00	0.00	95	1.833	1,822	1.20	8	SGV	YES	No action warranted
	Nickel	mg/kg	70	SGV		11.00	16.00	9.00	9.00	10.00	1.00	12.00	12.00	11.00	13.00	10	9	10.30	3.95	0.12	95	1.833	1,222	12.89	50	SGV	YES	No action warranted
	Selenium	mg/kg	35	SGV		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	10	9	3.00	0.00	0.00	95	1.833	1,000,000	3.00	35	SGV	YES	No action warranted
	Copper	mg/kg	2000	HGV Version 6 Dec 2008		1.00	1.00	1.00	1.00	1.00	6.00	1.00	1.00	1.00	4.00	10	9	2.00	2.18	0.23	95	1.833	1,417	6.25	8000	HGV Version 6 Dec 2008	YES	No action warranted
	Boron	mg/kg	130	HGV Version 6 Dec 2008		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10	9	1.00	0.00	0.00	95	1.833	1,000,000	1.00	130	HGV Version 6 Dec 2008	YES	No action warranted
	Zinc	mg/kg	8500	HGV Version 6 Dec 2008		21.00	74.00	163.00	44.00	31.00	160.00	61.00	63.00	38.00	62.00	10	9	72.70	49.02	0.27	95	1.833	1,391	101.12	8500	HGV Version 6 Dec 2008	YES	No action warranted

Maximum Value Test

232095
SAND
Stonegate Foods, Bramley
Former Foundry off Hough Lane, Wombwell

Log 10 concentrations

Key: [illegible]
[shaded] may be an outlier

Insert extra columns using the button as with the Mean Value sheet. Then copy across the formulas from column E.

CAS REG	Determinand	Units	Sample Ref	43	44	45	46	47	48	50	51	54	52	LEVEL TEST [illegible]									
			trial pit / borehole ref	TP213	TP214	TP215	TP216	TP217	TP219	TP220	TP222	TP225	TP223	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Value of outlier @ 7.4 [illegible]
			Depth	1	0.8	1	0.4	0.6	0.3	0.5	0.5	0.5	0.5										
0	Arsenic	mg/kg		0	0	0.301	0	0	0	0	0.301	0.301	[illegible]	0.498	0.341	2.587	10	10	2.036	12.00	[illegible]	Maximum value may be an outlier	7.79
0	Cadmium	mg/kg		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	#DIV/0!	10	10	2.036	1.00	#DIV/0!	#DIV/0!	1.00
0	Chromium	mg/kg		0.9031	1.0414	0.8451	[illegible]	0.8451	0.6021	0.9031	0.9542	1	1	0.940	0.177	2.039	10	10	2.036	20.00	[illegible]	Maximum value may be an outlier	10.88
0	Lead	mg/kg		1.3222	1.4314	1.8261	1.3979	1.2553	0.7782	1.415	1.5563	1.4771	1.699	1.418	0.282	1.457	10	10	2.036	67.00	YES	Assume maximum value is not an outlier	97.54
0	Mercury	mg/kg		0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.0792	0.079	0.000	0.000	10	10	2.036	1.20	YES	Assume maximum value is not an outlier	1.20
0	Nickel	mg/kg		1.0414	1.2041	0.9542	0.9031	1	0	1.0792	1.0792	1.0414	1.1139	0.942	0.341	0.789	10	10	2.036	18.00	YES	Assume maximum value is not an outlier	43.29
0	Selenium	mg/kg		0.4771	0.4771	0.4771	0.4771	0.4771	0.4771	0.4771	0.4771	0.4771	0.4771	0.477	0.000	#DIV/0!	10	10	2.036	3.00	#DIV/0!	#DIV/0!	3.00
0	Copper	mg/kg		0	0	0.8451	0.4771	0.4771	0.7782	0	0.4771	0	0.6021	0.366	0.338	1.419	10	10	2.036	7.00	YES	Assume maximum value is not an outlier	11.32
0	Boron	mg/kg		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000	0.000	#DIV/0!	10	10	2.036	1.00	#DIV/0!	#DIV/0!	1.00
0	Zinc	mg/kg		1.4914	1.8692	2.2122	1.8435	1.4914	2.2041	1.7853	1.7993	1.5798	1.7924	1.787	0.258	1.847	10	10.4	2.036	163.00	YES	Assume maximum value is not an outlier	205.39

Mean Value Test

Key:	
	exceeds screen and is potential outlier
	Does not exceed screen but may be outlier
	Exceeds screen but is not an outlier

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232095
SAND
Stonegate Foods, Bramley
Former Foundry off Hough Lane, Wombwell

CAS REG No	Determinand	Units	*Screening Value	*Source of screening value	Sample Ref	Bramley D1	Bramley D2	Bramley D3	Bramley D4	Bramley D5	LEVEL 1 CHECK												
					Unit pH / borehole ref	N/A	N/A	N/A	N/A	N/A	No of samples in the averaging area	Degrees of freedom	Arithmetic Mean	Standard deviation	Coefficient of variation	Confidence Bound required	Value	Normalised upper bound on confidence limit of population	Normalised upper bound 95% UCL of mean	Soil Sample Value	Source for SGV	Upper Bound less than the guideline value	Action: note if no further action indicated will be maximum value test
					Depth	N/A	N/A	N/A	N/A	N/A													
	Benzo (a) pyrene	mg/kg	0.73	IHSV Version 6 December 2005		0.20	0.40	0.10	0.10	0.10	5	4	0.18	0.13	0.32	95	2.132	1,691	0.30	0.73	IHSV Version 6 December 2005	YES	No action warranted
	benz (a) anthracene	mg/kg	8.4	IHSV Version 6 December 2005		0.10	0.40	0.10	0.10	0.10	5	4	0.16	0.13	0.38	95	2.132	1,799	0.29	8.4	IHSV Version 6 December 2005	YES	No action warranted
	benz (b) fluoranthene	mg/kg	8.8	IHSV Version 6 December 2005		0.20	0.60	0.20	0.10	0.10	5	4	0.24	0.21	0.39	95	2.132	1,824	0.44	8.8	IHSV Version 6 December 2005	YES	No action warranted
	benz (k) fluoranthene	mg/kg	88	IHSV Version 6 December 2005		0.10	0.20	0.10	0.10	0.10	5	4	0.12	0.04	0.17	95	2.132	1,355	0.16	88	IHSV Version 6 December 2005	YES	No action warranted
	chrysene	mg/kg	880	IHSV Version 6 December 2005		0.10	0.30	0.10	0.10	0.10	5	4	0.14	0.09	0.29	95	2.132	1,609	0.23	880	IHSV Version 6 December 2005	YES	No action warranted
	dibenz (a,h) anthracene	mg/kg	0.92	IHSV Version 6 December 2005		0.10	0.10	0.10	0.10	0.10	5	4	0.10	0.00	0.00	95	2.132	1,000	0.10	0.92	IHSV Version 6 December 2005	YES	No action warranted
	indeno (1,2,3-c,d) pyrene	mg/kg	7.8	IHSV Version 6 December 2005		0.10	0.30	0.10	0.10	0.10	5	4	0.14	0.09	0.29	95	2.132	1,609	0.23	7.8	IHSV Version 6 December 2005	YES	No action warranted
	Naphthalene	mg/kg	[illegible]	Draft SGV		0.20	0.30	0.30	0.30	0.30	5	4	0.28	0.04	0.07	95	2.132	1,152	0.32	7	Draft SGV	YES	No action warranted
	Acenaphthene	mg/kg	330	IHSV Version 6 December 2005		0.10	0.10	0.10	0.10	0.10	5	4	0.10	0.00	0.00	95	2.132	1,000	0.10	330	IHSV Version 6 December 2005	YES	No action warranted
	Fluorene	mg/kg	250	IHSV Version 6 December 2005		0.10	0.10	0.10	0.10	0.10	5	4	0.10	0.00	0.00	95	2.132	1,000	0.10	250	IHSV Version 6 December 2005	YES	No action warranted
	Anthracene	mg/kg	2000	IHSV Version 6 December 2005		0.10	0.10	0.10	0.10	0.10	5	4	0.10	0.00	0.00	95	2.132	1,000	0.10	2000	IHSV Version 6 December 2005	YES	No action warranted
	Fluoranthene	mg/kg	310	IHSV Version 6 December 2005		0.30	1.60	0.30	0.20	0.30	5	4	0.54	0.59	0.49	95	2.132	2,049	1.11	310	IHSV Version 6 December 2005	YES	No action warranted
	Pyrene	mg/kg	230	IHSV Version 6 December 2005		0.30	1.40	0.30	0.20	0.30	5	4	0.50	0.50	0.46	95	2.132	1,963	0.98	230	IHSV Version 6 December 2005	YES	No action warranted

Maximum Value Test

232095
SAND
Stonegate Foods, Bramley
Former Foundry off Hough Lane, Wombwell

Log 10 concentrations

Key

may be an outlier

insert extra columns using the button as with the Mean Value sheet. Then copy across the formulas from column E.

CAS REG	Determinand	Units		Sample Ref	Bramley	Bramley	Bramley	Bramley	Bramley	LEVEL 1 TEST									
				trial pit / borehole ref	N/A	N/A	N/A	N/A	N/A	Mean of Log10 values	Unbiased standard deviation for log10 values	Outlier? test	% critical value required		Critical value Tcrit	Max Value	Is maximum value less than critical value?		Approx Value of Outlier @ 1% Tcrit
				Depth	N/A	N/A	N/A	N/A	N/A										
0	0	0			#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	10	0.05	insert value	0.00	#NUM!	#NUM!	#VALUE!
0	Benzo (a)pyrene	mg/kg			-0.699	-0.398	-1	-1	-1	-0.819	0.269	1.565	10	5	1.602	0.40	YES	Assume maximum value is not an outlier	0.41
0	benz (a) anthracene	mg/kg			-1	-0.523	-1	-1	-1	-0.880	0.269	1.789	10	5	1.602	0.40	YES	Maximum value may be an outlier	0.36
0	benz (b) fluoranthene	mg/kg			-0.699	-0.222	-0.699	-1	-1	-0.724	0.318	1.676	10	5	1.602	0.60	YES	Assume maximum value is not an outlier	0.61
0	benz (k) fluoranthene	mg/kg			-1	-0.699	-1	-1	-1	-0.940	0.135	1.789	10	5	1.602	0.20	YES	Maximum value may be an outlier	0.19
0	chrysene	mg/kg			-1	-0.523	-1	-1	-1	-0.905	0.213	1.789	10	5	1.602	0.30	YES	Maximum value may be an outlier	0.27
0	dibenz (a,h) anthracene	mg/kg			-1	-1	-1	-1	-1	-1.000	0.000	#DIV/0!	10	5	1.602	0.10	#DIV/0!	#DIV/0!	0.10
0	indeno (1,2,3 c,d) pyrene	mg/kg			-1	-0.523	-1	-1	-1	-0.905	0.213	1.789	10	5	1.602	0.30	YES	Maximum value may be an outlier	0.27
0	Naphthalene	mg/kg			-0.699	-0.523	-0.523	-0.523	-0.523	-0.558	0.079	0.447	10	5	1.602	0.30	YES	Assume maximum value is not an outlier	0.37
0	Acenapthene	mg/kg			-1	-1	-1	-1	-1	-1.000	0.000	#DIV/0!	10	5	1.602	0.10	#DIV/0!	#DIV/0!	0.10
0	Fluorene	mg/kg			-1	-1	-1	-1	-1	-1.000	0.000	#DIV/0!	10	5	1.602	0.10	#DIV/0!	#DIV/0!	0.10
0	Anthracene	mg/kg			-1	-1	-1	-1	-1	-1.000	0.000	#DIV/0!	10	5	1.602	0.10	#DIV/0!	#DIV/0!	0.10
0	Flouranthene	mg/kg			-0.523	-0.204	-0.523	-0.699	-0.523	-0.413	0.353	1.747	10	5	1.602	1.60	YES	Maximum value may be an outlier	1.42
0	Pyrene	mg/kg			-0.523	-0.155	-0.523	-0.699	-0.523	-0.424	0.328	1.740	10	5	1.602	1.40	YES	Maximum value may be an outlier	1.26

APPENDIX C

Dust Monitoring Results

Report No:	LR DON 1799
Issue Date:	January 2007
Copy No:	1

Atmospheric Dust Monitoring

Hough Lane Wombwell

JPA - Doncaster			
Project Number: 232095			
Review: JRF [illegible]			
31 JAN 2007			
[illegible]	[illegible]		
		File:	[illegible]

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1. INTRODUCTION

As requested Scientifics undertook atmospheric dust monitoring at the Hough Lane, Wombwell site during remedial works.

2. MEASUREMENTS

Monitoring for dust was carried out using directional dust gauges.

Analysis of dust was carried out by Scientifics Derby by digestion of the filter in concentrated analytical grade nitric acid. The resulting solution from each sample was made to a known volume with de-ionised water. The prepared samples were analysed, quantitatively, by the technique of Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES). Analysis for poly Aromatic Hydrocarbons was undertaken using a Hewlett-Packard 6890/5973 gas chromatograph-mass spectrometer running in selected ion monitoring (SIM) mode. The UKAS accredited methods used for the PAH sample preparation and measurement were HS/GWI/3009 – issue 9, and HS/GWI/3005 – issue 7 respectively.

3. RESULTS

The results of the metals analysis are given in the attached table. The following PAH,s were analysed for :

- Napthalene
- Acenapthylene
- Acenapthene
- Fluorene
- Phenanthrene
- Anthracene
- Anthracene
- Pyrene
- Benzo(a)anthracene
- Chrysene
- Benzo(b+j)fluoranthene
- Benzo(k)fluoranthene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene
- Benzo(ghi)perylene

None were detected. The limit of detection is 0.01 mg.

4. DISTRIBUTION LIST

Report No: LR DON 1799

Title: Atmospheric Dust Monitoring

Copy No: **Recipient:**

1. D Sykes, Joynes Pike & Associates Ltd, 1-2 Aire House, Richmond Business Park, Sidings Court, Doncaster, DN4 5NL.

2. W Halkett, Scientifics Ltd, 4 Hexthorpe Road, Doncaster, DN4 0AE.

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APPENDIX A

RESULTS

Hough Lane Wombwell: Dust Sample 19/06/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	1	1.6	0.7	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	<0.002	<0.01	<0.01	0.8
South	2	4.4	1.6	<0.002	<0.002	<0.002	0.8	<0.002	<0.002	<0.002	<0.01	<0.01	2.9
East	3	5.9	1.8	<0.002	<0.002	<0.002	1.0	<0.002	<0.002	<0.002	<0.01	<0.01	3.0
West	4	3.3	1.1	<0.002	<0.002	<0.002	0.5	<0.002	<0.002	<0.002	<0.01	<0.01	1.8

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	5	2.9	1.1	<0.002	<0.002	<0.002	0.1	<0.002	<0.002	<0.002	<0.01	<0.01	0.6
South	6	5.2	1.4	<0.002	<0.002	<0.002	0.6	<0.002	<0.002	<0.002	<0.01	<0.01	3.9
East	7	10.2	3.0	<0.002	0.006	0.006	0.34	0.011	<0.002	0.004	0.18	<0.01	6.5
West	8	3.3	0.8	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	<0.002	<0.01	<0.01	0.7

Hough Lane Wombwell: Dust Sample 19/06/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	9	2.3	0.8	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
South	10	4.3	1.0	<0.002	<0.002	<0.002	0.6	<0.002	<0.002	<0.002	<0.01	<0.01	2.1
East	11	1.3	0.6	<0.002	<0.002	<0.002	0.2	<0.002	<0.002	<0.002	<0.01	<0.01	0.3
West	12	2.1	0.3	<0.002	<0.002	<0.002	1.0	<0.002	<0.002	<0.002	<0.01	<0.01	0.5

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Ai	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	13	5.5	1.8	<0.002	<0.002	<0.002	1.0	<0.002	<0.002	<0.002	<0.01	<0.01	2.8
South	14	1.4	0.3	<0.002	<0.002	<0.002	0.4	<0.002	<0.002	<0.002	<0.01	<0.01	0.3
East	15	1.1	0.3	<0.002	<0.002	<0.002	0.4	<0.002	<0.002	<0.002	<0.01	<0.01	0.2
West	16	4.0	1.1	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	<0.002	<0.01	<0.01	1.6

Hough Lane Wombwell: Dust Sample 26/06/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	17	5.6	1.8	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	<0.002	0.08	<0.01	2.9
South	18	2.6	0.9	<0.002	<0.002	<0.002	0.8	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
East	19	20.5	6.5	<0.002	0.009	0.008	1.9	0.05	0.003	0.1	1.3	<0.01	10.8
West	20	3	1.0	<0.002	<0.002	<0.002	0.5	<0.002	<0.002	<0.002	<0.01	<0.01	1.6

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	21	12.8	1.9	<0.002	<0.002	<0.002	0.1	<0.002	<0.002	0.002	<0.01	<0.01	0.6
South	22	5.4	0.4	<0.002	<0.002	<0.002	0.06	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
East	23	5.2	0.4	<0.002	<0.002	<0.002	0.03	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
West	24	20.1	2.8	<0.002	0.007	<0.002	0.21	0.011	<0.002	0.004	0.07	<0.01	4.5

Hough Lane Wombwell: Dust Sample 26/06/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	25	10.3	3.8	<0.002	0.005	<0.002	0.9	<0.002	<0.002	<0.002	0.28	<0.01	4.8
South	26	15.7	4.2	<0.002	0.007	0.008	0.12	0.004	<0.002	0.002	0.34	<0.01	6.3
East	27	8.9	2.0	<0.002	<0.002	<0.002	0.2	<0.002	<0.002	<0.002	0.08	<0.01	3.2
West	28	12.2	2.1	<0.002	0.007	<0.002	1.0	<0.002	<0.002	<0.002	0.10	<0.01	4.0

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	29	36.3	8.4	<0.002	0.010	0.011	3.0	<0.002	<0.002	<0.002	0.49	<0.01	12.9
South	30	9.7	4.2	<0.002	0.007	0.008	0.5	<0.002	<0.002	<0.002	0.08	<0.01	6.3
East	31	8.2	3.8	<0.002	0.007	0.008	0.4	<0.002	<0.002	<0.002	0.09	<0.01	0.2
West	32	19.1	4.2	<0.002	0.007	0.008	0.18	<0.002	<0.002	<0.002	0.18	<0.01	6.3

Hough Lane Wombwell: Dust Sample 03/07/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	33	6.2	2.0	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	0.001	0.08	<0.01	3.2
South	34	3.3	1.1	<0.002	<0.002	<0.002	0.8	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
East	35	2.7	0.8	<0.002	<0.002	<0.002	0.5	0.05	<0.002	<0.002	1.1	<0.01	1.1
West	36	8.4	2.3	<0.002	0.004	0.005	1.5	<0.002	<0.002	0.005	<0.01	<0.01	4.2

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	37	7.9	1.9	<0.002	<0.002	<0.002	0.1	<0.002	<0.002	0.002	<0.01	<0.01	0.6
South	38	4.0	0.4	<0.002	<0.002	<0.002	0.06	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
East	39	3.2	0.4	<0.002	<0.002	<0.002	0.03	<0.002	<0.002	<0.002	<0.01	<0.01	1.0
West	40	7.7	2.8	<0.002	0.007	<0.002	0.21	0.011	<0.002	0.004	0.07	<0.01	4.5

Hough Lane Wombwell: Dust Sample 03/07/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	41	10.3	4.1	<0.002	0.006	0.01	0.26	0.008	<0.002	0.004	0.50	<0.01	6.1
South	42	13.3	4.6	<0.002	0.1	0.2	0.34	0.10	<0.002	0.02	0.92	<0.01	6.8
East	43	4.5	1.7	<0.002	<0.002	<0.002	0.2	<0.002	<0.002	<0.002	0.18	<0.01	2.1
West	44	3.5	1.6	<0.002	<0.002	<0.002	0.15	<0.002	<0.002	<0.002	0.07	<0.01	1.9

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	-	Positions vandalised.											
South	-												
East	-												
West	-												

Hough Lane Wombwell: Dust Sample 10/07/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	45	4.0	1.1	<0.002	<0.002	0.003	-	<0.002	<0.002	<0.002	-	<0.01	-
South	46	3.9	0.9	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	-	<0.01	-
East	47	2.6	0.8	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	-	<0.01	-
West	48	3.9	1.1	<0.002	<0.002	0.003	-	<0.002	<0.002	<0.002	-	<0.01	-

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	49	3.4	1.2	<0.002	<0.002	<0.002	0.080	<0.002	<0.002	<0.002	0.05	<0.01	1.9
South	50	2.7	0.8	<0.002	<0.002	<0.002	0.070	<0.002	<0.002	<0.002	0.05	<0.01	1.2
East	51	3.1	0.9	<0.002	<0.002	<0.002	0.080	<0.002	<0.002	<0.002	0.05	<0.01	1.2
West	52	7.7	2.8	<0.002	<0.002	<0.002	0.357	<0.002	<0.002	<0.002	0.120	<0.01	3.2

Hough Lane Wombwell: Dust Sample 10/07/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	53	1.4	0.06	<0.002	<0.002	<0.002	0.030	<0.002	<0.002	<0.002	<0.003	<0.01	0.930
South	54	5.9	1.2	<0.002	<0.002	<0.002	0.102	<0.002	<0.002	<0.002	0.050	<0.01	2.30
East	55	1.3	0.04	<0.002	<0.002	<0.002	0.029	<0.002	<0.002	<0.002	<0.003	<0.01	0.72
West	56	3.6	0.93	<0.002	<0.002	<0.002	0.040	<0.002	<0.002	<0.002	0.60	<0.01	1.4

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	57	5.0	1.5	<0.002	<0.002	0.004	0.340	<0.002	<0.002	0.003	0.070	<0.01	2.3
South		Position vandalized.											
East	58	16.9	5.5	<0.002	<0.002	0.21	0.97	<0.002	<0.002	0.18	0.790	<0.01	7.3
West		Position vandalized.											

Hough Lane Wombwell: Dust Sample 17/07/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	59	2.4	0.83	<0.002	<0.002	0.01	0.03	<0.002	<0.002	<0.002	0.06	<0.01	1.2
South	60	4.2	1.2	<0.002	<0.002	0.04	0.13	<0.002	<0.002	<0.002	0.09	<0.01	2.3
East	61	2.5	0.79	<0.002	<0.002	0.01	0.04	<0.002	<0.002	<0.002	0.07	<0.01	1.2
West	62	2.9	0.78	<0.002	<0.002	0.01	0.04	<0.002	<0.002	<0.002	0.05	<0.01	1.3

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	63	3.4	0.87	<0.002	<0.002	0.02	0.13	<0.002	<0.002	<0.002	0.08	<0.01	1.7
South	64	2.7	0.78	<0.002	<0.002	0.01	0.12	<0.002	<0.002	<0.002	0.07	<0.01	1.1
East	65	2.9	0.78	<0.002	<0.002	0.01	0.12	<0.002	<0.002	<0.002	0.07	<0.01	1.1
West	66	3.1	0.88	<0.002	<0.002	0.01	0.14	<0.002	<0.002	<0.002	0.05	<0.01	1.5

Hough Lane Wombwell: Dust Sample 17/07/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	67	1.7	0.5	<0.002	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.003	<0.01	0.9
South	68	5.1	1.4	<0.002	<0.002	<0.002	0.17	<0.002	<0.002	<0.002	0.089	<0.01	1.9
East	69	3.0	1.1	<0.002	<0.002	<0.002	0.09	<0.002	<0.002	<0.002	0.047	<0.01	1.9
West	70	1.9	0.7	<0.002	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.003	<0.01	1.1

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	71	0.9	0.08	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.01	0.09
South	72	1.7	0.87	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.01	0.98
East	73	1.0	0.53	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.01	0.86
West	74	1.6	0.41	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.01	0.87

Hough Lane Wombwell: Dust Sample 24/07/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	75	10.1	3.6	<0.002	0.005	0.19	0.08	<0.002	<0.002	0.003	0.32	<0.01	4.5
South	76	20.9	7.2	<0.002	0.12	0.22	0.96	<0.002	<0.002	0.003	0.97	<0.01	9.1
East	77	13.7	4.8	<0.002	0.005	0.11	0.07	<0.002	<0.002	0.004	0.42	<0.01	7.5
West	78	12.3	5.3	<0.002	0.005	0.11	0.07	<0.002	<0.002	0.004	0.32	<0.01	6.9

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	79	2.9	0.93	<0.002	<0.002	<0.002	0.040	<0.002	<0.002	<0.002	0.60	<0.01	1.4
South	-	Positions vandalized.											
East	-												
West	80	3.1	1.0	<0.002	<0.002	<0.002	0.055	<0.002	<0.002	<0.002	0.60	<0.01	2.0

Hough Lane Wombwell: Dust Sample 24/07/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	81	19.9	6.3	<0.002	0.004	<0.002	1.3	0.007	<0.002	0.03	1.1	<0.01	9.2
South	82	14.2	5.2	<0.002	0.004	0.002	0.24	0.007	<0.002	0.03	0.120	<0.01	8.4
East	83	7.3	2.3	<0.002	<0.002	<0.002	0.003	0.003	<0.002	<0.002	0.89	<0.01	3.9
West	84	18.3	5.9	<0.002	0.004	<0.002	0.23	0.007	<0.002	0.03	0.95	<0.01	7.9

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	85	10.7	3.8	<0.002	<0.002	0.003	0.050	<0.002	<0.002	0.002	0.83	<0.01	4.9
South	86	27.4	7.3	<0.002	<0.002	0.020	1.9	<0.002	<0.002	0.040	1.65	<0.01	10.1
East	87	2.5	0.76	<0.002	<0.002	-	0.002	<0.002	<0.002	0.002	0.03	<0.01	1.3
West	88	15.6	4.5	<0.002	<0.002	0.005	0.08	<0.002	<0.002	0.20	1.1	<0.01	5.2

Hough Lane Wombwell: Dust Sample 31/07/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	89	12.8	5.1	<0.002	<0.002	<0.002	0.96	<0.002	<0.002	<0.002	0.85	<0.01	5.9
South	90	42.9	8.2	<0.002	0.004	0.03	1.8	0.04	<0.002	0.03	1.9	<0.01	10.7
East	91	10.5	3.8	<0.002	<0.002	<0.002	0.87	<0.002	<0.002	<0.002	0.76	<0.01	5.3
West	92	11.8	4.8	<0.002	<0.002	<0.002	0.87	<0.002	<0.002	<0.002	0.77	<0.01	5.6

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	93	11.6	4.9	<0.002	<0.002	0.08	0.39	<0.002	0.001		0.89	<0.01	5.2
South	94	21.3	8.3	<0.002	0.002	0.10	0.37	0.01	0.003	0.03	1.2	<0.01	10.0
East	95	9.0	2.9	<0.002	<0.002	0.06	0.27	<0.002	<0.002	<0.002	0.79	<0.01	4.3
West	96	13.9	5.1	<0.002	<0.002	0.07	0.40	<0.002	<0.002	<0.002	0.99	<0.01	6.3

Hough Lane Wombwell: Dust Sample 31/07/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	97	5.5	1.3	<0.002	<0.002	<0.002	0.050	<0.002	<0.002	<0.002	0.009	<0.01	2.2
South	98	4.9	1.3	<0.002	<0.002	<0.002	0.050	<0.002	<0.002	<0.002	0.007	<0.01	2.2
East	99	2.3	0.5	<0.002	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	0.008	<0.01	1.4
West	100	5.2	0.9	<0.002	<0.002	<0.002	0.03	<0.002	<0.002	<0.002	0.005	<0.01	2.1

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	101	1.7	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.01	0.8
South	102	2.8	0.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.01	1.9
East	103	0.5	0.10	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.01	0.20
West	104	0.9	0.30	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.01	0.40

Hough Lane Wombwell: Dust Sample 07/08/06

Position 1

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	105	18.4	5.5	<0.002	<0.002	0.21	0.97	<0.002	<0.002	0.18	0.79	<0.01	7.3
South	106	8.2	2.9	<0.002	<0.002	0.006	0.36	<0.002	<0.002	0.003	0.13	<0.01	4.1
East	107	6.5	1.7	<0.002	<0.002	0.007	0.29	<0.002	<0.002	<0.002	0.14	<0.01	2.4
West	108	26.5	7.1	<0.002	<0.002	0.21	1.2	<0.002	<0.002	0.17	1.21	<0.01	9.2

Position 2

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	109	10.4	3.8	<0.002	0.004	0.021	0.37	0.037	0.002	0.110	0.69	<0.01	5.0
South	110	4.0	1.2	<0.002	<0.002	<0.002	0.06	0.003	<0.002	<0.002	0.12	<0.01	2.1
East	111	4.4	1.2	<0.002	<0.002	<0.002	0.05	0.003	<0.002	<0.002	0.13	<0.01	2.3
West	112	9.3	2.3	<0.002	0.003	0.005	0.28	0.024	<0.002	0.080	0.56	<0.01	3.9

Hough Lane Wombwell: Dust Sample 07/08/06

Position 3

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	113	12.9	5.1	<0.002	0.003	0.013	0.39	0.011	0.002	0.11	1.3	<0.010	7.8
South	114	2.5	0.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.010	1.2
East	115	2.1	0.7	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.010	1.3
West	116	11.4	4.8	<0.002	<0.002	0.009	0.27	<0.002	<0.002	0.004	0.90	<0.010	6.9

Position 4

Direction	Sample No	Total Dust Collected	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Sl	Sn	Zn
North	117	16.5	6.8	<0.002	<0.002	0.02	0.51	<0.002	<0.002	0.003	0.005	<0.010	7.2
South	118	2.4	0.5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.010	1.5
East	119	0.5	0.07	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.010	0.2
West	120	13.1	5.0	<0.002	0.007	0.02	0.40	0.014	<0.002	0.006	0.005	<0.010	8.1

Hough Lane Wombwell: Dust Sample 14/08/06

**Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	121	10.9	3.8	<0.005	0.002	<0.001	0.28	0.004	<0.001	<0.001	0.48	<0.01	5.9
South	122	0.8	0.2	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	0.3
East	123	4.5	1.0	<0.005	<0.001	<0.001	0.033	<0.001	<0.001	<0.001	0.09	<0.01	2.8
West	124	15.8	5.0	<0.005	0.004	<0.001	0.34	0.012	0.001	0.005	0.57	<0.01	7.2

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	125	9.0	3.4	<0.005	<0.001	<0.001	0.22	<0.001	<0.001	<0.001	0.37	<0.01	4.3
South	126	1.8	0.6	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.0
East	127	1.5	0.4	<0.005	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.03	<0.01	0.8
West	128	3.0	0.9	<0.005	<0.001	0.001	<0.001	<0.001	0.001	<0.001	0.08	<0.01	1.7

Hough Lane Wombwell: Dust Sample 14/08/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	129	22.6	3.5	0.005	0.004	0.002	9.6	0.012	0.001	0.005	0.076	<0.01	6.1
South	130	0.7	0.25	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	0.25
East	131	1.4	0.43	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	0.72
West	132	5.1	1.3	<0.001	<0.001	<0.001	0.03	<0.001	<0.001	<0.001	<0.03	<0.01	2.6

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	133	18.0	5.8	<0.005	0.003	0.003	3.3	0.018	0.001	0.006	0.61	<0.01	7.2
South	134	4.7	1.8	<0.005	<0.001	<0.001	0.56	<0.001	<0.001	<0.001	0.07	<0.01	2.2
East	135	6.2	2.2	<0.005	<0.001	0.001	0.67	<0.001	<0.001	<0.001	0.08	<0.01	2.8
West	136	5.1	1.8	<0.005	<0.001	<0.001	0.54	<0.001	<0.001	<0.001	0.07	<0.01	2.3

Hough Lane Wombwell: Dust Sample 21/08/06

Position 1 +

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	137	6.1	1.9	<0.005	<0.001	<0.001	0.25	<0.001	<0.001	0.003	<0.03	<0.01	3.4
South	138	31.6	8.9	<0.005	0.002	0.006	5.2	0.156	<0.001	0.300	1.03	<0.01	9.4
East	139	11.2	2.9	<0.005	0.001	<0.001	1.1	0.008	<0.001	0.004	<0.03	<0.01	5.6
West	140	17.7	3.9	<0.005	0.001	<0.001	1.5	0.014	<0.001	0.002	<0.03	<0.01	7.0

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	141	5.5	1.1	<0.005	<0.001	<0.001	0.09	<0.001	<0.001	<0.001	0.11	<0.01	3.2
South	142	10.6	3.4	<0.005	<0.001	0.002	0.43	0.002	<0.001	<0.001	0.55	<0.01	5.3
East	143	5.7	1.1	<0.005	<0.001	<0.001	0.08	<0.001	<0.001	<0.001	0.09	<0.01	3.4
West	144	4.4	0.9	<0.005	<0.001	<0.001	0.43	<0.001	<0.001	<0.001	0.03	<0.01	3.0

Hough Lane Wombwell: Dust Sample 21/08/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	145	16.4	5.3	<0.005	0.002	0.001	1.8	0.059	0.003	0.011	0.98	<0.01	6.9
South	146	3.1	0.9	<0.005	<0.001	<0.001	0.43	0.002	<0.001	<0.001	0.07	<0.01	1.8
East	147	6.2	2.1	<0.005	0.001	<0.001	0.99	0.002	<0.001	<0.001	0.09	<0.01	2.9
West	148	5.9	2.0	<0.005	0.001	<0.001	0.51	0.003	<0.001	<0.001	0.09	<0.01	3.0

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	149	18.0	5.5	<0.005	0.001	0.003	1.5	0.061	0.003	0.030	0.88	<0.01	7.9
South	150	25.8	6.9	<0.005	0.003	0.003	2.0	0.117	0.045	0.030	1.05	<0.01	10.3
East	151	3.2	0.8	<0.005	<0.001	<0.001	0.44	<0.001	<0.001	<0.001	<0.03	<0.01	1.9
West	152	17.3	5.8	<0.005	0.002	0.003	1.5	0.028	0.003	0.029	0.89	<0.01	7.3

Hough Lane Wombwell: Dust Sample 28/08/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	153	13.8	3.9	<0.005	0.001	0.001	0.069	0.038	<0.001	0.008	0.07	<0.01	5.8
South	154	0.6	0.1	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	0.4
East	155	4.6	1.3	<0.005	<0.001	<0.001	0.67	<0.001	<0.001	<0.001	<0.03	<0.01	2.7
West	156	16.3	5.4	<0.005	0.002	0.001	1.0	0.059	0.003	0.019	0.98	<0.01	7.1

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	157	3.7	0.7	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.8
South	158	13.5	5.0	<0.005	0.003	0.002	0.29	0.007	<0.001	0.001	0.09	<0.01	7.1
East	159	1.9	0.5	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.0
West	160	3.3	0.7	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.2

Hough Lane Wombwell: Dust Sample 28/08/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	161	6.2	1.9	<0.005	<0.001	<0.001	0.99	<0.001	<0.001	<0.001	<0.03	<0.01	3.2
South	162	3.0	0.7	<0.005	<0.001	<0.001	0.42	<0.001	<0.001	<0.001	<0.03	<0.01	1.3
East	163	0.3	0.07	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	0.2
West	164	No Sample											

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	165	16.4	5.9	<0.005	0.002	0.001	1.4	0.059	0.003	0.019	0.98	<0.01	7.3
South	166	8.0	2.7	<0.005	<0.001	0.001	0.36	0.038	<0.001	<0.001	0.13	<0.01	4.3
East	167	5.6	1.3	<0.005	<0.001	<0.001	0.06	<0.001	<0.001	<0.001	0.09	<0.01	3.8
West	168	16.5	5.5	<0.005	0.002	0.001	1.9	0.069	0.003	0.017	1.08	<0.01	6.7

Hough Lane Wombwell: Dust Sample 04/09/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	169	7.4	2.5	<0.005	0.002	0.001	0.58	0.12	<0.001	0.008	0.03	<0.01	4.4
South	170	17.0	5.9	<0.005	0.002	0.001	1.0	0.049	0.003	0.019	0.88	<0.01	7.1
East	172	3.3	1.5	<0.005	<0.001	<0.001	0.66	<0.001	<0.001	<0.001	0.06	<0.01	2.2
West	173	15.8	5.0	<0.005	0.002	0.001	0.94	0.059	0.003	0.019	0.98	<0.01	6.1

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	174	2.3	0.7	<0.005	<0.001	<0.001	0.06	<0.001	<0.001	<0.001	0.06	<0.01	1.2
South	175	5.8	1.7	<0.005	<0.001	<0.001	0.61	<0.001	<0.001	<0.001	0.03	<0.01	3.2
East	176	1.7	0.3	<0.005	<0.001	<0.001	0.03	<0.001	<0.001	<0.001	0.04	<0.01	1.0
West	177	3.8	0.7	<0.005	<0.001	<0.001	0.56	<0.001	<0.001	<0.001	0.06	<0.01	2.2

Hough Lane Wombwell: Dust Sample 04/09/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	178	4.7	1.3	<0.005	<0.001	<0.001	0.60	<0.001	<0.001	<0.001	0.05	<0.01	2.5
South	179	3.2	0.7	<0.005	<0.001	<0.001	0.56	<0.001	<0.001	<0.001	0.06	<0.01	2.2
East	180	1.7	0.3	<0.005	<0.001	<0.001	0.07	<0.001	<0.001	<0.001	0.04	<0.01	1.1
West	181	4.6	0.6	<0.005	<0.001	<0.001	0.59	<0.001	<0.001	<0.001	0.05	<0.01	2.6

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	182	15.9	4.6	<0.005	0.002	0.003	1.3	0.039	0.003	0.005	0.07	<0.01	6.7
South	183	16.1	4.6	<0.005	0.002	0.004	1.4	0.019	0.003	0.002	0.07	<0.01	7.1
East	184	2.1	0.5	<0.005	<0.001	<0.001	0.45	<0.001	<0.001	<0.001	<0.03	<0.01	1.1
West	185	21.1	7.0	<0.005	0.007	0.008	2.1	0.056	0.007	0.031	0.90	<0.01	9.0

Hough Lane Wombwell: Dust Sample 12/09/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	186	10.7	3.1	<0.005	0.002	0.003	1.1	0.045	0.003	0.002	0.06	<0.01	4.5
South	187	22.6	6.9	<0.005	0.002	0.006	2.2	0.087	0.003	0.002	0.07	<0.01	8.2
East	188	4.7	1.6	<0.005	<0.001	<0.001	0.81	0.006	<0.001	<0.001	<0.03	<0.01	2.3
West	189	21.7	6.8	<0.005	0.002	0.007	1.8	0.093	0.005	0.003	0.06	<0.01	8.0

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	190	4.0	1.1	<0.005	<0.001	<0.001	0.4	0.006	<0.001	<0.001	<0.03	<0.01	2.6
South	191	8.2	2.7	<0.005	0.003	0.004	0.9	0.09	<0.001	<0.001	<0.03	<0.01	3.0
East	192	3.2	0.7	<0.005	<0.001	<0.001	0.1	0.002	<0.001	<0.001	<0.03	<0.01	1.2
West	193	4.8	1.3	<0.005	<0.001	<0.001	0.5	0.002	<0.001	<0.001	<0.03	<0.01	2.1

Hough Lane Wombwell: Dust Sample 12/09/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	194	4.4	1.3	<0.005	<0.001	<0.001	0.42	0.002	<0.001	<0.001	<0.03	<0.01	2.6
South	195	4.0	1.0	<0.005	<0.001	<0.001	0.35	0.003	<0.001	<0.001	<0.03	<0.01	2.5
East	196	1.8	0.8	<0.005	<0.001	<0.001	0.04	<0.001	<0.001	<0 001	<0.03	<0.01	0.9
West	197	3.9	1.1	<0.005	<0.001	<0.001	0.41	0.001	<0.001	<0.001	<0.03	<0.01	2.6

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	198	21.0	5.4	<0.005	0.036	0.005	1.1	0.006	0.002	0.003	0.08	<0.01	6.7
South	199	2.0	0.8	<0.005	<0.001	<0.001	0.04	<0.001	<0.001	<0.001	<0.03	<0.01	0.9
East	200	1.3	0.4	<0.005	<0.001	<0.001	0.04	<0.001	<0.001	<0.001	<0.03	<0.01	0.5
West	201	5.5	1.2	<0.005	0.004	<0.001	0.98	<0.001	<0.001	<0.001	0.03	<0.01	2.7

Hough Lane Wombwell: Dust Sample 18/09/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	202	20.4	4.6	<0.005	0.014	0.019	1.1	0.016	0.002	0.006	<0.03	<0.01	6.5
South	203	22.4	5.5	<0.005	0.008	0.011	1.5	0.026	0.003	0.043	0.09	<0.01	7.4
East	204	13.5	3.2	<0.005	0.002	0.003	0.61	0.013	<0.001	0.002	<0.03	<0.01	5.9
West	205	1.3	0.1	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.2

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	206	6.6	1.6	<0.005	0.004	<0.001	1.3	<0.001	<0.001	<0.001	0.03	<0.01	2.8
South	207	12.8	2.5	<0.005	0.006	<0.001	1.5	0.013	<0.001	<0.001	0.03	<0.01	4.9
East	208	3.9	0.5	<0.005	0.001	<0.001	0.81	<0.001	<0.001	<0.001	0.03	<0.01	1.9
West	209	7.2	1.2	<0.005	0.004	<0.001	1.9	<0.001	<0.001	<0.001	0.03	<0.01	2.9

Hough Lane Wombwell: Dust Sample 18/09/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	210	7.8	2.8	<0.005	0.010	0.004	0.78	0.001	0.001	0.002	0.03	<0.01	3.5
South	211	5.2	0.9	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	2.7
East	212	2.3	0.3	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.0
West	213	11.8	2.4	<0.005	0.009	0.007	0.93	0.002	0.003	0.002	0.08	<0.01	4.3

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	214	16.7	4.3	<0.005	0.21	0.006	0.93	0.041	<0.001	0.005	0.10	<0.01	5.9
South	215	10.4	3.4	<0.005	0.005	0.004	0.73	0.034	<0.001	0.004	0.08	<0.01	5.1
East	216	14.3	3.8	<0.005	0.10	0.003	0.89	0.002	<0.001	0.001	0.11	<0.01	5.5
West	217	6.9	1.5	<0.005	0.006	0.001	0.98	0.001	<0.001	<0.001	0.03	<0.01	3.0

Hough Lane Wombwell: Dust Sample 25/09/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	218	30.5	6.9	<0.005	0.056	0.009	3.1	0.048	0.009	0.011	1.9	<0.01	8.4
South	219	16.1	3.5	<0.005	0.021	0.005	1.7	0.018	0.005	0.004	0.87	<0.01	6.2
East	220	11.0	2.3	<0.005	0.006	0.004	1.5	0.007	0.003	0.003	0.06	<0.01	5.2
West	221	34.8	7.1	<0.005	0.045	0.016	3.8	0.059	0.017	0.025	1.8	<0.01	9.2

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	222	9.7	1.9	<0.005	0.003	0.004	0.08	0.004	0.001	0.002	0.04	<0.01	3.9
South	223	30.3	8.0	<0.005	0.015	0.055	9.5	0.15	0.017	0.045	0.08	<0.01	8.0
East	224	23.4	4.9	<0.005	0.003	0.024	3.7	0.006	0.008	0.010	0.06	<0.01	6.5
West	225	8.8	2.3	<0.005	0.002	0.014	0.65	0.001	0.001	0.006	0.04	<0.01	4.3

Hough Lane Wombwell: Dust Sample 25/09/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	226	17.6	4.3	<0.005	0.004	0.006	0.93	0.011	<0.001	0.005	0.10	<0.01	5.9
South	227	11.3	3.6	<0.005	0.005	0.004	0.86	0.024	<0.001	0.006	0.08	<0.01	6.1
East	228	5.9	1.1	<0.005	0.001	<0.001	0.07	<0.001	<0.001	0.001	0.08	<0.01	3.2
West	229	21.9	4.8	<0.005	0.006	0.00	1.12	0.023	<0.001	0.006	0.87	<0.01	6.4

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	230	6.7	2.5	<0.005	0.006	0.001	0.98	0.001	<0.001	<0.001	0.03	<0.01	3.3
South	231	32.9	6.3	<0.005	0.025	0.011	9.8	0.063	0.041	0.016	0.96	<0.01	8.3
East	232	6.1	1.8	<0.005	0.006	0.001	0.98	0.001	<0.001	<0.001	0.03	<0.01	3.2
West	233	2.4	0.6	<0.005	<0.001	<0.001	0.06	0.001	<0.001	<0.001	0.03	<0.01	1.1

Hough Lane Wombwell: Dust Sample 02/10/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	234	2.5	0.6	<0.005	<0.001	<0.001	0.08	0.003	<0.001	<0.001	0.06	<0.01	1.3
South	235	10.5	2.5	<0.005	0.005	0.005	1.86	0.024	<0.001	0.006	0.08	<0.01	5.1
East	236	2.1	0.6	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.02	<0.01	1.1
West	237	9.4	2.8	<0.005	0.002	0.005	1.1	0.009	0.001	0.001	0.11	<0.01	4.3

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	238	3.0	0.9	<0.005	<0.001	<0.001	0.04	<0.001	<0.001	<0.001	0.04	<0.01	2.4
South	239	4.3	0.9	<0.005	0.001	<0.001	0.85	<0.001	<0.001	0.001	0.08	<0.01	3.0
East	240	2.3	0.5	<0.005	<0.001	<0.001	0.07	<0.001	<0.001	<0.001	<0.03	<0.01	1.7
West	241	3.5	0.6	<0.005	<0.001	<0.001	0.10	<0.001	<0.001	<0.001	0.05	<0.01	2.1

Hough Lane Wombwell: Dust Sample 02/10/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	242	5.4	1.1	<0.005	0.001	<0.001	0.07	<0.001	<0.001	0.001	0.08	<0.01	3.7
South	243	3.7	0.9	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.6
East	244	0.7	0.1	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	0.5
West	245	2.2	0.4	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.01	1.1

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	246	4.2	1.1	<0.005	<0.001	<0.001	0.97	0.001	<0.001	<0.001	0.03	<0.01	1.9
South	247	2.6	0.4	<0.005	<0.001	<0.001	0.07	0.001	<0.001	<0.001	<0.03	<0.01	0.8
East	248	3.2	0.6	<0.005	<0.001	<0.001	0.05	0.001	<0.001	<0.001	<0.03	<0.01	1.5
West	249	6.6	1.9	<0.005	0.004	0.001	0.77	0.001	<0.001	<0.001	0.03	<0.01	4.0

Hough Lane Wombwell: Dust Sample 09/10/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	250	9.9	3.7	<0.002	<0.002	<0.002	0.9	<0.002	<0.002	<0.002	<0.01	<0.01	3.8
South	252	5.8	1.6	<0.002	<0.002	<0.002	0.6	<0.002	<0.002	<0.002	<0.01	<0.01	2.9
East	253	5.7	1.8	<0.002	<0.002	<0.002	1.0	<0.002	<0.002	<0.002	<0.01	<0.01	3.0
West	254	13.5	4.1	<0.002	<0.002	<0.002	0.5	<0.002	<0.002	<0.002	<0.01	<0.01	6.8

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	255	5.1	1.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	2.3
South	256	3.6	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.8
East	257	0.9	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.5
West	258	2.7	4.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1..1

Hough Lane Wombwell: Dust Sample 09/10/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	250	4.9	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	2.4
South	260	1.5	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.7
East	261	1.1	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.5
West	262	3.5	1.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.8

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	263	31.2	3.9	<0.002	<0.002	0.07	1.2	<0.002	<0.002	<0.002	1.1	<0.01	5.2
South	264	2.8	0.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.7
East	264	1.8	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.9
West	266	11.4	3.9	<0.002	<0.002	0.06	0.34	<0.002	<0.002	<0.002	0.9	<0.01	6.3

Hough Lane Wombwell: Dust Sample 16/10/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	267	3.7	1.1	<0.002	<0.002	<0.002	0.08	<0.002	<0.002	<0.002	<0.01	<0.01	1.4
South	268	3.2	0.9	<0.002	<0.002	<0.002	0.07	<0.002	<0.002	<0.002	<0.01	<0.01	1.1
East	269	4.2	1.4	<0.002	0.003	<0.002	0.03	<0.002	<0.002	<0.002	<0.01	<0.01	1.9
West	270	6.1	1.5	<0.002	0.005	<0.002	0.12	<0.002	<0.002	<0.002	0.87	<0.01	2.7

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	271	1.7	0.5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.9
South	272	17.6	5.4	<0.002	0.01	0.003	0.40	0.014	<0.002	0.005	2.0	<0.01	9.3
East	273	2.9	1.2	<0.002	<0.002	<0.002	0.02	<0.002	<0.002	<0.002	<0.01	<0.01	2.1
West	274	2.3	1.1	<0.002	<0.002	<0.002	0.02	<0.002	<0.002	<0.002	<0.01	<0.01	0.9

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Hough Lane Wombwell: Dust Sample 16/10/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	275	3.5	1.1	<0.002	<0.002	<0.002	0.33	<0.002	<0.002	<0.002	<0.01	<0.01	2.0
South	276	2.7	0.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.4
East	277	1.1	0.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.5
West	278	2.3	0.7	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.1

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	279	2.4	0.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.3
South	280	3.3	1.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.5
East	281	2.0	0.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.9
West	282	1.5	0.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.6

Hough Lane Wombwell: Dust Sample 23/10/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	283	2.8	0.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.3
South	284	13.0	3.9	<0.002	0.003	0.004	0.1	<0.002	<0.002	<0.002	0.9	<0.01	6.8
East	285	4.3	0.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.9
West	286	7.4	2.2	<0.002	<0.002	0.002	0.05	<0.002	<0.002	0.002	0.08	<0.01	4.1

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	287	1.2	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.5
South	288	62.6	5.2	<0.002	<0.002	<0.002	1.6	<0.002	<0.002	0.10	2.0	<0.01	8.6
East	289	26.4	4.1	<0.002	<0.002	<0.002	0.92	<0.002	<0.002	0.03	1.8	<0.01	8.9
West	290	16.1	3.8	<0.002	<0.002	<0.002	0.14	<0.002	<0.002	<0.002	0.9	<0.01	6.7

Hough Lane Wombwell: Dust Sample 23/10/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	291	2.6	0.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.9
South	292	8.4	1.5	<0.002	<0.002	0.005	0.10	<0.002	<0.002	<0.002	<0.01	<0.01	3.9
East	293	4.7	0.8	<0.002	<0.002	<0.002	0.06	<0.002	<0.002	<0.002	<0.01	<0.01	2.4
West	294	4.7	1.1	<0.002	<0.002	<0.002	0.07	<0.002	<0.002	<0.002	<0.01	<0.01	2.4

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	295	4.2	0.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	2.8
South	296	3.4	0.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.3
East	297	0.4	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.2
West	298	1.2	0.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.8

Hough Lane Wombwell: Dust Sample 30/10/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	299	1.1	0.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.7
South	300	0.8	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.2
East	301	1.0	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.8
West	302	5.3	1.3	<0.002	<0.002	<0.002	0.08	<0.002	<0.002	<0.002	0.11	<0.01	2.8

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	303	2.3	0.9	<0.002	<0.002	<0.002	0.11	<0.002	<0.002	<0.002	0.03	<0.01	1.0
South	304	3.2	1.1	<0.002	<0.002	<0.002	0.11	<0.002	<0.002	<0.002	0.04	<0.01	1.9
East	305	4.9	0.9	<0.002	<0.002	<0.002	0.21	<0.002	<0.002	<0.002	0.10	<0.01	2.3
West	306	0.5	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.3

Hough Lane Wombwell: Dust Sample 30/10/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	307	0.6	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.4
South	308	3.2	0.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	1.5
East	309	0.6	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.4
West	310	1.1	0.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.6

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	311	0.3	0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.2
South	312	1.0	0.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.5
East	313	1.0	0.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.5
West	314	0.5	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.3

Hough Lane Wombwell: Dust Sample 06/11/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	315	25.7	1.51	<0.002	0.003	0.009	1.10	0.036	0.002	0.026	0.67	<0.01	1.02
South	316	1.0	0.51	<0.002	0.003	0.006	0.002	0.006	0.002	0.026	0.01	<0.01	0.02
East	317	5.7	1.23	<0.002	0.003	0.002	0.033	0.009	<0.002	0.034	0.08	<0.01	1.98
West	318	26.7	2.89	<0.002	0.003	0.009	1.22	0.039	0.002	0.026	0.98	<0.01	1.02

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	319	42.7	7.9	<0.002	<0.002	0.02	1.36	<0.002	<0.002	<0.002	1.20	<0.01	10.3
South	320	1.6	0.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.6
East	321	0.7	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.2
West	322	11.2	3.2	<0.002	<0.002	0.005	0.68	<0.002	<0.002	<0.002	0.06	<0.01	5.8

Hough Lane Wombwell: Dust Sample 06/11/06

Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	323	5.7	2.1	<0.002	<0.002	<0.002	0.5	<0.002	<0.002	<0.002	0.5	<0.01	3.8
South	324	2.7	0.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.9
East	325	0.3	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.1
West	326	3.9	1.5	<0.002	<0.002	<0.002	0.1	<0.002	<0.002	<0.002	0.3	<0.01	1.6

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	327	10.9	3.3	<0.002	<0.002	<0.002	1.2	<0.002	<0.002	0.03	0.9	<0.01	5.3
South	328	1.0	0.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.3
East	329	30.4	6.7	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	1.6	<0.01	9.0
West	330	0.7	0.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.3

Hough Lane Wombwell: Dust Sample 13/11/06

Position 1

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	331	28	5.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.89	<0.01	7.8
South	332	8.3	2.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.03	<0.01	3.1
East	333	7.3	2.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.03	<0.01	4.0
West	334	20.0	6.5	<0.002	0.003	0.04	1.2	<0.002	<0.002	0.003	1.1	<0.01	7.8

Position 2

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	335	13.2	4.3	<0.002	<0.002	<0.002	1.3	<0.002	<0.002	0.020	1.2	<0.01	6.7
South	336	5.2	1.5	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.002	0.01	<0.01	2.3
East	337	14.0	3.9	<0.002	<0.002	<0.002	0.98	<0.002	<0.002	0.004	0.97	<0.01	5.4
West	338	4.2	1.1	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.002	0.01	<0.01	2.2

Hough Lane Wombwell: Dust Sample 13/11/06

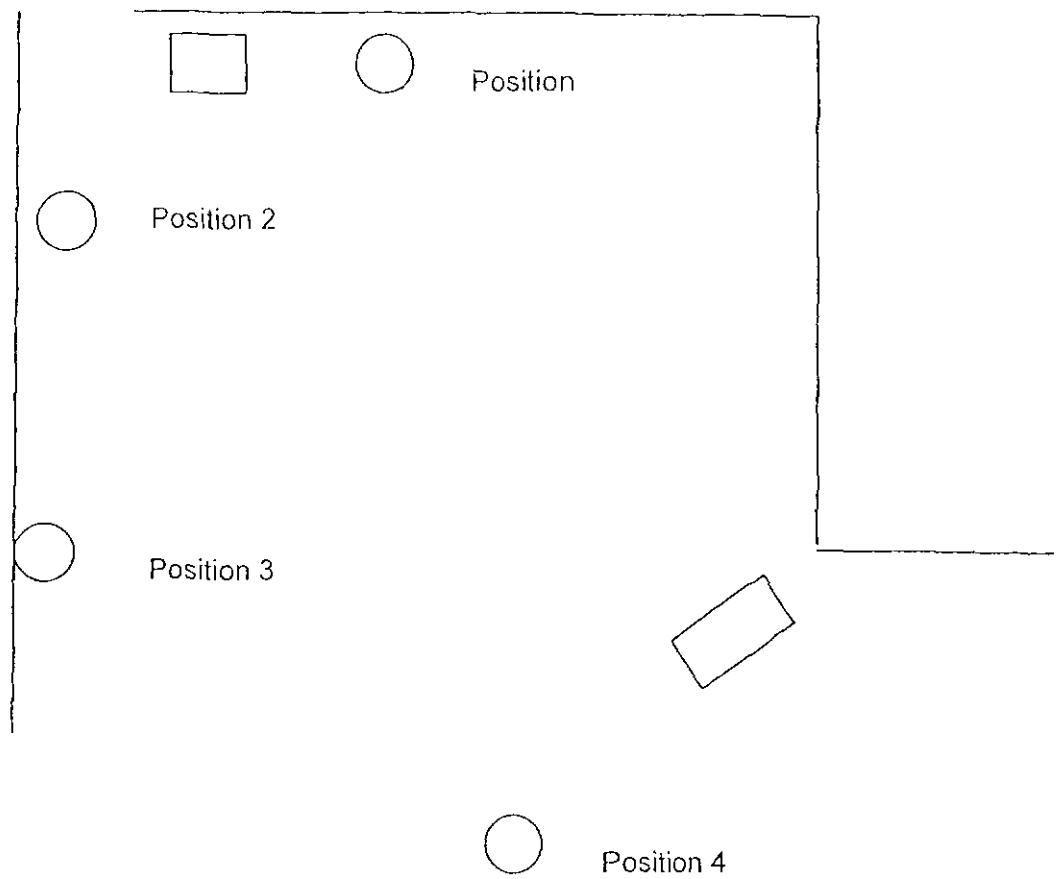
Position 3

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	339	7.3	3.21	<0.002	0.003	0.002	0.98	<0.002	<0.002	<0.002	0.89	<0.01	2.35
South	340	1.6	0.35	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.54
East	341	1.9	0.39	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.54
West	342	6.9	2.21	<0.002	0.003	<0.002	0.26	<0.002	<0.002	<0.002	0.56	<0.01	2.54

Position 4

Direction	Sample No	Total Dust Collected (mg)	Elements Present (mg)										
			Al	Cd	Cr	Cu	Fe	Mn	Ni	Pb	Si	Sn	Zn
North	343	38.3	13.7	<0.002	0.005	0.17	1.23	<0.002	<0.002	<0.002	2.44	<0.01	5.9
South	344	1.2	0.21	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	0.65
East	345	15.4	4.87	<0.002	0.003	0.015	0.89	<0.002	<0.002	<0.002	1.3	<0.01	7.43
West	346	13.0	2.98	<0.002	0.003	0.09	0.98	<0.002	<0.002	<0.002	1.5	<0.01	5.89

Schematic Diagram of Hough Lane Wombwell Site



APPENDIX D

Plate Load Tests

scientifics

Joynes Pike and Associates
1-2 Aire House
Richmond Business Park
Sidings Court
Doncaster
DN4 5NL

JPA - Doncaster			
Project Number: 232095			
Review			
26 MAY 2006			
	DRS		
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		File.	

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Joynes Pike and Associates Ltd
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Sidings Court
Doncaster
DN4 5NL

For the Attention of: Mr Dan Sykes

Report Date: 25th May 2006

Report Reference: 06FW0662
Project Code: JOYDONC064

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20430 and executed on 24th May 2006 by our Mr G Barley.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 5 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240, 241, 411).
b. 600mm diameter rigid steel plate.
c. Pressure gauge referenced 905/172A calibration certificate 172A-19.
d. Reaction load on site – Moxy Earth Mover.

The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

1015

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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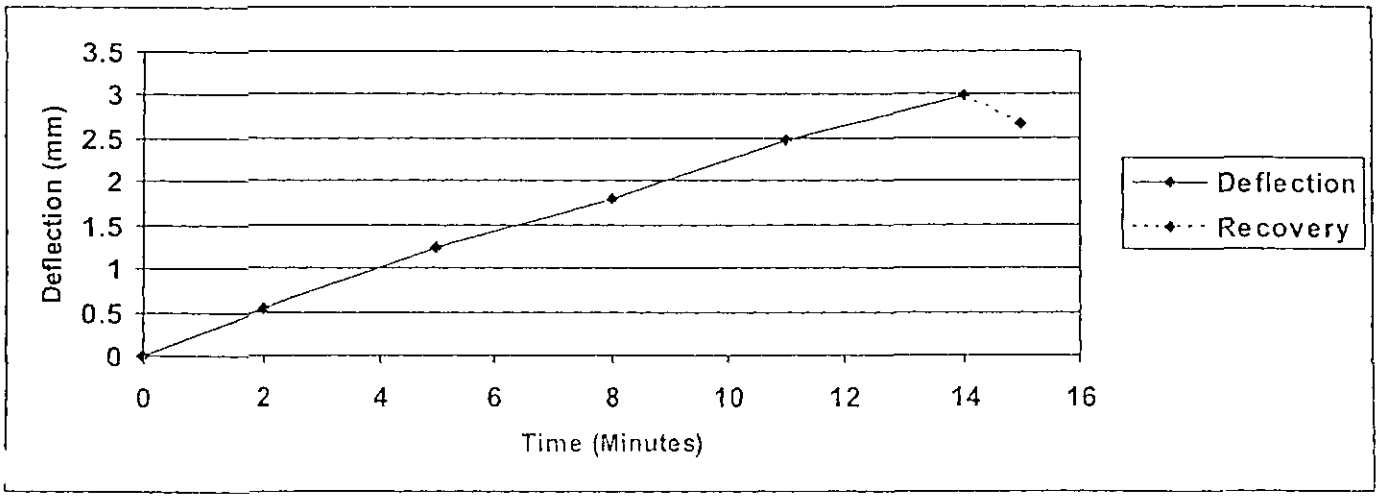
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0662
Site:	Hough Lane, Wombwell	Date Tested:	24/5/2006
Material Under Test:	Silt, Sand & Rubble	Tested By:	G Barley
Client Reference	1	Test Location	53° 30.964N 001° 24.787W E 67m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Earth Mover
Weather conditions	Overcast 11.4°C	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.75%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black silty/sand & fine to coarse sub-rounded gravel & (occ) sandstone & rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.53		
60	5	1.23		
90	8	1.79		
120	11	2.47		
150	14	2.98	3.50	
0	15	2.66		10.7



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UKAS TESTING 1015

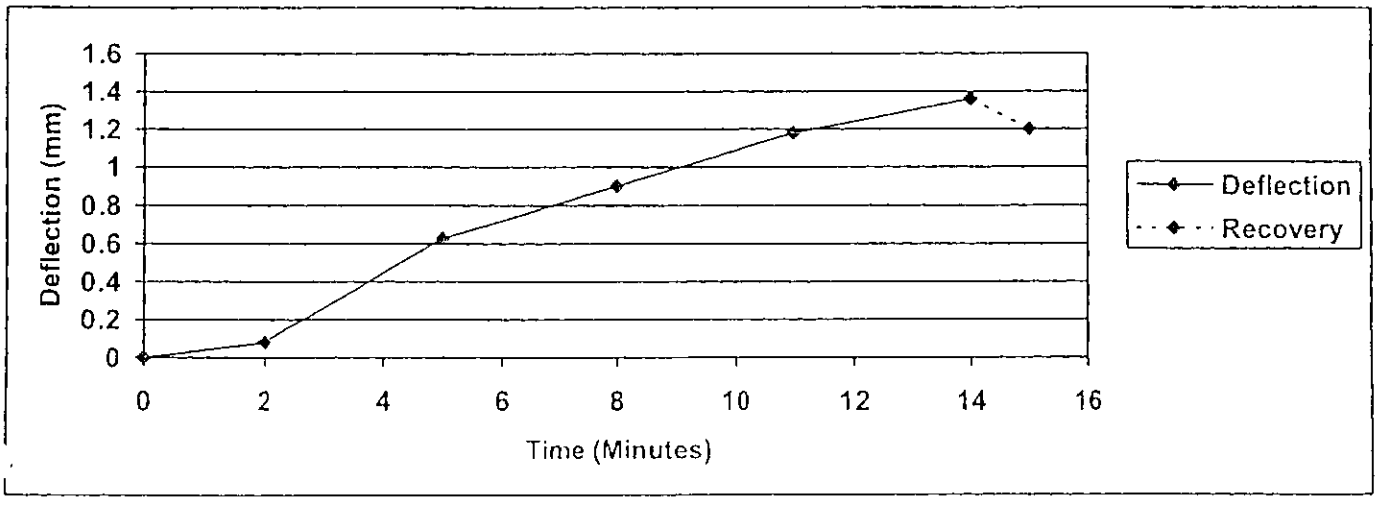
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0662
Site:	Hough Lane, Wombwell	Date Tested:	24/5/2006
Material Under Test:	Silt, Sand & Rubble	Tested By:	G Barley
Client Reference	2	Test Location	53° 30.972N 001° 24.764W E 52m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Tipper
Weather conditions	Overcast 10°C	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black silty/sand & fine to coarse sub-rounded gravel & (occ) sandstone & rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.08		
60	5	0.63		
90	8	0.90		
120	11	1.18		
150	14	1.36	2.03	
0	15	1.20		11.8



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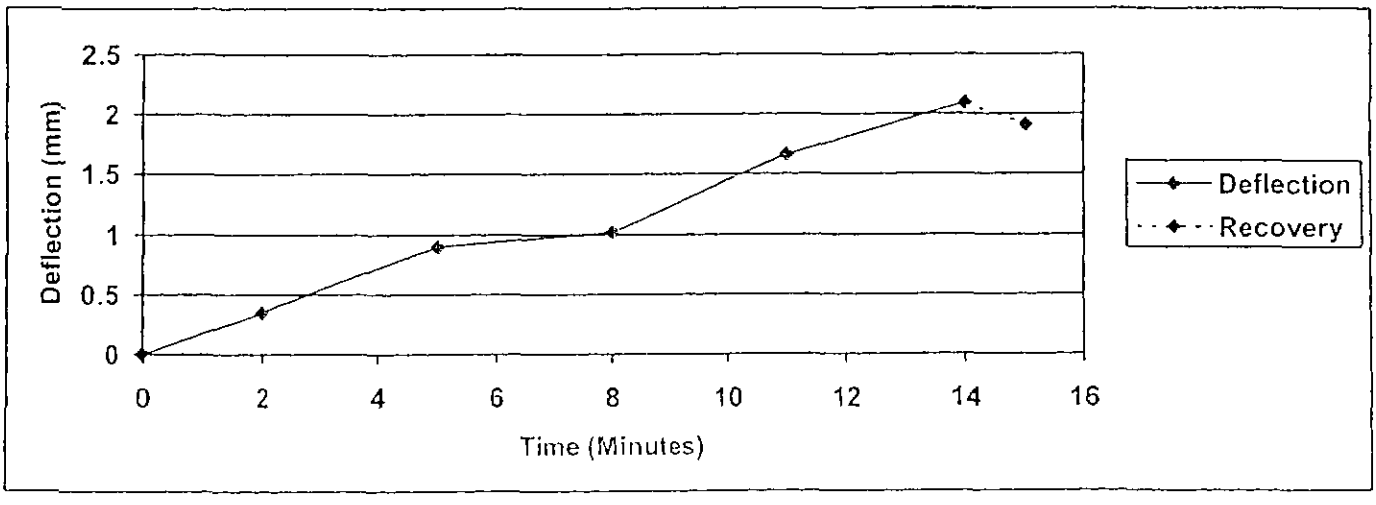
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0662
Site:	Hough Lane, Wombwell	Date Tested:	24/5/2006
Material Under Test:	Silt, Sand & Rubble	Tested By:	G Barley
Client Reference	3	Test Location	53° 30.988N 001° 24.763W E 69m
Test Method	*Incremental*	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Tipper
Weather conditions	Cloudy/Sunny 18°C	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black silty/sand & fine to coarse sub-rounded gravel & (occ) *sandstone & rubble*

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.35		
60	5	0.90		
90	8	1.02		
120	11	1.66		
150	14	2.09	2.33	
0	15	1.91		8.6



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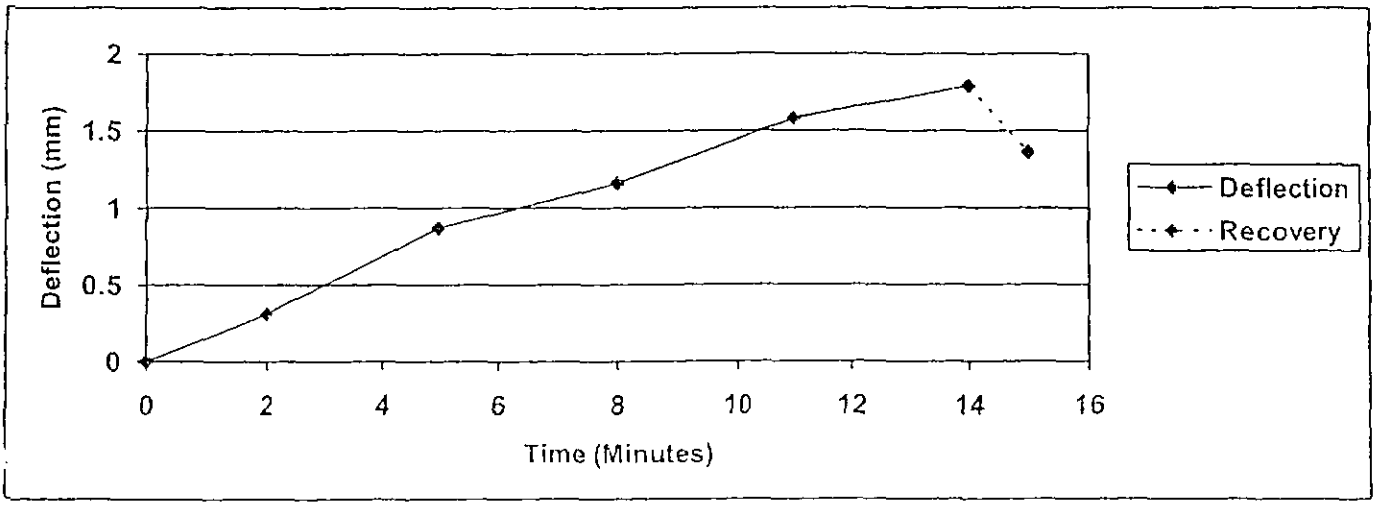
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0662
Site:	Hough Lane, Wombwell	Date Tested:	24/5/2006
Material Under Test:	Silt, Sand & Rubble	Tested By:	G Barley
Client Reference	4	Test Location	53° 30.974N 001° 24.784W E 72m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Tipper
Weather conditions	Cloudy/Sunny 19°C	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black silty/sand & fine to coarse sub-rounded gravel & (occ) sandstone & rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.31		
60	5	0.87		
90	8	1.16		
120	11	1.58		
150	14	1.79	2.12	
0	15	1.36		24.0



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UKAS TESTING 1015

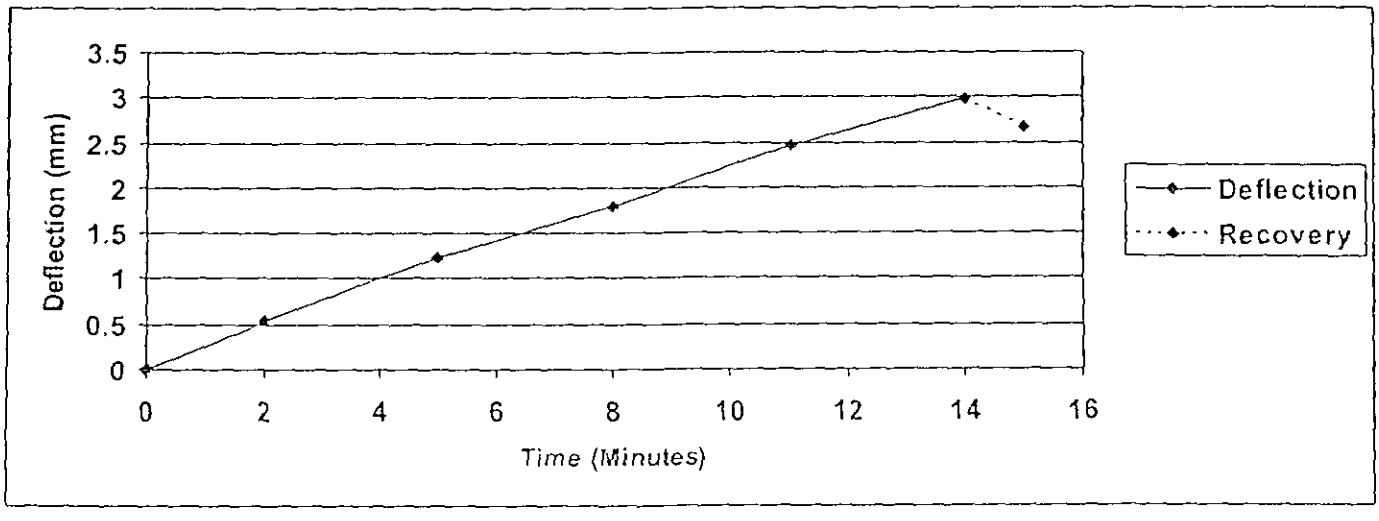
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0662
Site:	Hough Lane, Wombwell	Date Tested:	24/5/2006
Material Under Test:	Silt, Sand & Rubble	Tested By:	G Barley
Client Reference	5	Test Location	53° 30.981N 001° 24.805W E 65m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Tipper
Weather conditions	Cloudy/Sunny 18°C	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black silty/sand & fine to coarse sub-rounded gravel & (occ) sandstone & rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.44		
60	5	0.81		
90	8	1.59		
120	11	1.85		
150	14	2.05	2.45	
0	15	1.83		10.7



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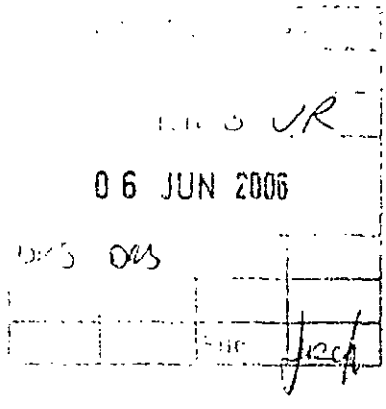

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For the Attention of: Mr Daniel Sykes

Report Date: 5th June 2006

Report Reference: 06FW0680
Project Code: JOYDONC070

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited is pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20441 and executed on 1st June 2006 by our Mr G Barley.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 9 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240, 241, 411).
b. *600mm diameter rigid steel plate.*
c. Pressure gauge referenced 905/172A calibration certificate 905/172A-19.
d. Reaction load on site – 360° Excavator.

The weather at the time of test – Overcast/Drizzle

R Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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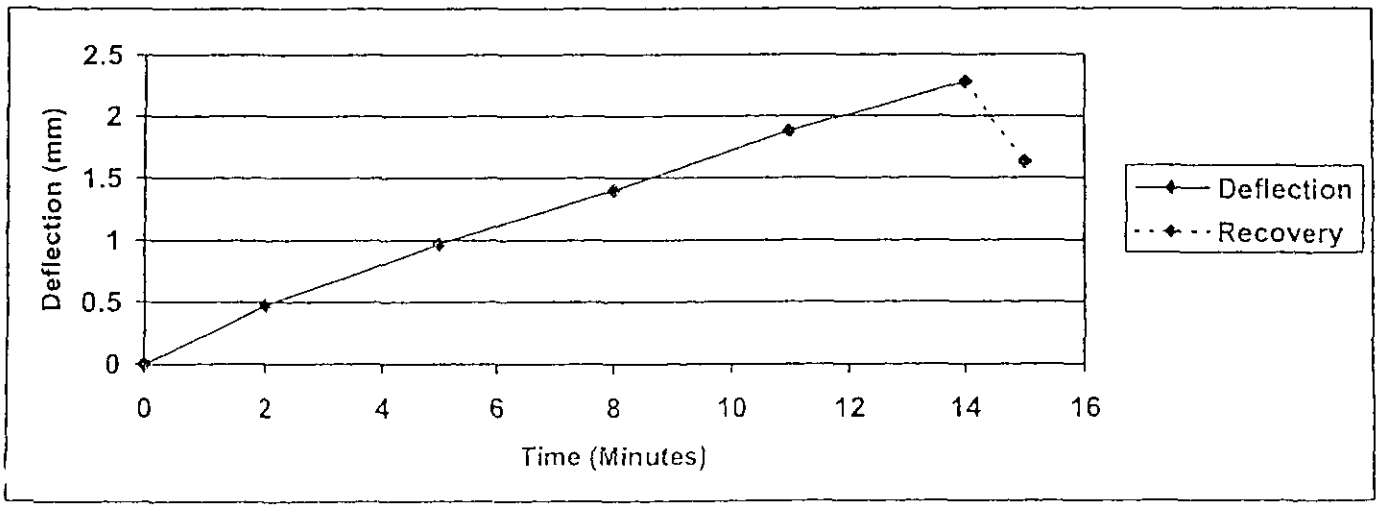
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	6	Test Location	53° 30.971W 001° 24.804W E = 64m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast/Drizzle	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.74		
60	5	1.38		
90	8	2.52		
120	11	3.22		
150	14	3.85	4.48	
0	15	2.90		24.7



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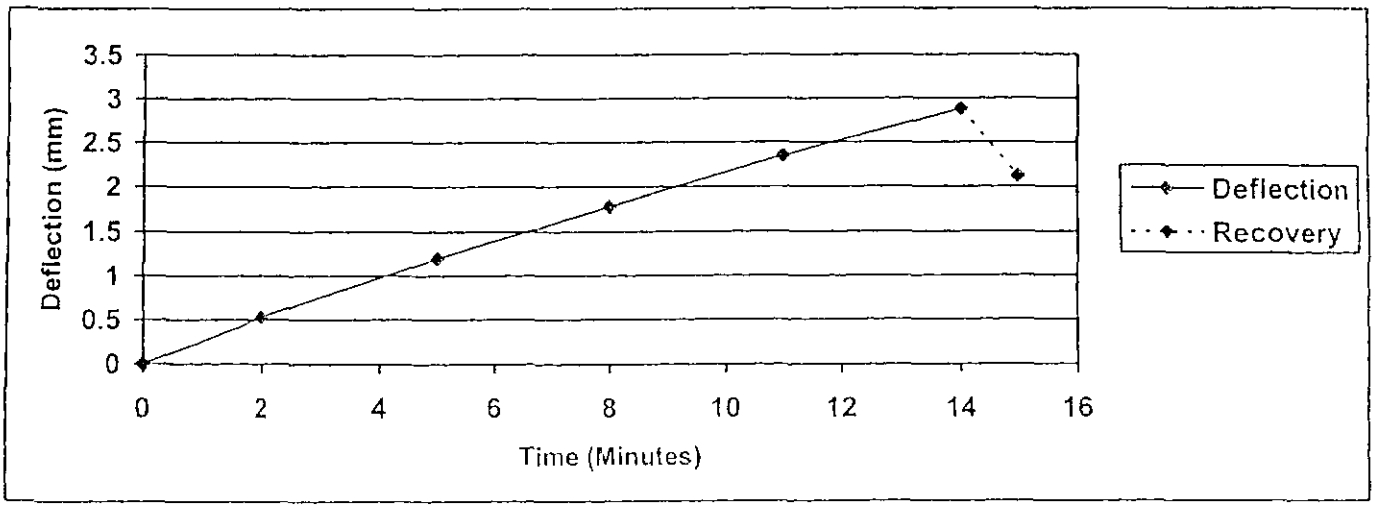
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	7	Test Location	53° 30.982W 001° 24.786W E = 70m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.53		
60	5	1.20		
90	8	1.78		
120	11	2.35		
150	14	2.88	3.35	
0	15	2.12		26.4



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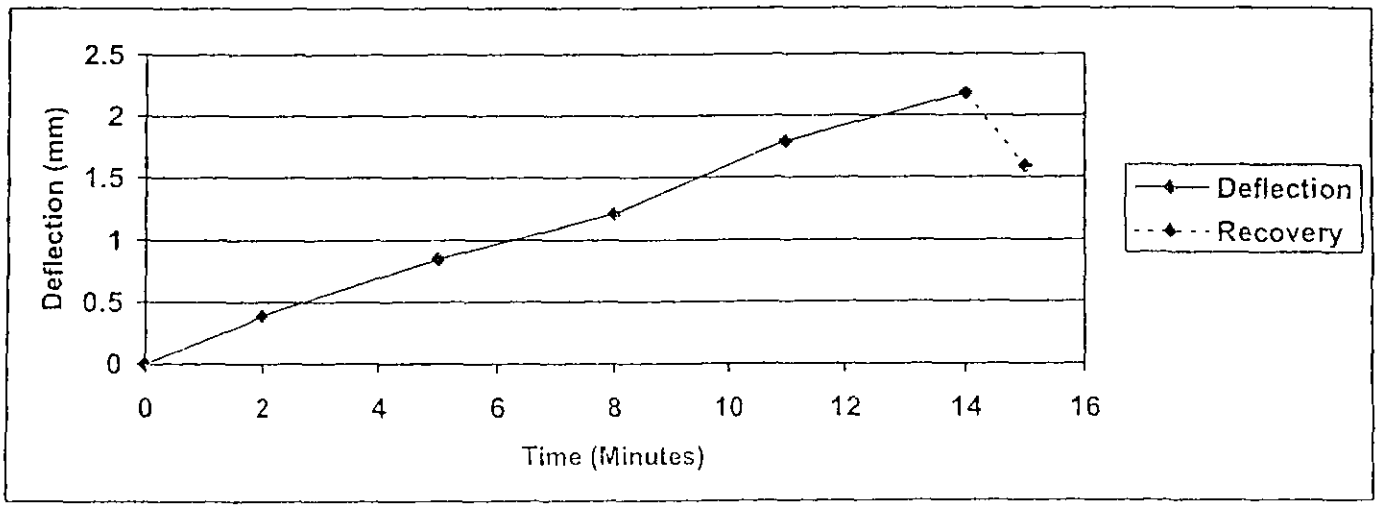
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	8	Test Location	53° 30.987W 001° 24.773W E ≈ 73m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.0%
Distance from edge of *plate to Wall of Excavation*	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.39		
60	5	0.85		
90	8	1.21		
120	11	1.79		
150	14	2.18	2.42	
0	15	1.59		27.1



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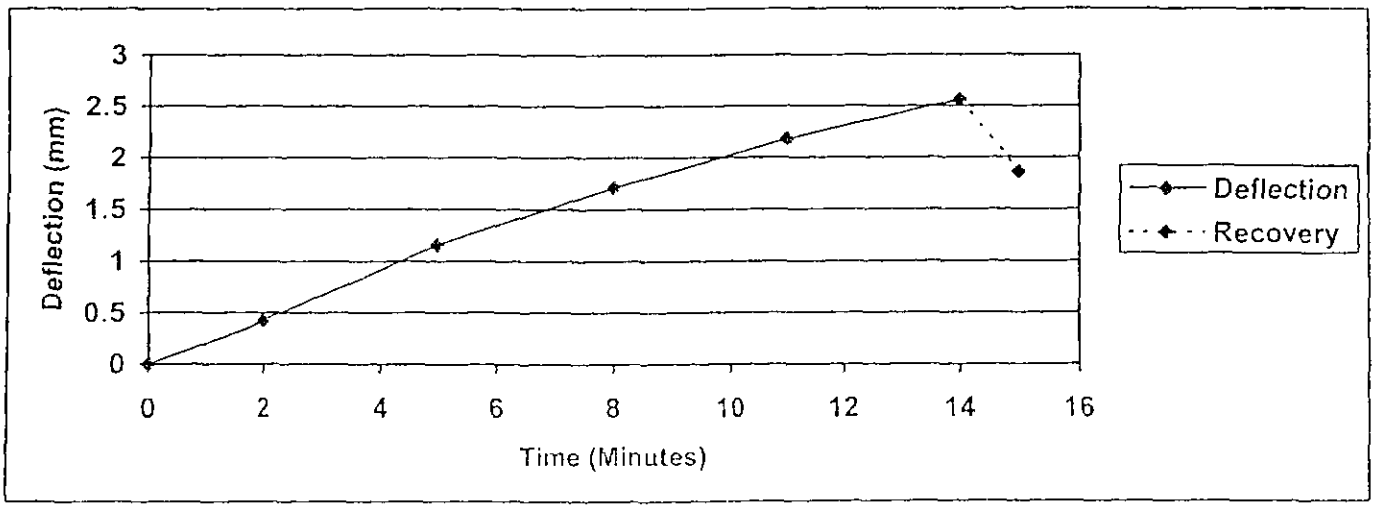
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	9	Test Location	53° 30.998W 001° 24.790W E = 64m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990	10.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.42		
60	5	1.16		
90	8	1.71		
120	11	2.18		
150	14	2.56	2.85	
0	15	1.86		27.3



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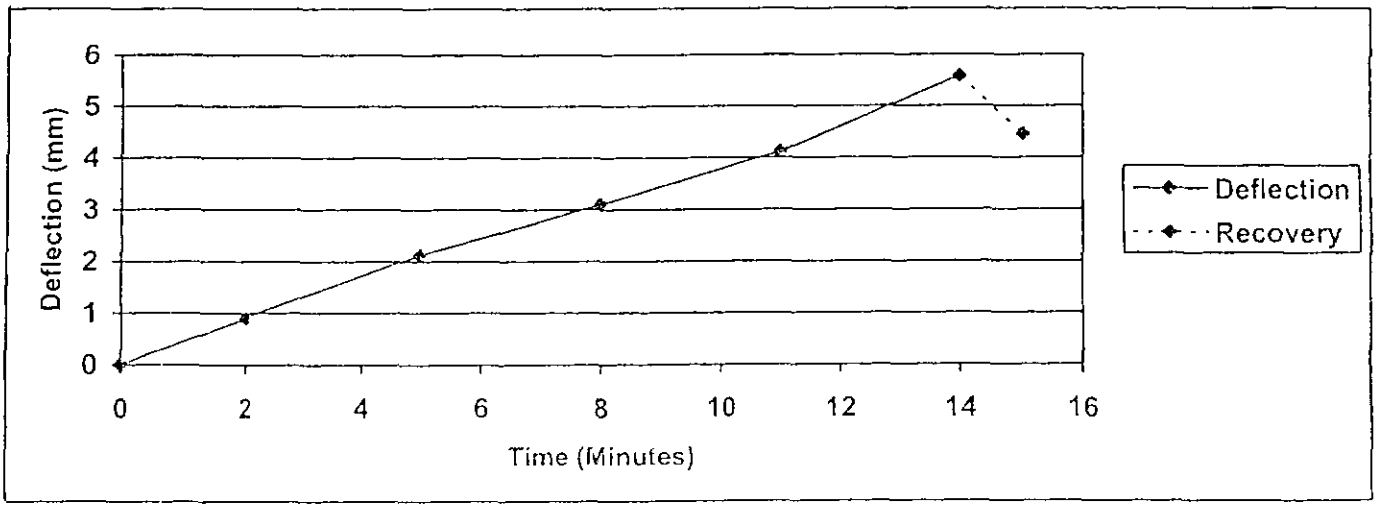
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	10	Test Location	53° 30.984W 001° 24.811W E = 64m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	*Overcast*	*Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990*	13.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.90		
60	5	2.13		
90	8	3.10		
120	11	4.11		
150	14	5.58	6.15	
0	15	4.46		20.1



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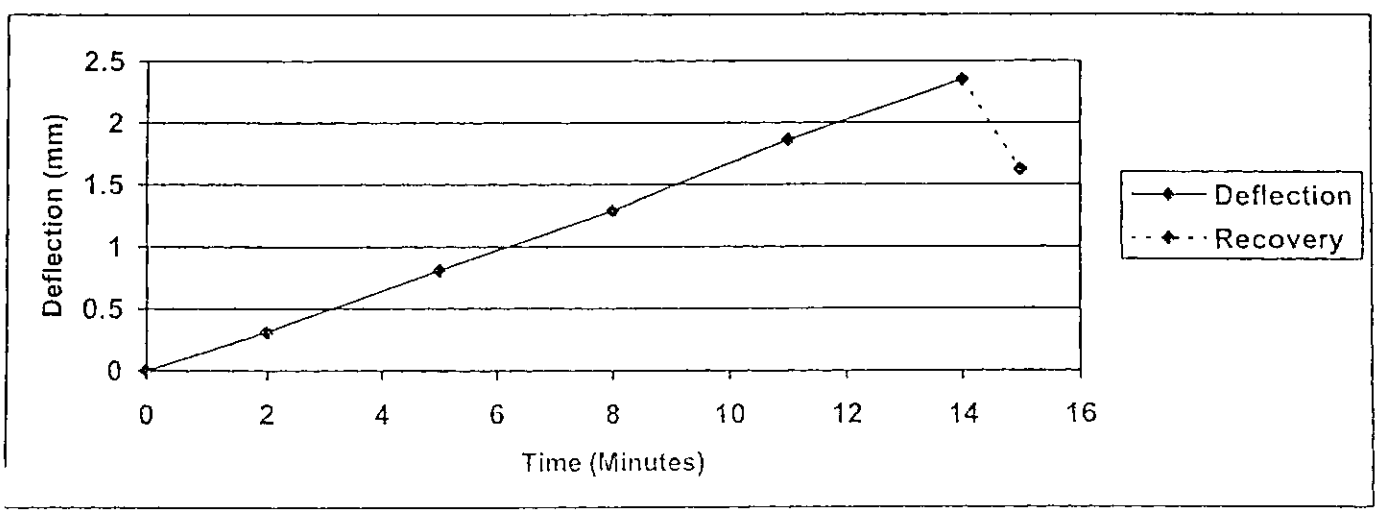
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	11	Test Location	53° 30.966W 001° 24.796W E = 71m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.31		
60	5	0.81		
90	8	1.29		
120	11	1.86		
150	14	2.35	2.48	
0	15	1.62		31.1



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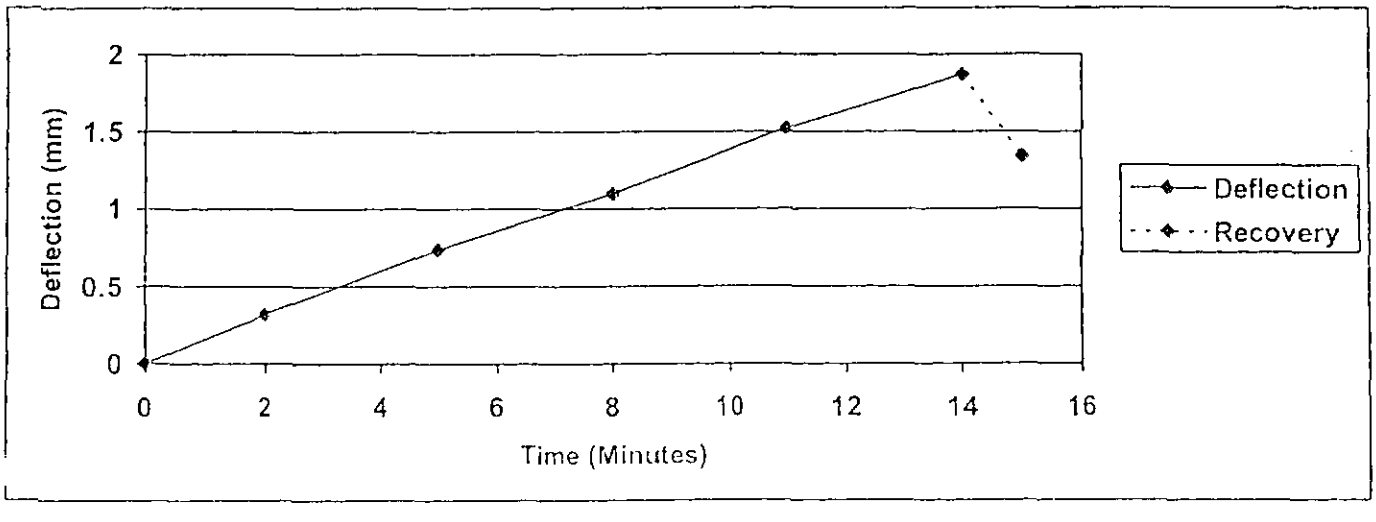
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	*Report No:*	*06FW0680*
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	12	Test Location	53° 30.978W 001° 24.775W E = 67m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	4.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.32		
60	5	0.74		
90	8	1.10		
120	11	1.52		
150	14	1.87	2.12	
0	15	1.34		28.3



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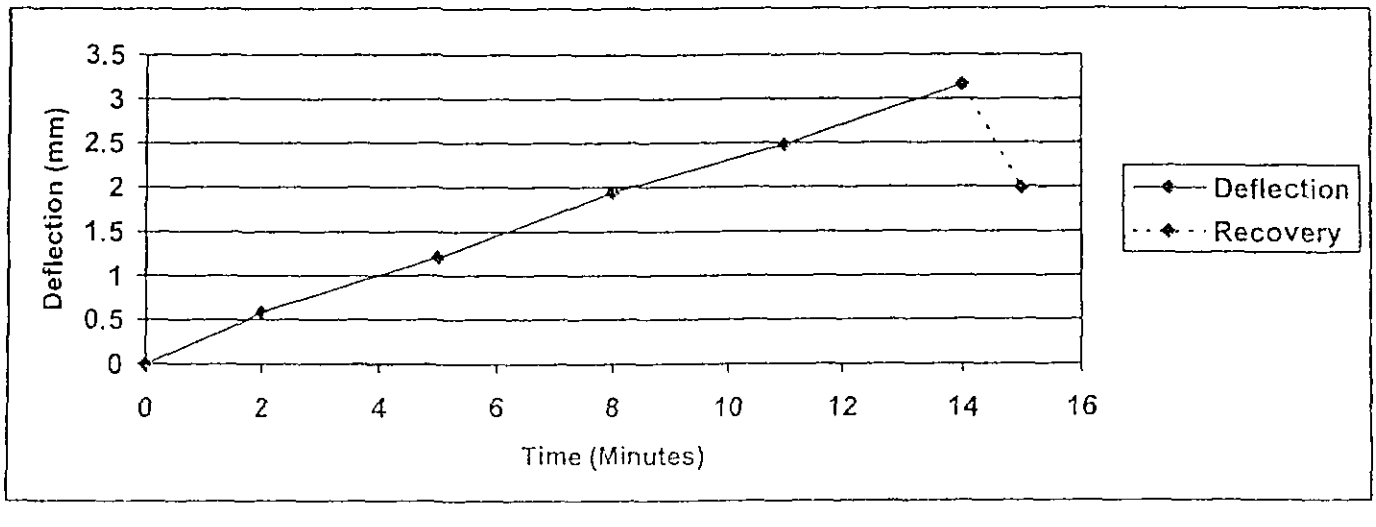
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	13	Test Location	53° 30.968W 001° 24.760W E = 70m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.59		
60	5	1.21		
90	8	1.94		
120	11	2.48		
150	14	3.16	3.29	
0	15	1.99		37.0



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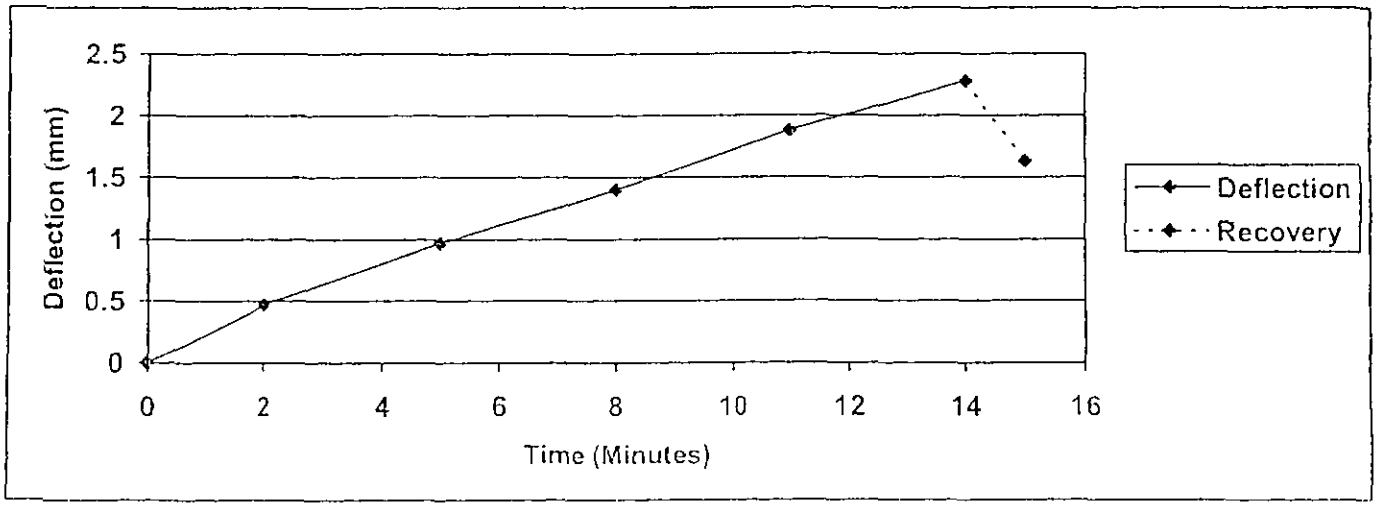
CERTIFICATE OF TEST

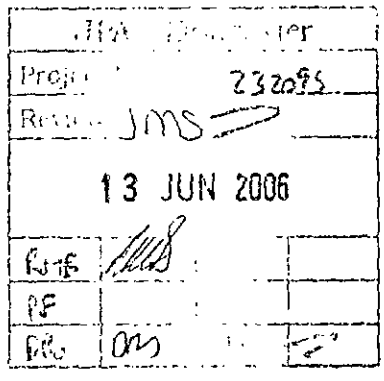
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0680
Site:	Hough Lane, Wombwell	Date Tested:	1/6/2006
Material Under Test:	Ash & Crushed Rubble Fill	Tested By:	G Barley
Client Reference	14	Test Location	53° 30.957W 001° 24.777W E = 62m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose black sandy CLAY with fine to coarse brick rubble and sandstone gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.47		
60	5	0.97		
90	8	1.40		
120	11	1.88		
150	14	2.28	2.70	
0	15	1.63		28.5



Joynes Pike and Associates Ltd
1-2 Aire House
Richmond Business Park
Sidings Court
Doncaster
DN4 5NL



Scientifics Limited
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Ecclesfield
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S35 9ZX
Tel: 0114 240 1901
Fax: 0114 240 1744

Report Date: 12th June 2006

Joynes Pike and Associates Ltd
1-2 Aire House
Richmond Business Park
Sidings Court
Doncaster
DN4 5NL

For the Attention of: Richard Butterworth

Report Reference: 06FW0696
Project Code: JOYDONC073

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R. Butterworth under your official order number 20712 and executed on 7th June 2006 by our Mr G Barley.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 10 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240, 241, 411).
b. 600mm diameter rigid steel plate.
c. Pressure gauge referenced 905/172A calibration certificate 172A-19.
d. Reaction load on site – 360° Excavator

The weather at the time of test – Clear/Sunny

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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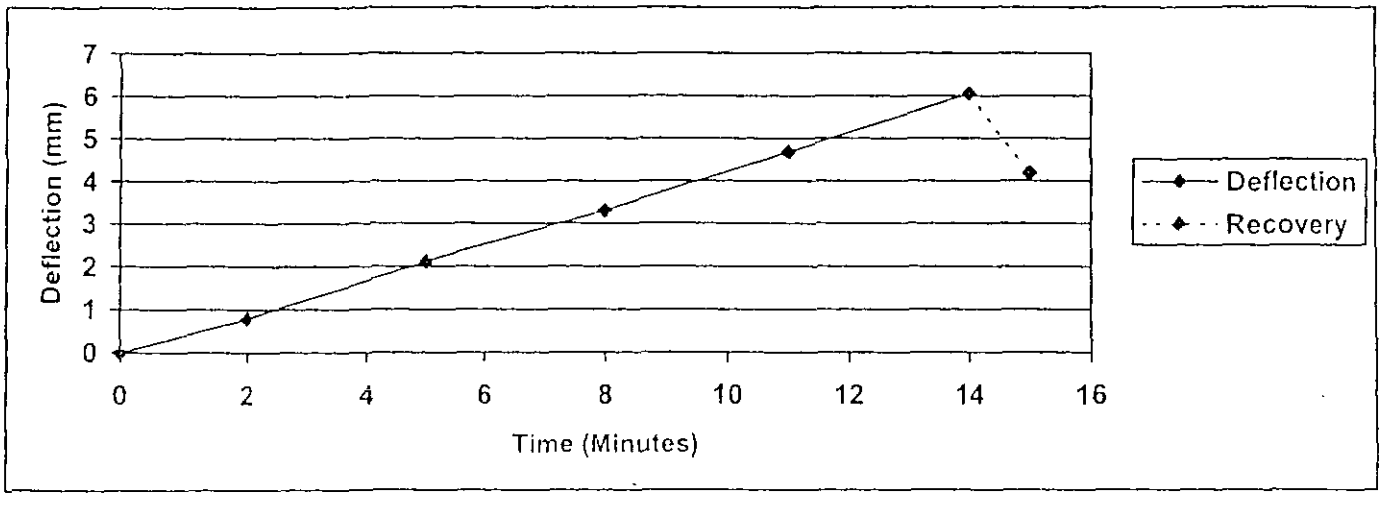
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Sandy clay and crushed rubble fill	Tested By:	G Barley
Client Reference	15	Test Location	53°30.957N; 001°24.823W E = 73m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Clear/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Loose brown SAND with fine to coarse crushed concrete

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.78		
60	5	2.11		
90	8	3.30		
120	11	4.68		
150	14	6.05	6.21	
0	15	4.18		30.9



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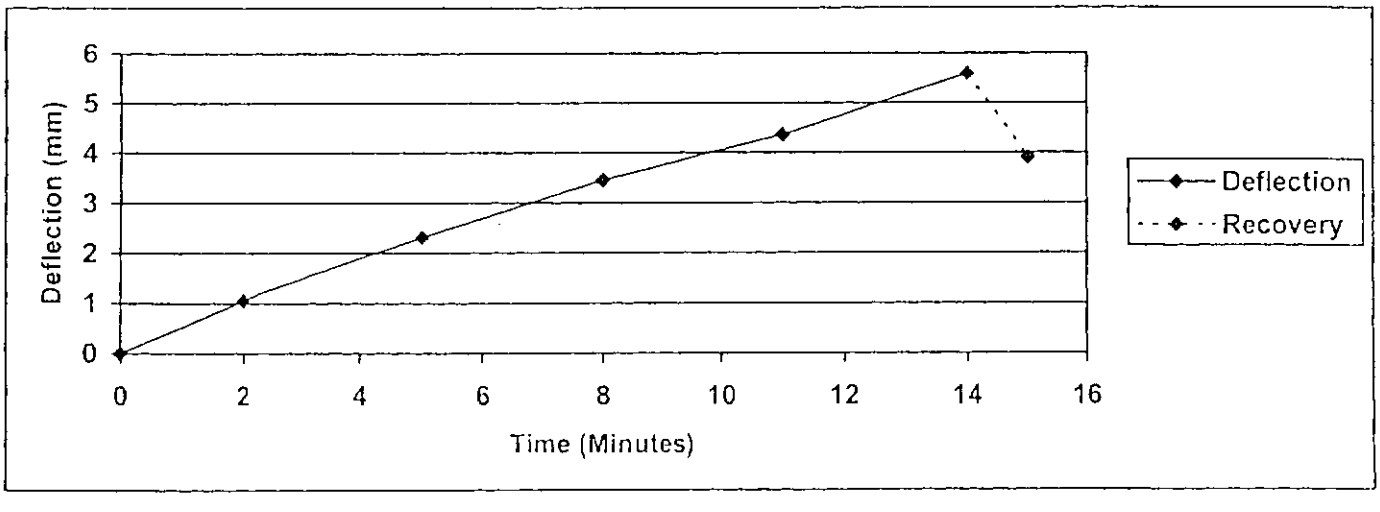
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	16	Test Location	53°30.965N; 001°24.798W E = 54m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Clear/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.05		
60	5	2.31		
90	8	3.45		
120	11	4.36		
150	14	5.59	6.59	
0	15	3.90		30.2



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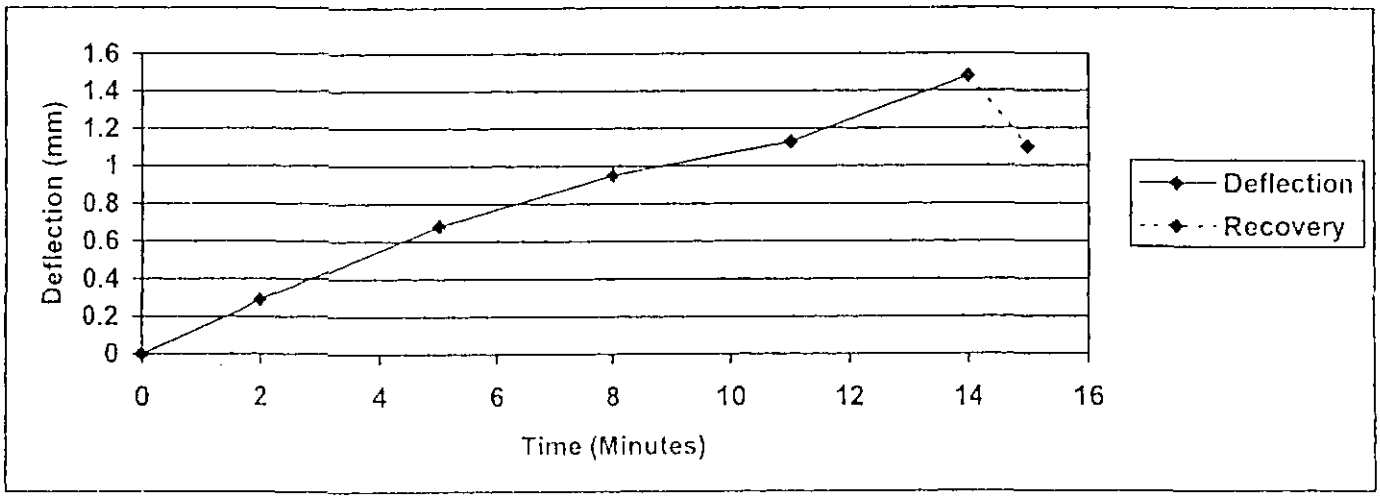
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Sandy clay and crushed rubble fill	Tested By:	G Barley
Client Reference	17	Test Location	53°30.979N; 001°24.779W E = 62m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Clear/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.29		
60	5	0.68		
90	8	0.95		
120	11	1.13		
150	14	1.48	1.63	
0	15	1.10		25.7



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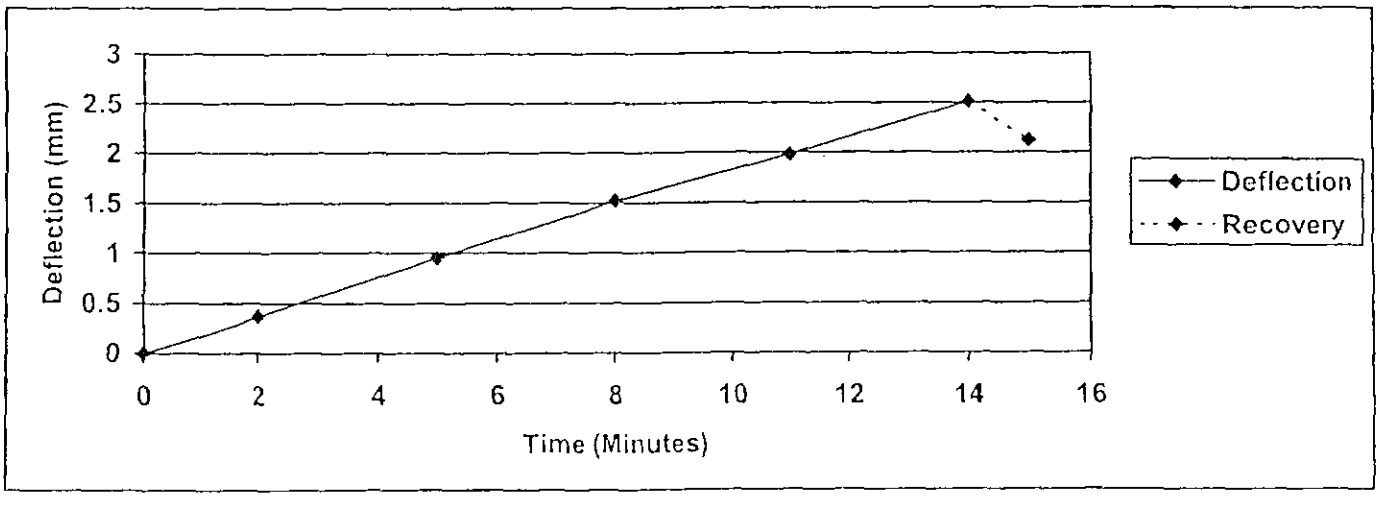
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	18	Test Location	53°31.004N; 001°24.801W E = 81m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Clear/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.37		
60	5	0.95		
90	8	1.52		
120	11	1.98		
150	14	2.51	2.83	
0	15	2.12		15.5



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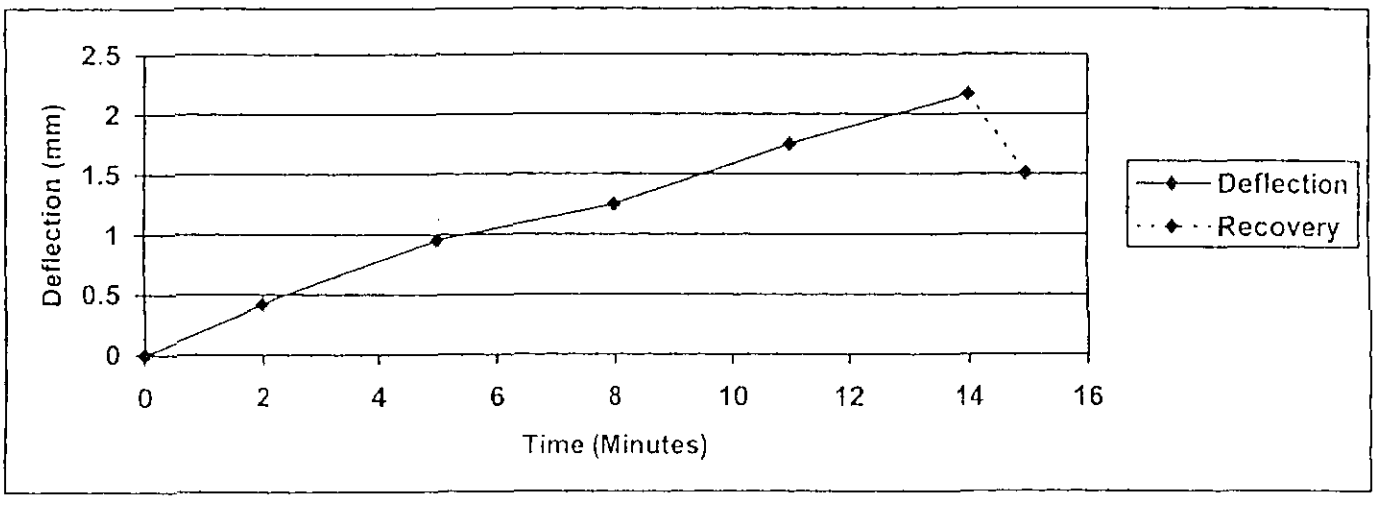
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	19	Test Location	53°30.994N; 001°24.825W E ≈ 70m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.42		
60	5	0.94		
90	8	1.25		
120	11	1.75		
150	14	2.17	2.58	
0	15	1.51		30.4



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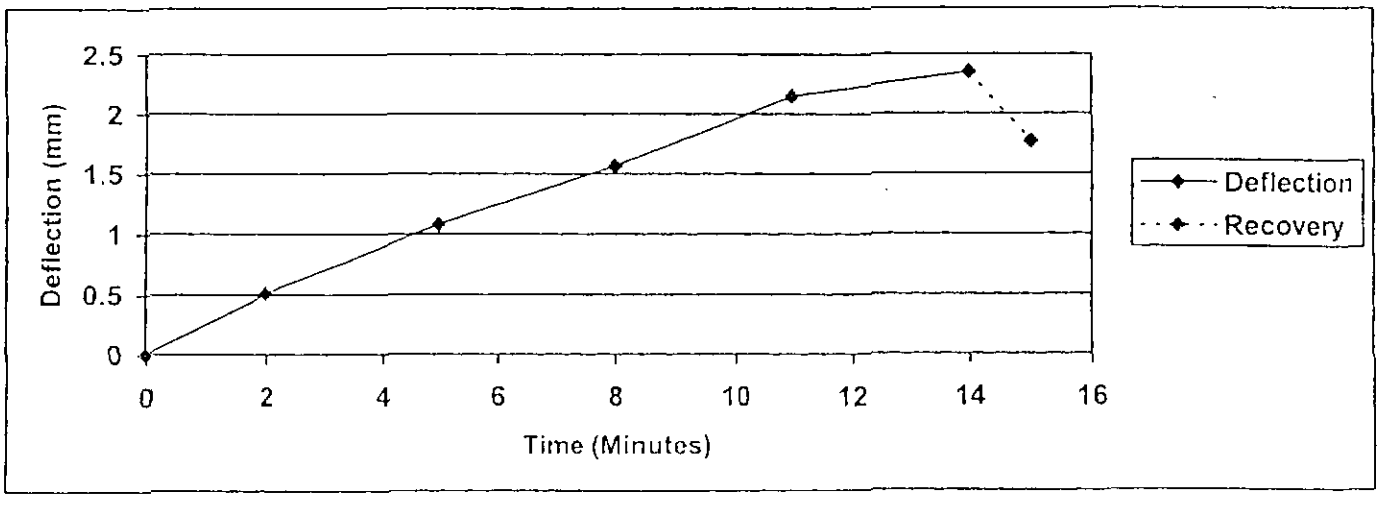
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Sandy clay and crushed rubble fill	Tested By:	G Barley
Client Reference	20	Test Location	53°30.985 N; 001°24.763W E = 75m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance* with BS1377:Pt2:1990	7.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.51		
60	5	1.08		
90	8	1.57		
120	11	2.15		
150	14	2.35	2.77	
0	15	1.77		24.7



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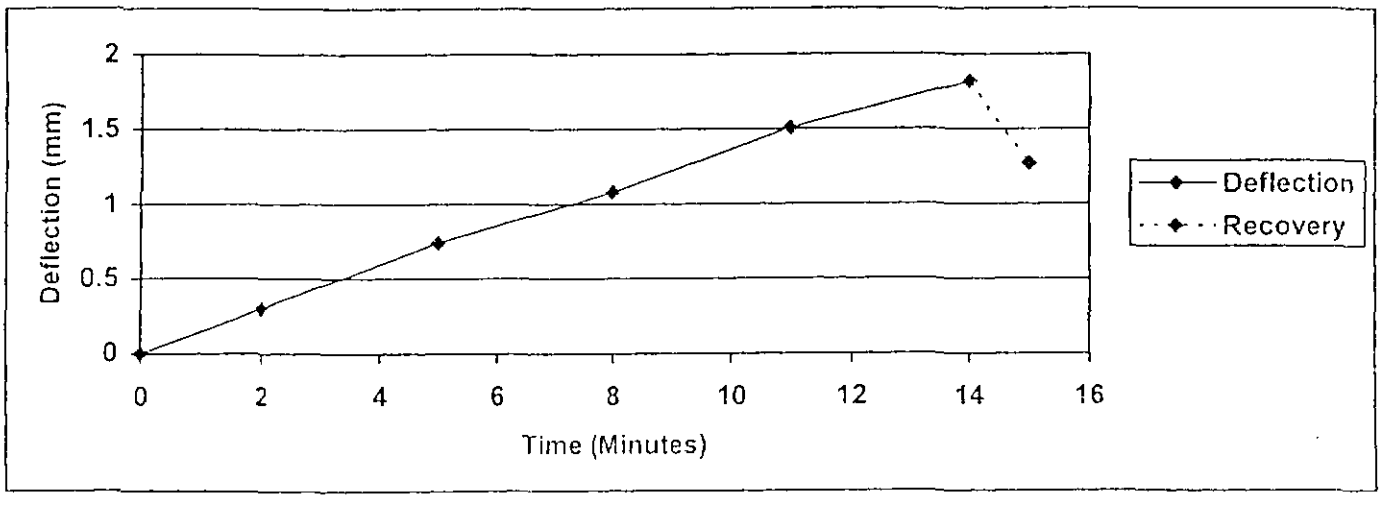
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	21	Test Location	53°30.998N; 001°24.787W E = 68m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.30		
60	5	0.74		
90	8	1.08		
120	11	1.51		
150	14	1.82	1.95	
0	15	1.27		30.2



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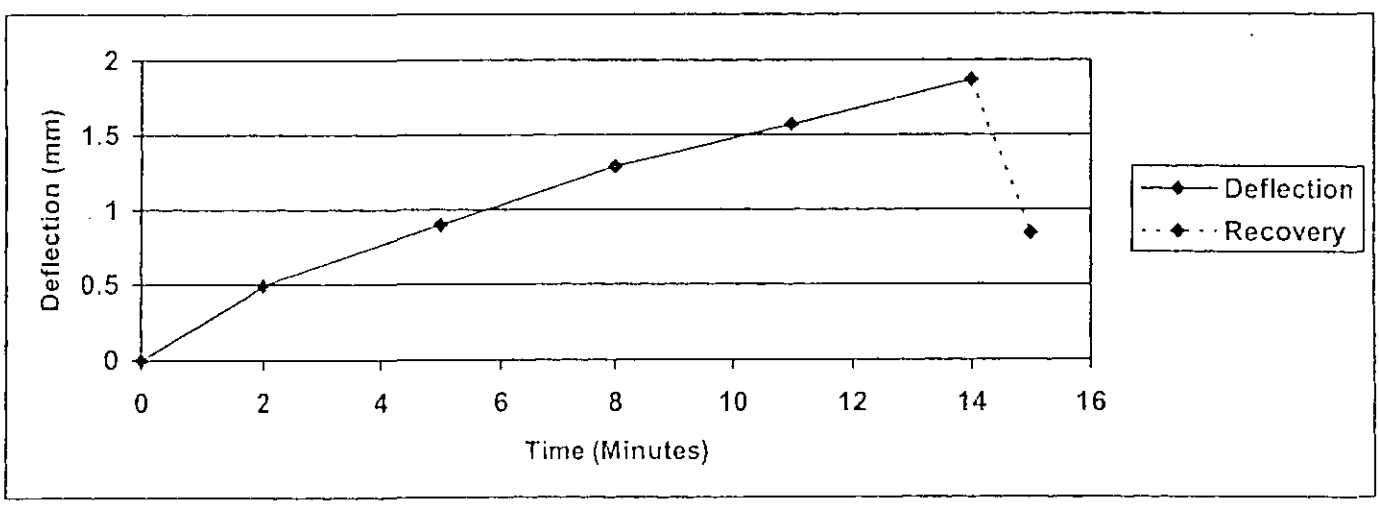
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	22	Test Location	53°30.984N; 001°24.805W E = 70m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.49		
60	5	0.90		
90	8	1.29		
120	11	1.57		
150	14	1.87	2.20	
0	15	0.84		55.1



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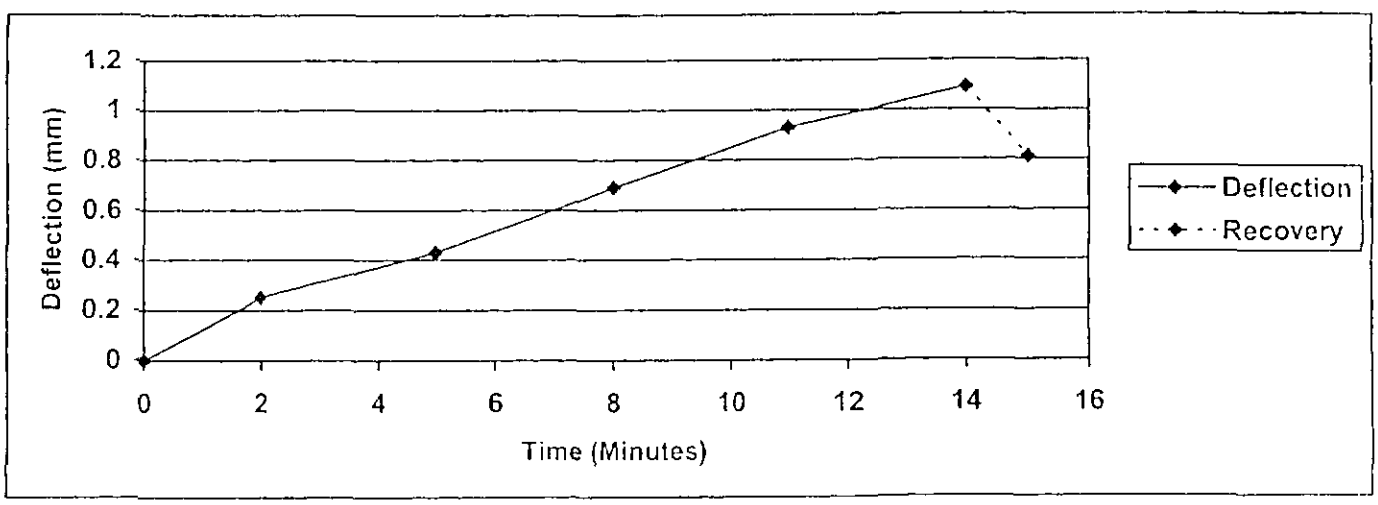
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	23	Test Location	53°30.976N; 001°24.823W E = 64m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.25		
60	5	0.43		
90	8	0.69		
120	11	0.93		
150	14	1.09	1.32	
0	15	0.81		25.7



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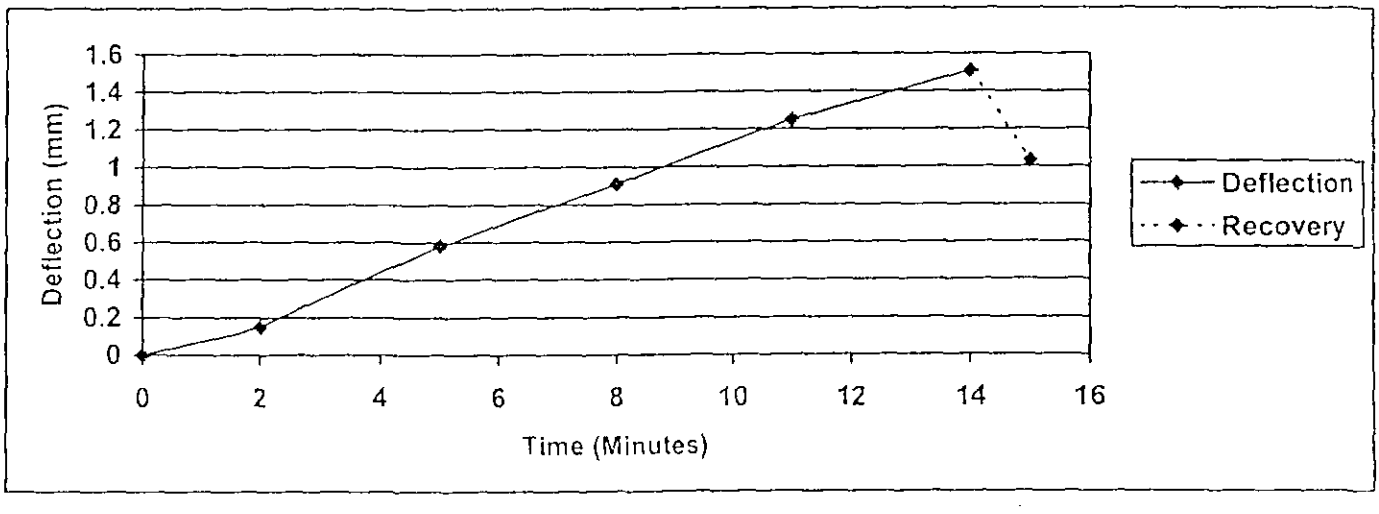
CERTIFICATE OF TEST

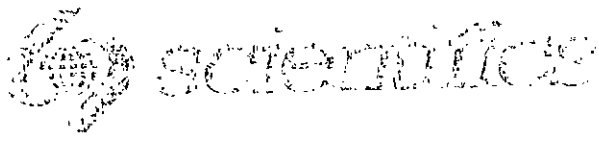
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

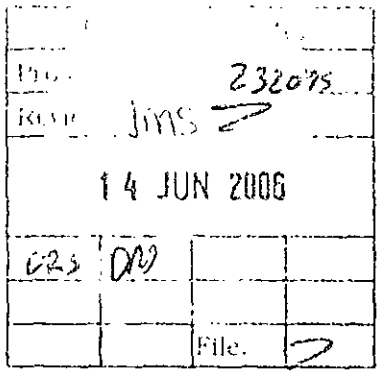
Client:	Joynes Pike and Associates Ltd	Report No:	06FW0696
Site:	Hough Lane, Wombwell	Date Tested:	07/06/2006
Material Under Test:	Ash and crushed rubble fill	Tested By:	G Barley
Client Reference	24	Test Location	53°30.942N; 001°24.809W E = 71m
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy/Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black sand and ash with fine to coarse brick rubble and ash gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.15		
60	5	0.58		
90	8	0.91		
120	11	1.25		
150	14	1.51	1.71	
0	15	1.03		31.8







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For the Attention of: Mr Rob Fone

Report Date: 13th June 2006

Report Reference: 06FW0699
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R. Fone under your official order number 20712 and executed on 12th June 2006 by our Mr R. Thorne.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 6 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – 360° Excavator

The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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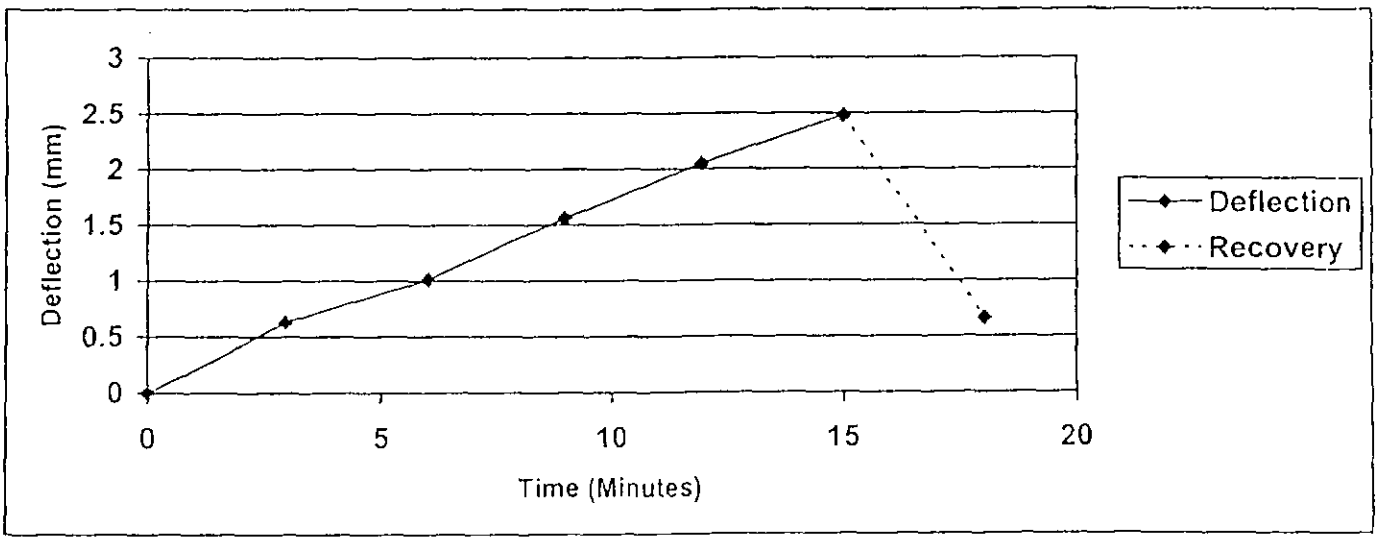
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0699
Site:	Hough Lane, Wombwell	Date Tested:	12/06/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	25	Test Location	25
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.18%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark grey silty SAND and rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.63		
60	6	1.01		
90	9	1.56		
120	12	2.05		
150	15	2.48	2.65	
0	18	0.66		73.4



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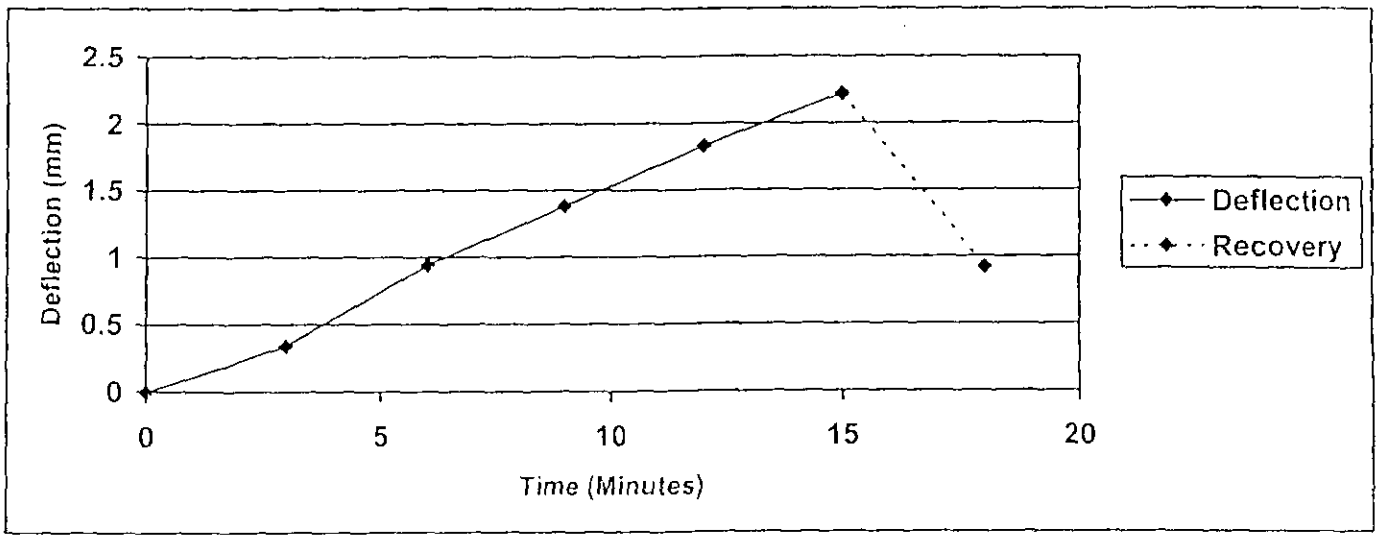
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0699
Site:	Hough Lane, Wombwell	Date Tested:	12/06/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	26	Test Location	26
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.29%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark grey silty SAND and rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.34		
60	6	0.94		
90	9	1.38		
120	12	1.83		
150	15	2.22	2.73	
0	18	0.92		58.6



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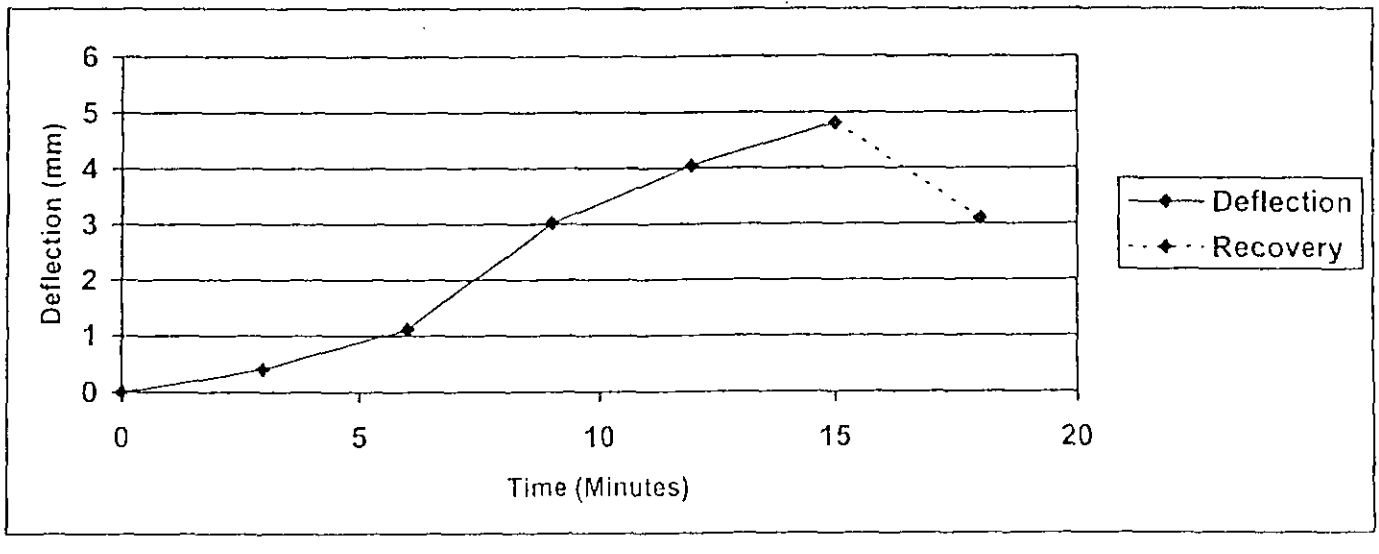
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0699
Site:	Hough Lane, Wombwell	Date Tested:	12/06/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	27.1	Test Location	27.1
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.58%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark grey silty SAND and rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.41		
60	6	1.12		
90	9	3.02		
120	12	4.05		
150	15	4.81	9.37	
0	18	3.10		35.6



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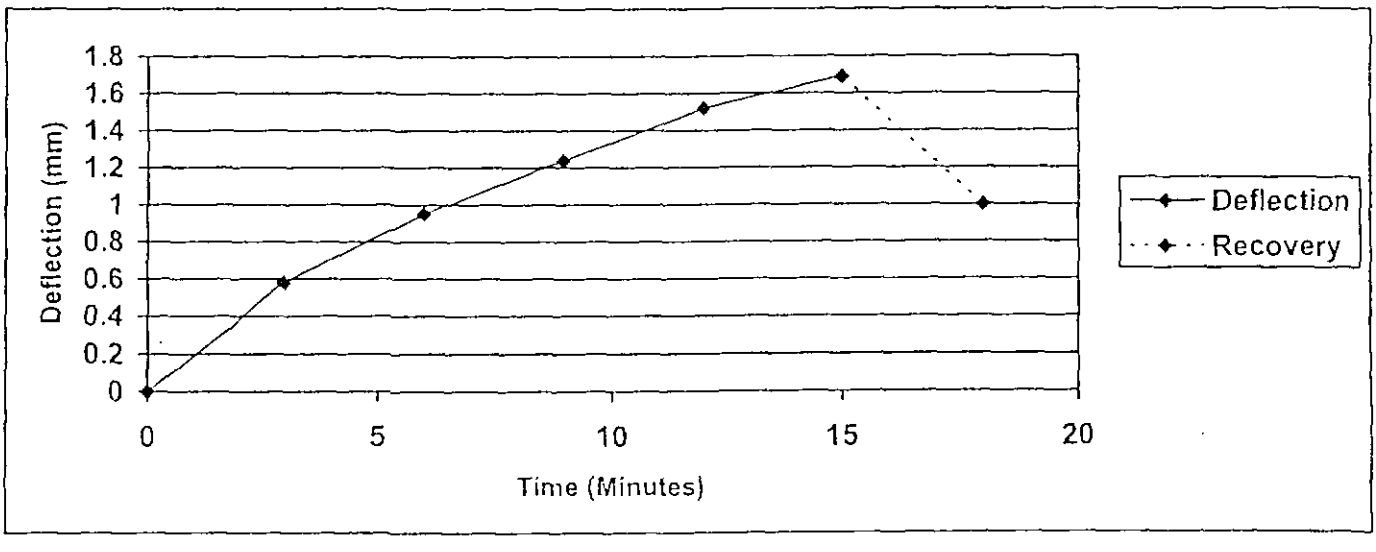
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0699
Site:	Hough Lane, Wombwell	Date Tested:	12/06/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	28	Test Location	28
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.63%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark grey silty SAND and rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.58		
60	6	0.95		
90	9	1.24		
120	12	1.52		
150	15	1.69	2.71	
0	18	1.00		40.8



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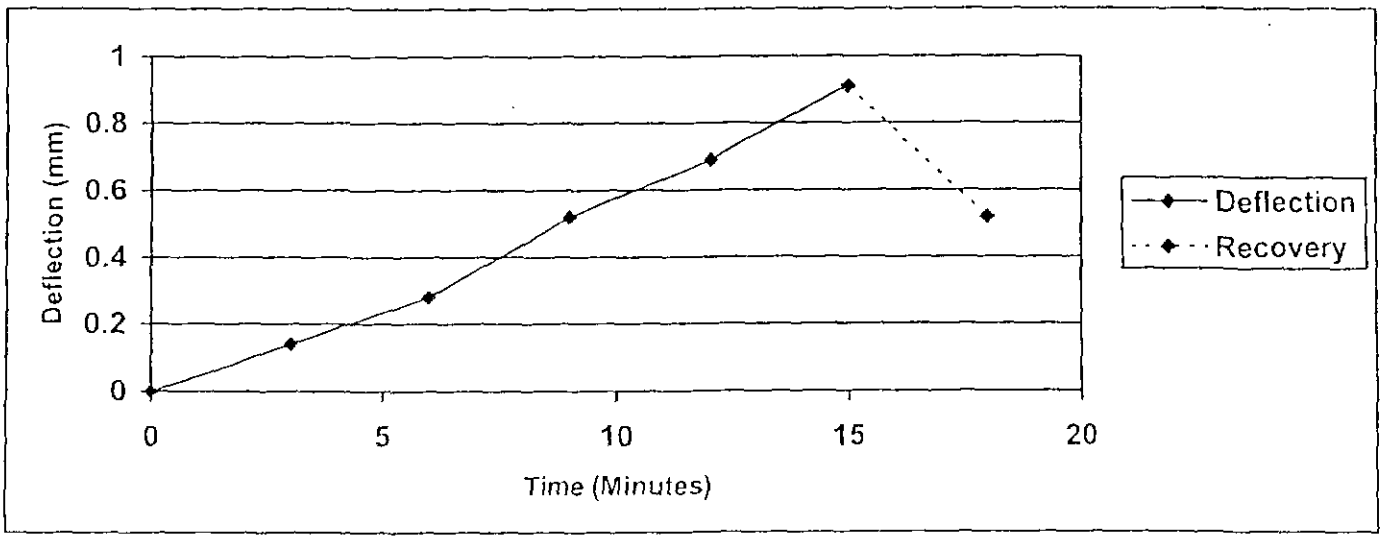
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0699
Site:	Hough Lane, Wombwell	Date Tested:	12/06/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	29	Test Location	29
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.88%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark grey silty SAND and rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.14		
60	6	0.28		
90	9	0.52		
120	12	0.69		
150	15	0.91	1.27	
0	18	0.52		42.9



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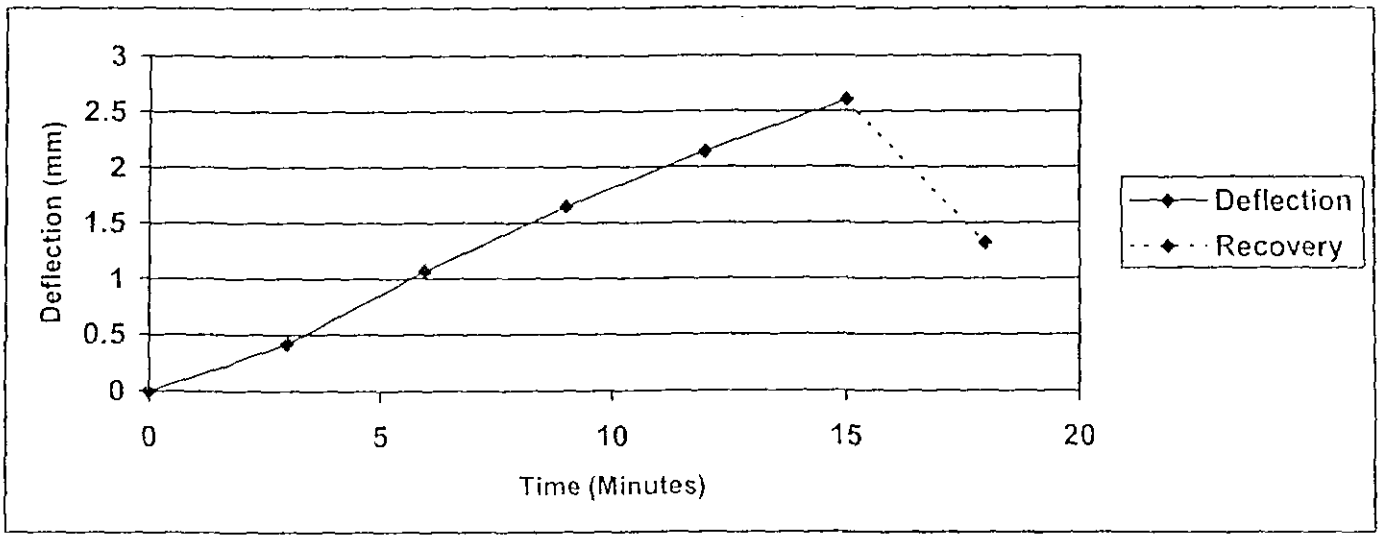
CERTIFICATE OF TEST

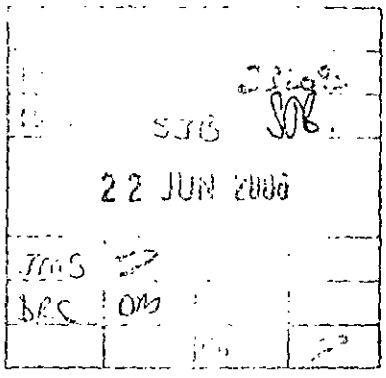
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0699
Site:	Hough Lane, Wombwell	Date Tested:	12/06/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	30	Test Location	30
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark grey silty SAND and rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.42		
60	6	1.07		
90	9	1.65		
120	12	2.14		
150	15	2.60	2.83	
0	18	1.32		49.2





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For the Attention of: Mr Daniel Sykes

Report Date: 21st June 2006

Report Reference: 06FW0719
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 19th June 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 8 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 408, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – 360° Excavator

The weather at the time of test – Sunny/Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
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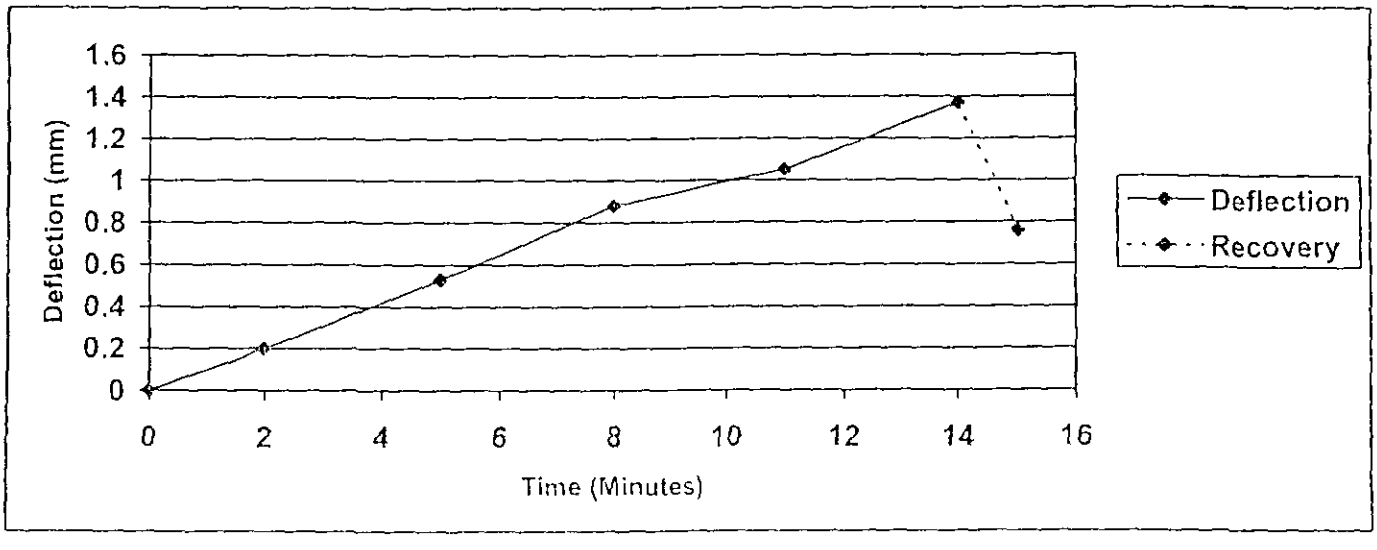
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	31	Test Location	31 test on natural fill
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed brick/ rubble with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.20		
60	5	0.53		
90	8	0.88		
120	11	1.05		
150	14	1.37	1.70	
0	15	0.76		44.5



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UKAS TESTING 1015

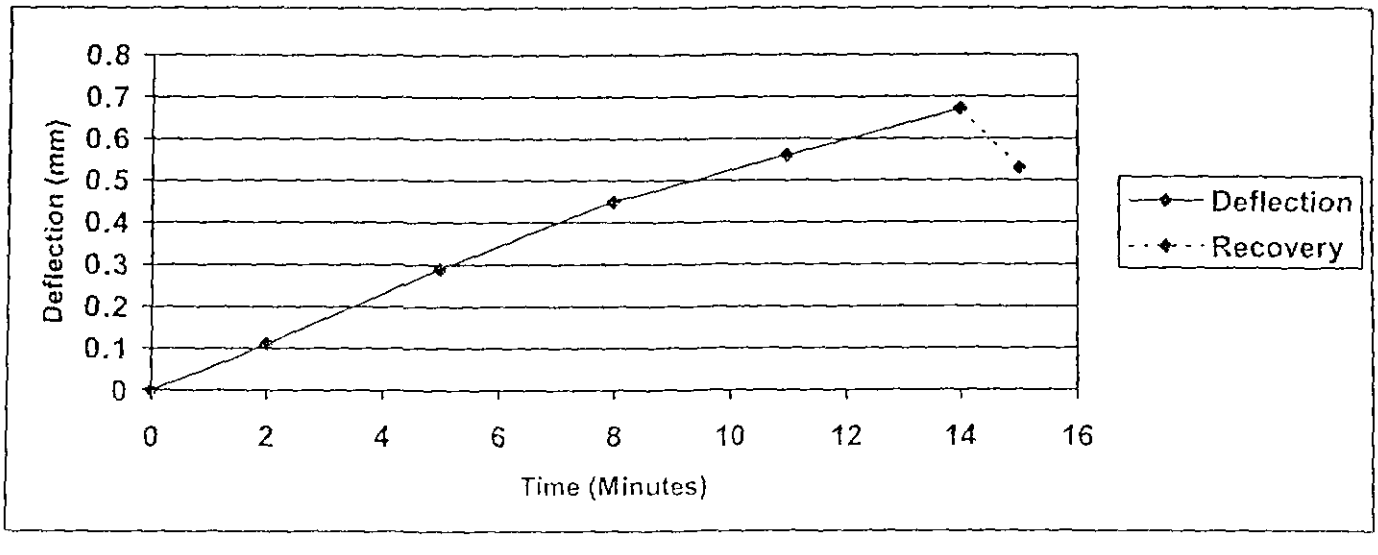
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	32	Test Location	32 test on final layer
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed brick/ rubble with medium to coarse rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.11		
60	5	0.29		
90	8	0.45		
120	11	0.56		
150	14	0.67	1.07	
0	15	0.53		20.9



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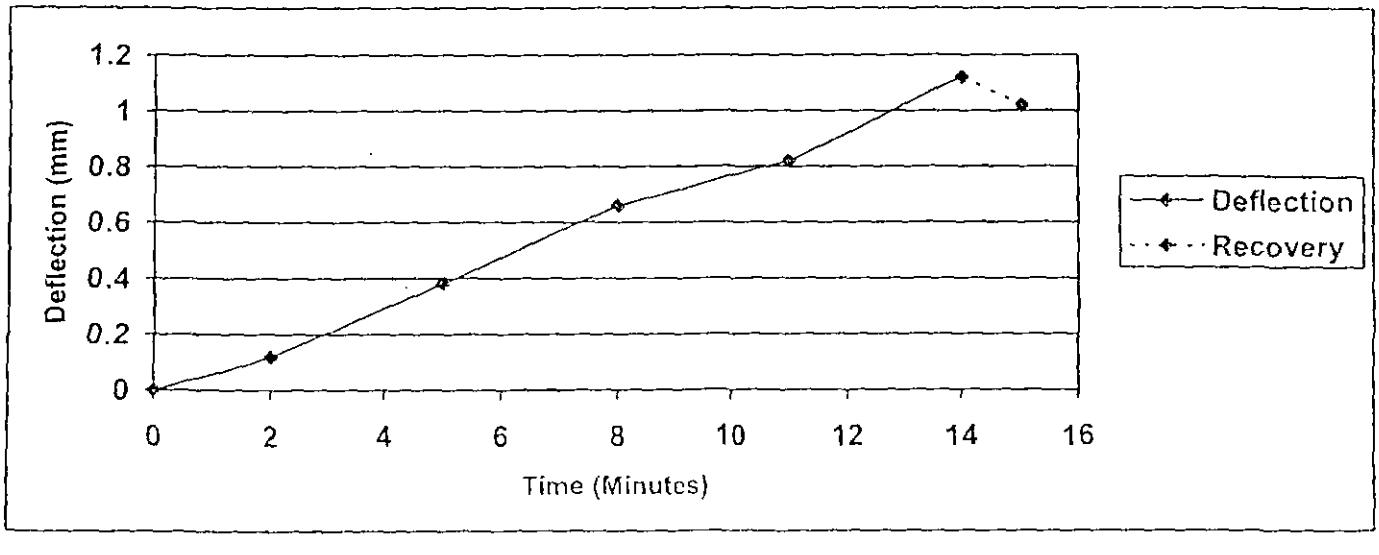
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	33	Test Location	33 test on final layer
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	*Surface*	*Reaction Load Used*	*360° Excavator*
Weather conditions	Sunny/Overcast	*Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990*	5.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed brick/ rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.12		
60	5	0.38		
90	8	0.66		
120	11	0.82		
150	14	1.12	1.22	
0	15	1.02		8.9



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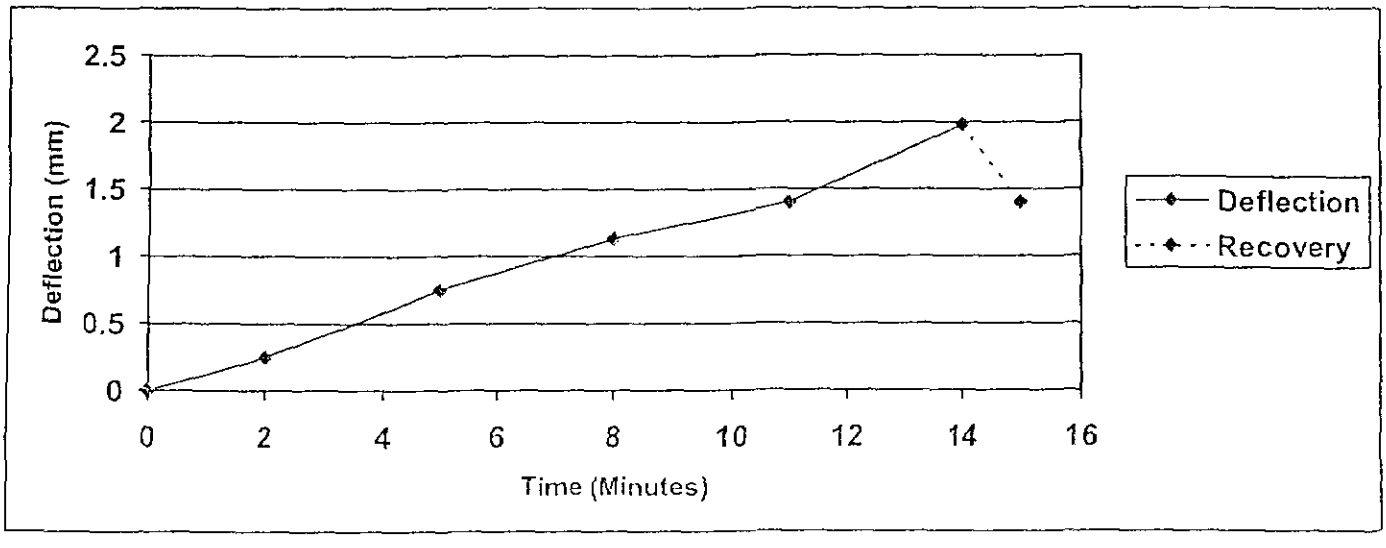
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Dale Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	34	Test Location	34
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	4.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Mixed brick/rubble with fine cobble rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.25		
60	5	0.75		
90	8	1.13		
120	11	1.40		
150	14	1.98	2.53	
0	15	1.40		29.3



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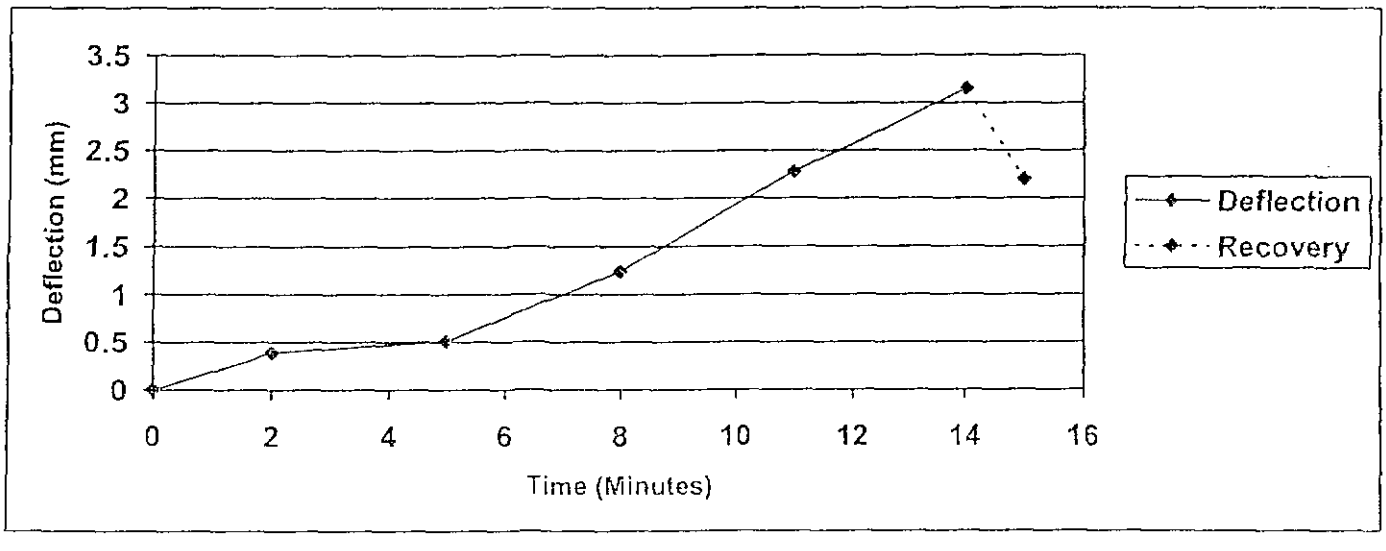
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	35	Test Location	35
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed brick/rubble with medium to coarse cobble.

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.39		
60	5	0.51		
90	8	1.24		
120	11	2.28		
150	14	3.15	3.20	
0	15	2.20		30.2



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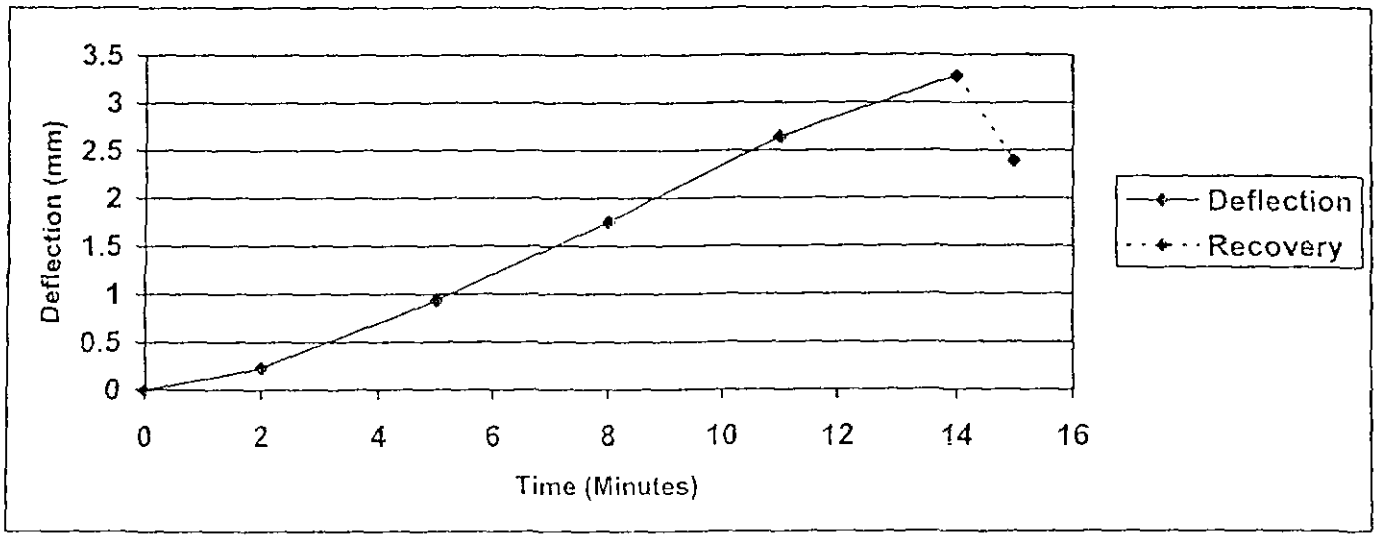
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	36	Test Location	36
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	4.7%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed rubble with fine to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.23		
60	5	0.93		
90	8	1.75		
120	11	2.64		
150	14	3.28	3.93	
0	15	2.39		27.1



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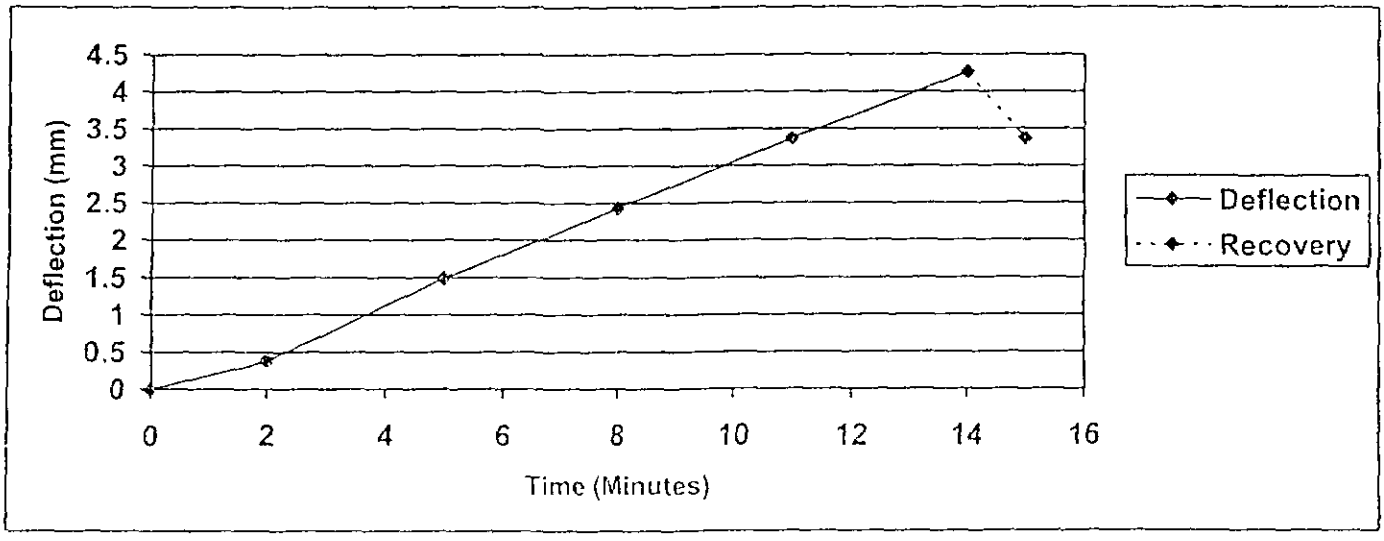
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	Tested By:	R Gaunt
Client Reference	37	Test Location	37
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed rubble with fine to coarse rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.38		
60	5	1.49		
90	8	2.43		
120	11	3.37		
150	14	4.26	5.17	
0	15	3.37		20.9



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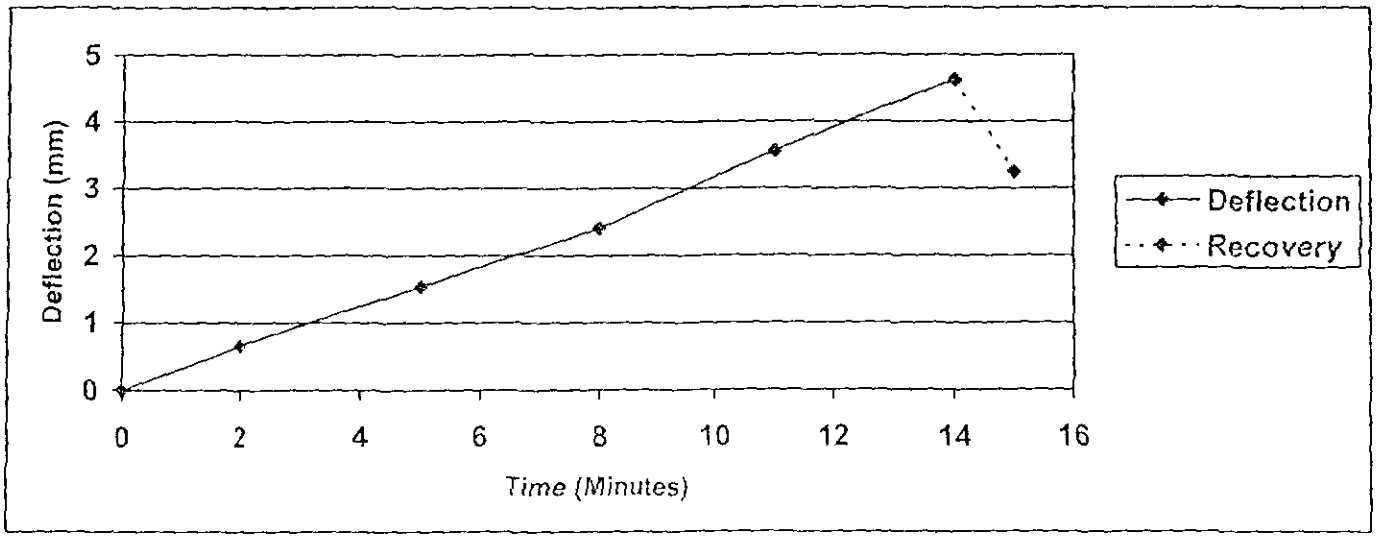
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	*Report No:*	06FW0719
Site:	Hough Lane, Wombwell	Date Tested:	19/6/2006
Material Under Test:	Mixed Brick/Rubble	*Tested By:*	R Gaunt
Client Reference	38	Test Location	38
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny/Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown mixed brick/rubble with fine to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.66		
60	5	1.54		
90	8	2.40		
120	11	3.56		
150	14	4.62	5.45	
0	15	3.25		29.7



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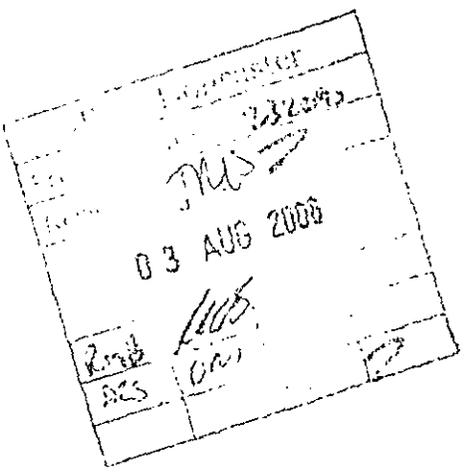

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Fax: 0114 240 1744

Report Date: 2nd August 2006

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For the Attention of: Mr Richard Butterworth

Report Reference: 06FW0830
Project Code: JOYDONC070

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 *Introduction and Background:*

Scientifics Limited is pleased to submit this report in relation to the above. Testing was requested by your Mr R Butterworth under your official order number 20441 and executed on 31st July 2006 by our Mr D Ratcliffe.

2.0 *Scope of Work:*

As requested Scientifics Limited performed the following scope of work: -

To carry out 10 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 410,411,412).
b. 600mm diameter rigid steel plate.
c. Pressure gauge referenced 905/172A calibration certificate 905/172A-19.
d. Reaction load on site – Dozer

The weather at the time of test – Fine

R Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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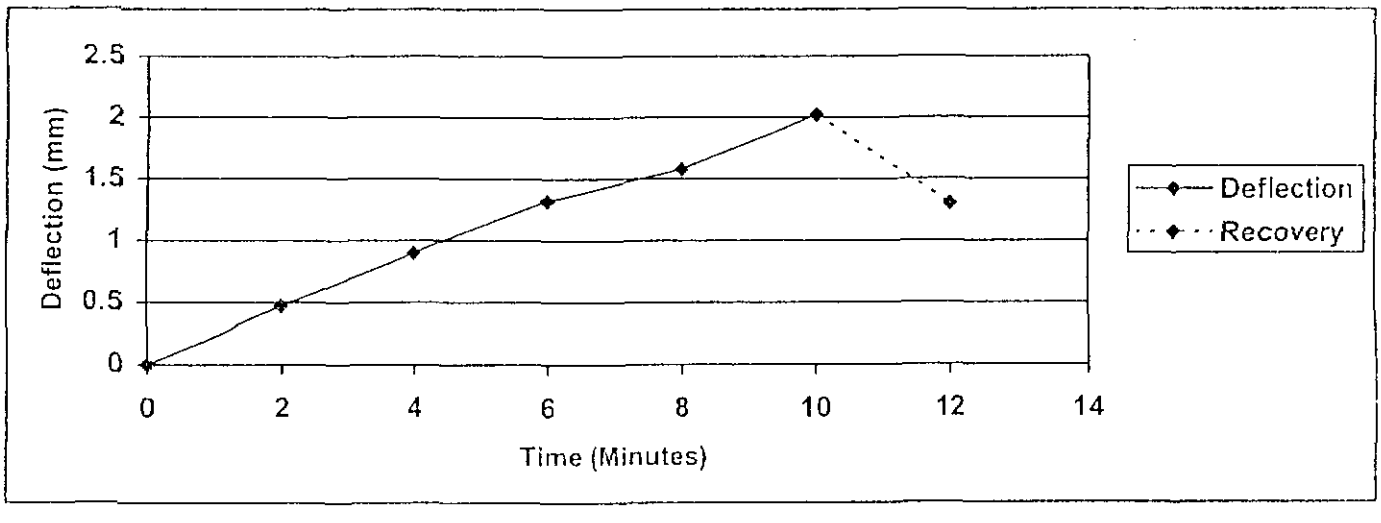
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	39	Test Location	39
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.47		
60	4	0.90		
90	6	1.32		
120	8	1.58		
150	10	2.02	2.10	
0	12	1.30		35.5



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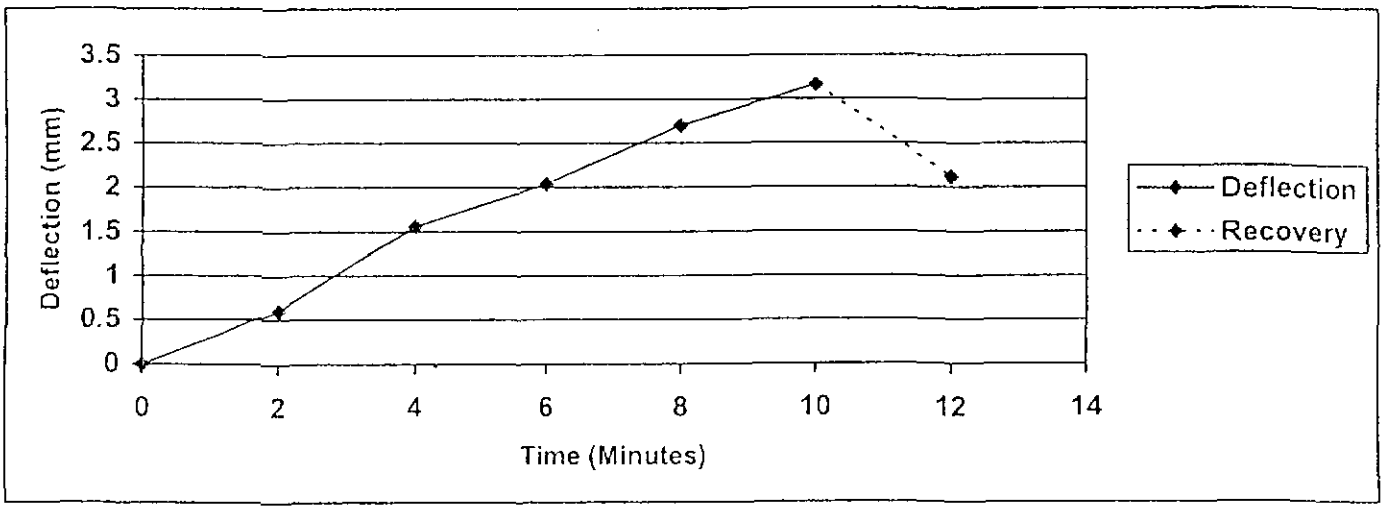
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	40	Test Location	40
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.60		
60	4	1.56		
90	6	2.04		
120	8	2.70		
150	10	3.16	3.35	
0	12	2.12		32.9



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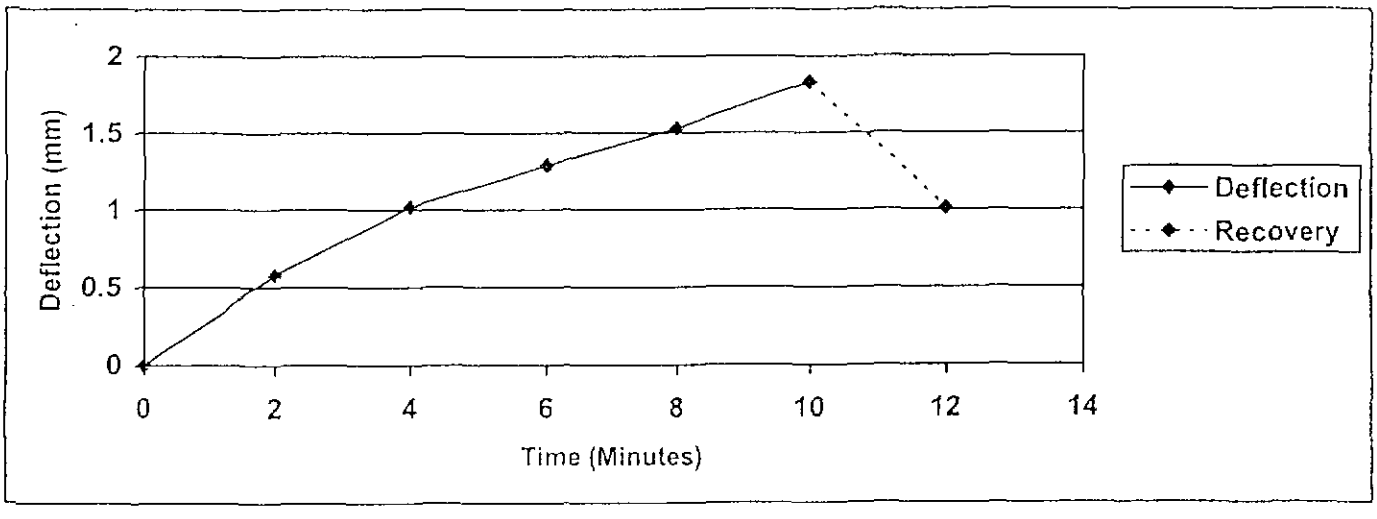
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	41	Test Location	41
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.58		
60	4	1.02		
90	6	1.29		
120	8	1.53		
150	10	1.83	1.85	
0	12	1.01		44.8



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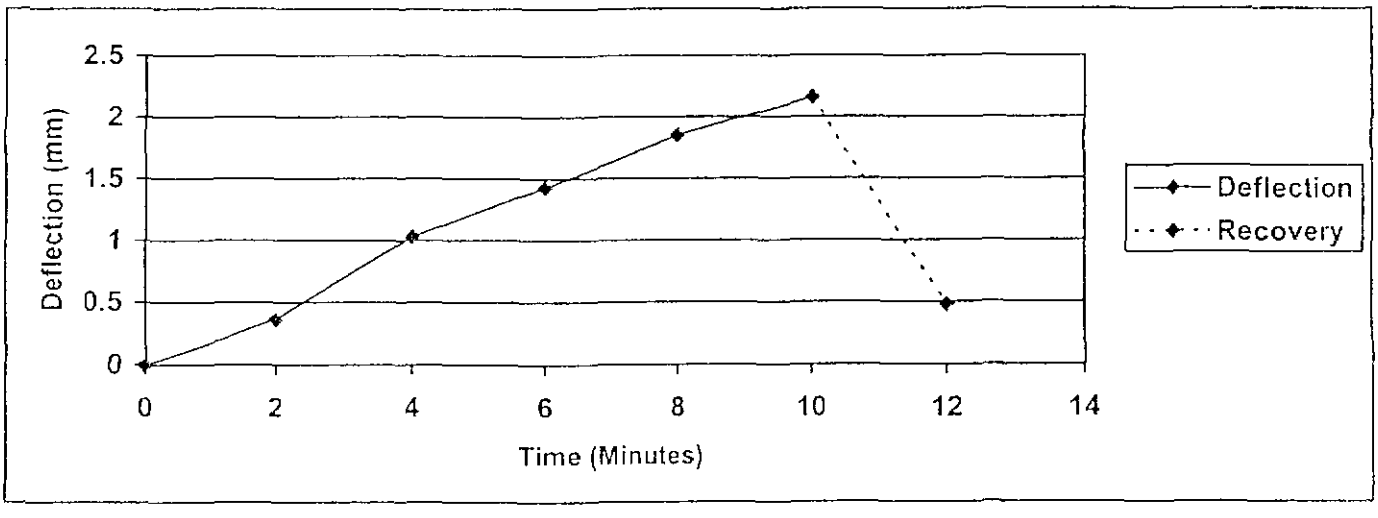
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	42	Test Location	42
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	4	1.03		
90	6	1.43		
120	8	1.85		
150	10	2.16	3.00	
0	12	0.48		77.8



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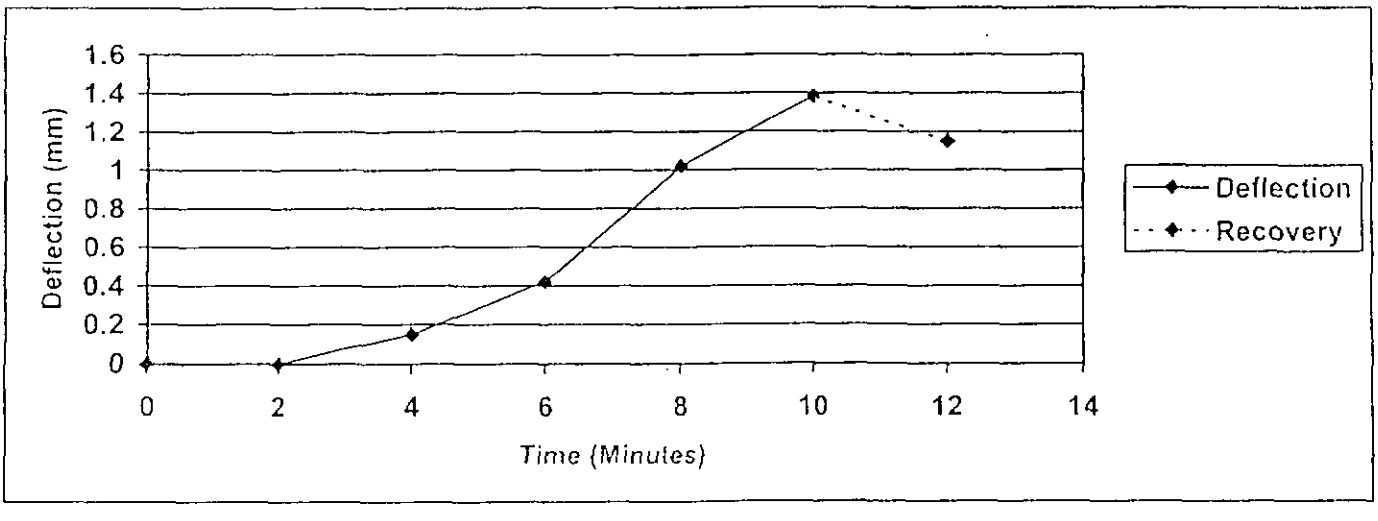
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	43	Test Location	43
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.00		
60	4	0.15		
90	6	0.42		
120	8	1.02		
150	10	1.38	1.50	
0	12	1.15		16.7



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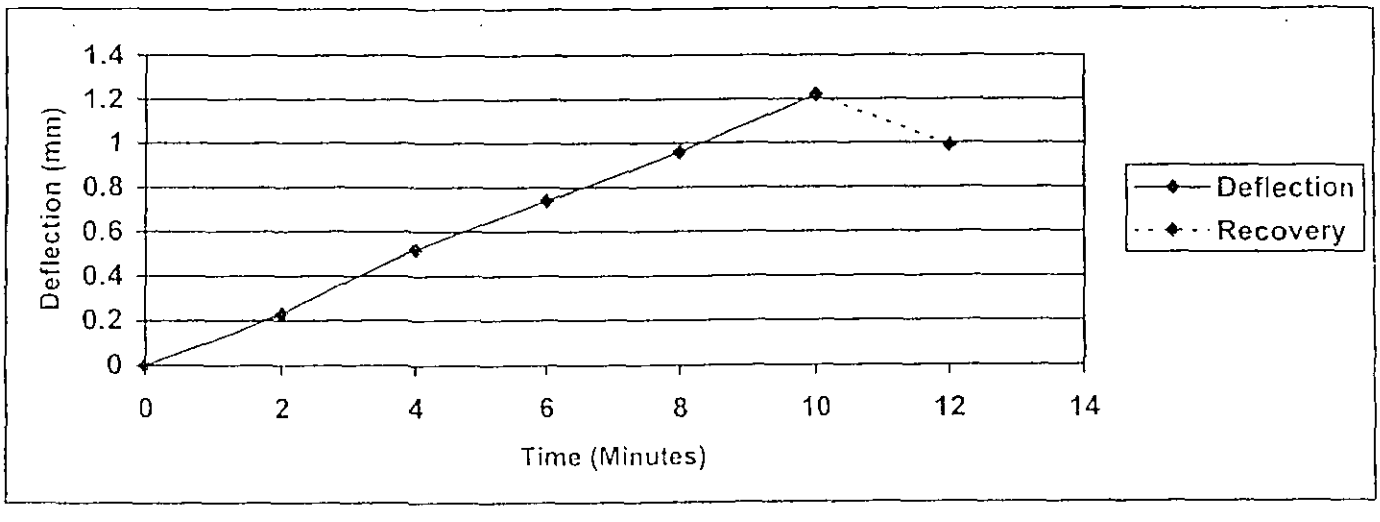
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	44	Test Location	44
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	*Crushed brick, rubble* and soil

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.23		
60	4	0.52		
90	6	0.74		
120	8	0.96		
150	10	1.22	1.65	
0	12	0.99		18.9



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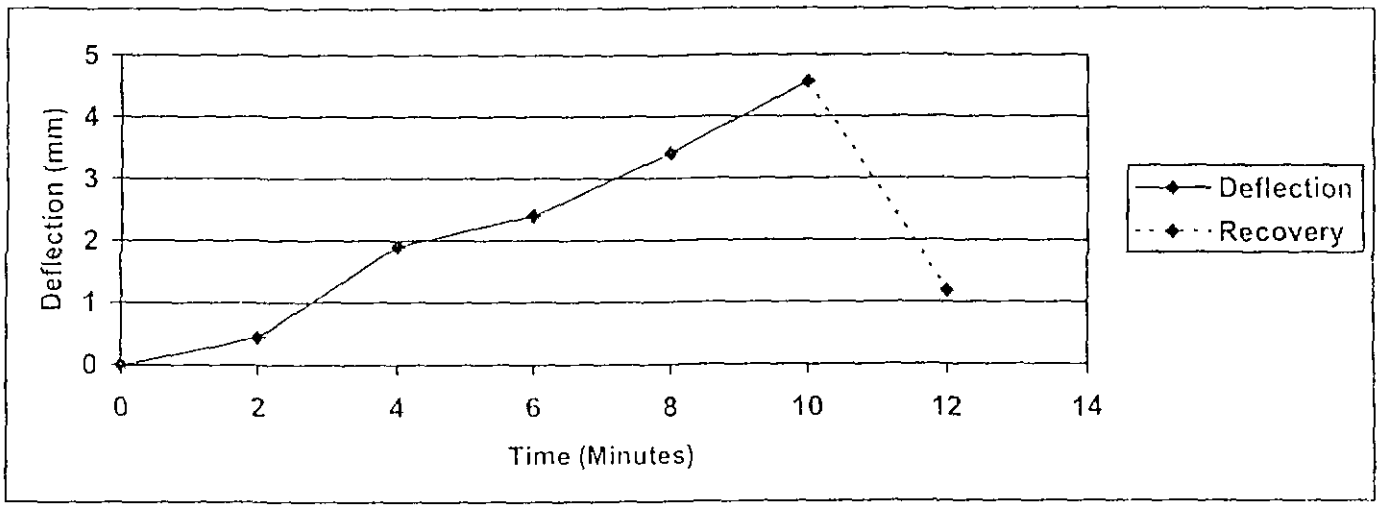
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	45	Test Location	45
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.44		
60	4	1.90		
90	6	2.40		
120	8	3.41		
150	10	4.56	5.15	
0	12	1.18		74.1



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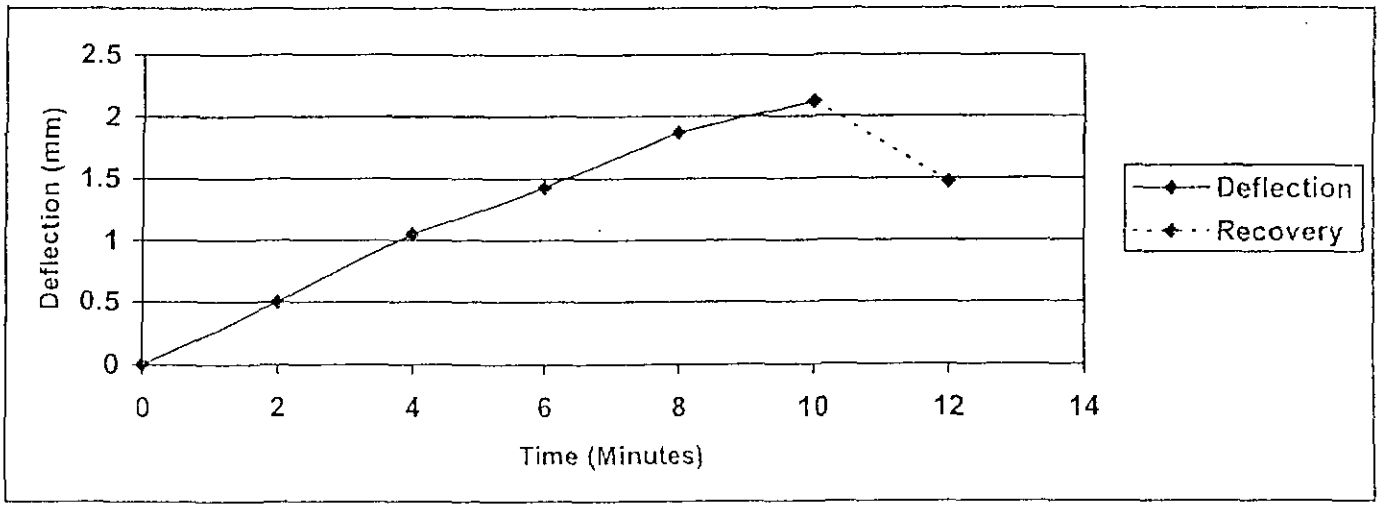
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	46	Test Location	46
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	4.8%
Distance from edge of *plate to Wall of Excavation*	N/A	Visual Description:	Crushed brick, rubble *and soil*

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.50		
60	4	1.05		
90	6	1.43		
120	8	1.87		
150	10	2.12	2.30	
0	12	1.47		30.7



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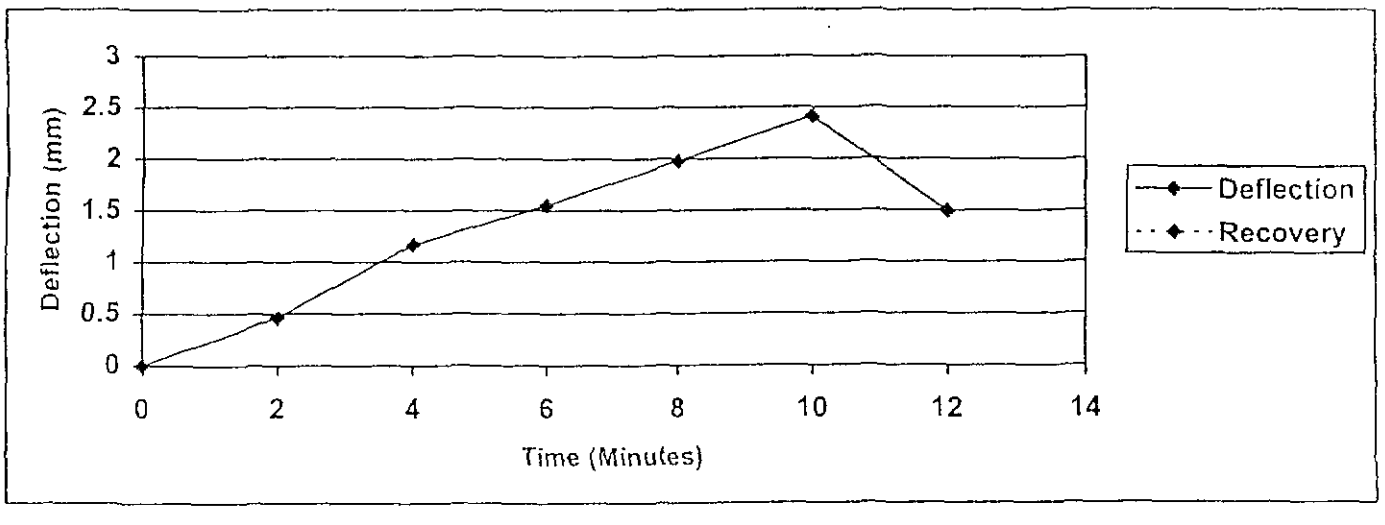
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	*Joynes Pike and Associates*	*Report No:*	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	47	Test Location	47
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Fine	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	4.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.46		
60	4	1.17		
90	6	1.55		
120	8	1.98		
150	10	2.41	2.88	
0	12	1.49		38.2



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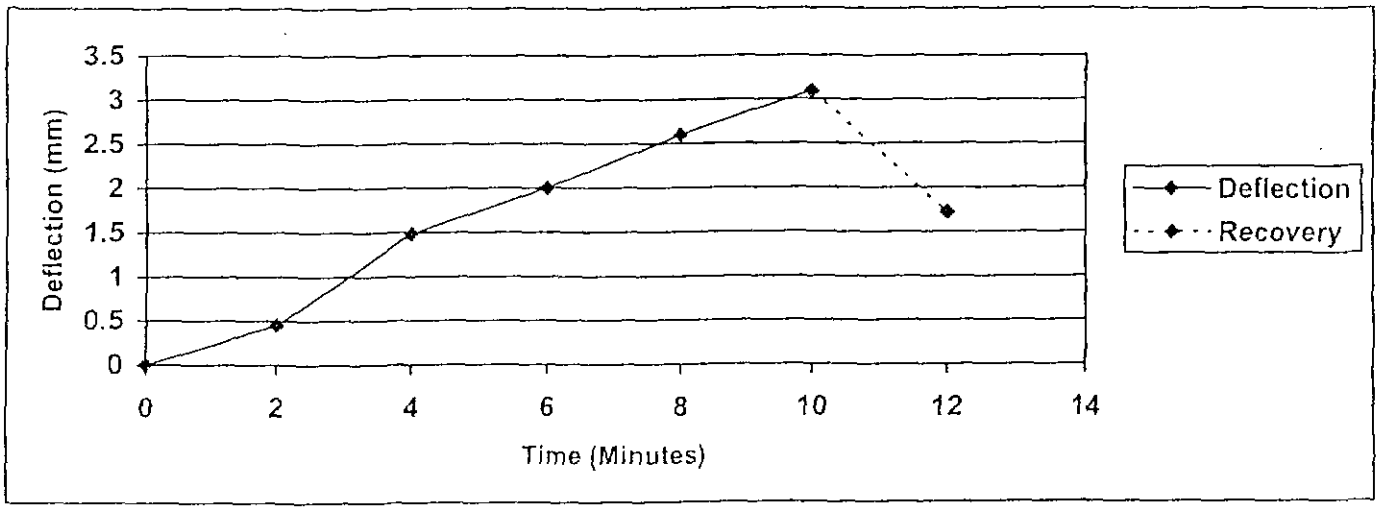
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0830
Site:	Hough Lane, Wombwell	Date Tested:	31/07/20006
Material Under Test:	6F2	Tested By:	D Ratcliffe
Client Reference	48	Test Location	48
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	*Surface*	Reaction Load Used	*Dozer*
Weather conditions	*Fine*	*Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990*	6.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Crushed brick, rubble and soil

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.45		
60	4	1.48		
90	6	2.00		
120	8	2.60		
150	10	3.09	3.50	
0	12	1.72		44.3



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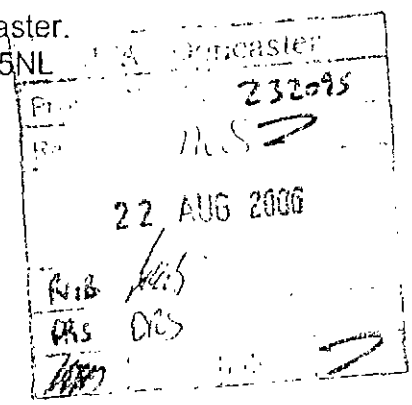
DN4 5NL



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Fax: 0114 240 1744

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Doncaster
DN4 5NL

For the Attention of: Mr Richard Butterworth

Report Date: 21st August 2006

Report Reference: 06FW0881
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 18th August 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 6 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – Dumper

The weather at the time of test – Rain

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. *The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.*
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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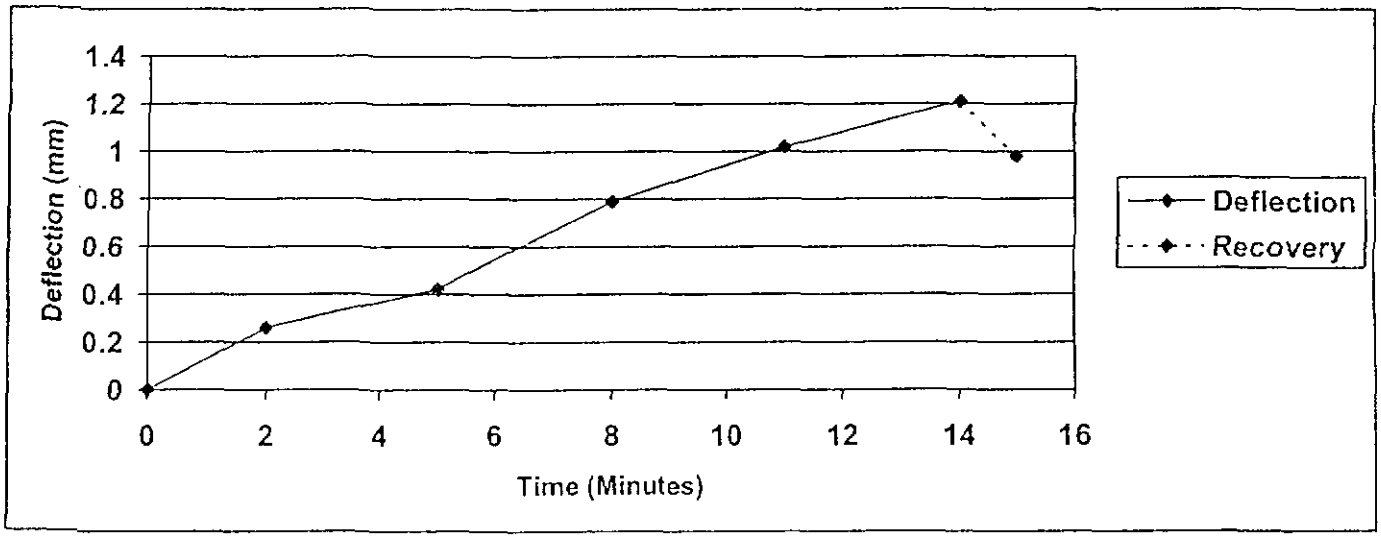
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0881
Site:	Hough Lane, Wombwell	Date Tested:	18/8/2006
Material Under Test:	Fill and Gravel	Tested By:	R Gaunt
Client Reference	49	Test Location	49
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	*Surface*	*Reaction Load Used*	*Dumper*
Weather conditions	*Rain*	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm fill with medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.26		
60	5	0.42		
90	8	0.79		
120	11	1.02		
150	14	1.21	1.27	
0	15	0.98		19.0



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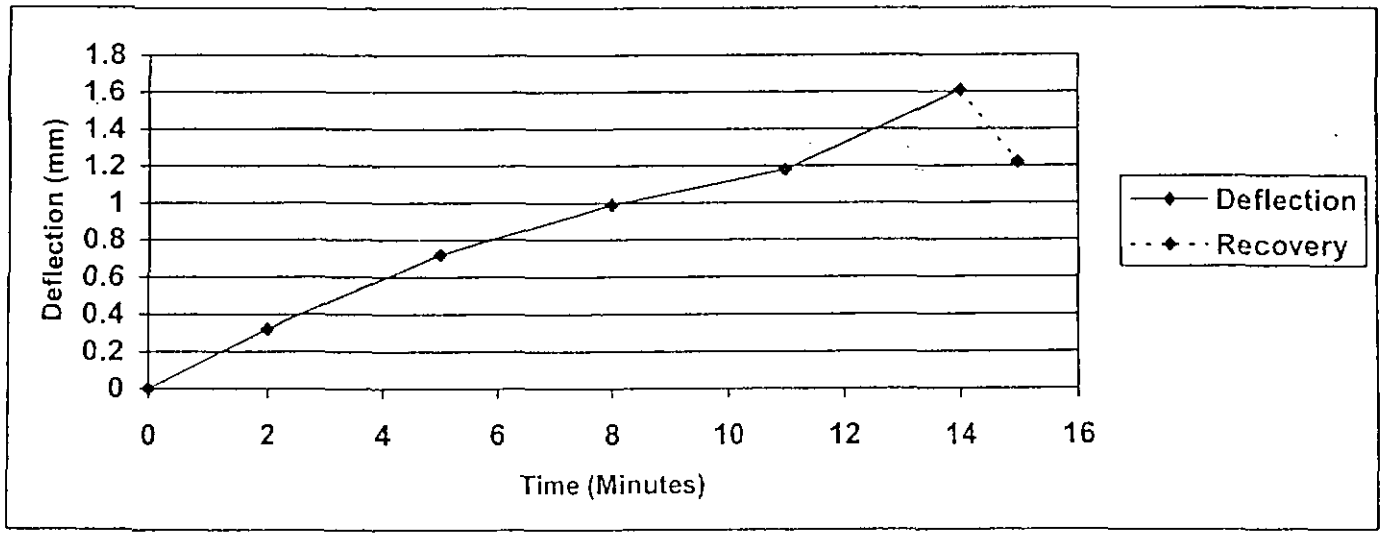
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0881
Site:	Hough Lane, Wombwell	Date Tested:	18/8/2006
Material Under Test:	Fill and Gravel	Tested By:	R Gaunt
Client Reference	50	Test Location	50
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	*Rain*	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm fill with medium to coarse gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.32		
60	5	0.72		
90	8	0.99		
120	11	1.18		
150	14	1.61	1.64	
0	15	1.22		24.2



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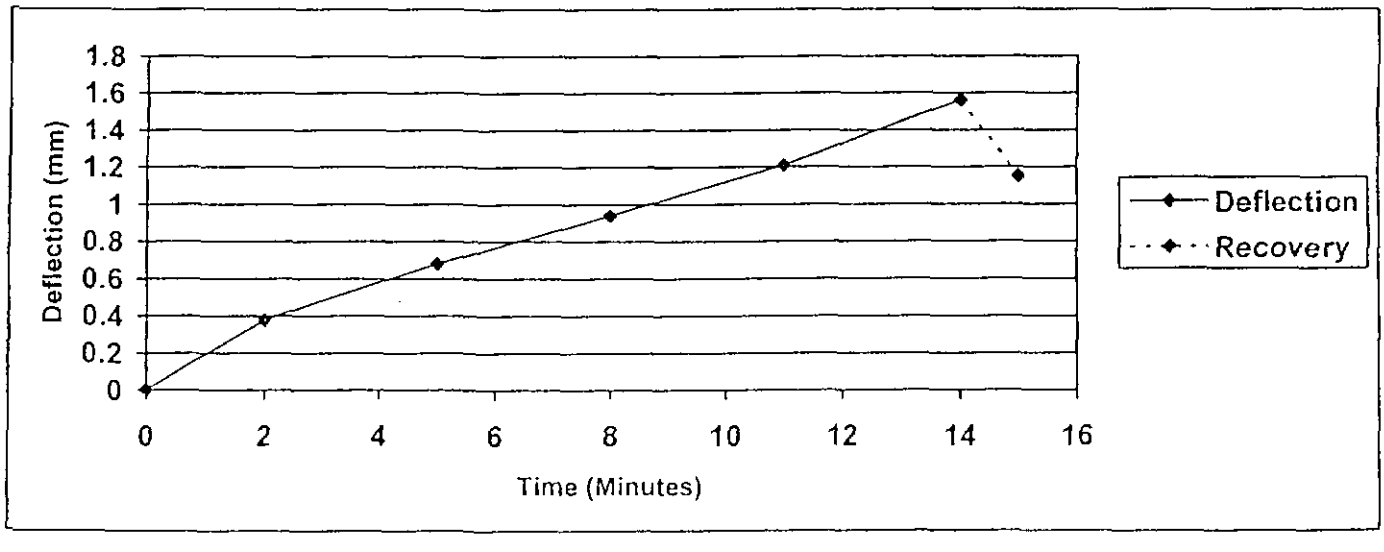
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0881
Site:	Hough Lane, Wombwell	Date Tested:	18/8/2006
Material Under Test:	Fill and Gravel	Tested By:	R Gaunt
Client Reference	51	Test Location	51
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm fill with medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.38		
60	5	0.68		
90	8	0.94		
120	11	1.21		
150	14	1.56	1.67	
0	15	1.15		26.3



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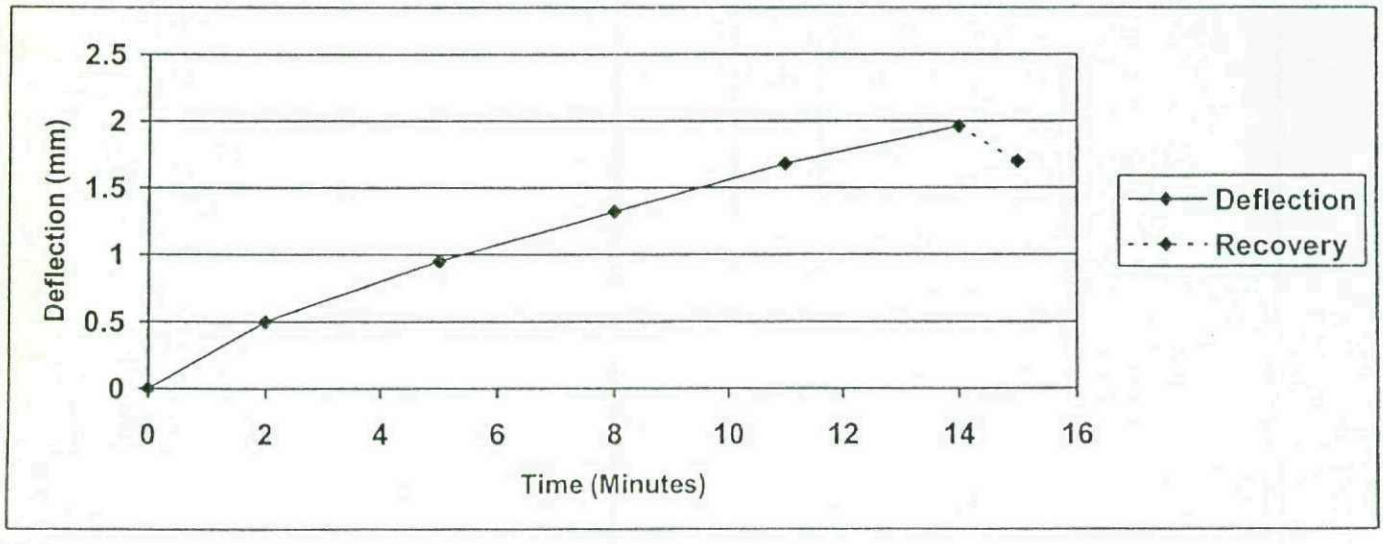
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0881
Site:	Hough Lane, Wombwell	Date Tested:	18/8/2006
Material Under Test:	Fill and Gravel	Tested By:	R Gaunt
Client Reference	52	Test Location	52
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm fill with medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.50		
60	5	0.95		
90	8	1.32		
120	11	1.68		
150	14	1.96	2.08	
0	15	1.70		13.3



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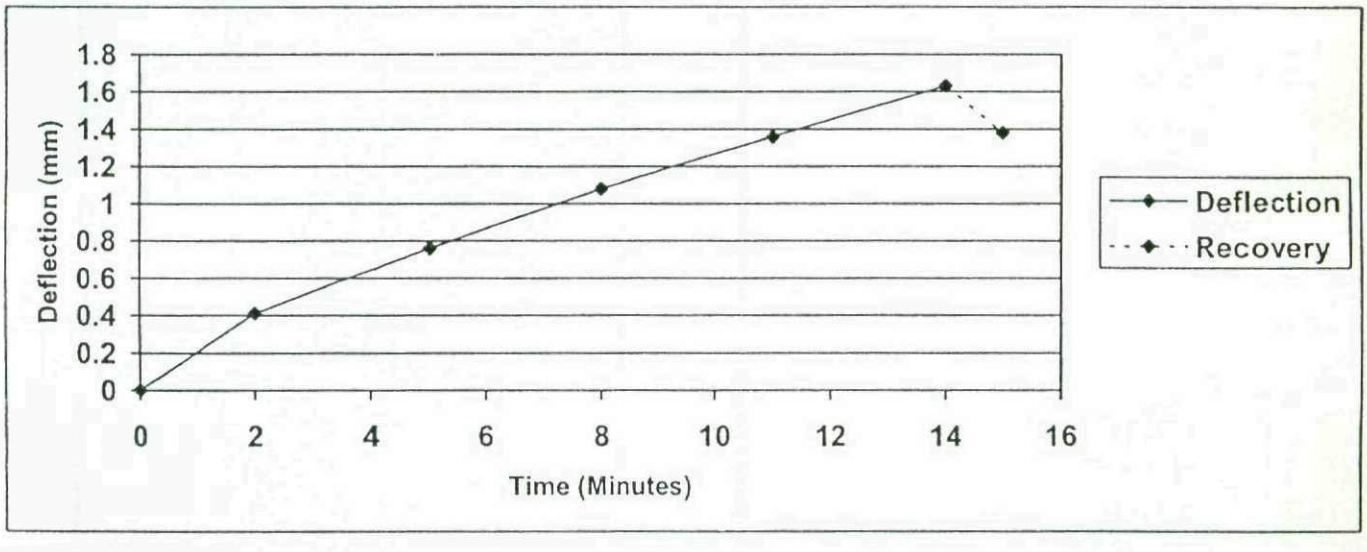
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0881
Site:	Hough Lane, Wombwell	Date Tested:	18/8/2006
Material Under Test:	Fill and Gravel	Tested By:	R Gaunt
Client Reference	53	Test Location	53
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm fill with medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.41		
60	5	0.76		
90	8	1.08		
120	11	1.36		
150	14	1.63	1.70	
0	15	1.38		15.3



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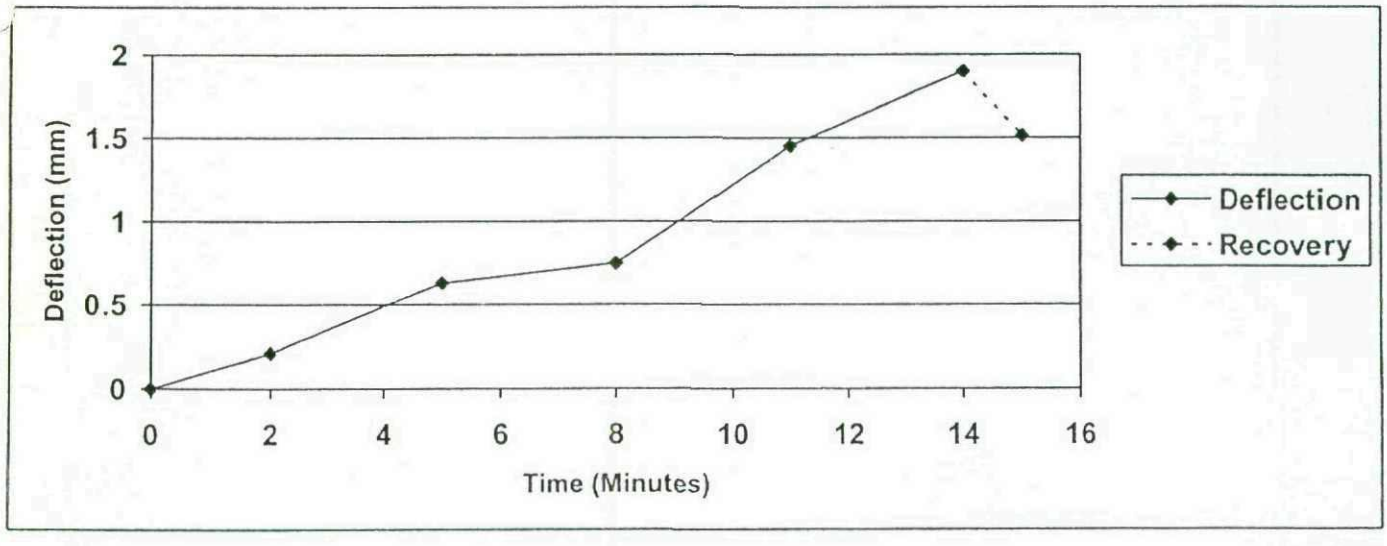
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0881
Site:	Hough Lane, Wombwell	Date Tested:	18/8/2006
Material Under Test:	Fill and Gravel	Tested By:	R Gaunt
Client Reference	54	Test Location	54
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm fill with medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.21		
60	5	0.63		
90	8	0.75		
120	11	1.45		
150	14	1.90	2.06	
0	15	1.51		20.5



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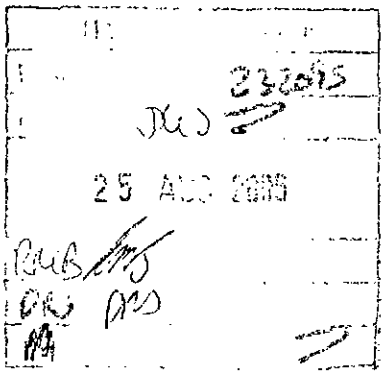
Doncaster
DN4 5NL



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For the Attention of: Mr Richard Butterworth

Report Date: 24th August 2006

Report Reference: 06FW0886
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 23rd August 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 4 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B0-18.
d. Reaction load on site – 360° Excavator.

The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
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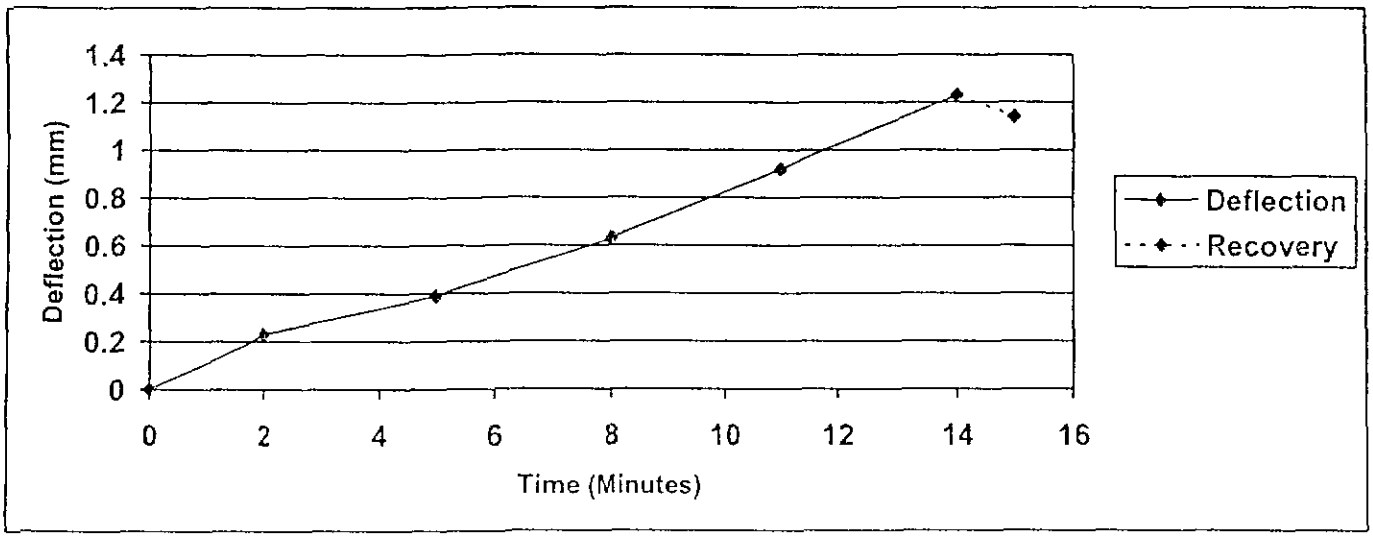
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0886
Site:	Hough Lane, Wombwell	Date Tested:	23/8/2006
Material Under Test:	Mixed Fill with Brick/Gravel	Tested By:	R Gaunt
Client Reference	55	Test Location	55
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm light brown FILL with medium to coarse brick/gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.23		
60	5	0.39		
90	8	0.63		
120	11	0.92		
150	14	1.23	1.26	
0	15	1.14		7.3



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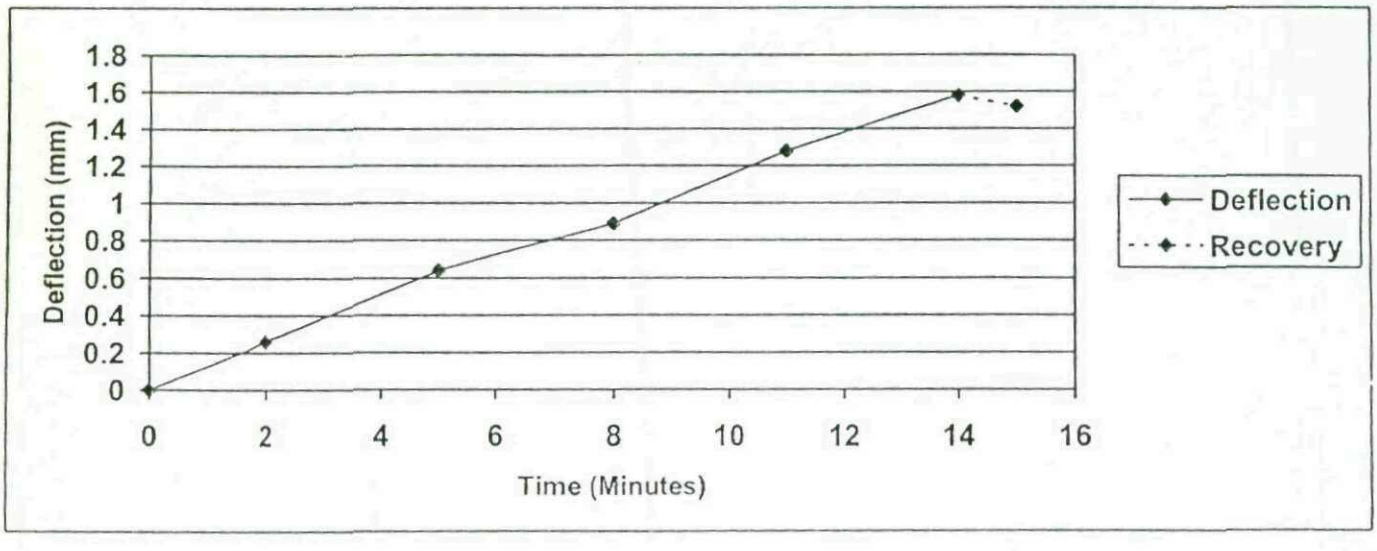
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0886
Site:	Hough Lane, Wombwell	Date Tested:	23/8/2006
Material Under Test:	Mixed Fill with Brick/Gravel	Tested By:	R Gaunt
Client Reference	56	Test Location	56
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm light brown FILL with crushed medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.26		
60	5	0.64		
90	8	0.89		
120	11	1.28		
150	14	1.58	1.76	
0	15	1.52		3.8



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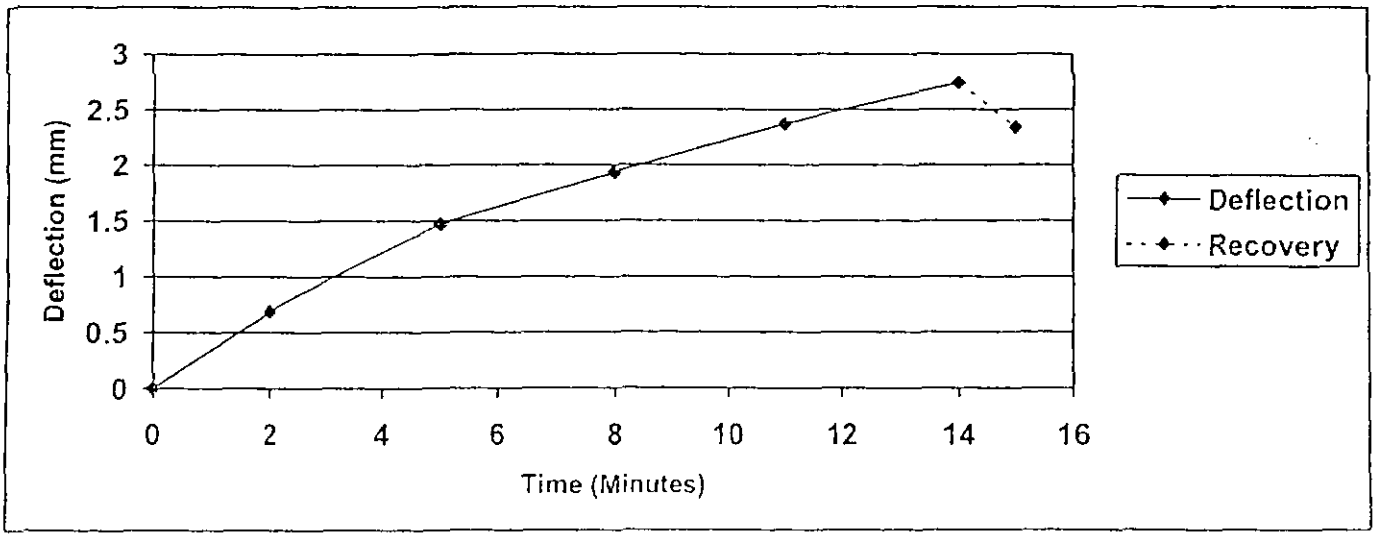
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0886
Site:	Hough Lane, Wombwell	Date Tested:	23/8/2006
Material Under Test:	Clay/Gravel	Tested By:	R Gaunt
Client Reference	57	Test Location	57
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	28.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Yellow/brown sand/silt/clay with fine gravel

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.69		
60	5	1.47		
90	8	1.93		
120	11	2.37		
150	14	2.74	3.00	
0	15	2.34		14.6



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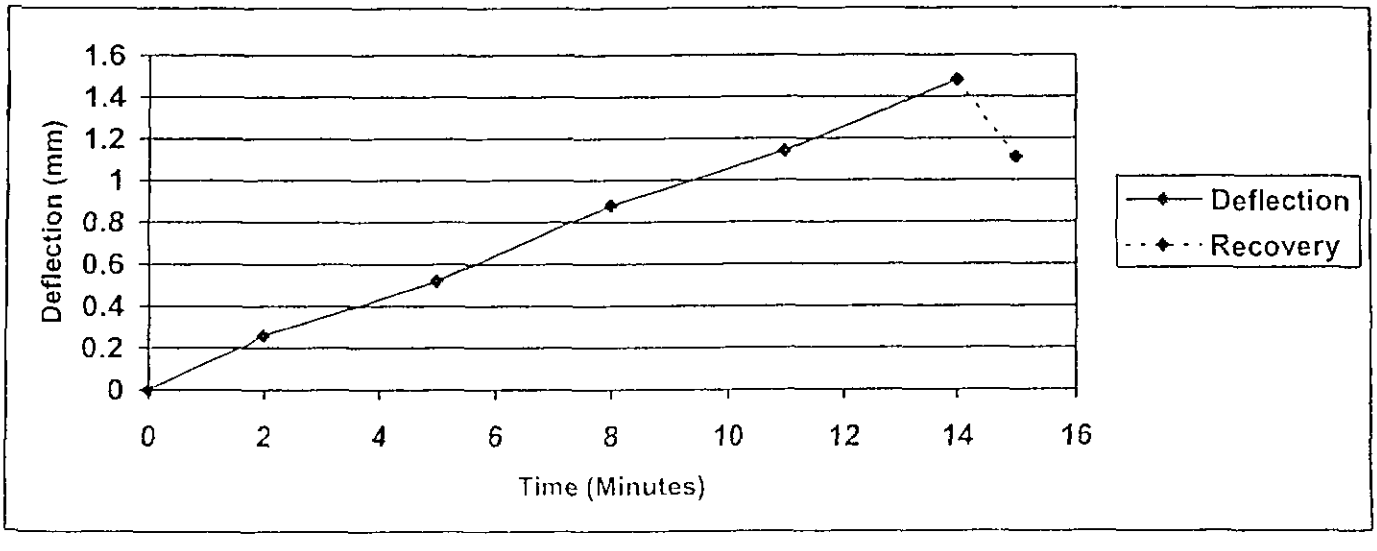
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0886
Site:	Hough Lane, Wombwell	Date Tested:	23/8/2006
Material Under Test:	Clay/Gravel	Tested By:	R Gaunt
Client Reference	58	Test Location	58
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	23.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Yellow/brown sand/silt/clay with fine gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.26		
60	5	0.52		
90	8	0.88		
120	11	1.14		
150	14	1.48	1.52	
0	15	1.11		25.0



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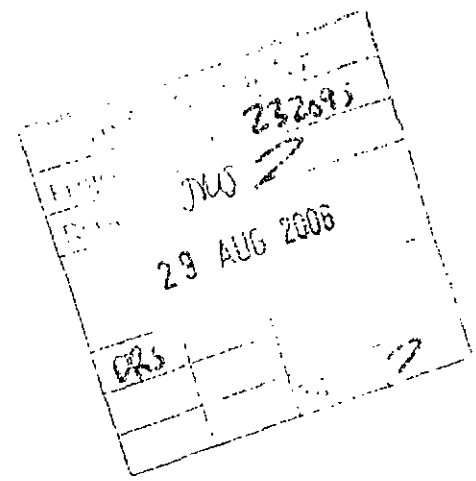

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Doncaster
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For the Attention of: Mr Richard Butterworth

Report Date: 25th August 2006

Report Reference: 06FW0892
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 24th August 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 4 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. *Pressure gauge referenced 905/173B calibration certificate 905/173B-18.*
d. Reaction load on site – 360° Excavator

The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
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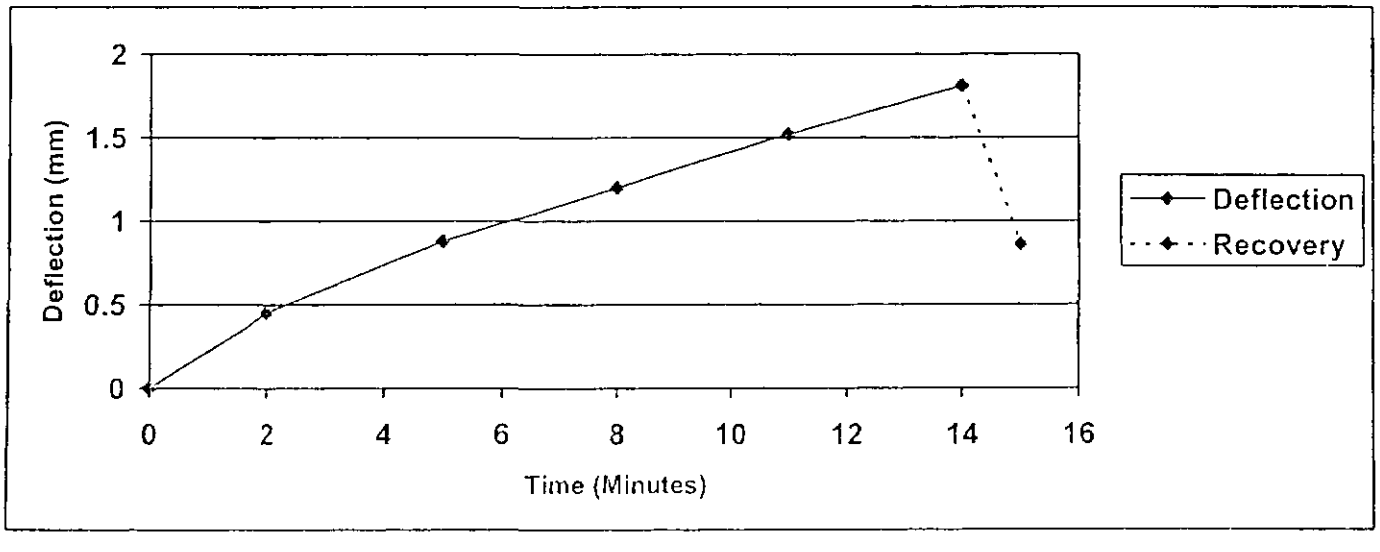
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0892
Site:	Hough Lane, Wombwell	Date Tested:	24/8/2006
Material Under Test:	Dark brown fill with rubble	Tested By:	R Gaunt
Client Reference	59	Test Location	59
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.7%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown FILL with coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.45		
60	5	0.88		
90	8	1.20		
120	11	1.52		
150	14	1.81	2.04	
0	15	0.86		52.5



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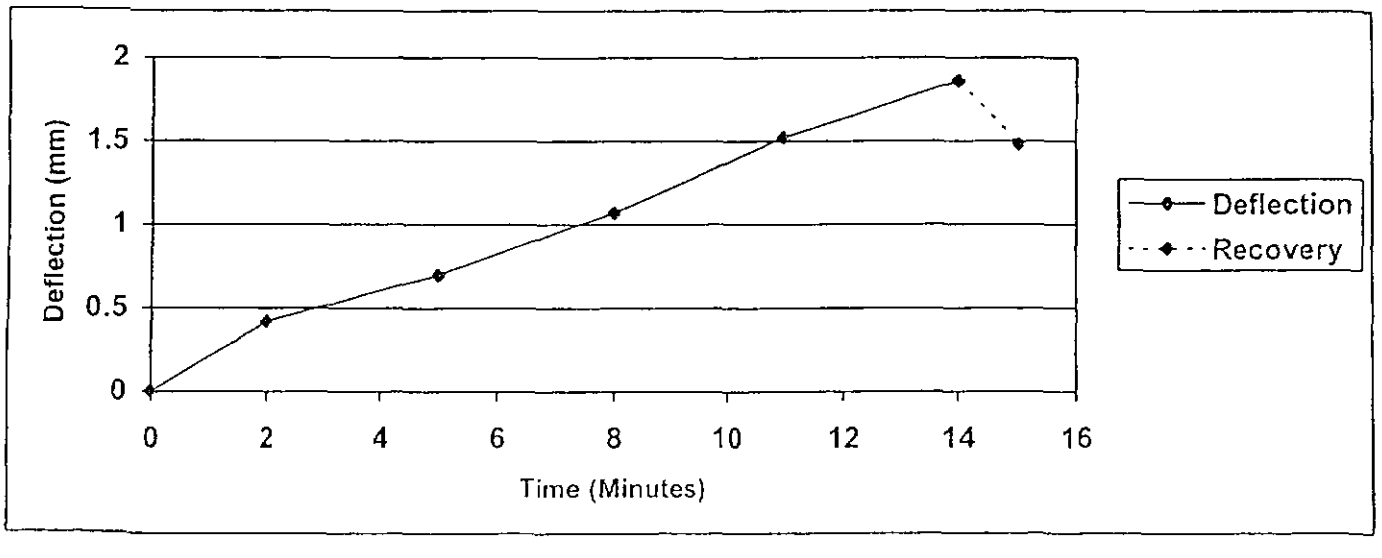
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0892
Site:	Hough Lane, Wombwell	Date Tested:	24/8/2006
Material Under Test:	Fill with brick/rubble	Tested By:	R Gaunt
Client Reference	60	Test Location	60
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown medium to coarse RUBBLE

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.42		
60	5	0.70		
90	8	1.07		
120	11	1.52		
150	14	1.86	2.16	
0	15	1.48		20.4



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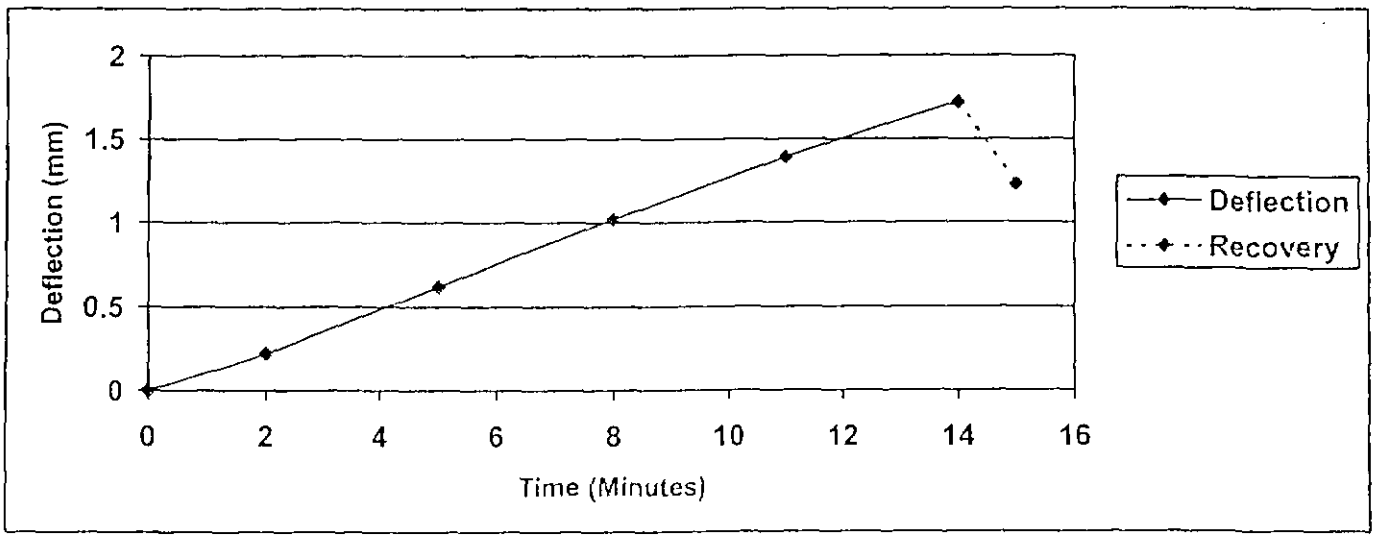
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0892
Site:	Hough Lane, Wombwell	Date Tested:	24/8/2006
Material Under Test:	Fill with rubble	Tested By:	R Gaunt
Client Reference	61	Test Location	61
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	FILL with cobble sized rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.22		
60	5	0.62		
90	8	1.02		
120	11	1.39		
150	14	1.72	1.83	
0	15	1.23		28.5



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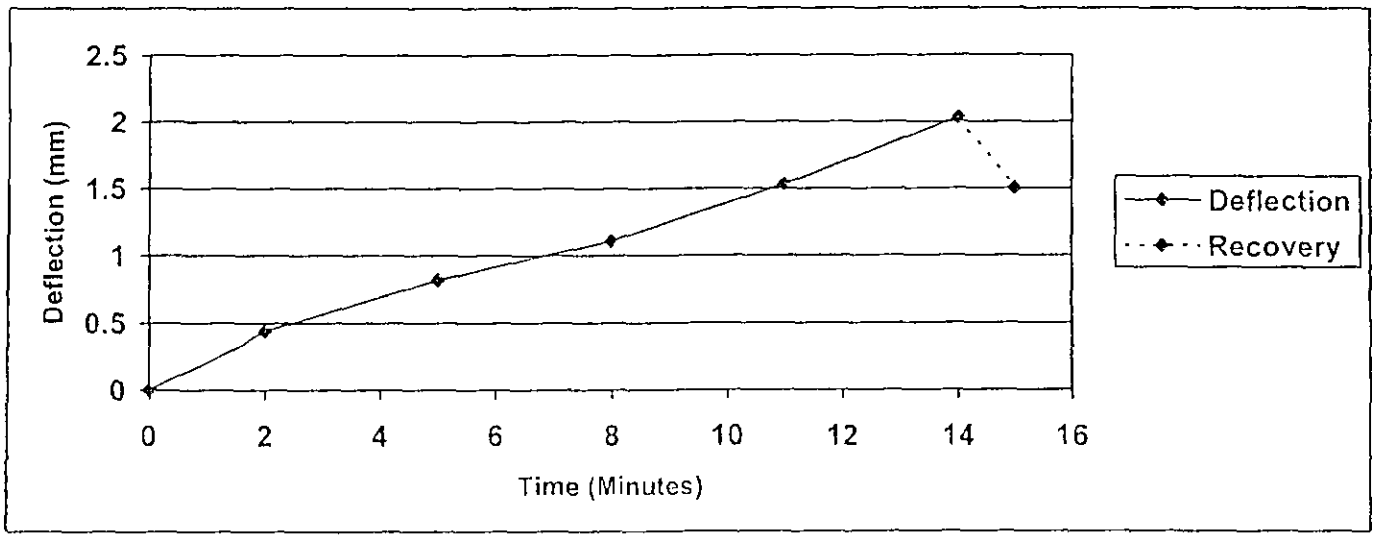
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0892
Site:	Hough Lane, Wombwell	Date Tested:	24/8/2006
Material Under Test:	Fill with brick/rubble	Tested By:	R Gaunt
Client Reference	62	Test Location	62
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown FILL with cobble sized rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.44		
60	5	0.82		
90	8	1.11		
120	11	1.53		
150	14	2.03	2.14	
0	15	1.50		26.1



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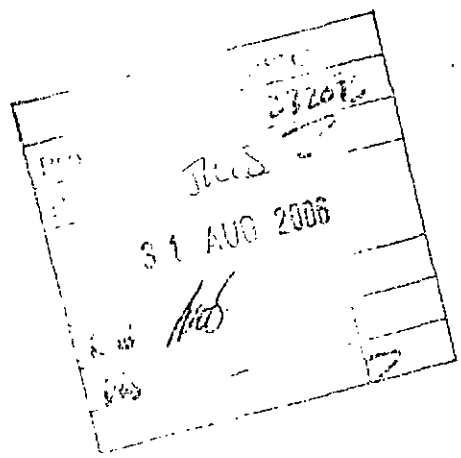

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For the Attention of: Mr Richard Butterworth

Report Date: 30th August 2006

Report Reference: 06FW0902
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 29th August 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 6 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B0-18.
d. Reaction load on site – dumper.

The weather at the time of test – sunny.

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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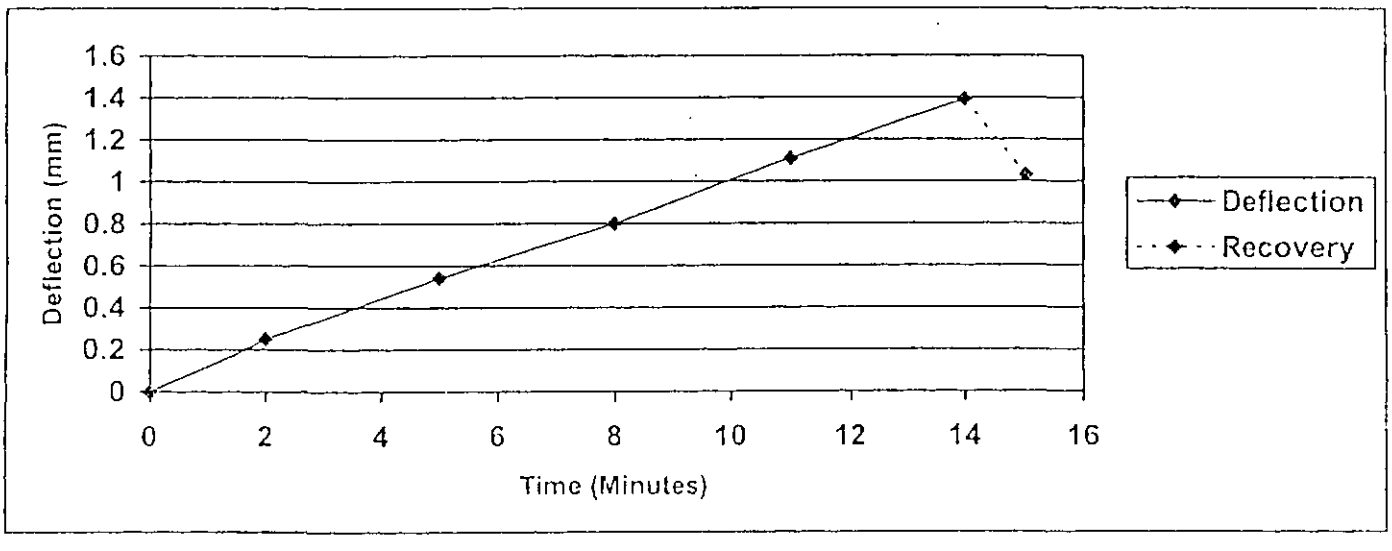
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0902
Site:	Hough Lane, Wombwell	Date Tested:	29/08/06
Material Under Test:	Fill with medium coarse rubble	Tested By:	R Gaunt
Client Reference	63	Test Location	63
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with medium to coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.25		
60	5	0.54		
90	8	0.80		
120	11	1.11		
150	14	1.39	1.40	
0	15	1.03		25.9



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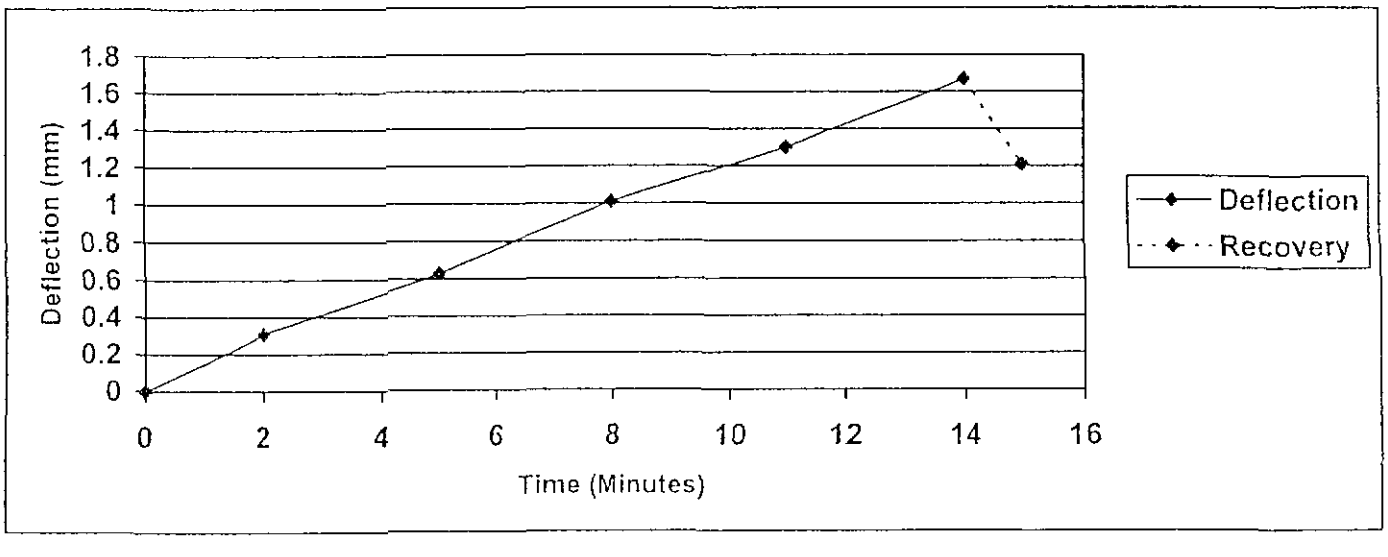
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0902
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Mixed Fill with medium coarse rubble	Tested By:	R Gaunt
Client Reference	64	Test Location	64
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with medium to coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.31		
60	5	0.63		
90	8	1.01		
120	11	1.30		
150	14	1.67	1.76	
0	15	1.21		27.5



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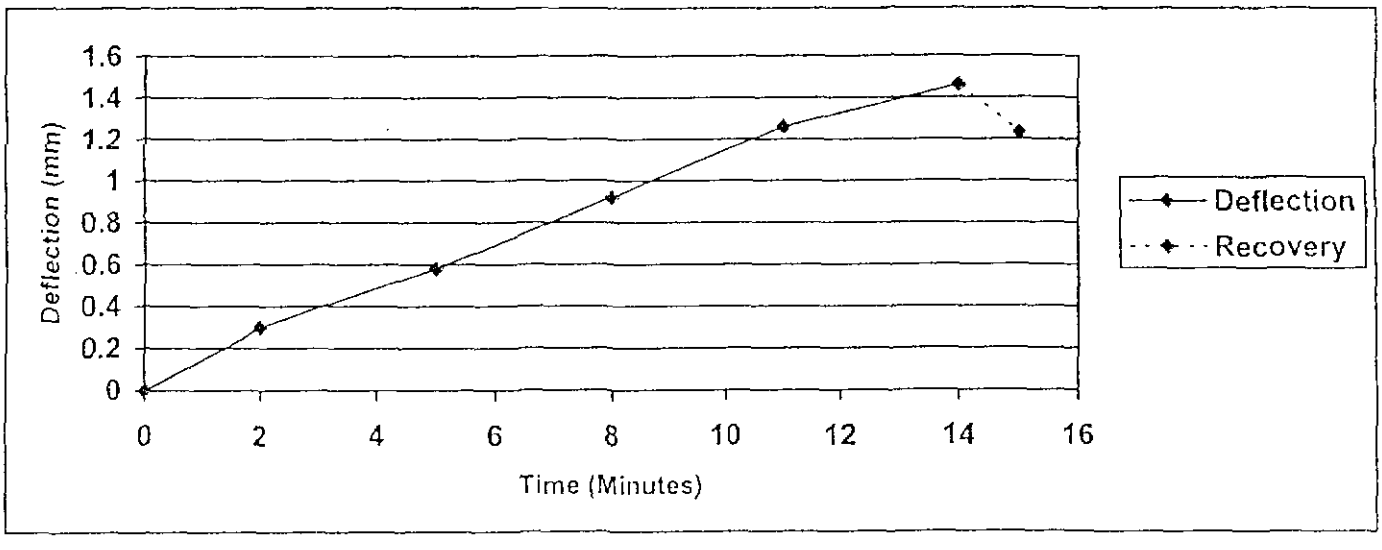
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0902
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Mixed Fill with coarse rubble	Tested By:	R Gaunt
Client Reference	65	Test Location	65
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.7%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Mixed FILL with coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.3		
60	5	0.58		
90	8	0.92		
120	11	1.26		
150	14	1.46	1.58	
0	15	1.23		15.8



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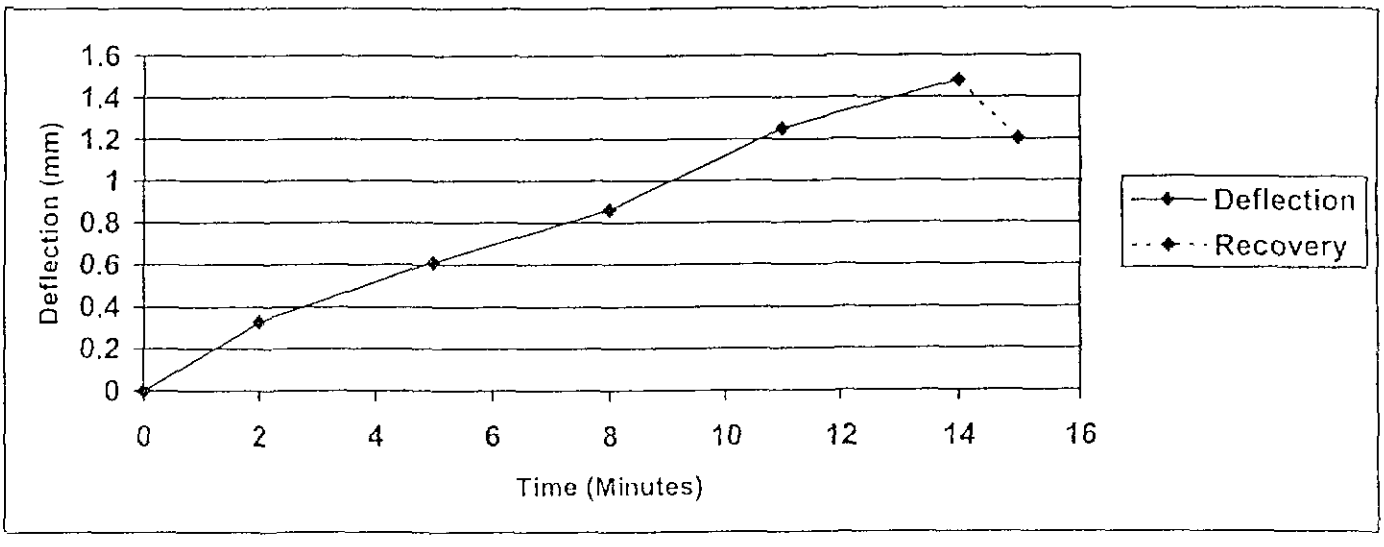
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0902
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Mixed Fill with coarse rubble	Tested By:	R Gaunt
Client Reference	66	Test Location	66
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.33		
60	5	0.61		
90	8	0.86		
120	11	1.25		
150	14	1.48	1.54	
0	*15*	*1.20*		*18.9*



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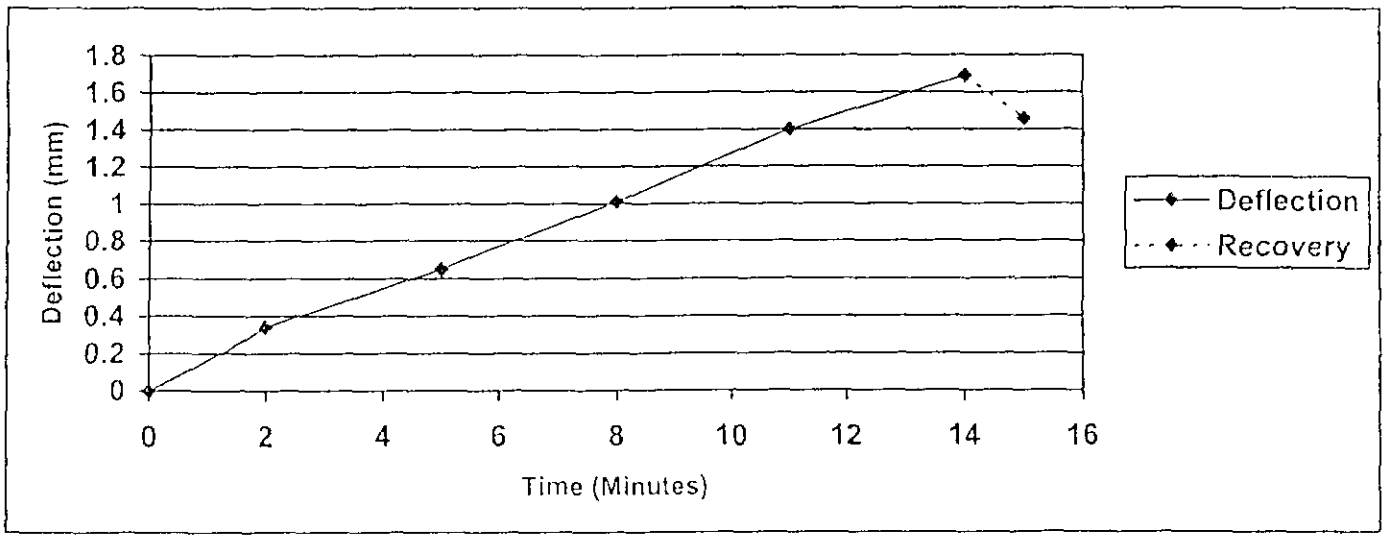
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0902
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Mixed Fill with coarse rubble	Tested By:	R Gaunt
Client Reference	67	Test Location	67
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Sunny	*Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990*	8.5%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	FILL with medium to coarse brick/rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.34		
60	5	0.65		
90	8	1.01		
120	11	1.40		
150	14	1.69	1.71	
0	15	1.46		13.6



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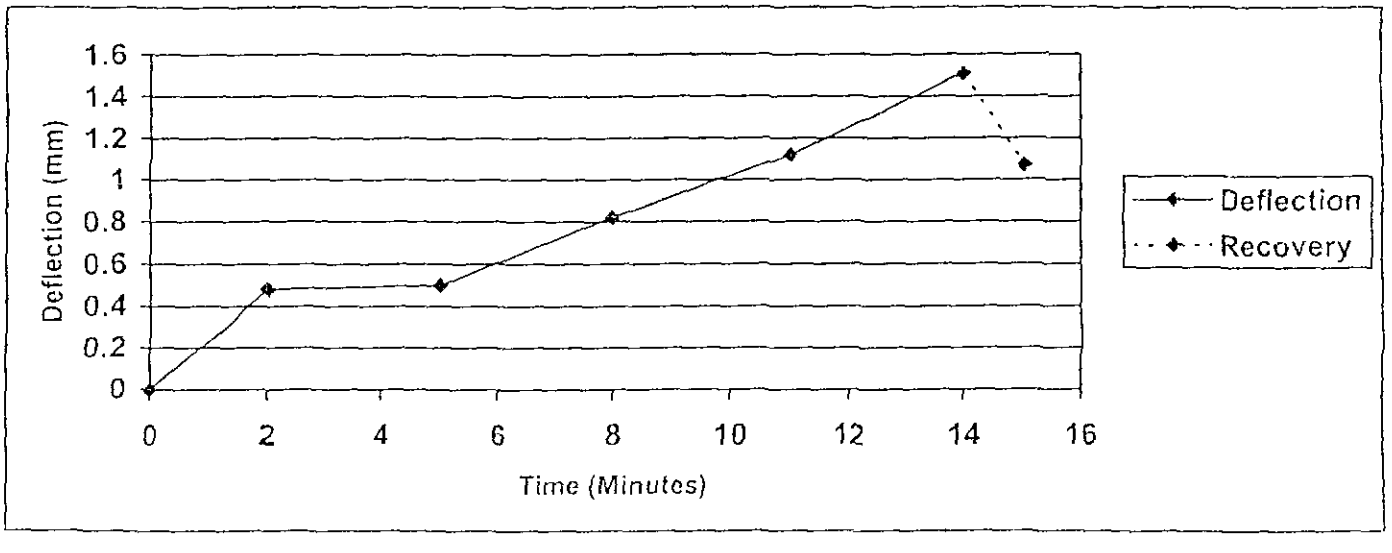
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0902
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Mixed Fill with coarse rubble	Tested By:	R Gaunt
Client Reference	68	Test Location	68
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.48		
60	5	0.50		
90	8	0.82		
120	11	1.12		
150	14	1.51	1.67	
0	15	1.07		29.1



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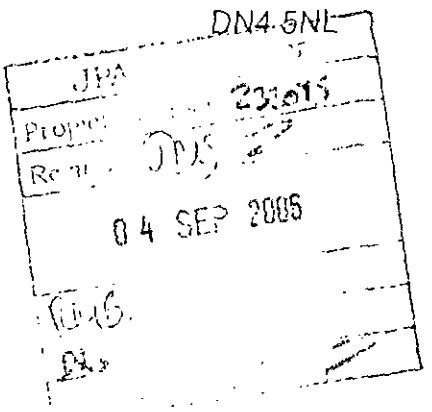

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For the Attention of: Mr Richard Butterworth

Report Date: 1st September 2006

Report Reference: 06FW0907
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited is pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on the 30th August 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 6 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – Dumper

The weather at the time of test – Rain/Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
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5. The results in this report relate only to the samples tested

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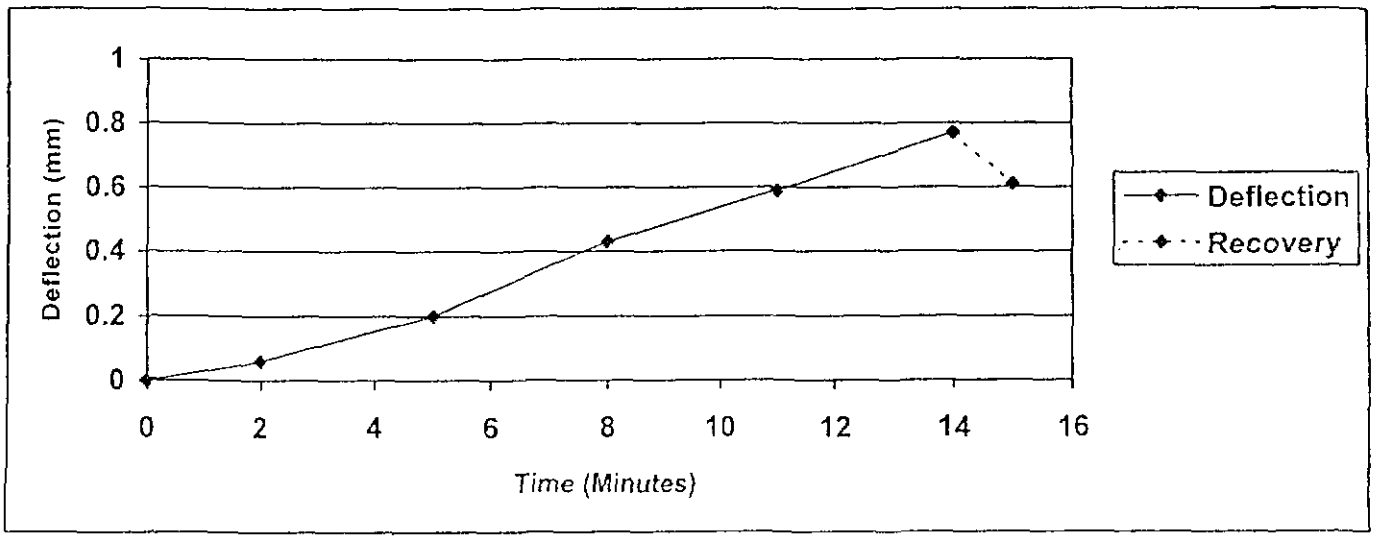
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0907
Site:	Hough Lane, Wombwell	Date Tested:	30/08/2006
Material Under Test:	Brown fill with coarse rubble	Tested By:	R Gaunt
Client Reference	69	Test Location	69
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown fill with mixed fine to coarse brick/rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.06		
60	5	0.20		
90	8	0.43		
120	11	0.59		
150	14	0.77	0.80	
0	15	0.61		20.8



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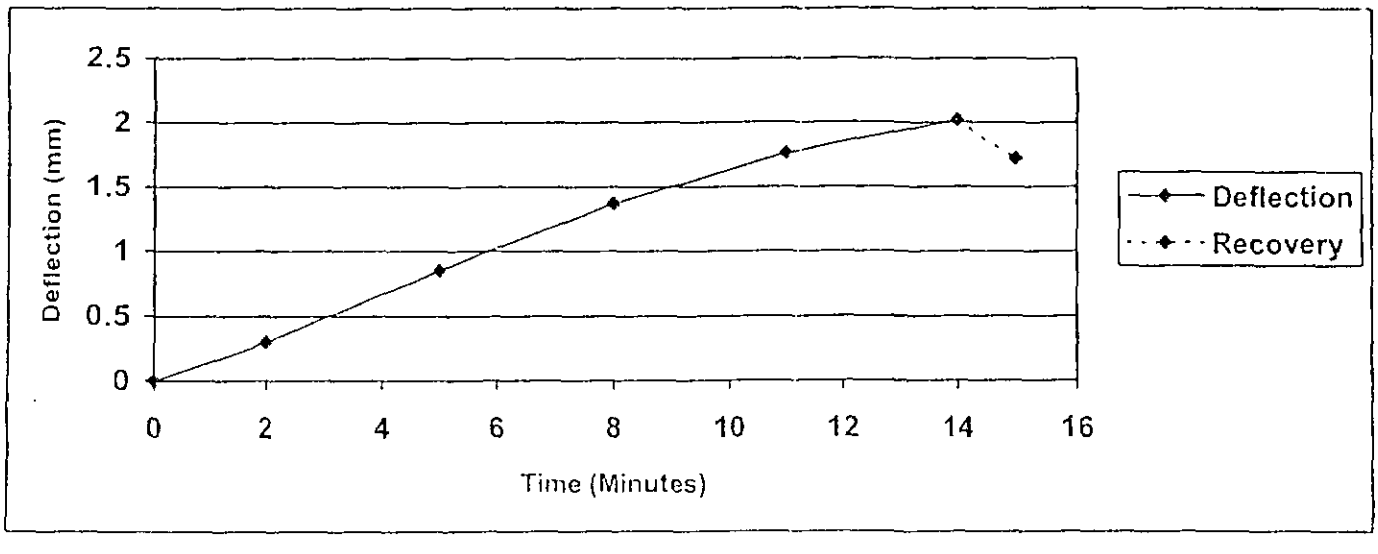
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0907
Site:	Hough Lane, Wombwell	Date Tested:	30/08/2006
Material Under Test:	Brown fill with coarse rubble	Tested By:	R Gaunt
Client Reference	70	Test Location	70
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown fill with mixed fine to coarse brick/rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.30		
60	5	0.85		
90	8	1.37		
120	11	1.76		
150	14	2.02	2.28	
0	15	1.72		14.9



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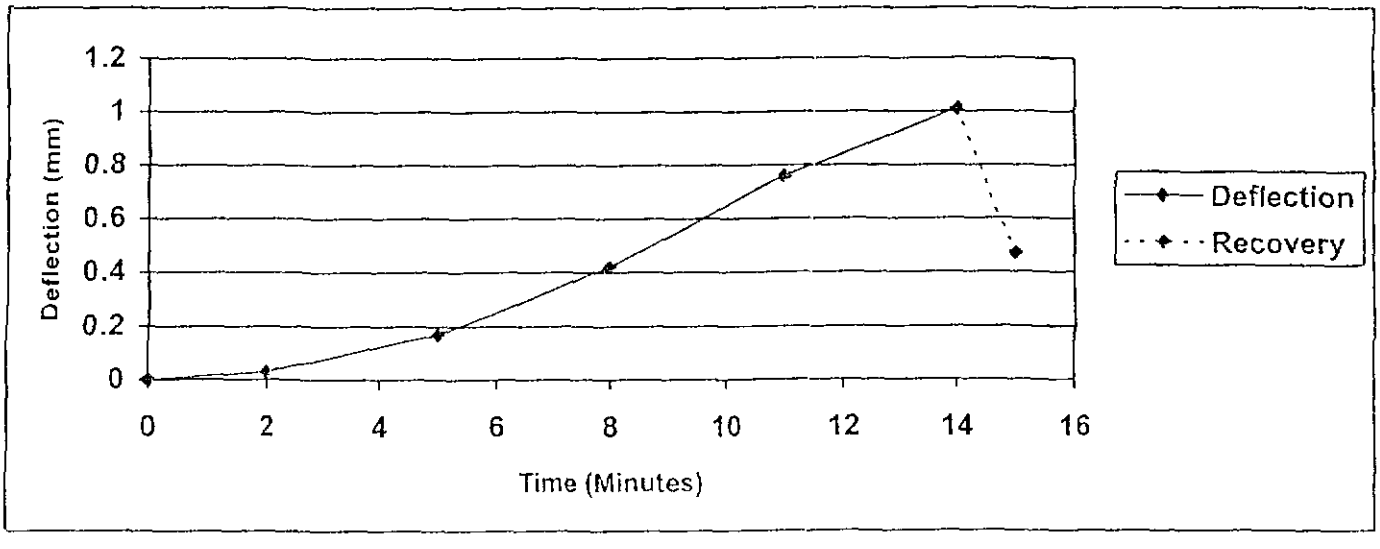
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY

IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0907
Site:	Hough Lane, Wombwell	Date Tested:	30/08/2006
Material Under Test:	Brown fill with coarse rubble	Tested By.	R Gaunt
Client Reference	71	Test Location	71
Test Method	*Incremental*	*Plate Size (mm)*	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.4%
Distance from edge of plate to Wall of Excavation	*N/A*	*Visual Description:*	*Firm brown fill with mixed* fine to coarse brick/rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.03		
60	5	0.17		
90	8	0.42		
120	11	0.76		
150	14	1.01	1.05	
0	15	0.47		53.5



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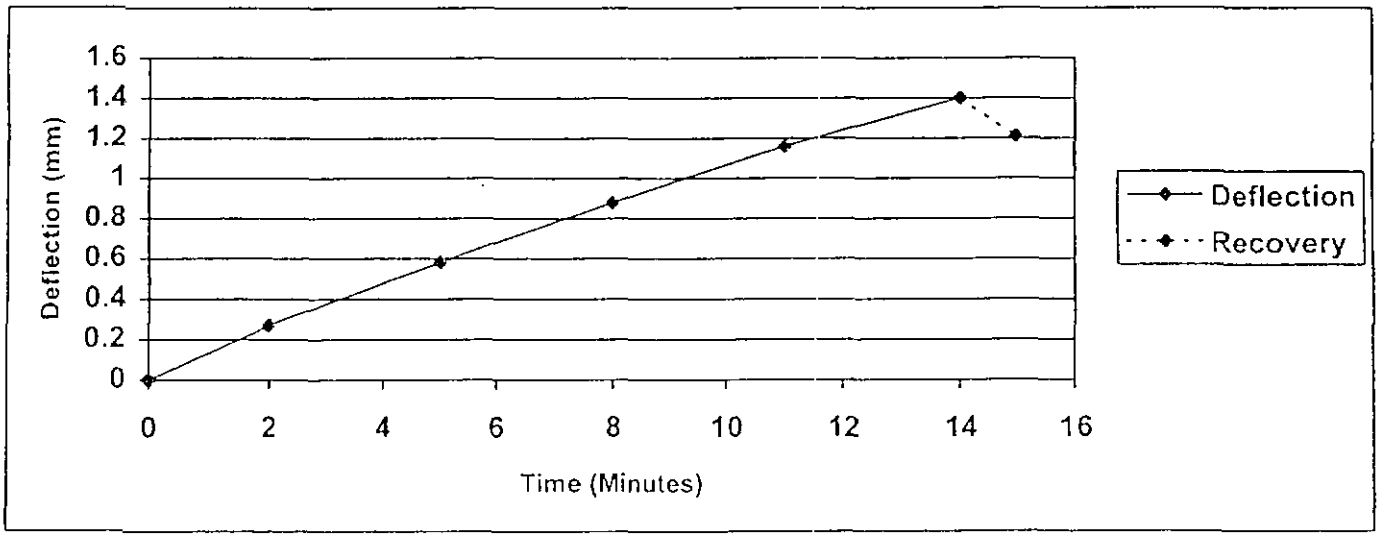
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0907
Site:	Hough Lane, Wombwell	Date Tested:	30/08/2006
Material Under Test:	Brown fill with coarse rubble	Tested By:	R Gaunt
Client Reference	72	Test Location	72
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown fill with mixed fine to coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.27		
60	5	0.58		
90	8	0.88		
120	11	1.16		
150	14	1.40	1.44	
0	15	1.21		13.6



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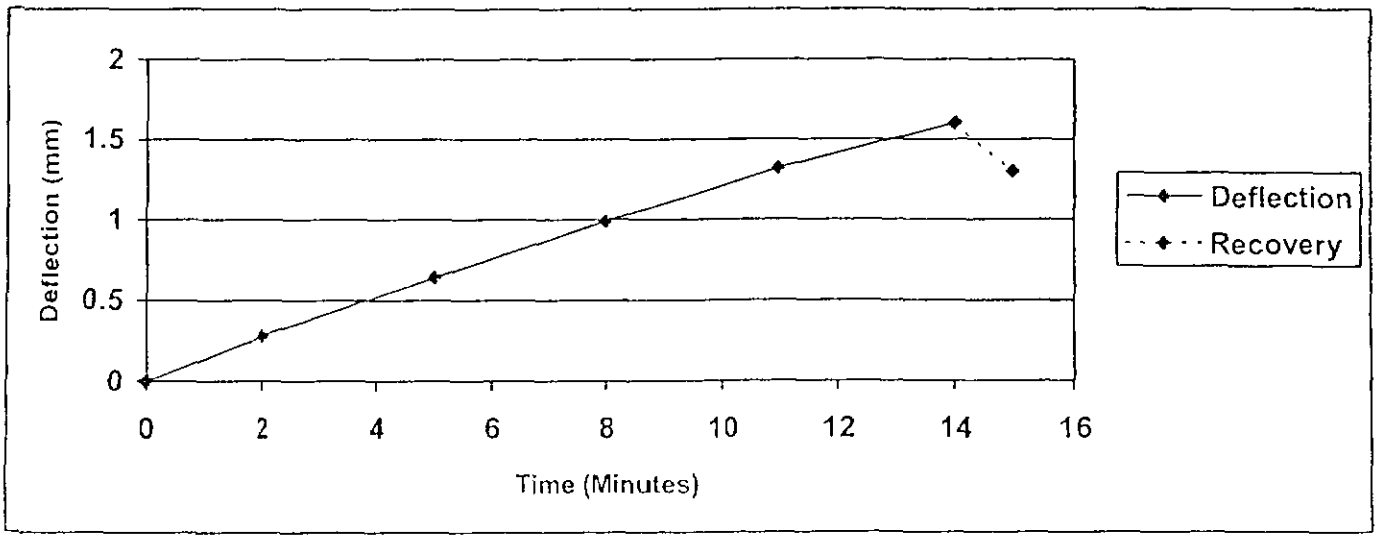
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0907
Site:	Hough Lane, Wombwell	Date Tested:	30/08/2006
Material Under Test:	*Brown fill with coarse rubble*	*Tested By:*	*R Gaunt*
Client Reference	73	Test Location	73
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown fill with mixed fine to coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.28		
60	5	0.64		
90	8	0.99		
120	11	1.32		
150	14	1.60	1.63	
0	15	1.30		18.7



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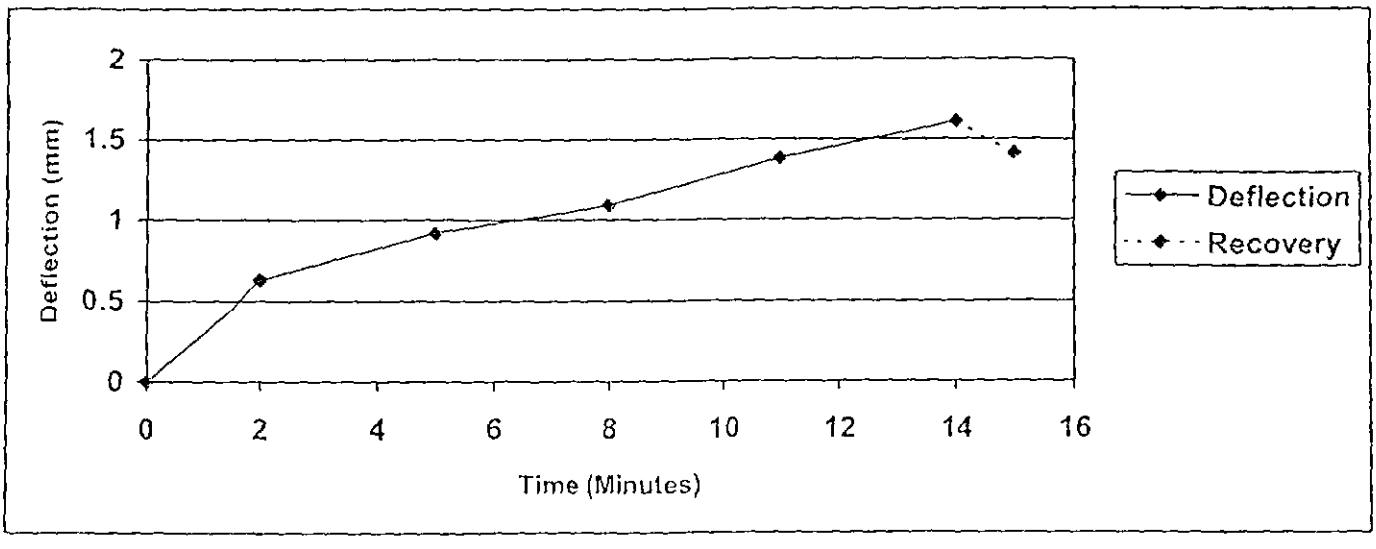
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0907
Site:	Hough Lane, Wombwell	Date Tested:	30/08/2006
Material Under Test:	Brown fill with coarse rubble	Tested By:	R Gaunt
Client Reference	74	Test Location	74
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown fill with mixed fine to coarse brick/rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.63		
60	5	0.92		
90	8	1.09		
120	11	1.38		
150	14	1.61	1.85	
0	15	1.41		12.4



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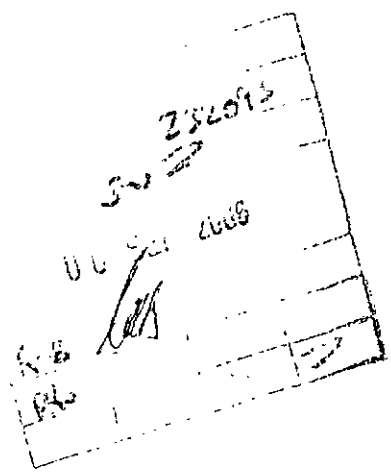

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Doncaster
DN4 5NL

For the Attention of: Mr Richard Butterworth

Report Date: 5th September 2006

Report Reference: 06FW0914
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 4th September 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 7 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – Dumper

The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
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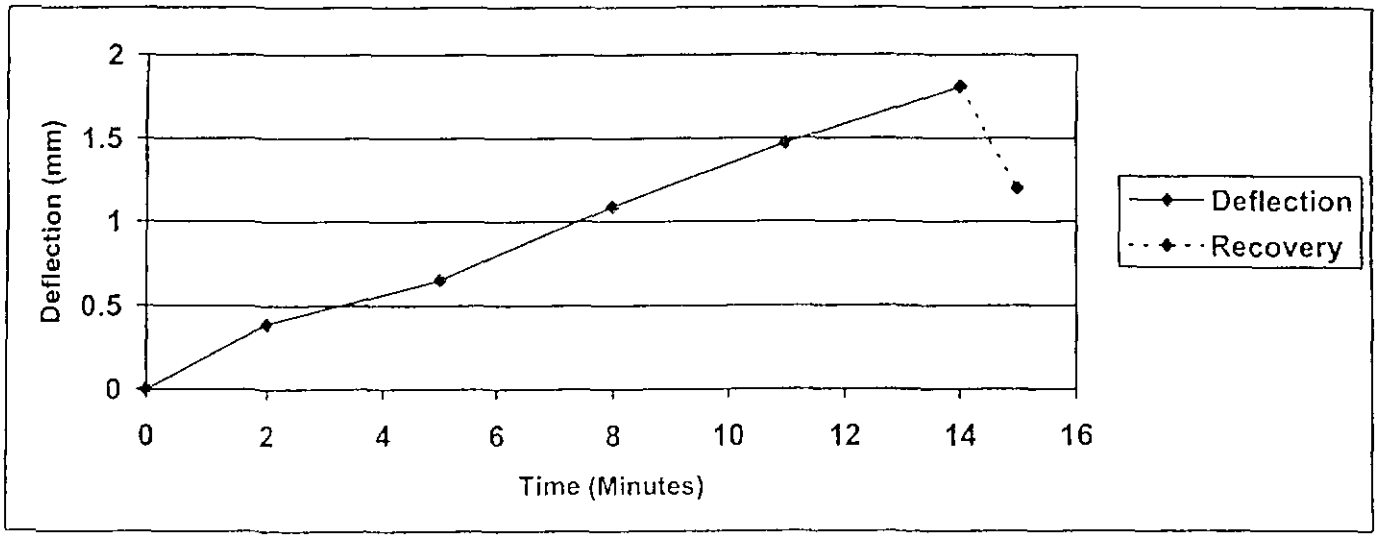
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	*75*	*Test Location*	*75*
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.39		
60	5	0.65		
90	8	1.09		
120	11	1.47		
150	14	1.81	2.17	
0	15	1.20		33.7



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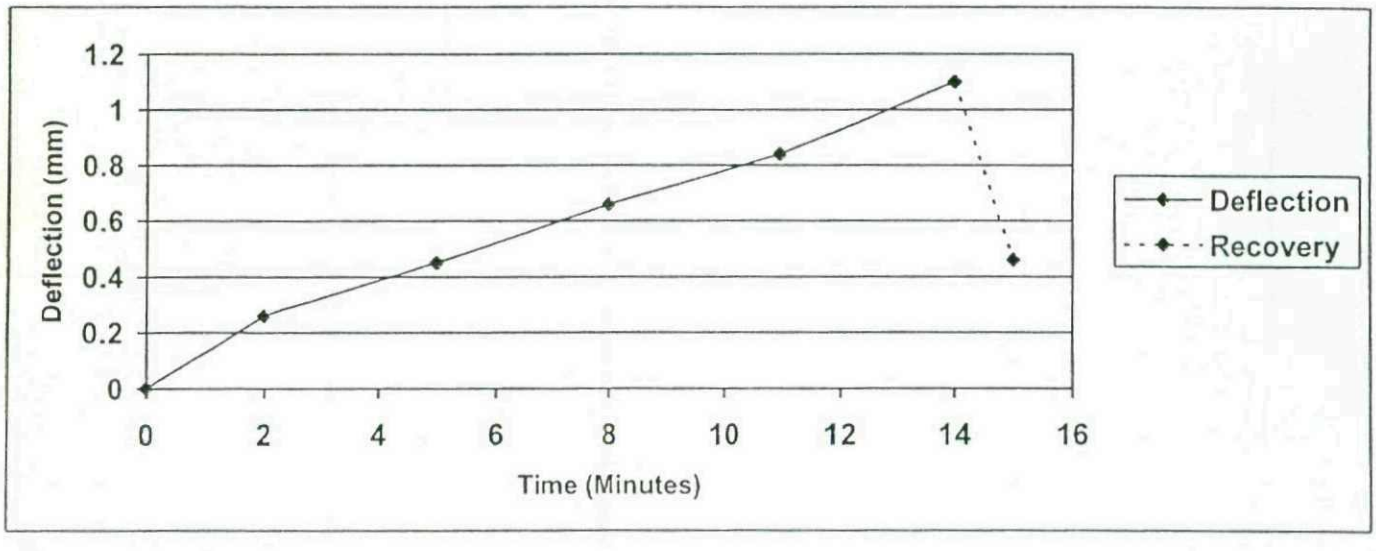
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	76	Test Location	76
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.26		
60	5	0.45		
90	8	0.66		
120	11	0.84		
150	14	1.10	1.30	
0	15	0.46		58.2



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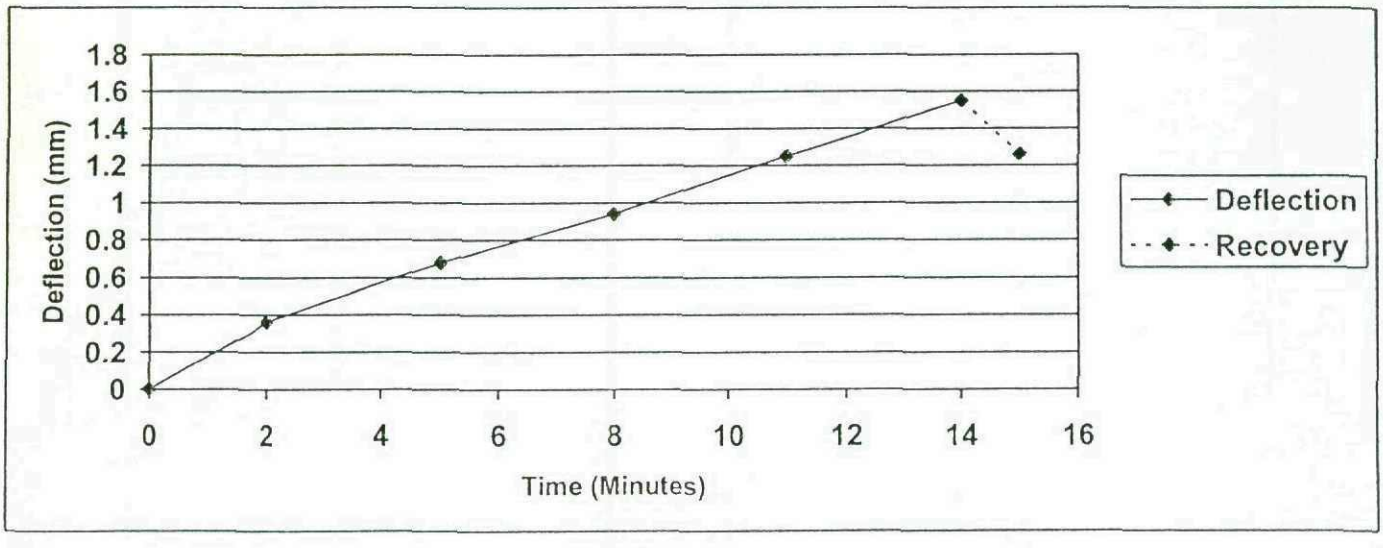
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	77	Test Location	77
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	5	0.68		
90	8	0.94		
120	11	1.25		
150	14	1.55	1.63	
0	15	1.26		18.7



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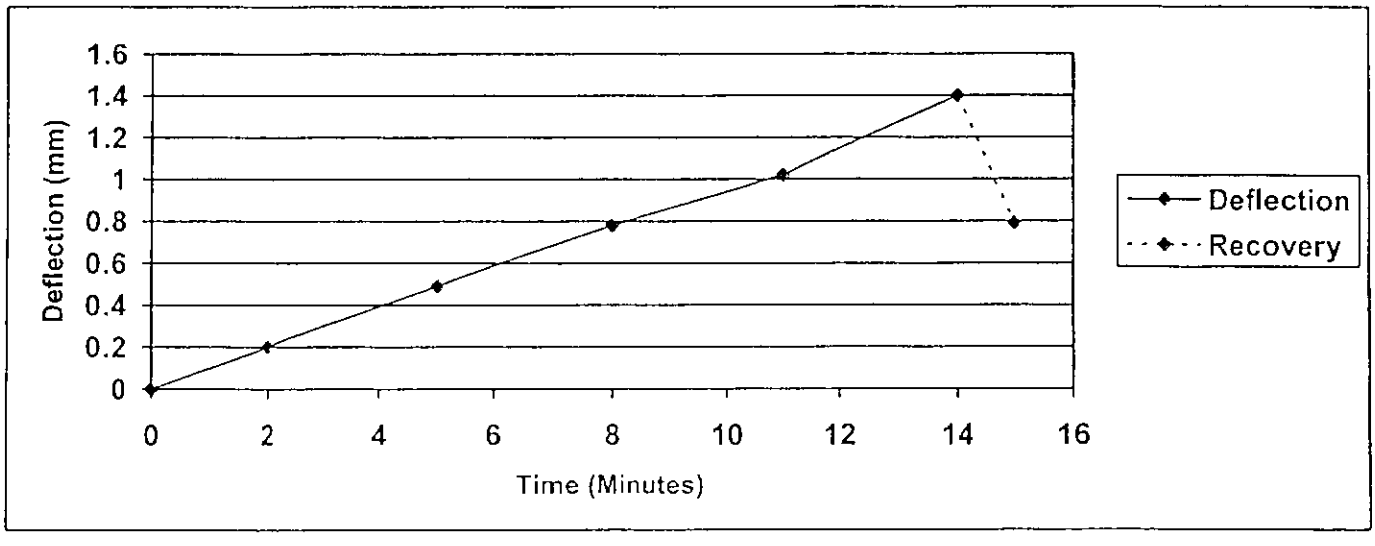
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	78	Test Location	78
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.20		
60	5	0.49		
90	8	0.78		
120	11	1.02		
150	14	1.40	1.54	
0	15	0.79		43.6



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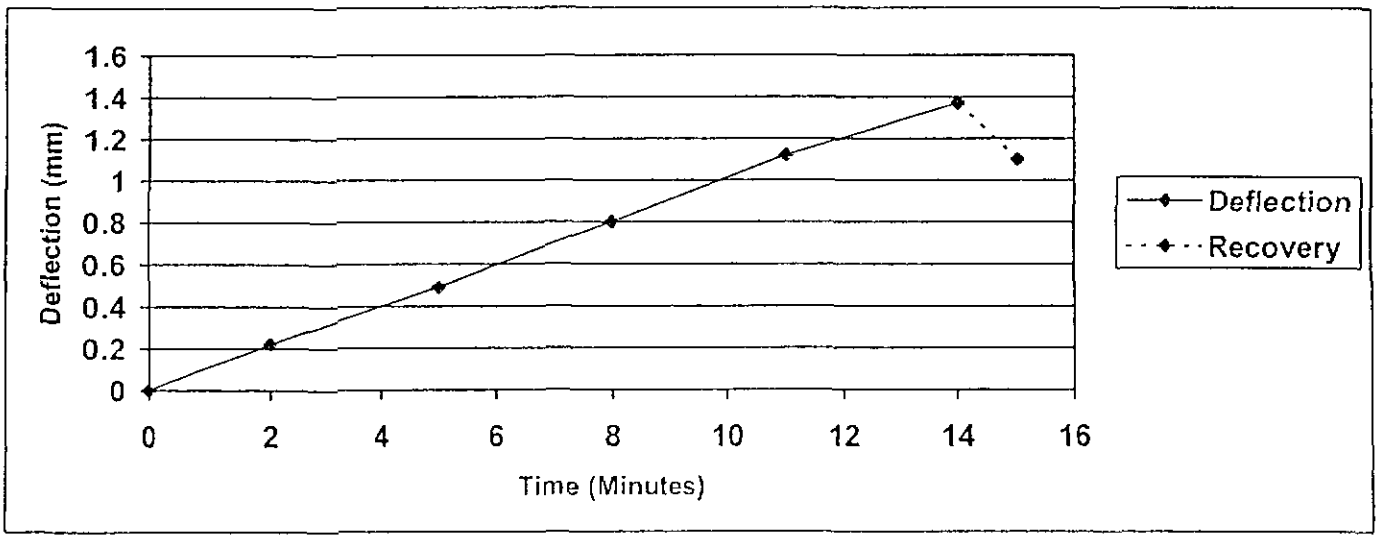
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	79	Test Location	79
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.22		
60	5	0.49		
90	8	0.80		
120	11	1.12		
150	14	1.37	1.51	
0	15	1.10		19.7



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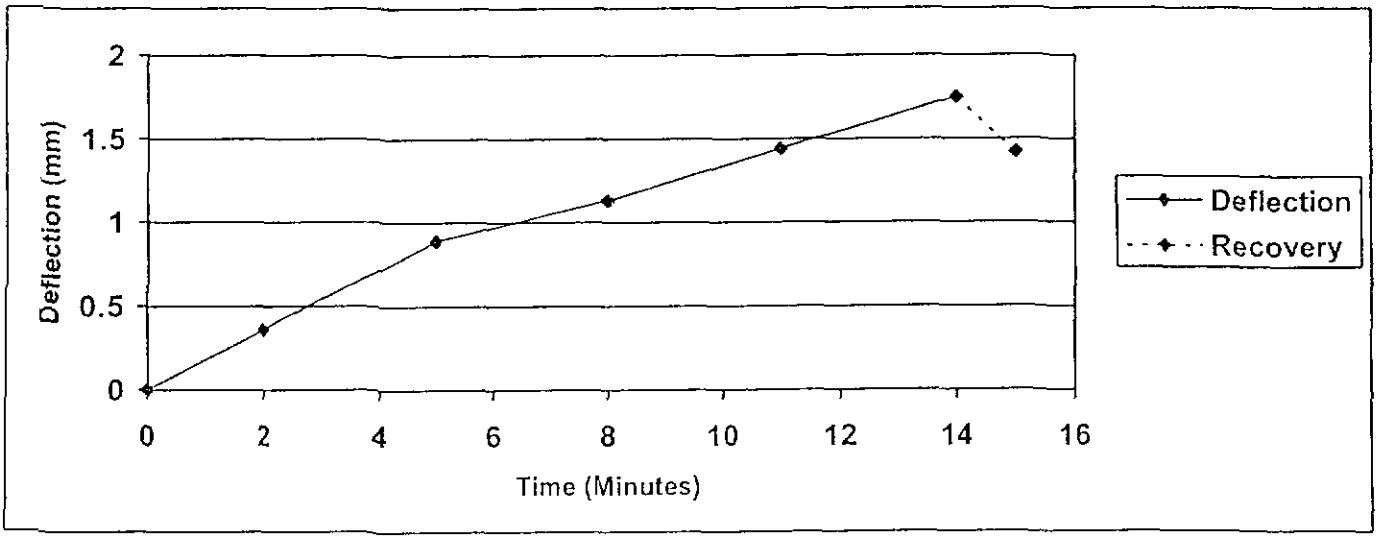
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	80	Test Location	80
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	5	0.89		
90	8	1.13		
120	11	1.44		
150	14	1.75	1.96	
0	15	1.42		18.9



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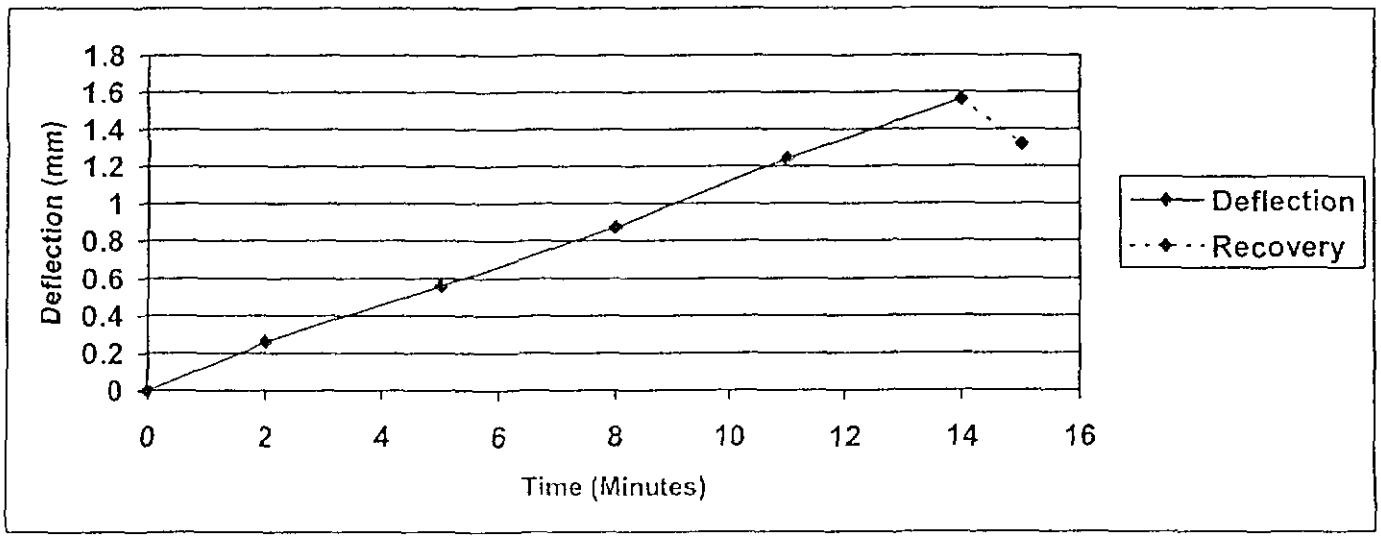
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0914
Site:	Hough Lane, Wombwell	Date Tested:	4/9/2006
Material Under Test:	Mixed fill	Tested By:	R Gaunt
Client Reference	81	Test Location	81
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT with coarse crushed concrete/brick gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.26		
60	5	0.56		
90	8	0.87		
120	11	1.24		
150	14	1.56	1.62	
0	15	1.32		15.4



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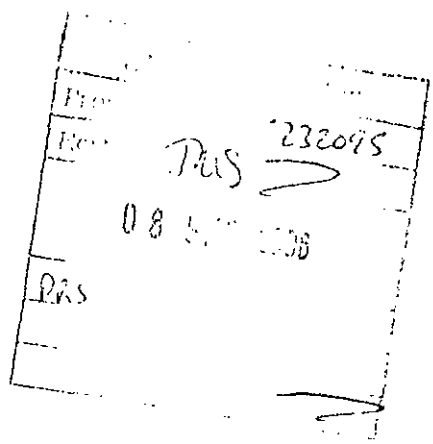
1-2 Aire House
Richmond Business Park
Sidings Court
Doncaster
DN4 5NL



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Joynes Pike and Associates Ltd
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Richmond Business Park
Sidings Court
Doncaster
DN4 5NL

For the Attention of: Mr Richard Butterworth

Report Date: 7th September 2006

Report Reference: 06FW0920
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 6th September 2006 by our Mr G Barley.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 8 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240,241,411)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/097A calibration certificate 905/097A-3.
d. Reaction load on site – 360° Excavator

The weather at the time of test – Overcast/Fine

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
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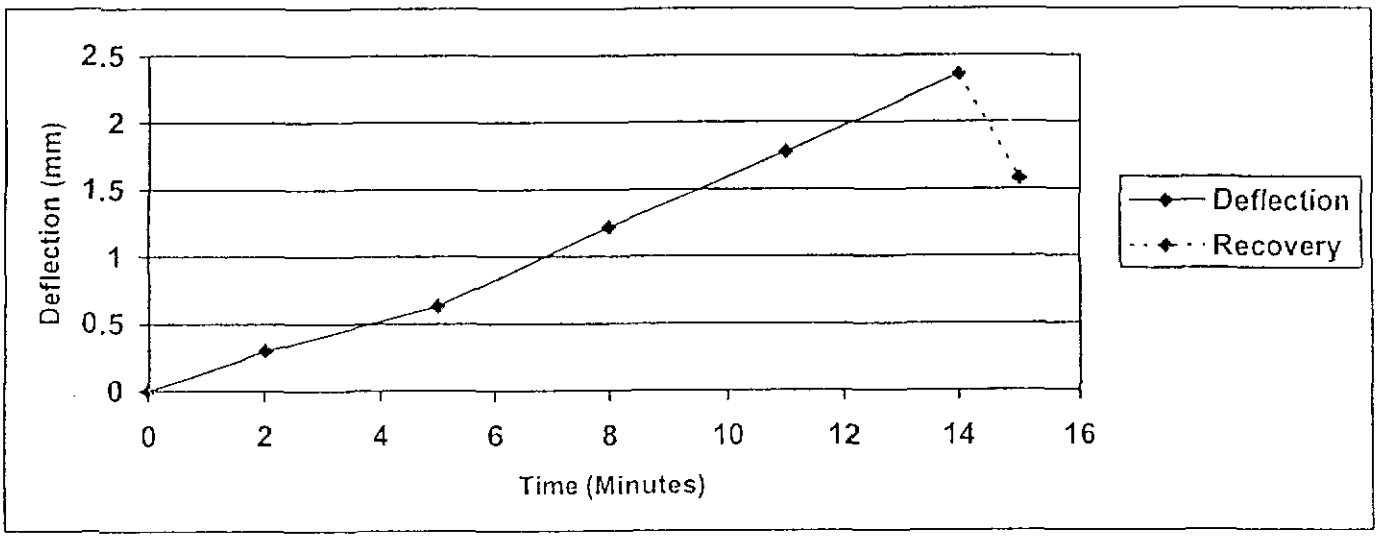
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	Sandy clay and crushed rubble	Tested By:	G Barley
Client Reference	82	Test Location	82
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Fine/Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown sand/silt with clay inclusions and fine to coarse crushed concrete/brick rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.30		
60	5	0.63		
90	8	1.22		
120	11	1.78		
150	14	2.36	2.55	
0	15	1.58		33.1



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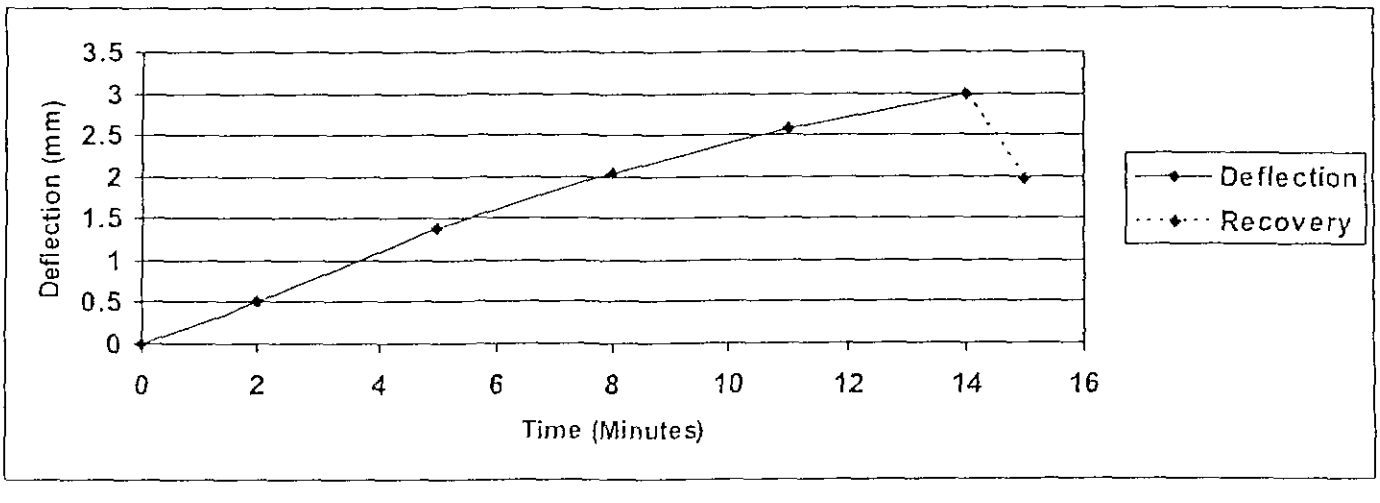
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	Sandy clay and crushed rubble	Tested By:	G Barley
Client Reference	83	Test Location	83
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Fine/Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown sand/silt with clay inclusions and fine to coarse crushed concrete/brick rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.52		
60	5	1.38		
90	8	2.04		
120	11	2.57		
150	14	2.98	3.22	
0	15	1.98		33.6



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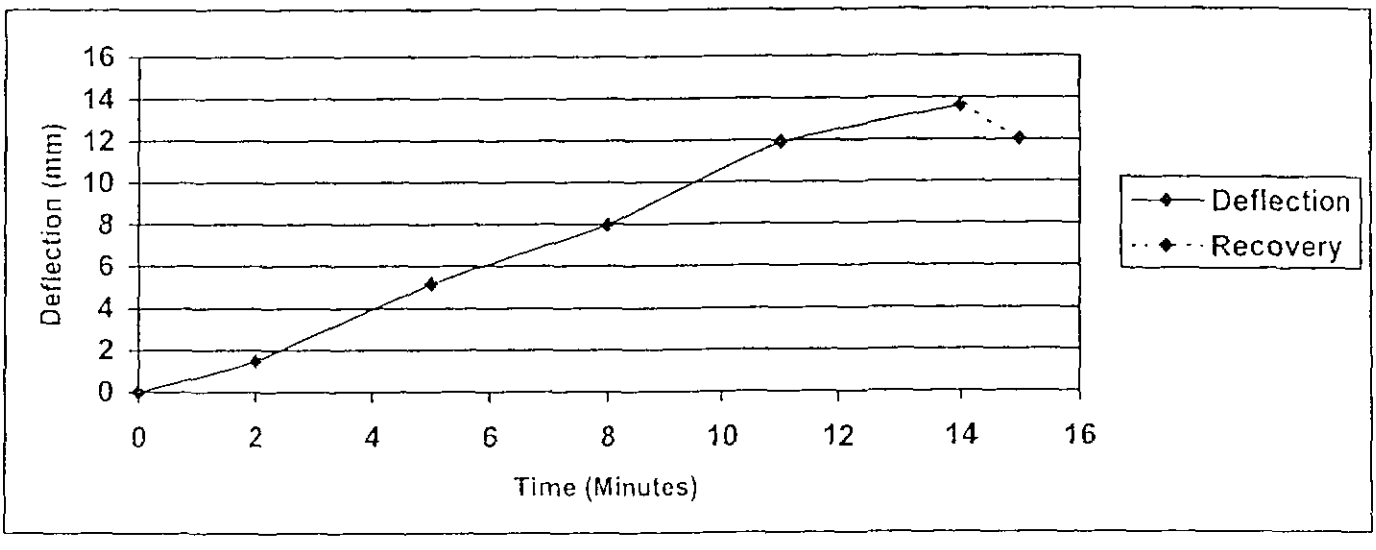
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	Sand and crushed rubble	Tested By:	G Barley
Client Reference	84	Test Location	84
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Fine/Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black SAND with fine to coarse sandstone

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.48		
60	5	5.16		
90	8	7.96		
120	11	11.93		
150	14	13.63	14.57	
0	15	12.03		11.7



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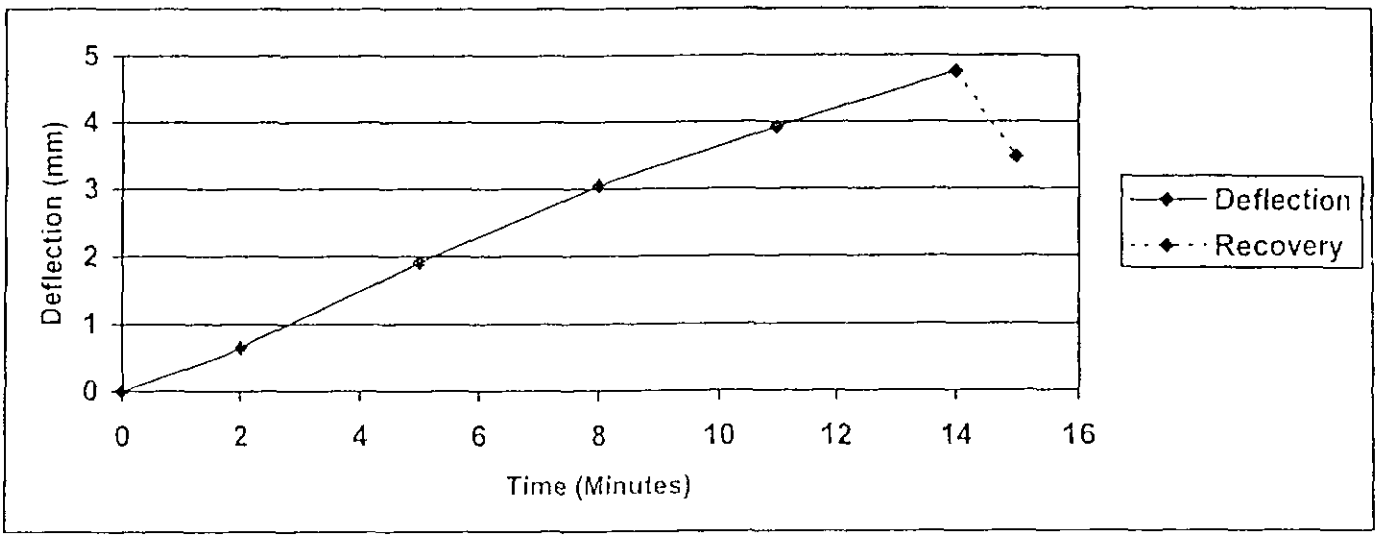
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	Sand and crushed rubble	Tested By:	G Barley
Client Reference	85	Test Location	85
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Fine/Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black SAND with fine to coarse sandstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.65		
60	5	1.91		
90	8	3.05		
120	11	3.92		
150	14	4.76	5.44	
0	15	3.47		27.1



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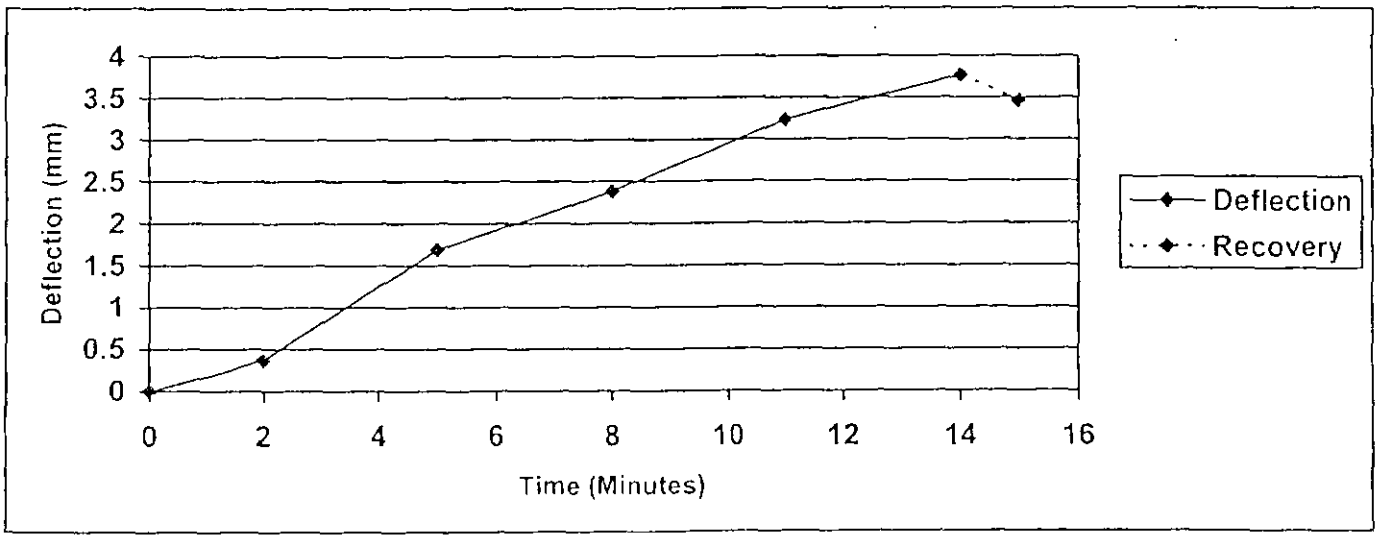
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	*Sand and crushed rubble*	*Tested By:*	*G Barley*
Client Reference	86	Test Location	86
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Fine/Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	4.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black SAND with fine to coarse sandstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.37		
60	5	1.69		
90	8	2.38		
120	11	3.23		
150	14	3.77	3.94	
0	15	3.46		8.2



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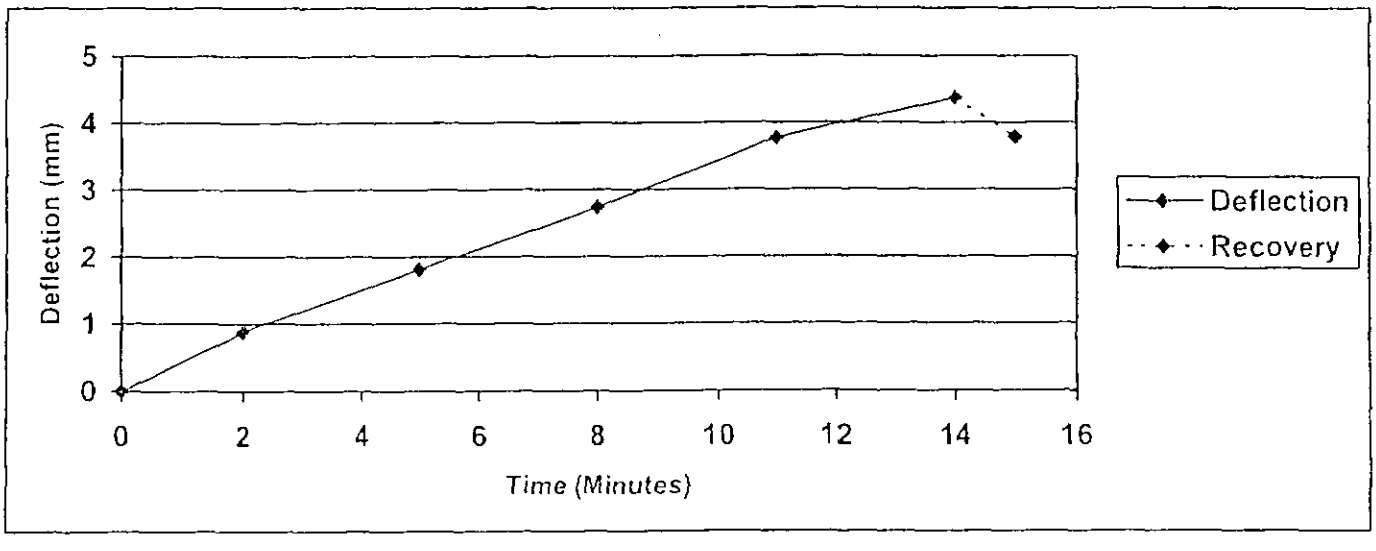
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test	Sand and crushed rubble	Tested By:	G Barley
Client Reference	87	Test Location	87
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	*Overcast*	*Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990*	5.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black SAND with fine to coarse sandstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.88		
60	5	1.81		
90	8	2.74		
120	11	3.77		
150	14	4.37	4.73	
0	15	3.78		13.5



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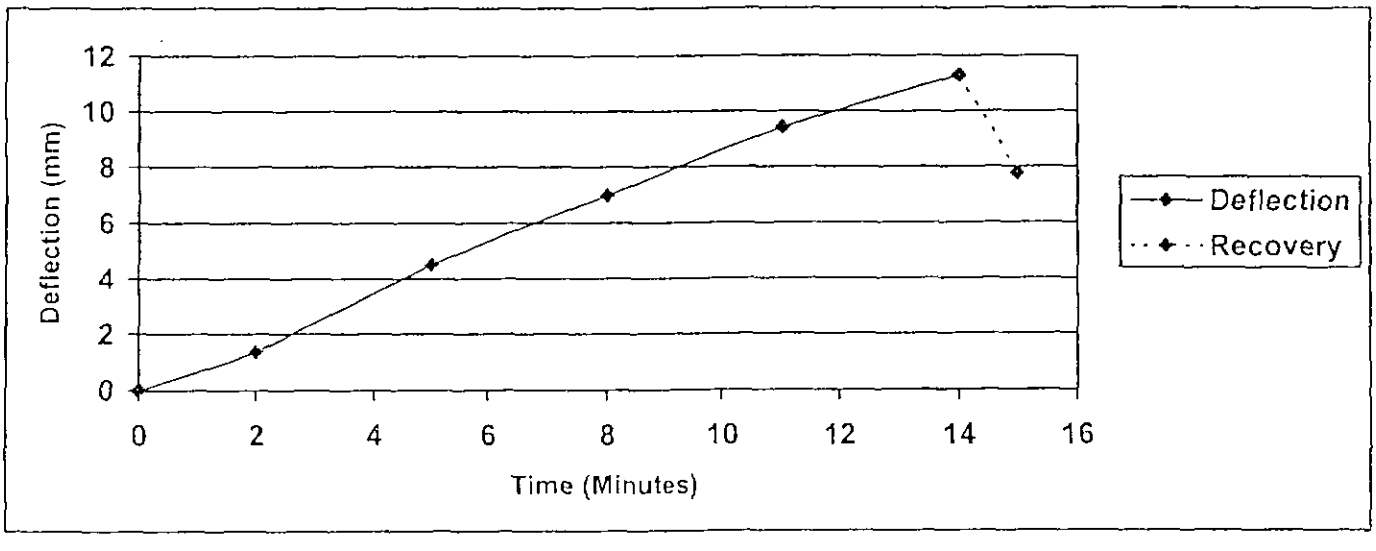
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	Sand and crushed rubble	Tested By:	G Barley
Client Reference	88	Test Location	88
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black SAND with fine to coarse sandstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.37		
60	5	4.51		
90	8	6.99		
120	11	9.41		
150	14	11.30	12.67	
0	15	7.77		31.2



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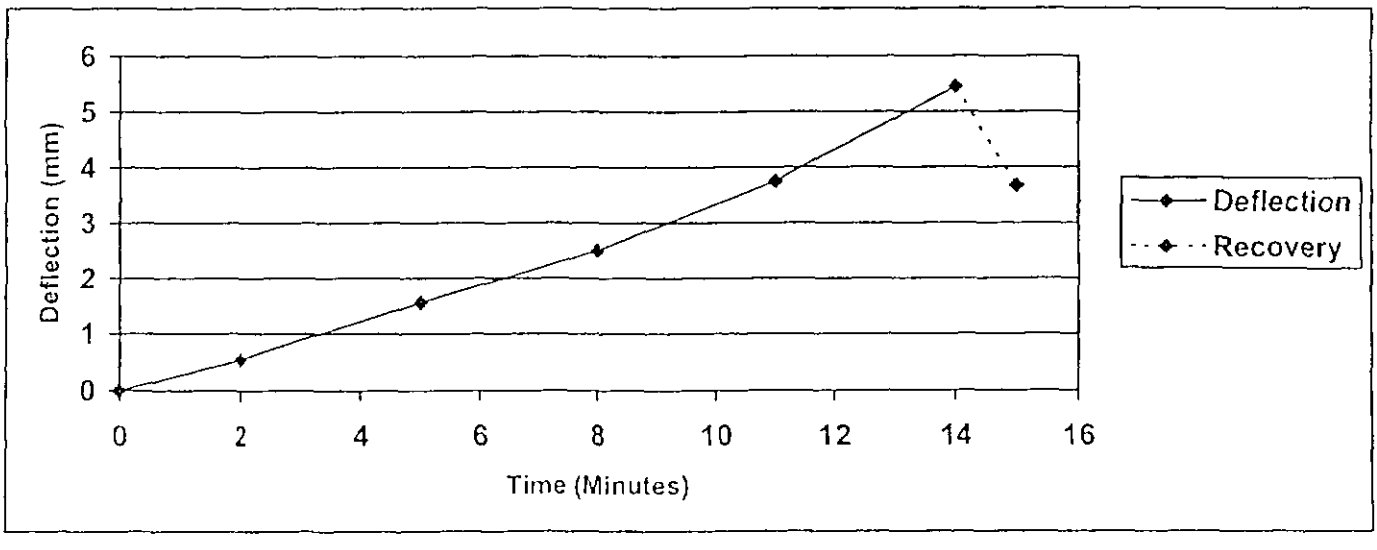
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0920
Site:	Hough Lane, Wombwell	Date Tested:	06/09/2006
Material Under Test:	Sand and crushed rubble	Tested By:	G Barley
Client Reference	89	Test Location	89
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Fine/Cloudy	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Black SAND with fine to coarse sandstone

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.54		
60	5	1.56		
90	8	2.50		
120	11	3.75		
150	14	5.45	6.02	
0	15	3.67		32.7



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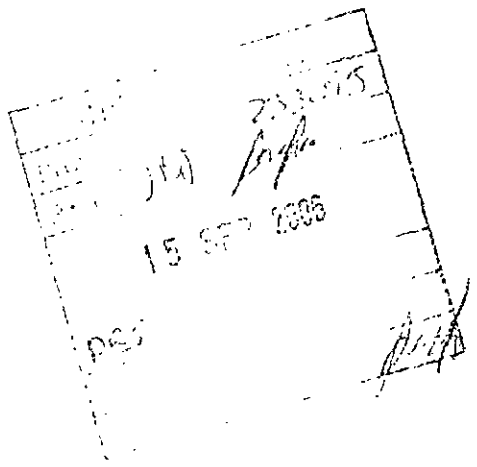
Doncaster
DN4 5NL



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Tel: 0114 240 1901
Fax: 0114 240 1744

Report Date: 13th September 2006

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1-2 Aire House
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DN4 5NL

For the Attention of: Mr Richard Butterworth

Report Reference: 06FW0940
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 11th September 2006 by our Mr D Peace.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 7 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240, 241, 411)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B0-18.
d. Reaction load on site – dumper.

The weather at the time of test – sunny.

D Swindells
Laboratory Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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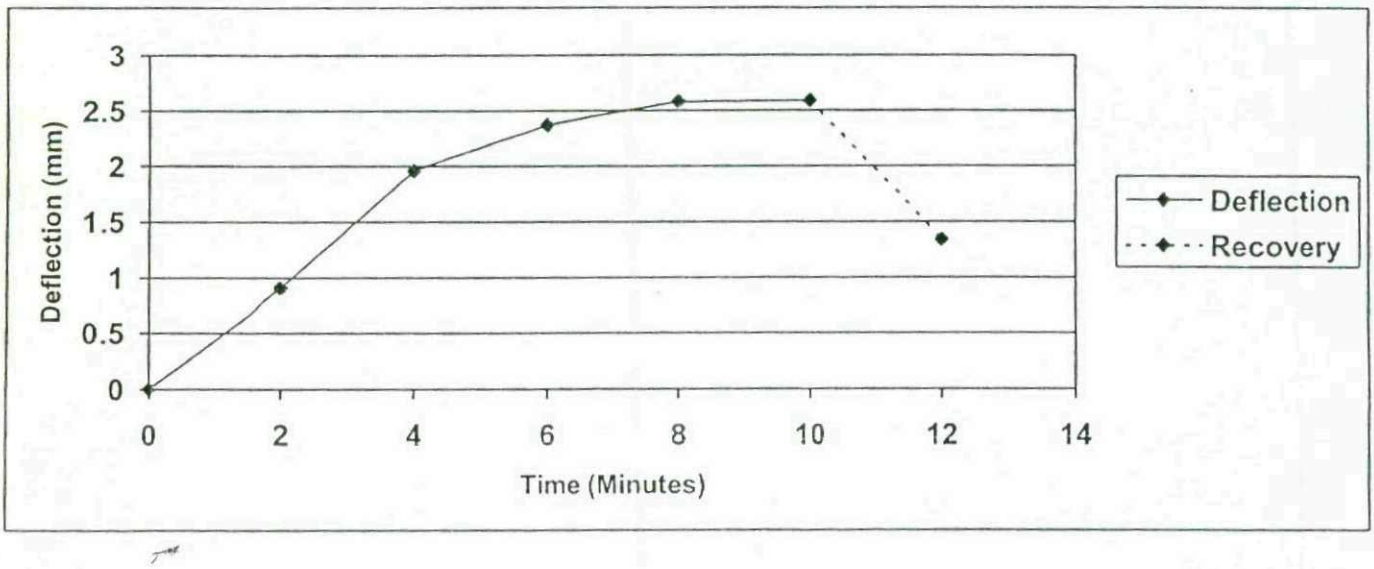
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	11/09/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	1 (88A)	Test Location	1
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.98%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with medium to coarse brick/rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.91		
60	4	1.96		
90	6	2.37		
120	8	2.58		
150	10	2.59	3.46	
0	12	1.34		48.3



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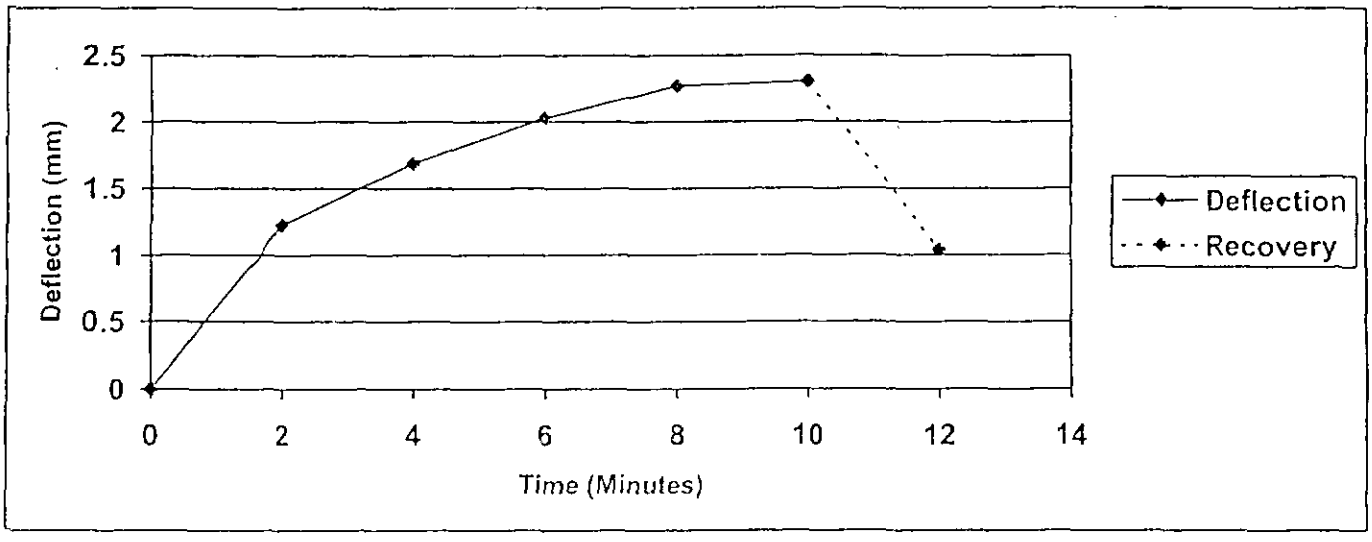
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	11/09/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	2 (84A)	Test Location	84A
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.31%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with medium to coarse brick/rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.23		
60	4	1.69		
90	6	2.03		
120	8	2.27		
150	10	2.30	2.63	
0	12	1.04		54.8



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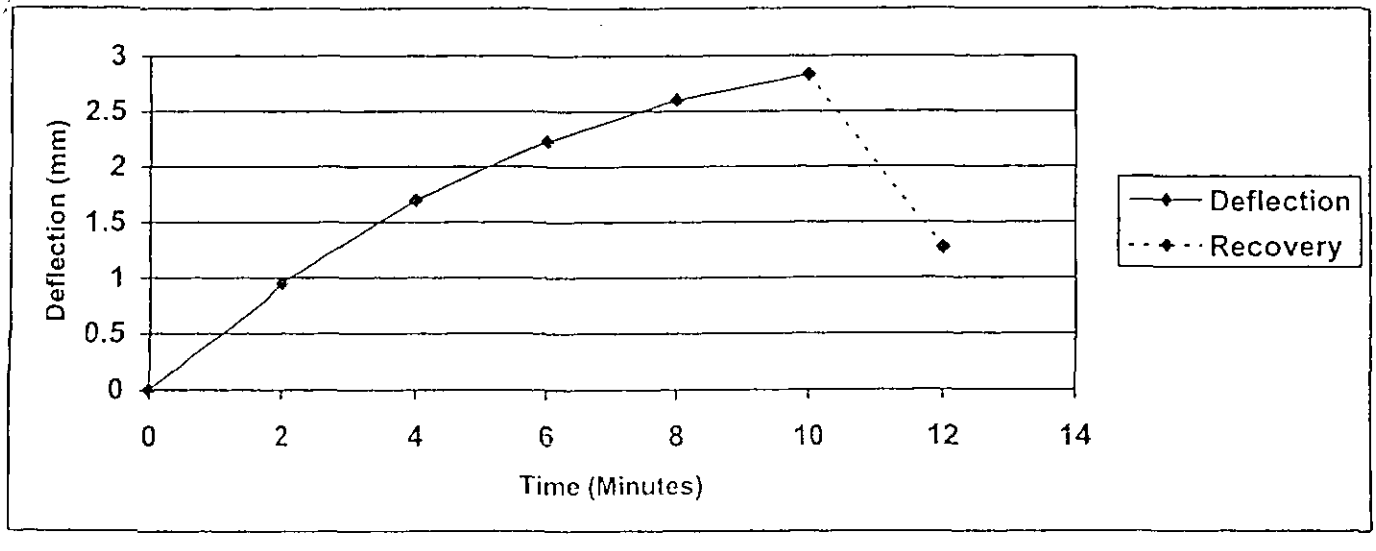
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	3 (90)	Test Location	90
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Mixed FILL with coarse brick/rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.95		
60	4	1.70		
90	6	2.23		
120	8	2.60		
150	10	2.83	3.65	
0	12	1.27		55.1



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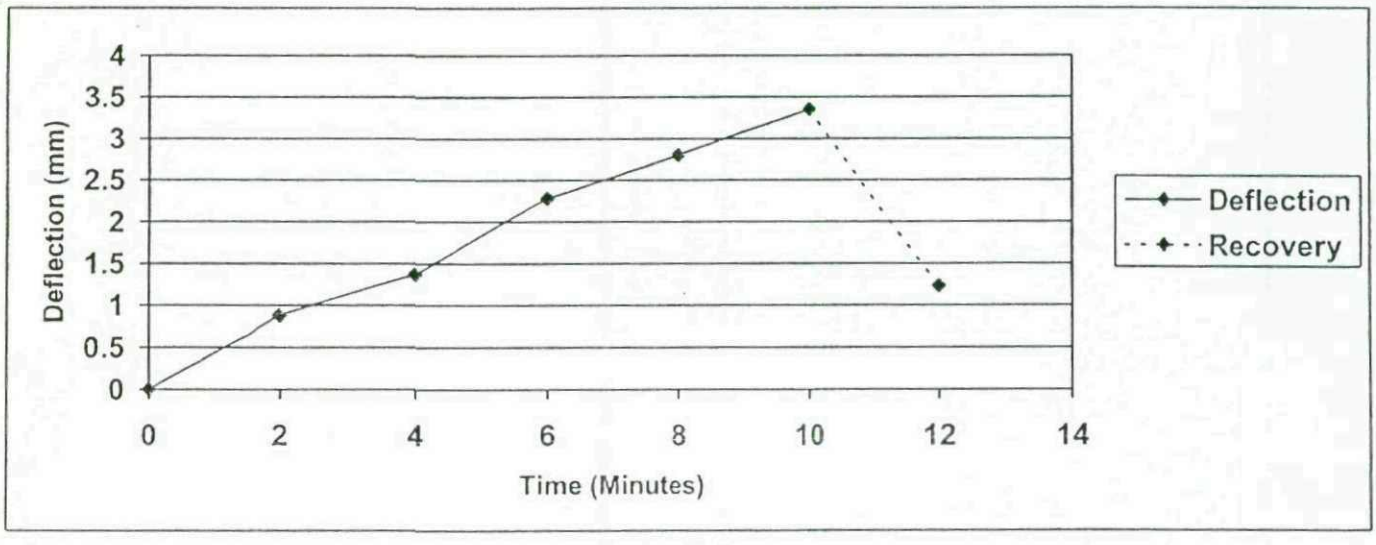
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	29/8/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	4 (91)	Test Location	91
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.16%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.88		
60	4	1.37		
90	6	2.28		
120	8	2.80		
150	10	3.35	3.57	
0	12	1.23		65.5



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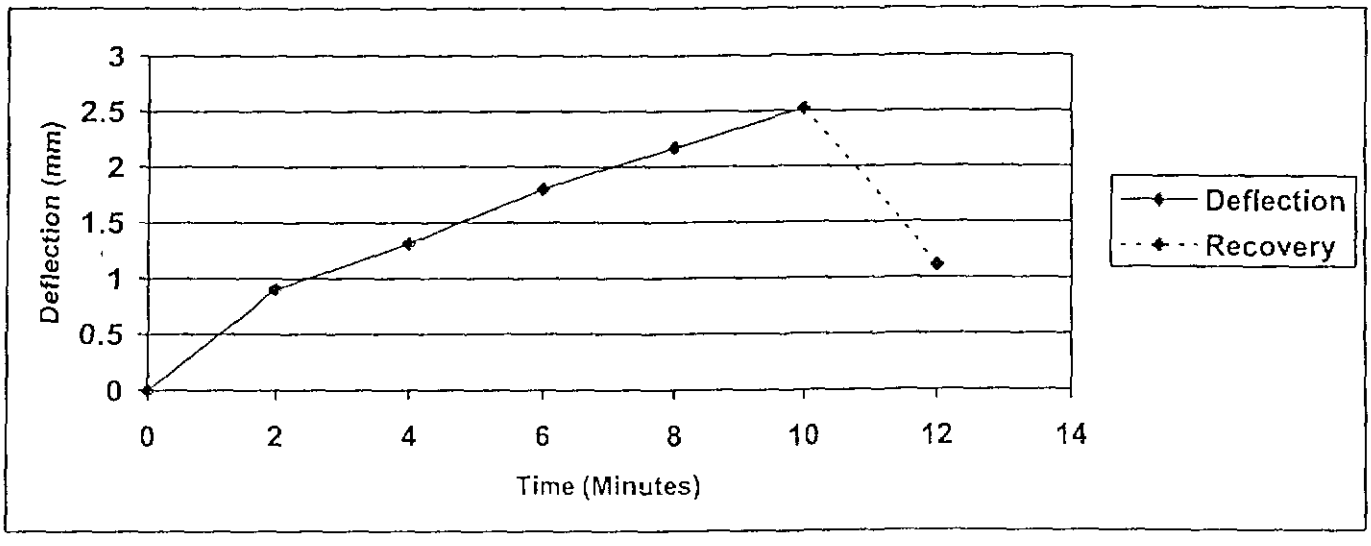
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	11/9/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	5 (12)	Test Location	92
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	*Natural Moisture Content Carried out in accordance with BS1377:Pt2:1990*	6.37%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	FILL with medium to coarse brick/rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.90		
60	4	1.31		
90	6	1.80		
120	8	2.17		
150	10	2.52	2.91	
0	12	1.11		56.0



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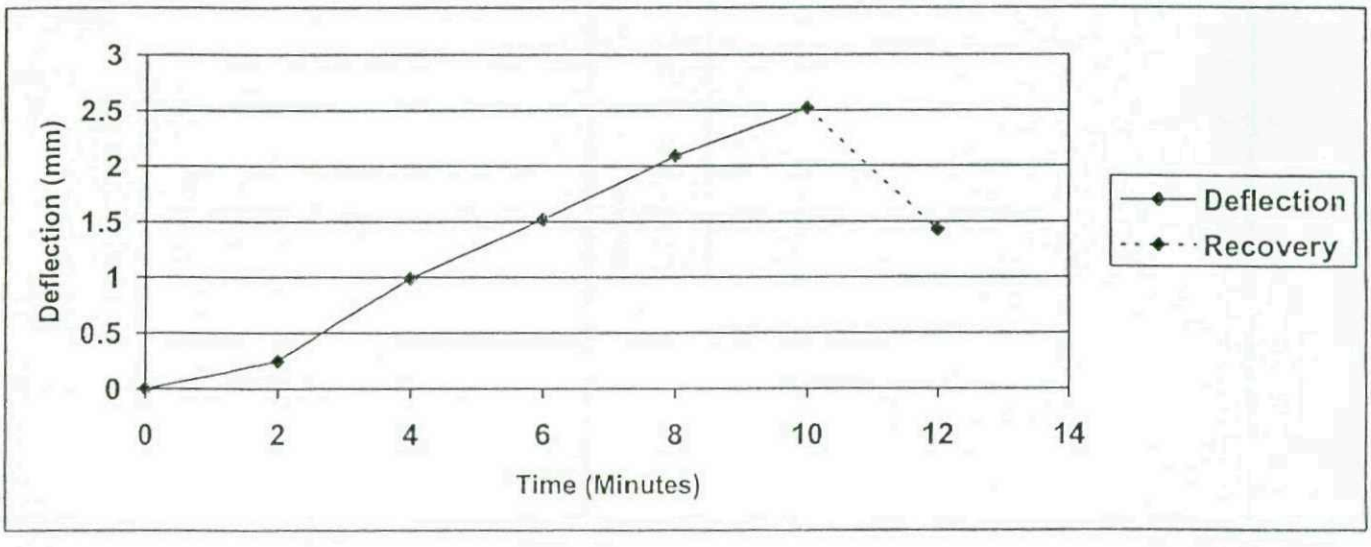
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	11/09/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	6 (93)	Test Location	93
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with coarse brick/rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.25		
60	4	0.99		
90	6	1.52		
120	8	2.09		
150	10	2.52	3.29	
0	12	1.43		43.3



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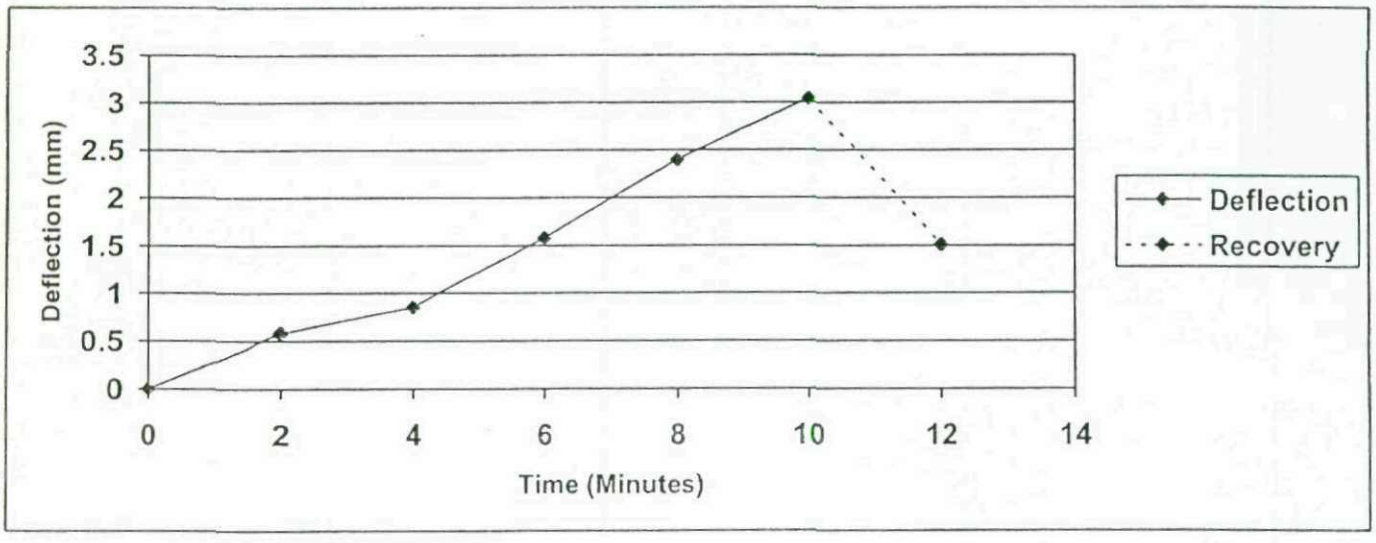
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW0940
Site:	Hough Lane, Wombwell	Date Tested:	11/09/2006
Material Under Test:	Clay/Brick Rubble	Tested By:	D Peace
Client Reference	7 (94)	Test Location	94
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.95%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Brown FILL with coarse brick/rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.58		
60	4	0.85		
90	6	1.58		
120	8	2.40		
150	10	3.04	3.55	
0	12	1.51		50.3



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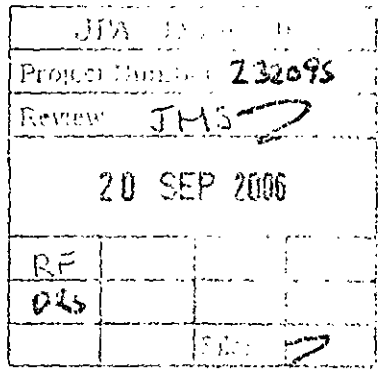

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Tel: 0114 240 1901
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Joynes Pike and Associates
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For the Attention of: Mr Rob Fone

Report Date: 18th September 2006

Report Reference: 06FW0951
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D. Sykes under your official order number 20712 and executed on 14th September 2006 by our Mr D. Peace.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 6 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 413,414,415)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/097A calibration certificate 905/097A-4
d. Reaction load on site – Moxy Dumper
e. The weather at the time of test – Overcast.

D. Swindells
Laboratory Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
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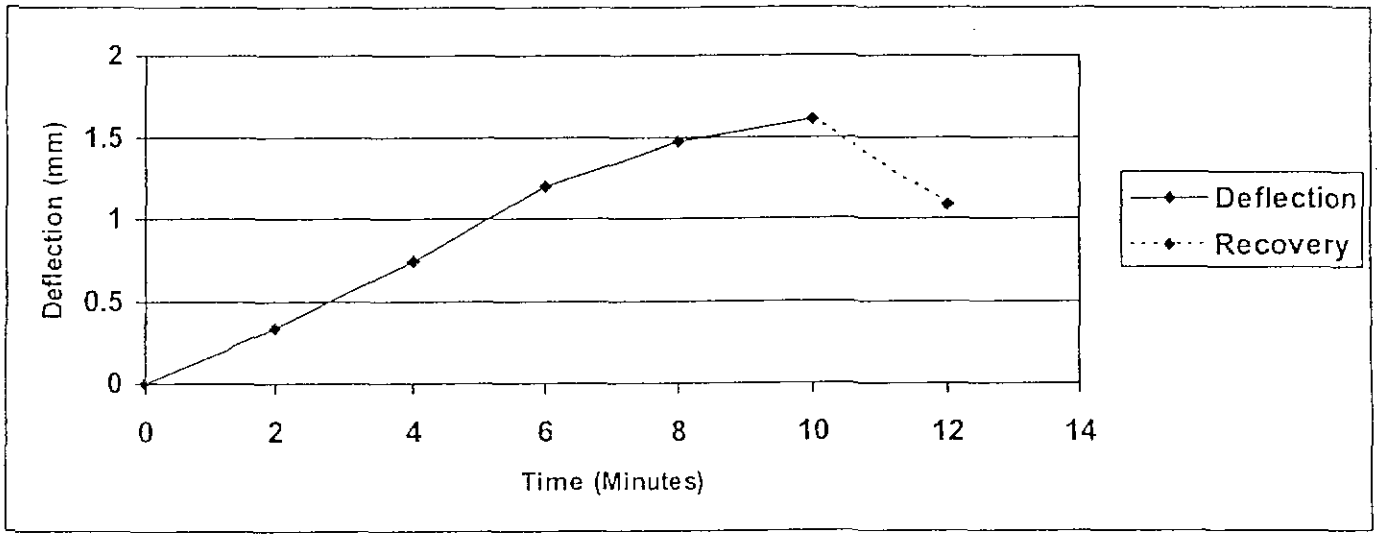
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and *Associates*	Report No:	06FW0951
Site:	Hough Lane, Wombwell	Date Tested:	14/09/2006
Material Under Test:	Sand with medium gravel	Tested By:	D Peace
Client Reference	95	Test Location	95
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown SAND with medium gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.33		
60	4	0.74		
90	6	1.20		
120	8	1.47		
150	10	1.61	1.69	
0	12	1.09		32.3



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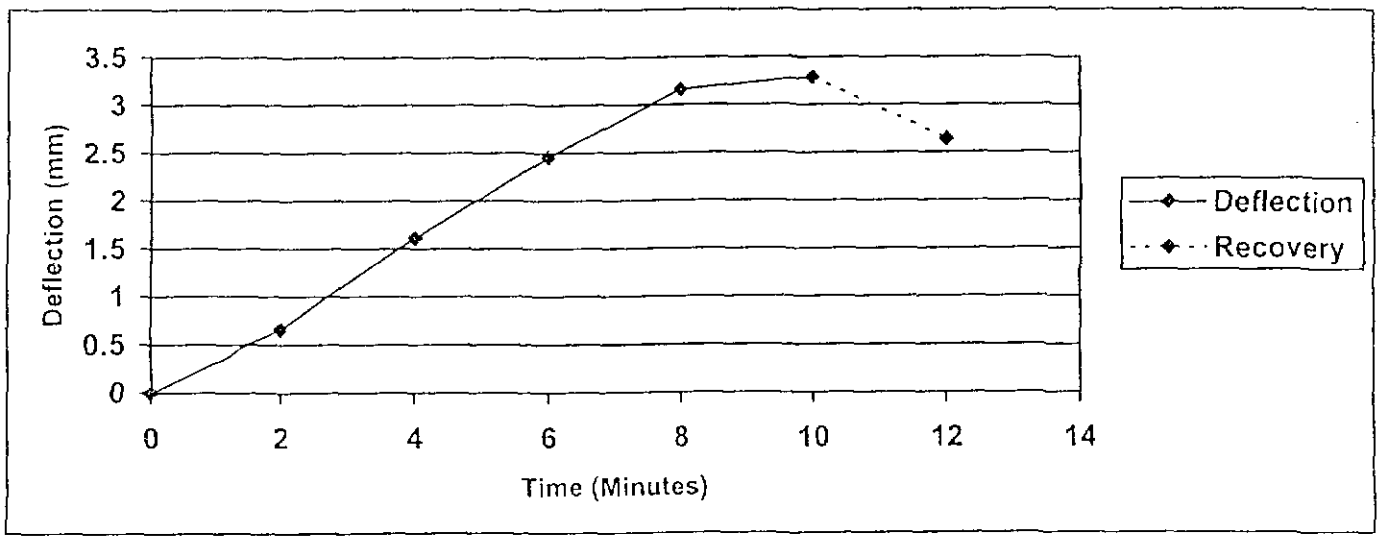
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0951
Site:	Hough Lane, Wombwell	Date Tested:	14/09/2006
Material Under Test:	Sand with medium gravel	Tested By:	D Peace
Client Reference	96	Test Location	96
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown SAND with medium gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.66		
60	4	1.61		
90	6	2.46		
120	8	3.16		
150	10	3.29	3.84	
0	12	2.64		19.8



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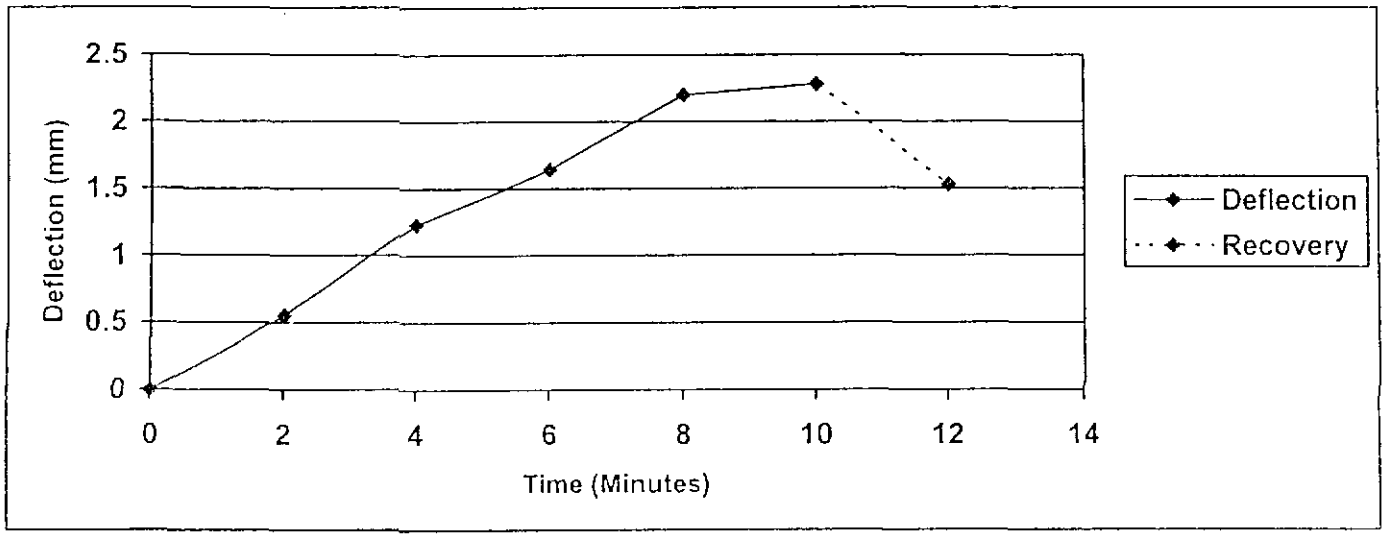
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0951
Site:	Hough Lane, Wombwell	Date Tested:	14/09/2006
Material Under Test:	Sand with medium gravel	Tested By:	D Peace
Client Reference	97	Test Location	97
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown SAND with medium gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.55		
60	4	1.23		
90	6	1.64		
120	8	2.20		
150	10	2.28	2.83	
0	12	1.53		32.9



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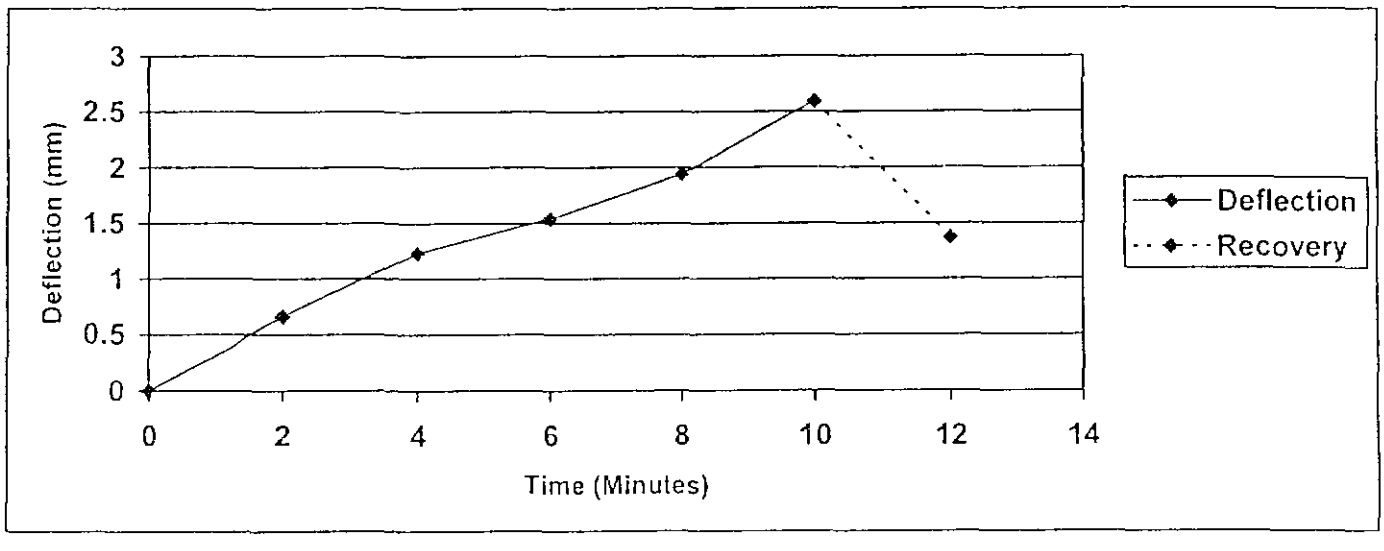
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0951
Site:	Hough Lane, Wombwell	Date Tested:	14/09/2006
Material Under Test:	Sand with medium gravel	Tested By:	D Peace
Client Reference	98	Test Location	98
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown SAND with medium gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.66		
60	4	1.23		
90	6	1.54		
120	8	1.94		
150	10	2.59	2.82	
0	12	1.37		47.1



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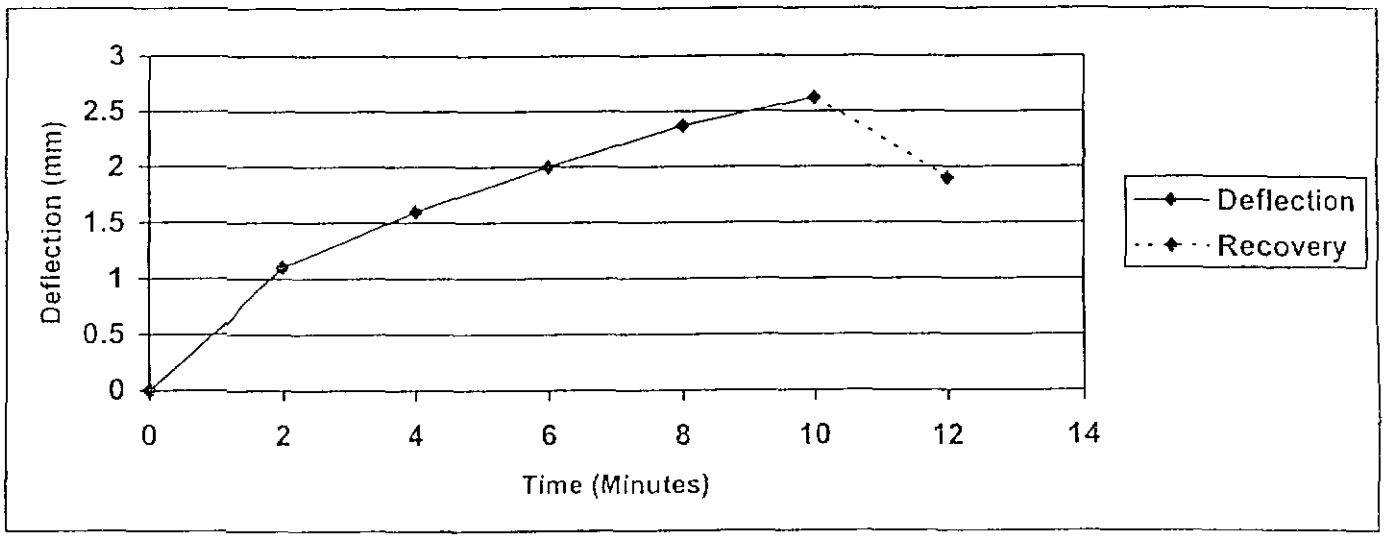
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0951
Site:	Hough Lane, Wombwell	Date Tested:	14/09/2006
Material Under Test:	Sand with medium gravel	Tested By:	D Peace
Client Reference	99	Test Location	99
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown SAND with medium gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.10		
60	4	1.60		
90	6	2.00		
120	8	2.37		
150	10	2.62	2.89	
0	12	1.90		27.5



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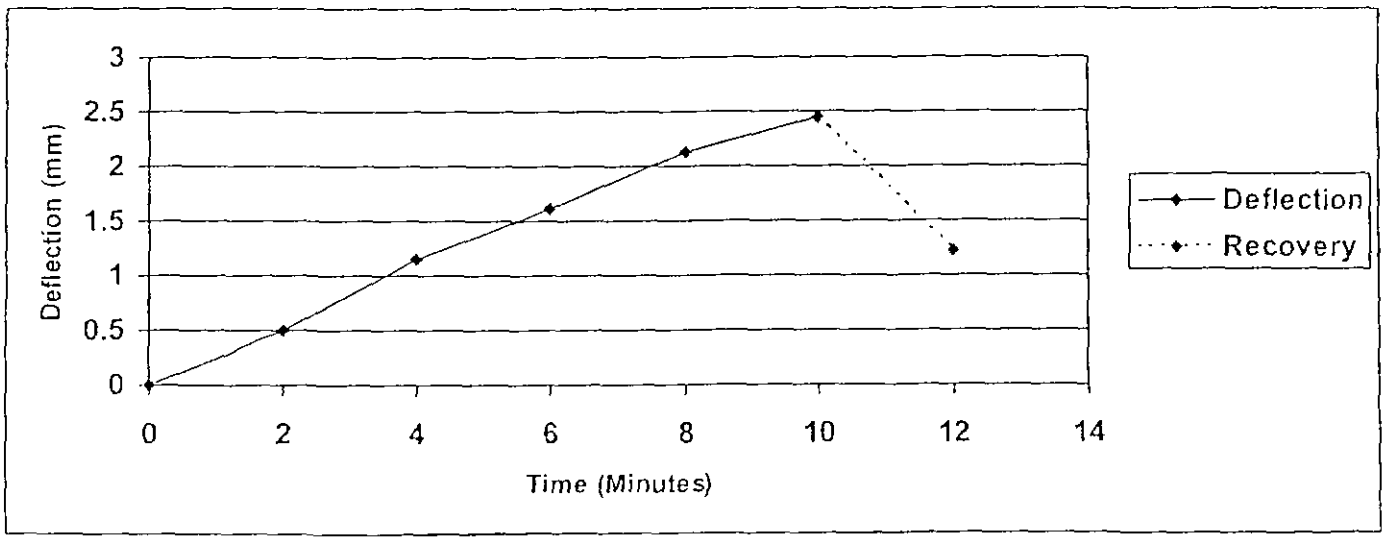
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates	Report No:	06FW0951
Site:	Hough Lane, Wombwell	Date Tested:	14/09/2006
Material Under Test:	Sand with medium gravel	Tested By:	D Peace
Client Reference	100	Test Location	100
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy Dumper
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.54%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown SAND with medium gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.50		
60	4	1.15		
90	6	1.62		
120	8	2.13		
150	10	2.45	2.62	
0	12	1.22		50.2



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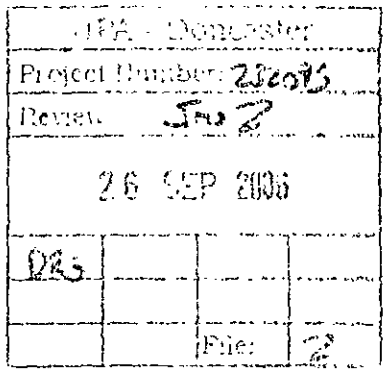

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Fax: 0114 240 1744

Joynes Pike and Associates Limited
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Richmond Business Park
Doncaster
DN4 5JB

For the Attention of: Mr Rob Fone

Report Date: 25th September 2006

Report Reference: 06FW0975
Project Code: JO8/DONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 19th September 2006 by our Mr D Peace.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 4 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 2 Number Displacement dial gauges (Ref. 905/410 & 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/172A calibration certificate 905/172A-19
d. Reaction load on site – moxy dumper.
e. The weather at the time of test – sunny.

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
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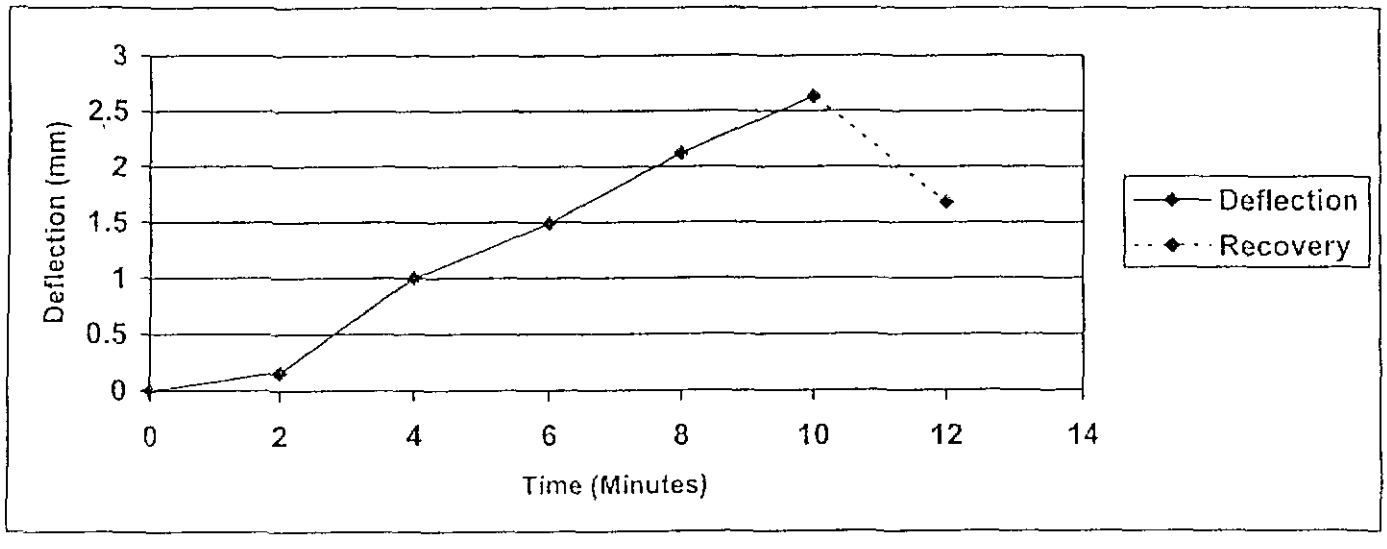
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0975
Site:	Haugh Lane, Wombwell	Date Tested:	19/9/2006
Material Under Test:	Soil/demolition material	Tested By:	D Peace
Client Reference	101	Test Location	4
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.16		
60	4	1.00		
90	6	1.49		
120	8	2.12		
150	10	2.63	3.04	
0	12	1.68		36.1



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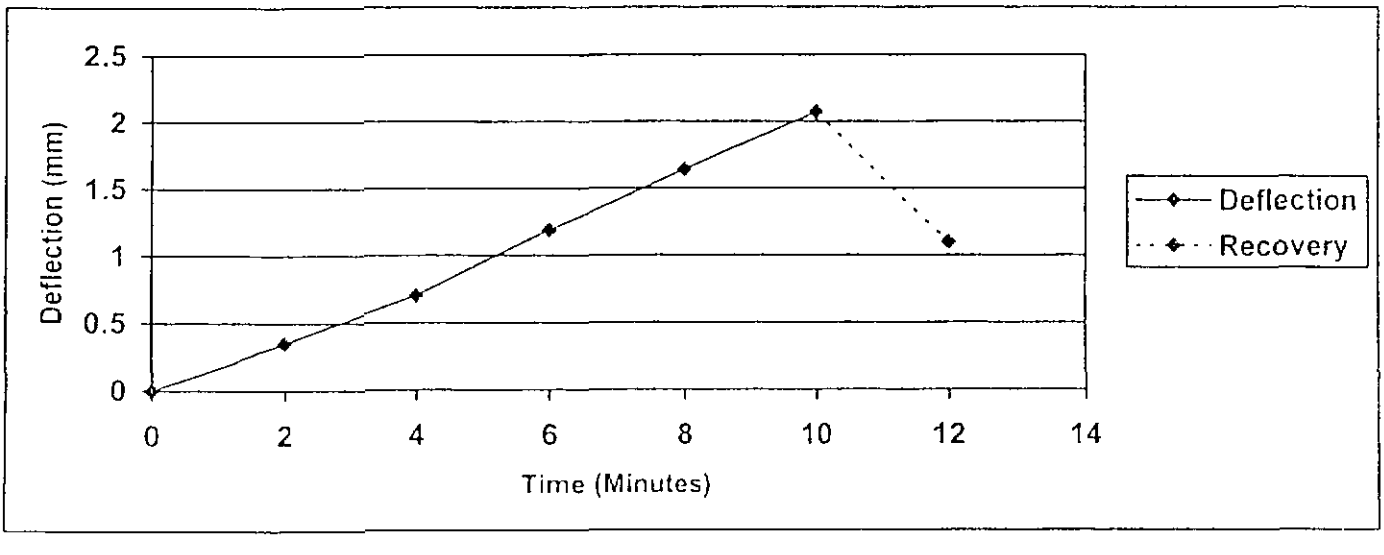
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0975
Site:	Haugh Lane, Wombwell	Date Tested:	19/9/2006
Material Under Test:	Sand Medium Gravel	Tested By:	D Peace
Client Reference	102	Test Location	2
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.35		
60	4	0.70		
90	6	1.19		
120	8	1.64		
150	10	2.07	2.43	
0	12	1.10		46.1



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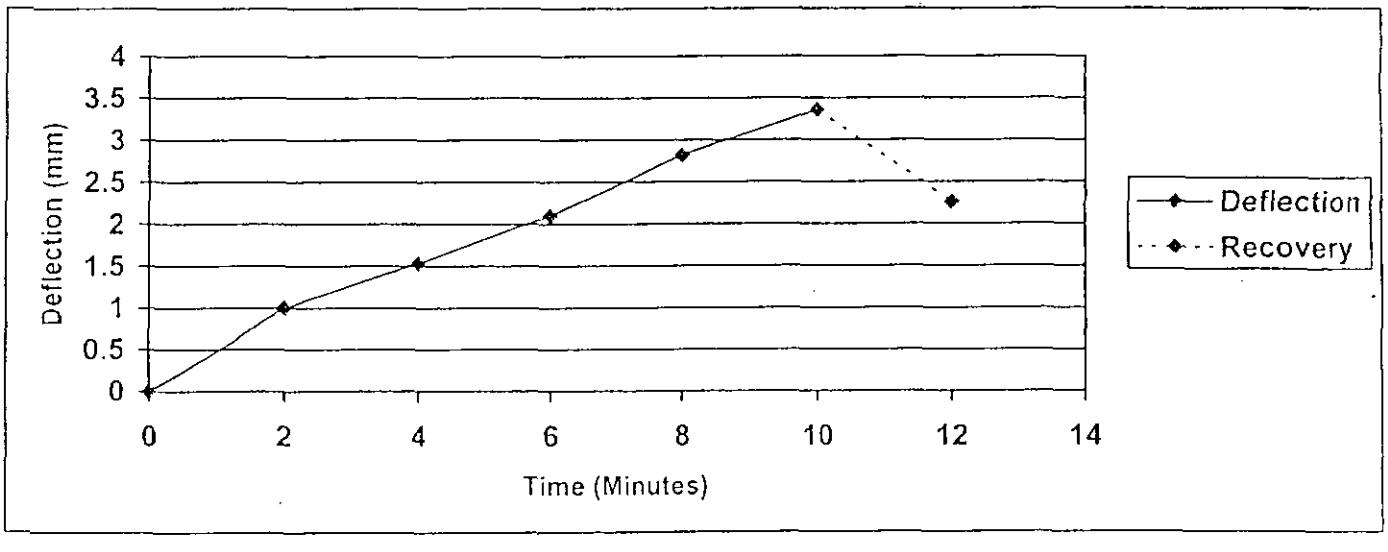
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0975
Site:	Haugh Lane, Wombwell	Date Tested:	19/9/2006
Material Under Test:	Sand Medium Gravel	Tested By:	D Peace
Client Reference	103	Test Location	3
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.00		
60	4	1.53		
90	6	2.10		
120	8	2.82		
150	10	3.36	3.94	
0	12	2.26		32.7



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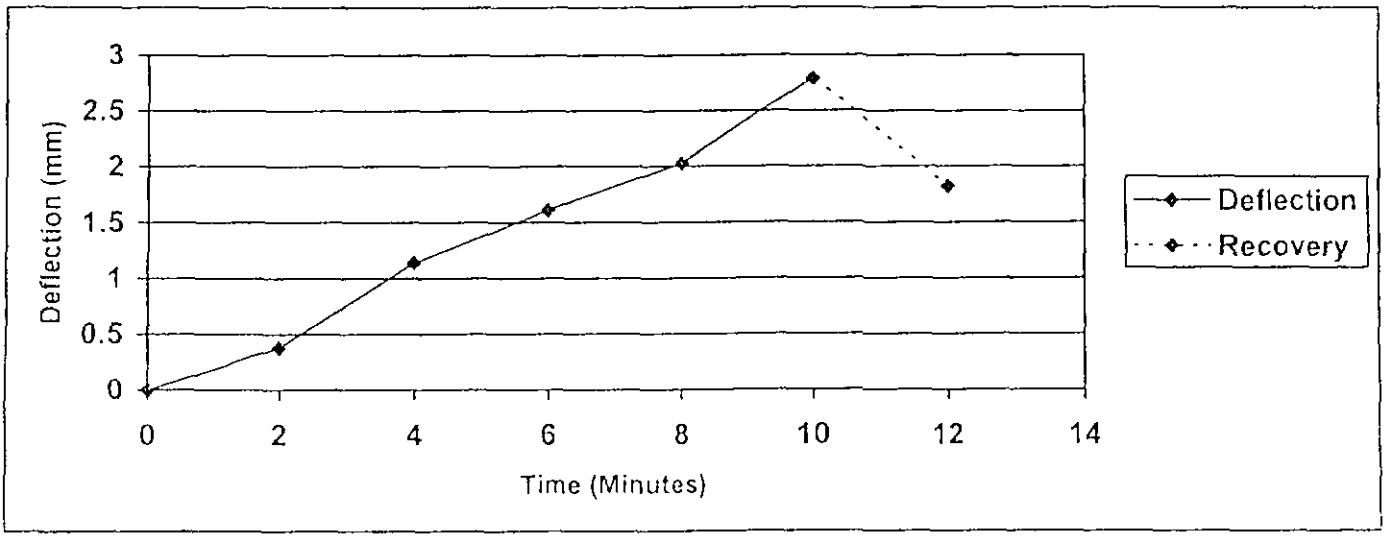
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0975
Site:	Haugh Lane, Wombwell	Date Tested:	19/9/2006
Material Under Test:	Sand Medium Gravel	Tested By:	D Peace
Client Reference	*104*	*Test Location*	1
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.5%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.38		
60	4	1.14		
90	6	1.61		
120	8	2.03		
150	10	2.79	3.71	
0	12	1.82		34.8



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JPA - Doncaster			
Project Number. 232095			
Review. JMS			
26 SEP 2006			
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		File:	2

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For the Attention of: Mr Rob Fone

Report Date: 25th September 2006

Report Reference: 06FW0980
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 21st September 2006 by our Mr D Peace.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 4 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/172A calibration certificate 905/172A-19
d. Reaction load on site – moxy dumper.
e. The weather at the time of test – sunny.

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
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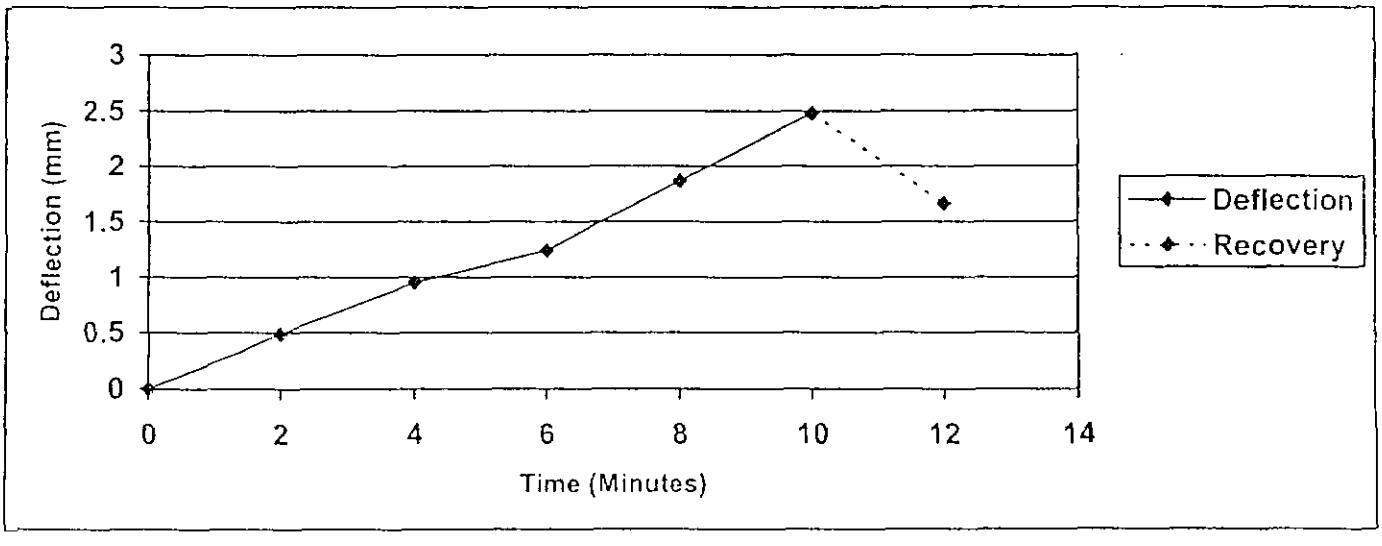
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0980
Site:	Hough Lane, Wombwell	Date Tested:	21/09/2006
Material Under Test:	Sand with Medium Gravel	Tested By:	D Peace
Client Reference	105	Test Location	105
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	6.5%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sand with medium gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.49		
60	4	0.95		
90	6	1.24		
120	8	1.87		
150	10	2.48	2.74	
0	12	1.66		33.1



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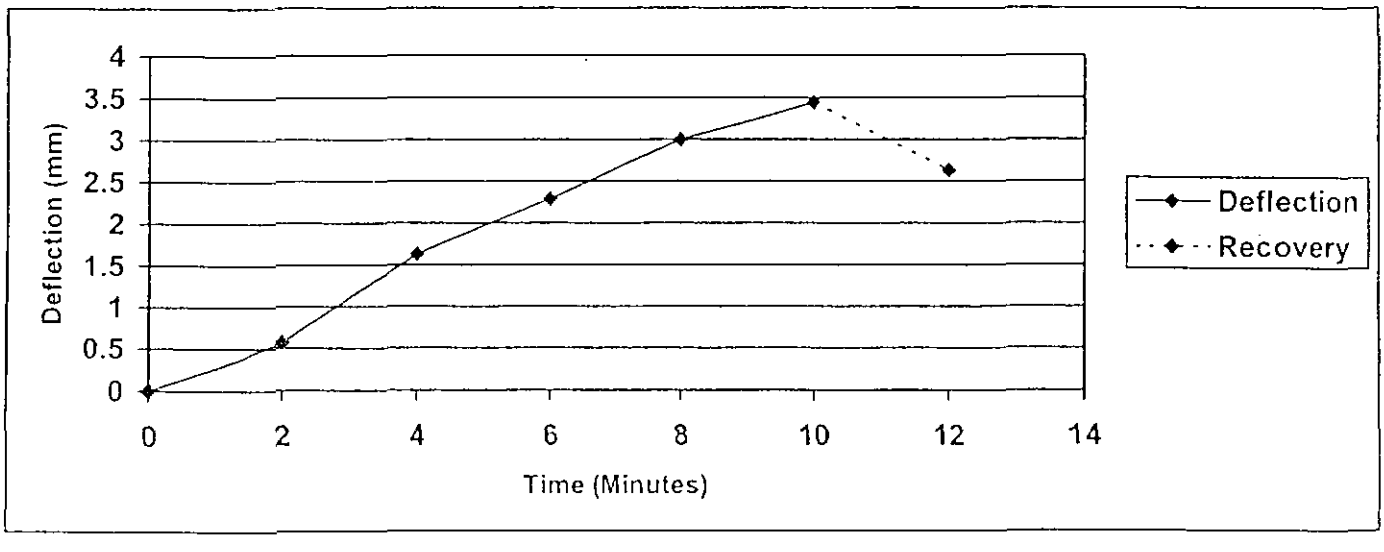
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0980
Site:	Hough Lane, Wombwell	Date Tested:	21/09/2006
Material Under Test:	Sand with Medium Gravel	Tested By:	D Peace
Client Reference	106	Test Location	106
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.7%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sand with medium gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.57		
60	4	1.63		
90	6	2.29		
120	8	3.00		
150	10	3.44	3.93	
0	12	2.63		23.5



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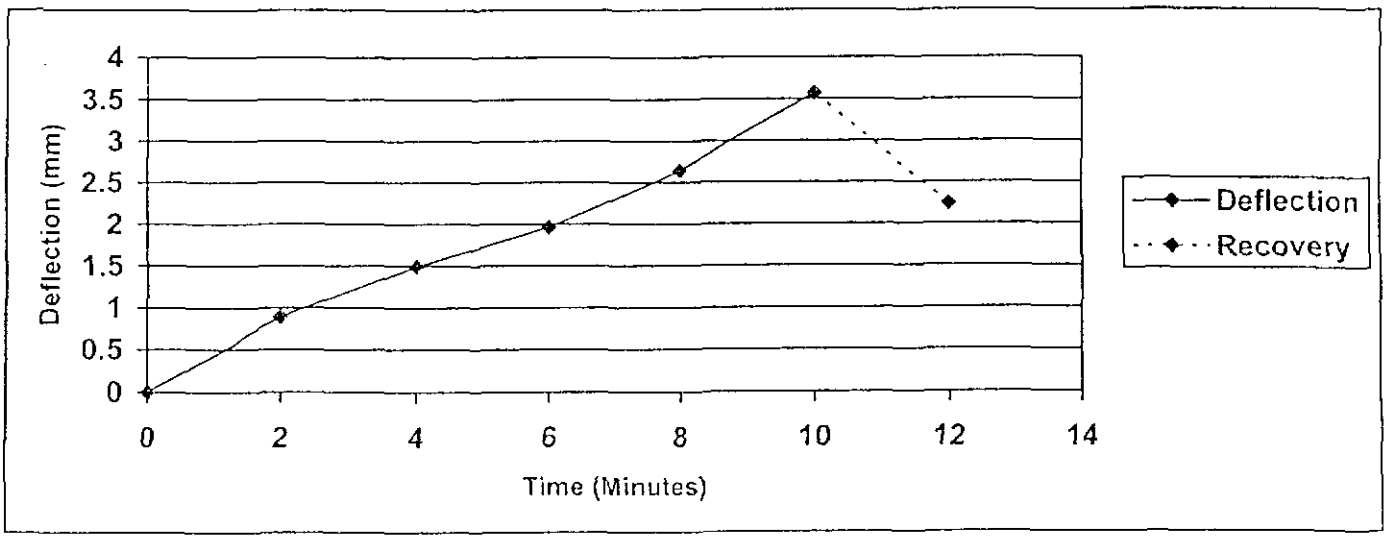
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0980
Site:	Hough Lane, Wombwell	Date Tested:	21/09/2006
Material Under Test:	Sand with Medium Gravel	Tested By:	D Peace
Client Reference	107	Test Location	107
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sand with medium gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.89		
60	4	1.49		
90	6	1.96		
120	8	2.64		
150	10	3.57	4.17	
0	12	2.24		37.3



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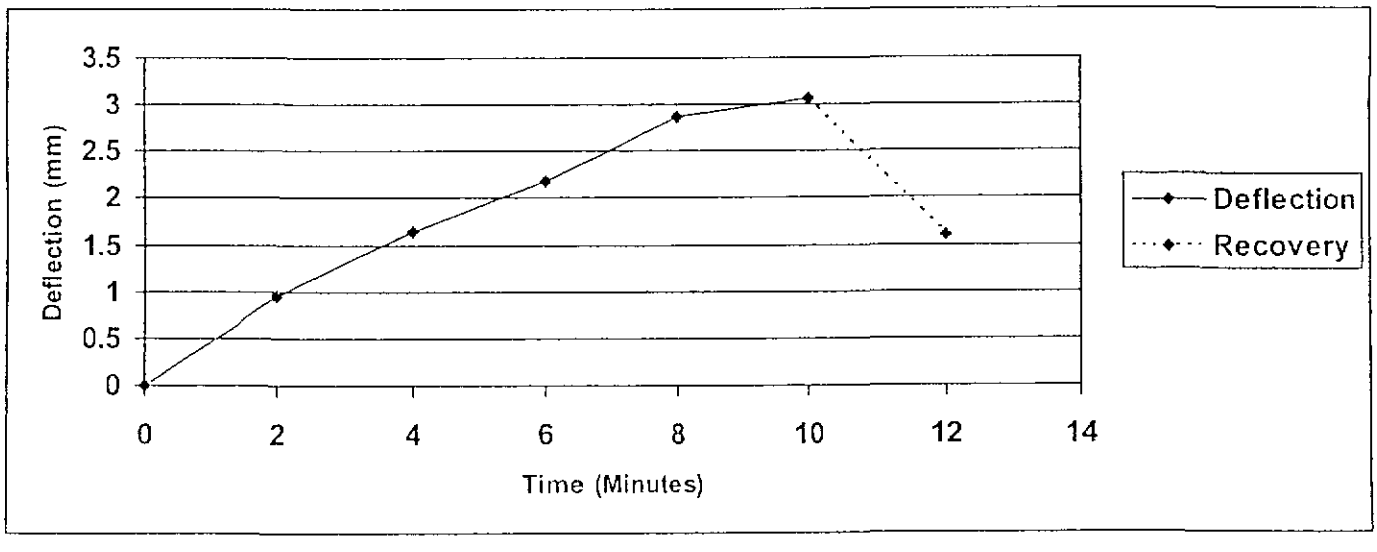
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0980
Site:	Hough Lane, Wombwell	Date Tested:	21/09/2006
Material Under Test:	Sand with Medium Gravel	Tested By:	*D Peace*
Client Reference	108	Test Location	108
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sand with medium gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.94		
60	4	1.65		
90	6	2.18		
120	8	2.87		
150	10	3.06	3.32	
0	12	1.60		47.7



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Review: JMS
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For the Attention of: Mr Rob Fone

Report Date: 26th September 2006

Report Reference: 06FW0989
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 25th September 2006 by our Mr D Ratcliffe.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 3 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 2 Number Displacement dial gauges (Ref. 905 – 413,414)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – moxy dumper.
e. The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
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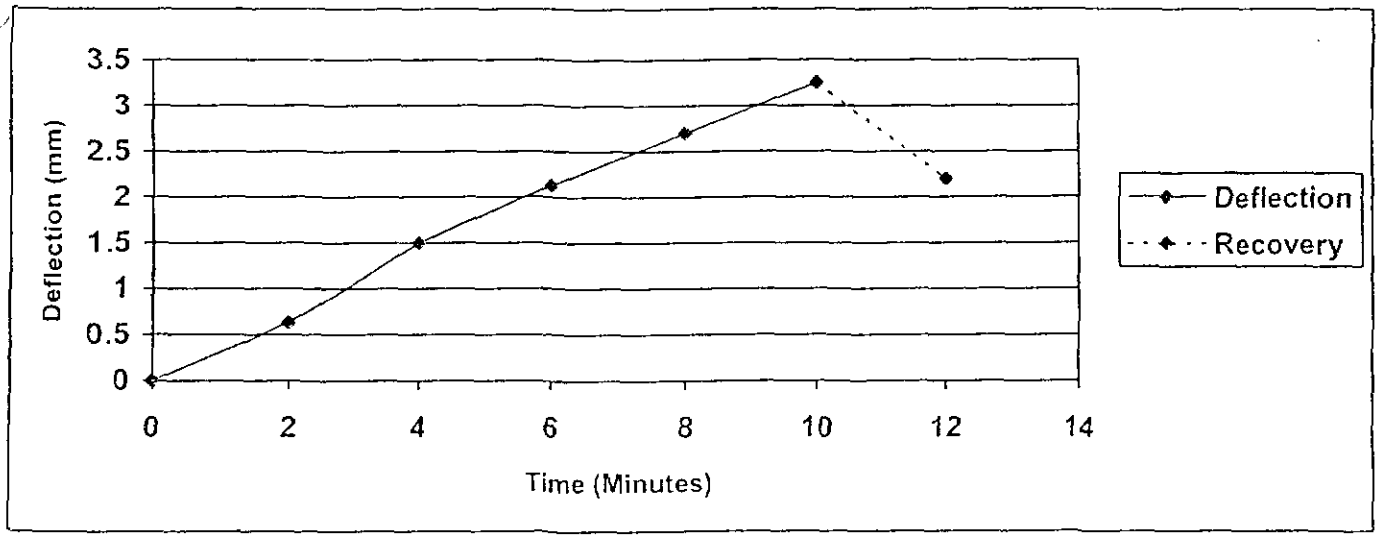
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0989
Site:	Hough Lane, Wombwell	Date Tested:	25/09/2006
Material Under Test:	Sand	Tested By:	D Ratcliffe
Client Reference	109	Test Location	109
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Overcasr	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	16.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown Sand

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.63		
60	4	1.50		
90	6	2.13		
120	8	2.70		
150	10	3.25	4.20	
0	12	2.20		32.3



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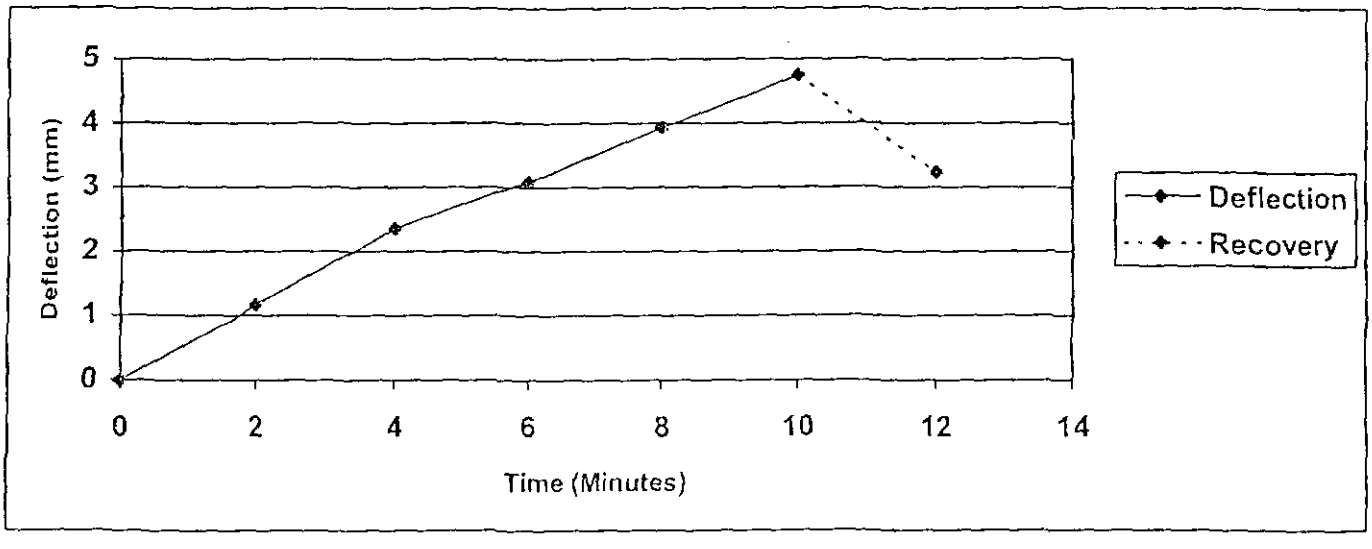
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0989
Site:	Hough Lane, Wombwell	Date Tested:	25/09/2006
Material Under Test:	Sand	Tested By:	D Ratcliffe
Client Reference	110	Test Location	110
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Overcasr	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown Sand

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.16		
60	4	2.36		
90	6	3.08		
120	8	3.93		
150	10	4.75	4.95	
0	12	3.23		32.0



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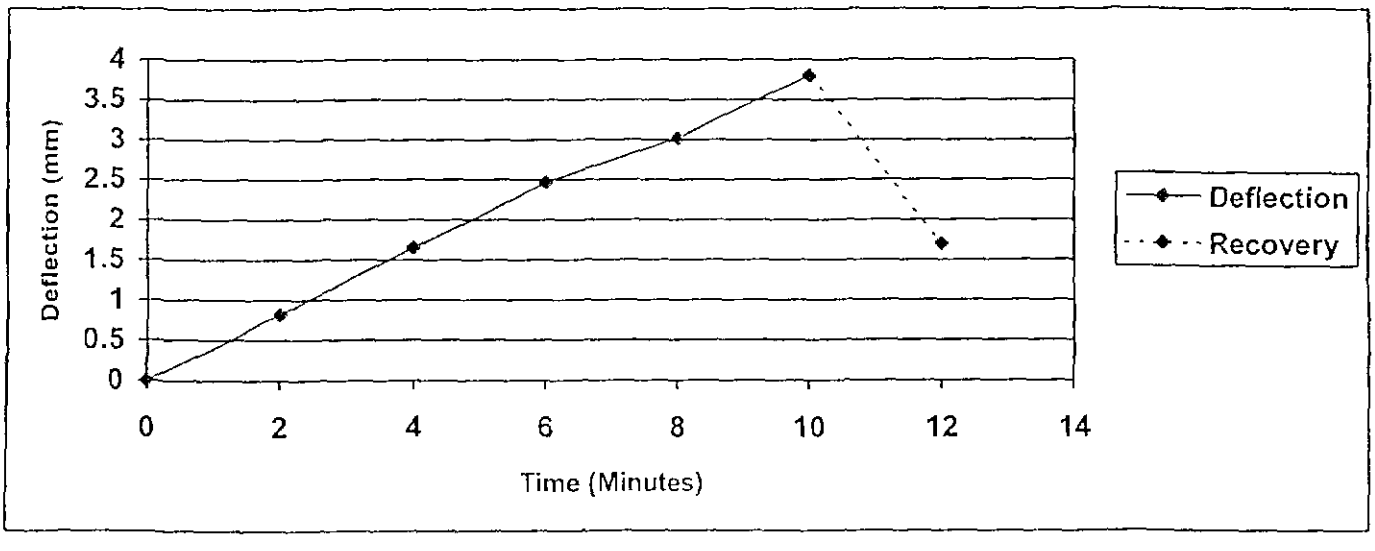
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW0989
Site:	Hough Lane, Wombwell	Date Tested:	25/09/2006
Material Under Test:	Sand	Tested By:	D Ratcliffe
Client Reference	111	Test Location	111
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Overcasr	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark Brown Sand

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.82		
60	4	1.65		
90	6	2.47		
120	8	3.02		
150	10	3.80	4.69	
0	12	1.70		55.3



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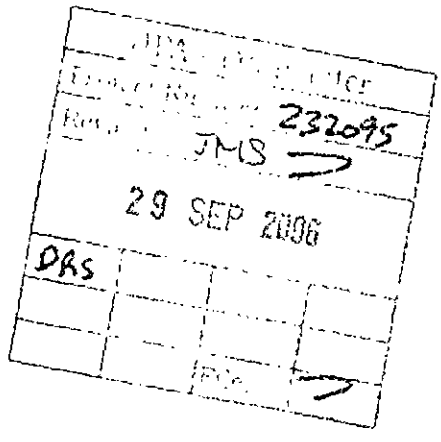

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For the Attention of: Mr Richard Butterworth

Report Date: 28th September 2006

Report Reference: 06FW1001
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 27th September 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 3 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – 360° Excavator
e. The weather at the time of test – Overcast/Fine

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
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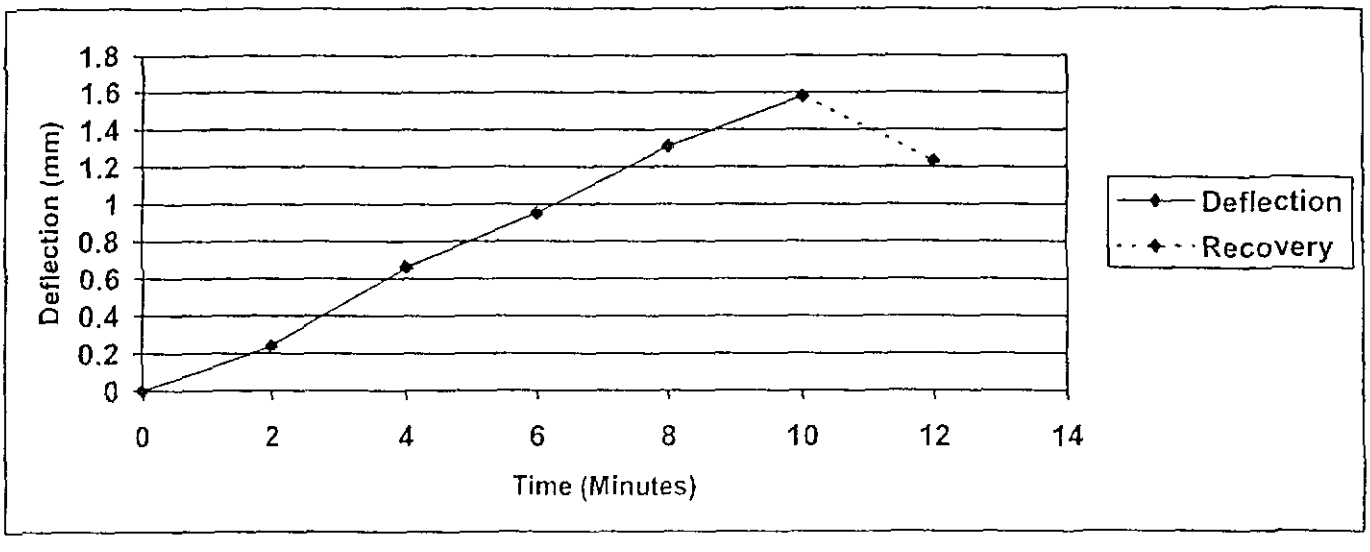
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1001
Site:	Hough Lane, Wombwell	Date Tested:	27/09/2006
Material Under Test:	Silty Sand	Tested By:	R Gaunt
Client Reference	112	Test Location	112
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.5%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown silty SAND with fine to medium rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.24		
60	5	0.66		
90	8	0.95		
120	11	1.31		
150	14	1.58	1.69	
0	15	1.23		22.2



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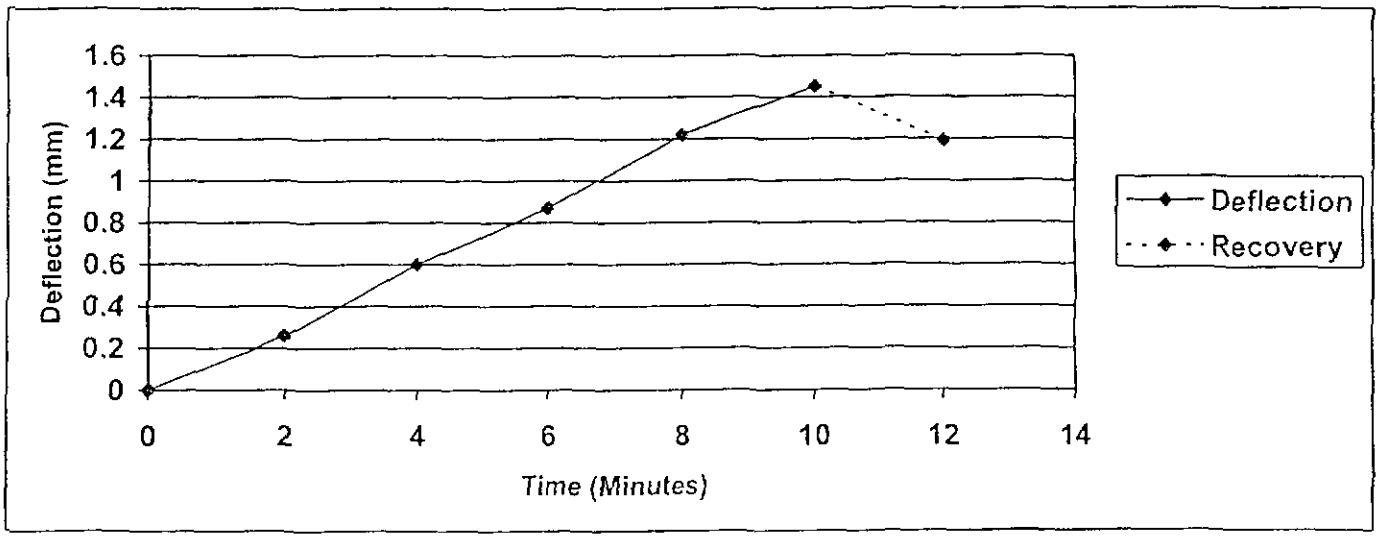
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1001
Site:	Hough Lane, Wombwell	Date Tested:	27/09/2006
Material Under Test:	Silty Sand	Tested By:	R Gaunt
Client Reference	113	Test Location	113
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown silty SAND with fine to medium rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.26		
60	5	0.60		
90	8	0.87		
120	11	1.22		
150	14	1.45	1.57	
0	15	1.19		17.9



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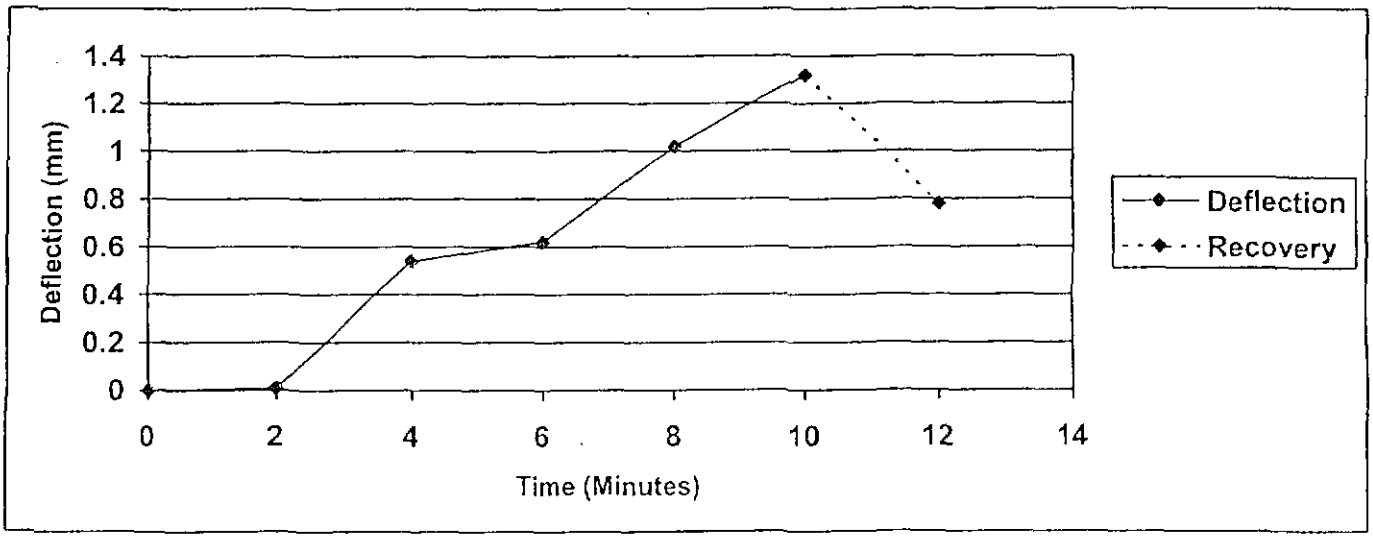
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1001
Site:	Hough Lane, Wombwell	Date Tested:	27/09/2006
Material Under Test:	Silty Sand	Tested By:	R Gaunt
Client Reference	114	Test Location	114
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm brown silty SAND with fine to medium rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.01		
60	5	0.54		
90	8	0.62		
120	11	1.02		
150	14	1.32	1.48	
0	15	0.78		40.9



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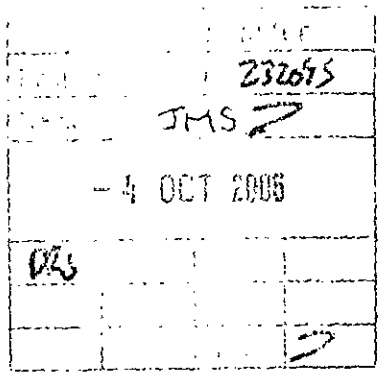

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For the Attention of: Mr Richard Butterworth

Report Date: 2nd October 2006

Report Reference: 06FW1008
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 29th September 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 4 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 –409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – 360° Excavator

The weather at the time of test – Fine

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
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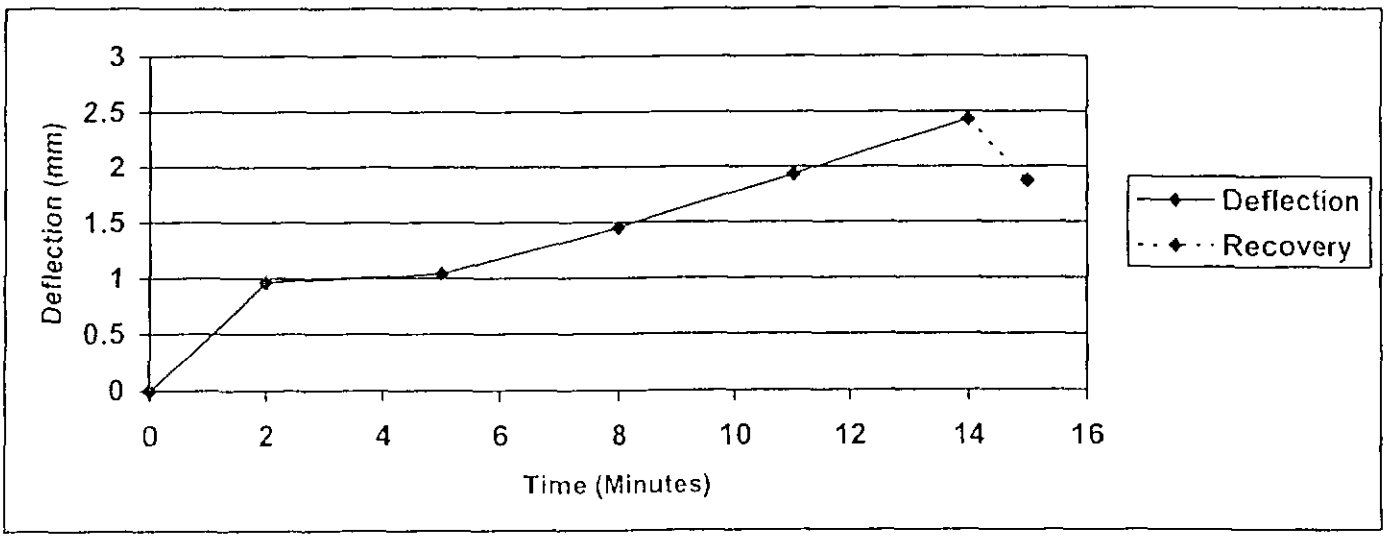
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1008
Site:	Hough Lane, Wombwell	Date Tested:	29/09/2006
Material Under Test:	Silty sand with fine gravel	Tested By:	R Gaunt
Client Reference	115	Test Location	115
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty SAND with fine gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.96		
60	5	1.04		
90	8	1.45		
120	11	1.93		
150	14	2.43	2.52	
0	15	1.87		23.0



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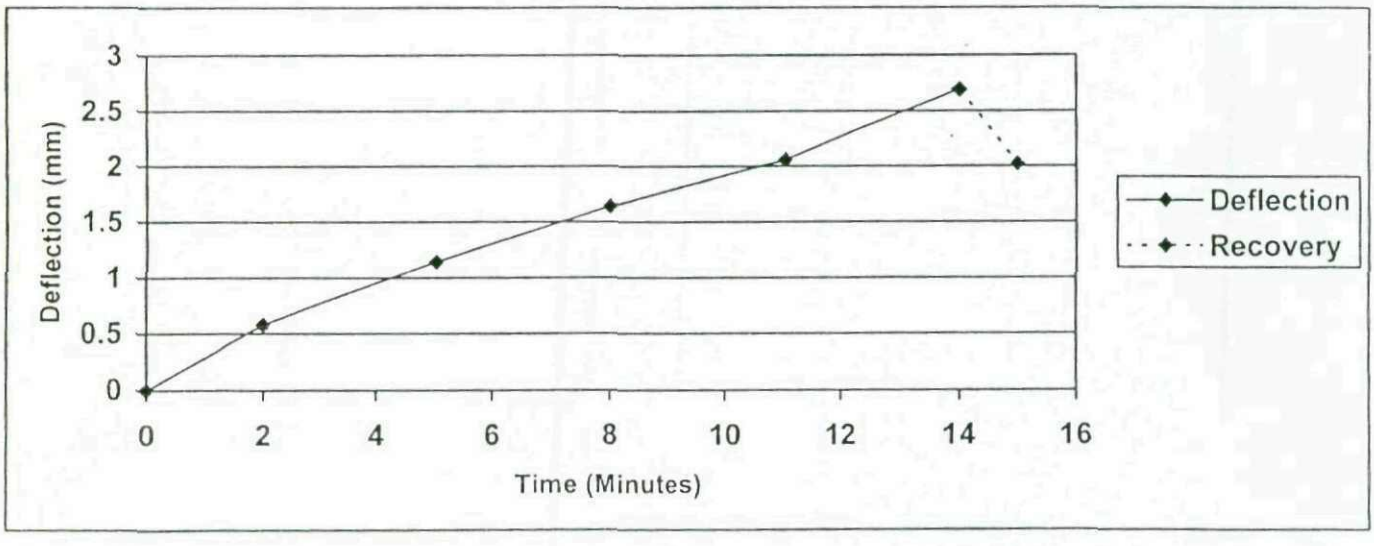
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1008
Site:	Hough Lane, Wombwell	Date Tested:	29/09/2006
Material Under Test:	Silty sand with fine gravel	Tested By:	R Gaunt
Client Reference	117	Test Location	117
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty SAND with fine gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.58		
60	5	1.14		
90	8	1.64		
120	11	2.06		
150	14	2.69	3.02	
0	15	2.02		24.9



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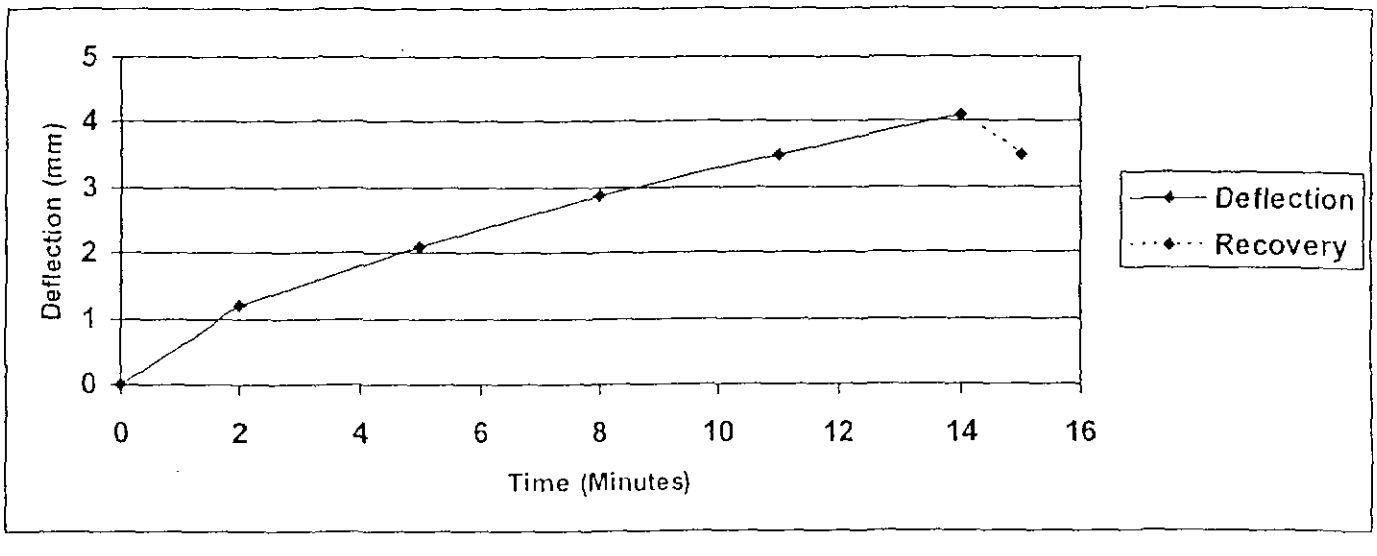
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1008
Site:	Hough Lane, Wombwell	Date Tested:	29/09/2006
Material Under Test:	Silty sand with fine gravel	Tested By:	R Gaunt
Client Reference	118	Test Location	118
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.2%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty SAND with fine gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.21		
60	5	2.09		
90	8	2.86		
120	11	3.48		
150	14	4.09	4.27	
0	15	3.48		14.9



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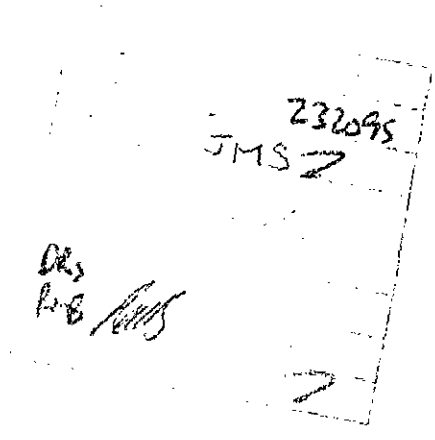

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***For the Attention of:** Mr Richard Butterworth*

Report Date: 4th October 2006

Report Reference: 06FW1014
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 2nd October 2006 by our Mr D Peace.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 3 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240,241,411)
b. 600mm diameter rigid steel plate
c. *Pressure gauge referenced 905/097A calibration certificate 905/097A-4.*
d. Reaction load on site – 360° Excavator

The weather at the time of test – Fine

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
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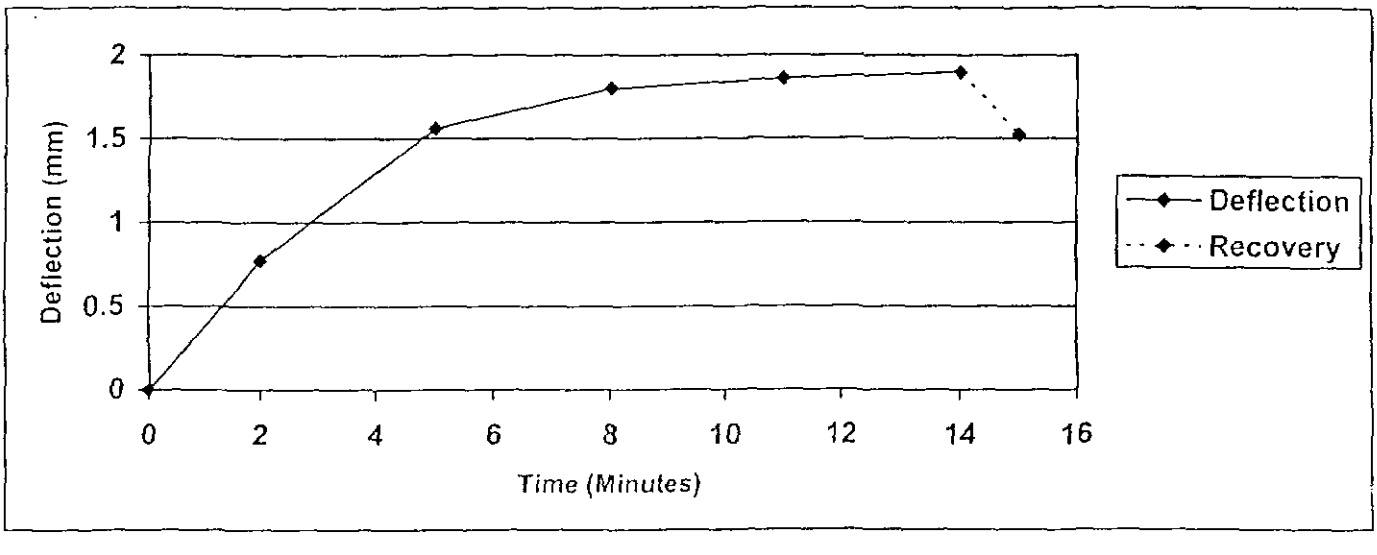
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1014
Site:	Hough Lane, Wombwell	Date Tested:	02/10/2006
Material Under Test:	Sandy clay/stone	Tested By:	D Peace
Client Reference	119	Test Location	119
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	17.0%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.77		
60	5	1.56		
90	8	1.80		
120	11	1.86		
150	14	1.90	2.19	
0	15	1.52		20.0



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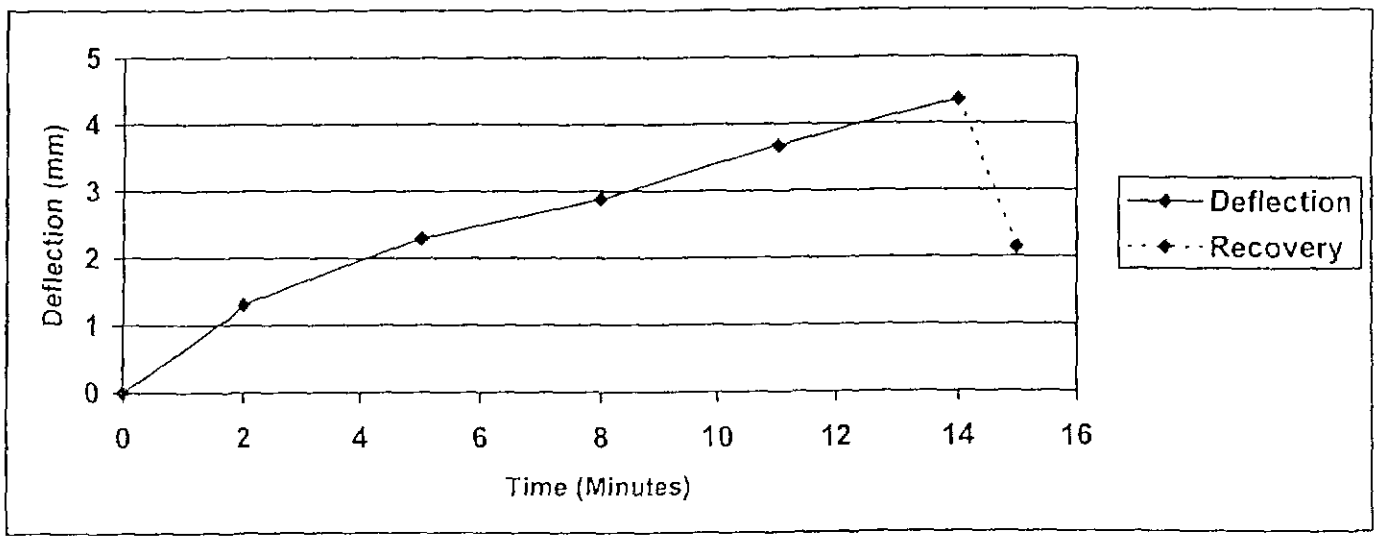
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1014
Site:	Hough Lane, Wombwell	Date Tested:	02/10/2006
Material Under Test:	Sandy clay/stone	Tested By:	D Peace
Client Reference	120	*Test Location*	120
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	16.7%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.30		
60	5	2.29		
90	8	2.88		
120	11	3.68		
150	14	4.36	5.02	
0	15	2.14		50.9



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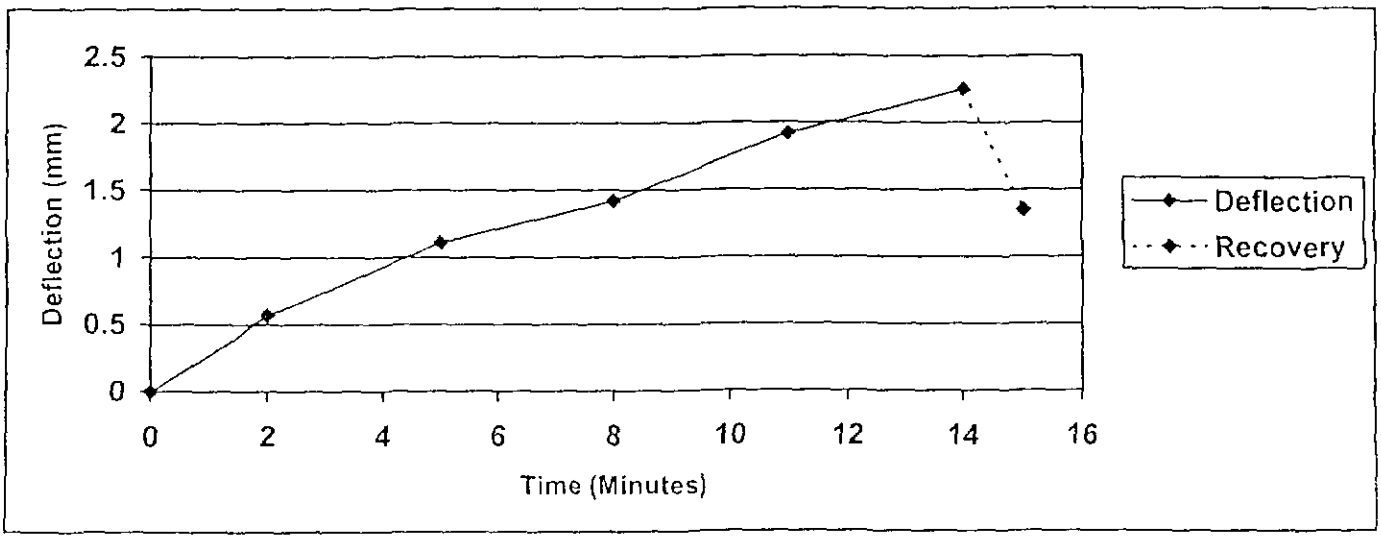
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1014
Site:	Hough Lane, Wombwell	Date Tested:	02/10/2006
Material Under Test:	Sandy clay/stone	Tested By:	D Peace
Client Reference	121	Test Location	121
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.7%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.57		
60	5	1.11		
90	8	1.42		
120	11	1.92		
150	14	2.25	2.48	
0	15	1.35		40.0



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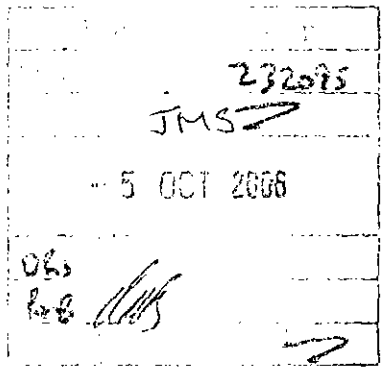

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For the Attention of: Mr Richard Butterworth

Report Date: 4th October 2006

Report Reference: 06FW1016
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 3rd October 2006 by our Mr R Thorne.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 5 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 413,414,415)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173A calibration certificate 905/173A-19
d. Reaction load on site – Loading Shovel
e. The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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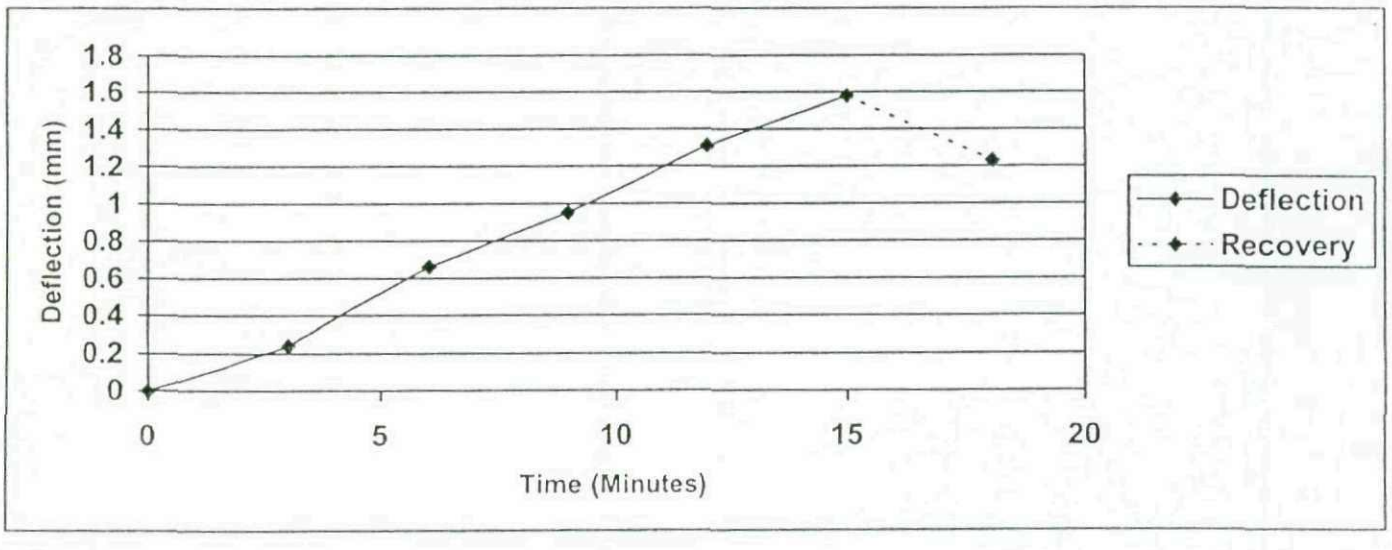
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1016
Site:	Hough Lane, Wombwell	Date Tested:	03/10/2006
Material Under Test:	Silty Sand	Tested By:	R Thorne
Client Reference	122	Test Location	122
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	3m	Reaction Load Used	Loading Shovel
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	13.1%
Distance from edge of plate to Wall of Excavation	3m	Visual Description:	Black silty SAND with coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	1.62		
60	6	3.62		
90	9	5.28		
120	12	6.94		
150	15	8.48	10.12	
0	18	6.20		26.9



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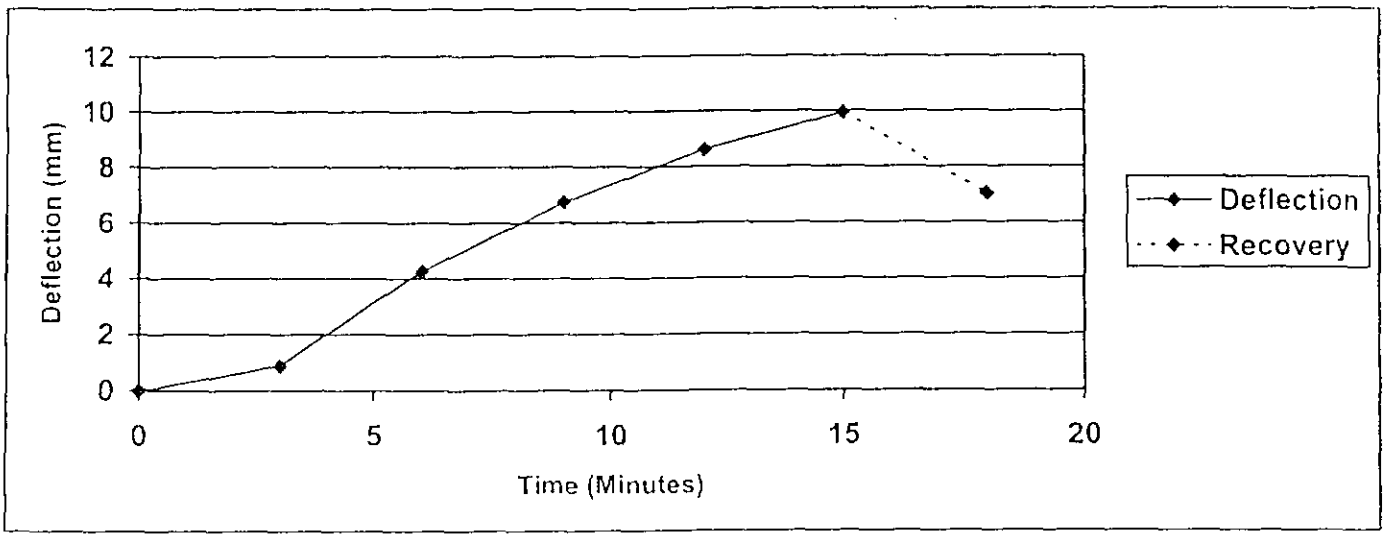
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1016
Site:	Hough Lane, Wombwell	Date Tested:	03/10/2006
Material Under Test:	Silty Sand	Tested By:	R Thorne
Client Reference	123	Test Location	123
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	3m	Reaction Load Used	Loading Shovel
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.8%
Distance from edge of plate to Wall of Excavation	2.5m	Visual Description:	Black silty SAND with coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	0.90		
60	6	4.25		
90	9	6.74		
120	12	8.62		
150	15	9.94	10.29	
0	18	7.02		29.4



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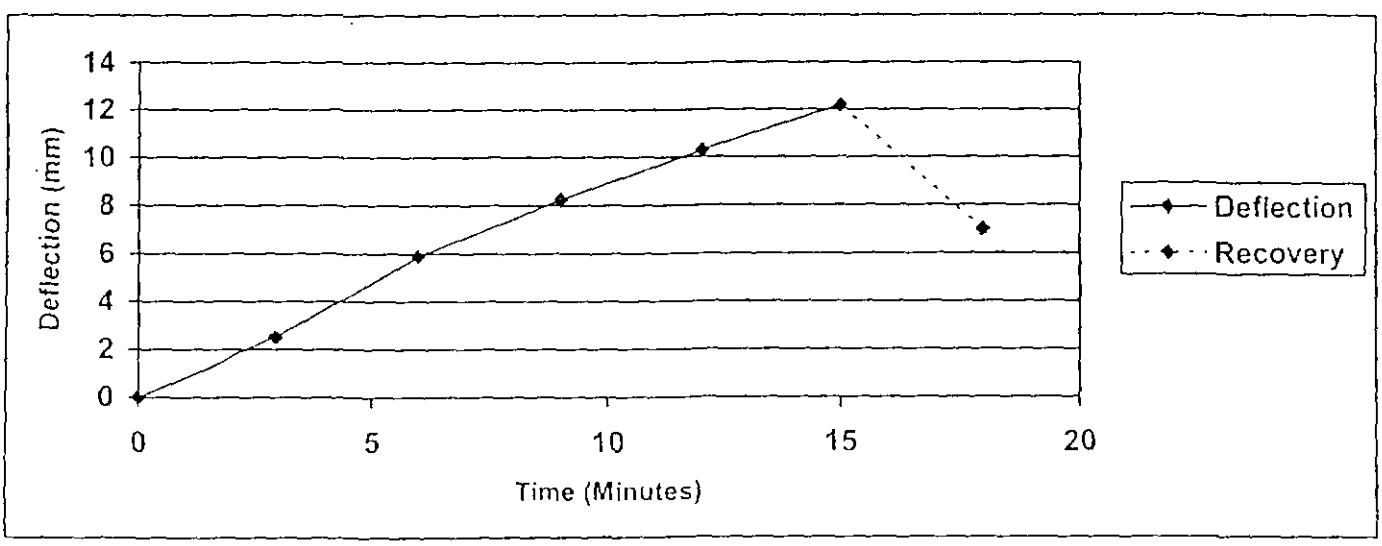
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1016
Site:	Hough Lane, Wombwell	Date Tested:	03/10/2006
Material Under Test:	Silty Sand	Tested By:	R Thorne
Client Reference	124	Test Location	124
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	2.5m	Reaction Load Used	Loading Shovel
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.4%
Distance from edge of plate to Wall of Excavation	3m	Visual Description:	Black silty SAND with coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	2.52		
60	6	5.89		
90	9	8.25		
120	12	10.30		
150	15	12.16	12.89	
0	18	7.02		42.3



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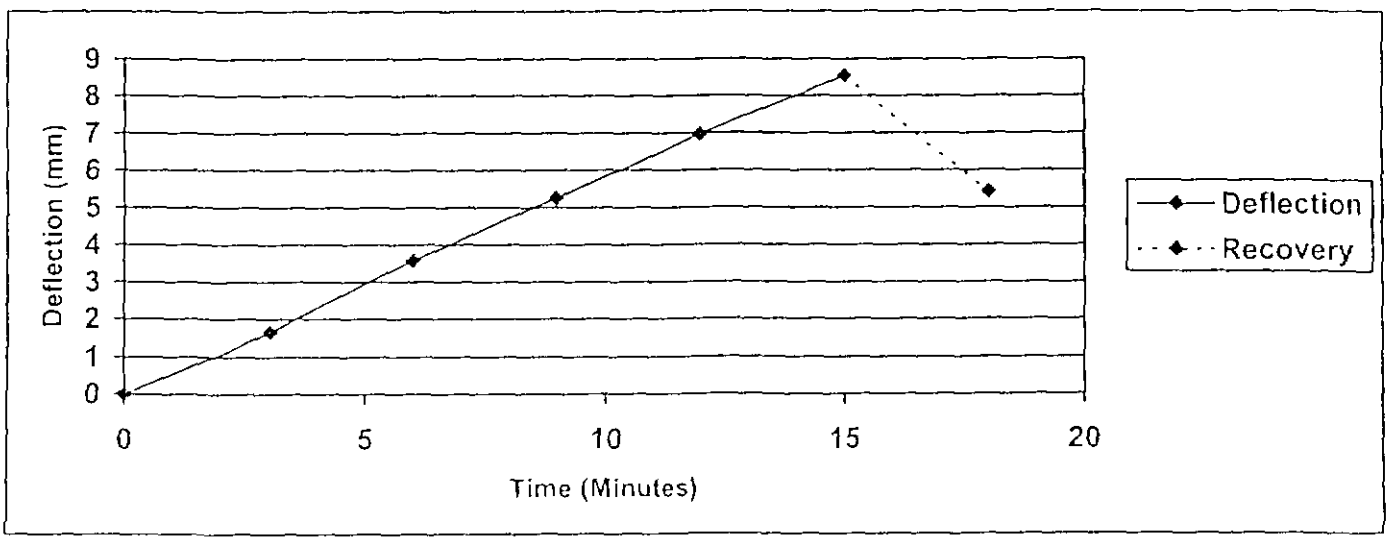
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1016
Site:	Hough Lane, Wombwell	Date Tested:	03/10/2006
Material Under Test:	Silty Sand	Tested By:	R Thorne
Client Reference	124 (retest)	Test Location	124 (retest)
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	2.5m	Reaction Load Used	Loading Shovel
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.4%
Distance from edge of plate to Wall of Excavation	3m	Visual Description:	Black silty SAND with coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	1.67		
60	6	3.58		
90	9	5.26		
120	12	6.97		
150	15	8.55	9.06	
0	*18*	*5.43*		*36.5*



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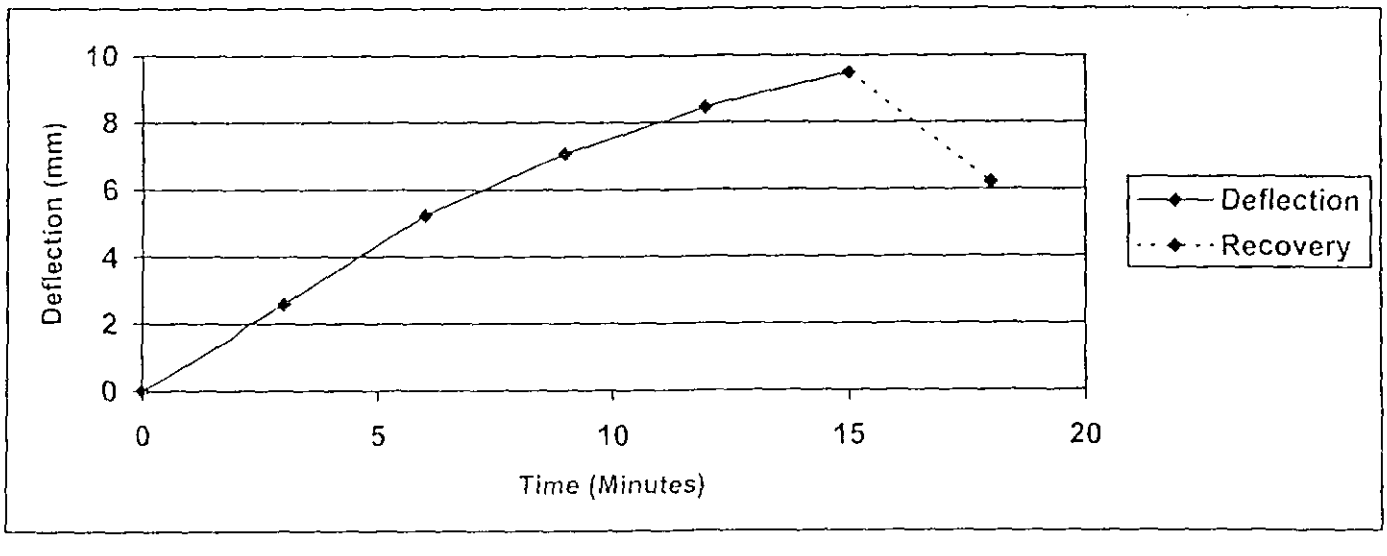
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1016
Site:	Hough Lane, Wombwell	Date Tested:	03/10/2006
Material Under Test:	Silty Sand	Tested By:	R Thorne
Client Reference	125	Test Location	125
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	1.5m	Reaction Load Used	Loading Shovel
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.6%
Distance from edge of plate to Wall of Excavation	2m	Visual Description:	Black silty SAND with coarse gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	3	2.58		
60	6	5.24		
90	9	7.08		
120	12	8.46		
150	15	9.50	10.99	
0	18	6.22		34.5



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For the Attention of: Mr Richard Butterworth

Report Date: 5th October 2006

Report Reference: 06FW1023
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 4th October 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 7 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m² be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – 360° Excavator
e. The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
3. Any remaining sample shall be retained for a period of one month from the date of this report and thereafter discarded.
4. This report shall not be reproduced, except in full, without written approval of the issuing laboratory.
5. The results in this report relate only to the samples tested

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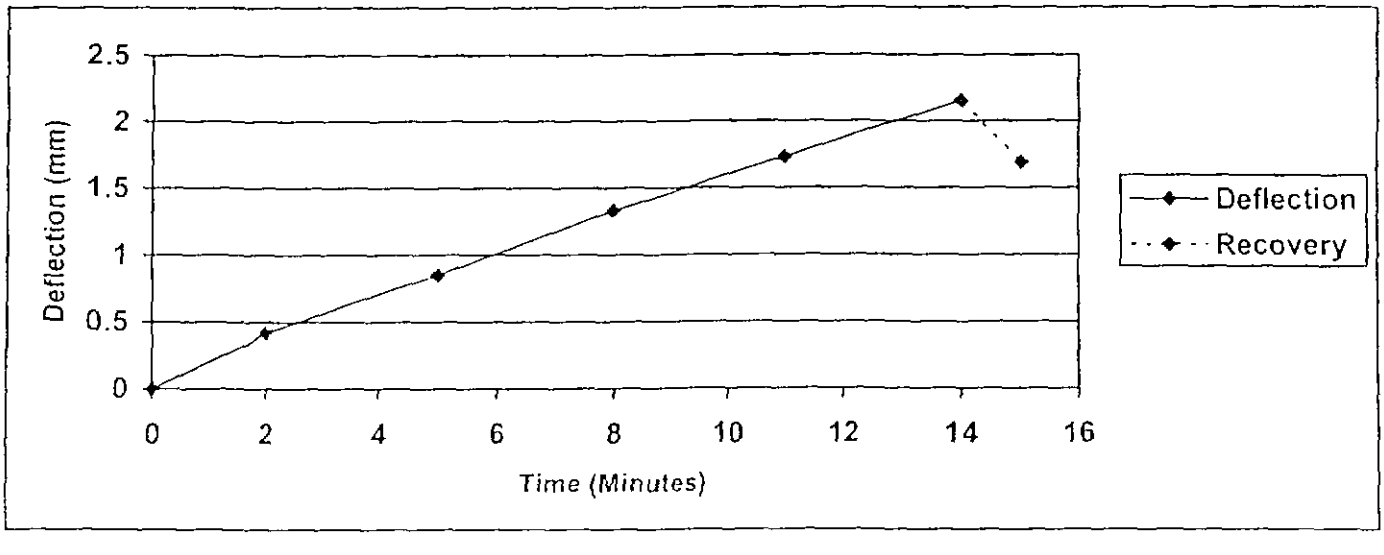
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	126	Test Location	126
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm sandy SILT with medium to coarse rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.42		
60	5	0.85		
90	8	1.33		
120	11	1.73		
150	14	2.15	2.24	
0	15	1.69		21.4



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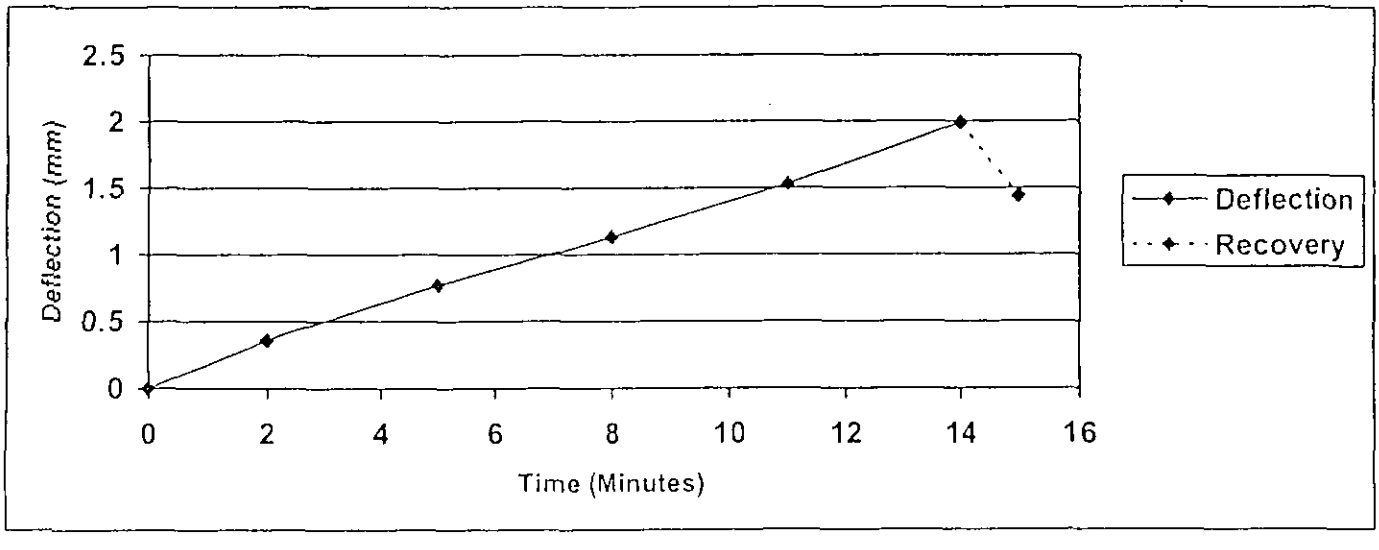
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	127	Test Location	127
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm sandy SILT with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	5	0.72		
90	8	1.13		
120	11	1.53		
150	14	1.99	2.00	
0	15	1.44		27.6



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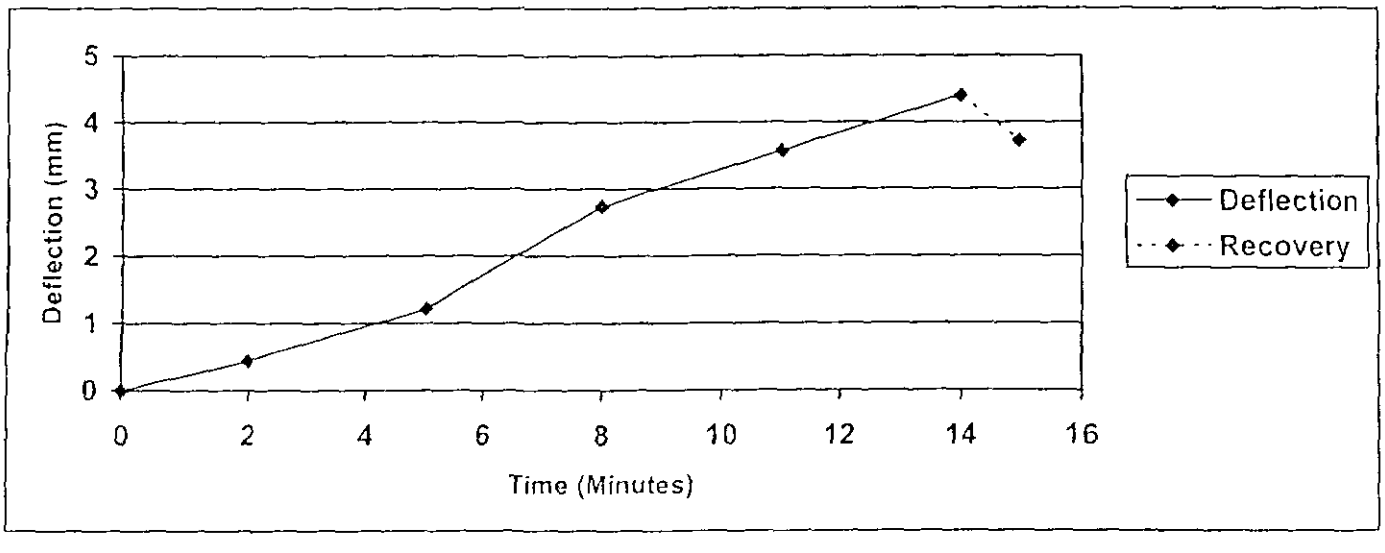
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	128	Test Location	128
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm sandy SILT with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.44		
60	5	1.21		
90	8	2.74		
120	11	3.57		
150	14	4.40	4.61	
0	15	3.72		15.5



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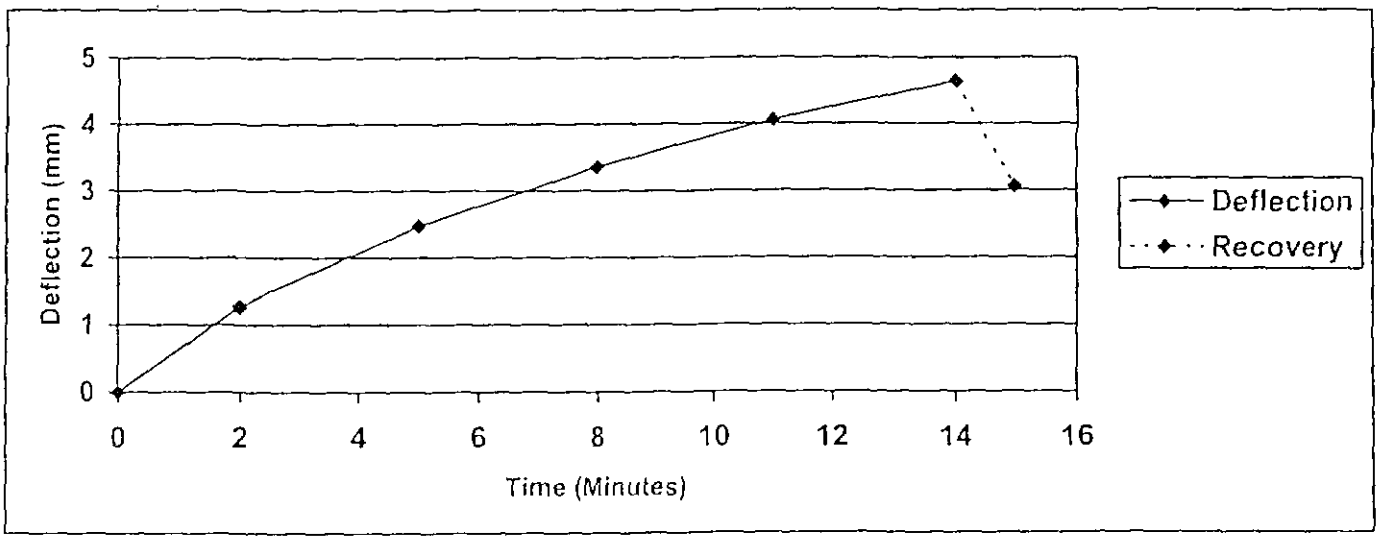
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	129	Test Location	129
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	*Overcast*	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	7.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	*Firm sandy SILT with medium to coarse rubble*

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.26		
60	5	2.47		
90	8	3.36		
120	11	4.06		
150	14	4.64	4.90	
0	15	3.06		34.1



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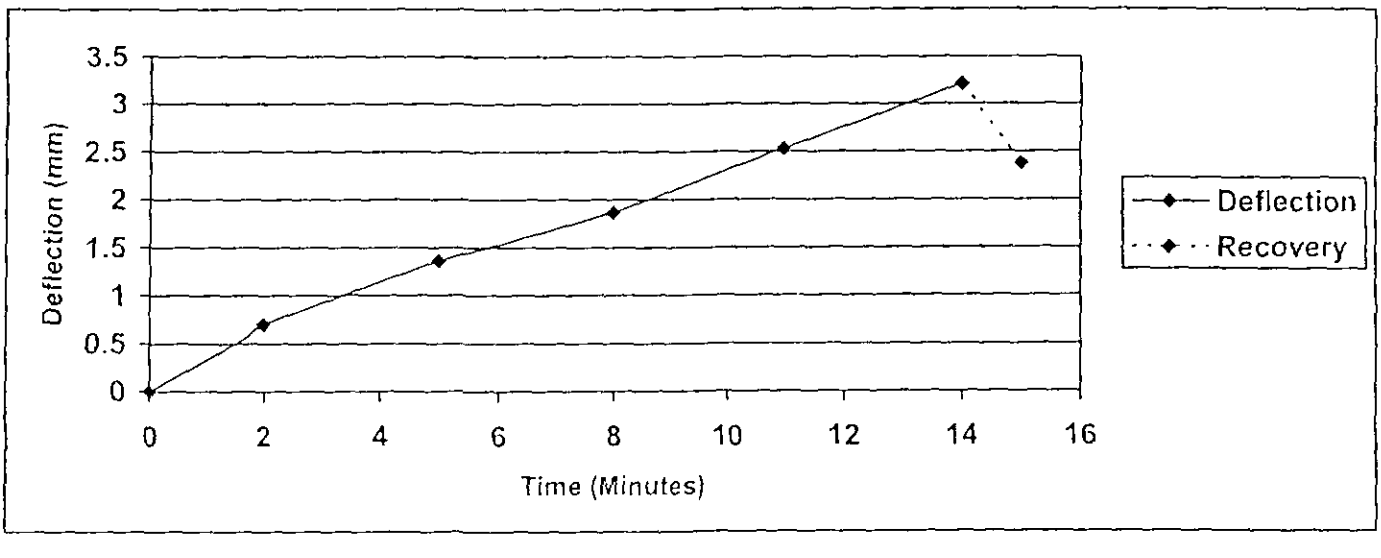
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	130	Test Location	130
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.6%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm sandy SILT with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.70		
60	5	1.36		
90	8	1.87		
120	11	2.53		
150	14	3.21	3.78	
0	15	2.38		25.9



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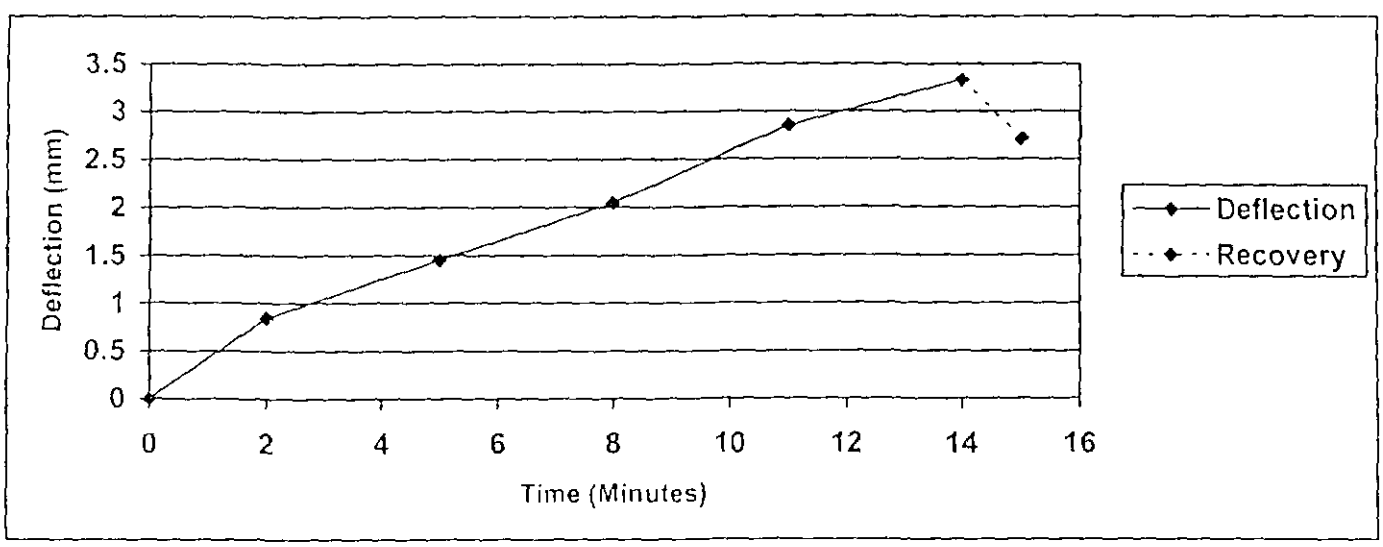
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	131	Test Location	131
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.5%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm sandy SILT with medium to coarse rubble

RESULTS				
Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.85		
60	5	1.45		
90	8	2.05		
120	11	2.85		
150	14	3.33	3.40	
0	15	2.71		18.6



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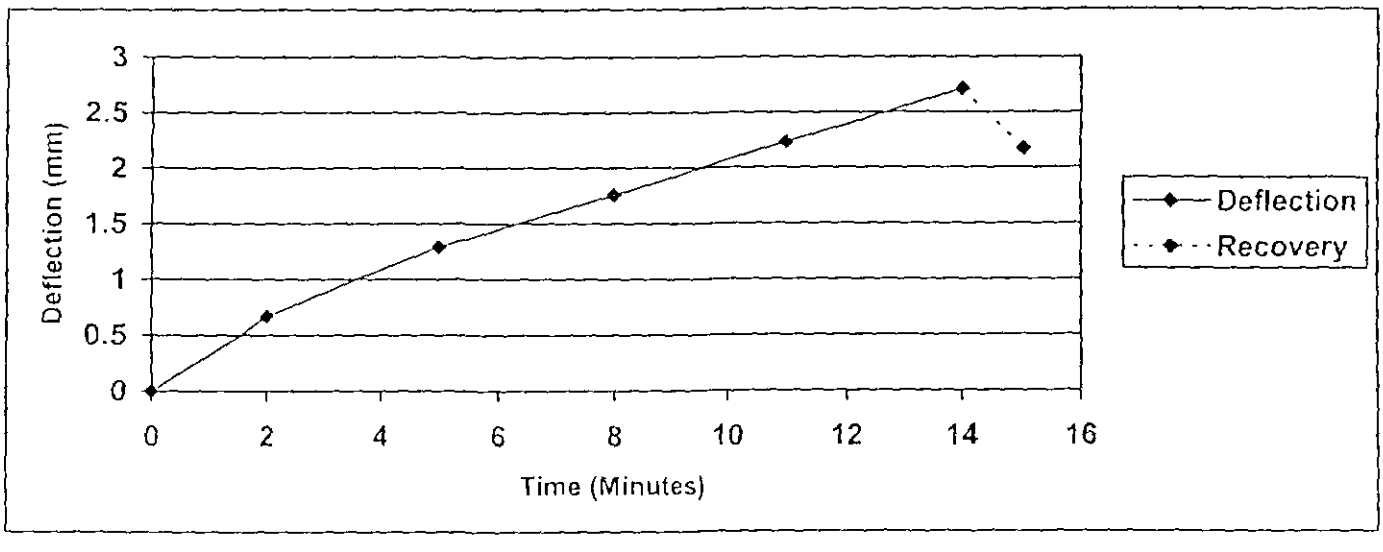
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1023
Site:	Hough Lane, Wombwell	Date Tested:	04/10/2006
Material Under Test:	Firm sandy silt with rubble	Tested By:	R Gaunt
Client Reference	132	Test Location	132
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	9.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm sandy SILT with medium to coarse rubble

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.67		
60	5	1.29		
90	8	1.76		
120	11	2.23		
150	14	2.71	2.81	
0	15	2.17		19.9



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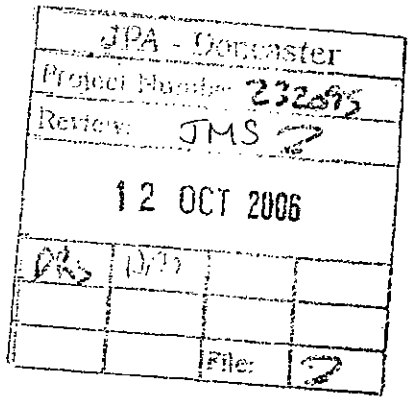

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For the Attention of: Mr Rob Fone

Report Date: 11th October 2006

Report Reference: 06FW1028
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 5th October 2006 by our Mr D Peace.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 3 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/176 calibration certificate 905/176
d. Reaction load on site – Moxy Dumper
e. The weather at the time of test – Light Rain

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
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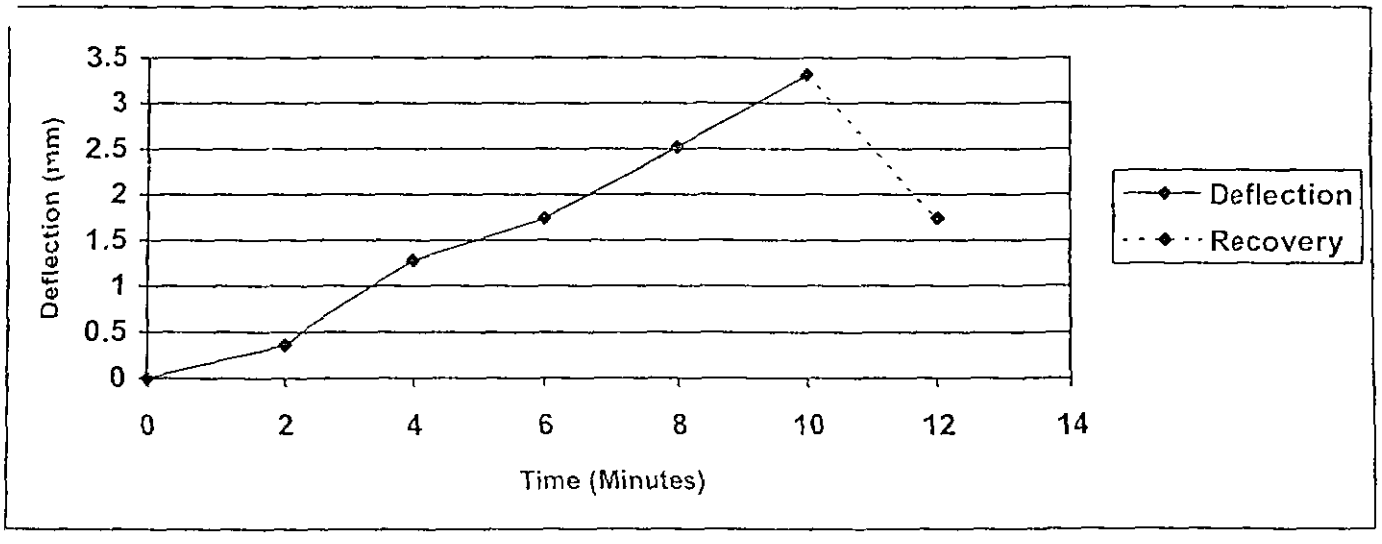
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW1028
Site:	Hough Lane, Wombwell	Date Tested:	25/09/2006
Material Under Test:	Silt/clay	Tested By:	D Peace
Client Reference	133	Test Location	1
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Light Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	8.9%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	4	1.28		
90	6	1.74		
120	8	2.52		
150	10	3.31	3.99	
0	12	1.74		47.4



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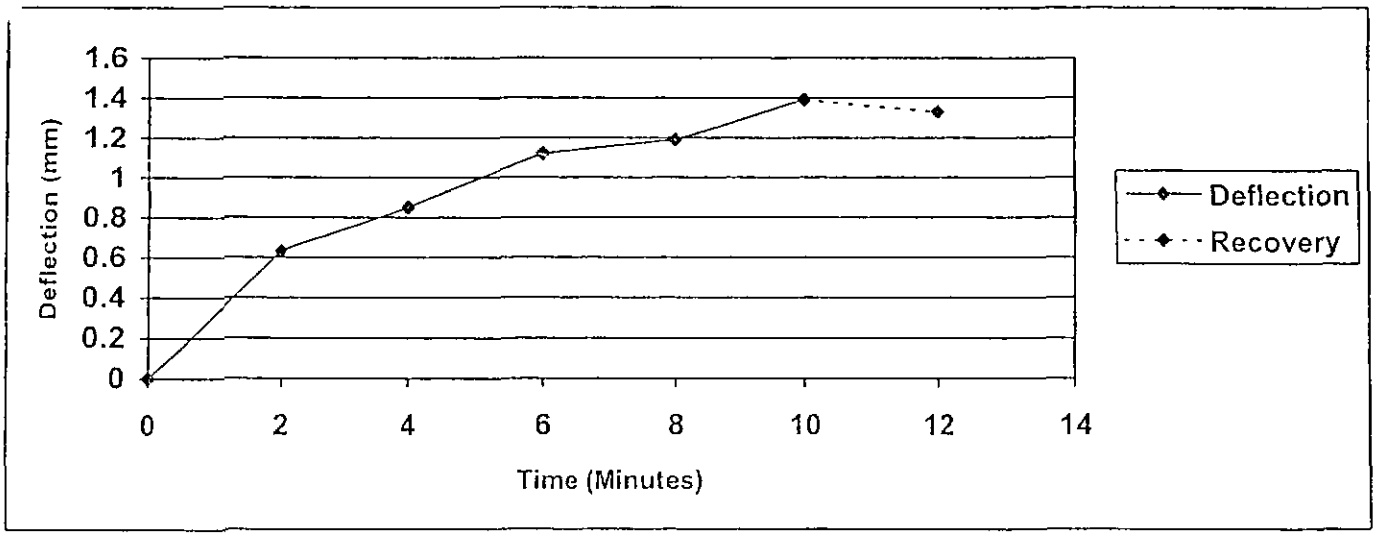
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW1028
Site:	Hough Lane, Wombwell	Date Tested:	25/09/2006
Material Under Test:	Silt/clay	Tested By:	D Peace
Client Reference	134	Test Location	2
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Light Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.63		
60	4	0.85		
90	6	1.12		
120	8	1.19		
150	10	1.39	1.67	
0	12	1.33		4.3



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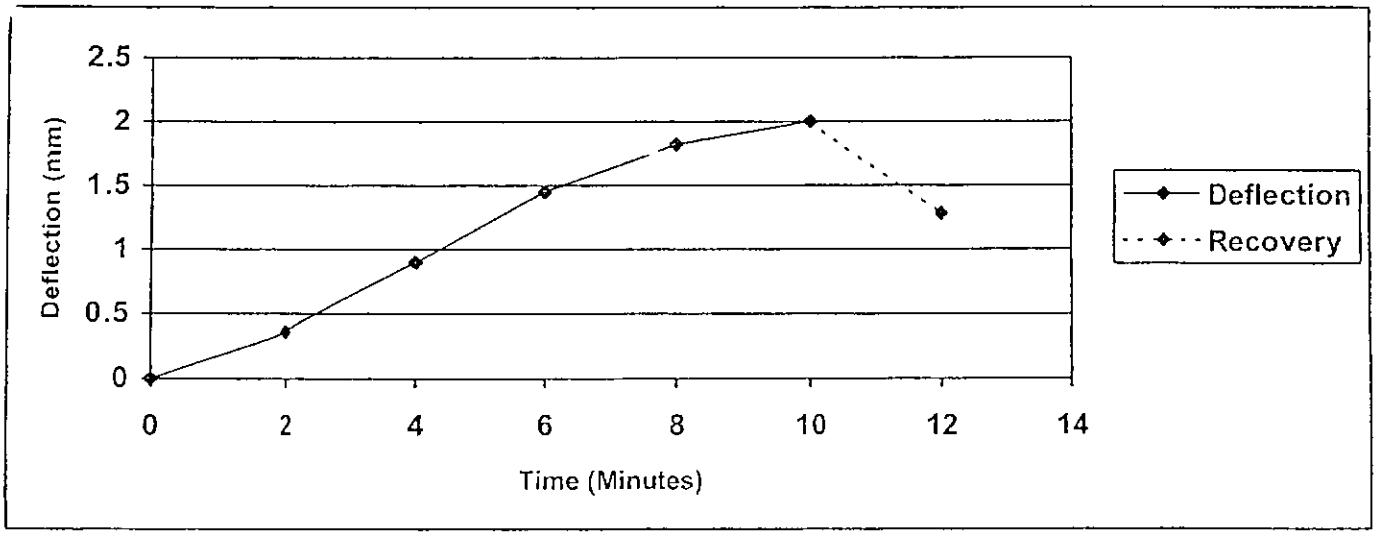
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike & Associates	Report No:	06FW1028
Site:	Hough Lane, Wombwell	Date Tested:	25/09/2006
Material Under Test:	Silt/clay	Tested By:	D Peace
Client Reference	135	Test Location	3
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Light Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	5.73%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	4	0.90		
90	6	1.45		
120	8	1.82		
150	10	2.00	2.74	
0	12	1.28		36



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For the Attention of: Mr Richard Butterworth

Report Date: 12th October 2006

Report Reference: 06FW1033
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr R Fone under your official order number 20712 and executed on 9th October 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 3 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 240,241,411)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18.
d. Reaction load on site – 360° Excavator

The weather at the time of test – Rain

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
1. *Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.*
2. The samples(s) reported on herein were neither sampled nor identified by Scientifics unless otherwise stated.
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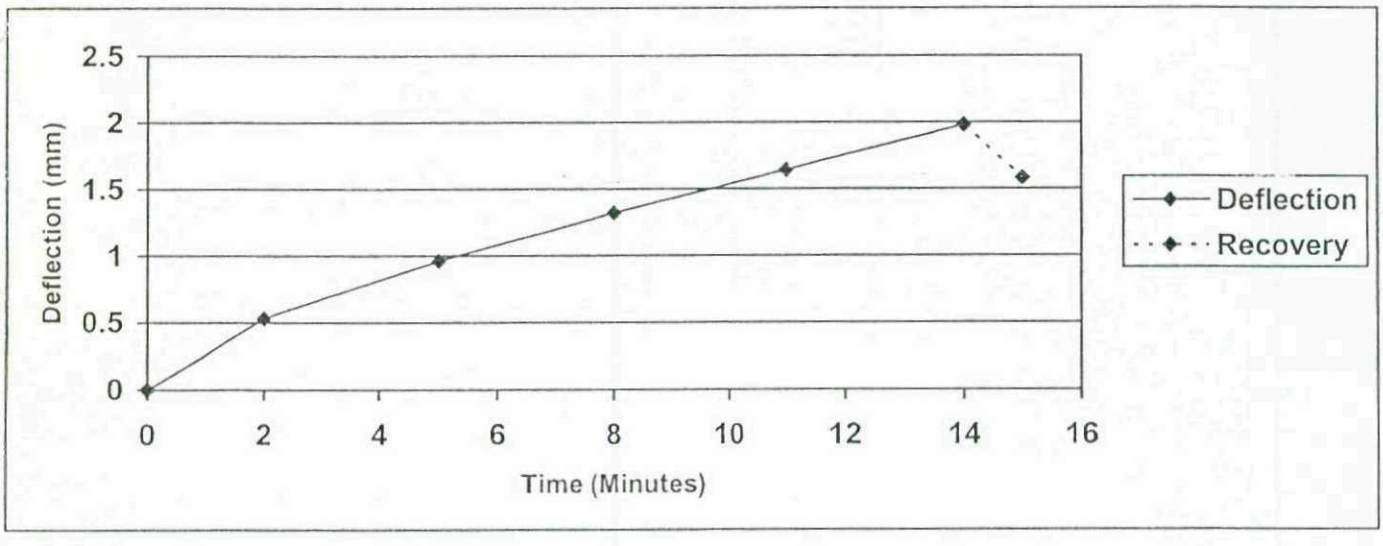
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1033
Site:	Hough Lane, Wombwell	Date Tested:	09/10/2006
Material Under Test:	Firm silty sand with rubble	Tested By:	R Gaunt
Client Reference	136	Test Location	136
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty SAND with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.53		
60	5	0.96		
90	8	1.32		
120	11	1.64		
150	14	1.98	2.27	
0	15	1.58		20.2



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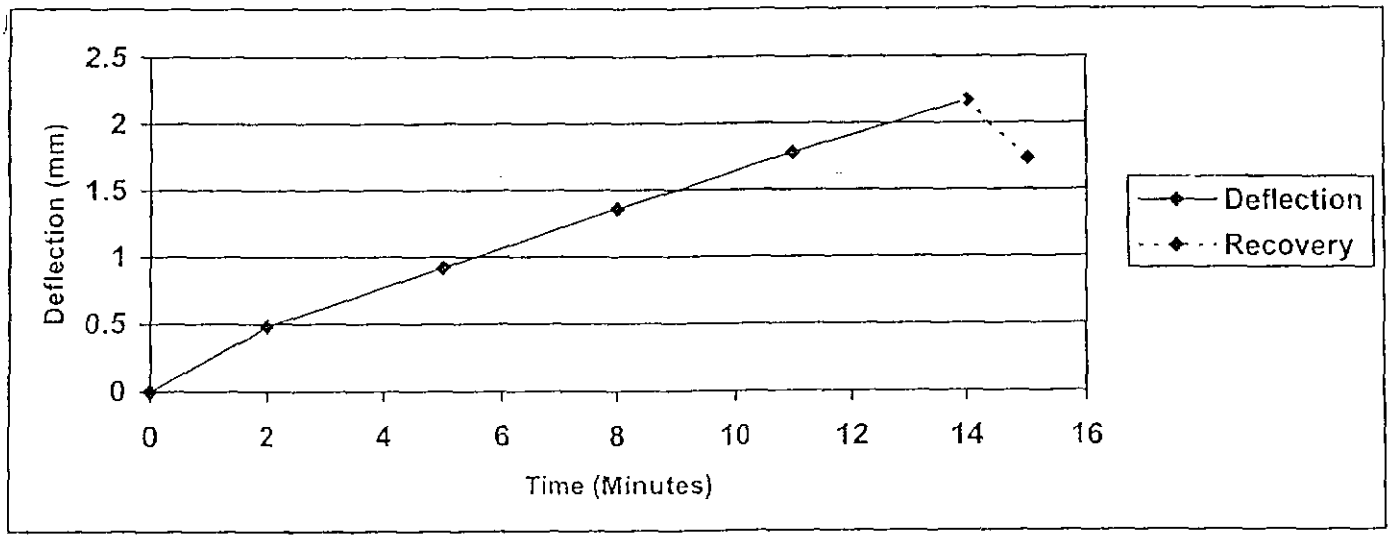
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1033
Site:	Hough Lane, Wombwell	Date Tested:	09/10/2006
Material Under Test:	Firm silty sand with rubble	Tested By:	R Gaunt
Client Reference	137	Test Location	137
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	15.4%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty SAND with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.48		
60	5	0.92		
90	8	1.36		
120	11	1.78		
150	14	2.17	2.25	
0	15	1.73		20.3



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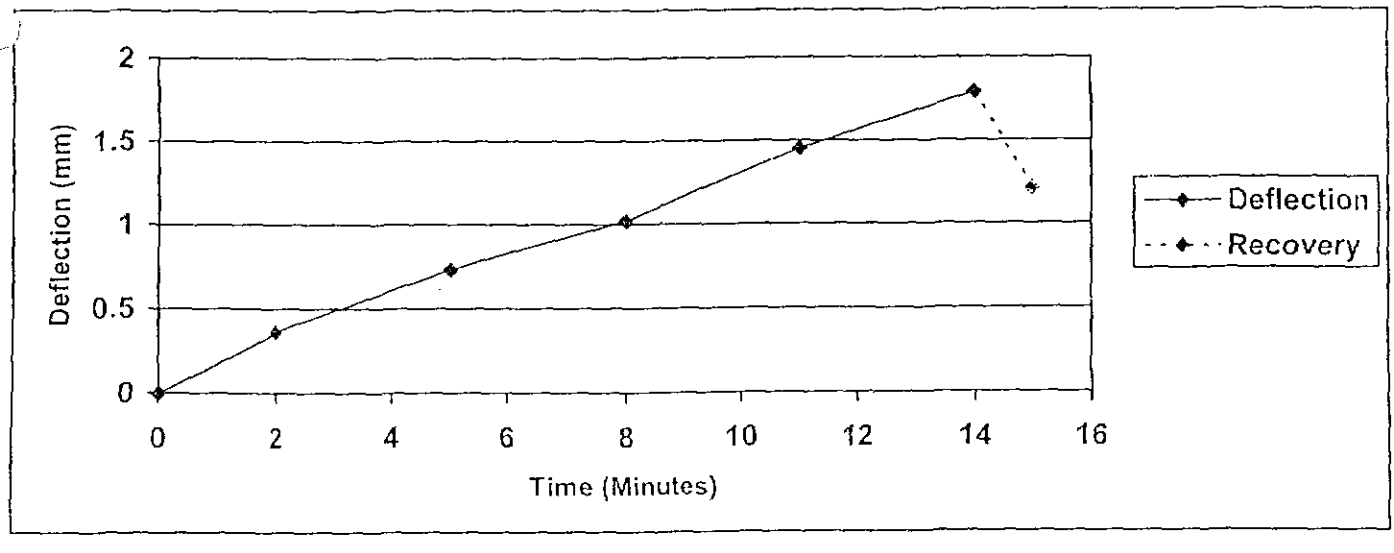
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1033
Site:	Hough Lane, Wombwell	Date Tested:	09/10/2006
Material Under Test:	Firm silty sand with rubble	Tested By:	R Gaunt
Client Reference	138	Test Location	138
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	360° Excavator
Weather conditions	Rain	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	10.8%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty SAND with medium to coarse rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.36		
60	5	0.73		
90	8	1.02		
120	11	1.45		
150	14	1.79	1.86	
0	15	1.21		32.4



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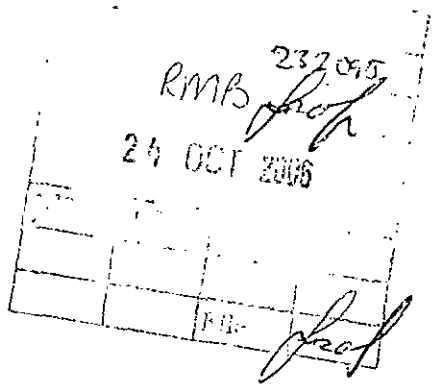

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For the Attention of: Mr Richard Butterworth

Report Date: 23rd October 2006

Report Reference: 06FW1061
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 17th October 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 2 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18.
d. Reaction load on site – Dozer.

The weather at the time of test – Overcast

R Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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Notes:
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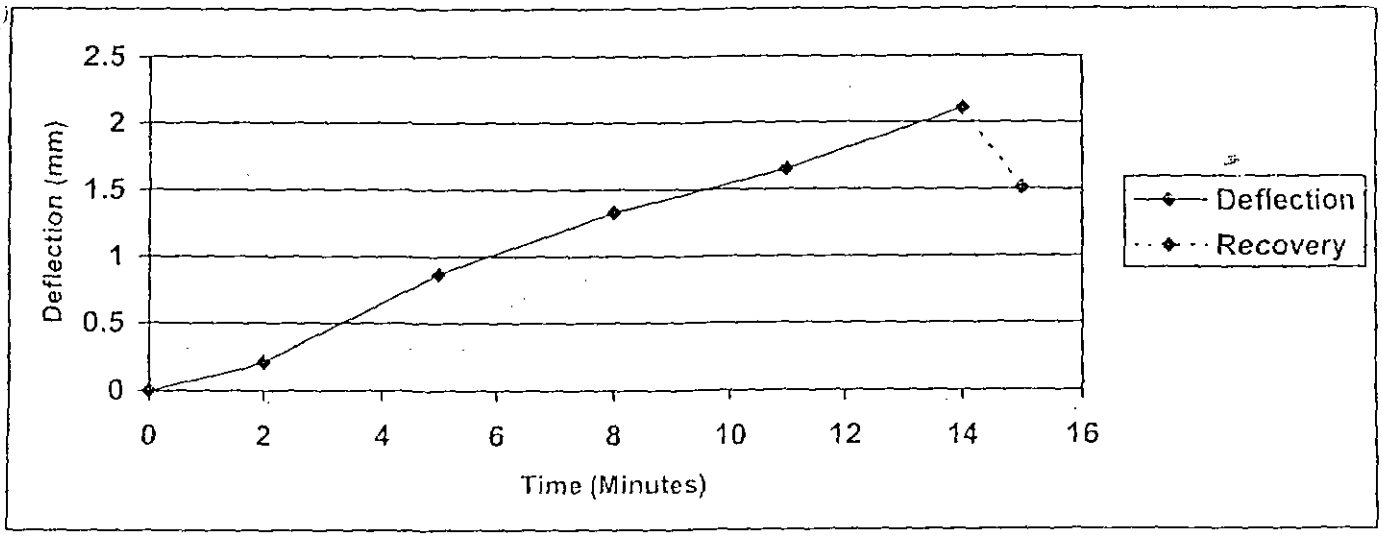
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1061
Site:	Hough Lane, Wombwell	Date Tested:	17/10/2006
Material Under Test:	Firm silty sand with gravel	Tested By:	R Gaunt
Client Reference	139	Test Location	139
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty sand with medium gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.21		
60	5	0.87		
90	8	1.33		
120	11	1.65		
150	14	2.11	2.34	
0	15	1.51		28.4



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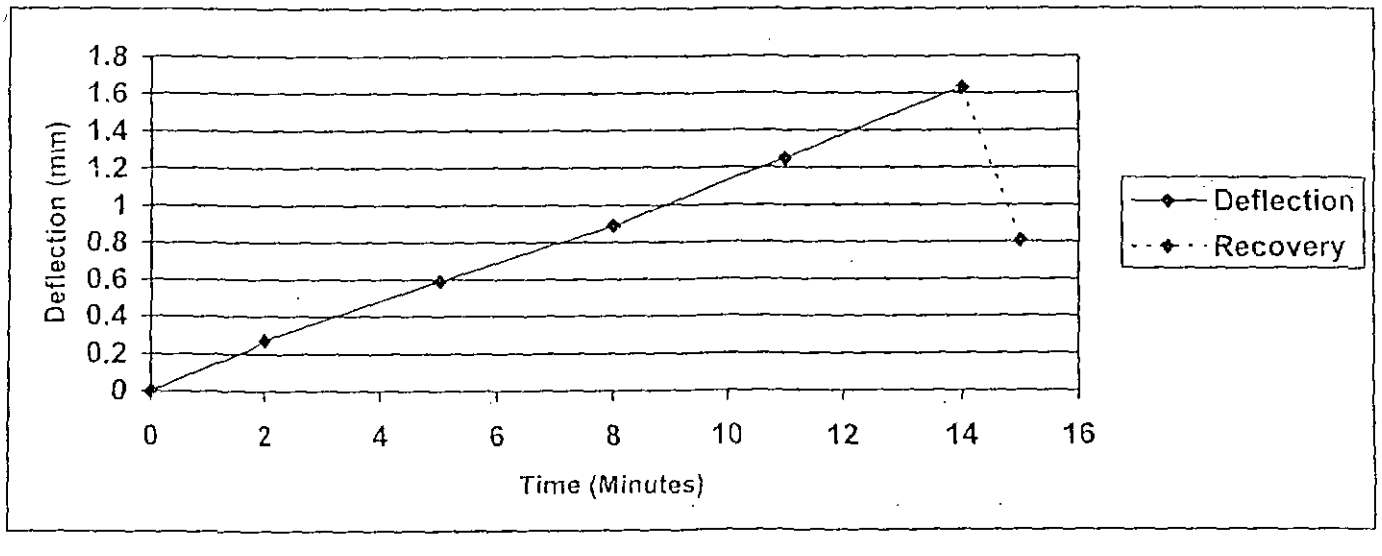
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1061
Site:	Hough Lane, Wombwell	Date Tested:	17/10/2006
Material Under Test:	Firm silty sand with gravel	Tested By:	R Gaunt
Client Reference	140	Test Location	140
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	12.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm silty sand with medium gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.27		
60	5	0.59		
90	8	0.89		
120	11	1.25		
150	14	1.63	1.73	
0	15	0.81		50.3



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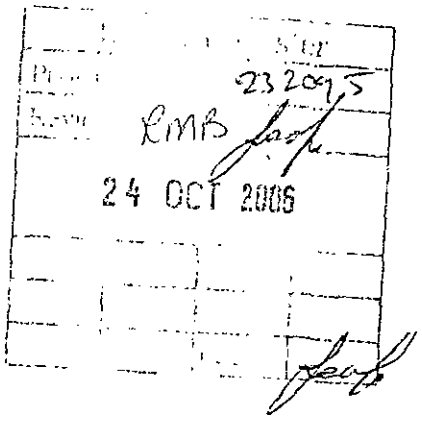

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For the Attention of: Mr Richard Butterworth

Report Date: 23rd October 2006

Report Reference: 06FW1067
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 18th October 2006 by our Mr R Gaunt.

2.0 Scope of Work:

As *requested Scientifics Limited performed the following scope of work: -*

To carry out 2 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 *Equipment used and additional information*

a. 3 Number Displacement dial gauges (Ref. 905 - 409, 410, 412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B-18
d. Reaction load on site – Dozer
e. The weather at the time of test – Overcast

R. Gould
Business Manager

FOR AND ON BEHALF OF SCIENTIFICS LIMITED

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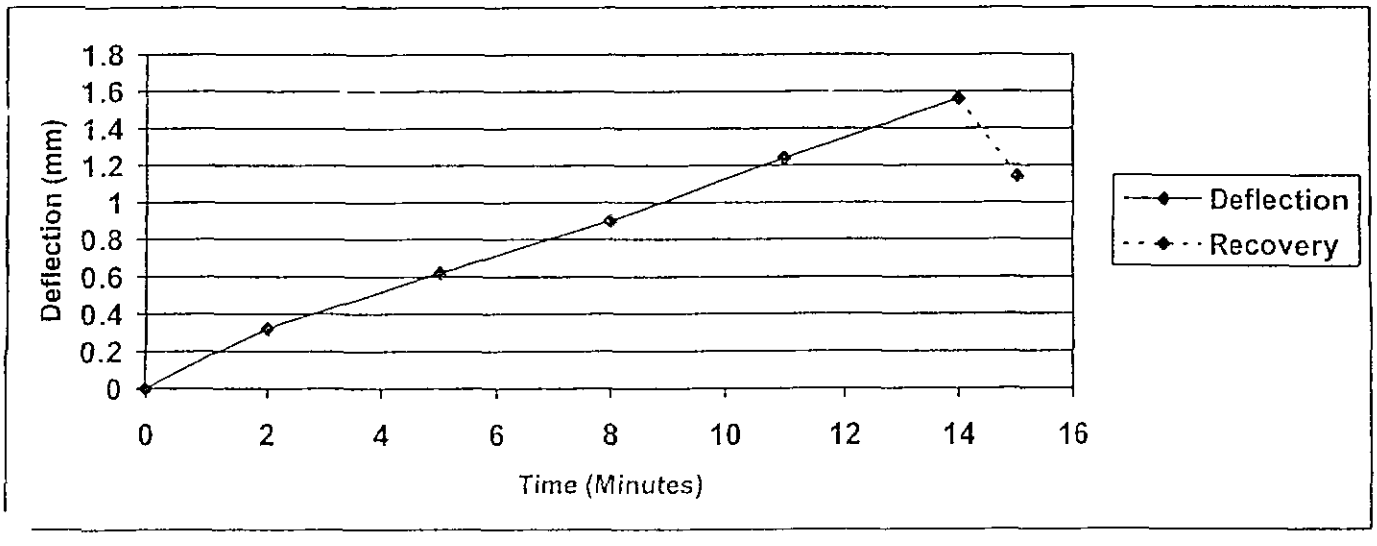
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1067
Site:	Hough Lane, Wombwell	Date Tested:	18/10/2006
Material Under Test:	Silty Clay with Gravel	Tested By:	R Gaunt
Client Reference	141	*Test Location*	141
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.5%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Firm SILT/CLAY with medium to coarse gravel

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.32		
60	5	0.62		
90	8	0.90		
120	11	1.24		
150	14	1.56	1.69	
0	15	1.14		26.9



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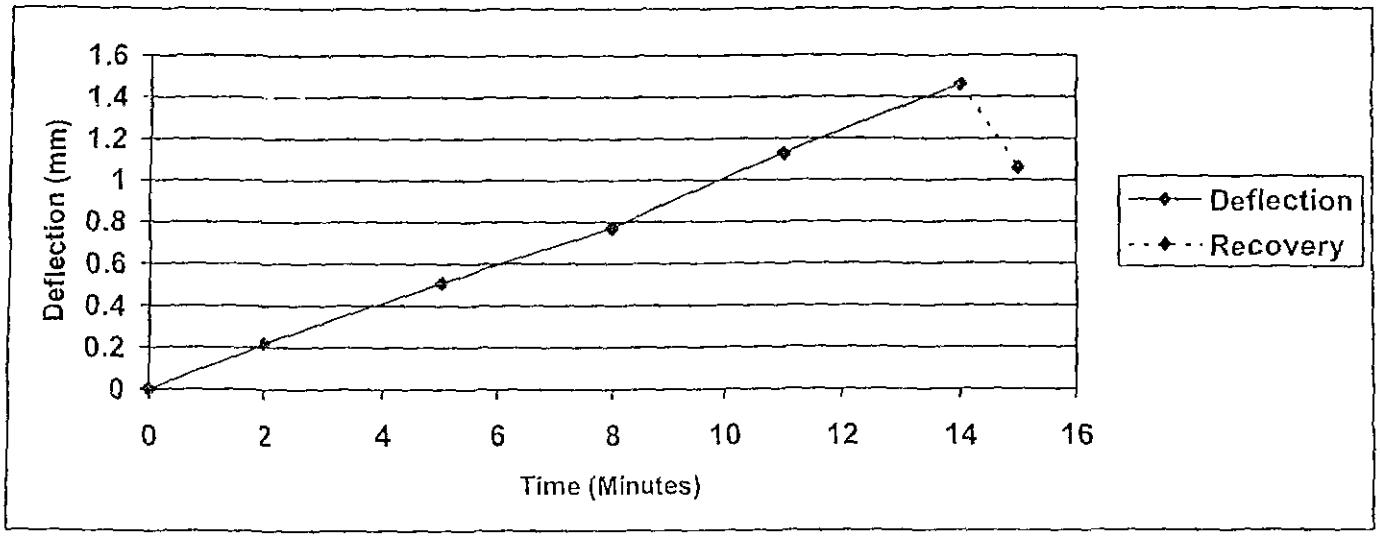
CERTIFICATE OF TEST

DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1067
Site:	Hough Lane, Wombwell	Date Tested:	18/10/2006
Material Under Test:	Silty Clay with Gravel	Tested By:	R Gaunt
Client Reference	142	Test Location	142
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Dozer
Weather conditions	Sunny	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	11.2%
Distance from edge of plate to Wall of Excavation	N/A	*Visual Description:*	Firm SILT/CLAY with medium to coarse gravel

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.22		
60	5	0.51		
90	8	0.77		
120	11	1.13		
150	14	1.46	1.59	
0	15	1.06		27.4



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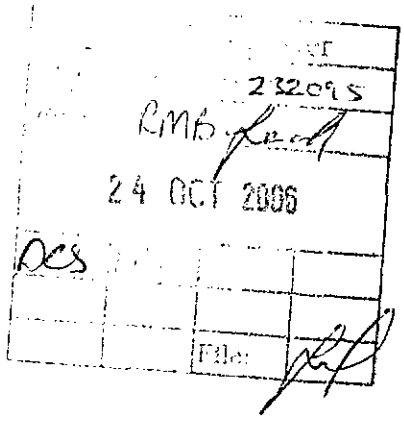

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For the Attention of: Mr Richard Butterworth

Report Date: 23rd October 2006

Report Reference: 06FW1072
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by *your Mr D Sykes under your official order number 20712 and executed on 19th October 2006 by our Mr D Peace.*

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 3 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: *Clause 4.1: 1990 using fine grained sand* as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 – 409, 410, 412)
b. 600mm diameter rigid steel plate
c. *Pressure gauge referenced 905/176A calibration certificate 905/176A-4*
d. Reaction load on site – CAT & Roller
e. The weather at the time of test – Overcast

R. Gould
Business Manager

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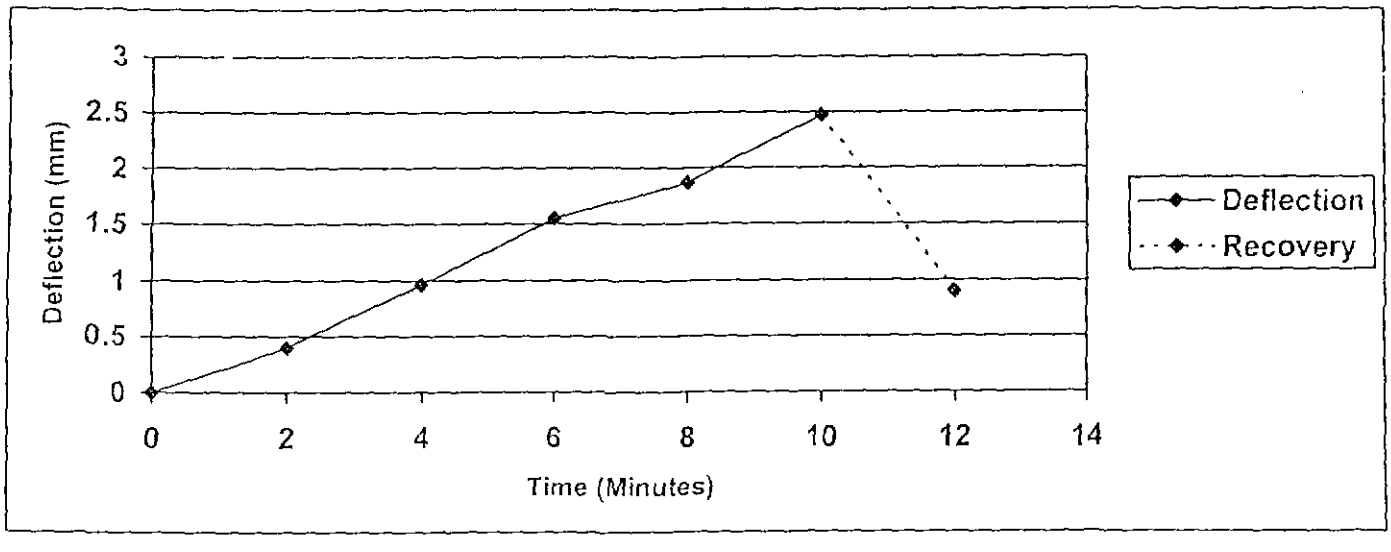
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1072
Site:	Hough Lane, Wombwell	Date Tested:	19/10/2006
Material Under Test:	Fill	Tested By:	R Gaunt
Client Reference	143	Test Location	143
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	CAT & Roller
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.3%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.40		
60	4	0.96		
90	6	1.55		
120	8	1.87		
150	10	2.47	2.73	
0	12	0.90		63.6



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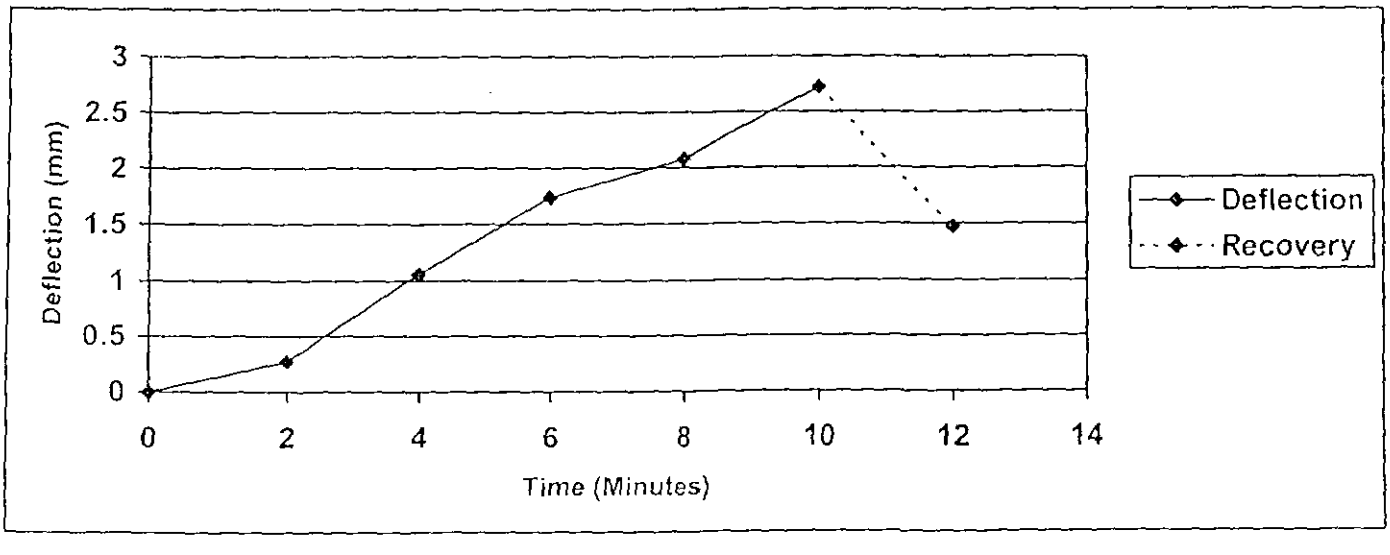
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1072
Site:	Hough Lane, Wombwell	Date Tested:	19/10/2006
Material Under Test:	Fill	Tested By:	R Gaunt
Client Reference	144	Test Location	144
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.9%
Distance from edge of *plate to Wall of Excavation*	*N/A*	*Visual Description:*	Dark brown sandy *SILT/CLAY with medium* mudstone

RESULTS				
Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.27		
60	4	1.06		
90	6	1.74		
120	8	2.08		
150	10	2.72	3.12	
0	12	1.47		46.0



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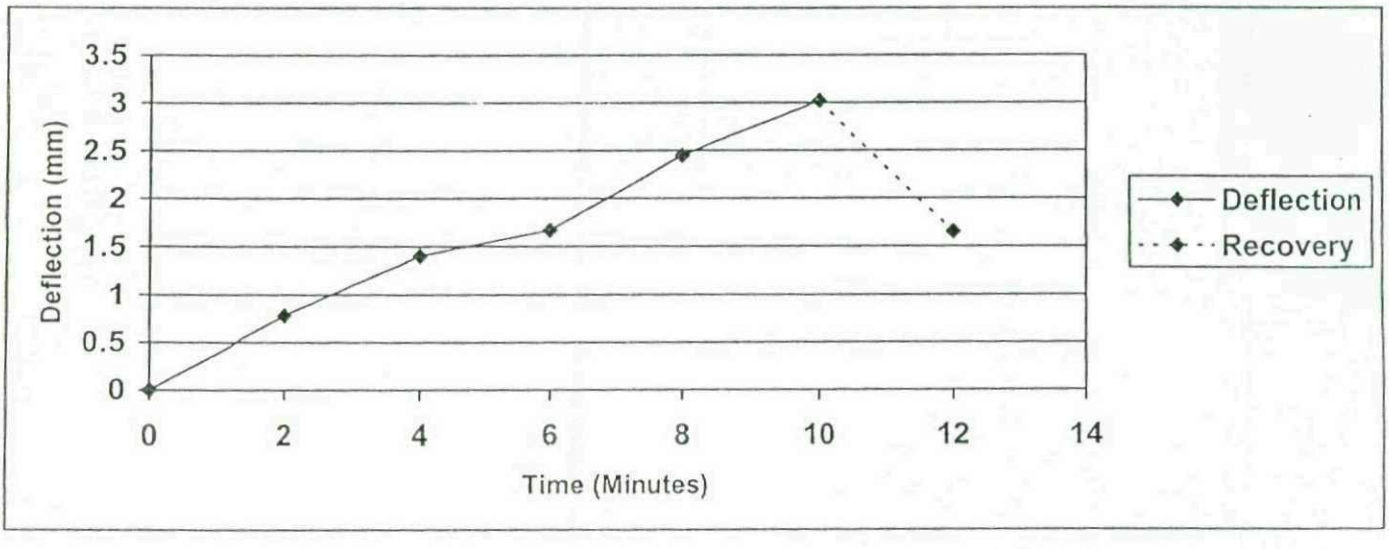
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd	Report No:	06FW1072
Site:	Hough Lane, Wombwell	Date Tested:	19/10/2006
Material Under Test:	Fill	Tested By:	R Gaunt
Client Reference	145	Test Location	145
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	Surface	Reaction Load Used	Moxy
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.1%
Distance from edge of plate to Wall of Excavation	N/A	Visual Description:	Dark brown sandy SILT/CLAY with medium mudstone

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	0.78		
60	4	1.40		
90	6	1.67		
120	8	2.45		
150	10	3.02	3.19	
0	12	1.65		45.4



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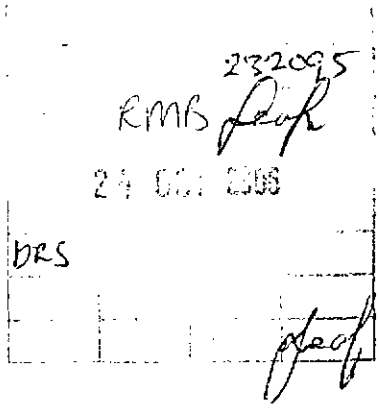

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For the Attention of: Mr Richard Butterworth

Report Date: 23rd October 2006

Report Reference: 06FW1074
Project Code: JOYDONC074

REPORT FOR PLATE LOAD TESTS AT HOUGH LANE, WOMBWELL

1.0 Introduction and Background:

Scientifics Limited are pleased to submit this report in relation to the above. Testing was requested by your Mr D Sykes under your official order number 20712 and executed on 20th October 2006 by our Mr R Thorne.

2.0 Scope of Work:

As requested Scientifics Limited performed the following scope of work: -

To carry out 2 Number Plate Bearing tests at locations specified by the client to determine the vertical deformation and strength characteristics of the underlying fill material.

It was requested that a load of 150kN/m^2 be applied in five equal increments.

Testing was carried out in accordance with BS1377: Part 9: Clause 4.1: 1990 using fine grained sand as a levelling bed for the steel plate.

3.0 Equipment used and additional information

a. 3 Number Displacement dial gauges (Ref. 905 –409,410,412)
b. 600mm diameter rigid steel plate
c. Pressure gauge referenced 905/173B calibration certificate 905/173B0-18.
d. Reaction load on site – Dozer.

The weather at the time of test – Overcast.

R Gould
Business Manager

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Notes:
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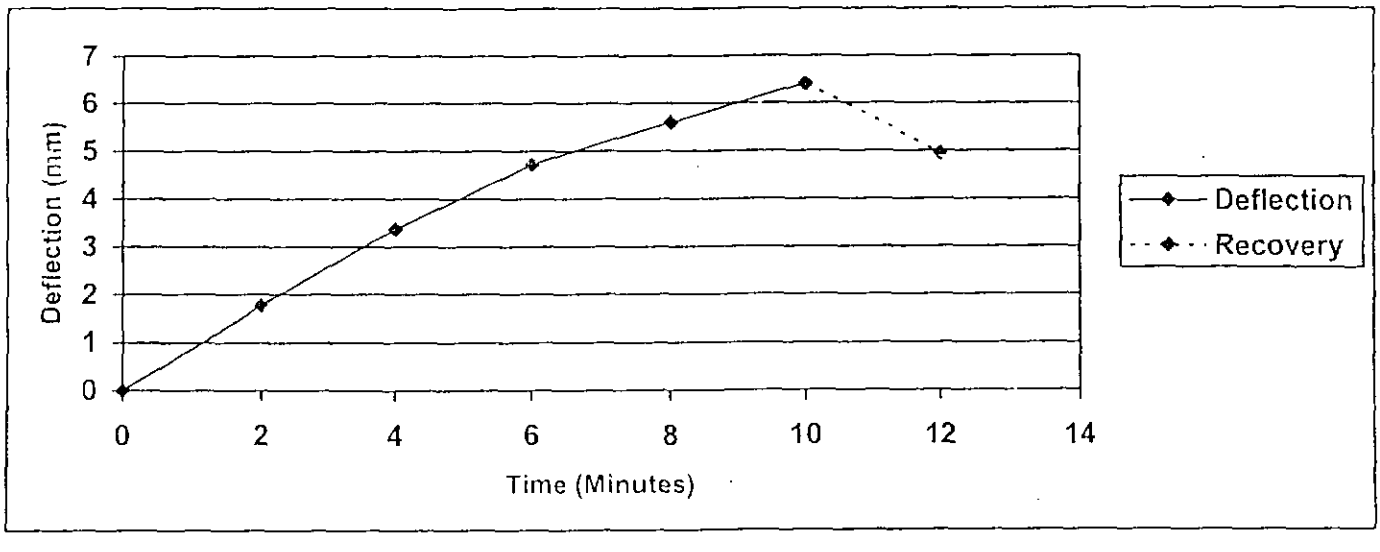
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1074
Site:	Hough Lane, Wombwell	Date Tested:	20/10/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	146	Test Location	146
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	1m	Reaction Load Used	Dozer
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.7%
Distance from edge of plate to Wall of Excavation	3m	Visual Description:	Black silty SAND and rubble

RESULTS

Applied load:kN/m^2	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.77		
60	5	3.37		
90	8	4.72		
120	11	5.60		
150	14	6.41	6.76	
0	15	4.95		22.8



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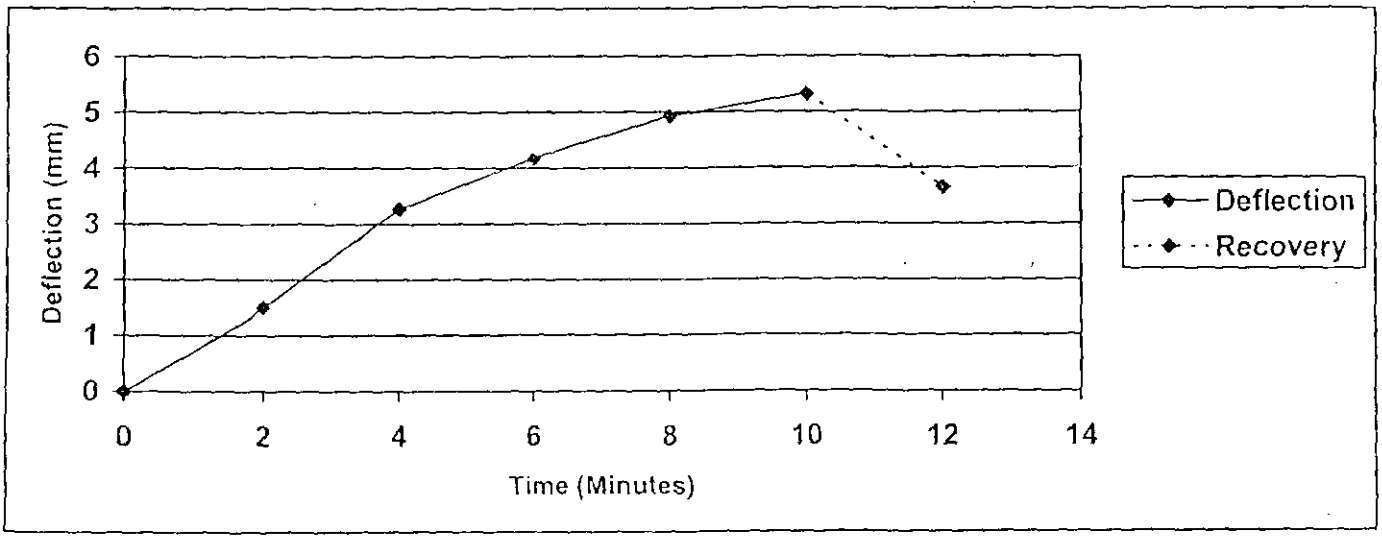
DETERMINATION OF PLATE BEARING CAPACITY IN ACCORDANCE WITH BS 1377: PART 9: 1990

Client:	Joynes Pike and Associates Ltd.	Report No:	06FW1074
Site:	Hough Lane, Wombwell	Date Tested:	20/10/2006
Material Under Test:	Silty sand and rubble	Tested By:	R Thorne
Client Reference	147	Test Location	147
Test Method	Incremental	Plate Size (mm)	600
Depth of Test	1m	Reaction Load Used	Dozer
Weather conditions	Overcast	Natural Moisture Content *Carried out in accordance with BS1377:Pt2:1990*	14.7%
Distance from edge of plate to Wall of Excavation	3m	Visual Description:	Black silty SAND and rubble

RESULTS

Applied load:kN/m²	Time Interval:mins	Mean Deflection:mm	Max Deflection:mm	Recovery:%
30	2	1.49		
60	5	3.27		
90	8	4.18		
120	11	4.93		
150	14	5.31	5.65	
0	15	3.65		31.7



APPENDIX E

PSD Results

UKAS TESTING 1342

BUREAU VERITAS

L.J. CHURCH LABORATORY SERVICES LTD.
Lumley Street
Castleford, West Yorkshire WF10 5LB
Tel: (01977) 518903 • Fax: (01977) 553812
castleford.lab@uk.bureauveritas.com

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Albion House
Saville St
Sheffield
S4 7RX

Approved Signatories: L J Church, Regional Manager; F A Ratcliffe, General Manager; A F D Lozano, Lab Manager; A Byers, Deputy Lab Manager

For the attention of Mr M Grandy

SHEFFIELD INNER RING ROAD STAGE II

Laboratory Report	SA/05/8047	Date Sampled	07/10/05
Sample Number	SA/05/8047	Date Received	07/10/05
Date	18-Oct-05	Date Completed	17/10/05
Material Description	Fine to Medium to Coarse Sandstone and Clay	Client Ref	Not Stated
Source	Ex Site	Location	Stockpile
Supplier	Ex Site		

The results below represent tests conducted on a sample of the above material which was taken from the site by L J Church Laboratory Services Ltd
The sample was received with an accompanying certificate of sampling
The tests were carried out on a bulk sample in accordance with the appropriate standards

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3
Sample prepared in accordance with BS 1377: Part 1: 1990 Clause 7.3.4(a)

Moisture Content 9.1 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2
Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve	Specification
125 mm	100 %	
100 mm	100 %	
90 mm	100 %	
75 mm	100 %	
63 mm	100 %	
50 mm	100 %	
37.5 mm	95 %	
28 mm	81 %	
20 mm	70 %	
14 mm	64 %	
10 mm	50 %	
6.3 mm	40 %	
5 mm	37 %	
3.35 mm	32 %	
2 mm	29 %	
1.18 mm	26 %	
600 µm	24 %	
425 µm	23 %	
300 µm	22 %	
150 µm	20 %	
63 µm	14 %	

pp L J Church Laboratory Services Ltd

Bureau Veritas UK Head Office Tower Bridge Court, 224-226 Tower Bridge Road, London SE1 2TX
Registered in England No. 02532885

UKAS TESTING 1342

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S4 7RX

Approved Signatories
L J Church, Regional Manager
J A Wimbrath, General Manager
A F D'Rosario, Lab Manager
A Dyson, Deputy Lab Manager

For the attention of Mr M Grandy

SHEFFIELD INNER RING ROAD STAGE II

Laboratory Report	SA/05/8046	Date Sampled	07/10/05
Sample Number	SA/05/8046	Date Received	07/10/05
Date	18-Oct-05	Date Completed	17/10/05
Material Description	Fine to Medium to Coarse Sandstone and Clay	Client Ref	Not Stated
Source	Ex Site	Location	Stockpile
Supplier	Ex Site		

The results below represent tests conducted on a sample of the above material which was taken from the site by L J Church Laboratory Services Ltd.
The sample was received with an accompanying certificate of sampling.
The tests were carried out on a bulk sample in accordance with the appropriate standards

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3
Sample prepared in accordance with BS 1377: Part 1: 1990 Clause 7.3.4(a)

Moisture Content 8.6 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2
Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve	Specification
125 mm	100 %	
100 mm	100 %	
90 mm	100 %	
75 mm	100 %	
63 mm	58 %	
50 mm	58 %	
37.5 mm	58 %	
28 mm	58 %	
20 mm	52 %	
14 mm	41 %	
10 mm	36 %	
63 mm	31 %	
5 mm	29 %	
3.35 mm	26 %	
2 mm	23 %	
1.18 mm	21 %	
600 µm	19 %	
425 µm	18 %	
300 µm	17 %	
150 µm	15 %	
63 µm	10 %	

pp L J Church Laboratory Services Ltd

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UKAS TESTING 1342

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Approved Signatories
L J Church, Regional Manager
J A Hardcastle, General Manager
A F D'Rossio, Lab Manager
A Dyson, Deputy Lab Manager

For the attention of Mr M Grandy

SHEFFIELD INNER RING ROAD STAGE II

Laboratory Report	SA/05/8048	Date Sampled	07/10/05
Sample Number	SA/05/8048	Date Received	07/10/05
Date	18-Oct-05	Date Completed	17/10/05
Material Description	Fine to Medium to Coarse Sandstone and Clay	Client Ref	Not Stated
Source	Ex Site	Location	Stockpile
Supplier	Ex Site		

The results below represent tests conducted on a sample of the above material which was taken from the site by L J Church Laboratory Services Ltd
The sample was received with an accompanying certificate of sampling.
The tests were carried out on a bulk sample in accordance with the appropriate standards

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3
Sample prepared in accordance with BS 1377: Part 1: 1990 Clause 7.3.4(a)

Moisture Content 9.0 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2
Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

Specification

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	86 %
28 mm	71 %
20 mm	62 %
14 mm	48 %
10 mm	42 %
6.3 mm	35 %
5 mm	33 %
3.35 mm	30 %
2 mm	27 %
1.18 mm	24 %
600 µm	22 %
425 µm	21 %
300 µm	20 %
150 µm	18 %
63 µm	12 %

AFD Rossio
pp L J Church Laboratory Services Ltd

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Registered In England No 02532665

UKAS TESTING 1342

BUREAU VERITAS

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Approved Signatories
L J Church, Regional Manager
J A Hardcastle, Quality Manager
A P D'Rosario, Lab Manager
A Dyson, Deputy Lab Manager

For the attention of Mr M Grundy

SHEFFIELD INNER RING ROAD STAGE II

Laboratory Report	SA/05/3049	Date Sampled	07/10/05
Sample Number	SA/05/F040	Date Received	07/10/05
Date	18-Oct-05	Date Completed	17/10/05
Material Description	Fine to Medium to Coarse Sandstone and Clay	Client Ref	Not Stated
Source	Ex Site	Location	Stockpile
Supplier	Ex Site		

The results below represent tests conducted on a sample of the above material which was taken from the site by L J Church Laboratory Services Ltd.
The sample was received with an accompanying certificate of sampling.
The tests were carried out on a bulk sample in accordance with the appropriate standards

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3
Sample prepared in accordance with BS 1377: Part 1: 1990 Clause 7.3.4(a)

Moisture Content 8.8 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2
Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve	Specification
125 mm	100 %	
100 mm	100 %	
90 mm	100 %	
75 mm	100 %	
63 mm	86 %	
50 mm	86 %	
37.5 mm	73 %	
28 mm	69 %	
20 mm	55 %	
4 mm	44 %	
10 mm	37 %	
6.3 mm	31 %	
5 mm	29 %	
3.35 mm	25 %	
2 mm	22 %	
1.18 mm	20 %	
895 µm	18 %	
425 µm	18 %	
300 µm	17 %	
150 µm	15 %	
63 µm	11 %	

BIRSE RECEIVED 19 OCT 2005 3845
ORIGINAL 5.20
ACTION MG
COPY AH

pp L J Church Laboratory Services Ltd

Bureau Veritas UK Head Office Tower Bridge Court, 224-226 Tower Bridge Road, London SE1 2TX
Registered in England No. 02632665

APPENDIX F

Trial Pit 1 Approval Letter

BARNSLEY
Metropolitan Borough Council

Regulatory Services
Assistant Director: Ken E Eastwood
Central Offices, Kendray Street, Barnsley. S70 2TN.

My Ref: SR132429 Your Ref: DRS/DRS/232095.20060813 Date: 20 June 2006

Enquiries To: James Fox
jamesfox@barnsley.gov.uk
Dial Direct: (01226) 772456 Fax: (01226) 775699

Dear Daniel

RE: Wombwell Foundry – TP1 Validation Results

Thank you for the validation results you recently submitted with regards to Trial Pit 1 at the former Wombwell Foundry, Hough Lane, Wombwell.
I have reviewed the results and I am satisfied that the Trial Pit and associated immediate area do not pose a significant risk to end users, especially taking into account the capping system you will employ.
I agree with your conclusion that this specific area has been suitably remediated and validated.

Yours faithfully,

Dr James Fox
Contaminated Land Support Officer

JPA - Doncaster
Project Number: 232095
Review: SJB SOK.
22 JUN 2006
DRS
JMS File:

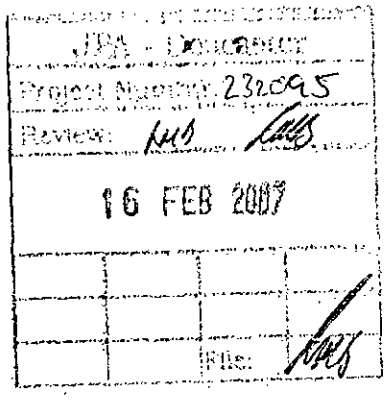
D R Sykes
Joynes Pike & Associates Ltd
1-2 Aire House
Sidings Court
Doncaster DN4 5NL

APPENDIX G

PCB Test Validation

Client: Joynes Pike & Associates Ltd.
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
South Yorkshire
DN4 5NL

FAO: Mr R Fone



Analytical Report Number: R07/0072

Client Project Name:	Hough Lane, Wombwell
Client Project Number:	232095
Your Order Number:	22845
Order Receipt Date:	16/01/07
Reporting Date:	Tuesday 23 January 2007

If you have any queries regarding this report please contact our Customer Services Section

ECöS Environmental Limited
Low Moor Business Park, Common Road, Bradford BD12 0NB
Tel: 01274 691122 Fax: 01274 608100

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 23 January 2007

Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

Soil Samples

Results are expressed based on air dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

Key:

Accreditation:

MCERTS = This test is accredited to the British Standard BS EN ISO/IEC 17025:2005 and the Environment Agency MCERTS for soil standard.

17025 = This test is accredited to the British Standard BS EN ISO/IEC 17025:2005.

None = This test is currently not on our scope of accreditation.

Sample Pretreatment (Appended to Method of Detection)

D = Air Dried @ 40°C

R = As Received

Sample Type

B = Bulk disturbed sample
C = Core Sample
D = Small disturbed sample
P = Piston sample
U = Undisturbed sample - open drive
W = Water Sample

Sample Results

Analysis not requested
*** Test not completed. Please see notes on last page

Signed: _____

For and on behalf of ECOS Environmental Limited

Approved signatories:

Name	Position
J R Brown	Business Development Manager
L Dewell	Production Manager
P Richardson	Section Head
J Stoddart	Technical Manager

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 23 January 2007

Soil Samples

Method Statement

Determinand	Method of Detection	Sample Pretreatment	Limit of Detection	Accredi-tation	Sub-Contracted	Result Date
Polychlorinated biphenyl BZ#101	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07
Polychlorinated biphenyl BZ#118	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07
Polychlorinated biphenyl BZ#138	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07
Polychlorinated biphenyl BZ#153	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07
Polychlorinated biphenyl BZ#180	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07
olychlorinated biphenyl BZ#28	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07
Polychlorinated biphenyl BZ#52	GC-MS (HR)	D	0.05 ug/kg	None	Yes	23/01/07

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 23 January 2007

Hole No./Sample ID		Substation	Substation	Substation	Substation	Substation
Top Depth / m						
Bottom Depth / m						
Sample No.		D1	D2	D3	D4	D5
Sample Type		Clay	Clay	Clay	Clay	Clay
Date Sampled						
Receipt Date		16/01/07	16/01/07	16/01/07	16/01/07	16/01/07
ECõS Sample ID		S0700536	S0700537	S0700538	S0700539	S0700540
Matrix Type		Soil	Soil	Soil	Soil	Soil
Determinand	Units					
Polychlorinated biphenyl BZ#101	ug/kg	<0.05	<0.05	<0.05	<0.05	0.05
Polychlorinated biphenyl BZ#118	ug/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#138	ug/kg	<0.05	<0.05	<0.05	<0.05	0.06
Polychlorinated biphenyl BZ#153	ug/kg	<0.05	<0.05	<0.05	<0.05	0.07
Polychlorinated biphenyl BZ#180	ug/kg	<0.05	<0.05	<0.05	<0.05	0.05
Polychlorinated biphenyl BZ#28	ug/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#52	ug/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Client Project Name: Hough Lane, Wombwell

Project Number: 232095

Client: Joynes Pike & Associates Ltd.

Reporting Date: Tuesday 23 January 2007

Notes and Preservation Details

None

APPENDIX A

Joynes Pike & Associates Reclamation Method Statement

Your Ref:

Our Ref: DRS/DRS/232095.20060450

19 April 2006

JPA
JOYNES PIKE
& ASSOCIATES LTD

CONSULTING ENGINEERS

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www.joynespike.co.uk

SPECIFICATION FOR REMEDIATION WORKS AT HOUGH LANE, WOMBWELL ON BEHALF OF BEN BAILEY HOMES LIMITED

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- 2.6 Proposed Development
- 2.7 Regulatory Consultation

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DRAWINGS

232095/01	Site Location Plan
232095/04	Preliminary Pre-Development Conceptual Site Model
232095/05	Post Development Conceptual Site Model (Unremediated)
232095/06	Post Development Conceptual Site Model (Remediated)
2461/01 Rev.B.	Ben Bailey Homes, Site Layout

APPENDICES

APPENDIX A	Environmental Acceptability Criteria
APPENDIX B	JPA Consolidated Report
APPENDIX C	NHBC Conditions

1.0 INTRODUCTION

1.1 This document has been prepared on behalf of our Client Ben Bailey Homes Limited for the proposed redevelopment works on a site at Hough Lane, Wombwell as shown on our site location plan 232095/01 and no liability is accepted for its contents in whole or part to any third party.

1.2 This Specification is based primarily on the findings of ground investigations carried out by Joynes Pike & Associates Limited and detailed in our Consolidated Geo-Environmental Assessment Report Ref: DRS/RMB/232095.20051540 and Johnson Poole and Bloomer, a copy of which is enclosed as Appendix B.

1.3 The site had two major previous uses, those being a foundry and a landfill used for disposal of the foundry by-products. The site is proposed to be redeveloped with residential housing comprising two to three-storey houses and flats of conventional construction with timber first floors.

1.4 The site reclamation and redevelopment works are to be carried out and organised by a suitably experienced Contractor and the Contractor (appointed by the Developer) is required to undertake the works detailed in this Specification. It is anticipated that Joynes Pike & Associates Limited will be appointed as the Supervising Engineer.

1.5 This Specification has been prepared for the purposes of remediation of contamination at Hough Lane, Wombwell site as well as advising on the geotechnical issues on site. Acceptance criteria have been specified for validation testing and the quality of any imported soils brought to the site. The works will include;

- Removal and validation of the substation present on site (after suitable decommissioning).
- Pumping dry of the oil interceptor and validation of the surrounding area after the underground tank has been removed.
- Grubbing up and breaking out all hardstanding, floor slabs, foundations, machine bases and deep pits in the former foundry areas. The breaking out of foundations, machine bases and pits should be to 2.0m below the proposed capillary break with levels being re-instated in accordance with the Highways Agency Specification for Highway Works, Series 600 – Earthworks, dated May 2001.
- Provision of gas protection measures within foundation design of properties;
- Provision of capping within garden areas; and the validation of various stages of the works.

1.6 This Specification should be submitted to Barnsley Metropolitan Borough Council and the NHBC for approval prior to any irrevocable actions and prior to adopting the Specification on site.

2.0 THE SITE

2.1 Location and Access

2.1.1 The site is approximately 6.5 hectares in area and is located off Hough Lane, south west of Wombwell town centre at National Grid Reference SE 3898 0237 as shown on the site location plan, drawing no. 232095/01.

2.1.2 Access to the site is gained via the main gates off Hough Lane. A further two access points are present on Hough Lane and one locked access gate is present at the roundabout on the A9195 Dearne Valley Parkway.

2.2 Site Description

2.2.1 The site is bound to the north by Hough Lane beyond which is an existing Ben Bailey Homes Limited development and a community centre. To the east the site is partially bound by existing industrial premises and open fields. To the south of the site are open fields and to the west is an operational railway.

2.2.2 The site generally slopes away from Hough Lane to the south west and the site is currently terraced from the northern boundary to the southern boundary.

2.2.3 There is one remaining building on the site associated with the electric sub-station. Hardstanding is present at the surface across approximately half of the site associated with the former foundry.

2.2.4 The locations of live services on the site are known and the electric supply is currently live on the northern half of the site.

2.2.5 Numerous mature/semi-mature trees are situated on and around the site as shown on our site plan drawing 232095/03.

2.2.6 A relaining wall is present on the far north eastern boundary.

2.3 Site History

2.3.1 The historical maps for the area have been reviewed and the pertinent points are summarised in the table below. It is not the intention to give a detailed history of the site and its surroundings, as this has been supplied within out previous report for the site.

Feature	Location	Maps
Wooded areas and open fields	On site	1851-1929
Well	On site	1892
Railway	West of site	1901
Foundry	On site	1929 - 2000
Infilling to south of site	On Site	1961 – 2000
Small Industrial Unit	On site	2000 - Present

2.3.2 In summary the northern half of the site has previously been used as a foundry. Part of the southern area has previously been used as a licensed landfill for the foundry.

2.3.3 The Envirocheck report showed the landfill to be present on part of the southern are of the site.

2.4 Geology, Hydrogeology and Hydrology

2.4.1 We have inspected the 1:50,000 Geological Survey Sheet 87 'Barnsley' together with the Geological Survey memoir.

2.4.2 The 1:50,000 scale Geological Maps show the solid geology underlying the site to be Middle Coal Measures comprising mudstones, siltstones and sandstones. The northern eastern half of the site is shown to be over the Woolley Edge Rock with another mudstone unit separating this from an unnamed sandstone unit. There is an unnamed coal seam believed to cross the northern section of the site. These strata are overlain by a thickness of weathered materials derived from the underlying bedrock.

2.4.3 According to the Environment Agency Groundwater Vulnerability Map Sheet 11 'South Penines', the site is shown to be underlain by strata which represent a Minor Aquifer overlain with soils of low leaching potential. This means that the soils have good or some ability to attenuate/diffuse source pollutants, which cannot as a result move readily to the underlying groundwater.

2.4.4 The nearest water abstraction licenses are between 501 and 1000m from the site. It is considered highly unlikely that conditions on this site will significantly affect water abstracted at that distance. The status of the

aquifer indicates that is unlikely to be used as a major source of potable water.

2.4.5 There is one partially culverted watercourse which crosses the site in an adit and exits in the southern area, as shown on the utility survey by Tower Surveys.

2.4.6 All of the above is covered in more detail within our Consolidated Geo-Environmental Assessment Report ref: DRS/RMB/232095.20051540.

2.5 Environmental Considerations

2.5.1 A review of the information contained within the supplied Envirocheck report was made in our Consolidated Geo-Environmental Assessment Report. The main points from this report are summarised below (unless the same detail has been covered in the above sections).

- Landfills – There is on know landfill on site and one located between 500 – 1000m from the site boundary. The landfill known to be present on site was observed during the site walkover and subsequently the waste management license associated with this has successfully been handed back to the Environment Agency after a consultation and monitoring period. The landfill was licensed to accept industrial type wastes and difficult types of waste (both from the foundry).

- Discharge consents – There is one discharge consent between 500m and 1000m for the purposes of site drainage.

2.6 Proposed Development

2.6.1 It is understood that the site is to be developed for residential housing comprising two and three-storey houses and flats of conventional construction

2.6.2 The current proposed layout of the development is shown on the enclosed Ben Bailey Homes drawing 2461/01 Rev.B.

2.7 Regulatory Consultation

2.7.1 Our Consolidated Geo-Environmental Assessment Report ref: DRS/RMB/232095.20051540 dated 02nd February has been presented to the NHBC for approval purposes. The response received is contained within Appendix C. Two copies were also issued to Ben Bailey Homes for submission in relation to planning issues and for budgetary purposes.

3.0 CONCEPTUAL SITE MODEL

3.1 Potential Sources of Contamination

3.1.1 The following potential on site sources of ground contamination have been identified:

- Previous use as a foundry and associated processes
- Made Ground present on site arising from foundry uses.
- Landfill present on site and importation of materials including asbestos.
- Spillage and leakage of oil/diesel or chemicals from the tanks/drums on site.
- Maintenance of equipment and vehicles on site.
- Substation on site which may give rise to contamination.

3.2 Receptors of Contamination and Migration Pathways

3.2.1 Receptors are defined as human or non-human organisms that have the potential to experience adverse effects from direct or indirect exposure to contaminated media. Migration pathways are defined as the course a chemical takes from a source to an exposed organism or receptor. The exposure pathway can be direct (i.e. stays within the same exposure media) orindirect transport, from one media to another.

3.2.2 The following potential human and environmental receptors have been identified on the site for the redevelopment of domestic houses and gardens.

- Future end users (residents);
- Plants and vegetables grown in garden areas;
- Occupants of neighbouring residential properties;
- Site construction and maintenance workers;
- Building materials.

3.2.3 The following potential migration pathways have been identified on the site:-

- Inhalation-
  Human health can potentially be at risk from breathing dust and vapours from contaminated soil in the outdoor air. Vapours from contaminated soil and groundwater can also migrate into buildings and be inhaled by occupants;

- Ingestion-
  Human health can be potentially at risk from eating and swallowing contaminated soil and groundwater. Ingestion can also occur by deliberately eating contaminated soil or indirectly by eating and smoking with dirty hands etc., or by ingestion of fugitive dust;

- Dermal Contact-
  Human health can be potentially at risk from direct skin contact with contaminated soil and groundwater causing skin conditions such as dermatitis etc. Certain contaminants can be absorbed into the body through the skin or enter directly through open cuts and abrasions;

- Uptake by Plant and vegetables-
  Some contaminants may be toxic to plants (phytotoxic) but not necessarily to human health at the same concentrations. Also plants may uptake contaminants through their roots;

- Migration of Contaminated Water-
  Depending on the permeability of the ground conditions and any other man made voids or preferential pathways, contaminated groundwater can potentially migrate laterally or vertically affecting the surface and groundwaters;

- Leaching-
  Infiltration of water through the soil and waste can leach out soluble contaminants resulting in groundwater pollution;

- Migration of Ground Gas-
  Depending on the permeability of the ground conditions and any other man made voids, ground gases can potentially migrate laterally or vertically where it may enter and accumulate in unprotected buildings;

- Aggressive Attack-
  Some building materials can be damaged by direct contact with aggressive ground conditions, for example sulphate attack on concrete and hydrocarbon attack on plastics.

3.3 Source-Pathway-Receptor Relationships

3.3.1 For the intended use of the site for domestic housing with gardens, the following potential Source-Pathway-Receptor relationships have been identified:-.

SOURCE	PATHWAY	RECEPTORS	RISK
Contaminated Soil	Ingestion, Dermal Contact, Inhalation	Future resident construction workers	Low
Contaminated Soil	Root uptake & Subsequent Ingestion	Plants, vegetables & residents	Medium
Contaminated Soil	Leaching	Groundwater	Low
Contaminated Soil	Aggressive attack	Building materials	Low
Ground Gas (Carbon Dioxide and Radon)	Lateral & vertical migration	Future site users Neighbouring occupants	Medium
Former drums/tanks, machinery maintenance	Leakage	Soil and groundwater	Medium
Contaminated Groundwater/Leachate	Aggressive attack	Building Materials	Low

3.3.2 Drawing 232095/04 shows a Preliminary Pre-Development Conceptual Site Model for the site with drawing 232095/05 showing an un-remediated schematic conceptual site model and drawing 232095/06 showing a remediated version.

4.0 RESULTS OF THE INVESTIGATION

4.1 General

4.1.1 The ground conditions encountered during the two site investigations by Johnson Poole and Bloomer and Joynes Pike & Associates Limited generally encountered similar ground and this is discussed further in the Consolidated Report enclosed as Appendix B. The ground conditions generally comprised Made Ground and where the natural ground was encountered this consisted of a sandy silty CLAY beneath which was bedrock. The landfill area had evidence of asbestos fragments within the infill.

4.2 Ground Conditions

4.2.1 The JPB report indicates a range in thickness of MADE GROUND to be predominantly less than 4.0m beneath the former buildings and greater than 4.0m where the former landfill is. A copy of the report is included within JPA Consolidated report n Appendix B.

4.2.2 The ground conditions encountered by JPA beneath the site was predominantly very similar to that previously encountered and reported within the JPB report. The MADE GROUND encountered in the further investigation ranged from 1.2m to 4.0m below existing ground level. The predominant MADE GROUND generally comprised a medium dense foundry sand with ash, clinker and slag gravel. Where the former foundry buildings were located there was a thickness of concrete, reinforced in places. The concrete bases were generally up to 0.3m in thickness with one gable end wall noted to have footings up to 2.0m thick.

4.2.3 The natural ground beneath the MADE GROUND was generally a firm, brown, slightly sandy, silty CLAY, beneath which was bedrock comprising Middle Coal Measures.

4.2.4 Six rotary open boreholes were drilled to determine the presence or absence of an unnamed coal seam and to assess if workings are present. Coal was encountered in one of the six boreholes drilled to determine the unnamed seam and a further three elsewhere on the site. The other boreholes drilled to determine the unnamed seam encountered a very dark, grey/black MUDSTONE at the same level of the coal. No evidence of workings was encountered (such as voids, broken ground, loss of flush etc.) Due to the findings highlighted in this section it is believed that there will be no risk of settlement due to coal mine workings beneath the site as the coal

seam is of discontinuous and poor quality and grades from a poor quality coal to a black carbonaceous mudstone.

4.2.5 There were various pits identified associated with the former foundry on site. These pits were of various sizes and shapes and have been highlighted within the Consolidated Report enclosed in Appendix B.

4.3 Contamination Testing

4.3.1 The legislative framework for the regulation of contaminated land is contained in Part IIA of the Environmental Protection Act 1990, which was implemented in the Contaminated Land (England) Regulations 2000. This legislation allows for identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment. The basis of the UK contaminated land policy is the 'Suitable for Use' approach, which states that land should be suitable for its current use and made suitable for any new use as official permission (through the planning process) is given for that use.

4.3.2 Under Part IIA of the Environmental Protection Act 1990, contaminated land is defined as land where significant harm is being caused or there is a significant possibility of such harm being caused or where pollution of controlled waters is being, or is likely to be caused. For significant harm to occur, a significant pollutant linkage must exist i.e. there must be a contamination source, a relevant receptor and a plausible migration pathway, by which the contaminant can cause significant harm to the receptor.

4.3.3 As part of the new regulatory framework discussed above, the UK Government published on 14th March 2002, the Contaminated Land Exposure Assessment model (CLEA). This presents new Soil Guidline Values, which are 'generic' guideline values for assessing the risks to human health from chronic exposure to contaminated soils. The Soil Guideline Values represent 'intervention values' above which the levels of soil contamination might represent an unacceptable risk to the health of site-users such that further investigation and/or remediation is required. The Soil Guideline Values are not intended to represent binding standards or statutory objectives.

4.3.4 The Soil Guideline Values have only been derived on the basis of a particular land use. Currently there are three types of 'standard' land use for which Soil Guidline Values have been developed, namely residential; allotments; and commercial/industrial. For each standard land use there are a number of different exposure routes which may or may not be active depending on the site-specific scenario and proposed land use. The Soil Guideline Values discussed below represent worst-case exposure scenarios with all exposure routes active for residential with plant uptake.

4.3.5 At the time of writing the Consolidated Geo-Environmental Assessment Report, Soil Guideline Values had only been prepared for arsenic,

cadmium, chromium, inorganic mercury, nickel, selenium, lead, ethylbenzene and toluene. The Soil Guideline Values have replaced the withdrawn ICRCL trigger concentrations. Where no Soil Guideline Values have been prescribed for certain contaminants, the results have been assessed by comparison to in-house version 5 screening values used by Joynes Pike & Associates Limited. The JPA in-house screening values have been calculated using published toxicological data and the CLEA model and have been approved for use by a number of Local Authority Environmental Health & Contaminated Land Departments.

4.3.6 The results of the analysis were assessed using statistical tests as outlined in CLR 7. Appropriate US_{95} values have been calculated for each of the identified strata types on site with the following being recorded as having concentrations of determinands in excess of the relevant SGV or JPA in-house trigger concentration value (Version 5, Sept 2005) for a proposed end use of residential with gardens. The following main strata types have been identified;

- MADE GROUND – brick rubble (Type A)
- MADE GROUND – foundry sand (Type B)
- MADE GROUND – gravel (Type C)
- Natural CLAY

4.3.7 Brick Rubble Made Ground (Type A)

The results of the four samples of brick rubble made ground indicate that the determinands were either below the published SGV or the Tier 1 in-house screening values (IHSV) with the exception of:

- Arsenic with a US^{95} of 40.42 mg/kg compared to the SGV of 20 mg/kg
- Lead with US^{95} of 499.86 mg/kg compared to the SGV of 450 mg/kg
- Nickel with a US^{95} of 59.51 mg/kg compared to the SGV of 50 mg/kg
- Benzo (a) pyrene with US^{95} of 1.19 mg/kg compared to the IHSV of 1.1 mg/kg
- Benz (b) fluoranthene with US^{95} of 1.19 mg/kg compared to the IHSV of 1.1 mg/kg
- Chrysene with US^{95} of 1.24 mg/kg compared to the IHSV of 1.1 mg/kg

4.3.8 Foundry Sand Made Ground (Type B)

The results of the eleven samples of foundry sand made ground indicate that the determinands were either below the published SGV or the Tier 1 IHSV with the exception of:

- Arsenic with a US^{95} of 35.3 mg/kg compared to the SGV of 20 mg/kg
- Nickel with a US^{95} of 143.37 mg/kg compared to the SGV of 50 mg/kg

- Elevated PAH.

4.3.9 Gravelly Made Ground (Type C)

The results of the eight samples of gravelly made ground indicate that the determinands were either below the published SGV or the Tier 1 IHSV with the exception of:

- Arsenic with a US^{95} of 34.95 mg/kg compared to the SGV of 20 mg/kg
- Nickel with a US^{95} of 74.43 mg/kg compared to the SGV of 50 mg/kg
- Lead with US^{95} of 464.62 mg/kg compared to the SGV of 450 mg/kg
- Chrysene with US^{95} of 1.29 mg/kg compared to the IHSV of 1.1 mg/kg

4.3.10 Natural Clay

The results of the four samples of natural clay indicate that the determinands were below either the published SGV or the Tier 1 IHSV.

4.3.11 Hydrocarbons odours that were noted by JPB during the site investigation were tested and showed no significant levels of contamination

4.3.12 I should be noted that the classification of soil for waste disposal purposes and any resulting waste acceptance criteria (WAC testing) required under the Landfill Regulations introduced in July 2005 is beyond the scope of this report.

5.0 PROPOSED REMEDIATON WORKS

5.1 Remediation Philosophy

5.1.1 The proposed remediation of soil contamination at the Hough Lane, Wombwell site has been based on the 'Suitable for Use' approach as advocated by Part IIA of the Environmental Protection Act 1990. The basis of the suitable for use approach is that land should be suitable for its current use and made suitable for any new use as official permission is given for that use. In addition, the requirements for remediation of contaminated land should be limited to the work necessary to prevent unacceptable risks to human health and the environment in relation to the current use, or officially permitted future use, of the land.

5.1.2 Under Part IIA of the Environmental Protection Act 1990 Contaminated Land is defined as land where significant harm is being caused or there is a significant possibility of such harm being caused, or where pollution of controlled waters is being, or is likely to be caused. For significant harm to occur, a significant pollutant linkage must exist i.e. there must be a contamination source, a relevant receptor and a plausible migration pathway, by which the contaminant can cause significant harm to the receptor.

5.2 Recommended Remedial Strategy

5.2.1 Based on the results of the investigation, the Revised Conceptual Site Model and the Risk Assessments, it is recommended that the following remedial works are undertaken in the context of the development proposals.

5.2.2 Suitable decommissioning and removal of the substation present on site. Validation samples should also be taken from beneath this area following removal of the substation. The excavations can be suitably backfilled in an engineered manner with either natural soil arisings from any excavations or processed, crushed and screened demolition materials as outlined below. At this stage it should be assumed that a maximum of approximately 70m^3 will require removal and suitable disposal from site.

5.2.3 The oil interceptor observed on site currently has liquid present within it. This should be pumped dry. Following this, the area around the interceptor should be broken out and the plastic vessel removed. Validation samples should be taken and sent for suitable contamination testing. The excavation can be suitably backfilled in an engineered manner with either natural soil arisings from any excavations or processed, crushed and screened demolition materials as outlined below. At this stage it should be assumed that approximately 75m^3 will require removal and suitable disposal from this area of the site.

5.2.4 Grubbing up and breaking out in part of hardstanding, floor slabs, foundations, machine bases and deep pits in the former foundry areas of

the site should take place. Where there are no deep pits or foundations and the bases are underlain by uniform moderately dense foundry sand, then this will be proof rolled at depths set by the formation levels or base of the capping in rear gardens. When considering the former pits/deeper foundations, machine bases or variable made ground, these should be excavated, with all sides and bases broken out to 2.0m below the capping layer. Excavation sides should be battered back at a minimum of 1v:1h gradient and locally deepened where there are deeper services. This material as well as stockpiled demolition material should be crushed, screened and reused to produce either a class 6F2 material or where possible a Type 1 material. The excavations should then be re-instated using a class 6F2 material benched into the sides of the excavation in accordance with Highways Agency Specification. There is sufficient laboratory testing to show that this material is acceptable for re-use beneath capping but if any unusual material is encountered it should be stockpiled separately and tested.

5.2.5 The material excavated should be replaced in an engineered manner and benched into the sides of the excavation in accordance with the Highways Agency Specification for Highway Works, Series 600 – Earthworks, dated May 2001 to allow a minimum safe bearing capacity of 50 kN/m^2 for the use of raft foundations and beneath roads. Appropriate testing will be carried out on all treated ground through plate load tests.

5.2.6 Excavations should be surveyed in order to fully assess the impact and location of these backfilled excavations in relation to the proposed finished levels and plot layouts.

5.2.7 Testing in the form of plate load tests should be carried out utilising a 600mm plate generally loaded to 150kN/m^2 or three times the working load of the proposed foundations, whichever is the greater. The allowable total deflection should be set at 10mm at three times the working load. Where the formation layer is to be proof rolled then tests should be carried out on a 35m grid. Where the localised removal of obstructions to a depth of 2.0m below the base of the capping or where a localised two metre turnover is carried out, tests should be carried out at 1.0m below and formation level on a 35m grid. Should the deepening be more localised then more targeted testing should be carried out at the discretion on the supervising engineer.

5.2.8 The culvert running beneath the site will require fully proving in order to avoid damage during construction. This is likely to involve working in confined spaces in order to unblock the culvert and gain access with the probe. As part of the redevelopment of the site the culvert is to be diverted. Made Ground materials excavated as part of these works should be processed to remove deleterious components and oversized fragments should be crushed to produce an engineered material before re-use as an engineered backfill. All of this material will be retained beneath the capping required on site.

5.2.9 During the raising of site levels, where natural ground is to remain in garden areas a minimum growing medium of 225mm of site won topsoil (following further testing) should be provided. Where MADE GROUND is to remain in garden areas it should be capped with a minimum of 600mm of clean material, with 225mm of clean site won or imported topsoil and 375mm of clean site won or imported clay rich material. In the area of the former foundry landfill a minimum of 150mm thick hard to dig layer comprising site won demolition materials should be provided at the base of the capping which would comprise 225mm of topsoil and 225mm of clay rich material. Should asbestos be noted within the MADE GROUND then an assessment by an engineer from Joynes Pike and Associates should assess as to whether the capping needs increasing to 1.0m.

5.2.10 Excavation arisings within Made Ground materials, will be suitable for retention and re-use on site, subject to waste management exemption, beneath the appropriate thickness of capping layer providing it is typical of that material type previously excavated.

5.2.11 Testing on imported material for capping is to be at a frequency of one test per 250m^3 of material; tested for a full suite of determinands that will be compared with the stated acceptable levels of determinands in Appendix A.

5.2.12 The capping thickness will be validated through machine or hand excavated trial pits in the rear garden of plots with enough plots being validated to gain a reasonable level of confidence in the capping thickness. It is envisaged that plots will have topsoil placed in phases as they are to be released for sale. As a consequence it is probable that the ratio of validation will vary between 1 plot in 3 to 1 plot in 5.

5.2.13 During excavation of contaminated soil and the placement of certifiably clean capping soils, the Contractor will employ all reasonable measures to ensure segregation of the of the contaminated and clean soils. Similarly, the Contractor shall employ all reasonable measures to prevent cross contamination during the handling of the clean and contaminated soils particularly during the loading and movement of wagons.

5.2.14 Should unexpected contamination be encountered during development that has not been identified previously during the ground investigations, then the Supervising Engineer shall be notified immediately and the works in the affected area of the site suspended until the Supervising Engineer has carried out an inspection and made appropriate recommendations.

5.2.15 Should it be necessary to excavate and dispose off-site contaminated soil in order to facilitate the required thickness of clean soil and maintain ground levels, then the Contractor shall supply the Supervising Engineer with details of the receiving landfill site. On completion of the disposal of the contaminated soil, the Contractor shall provide the Supervising Engineer with the waste consignment notes.

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5.2.15 Should it be necessary to excavate and dispose off-site contaminated soil in order to facilitate the required thickness of clean soil and maintain ground levels, then the Contractor shall supply the Supervising Engineer with details of the receiving landfill site. On completion of the disposal of the contaminated soil, the Contractor shall provide the Supervising Engineer with the waste consignment notes.

5.3 Gas Protection to Dwellings

5.3.1 Joynes Pike and Associates are currently undertaking an extended gas monitoring period on the site and will make recommendations on the findings.

5.3.2 Basic radon gas protective measures are required on this site. Accordingly membranes must, as a minimum, be appropriate to prevent ingress of both radon and carbon dioxide.

5.3.3 In order to prevent cold bridging and damp penetration above the membrane, a cavity tray should be incorporated above the membrane.

5.4 Supervision

5.4.1 The Contractor is to provide a competent representative on site for the duration of the Works to liaise with the Supervising Engineer and Employer to provide all necessary supervision to produce workmanship to the complete satisfaction of the Engineer. The Contractor must also provide adequate engineering staff to ensure accurate quality control. The Contractor's staff and Sub-Contractors must have had experience of similar works. The Contractor is to notify the Engineer in writing of the identity of his representative. All excavations must have a suitable banksman.

5.5 Disposal of Solids

5.5.1 The Works will generate potentially hazardous materials.

5.5.2 Before any contaminated material leaves the site, the Contractor shall satisfy the Engineer that the disposal operation will not breach the Waste Management Duty of Care (1991) requirements of the Environmental Protection Act 1990. In addition the Contractor shall ensure that the disposal operation is carried out in accordance with the requirements of the appropriate Local Authorities and Environment Agency.

5.5.3 Loading of vehicles shall be performed in an organised manner so as to prevent the spread of contaminants. All vehicles are to be sheeted and clean prior to leaving the site. The Contractor shall take all reasonable and applicable measures to prevent the escape of material during transportation.

5.5.4 The Contractor shall provide the Engineer with the following details of appropriately licensed disposal site(s) to which wastes are to be transferred atleast one week in advance to disposal:

- Name, address and telephone number of disposal site and contact name;

- Extract of disposal site Waste Management Licence confirming that the waste may be accepted;

- Name, address and telephone number of the appropriate Environment Agency office;

- Copy of consignment note for each load of material carried off site including proof of receipt of material at an appropriate landfill site.

5.5.5 No waste shall be disposed of until the Engineer has given written prior approval, and is satisfied that the site is properly licensed to receive the waste.

5.5.6 Should asbestos be encountered within excavation arisings then the materials should be assessed by a suitable engineer from Joynes Pike and Associates as to whether it requires removing from site as a special waste.

5.6 Highways

5.6.1 For the majority of the site, internal development roads, car parking, drives and paths will be constructed on proof rolled medium dense sand or deeper excavations backfilled with a compacted engineered granular material in accordance with section 5.2.5. Settlement potential in these areas will be minimal and construction should be based on a CBR value of between 2% and 5%.

5.6.2 Where adoptable roads cross the former landfill, construction details should be agreed with the Local Authority Highways Department. This will involve proof rolling of the excavation and where necessary, due to either unacceptable exposed material or deflections, localised excavation of the landfill material and where necessary screening out of deleterious material and crushing of any oversized material before re-use of the granular product to re-instate the excavation. It is anticipated this will be carried out to a maximum depth of 2.0m and an average of 1.5m below existing levels dependant upon the results of proof rolling.

6.0 HEALTH AND SAFETY

6.1 The Contractor shall be responsible for ensuring that the remedial works activities, whether on or off the site, are carried out in full compliance with the appropriate health and safety legislation, at current amendments, and with the appropriate guidance documents and approved Codes of Practice published by the Health & Safety Executive. Relevant legislation and guidance includes, but is by no means limited to the following (together with any amendments or updates):-

- BS 6187 Code of Practise for Demolition;
- Health and Safety at Work Act 1974;
- Management of Health and Safety at Work Regulations 1992;
- Construction (Design and Management) Regulations 1994;
- Control of Substances Hazardous to Health Regulations 1988;

- Health and Safety Executive Report Ref. HS(G)66 'Protection of the workers and the general public during the development of contaminated land' 1994;
- The Construction (Health, Safety and Welfare) Regulatations 1996.

6.2 The Contractor should be aware of the potentially contaminated nature of the Made Ground at the site and a high standard of health and safety awareness should be adopted in order to protect the health of wokers and the general public. The Contractor shall therefore implement the appropriate precautions given in the HSE report HS(G)66 entitled 'Protection of workers and the general public during the redevelopment of contaminated land'. A 'decontamination unit' will be required during the removal of any heavily contaminated materials (this should not be a major issue on this site apart from the potential risk of asbestos containing materials within the landfill backfill).

6.3 The remedial work shall be carried out with the minimum amount of disturbance and inconvenience to the neighbouring occupants and the general public. The site should be securely fenced from the general public to prevent unauthorised access or trespassing. Any excavations should be fenced off, labelled and covered if left open overnight.

6.4 The Contractor shall take all measures necessary to suppress the emission of dust and odours during the remedial works to minimise nuisance to neighbouring occupants and the general public.

6.5 A Health and Safety Plan for the Works shall be developed by the Contractor. No works will be permitted until an adequate plan has been submitted to the Planning Supervisor.

7.0 CONSTRAINTS

7.1 General

7.1.1 The work will be carried out to ensure minimum disturbance and inconvenience both to the general public and the commercial business of Ben Bailey Homes Limited. The site will be fully fenced prior to commencement of site works. The Contractor will be required to ensure all works and equipment do not present a hazard to persons on site. All equipment must be adequately labelled and the working areas of any excavations are to be fenced to ensure hazardous areas are clearly identified. The Principal Contractor will be required to produce a detailed Health and Safety Plan including method statements and risk assessments for the proposed site remediation works and only the critical issues with regard to potential environmental impacts are noted below.

7.2 Hours Of Working

7.2.1 Normal working hours will be 7:30 to 18:00 Monday to Friday and 7:30 to 13:00 Saturday unless otherwise instructed by the Planning Authority. No Sunday working is allowed. Access outside these hours will be available but only for emergency activities. During the winter months, the above times may be reduced.

7.3 Site Access

7.3.1 Access to the site is likely to be Hough Lane. Care shall be given to ingress and egress from the site onto the main carriageway and consideration given to other road users.

7.4 Traffic Management

7.4.1 The Contractor, his Sub-Contractor, his Sub-Contractors and Suppliers shall comply with any requirements for the routing of their vehicles. The Contractor shall erect and maintain in good condition signs of a type approved by the Engineer giving effect to these routing requirements.

7.4.2 The Contractor will maintain suitable access to the site at all times. Road signs will be provided by the Contractor on all access points, warning of the site access. The type, size, number and location of the signs shall be in accordance with Chapter 8 of HMSO Traffic Signs Manual and shall be agreed with the Highways Authority. All necessary signs must be erected prior to commencing works.

7.4.3 All vehicles on site will be driven in an appropriate and safe manner and will be parked in appropriate areas. Visitors to the site will park vehicles in a designated area and only vehicles authorised to be on site will be allowed past the designated parking area. All vehicles which leave the site will be checked and if required subject to wheel cleaning operations to ensure that

the highways are kept in an acceptable condition. The Contractor will take all steps necessary to prevent and if required remove any mud, debris or spoil resulting from the works being deposited on the roads, adjacent to or approaching the site, to the satisfaction of the Highways Authority. Where required sheeting facilities should be provided along with cleaning facilities for wheels. All vehicles leaving the site will be authorised to do so, if suitable, by the Site Checker / Gateman employed by the Contractor. Leakage from the lorries will not be allowed. Vehicle movements within the site will be controlled to minimise the coating of wheels / tracks with excavated arisings, particularly in areas of contaminated materials they will be cleaned prior to moving into adjacent uncontaminated areas leaving the site.

7.4.4 In the event of the Highway becoming contaminated with site arisings, vehicle movements will be suspended until the surface has been cleaned. Repeat occurrences will require vehicle movements to be suspended until more adequate wheel cleaning facilities are in place. Public highways adjacent to the site should be inspected daily during the works to ensure that cleanliness is being maintained at an acceptable standard.

7.4.5 Any restrictions to commercial vehicle movements during ground remedial works to and from the site will be managed by the Contractor in accordance with any stipulations made by the relevant regulatory bodies.

7.5 Utilities Apparatus

7.5.1 Details of approximate locations shall be determined on site and are the sole responsibility of the Contractor. Liaison and consultation with the relevant service utility companies will be required to ensure the locations of all live services are known and the necessary procedures of working are followed. The Contractor will be required to consult with the appropriate service utility company.

7.5.2 The Contractor will arrange to make good, at their own expense any damage whatsoever to existing services or statutory equipment to the complete satisfaction of the Employer and the undertaker concerned, and shall keep the Employer indemnified at all times from claims in connection with such damage. All live services and equipment, which are encountered in the course of excavation shall be adequately supported and protected from damage until re-routing or other appropriate measures are agreed with the relevant statutory undertakers. Redundant services are however expected to be removed or adequately sealed.

7.5.3 An adequate number of fire extinguishers will be provided by the Contractor in appropriate areas. All necessary equipment will be fitted with spark arrestors.

7.5.4 The site is to be a 'No Smoking' area outside welfare facilities.

7.5.5 The Contractor will take appropriate precautions to protect and prevent damage to properties, utilities and surface structures, either fixed or otherwise, on or adjacent to the site in or through which works and works activities will be executed, and indemnify the Employer against all claims in connection thereto. Damage shall be promptly made good where appropriate at the Contractor's expense and third party claims shall be promptly dealt with accordingly by the Contractor.

7.5.6 The Contractor shall, where required, provide evidence of all insurances relating to works on or associated with statutory undertakers sevices.

7.6 Health & Safety

7.6.1 The Contractor will make sufficient allowances, and will allow sufficient time in this programme to fulfil the relevant European Directives and U.K. Health and Safety Regulations. The works will be undertaken in accordance with The Construction (Design and Management) (Ammendment) Regulations 2000 (CDM). All visitors to the site will be required to undergo a site induction by the Contractor at the time of their visit and will be required, for every visit to sign the visitors book prior to entry and on exit from the site.

7.7 Temporary Works

7.7.1 The Contractor is responsible for the stability of all existing or surrounding trees, roads, sewers, embankments, buildings and structures, which are adjacent to, and may be adversely affected by the works, from the date of possession of the site until practical completion of the remediation works. Where works are to be carried out by separate contractors, the appropriate responsibilities will be borne by the relevant contractor. The Contractor will advise the overseeing organisation before commencement of the works of his proposals for any necessary supports and sequence of construction of the reclamation proposals. In addition, all temporary works will be inspected on a regular basis by the Principal Contractor.

7.8 Dust and Odour Control

7.8.1 During the works, dust suppression may be required during dry conditions. Appropriate actions will be taken by the Contractor to minimise any dust generation.

7.8.2 Daily records will be kept by the Contractor of noticeable odours at the perimeter of the site, particularly in the vicinity of occupied properties to the east, south and west. During periods of settled weather, it may be necessary for dust and odour suppression, however apart from the remote possibility in the far north western area of the site, odourus material should not pose a problem. When and if necessary suppression units may need to be employed to minimise and / or mask or neutralise any odours.

7.9 Noise Control & Vibration Control

7.9.1 The Contractor will employ all practicable means to minimise noise produced by site operations including plant maintenance and shrouding in compliance with the recommendations in BS 5228 : 1997 Guide to noise and vibration control on construction and open sites. The Contractor will liaise with the local Environmental Health Officer as to the noise restrictions to be complied with.

7.9.2 All vehicles and mechanical plant used on the site will be fitted with effective exhaust silencers and shall be maintained in good and efficient working order for the duration of the works and comply with the requirements of BS 5228.

7.9.3 Machines in intermittent use will be shut down in periods between work or adjusted to a minimum noise and nuisance level. The Contractor will remove from site all items of plant which are ineffectively silenced.

7.9.4 All compressors will be 'sound reduced' models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with mufflers or silences of the type recommended by the manufacturers. Pumps and mechanical static plants will be enclosed by acoustic sheds or screens in accordance with BS 5228.

7.9.5 The Contractor will comply with the requirements of the Environmental Health Officer with regard to the control of vibration.

7.10 Complaints From The Public

7.10.1 The Contractor will instruct his staff to respond courteously to all complaints from the public and will immediately rectify any matter giving reasonable grounds for complaints that lie within his jurisdiction. All matters of complaint shall be immediately reported to the overseeing organisation and a log will be kept on site of all such complaints together with action taken.

7.11 Fencing

7.11.1 The Works area is to be bounded off by fencing at all times. Heras fencing must be provided to protect the unprotected boundaries and should be left by the Employer at the end of the Works. Additional fencing will also be required to maintain security and define safe zones. All excavations deeper than 1.0m should be surrounded by Heras fencing or similar or to be bounded by bright orange coloured plastic mesh fencing held securely in place by steel road pins.

7.12 Materials & Workmanship

7.12.1 All materials used in the proposed contract shall be in accordance with the relevant British Standard where such exist. Where possible, materials shall

be obtained from manufactories licensed to use the British Standards Institution Certification Trademark. All materials will be of good quality and suitable for the required purpose. Where reference to British Standards are made, the latest edition applies together with subsequent amendments.

7.13 *Materials For Restoration*

7.13.1 Materials used to repair or renew any existing features damaged as a result of the works shall, as far as possible, be visually identical to the original and also be of no lower quality compared to the original.

7.14 Temporary Storage of Fuels

7.14.1 Any facilities for the storage of oils fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound should be at least equivalent to the capacity of the tank plus 10%. If there is multiple tank leakage, the compound should be at least equivalent to the capacity of the largest tank, or the combined capacity of interconnected tanks, plus 10%. All filling points, vents, gauges and sight glasses must be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipework should be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets should be detailed to discharge downwards into the bund.

7.15 Welfare Facilities

7.15.1 The Contractor will be responsible to provide suitable and adequate welfare facilities including suitable health and safety facilities. In addition, a fully furnished cabin with fax machine will be required for the Supervising Engineer and visitors.

7.16 Existing Boreholes and Services

7.16.1 All services to remain should be located and protected by all reasonable and practicable means. Any damage occurring shall be rectified by the Contractor at the Contractor's own cost.

7.16.2 There are a number of boreholes that require further gas monitoring and these should not be destroyed until the monitoring period has finished.

7.17 Contaminated Materials Arisings

7.17.1 Any contaminated materials including excavated / abstracted contaminated soils, or liquids will be the responsibility of the Contractor. Any such materials should be abstracted / excavated, stored and disposed of in accordance with all relevant regulations and with due regard for good working practices ensuring no unauthorised escape of materials either into the ground, surface water or atmosphere. Disposal will be in strict accordance with Duty of Care Regulations and the Contractor will notify the

Supervising Engineer of the proposed carrier and treatment / disposal facility prior to removal of any materials.

7.18 Consents, Agreements & Licenses

7.18.1 The abstraction, treatment and disposal of solids and liquids shall comply with the requirements of the Environment Agency together with relevant legislation. The consents and agreements will be responsibility of the Contractor. All other necessary consents or approvals shall be obtained by the Contractor prior to commencement of site works (if necessary).

We trust the above is suitable for your present requirements. We would be pleased to discuss the issues further as required. Please do not hesitate to contact us if you require further assistance in these matters.

For and on behalf of Joynes Pike & Associates Limited

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DRAWINGS

NOTES

1. DO NOT SCALE
2. This drawing is to be read in conjunction with all other relevant drawings.
3. Should there be any conflict between the details indicated on this drawing and those indicated on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings and details issued are PRELIMINARY and NOT FOR CONSTRUCTION. Should the contractor commence site work prior to approval being given, it is entirely at his own risk.
5. All dimensions are in millimetres unless otherwise stated.

A4

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DRAWING STATUS

INFORMATION

DESCRIPTION	REV	DATE	CHKD	APP

CLIENT
BEN BAILEY HOMES LIMITED

PROJECT TITLE
WOMBWELL FOUNDRY, HOUGH LANE, WOMBWELL

DRAWING DETAIL
SITE LOCATION PLAN

DRAWN	JSP	DATE	FEBRUARY 2006
PROJECT ENGINEER	DRS		
CHECKED		SCALE	1:25000
APPROVED			
DRAWING NUMBER	232095-07	REVISION	

Appendix A
Environmental Acceptability Criteria

ACCEPTANCE CRITERIA FOR THE IMPORTATION OF SOILS TO THE SITE OR USE OF SITE GENERATED MATERIALS AS COVER LAYER

Determinand	Maximum Acceptable Soil Concentration (mg/kg unless otherwise stated)
Arsenic	20[1]
Cadmium	1 at pH 6[1] 2 at pH 7[1] 8 at pH 8[1]
Chromium	130[1]
Copper	8000 [4]
Lead	450[1]
Mercury (inorganic)	8[1]
Nickel	50[1]
Zinc	8500[4]
Selenium	35[1]
Boron (water soluble)	130[4]
pH	<5 and >9 pH unit
Phenols	78
Sulphate	0.24%[5]
Water Soluble Sulphate	1.0g/l[5]
Speciated PAH	[2]
Speciated TPH by CWG	[3]
Asbestos	0.01[7]
FOC	[6]
BTEX	[3]

Notes:

(1) Soil Guideline Value 'Residential with Plant Uptake'.

(2) Speciated PAH to be compared to JPA In house trigger concentrations Version 6, December 2005.

(3) TPH to be speciated by Criteria Working Group and compared to JPA In house trigger concentrations Version 6, December 2005.

(4) Value derived by Sniffer and part of JPA In house trigger concentrations Version 6, December 2005.

(5) Protective of building materials in line with BRE Special Digest 1, 2005.

(6) Fraction of Organic Carbon, to be used in conjunction with Version 6, December 2005.

(7) Asbestos containing materials (ACM's): At this time there is no definitive guidance on what level of asbestos in soil might be considered as suitable for use. If the asbestos content is equal to or greater than 0.1% w/w (1000 mg/kg) then the material is classified as Hazardous Waste. Material containing less than 0.1% w/w (10 mg/kg). Imported and/or potential source materials should be rigorously inspected for the presence of ACM's during suitability testing. Site specific liaison with Environment Agency (Waste Management Licensing) and Local Authority (Human Health) may be required.

Example: Hazardous Waste Perspective – A 1kg soil sample containing a single piece of cement material weighing 10g and containing 12% v/v Chrysotile (White) would be equal to the 0.1 w/w Hazardous Waste limit.

APPENDIX B
JPA Consolidated Report

Your Ref:

Our Ref: DRS/RMB/232095.20051540

02 February 2006

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CONSOLIDATED GEO-ENVIRONMENTAL INVESTIGATION REPORT

For

BEN BAILEY HOMES LIMITED

On a Site at

FORMER WOMBWELL FOUNDRY, HOUGH LANE, WOMBWELL, BARNSLEY, SOUTH YORKSHIRE

JPA
JOYNES PIKE
& ASSOCIATES LTD

BEN BAILEY HOMES LIMITED

LAND AT FORMER WOMBWELL FOUNDRY, HOUGH LANE, WOMBWELL, BARNSLEY

JOB NUMBER: 232095		DOCUMENT REF: DRS/RMB/232095.2005		
Status	Originated	Reviewed	Authorised	Date
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232095-07	Site Location Plan
JPA/10-05-0883/101	Utilities Survey

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EXECUTIVE SUMMARY

Wombwell Foundary, Hough Lane, Wombwell

Location:	The site in its entirely covers approximately 6.5 hectares in area is centre on National Grid Reference SE 3898 0237.
History:	The site has had two major previous uses which included a foundry and landfill. There was also a well noted to be on site.
Geology & Hydrogeology:	The underlying geology is the Middle Coal Measures in particular the Wooley Edge Rock in the north of the site. The underlying strata are classified as a minor aquifer.
Environmental Considerations:	There is one landfill located on the site with an additional site within 250m of the site and one 250 – 500m from the site. There is one discharge consent within 500 – 1000m from the site.
Mineral Extraction:	There is one unnamed coal seam known to cross the site. The property is within the likely zone of influence on the surface from recorded workings in 3 seams of coal between 90m to 530m depth, the last date of working being 1980. The Coal Authority Report states that ground movement from the past coal workings should by now have ceased. The site does not lie within an area of present or future underground coal mining. The property is not within the boundary of a past, present or future opencast site. There are no recorded mineshafts on or within 20m of the site. The possibility of encountering an un-recorded mineshaft cannot be discounted, although it is considered unlikely.
Ground Conditions:	MADE GROUND; Concrete, foundry sand, ash, clinker, slag and possible asbestos This overlays natural CLAY and subsequently natural BEDROCK.
Contamination Summary:	Contamination was identified within all types of MADE GROUND found on site.
Foundation Design:	Foundations shall be a combination of strip/trench footings, rafts and piles as follows; Strip/trench footings on the periphery. Raft foolings on the area formally covered by the foundry buildings following re-engineering of the fill materials. Pile foolings on the area of a former landfill along with the

	areas of deep trenches.
Floor Slab Design:	Suspended ground floor slabs with gas protection measures.
Remedial Measures:	Suitable decommissioning and removal of all identified above and below ground storage tanks across the site with validation testing of the bases. Decommissioning of the substation with validation testing of the base. Grubbing up of all hardstanding. This material should be crushed, screened and reused subject to appropriate chemical contamination testing and approval from the local authority. The general MADE GROUND will be suitable for reuse on site except for within proposed garden areas (unless suitably capped) due to some elevated contaminants. It is recommended that these materials are re-used beneath drives, pathways and other hardstandings. Where MADE GROUND is present in rear gardens a 600mm capping should be provided incorporating a 150mm hard to dig layer at its base and 225mm of topsoil. This is likely to be required in the majority if not all of the proposed rear gardens.

A. FACTUAL INFORMATION

1.0 INTRODUCTION

1.1 This report describes a geo-environmental investigation undertaken on behalf of Ben Bailey Homes Limited on a site at Former Wombwell Foundry, Hough Lane, Wombwell, Barnsley, South Yorkshire.

1.2 This investigation has been carried out knowing that the site is to be developed with residential properties including apartments of traditional 2 and 3 storey constructions with associated communal landscaped areas and private gardens.

1.3 This report has been prepared by Joynes Pike & Associates Limited with all reasonable skill, care and diligence within the terms of the Contract with the client Ben Bailey Homes Limited, and taking account of the information made available by the client, as well as the manpower and resources devoted to it by agreement with the client.Joynes Pike & Associates Limited disclaims any responsibility to the client and others in respect of any matters outside the scope of the above Contract.

1.4 The objectives of the investigation were to obtain information relating to the ground and groundwater conditions at the site in order to determine suitable methods of design and construction for foundations, floor slabs and roads etc, for the proposed development and to enable formulation of an appropriate remediation strategy in the context of development proposals.

1.5 This report has been produced on behalf of The Client, Ben Bailey Homes Limited, and no responsibility is accepted to any Third Party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of Joynes Pike & Associates Limited. If any unauthorised Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

1.6 The findings and opinions conveyed via the desk study information and Johnson Poole and Bloomer Ground Report within this report are based on information obtained from a variety of sources, as detailed, which Joynes Pike & Associates Limited believes are reliable. Nevertheless, Joynes Pike & Associates Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon from these sources.

1.7 Whilst this report may express an opinion on the possible configuration of (strata, contaminants or gases) between or beyond exploratory hole positions or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only, and no liability can be accepted for its accuracy.

1.8 The comments on groundwater and ground gas conditions are based on observations made at the time of the investigation and those previously reported from third parties. It should be noted, however, that groundwater and ground gas levels may vary from those reported due to seasonal or other effects.

1.9 Although every effort has been made to position exploratory holes in the least sensitive areas of the site, exploratory hole positions were located approximately as part of this investigation and no guarantee can be given as to their accuracy. Consideration should be given to the possibility that exploratory holes excavated as part of this investigation, and indeed any previous ground investigation work by others, may be encountered beneath or within the influence of individual foundations. JPA cannot be held responsible for failure of excavations or structural failures caused by the location of foundations of any form of structure within the influence of exploratory holes.

1.10 *Existing manhole covers were not lifted and drainage runs were not inspected* during the course of this ground investigation. However a full service and utility survey and post demolition topographical survey has been carried out by Tower Surveys Limited prior to the site investigation works being carried out and should be read in conjunction with this report.

1.11 The site plans enclosed in this report should not be used for scaling purposes

1.12 Johnson Poole and Bloomer have undertaken a Closure Report to surrender the Waste Management Licence for the former landfill present on site. No reference or comment is made in relation to this within this report.

2.0 THE SITE

2.1 Location & Access

2.1.1 The site in its entirety covers approximately 6.5 hectares in area and is centred on National Grid Reference SE 3898 0237.

2.1.2 At the time of both the original and further investigation, access to the site was gained via the main entrance gates off Hough Lane. A further two access points are present on Hough Lane and one locked access gate is present at the roundabout on the A9195 Dearne Valley Parkway.

2.2 Site Description

2.2.1 At the time of the JPB investigation the site was occupied by several of the foundry buildings. These were subsequently demolished to ground floor slab level apart from the electricity substation. It was observed that this electricity substation has asbestos containing materials present within its construction.

2.2.2 During the further investigation works carried out by Joynes Pike and Associates it was observed that approximately one third to one half of the site comprised several flat concrete areas (the former foundry building bases and floor slabs) with the rest of the site being scrub land and areas of semi-mature to mature trees. The concrete bases are at various topographical levels as shown on the attached topographical survey.

2.2.3 The site is bound to the north by Hough Lane beyond which is an existing Ben Bailey Homes Limited development. To the east the site is partially bound by existing industrial premises and partially by open fields, to the south are open fields and to the west is an operational railway.

2.2.4 The only retaining structure noted on site was a wall to the north east of the site bounding the works beyond. This retaining structure was previously part of a foundry building and as such will require a survey and possible remedial measures.

2.2.5 The site generally slopes away from Hough Lane to the south west and the site is currently terraced from the northern boundary to the southern boundary.

3.0 DESK STUDY

3.1 Sources of Information

3.1.1 The following sources of information have been consulted as part of the desk study for the site;

(a) JPA archives
(b) Environmental database report
(c) British Geological Survey 1:50,000 Sheet 87 'Barnsley' and 1:10,560 sheet 283 NW.
(d) BRE 211 – Radon, guidance on protective measures for new dwellings
(e) Law Society Guidance Notes and Directory for Coal Mining Searches
(f) Selected County Series and Ordnance Survey plans
(g) Johnson Poole and Bloomer Land Consultants (JPB), Ground Investigation Report Ref. DS074-46/SW dated 05 February 2004.

3.2 Site History

3.2.1 The history of the site is recorded over selected periods by the maps inspected, copies of which are supplied in the JPB report in Appendix A. The account presented in this report is restricted by specific time periods represented by these maps only.

3.2.2 Key dates in the development of the site and its environs are summarised below;

Feature	Location	Maps
Wooded areas	On site	1851-1929
Well	On site	1892
Railway	West of site	1901
Foundry	On site	1929 - 2000
Infilling to south of site	On Site	1961 – 2000

3.2.3 In summary the site has been a foundry since around 1929 with residential development taking place to the north and east of the site.

3.3 Geology, Hydrogeology and Hydrology

3.3.1 According to the inspected published geological information, the site is not underlain by any superficial deposits.

3.3.2 The solid strata in the south western half of the site is shown to be Middle Coal Measures comprising mudstones, siltstones and sandstones. The north eastern half of the site is shown to be the Woolley Edge Rock. There is an unnamed coal seam believed to cross the northern section of the site. These

strata are likely to be overlain by a thickness of weathered materials derived from the underlying bedrock.

3.3.3 According to Environment Agency Groundwater Vulnerability Map Sheet 11 'South Pennines', the site is shown to be underlain by strata which represent a Minor Aquifer of low leaching potential. This means that the soils have good or some ability to attenuate/diffuse source pollutants, which cannot as a result move readily to the underlying groundwater.

3.3.4 There is one partially culverted watercourse which crosses the site in an adit and exits in the southern area, as shown on the utility survey by Tower Surveys.

3.4 *Mineral Extraction*

3.4.1 A Coal Authority Mining Report was commissioned for the site by JPB and is attached within their ground investigation report.

3.4.2 The property is within the likely zone of influence on the surface from workings in 3 seams of coal between 90m to 530m depth, the last date of working being 1980. The Coal Authority Report states that ground movement from the past coal workings should by now have ceased.

3.4.3 The site also lies in an area where coal is believed to exist at or close to the surface.

3.4.4 The site does not lie within an area of present or future underground coal mining.

3.4.5 The property is not within the boundary of a past, present or future opencast site.

3.3.6 There are no recorded mineshafts on or within 20m of the site. The possibility of encountering an un-recorded mineshaft cannot be discounted, although it is considered unlikely.

3.5 Environmental Considerations

3.5.1 Specific details relating to the environmental setting of the site are presented within the environmental database report included within Appendix A. The salient issues which relate to the site are summarised as follows:

3.5.2 The Technical Report has identified one current and one former landfill within 250m of the site. It has also identified one current landfill between 250m and 500m and one former landfill between 250m and 500m. These landfills were licensed to accept industrial type wastes and difficult types of waste.

3.5.3 The landfill known to be present on the site was observed during the site walkover and subsequently the waste management license associated with this has succesfully been handed back to the Environment Agency after a consultation and monitoring period.

3.5.4 There is also one landfill located between 500m and 1000m of the site boundary. The waste types deposited here are unknown.

3.5.5 There is one discharge consent between 500m and 1000m for the purposes of site drainage.

3.5.6 There are no other features contained in the report which are pertinent to the redevelopment of the site.

3.6 Radon

3.6.1 The Building Research Establishment (BRE) has revised and updated BR211 'Radon: guidance on protective measures for new dwellings', with an edition, published in late December 1999 which is now in effect.

3.6.2 The revised BR211 provides a staged framework to determine whether radon protective measures should be afforded to dwellings, as follows:

Annex A; Maps of areas where basic or full protection should be provided,

Followed by,

Annex B; Maps of areas where a geological assessment should be carried out.

The site lies in an area requiring a BGS Geological Assessment Report.

3.6.3 The Geological Assessment Report has been obtained and states that basic radon protection measures are required for the site. The report is included as Appendix E.

3.7 Asbestos

3.7.1 A full Type 3 Asbestos Survey was undertaken by JPB.

3.7.2 The electricity substation still present on site was not fully accessed during the asbestos survey because of live equipment.

3.7.3 It is recommended that if the substation is decommissioned that a Type 3 Asbestos Survey should be carried out prior to demolition.

3.7.4 The landfill on site was licensed to and is known to have accepted asbestos containing materials and therefore it is likely that there will be asbestos materials within the landfill material.

4.0 PRELIMINARY CONCEPTUAL SITE MODEL

4.1 Potential Sources of Contamination

4.1.1 The following potential on site sources of ground contamination have been identified:

- Previous use of site as a foundry and all associated processes.
- Made Ground present on site arising from foundry uses.
- Landfill present on site and importation of materials including asbestos.
- Spillage and leakage of oil/diesel or chemicals from the tanks/drums on site and previously present on site.
- Maintenance of equipment and vehicles on site.
- Potential contamination of soils with asbestos during the demolition of buildings.
- Substation present on site which may give rise to contamination.

4.1.2 The following potential off site sources of ground contamination have been identified.

- Construction of adjacent railway line.

4.1.3 A preliminary pre-development conceptual site model has been produced (drawing 232095-04) based on the suspected ground conditions from the desk study.

4.2 Receptors of Contamination and Migration Pathways

4.2.1 Receptors are defined as human or non-human organisms that have the potential to experience adverse effects from direct or indirect exposure to contaminated material.

4.2.2 Migration pathways are defined as the courses chemicals take from a source to an exposed organism or receptor. The exposure pathway can be direct (ie stays within the same exposure media) or indirect transport from one medium to another takes place.

4.2.3 The following potential human health and environmental receptors have been identified:

- Future site occupants
- Site construction and maintenance workers
- Neighbouring occupants

4.2.4 The following potential migration pathways have been identified:

- Inhalation

  Breathing dust and vapours from contaminated soil in outdoor air. Vapours can also migrate into buildings resulting in inhalation by the occupants.

- Ingestion

  Eating and swallowing of contaminated soil and/or groundwater either by deliberate consumption, indirectly by eating or smoking with dirty hands or by ingestion of fugitive dust.

- Dermal Contact

  Direct contact with contaminated soil and groundwater, causing skin conditions such as dermatitis etc. Certain contaminants can be absorbed into the body through the skin or enter directly through open cuts or abrasions

- Migration of Contaminated Water

  Contaminated groundwater can migrate laterally or vertically dependent on permeability, preferential pathways, man-made voids etc.

- Leaching

  Infiltration of water through soil can leach out soluble contaminants resulting in groundwater pollution.

- Leaking Tanks, Pipelines and Drains

  Hydrocarbon based contaminants can leak due to cracks in tanks, pipes and drains and spillages can occur during tank filling operations. Escaped hydrocarbons can significantly impact surrounding soil and groundwater.

- Aggressive Attack

  Building materials can be damaged by direct contact with aggressive ground conditions, for example sulphate attack on concrete and hydrocarbon attack on plastics.

4.3 Source-Pathway-Receptors Relationships

4.3.1 A summary of the preliminary post-development conceptual site model is provided in drawing 232095-05. This is based on the information to date that consists of the desk study and has been revised with remedial options shown following completion of the site investigation in section 9.3.

4.3.2 The following potential Source-Pathway-Receptor relationships have been identified for the site bearing in mind the development proposals;

Source	Pathway	Receptor
Contaminated soil	Ingestion Dermal contact Inhalation (outdoor air)	Construction workers Future occupants
Contaminated soil	Inhalation (indoor air)	Future occupants
Contaminated soil	Leaching	Groundwater
Contaminated soil	Aggressive attack	Building materials
Former drums/ tanks, machinery maintenance	Leakage	Soil and groundwater
Substation	Leakage	Soil

5.0 INVESTIGATION METHODOLOGY

5.1 Objectives

5.1.1 Two phases of investigation have been undertaken on the site. The first phase was undertaken by Johnson Poole and Bloomer with full time supervision by Joynes Pike and Associates, with the second phase of works being undertaken solely by Joynes Pike and Associates (following demolition of the foundry buildings). The objectives of the investigation were to address the following;

- Determine geotechnical and environmental issues relating to the site in particular with relation to a residential end use.

- Full utility survey to trace all previous services due to the nature of the site and private ownership, including the attempt to trace the culverted watercourse present on site.

5.2 Clearance of Underground Services

5.2.1 Before the second phase of intrusive works were undertaken a full utility survey was undertaken by Tower Surveys Limited. The positions of exploratory holes were then scanned with a cable avoidance tool (CAT) prior to excavation.

5.3 Site Works

5.3.1 In total 39 trial pits, 19 rotary open holes, 15 windowless sampler boreholes and 9 shell and auger boreholes have been undertaken across the site in two separate phases of investigation as detailed below;

PHASE 1 – Johnson Poole and Bloomer, between 29 September and 13 October 2003.

14 trial pits to depths of between 1.5m (begl) and 4.6m (begl).

9 shell and auger boreholes to depths of between 4.5m (begl) and 9.0m (begl).

15 windowless sampler boreholes to depths of between 0.65m (begl) and 5.0m (begl).

4 rotary open holes to depths of between 15.0m (begl) and 30.0m (begl).

PHASE 2 – Joynes Pike and Associates, 23 December 2005, concentrated on the area formally dominated by the foundry buildings. The concrete base depths were determined and the majority of the internal pits were excavated with the depths of the bases proved.

25 trial pits to depths between 0.1m (begl) and 4.5m (begl).

15 rotary open holes to depths of between 1.20m (begl) and 20.0m (begl).

5.3.2 The approximate locations of the exploratory holes are shown on the appended Drawing No. 232095-03 with the JPA exploratory trial pit and borehole logs are presented in Appendix B and C respectively. JPB logs are enclosed within their ground report enclosed within Appendix A.

5.3.3 Disturbed samples were taken during the first phase of investigation at selected intervals from the strata encountered by a representative of JPB. These were placed in appropriate containers and submitted for geotechnical and chemical testing.

5.3.4 Standard Penetration Tests (SPT's) were undertaken at regular intervals within the cable percussion boreholes and windowless sampler boreholes to provide 'N' values for empirical assessment of strength and density parameters.

5.3.5 Gas/groundwater monitoring standpipes were installed within selected JPB boreholes. The standpipes were constructed using slotted pipe within a gravel surround and bentonite seal near surface, and fitted with a gas tap assembly at ground level suitable for connection to propriety gas monitoring equipment. A stop cock box was placed to provide protection at ground level.

5.4 Chemical Laboratory Testing

5.4.1 As part of the assessment for potential contamination at the site, soil samples were subjected to appropriate chemical analysis by JPB at their preferred UKAS accredited laboratory. Following statistical analysis by JPA following the initial phase of testing it was deemed that further chemical testing would not be required as suitable data sets already existed for the various material types to assess the material in accordance with current guidance (CLR 7).

5.4.2 In total 43 samples of representative strata were sent for a general suite of determinands.

5.4.3 Results of the chemical testing undertaken by JPB are presented in Appendix A.

5.5 Geotechnical Laboratory Testing

5.5.1 Representative samples were submitted by JPB to an approved and accredited laboratory and the following tests scheduled to determine soil properties as related to foundation design and construction:

- Natural Moisture Content
- Plasticity Index Analysis
- Particle Size Distribution
- Particle Density Tests
- Compaction tests using a 2.5kg rammer

5.5.2 Results of the geotechnical testing are presented in Appendix A.

5.6 Gas/Groundwater Monitoring

5.6.1 Monitoring of gas and groundwater levels has been undertaken over a one year period within the JPB installations since completion of the site work.

5.6.2 Measurements of concentrations of methane, carbon dioxide, oxygen, carbon monoxide and hydrogen sulphide carried out by JPB were taken using an Infra Red Gas Analyser.

5.6.3 Atmospheric pressure, gas flow rates and groundwater levels were also recorded on each occasion.

5.6.4 Results of the monitoring are presented in Appendix A within the JPB Ground Report.

6.0 RESULTS OF THE INVESTIGATION

6.1 Strata Encountered

6.1.1 The ground conditions beneath the site was predominantly very similar to that previously encountered, reported within the JPB report. The MADE GROUND encountered in the further investigation ranged from 1.2m to 4.0m below existing ground level. The predominant MADE GROUND generally comprised foundry sand with ash, clinker and slag gravel. Where the former foundry buildings were located there was a thickness of concrete, reinforced in places. The concrete bases were generally up to 0.3m in thickness with the exception of the slab encountered in TP8A where the gable end was proved to have a footing up to 2.0m thick. It may be prudent to assume that the other concrete footings on site have similar footings on the gable walls with the rest of the bases being up to 0.3m thick

6.1.2 The JPB report indicates a range in thickness of the MADE GROUND to be predominantly less than 4.0m beneath the former buildings and greater than 4.0m where the former landfill is. The further investigation by JPA generally coincides with this view, however deeper MADE GROUND was encountered towards the rear of the former foundry buildings.

6.1.3 Generally the MADE GROUND within the landfill was similar to that previously mentioned. However the landfill was licensed to accept asbestos containing products. Asbestos fragments were noted on the ground surface and it would be prudent to assume that the landfill area contains asbestos fragments and the material, if required to go off site, should be treated as special waste requiring removal to a suitably licensed landfill.

6.1.3 The natural ground beneath the MADE GROUND was generally a firm brown, slightly sandy, silty CLAY, beneath which was bedrock comprising Middle Coal Measures.

6.1.4 Due to nearby services the previously identified well was not investigated. It is recommended by Joynes Pike and Associates that this area be supervised during the site strip phase of the remediation works.

6.1.5 Six rotary open boreholes were drilled to determine the presence or absence of an unnamed coal seam and to assess if workings are present. Coal was encountered in one of the six boreholes drilled to determine the unnamed seam and a further three elsewhere on the site. The other boreholes drilled to determine the unnamed seam encountered a very dark grey/black MUDSTONE at the same level as the coal. No evidence of workings was encountered (such as voids, broken ground, loss of flush etc.). Due to the findings highlighted within this section it is believed that there will be no risk of settlement due to coal mine workings beneath the site as the coal seam is of discontinuous and of poor quality and grades from a poor quality coal to a black carbonaceous mudstone.

6.1.6 The pits marked on drawing 232095-03 shows the location and size of the pits within the concrete bases with the majority of the depths shown via the trial pit logs appended to this report. One pit (Pit J) had a deeper concrete strip beneath approximately 0.2m wide and 3.0m deep. All pits will require grubbing out and backfilling as detailed further in the report.

6.2 Groundwater Observations

6.2.1 Groundwater was not encountered in any trial pits across the site.

6.2.2 Groundwater was recorded and monitored during the JPB shell and auger boreholes and rotary boreholes. The depths ranged from ground level to 8.44m (begl) across the site.

6.3 Chemical Testing - Soils

6.3.1 The results of the chemical testing on soil samples have been reviewed in accordance with the legislative framework and criteria set out in Appendix D.

6.3.2 The results of the analysis have been assessed using statistical tests as outlined in CLR 7. Appropriate US_{95} values have been calculated for each of the identified strata types on site with the following being recorded as having concentrations of determinands in excess of the relevant SGV or JPA in-house trigger concentration value (Version 5, Sept 2005) for a proposed end use of residential with gardens. The following main strata types have been identified;

- MADE GROUND – brick rubble (Type A)
- MADE GROUND – foundry sand (Type B)
- MADE GROUND – gravel (Type C)
- Natural CLAY

6.3.3 Brick Rubble Made Ground (Type A)

The results of the four samples of brick rubble made ground indicate that the determinands were either below the published SGV or the Tier 1 in-house screening values (IHSV) with the exception of:

- Arsenic with a US^{95} of 40.42 mg/kg compared to the SGV of 20 mg/kg
- Lead with US^{95} of 499.86 mg/kg compared to the SGV of 450 mg/kg
- Nickel with a US^{95} of 59.51 mg/kg compared to the SGV of 50 mg/kg
- Benzo (a) pyrene with US^{95} of 1.19 mg/kg compared to the IHSV of 1.1 mg/kg
- Benz (b) fluoranthene with US^{95} of 1.19 mg/kg compared to the IHSV of 1.1 mg/kg
- Chrysene with US^{95} of 1.24 mg/kg compared to the IHSV of 1.1 mg/kg

6.3.4 Foundry Sand Made Ground (Type B)

The results of the eleven samples of foundry sand made ground indicate that the determinands were either below the published SGV or the Tier 1 IHSV with the exception of:

- Arsenic with a US^{95} of 35.3 mg/kg compared to the SGV of 20 mg/kg
- Nickel with a US^{95} of 143.37 mg/kg compared to the SGV of 50 mg/kg
- Elevated PAH.

6.3.5 Gravelly Made Ground (Type C)

The results of the eight samples of gravelly made ground indicate that the determinands were either below the published SGV or the Tier 1 IHSV with the exception of:

- Arsenic with a US^{95} of 34.95 mg/kg compared to the SGV of 20 mg/kg
- Nickel with a US^{95} of 74.43 mg/kg compared to the SGV of 50 mg/kg
- Lead with US^{95} of 464.62 mg/kg compared to the SGV of 450 mg/kg
- Chrysene with US^{95} of 1.29 mg/kg compared to the IHSV of 1.1 mg/kg

6.3.6 Natural Clay

The results of the four samples of natural clay indicate that the determinands were below either the published SGV or the Tier 1 IHSV.

6.3.7 Hydrocarbons odours that were noted by JPB during the site investigation were tested and showed no significant levels of contamination

6.3.8 It should be noted that the classification of soil for waste disposal purposes and any resulting waste acceptance criteria (WAC testing) required under the Landfill Regulations introduced in July 2005 is beyond the scope of this report.

6.4 Geotechnical Testing

6.4.1 Three representative samples were submitted to determine plasticity index values.

Plasticity Index Analysis - BS1377; Part 2; 1990.

6.4.2 Results of the geotechnical testing are presented in JPB Report, Appendix A.

6.4.3 These results indicate that the shallow cohesive soils encountered within the trial pits are of medium to high volume change potential in accordance with NHBC Standards Chapter 4.2. It would be prudent at this stage to assume a high volume change potential for this are of the site.

6.5 Gas/Groundwater Monitoring

6.5.1 The results of gas monitoring have been assessed based on the guidance presented in The Building Regulations Approved Document C, 2000, BRE Report 212, Construction of New Buildings on Gas Contaminated Land, 1991 and CIRIA Report 149, Protecting Development from Methane, 1995.

6.5.2 The guidance outlined within Approved Document C indicates that a gas risk assessment should be undertaken and the risks managed by remedial measures such as removing the gas generating material or the provision of gas resistant barriers within proposed dwellings.

6.5.3 From the installations constructed by JPB during the first phase of investigation the following boreholes were situated within the licensed landfill area.

- Boreholes BH8, BH22, BH25, BH26, BH27 and BH28.

Taking this in to account and due to the different conditions and compositions of the materials present on the site the results are reported as two separate areas.

Landfill area (Boreholes BH8, BH22, BH25, BH26, BH27 and BH28)

6.5.4 During the monitoring period, methane has been detected at concentrations ranging between 0.0% v/v and 16.0% v/v with the majority being detected within borehole BH27.

6.5.5 Carbon Dioxide has been detected at concentrations ranging between 0.0% v/v and 5.7% v/v on more than one occasion in each of the boreholes.

6.5.6 Depleted oxygen concentrations were recorded within the range 20.9% v/v and 0.0% v/v.

6.5.7 Average gas flow rates recorded only low peak emission rates of 0.0 to 4.0 l/h.

6.5.8 Hydrogen sulphide was not detected on any visit.

6.5.9 Groundwater has been recorded within the monitoring points at depths of from existing ground level (begl) to 8.12m (begl).

Remaining Site area

6.5.10 During the monitoring period, methane has been detected at concentrations ranging between 0.0% v/v and 2.0% v/v.

6.5.11 Carbon Dioxide has been detected at concentrations ranging between 0.0% v/v and 9.0% v/v on more than one occasion in each of the boreholes.

6.5.12 Depleted oxygen concentrations were recorded within the range 20.9% v/v and 0.0% v/v.

6.5.13 Average gas flow rates recorded only low peak emission rates of 0.0 to 4.0 l/h.

6.5.14 Hydrogen sulphide was not detected on any visit.

6.5.15 Groundwater has been recorded within the monitoring points at depths of from existing ground level (begl) to 7.61m (begl).

6.5.16 Due to a number of anomalies within the gas monitoring provided by JPB it is recommended that a further gas monitoring programme be carried out by JPA. This should include borehole 27 in particular, as this has had a reading of 0% v/v of oxygen with no other elevated gas levels. However it would be prudent to carry out gas monitoring in all available boreholes. Joynes Pike and Associates have carried out a preliminary inspection of the boreholes installed by JPB and currently we can confirm that gas monitoring will be able to be carried out at BH 17, 24, 26, 27 and 28. If further boreholes are encountered during this monitoring period they will be included within the report.

B. ASSESSMENT & RECOMMENDATIONS

7.0 INTRODUCTION

7.1 This report has been prepared on the understanding that the site is to be developed with residential properties of traditional 2 and 3 storey construction with associated access roads, landscaped areas, and private gardens. Should the proposed site usage change significantly from the above, the contents of this report will require review and amendment as appropriate.

7.2 The ground conditions are typified by the presence of MADE GROUND; concrete and foundry slag with ash, clinker, brick and slag which thickens towards the landfill.

7.3 Where present the natural ground beneath the MADE GROUND comprises of a soft to firm brown sandy, silty CLAY.

7.4 The rockhead encountered on site is that of the middle coal measures.

8.0 MINING ASSESSMENT

8.1 Evidence of Shallow Mining

8.1.1 Following the rotary open-hole borehole investigation it has been proven that shallow coal mining does not affect the site.

8.1.2 No future underground coal mining will affect the site at this time.

8.2 Abandoned Mine Entries

8.2.1 There are no abandoned mine entries on or within 20m of the site.

8.3 Stability Assessment Criteria

8.3.1 No stabilisation works are required with respect to underground coal mining beneath the site.

9.0 ENVIRONMENTAL ASSESSMENT

9.1 Soil Contamination Summary

9.1.1 Contamination was encountered within the results obtained from site. These are detailed below.

9.1.2 From the main strata types identified in accordance with CLR 7 elevated arsenic, nickel, lead and PAHs levels including benzo(a)pyrene have been recorded within the three main MADE GROUND strata types across the site.

9.1.3 Natural strata types had determinands which fell below their respective guideline values and are considered as suitable for re-use on site.

9.1.4 During the utility survey and further site works an oil inceptor was encountered at the southern boundary of the site beneath the former vehicle workshop. This will require further investigation and remediation during the site clearance works.

9.2 Risk Assessments

9.2.1 It is considered that the MADE GROUND materials encountered pose a risk to human health but not to controlled waters. As such they are suitable for retention on site beneath either a suitable capping layer (pathway break) or hardstanding.

9.2.2 The identified oil interceptor will require further investigation during site clearance with sampling of the underlying materials to determine if contamination has taken place to identify any remediation requirements.

9.2.3 The substation associated with the former foundry is still operational on site. It is assumed that this is to be suitably decommissioned and relocated. Following decommissioning the underlying soils will require contamination testing for PCB suite of determinands to assess whether the underlying soils require remediation. It was observed that this building has asbestos containing materials associated with it.

9.2.4 If the topsoil present in the south eastern area of the site is to be stripped and stockpiled then, following the site strip this will require contamination testing to determine its suitability and re-use on site within public open space and garden areas.

9.3 Revised Conceptual Site Model

9.3.1 This following section summarises the findings of the investigations into the site. Drawing 232095-06 shows the identified source pathway receptors on site considering an end use of residential housing with rear gardens.

9.4 Recommended Remedial Strategy

9.4.1 Based on the results of the investigation, the Revised Conceptual Site Model and the Risk Assessments, it is recommended that the following remedial works are undertaken in the context of the development proposals.

9.4.2 Suitable decommissioning and removal of the substation present on site. Validation samples should also be taken from beneath this area following removal of the substation. The excavations can be suitably backfilled in an engineered manner with either natural soil arisings from any excavations or demolition materials as outlined below. At this stage it should be assumed that a maximum of approximately 70m^3 will require removal and suitable disposal from site.

9.4.3 The oil interceptor observed on site has liquid present within it. This should be pumped dry. Following this the area around the interceptor should be broken out and the plastic vessel removed. Validation samples should be taken and sent for suitable contamination testing. The excavation can be suitably backfilled in an engineered manner with either natural soil arisings from any excavations or demolition materials as outlined below. At this stage it should be assumed that approximately 75m^3 will require removal and suitable disposal from this area of the site.

9.4.4 Grubbing up and breaking out of all hardstanding, floor slabs, bases and deep pits in the former foundry areas of the site should take place. Where the former bases are to be broken out, this should take place to 2.0m below the base of the proposed capillary break. When considering the former pits, these should be excavated, with all sides and bases broken out. Excavation sides should be stepped back at a minimum of 1v:1h gradient. This material as well as stockpiled demolition material should be crushed, screened and reused. There is sufficient laboratory testing to show that this material is acceptable for re-use beneath capping but if any unusual material is encountered it should be stockpiled separately and tested. Following stockpiling of this material the underlying MADE GROUND should be 'turned over' to a depth of 2.0m. The material excavated should be replaced in an engineered manner to allow a minimum safe bearing capacity of 50 kN/m^2 for the use of raft foundations. This technique will also be suitable for areas where over deepening has been required for the former pits on site.

9.4.5 The culvert running beneath the site will require fully proving in order to avoid damage during construction. This is likely to involve working in confined spaces in order to unblock the culvert and gain access with the probe.

9.4.6 During the raising in site levels, where natural ground is to remain in garden areas a minimum growing medium of 250mm of site won topsoil (following further testing) should be provided. Where MADE GROUND is to remain in garden areas it should be capped with a minimum of 600mm of clean material incorporating 150mm 'hard-to-dig' layer comprising site won demolition materials, with 225mm of clean site won or imported topsoil and 225mm of clean site won or imported clay rich material.

9.4.7 The above remediation strategy should be agreed with the Regulatory Authorities (Local Authority, Environment Agency and NHBC if required)

9.5 Health & Safety

9.5.1 During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land".

9.5.2 In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

9.6 Waste Disposal

9.6.1 Due to the implementation of the Landfill Directive any soils which may require removal from the site may be considered hazardous, however clarification should be sought from the disposal point about whether they would be licensed to receive materials with the contamination levels recorded. It is not anticipated that large quantities of material will require removal from site.

9.6.2 It may be necessary to register a waste exemption with the Environment Agency in relation to any regrading works to be undertaken.

9.7 Service Pipes

9.7.1 Certain hydrocarbons (particularly aromatic compounds) can permeate plastic water pipes and taint drinking water supplies. Other hydrocarbons can cause aggressive attack on plastic building materials. It is therefore recommended that water supply pipes should be laid above the groundwater level within a trench of clean granular material. If no significant concentrations of hydrocarbons are present, then the use of standard plastic supply pipes (such as HDPE) should be appropriate. It is also recommended that the water supply utility company is contacted to confirm that adopted protection measures are acceptable prior to progressing any construction at the site.

10.0 GEOTECHNICAL ASSESSMENT

10.1 Foundation Design

10.1.1 The most likely foundation solution for plots on this site will be dependant on the loadings, house type arrangements and relative position on site. The foundation options for the site can be split into several areas;

10.1.2 Within the vicinity of the well any plots that are affected by the feature will probably require pad and pier foundations or locally deepening and stepping back with reinforcement. It is currently believed that the well is likely to be located beneath the road construction. If this is the case then the depth will be required to be proved. Depending on the depth two options can be adopted, subject to prior Local Authority approval;

- Shallow; Break out the top and step back at a 1v:2h prior to the placement and compaction of single sized 50 – 75mm diameter stone infill.

- Deep (>5.0m); The wells depth will most likely require proving via drilling down the centre of the shaft using a shaft drilling platform. Further to this 50 – 75mm diameter stone should be used to infill the shaft and compacted with further holes drilled and grouted.

10.1.3 Where the relatively shallower predominantly foundry sand MADE GROUND is encountered a site turnover should be carried out to a minimum of 2.0m below the capillary break. All oversized material should be removed with specific notice taken of any significant slag and clinker that is likely to be encountered. Should significant quantities of this material be encountered all slag and clinker should be carefully removed and re-used in areas of Public Open Space (POS). The material should then be replaced in an engineered manner to allow raft foundations to be used.

10.1.4 Where foundations are over relatively shallower deepened sections due to former pits on site the excavations should be suitably backfilled in an engineered manner to allow raft foundations.

10.1.5 At this stage in order to limit exposure of contaminants to ground workers steel driven pile and ground beam foundations will be required where plots are located over the former landfill. Through the interpretation of intrusive investigations to date piles should be approximately 6.0m deep. Piles are also likely to be the most suitable foundation type where deep pits have been identified. The culvert will require fully proving prior to the commencement of piling to avoid damage.

10.1.6 Along the periphery of the site strip/trench fill footings are deemed suitable, deepened due to trees where applicable.

10.2 Floor Slab Design

10.2.1 Due to the presence of fill and its proposed reengineering across the site there will be greater than 600mm of MADE GROUND. Therefore the use of suspended ground floors will be required across the site.

10.2.2 It is currently Joynes Pike and Associates view that an extended gas monitoring period be carried out on the boreholes that can still be used. If this is not done, based on the information from the JPB report the site is shown to be characteristic 4 situation (as per the Wilson and Card model). This means that there is a requirement for; A well constructed suspended or ground slab, gas resistant membrane, passively ventilated underfloor sub-space, oversite capping and an in-ground venting layer.

10.2.4 These protection measures should be agreed with the Local Authority.

10.3 Building Near Trees

10.3.1 The near surface natural soils have been classed as high volume change potential, therefore specific vertical and lateral heave precautions are required due to existing or proposed trees in accordance with NHBC Standards Chapter 4.2.

10.5 Construction

10.5.1 Side stability of excavations in current made ground will be poor and should be suitably supported in accordance with current legislation and industry best practice. The stability of excavations in the engineered material should be improved.

10.6 Soakaways/Drainage

10.6.1 Due to moderate to deep thickneses of made ground affecting the site, soakaways will be unsuitable for surface water discharge. An alternative method of draining the site should be sought.

11.0 FURTHER RECOMMENDATIONS

11.1 The following further works have been recommended prior to the development of the site:

(a) Type 3 asbestos survey of substation following decommissioning.

(b) Foundation schedule and plot specific foundation designs.

(c) Production of a Remediation Method Statement.

(d) Further testing of the topsoil following stockpiling.

(e) Inspection of retaining wall on north eastern boundary of site during site works.

(f) Repair works and further gas monitoring of available wells, in particular well 27.

For and on Behalf of Joynes Pike and Associates Limited

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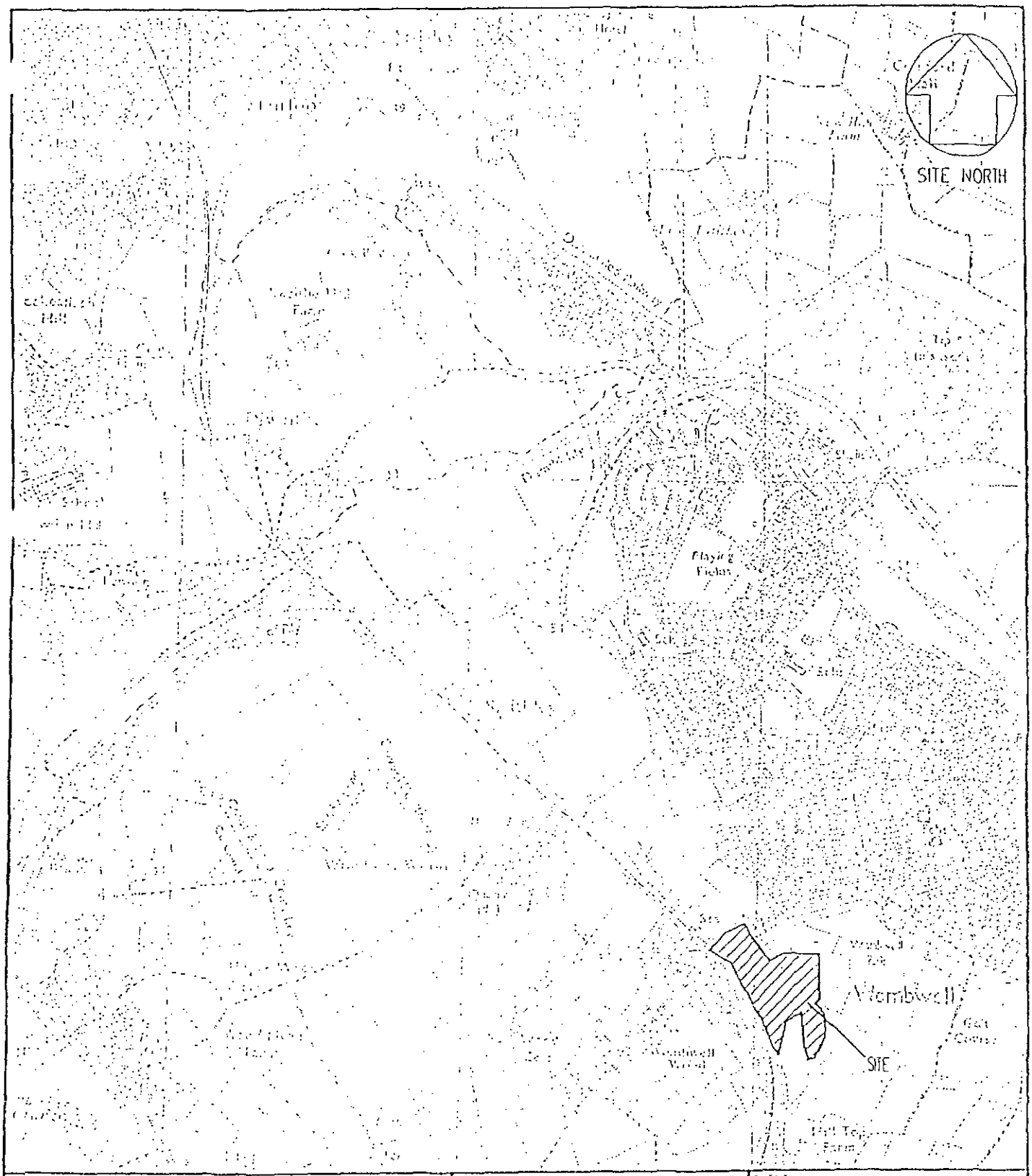
DRAWINGS



NOTES

1. DO NOT SCALE
2. This drawing is to be read in conjunction with all other relevant drawings.
3. Should there be any conflict between the details indicated on this drawing and those indicated on other drawings the Engineer should be informed PRIOR to construction on site.
4. Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings and details issued are PRELIMINARY and NOT FOR CONSTRUCTION. Should the contractor commence site work prior to approval being given, it is entirely at his own risk.
5. All dimensions are in millimetres unless otherwise stated.

A4

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JPA JOYNESPIKE

DRAWING STATUS

INFORMATION

CLIENT

BEN BAILEY HOMES LIMITED

PROJECT TITLE

WOMBWELL FOUNDRY, HOUGH LANE, WOMBWELL

DRAWING DETAIL

SITE LOCATION PLAN

DRAWN	JSP	DATE	FEBRUARY 2006
PROJECT ENGINEER	DRS		
CHECKED		SCALE	1:25000
APPROVED			

DRAWING NUMBER 232005-07

REVISION

APPENDIX A
Johnson Poole and Bloomer Ground Report

JOHNSON POOLE & BLOOMER
LAND CONSULTANTS

GROUND INVESTIGATION
AT
WOMBWELL FOUNDRY, WOMBWELL
SOUTH YORKSHIRE

JOHNSON
POOLE &
BLOOMER

BS07-46/SW

GROUND INVESTIGATION
AT
WOMBWELL FOUNDRY, WOMBWELL
SOUTH YORKSHIRE

For the attention of Mr D Grove

Hill & Smith Holding plc
2 Highlands Court
Cranmore Avenue
Shirley
Solihull
West Midlands B90 4LE

5 February 2004

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DS08/08 Copy of Original Licence Area dated 24.11.77

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G Gas and Groundwater Monitoring Results

H Envirocheck Report referenced 36993 dated 12th October 2001

I Coal Authority Mining Report

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1 INTRODUCTION

1.1 Johnson Poole & Bloomer were commissioned by Mr D Grove of Hill & Smith Holdings plc, on behalf of Wombwell Foundry Ltd, to undertake a Ground Investigation Report on a site known as Wombwell Foundry, Hough Lane, Wombwell, Barnsley, South Yorkshire. The site location is shown on Johnson Poole & Bloomer (JPB) Drawing DS074/01.

1.2 We understand that Hill & Smith Holdings plc are proposing to sell the site. It is anticipated that at least half of the area would go for housing development and the rest remain as green belt or other open space.

1.3 Prior to the intrusive investigation being undertaken, JPB were provided with information to aid in the design of the most suitable ground investigation. The following was provided by Wombwell Foundry Ltd,

i) IPPC Application 2002 (which included Envirocheck Report, Coal Authority Mining Report and Historical Site Use Plans, copies of which are provided in Appendices H, I and J).

ii) British Geotechnical Ground Investigation Report No: BG2458 dated January 1998.

iii) Wardell Armstrong contamination survey referenced NPT/JNS/SM/S1217/Report dated March 1996.

The latter two items are largely superseded by the site investigation described below, but can be made available for inspection.

1.4 An intrusive investigation was subsequently designed and undertaken to assess the near surface ground conditions beneath the site and to provide an assessment with regard to geotechnical and contamination issues.

1.5 Within the southern part of the site an area remains subject to a Waste Management Licence (the 'licence'), although landfill operations within the area have been completed and the area restored. The licence is partly suspended and the ground investigation recently undertaken has including obtaining chemical, physical and gas data for the purpose of surrendering the licence. The ground investigation aspects for the surrender of the licence will be reported separately.

1.6 The conclusions reached in this report are necessarily restricted to those that can be determined from the information consulted and the conditions established at each of the exploratory holes. However, ground conditions are highly variable and may differ between sampling points. This could affect our interpretation. Additionally, features may exist at depth and remain undetected by investigation. Our conclusions may, therefore, be subject to amendment in the light of additional information becoming available.

1.7 This report has been prepared for the sole use of the specified Client in response to an agreed brief, for a stated purpose and at a particular time, and its application must be made accordingly. No duty of care extends to any third party that may make use of the information contained herein unless written confirmation of such has been provided by Johnsen Poole & Bloomer.

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2 THE SITE

2.1 Site Description

The site is located off Junction 36 of the M1 on the *B6696* approximately 6 km to the south east of Barnsley, at Hough Lane, Wombwell, South Yorkshire at National Grid Reference SE 389 025. The general site location and existing site layout are shown on JPB Drawings DS074/01 and DS074/06 respectively.

At the time of the ground investigation the site comprised disused foundry buildings and adjoining offices, an area formerly used for landfill, and wooded areas surrounding the landfill towards the south of the site. The landfill area has been landscaped, as a stage in the process of surrendering the landfill licence. As part of the clearance works of the disused buildings, a mound of fly tipped waste has been created in the south of the site to the west of the licenced area. This material was seen to comprise general waste and foundry sand as well as appreciable amounts of asbestos cement profile roofing sheets. Asbestos is regarded as special waste and, as such, a duty of care applies regarding the removal of asbestos containing materials (ACMs) prior to redevelopment of the site. *JPB Drawing DS074/06* shows the existing site layout, including site levels following the landscaping of the landfill area. The site is accessible by vehicle from Hough Lane, although it may also be accessed on foot from the south and the east by scrambling over or through bushes and fences.

2.2 Site History

2.2.1 The history of the site has been traced using past editions of Ordnance Survey County Series and National Grid maps dating back to 1855. The maps are listed and summarised in Table 2.2 below, together with significant land use changes for the site and its immediate surroundings. The Envirocheck Report, included in Appendix H, contains historical maps which show the progress of development of the site. Historical Site Use Maps are also included in Appendix J.

Table 2.2: Summary of Site History (to present)

Plan	*On/ Off Site*	*Significant features or features altered since previous plan*	*Distance from site (m)*	*Bearing from site*	*Details*
1855 County Series Plans Yorkshire 1:10,560	On	The site is part of Wombwell Wood	-	-	The legend shows the site occupied by 'mixed wood'
		A drain is shown	-	-	Starting at the central north of the site and trending SE
	Off	At the north-western boundary is Hough Lane.	Adjacent	On boundary	
		There is a spring marked nearby.	20	SE	
		The Wombwell Main Colliery is shown	750	NW	A boiler house and various other buildings are associated
		Two quarries are marked within the woods.	1000/ 500	WNW/ WSW	Both are sandstone quarries
1893 County Series Plan Yorkshire 1:10,560	On	The woods have been cleared within the northern part of the site, and a house with a well is shown.	-	Northern part of the site	
		A keepers lodge with a well is now shown in the woods. Tracks are shown within the wood	-	South west corner of the site	
	Off	There are two rows of houses on the opposite side of Hough Lane to the site.	10	N	Terraced housing
		Lundhill Colliery is now marked.	500	SE	
		Five reservoirs are shown nearby.	100, 250, 400, 500 and 600m	N, SE and SW	One to the north, three to the south east, and one to the south west.
		Wombwell Main Colliery has expanded to include coke ovens, a brickyard as well as a school.	750	NW	
1905 County Series Plan Yorkshire 1:10,560	On	A railway sidings and 'Goods shed' have been built within the western boundary of the site.	-	-	An embankment has been created within the site in order to provide level ground.
	Off	A new railroad runs adjacent to the west of the site	0-5m	W	A new station has been built to the west of the site
		The Lundhill Colliery is now marked as 'Old'.	500	SE	Colliery buildings have been removed.
		Sewage beds are present to the south east of the site	1100 m	SE	
1930 County Series Plan Yorkshire 1: 2500	On	The site has been mostly cleared of wooded areas and Wombwell Foundry is shown to occupy the northern part of the site.	-	-	A railway leads from the foundry buildings onto the main line
	Off	Houses have now been built to the west of the railway.	200	W	The land around the railway line has been cleared of trees

1938 County Series Plan Yorkshire 1:10,560	On	There has been no significant change since the last plan.	-	-	Goods shed and keepers lodge are still shown.
	Off	Allotment gardens are now located behind the Pub on Hough Lane	50	NE	The pub is the St George's Arms
		There has been extensive development to the east of the site along Hough Lane	200	E	The development is progressing towards the site from Wombwell
		New housing to the west along Wood Walk	150	W	
		Sewage filter-beds are marked to the north west of the site.	400	NW	
		The various reservoirs around the site are now no longer there except the one to the SW.	600	SW	
1956 Ordnance Survey Plans 1: 10,560	On	The last of the woods have been cleared from the east of the site.	-	-	-
	Off	A building has been built, on the west side of the railway tracks.	10	W	The access is not shown.
		Continued development of houses from Wombwell towards the site.	200	NE	
		Further houses with gardens have now been built along Wood Walk within Wombwell Wood Walk.	100 - 700	WNW	This development is from Wombwell station to 'Warren House' and isolates part of Wombwell Wood.
1966 Ordnance Survey Plans 1:10,000	On	The foundry buildings have increased in size and tipping is shown to have progressed to the south of the buildings.	-	-	-
		The drain on site is now marked as 'drain'	-	-	Runs from the middle of the site to the SE
	Off	The building is growing in size on the west side of the railway tracks.	10	W	Accessed from Hemingfield Road
		Houses with gardens have now been built along the Hemingfield Road within Wombwell Wood.	20 - 400	W	-
		The Wombwell Main Colliery is marked as 'mine'.	700	NW	Soil heaps have been spread to the north.
		The sewage filter beds to north-west and south-east are no longer marked on the plan.	450/ 1000	NW/ SE	

4 GROUND INVESTIGATION WORKS

4.1 The ground investigation fieldwork was undertaken between the 29th September and 13th October, and comprised fifteen windowless sampler boreholes, four rotary open-hole drillholes, nine light cable percussive boreholes and fourteen trial pits.

4.2 The operations were supervised by an engineer from JPB and all positions were scanned with a cable avoidance tool (CAT) prior to boring.

4.3 The surveyed positions of the exploratory holes are shown on JPB Drawing DS074/06.

4.4 Windowless Sampler Boreholes

Fifteen windowless sampler boreholes were sunk by a "Competitor 130" drill rig and achieved depths of between 0.65m and 5.00m below existing ground level. In-situ cone penetration tests (CPT's) were taken at approximately metre intervals. The drilling works were undertaken by Integrated Environmental Technology Group (IETG) of Doncaster.

The samples obtained during the drilling process were examined, sampled and logged by the JPB engineer to aid in the production of the appended engineer verified borehole logs (see Appendix A). Selected samples were then scheduled and sent for chemical and physical analysis.

Upon completion, standpipes were installed in selected holes to permit monitoring of groundwater and ground gas. Details of the installations are included on the logs in Appendix A. The remaining windowless sampler boreholes were backfilled with acceptable fine chippings and bentonite pellets.

4.5 Rotary Open-hole Drillholes

Forkers Ltd. of West Bromwich, utilised a "Klemm" drill rig to sink four rotary open-hole drillholes to depths of between 15.0m and 30.0m below existing ground level using air flush techniques. The driller logged the cuttings expelled at the surface and the strata descriptions are provided on the appended drillhole logs in Appendix B.

Upon completion of the drillholes, combined groundwater / ground gas monitoring standpipes were installed in all four drillholes to a depth of 10.0m below existing ground level. The drillholes were backfilled to 10.00m below ground level using a mixture of bentonite cement grout. Slotted pipe, in a pea gravel response zone, was installed from 10.00m to 1.00m below ground level. The installation was then completed to ground level with a solid pipe section, covered with a cap, surrounded by a bentonite seal from 1.00m to 0.50m below ground level and fitted with a concreted lockable security cover at ground level.

4.6 Light Cable Percussive Boreholes

A.C. (Soil) Drilling Service, of Worksop, was commissioned to sink 9 light cable percussive boreholes to depths of between 4.50m and 9.00m below existing ground level using a Dando 150 'Shell and Auger' rig. (BH28A was abandoned at 1.50m due to an obstruction and was backfilled with arisings.) In-situ cone penetration tests (CPTs) and standard penetration tests (SPT's) were taken at approximately metre intervals.

The samples obtained during the drilling process were examined, sampled and logged by the JPB engineer to aid in the production of the appended engineer verified borehole logs (see Appendix C). Selected samples were then scheduled and sent for chemical and physical analysis.

Upon completion of the boreholes, combined groundwater/ ground gas monitoring standpipes were installed in all of the boreholes. Details of the installations are included on the logs in Appendix C.

4.7 Machine Excavated Trial Pits

Johnson Poole & Bloomer also supervised the excavation of 14 machine excavated trial pits using a JCB 3CX machine. A breaker attachment was utilised in order to break through surface concrete slabs within the buildings.

Again samples were taken of each horizon encountered during the excavations, sampled and logged by the JPB engineer to aid in the production of the engineer verified trial pit logs (see Appendix D). Selected samples were then scheduled and sent for chemical and physical analysis.

1.8 Monitoring Installations

Monitoring of groundwater levels and ground gases, including methane, carbondioxide, oxygen, carbon monoxide, hydrogen sulphide and atmospheric pressure, was undertaken by JPB on two occasions, from the standpipes installed on site using a dipmeter and a GA2000 infra red gas analyser. Gas and groundwater monitoring has been undertaken on two further occasions to date by Waste Management Associates (WMA) and is continuing on a monthly basis. WMA are using a GMI Landsurveyor II, Gas Data GT60, GMI Visa and dipmeter

The results of all the gas and groundwater observations to date are presented in Appendix G.

5 GROUND CONDITIONS

5.1 Made Ground

Made Ground deposits were identified in all the exploratory holes except TP10 and TP14. The greatest thickness was encountered in BH 23 (at the southern end of the foundry buildings) which proved predominantly foundry sand fill to a depth of 8.80m below existing ground level. The thickness of Made Ground varies across the site, being typically less than 4.0m thick beneath the foundry buildings and greater than 4.0m beneath the former landfill area. The Made Ground is overwhelmingly foundry sand, along with general foundry waste produced on site. This includes clinker, slag, broken refractory bricks and a small amount of tramp metal.

Standard Penetration Tests (SPT's) or Cone Penetration Tests (CPT's) were undertaken in the windowless sampler and cable tool boreholes, typically at 1.0m intervals, to determine the strength of the Made Ground. The penetration test results varied laterally across the site and also with depth, indicating the variable and uncontrolled nature of the deposition of these materials. SPT/CPT 'N' values within the Made Ground varied from 4 to refusal (greater than 50). Typical values were less than 20, which suggests a loose to medium dense consistency.

5.2 Natural Superficial Deposits

Natural superficial deposits were encountered in the majority of exploratory holes and comprised weathered materials derived from the underlying silty sandstone bedrock. The superficial deposits were generally encountered at less than 2.0m depth around the edges of the site. They were identified as stiff to very stiff clays or gravelly clays, the gravel component being of underlying bedrock regolith origin, as the superficials grade into weak weathered rockhead

5.3 Solid Geology

The anticipated Middle Coal Measures solid geology was proved in all of the rotary open-holes, generally to a depth of 30m around the site (15m in BH19). The strata encountered, which were logged by the driller, consisted of sandstones with mudstone bands. Towards the east and north on the site these sandstones were found to be overlain by mudstone with occasional bands of shale and shaley coal seams.

A 'firm shaley coal' was identified in BH19 (at the NE of the site near the Hough Lane boundary) at 11.5m to 13.0m depth below ground level, and a 0.2m thick coal seam was identified at 3.7m depth in BH12 (a windowless sampler borehole also located in the north-eastern area of the site).

5.4 Groundwater

Groundwater strikes were recorded only in windowless sampler boreholes BH 11 at 2.50m and BH14 at 4.40m depth below existing ground-level. The remainder of the windowless sampler boreholes and all of the trial pits were recorded as 'dry'. A slight water entry was recorded in rotary open-hole BH 16 which dried out, and a 'medium' water inflow was noted in rotary open-hole BH 19. A water seepage was noted in cable percussive BH 23 at 8.0m. The remainder of the rotary open-hole and cable percussive boreholes were recorded as dry. The water entries are summarised below in Table 5.4.

Table 5.4: Summary of Groundwater Strikes during Site Investigation

Location	Approx. Surface Level (mAOD)[1]	Strike Level (mbgl)[2]	(mAOD)
BH11	73.77	2.5	71.27
BH14	80.97	4.4	76.57
BH16	74.90	24.0	50.90
BH19	80.65	13.8	66.85
BH23	73.65	8.0	65.65

[1] mAOD = Metres Above Ordnance Datum [2] mbgl = Metres Below Ground Level

From the results of the investigation there appears to be a large difference in strike water levels, however, the groundwater strikes were slight and generally died out during the drilling. The groundwater levels recorded during the subsequent monitoring are discussed in Section 6.5.

5.5 Physical Laboratory Testing

Physical laboratory testing was scheduled on a number of disturbed samples to aid classification of the near surface soils. The testing was undertaken to British Standard Methods, BS1377:1990 'Soils for civil engineering purposes', at the UKAS accredited laboratories of Ground Investigation & Piling Limited. (UKAS number 1897).

The tests scheduled and undertaken were;

- 18 moisture content determination tests,
- 3 liquid and plastic limit determination tests,
- 2 particle size distribution,
- 2 particle density tests and
- 2 compaction tests using a 2.5kg rammer in a CBR mould.

A summary of the physical test results is presented in Appendix E.

5.6 Ground Contamination

Chemical Testing: - soil samples taken from the boreholes and trial pits were examined by a JPB engineer, who selectively sub-sampled and dispatched representative samples to the UKAS accredited laboratory Analytical & Environmental Services (AES). A total of 43 soil samples were analysed for the following suite of contaminants:

Arsenic, Cadmium, Chromium, Hexavalent Chromium, Lead, Iron, Mercury, Selenium, Zinc, Copper, Nickel, Sulphate (total), pH, Total cyanide, speciated PAH (Polycyclic Aromatic Hydrocarbons), TPH, Phenol, Sulphide, Thiocyanate, Manganese, Thiocyanate, Nitrate and Chloride.

The results, presented in Appendix F, have been assessed using the Contaminated Land Exposure Assessment (CLEA) Model, published by the Department for the Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) in April 2002. The model estimates contaminant intake and uptake from soil as a function

of contaminant concentration and the potential average daily human exposure to soil contamination. The model derives Soil Guideline Values (SGV) which provide a means of assessing chronic (long-term) risks to human health in accordance with the statutory guidance. The SGV can also be used to inform the selection of remediation standards or target values for individual sites.

Statistical tests have been undertaken on the chemical results in which the SGV is compared with the upper 95th percentile of the mean measured concentration (UCL95) of the contaminant. At this stage, SGVs are only available for seven contaminants; arsenic, cadmium, chromium, mercury, nickel, selenium and lead. All other contaminants have undergone this same statistical test, but instead have been compared to either;

- The New Dutch List (2000) as set out by the Ministry of Housing, Spatial Planning and Environment in The Netherlands, *or*;
- Former ICRCL trigger concentrations as set out in Guidance Note 59/83 (2nd edition)[1].

[1]IMPORTANT NOTE: On advice from the Environment Agency, and in consultation with other government departments, the ICRCL Guidance Note 59/83 (2nd edition), which contained trigger concentrations for contaminants, was officially withdrawn on 24th December 2002. The DEFRA/Environment Agency CLEA Model and the New Dutch List do not cover all contaminants and, therefore, currently there are no published SGV's for some of the contaminants of concern on this site. In such cases, a risk assessment using site specific criteria has been considered to establish the potential impact of contaminants to human health. Advice has been sought from Contaminated Land Branch Advice Notes (CLAN) 3/02 "more on the Withdrawal of ICRCL Trigger Values".

When the 95th percentile of the data set is lower than the SGV or equivalent value, it is unlikely that further action would be required with respect to the risk to human health. However, if the data set fails the tests, the results are further assessed on the basis of professional judgement and quantitative risk assessment. If further assessment identifies a moderate or high risk associated with any contamination, some form of remediation would normally be required.

In addition, a further statistical test known as the "Maximum Value Test" is undertaken to determine whether the recorded concentrations of contaminants fall within the range of values that can be expected to be consistent/representative from the data set. Data points that do not fall within the expected distribution of the data set are termed "outliers" and may be discounted as not being representative of the site as a whole.

The table below compares the statistical results of the investigations with the relevant guidelines. The test results have all been assessed against the latest CLEA and other relevant guidelines.

5.7 Soils Analysis

The site is being considered for a residential development. Therefore, the chemical results for soil have been assessed in relation to residential with plant uptake end use. The results are presented within Appendix F and summarised in Table 5.7 below.

Table 5.7

Soil Contamination Results Compared to CLEA, Dutch & ICRCL[3] Guidance for Residential End Use

Determinant	No Tested	Units	Guidance level	CLEA US95 Value	Exceeds SGV or Eq.
Arsenic	43	mg/kg	20[1]	22.69	Yes
Cadmium	43	mg/kg	1[1]	0.60	No
Chromium	43	mg/kg	130[1]	137.97	Yes
Chromium VI	43	mg/kg	n/a	1.60	-
Copper	43	mg/kg	190[2]	91.51	No
Mercury	43	mg/kg	8[1]	0.1	No
Nickel	43	mg/kg	50[1]	142.71	Yes
Lead	43	mg/kg	450[1]	241.72	No
Selenium	43	mg/kg	35[1]	0.47	No
Zinc	43	mg/kg	140[2]	99.08	No
Sulphide	43	mg/kg	250[3]	201.85	No
Thiocyanate	43	mg/kg	20[2]	1.55	No
PAH	43	mg/kg	40[2]	20.09	No
Phenol	43	mg/kg	40[2]	1	No
Sulphate	43	mg/kg	2000[3]	999.29	No
pH	43	units	<5	8.16	No
Cyanide (complex)	43	mg/kg	5	1.14	No
Cyanide	43	mg/kg	1[2]	1.24	Yes
Sulphur	43	mg/kg	5000[3]	1105.64	No
Manganese	43	mg/kg	n/a	1594.38	-
Iron	43	mg/kg	n/a	57923	-
Chloride (BRE)	43	mg/kg	SD1	37.09	-
Nitrate (BRE)	43	mg/kg	SD1	3.17	-

Notes [1] CLEA SGV (residential with plant uptake)
[2] Dutch Action level
[3] Former ICRCL values, as they were withdrawn 20 December 2002.
(BRE) SD1 = Building Research Establishment Special Digest 1.
* All values below Laboratory Detection Limit
US95 = 95th percentile of mean measured concentration

1980 Ordnance Survey Plan 1:10,000	On	The size of the foundry has grown slightly with further development southwards	-	-	The shape of the main building is roughly as it is at present.
	Off	The building across the tracks is marked 'factory'	10	W	
		The terraced houses across the road from the foundry, known as Wombwell Main Row have been demolished	15	N	The land is now shown as bare fields.
		The Wombwell Main Colliery has been completely removed along with its associated rail tracks.	700	NW	The spoil heaps are no longer marked on the plan.
1989 Ordnance Survey Plan 1:10,000	On	Foundry buildings have been extended slightly	-	-	-
	Off	No significant changes	-	-	-

2.3 Summary

In summary, the first available plans dated 1855, showed the site to be within woods to the south-west of the town of Wombwell. The area surrounding the woods comprised of open, undeveloped fields with isolated hamlets dotted around. There was a coal mining operation at Wombwell Main Colliery offsite to the north-east of the site, with a narrow gauge railway which extended to join the main line to the north, and into Wombwell Wood to the south (presumably to transport timber for propping up the mine workings).

By 1893 the first change on site had occurred, the northern portion of the site fronting Hough Lane which was previously wooded, is now bare pasturelland. A keepers lodge with a well was shown within the site boundaries towards the southern end. Newhouses, together with adjoining football and cricket ground, have been built north of Hough Lane. The Wombwell Main Colliery had expanded and now supported a school, brick yard and coke ovens. The new Lundhill Colliery had started mining operations offsite to the south-east of the site.

The 1903 sheet showed the new Chapeltown Branch Extension which brought a main line railroad adjacent to the western boundary of the site. Indeed rail sidings and a goods shed were built within the western edge of the site. Mining activities continue offsite to the north while more houses are being built along Hough Lane near the site.

Between 1905 and 1938 the site had been mostly cleared of trees and Wombwell Foundry (iron and brass) is now shown onsite. Two buildings are shown on the northern part of the site, with evidence of tipping to the rear of the buildings (towards the south). More houses were being built in the area whilst Wombwell town was expanding onto the land to the east of the site.

By 1956, although the site essentially remained the same, house building and mining activities had continued at the same rate. A factory was now located close to the site, to the west on the opposite side of the rail tracks. The 1966 plan showed that the foundry had grown greatly in size and tipping (presumably of foundry waste) was shown extending to the south up to 100m distant from the back of the buildings.

By 1980 the mining activities in the area had been abandoned but the foundry had continued to grow in size. The terraced houses across the road from the foundry had been demolished. The site and surrounds changed little by 1989, and indeed remained much the same until the foundry ceased production in April 2003.

3 ENVIRONMENTAL SETTING

3.1 Geology and Hydrogeology

3.1.1 Published Ground Conditions

The published geology beneath the site is detailed on British Geological Survey Sheet 87 scaled 1: 50,000 and dated 1976. The site is shown to be underlain by solid geology comprising the Middle Productive Coal Measures of the Carboniferous Period, which is described in the generalised vertical section as 'Grey sandstones and shales with coal seams of variable thickness'. A seam of coal identified as being the Newhill Coal is shown to outcrop within the northern and eastern part of the site. A small fault line is also seen to trend from north to south at the eastern edge of the site. Made Ground or natural superficial deposits are not indicated to overlie the solid strata, although some is anticipated taking into account the site's former foundry use.

The likely sequence of strata and general hydrogeological conditions beneath the site are thought to be as follows:

Table 3.1: Summary of Published Geology

Strata	Description	Aquifer[3]	Soil Leachability[3]
MADE GROUND	None indicated (Foundry sand expected)	-	High[2]
TOPSOIL	None indicated (Topsoil/ re-worked natural materials expected)	-	High[2]
MIDDLE COAL MEASURES	Grey shales and sandstones with thin bands and seams of coal	Minor[1]	High[2]

[1] Minor Aquifer: These can be fractured or potentially fractured rocks, which do not have a high permeability, or rock formations of variable permeability. Although these aquifers will seldom produce large quantities of water for abstraction, they are important both for local supplies and supplying base flows for river. In certain local circumstances minor aquifers can be highly vulnerable to pollution.

[2] Soils of High Leaching Potential: Soils with little ability to attenuate diffuse source pollutants and in which non-adsorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater.

[3] Aquifer and Soil Leachability taken from the Environment Agency's Groundwater Vulnerability Map Sheet 11 for South Pennines together with the Environment Agency's document 'Policy and Practice for the Protection of Groundwater'.

3.1.2 From our researched information, Made Ground in the form of foundry sand from progressive tipping during the foundry's operation is expected to be encountered on the site, particularly in the central and southern areas, as the historical data has shown progressive tipping on the land.

3.1.3 From our researched information, including supplied reports, it is known that the site is underlain by Middle Productive Coal Measures which include coal seams that have been worked historically, and that no recorded shafts are present either on or within influencing distance of the site and its boundaries. Further detail, in relation to the mining history of the site, is provided in Section 3.3 below.

3.1.4 It is anticipated that the solid strata dip at approximately 1 in 14 to the north-east. In addition, a small unnamed geological fault is shown to be present at the south-eastern boundary of the site. The fault trends approximately north to south with a down-throw to the east.

3.1.5 The Envirocheck Report indicates that within 1km of the site there is / are:

- No licenced groundwater abstractions (but four within 2km).
- Two licenced discharge consents to the south.
- Two recorded pollution incidents to controlled waters.

3.1.6 On the basis of the above information we consider the ground-waters within the vicinity of the site to be of MEDIUM sensitivity.

3.2 Hydrology

3.2.1 The nearest surface water features, identified from Ordnance Survey Plans, are listed below:

Table 3.2: Summary of Surface Water Features

Surface Water Feature	Distance from site	Flow direction	GQA Classification*
Culverted Stream	Onsite	south east	Not Available
Knoll Beck (Dearne Tributaries)	950m south	east	Grade "C" in 2000

* GQA = The General Quality Assessment (GQA) Classification scheme is the Environment Agency's national method for classifying water quality in rivers and canals.

3.2.2 The Envirocheck report indicates that within 1km of the site (and up to 2km for certain categories) there is / are:

- No licenced surface water abstractions. (4 up to 2km away, but all have their licences revoked.)
- 2 pollution incidents to surface waters since 1991.
  Incidents were classified as "Category 3 - Minor Incidents" by the Environment Agency. They relate to discharges of "sewage" and oils.
- 2 discharge consents to controlled waters, one noted as underground and the other to Knoll Beck in the Dearne Catchment area.

3.2.3 The Envirocheck Report states that the site does not lie within a river floodplain.

3.2.4 On the basis of the above information we consider the surface waters within the vicinity of the site to be of MEDIUM to LOW sensitivity.

3.3 Mining

3.3.1 Reference to the Law Society's Guidance Notes and Directory of Coal Mining Searches (1998) indicates that a Coal Authority Report is required for the subject area. A Coal Authority Report is appended to this report as Appendix I.

3.3.2 The Coal Authority Report indicates that the site is in an area known to be underlain by shallow coal seams, which may have been worked by past coal mining. It states that mine workings had been carried out in 14 seams of coal at depths in excess of 90m beneath the site, with the last known date of working being 1980. This is a little misleading because there are other seams shallower than 90m.

3.3.3 The shallower coal seam beneath the site, the Newhill Coal, which is around 0.3m thick. The Newhill Coal outcrops at the northern and eastern part of the site and dips to the east, so the seam should only be present below a small part of the proposed residential development area at the north-east. Underlying the Newhill Coal seam are other worked seams, the next being the Meltonfield Coal at 40m below it. Considering the depth and age of any such workings it is anticipated that any ground movement associated with these workings should have long since ceased.

3.3.4 The Newhill Coal was proved during the physical investigation described below. No other coal seams were found onsite as part of this investigation.

3.4 Quarrying / Landfill

Quarrying

3.4.1 Reference to the Quarry Management "Directory of Quarries, Pits and Quarrying Equipment" 2003/2004, indicates that there are no active quarries within the vicinity of the site, the nearest being some 1.5km away. Consideration of old Ordnance Survey maps, described in 2.2 above, revealed no former quarries or pits on or in the near neighbourhood of the site.

3.4.2 On the basis of the above information, quarrying activity is not considered to be significant in relation to the site.

Landfill

3.4.3 The Envirocheck Report provides details of a licence that had been granted to Wombwell Foundry Ltd to dispose of waste material in a landfill on this site. The licence, referenced WD20 B 142 MOD 4, was granted on 1 Dec 1977, and permitted the on-site disposal of :

Detergent / Oily waste from machines
Foundry slag
Boiler Clinker
Broken asbestos sheets
Industrial Non-Hazardous Waste Including – Refractory bricks, sand, general foundry debris.

This licence was replaced by another, referenced WD20 B 142 MOD 6 issued on 1 March 1997, permitting only the disposal of waste produced on site, i.e.:

Boiler clinker
Industrial Non-hazardous waste including – Refractory bricks, sand, general foundry debris and foundry slag.

The extent of the definitive licenced area is shown on JPB Drawing DS034.08. This is a copy of the original licence plan dated 24.11.77 provided by the Environment Agency and is rather more extensive than the supposed tip area

shown on recent published Environmental Agency maps. The 1977 licenced area is also indicated on JPB Drawing DS074/06.

3.4.4 The Envirocheck Report identifies one other waste treatment or disposal site within 1km of the subject site, a very small scrap-yard 326m north of the site.

3.4.5 Based on the available information, we do not consider landfill gas or leachate to be significant in relation to the subject site.

3.5 Radon Gas

3.5.1 Reference to Building Research Establishment Report 211 'Radon – Guidance on the Protective Measures for New Dwellings' (1999) states that a geological assessment should be carried out and consideration should be given to installing basic protection into new dwellings, if necessary. However the Envirocheck Report, using National Radiological Protection Board data, states that less than 1% of homes in the locality are recorded as being above the radon Action level and that only 'basic' radon protection measures are required in new buildings. The ground investigations described below have demonstrated the presence of carbon dioxide in the ground and it may be noted that standard precaution against this gas will be more robust than might be required to cater for any radon.

3.6 Further Envirocheck Information

3.6.1 The Envirocheck report also indicates that within 1km of the site there is / are:

- 1 authorised Air Pollution Control (APC), onsite but relating to the now *discontinued foundry activities*;
- 20 contemporary trade directory entries of possible contaminative use (in all directions);
- 1 registered location for the keeping and use of mobile radioactive sources.

5.8 Groundwater and Leachate Analysis

Twelve samples of leachate, prepared from samples of Made Ground, were analysed for a specific suite of contaminants in order to determine the mobility of determinands encountered in the soils. Two groundwater samples were also taken during the second monitoring visit (only two standpipes contained sufficient water for testing).

The results have been compared with 'Concentration Values' of the 'Water Supply (Water Quality) Regulations 2000'. Where a concentration value is not published under the 2000 Water Supply Regulations, other guidance has been consulted, including the 1989 Water Supply Regulations, as well as 'Action Values' under the Dutch Guidance Values. The laboratory results are presented in Appendix F and summarised in Table 5.8 below.

Table 5.8

Groundwater and Leachate Analysis Results compared to Water Supply (Water Quality) Regulations (WSR) 2000 & 1989 & Dutch Guidance

Determinand	No. Tested	Units	Guidance level	CLEA US95 Value	Exceeds SGV or Eq.
Arsenic	14	mg/l	0.01[1]	0.003	No
Boron	2	mg/l	1[1]	n/a	No
Chromium	14*	mg/l	0.05[1]	0.02	No
Copper	14	mg/l	2[1]	0.01	No
Iron	14	mg/l	200[1]	0.77	No
Magnesium	2	mg/l	50[2]	n/a	No
Manganese	14	mg/l	50[1]	0.81	No
Chloride	14	mg/l	250[1]	23.23	No
Nickel	14	mg/l	0.02[1]	0.02	Yes
Lead	14	mg/l	0.025[1]	0.02	No
Zinc	12	mg/l	5[2]	0.03	No
Sulphate	14	mg/l	250[1]	100.34	No
Mercury	14*	mg/l	0.001[1]	0.00008	No
Selenium	14*	mg/l	0.01[1]	0.0005	No
Total Phenols	14*	mg/l	0.0005[2]	0.02	Yes
Cyanide Total	14	mg/l	0.05[1]	0.01	No
Cyanide Complex	14*	mg/l	1.5[2]	0.03	No
Nitrate	14*	mg/l	50[1]	0.5	No
Cadmium	14*	mg/l	0.005[1]	0.002	No
Ammonia	2	mg/l	0.5[1]	n/a	No
Nitrite	2*	mg/l	0.5[1]	n/a	No
BOD	2	mg/l	n/a	n/a	No
Phosphate	2*	mg/l	2.2[2]	n/a	No

Notes: 1 Water Supply (Water Quality) Guidelines 2000
2 Water Supply (Water Quality) Guidelines 1989
3 Dutch Guidance Value
US95 = 95th percentile of mean measured concentration
* All results below laboratory detection limit

5.9 Ground Gases/Groundwater Levels

Ground gas monitoring of the eighteen standpipes installed within the drill holes and boreholes has been undertaken on four occasions to date. Monitoring continues on a monthly basis in order to determine trends. The standpipes were monitored on the first two occasions by JPB with a Geotechnical Instruments GA2000 infra-red gas analyser, which measures levels of methane, carbon dioxide, carbon monoxide, oxygen, hydrogen sulphide and atmospheric pressure, as well as the flow rate during the monitoring. The standpipes were monitored on the third and subsequent occasions by WALA with a GMI Landsurveyor II, Gas Data GF60 and GMI Visa. The results are attached as Appendix G.

Borehole groundwater levels have been monitored on most occasions after gas readings were taken in standpipes, the bungs were removed and the standpipes were dipped with a dipmeter to record the level of water. The water levels are included on the ground gas monitoring results sheets within Appendix G.

6 DISCUSSION

6.1 This report is written on a factual basis for the prospective purchasers to interpret the data. The discussion is based on the site being developed for a residential end-use with parts remaining as open space and green belt. It is for the prospective purchasers to determine the proposed layout and ground levels.

Within the southern part of the site an area remains subject to a Waste Management Licence. As part of this investigation and the ongoing monitoring, information is being compiled for the purpose of surrendering this licence. A separate report will be compiled, and a meeting is proposed with the Environment Agency, for the purpose of surrendering the licence in the early part of 2004.

6.2 Site Conditions

The site currently contains the disused foundry buildings, the demolition of which is proposed to start in the early part of 2004. The buildings are proposed to be demolished to the top of existing ground floor slabs, leaving the site levelled to existing ground level. It is not intended to re-grade the site levels as part of these works. The existing ground levels and extent of the main foundry buildings are shown on JPB Drawing DS074/06.

6.3 Physical Ground Conditions

As detailed in Section 5, Made Ground deposits were identified within all the exploratory holes except TP10 and TP14, to variable depths between 0.50m and 8.80m below existing ground level.

The Made Ground deposits mainly comprised foundry sand, along with general foundry waste produced on site, which included clinker and slag. No signs were found of asbestos-cement sheets or oily wastes of the sort permitted when the Site Licence was first issued. Topsoil was recorded in TP10 towards the east of the site.

Below the Made Ground deposits, natural deposits were encountered comprising clays or gravelly clays. The competence of the clays was proven with SPT/CPT tests and found to be predominantly stiff to very stiff.

Atterberg Limit Determinations were undertaken on three samples of the clay soils. The 'plasticity' of two of the clay samples were 'high' and 'very high', with Plasticity Index results of 30% and 44%. The third sample, taken from a layer in TP2 from 3.2-3.85m, had the general appearance of a compact peat. It had an extremely high Plasticity Index of 131% and Liquid Limit of 239%. The results of these tests are included in Appendix E, along with a summary graph, which show the results against the Atterberg Limit A-Line.

Compaction tests were undertaken on two samples of Made Ground, one from BH22 and a second combined sample from TP20, TP21 and TP26. The compaction tests utilised the 2.5kg rammer in a CBR mould. The Particle Density and Particle Size Distribution were also determined for both of these samples. The results of these tests are included in Appendix E.

The bedrock, comprising weathered sandstones and mudstone bands, was logged by the rotary drillers and described as competent.

6.4 Contamination Results

Soil Results

For residential end use, and in terms of human health the results of the 'total' analysis have been compared to the latest CLEA guidelines, or other appropriate guidance where guideline levels have not yet been produced by CLEA.

For assessment purposes all results below the laboratory detection limit are assumed to have a value at the detection limit. This means that great care must be taken in interpreting the results, so that over-pessimistic conclusions are not reported. Realistically, it is considered highly likely that the majority of those results reported as being at the detection limit are, in practice significantly below the detection limit.

For the 'total' soil results, Arsenic, Chromium, Nickel, and Cyanide were found to be elevated when compared to relevant guideline values. The contamination was found to be distributed around the site, both at near surface and at depth, predominantly within the Made Ground.

The SGV for Arsenic is 20 mg/kg, and the US95 value determined was 22.69 mg/kg. The highest result determined for Arsenic was 70 mg/kg in BH15 at 0.3m to 0.65m depth below existing ground level, within Made Ground towards the Hough Lane site boundary. For the site as a whole, the Arsenic values exceeding the SGV were widely distributed both laterally and with depth.

The SGV for Chromium is 130 mg/kg, and the US95 value determined was 137.97 mg/kg. The highest result determined for Chromium was 620 mg/kg in BH5 at 1.7m to 2.5m depth below ground level, within Made Ground materials in the south of the site. For the site as a whole, the Chromium values exceeding the SGV were located within the southern part of the foundry buildings area and the south of the site.

The SGV for Nickel is 50 mg/kg, and the US95 value determined was 142.71 mg/kg. The highest result determined for Nickel was 1100 mg/kg in TP8 at 0.5m to 0.7m depth below ground level, within Made Ground materials near the southern boundary of the site. For the site as a whole, the Nickel values exceeding the SGV were widely distributed both laterally and with depth.

The appropriate guideline (Dutch Guidance Action Level) for Total Cyanide is 1mg/kg and for Complex Cyanide is 5mg/kg. The US95 value determined for Total Cyanide was 1.24mg/kg, which exceeds the guidance level. The US95 value determine for Complex Cyanide is 1.14mg/kg which does not exceed the guidance levels. Total Cyanide is the combination of Complex Cyanide and Free Cyanide, although values for free cyanide were not obtained it can be assumed that the US95 value would be approximately 0.1mg/kg and therefore does not exceed the Dutch guidance level of 1mg/kg. The highest result determined for Total Cyanide and for Complex Cyanide was 48mg/kg in BH15 at 0.50m depth below ground level, within Made Ground materials towards the Hough Lane site boundary. However, for the whole of the site, the Total and Complex Cyanide values exceeding the Dutch Guidance level were located around the foundry buildings.

The US95 values for Zinc, Copper and Lead did not exceed the SGV or equivalent guideline levels. However some samples showed elevated levels. These were widely distributed both laterally and with depth.

As previously discussed, for calculation purposes all results below the detection limit were given a value the same as the detection limit. The detection limit for four of the PAH components is 1mg/kg and the relevant guideline (USEPA) is 0.6mg/kg. Therefore, the majority of the results were below the detection limit and it is possible that these samples are also below the guidance values. It should be noted that the relevant guidelines are widely considered to be very stringent in this respect. For clarification on the PAH components, the Total PAH US95 value does not exceed the Dutch Guidance value and only two of the Total PAH values exceed the SGV.

Leachate results

To assess the potential implications of any contamination upon the environment, the leachability/mobility of any contaminants present has been assessed. The leachate results have been compared against very stringent guidelines, including the 'Water Supply Regulations 2000'.

As previously discussed, for calculation purposes all results below the detection limit were given a value the same as the detection limit. The detection limit for five of the PAH components is 0.0001mg/kg, and the relevant guidance (Dutch) is 0.00005mg/kg for four of the components and Water Supply Regulations 2000 guidance of 0.0001mg/kg for the fifth. Therefore, the majority of the results were below the detection limit and it is possible that these samples are also below the guidance values. It should be noted that the relevant guidelines are widely considered to be very stringent in this respect.

Elevated levels of Total PAH were also recorded in the leachate analysis. The Water Supply Guideline 2000 threshold for Total PAH is 0.0001mg/kg, which is the laboratory detection limit. The US95 value for the leachate is 0.0007mg/kg, with a maximum value (determined to be an 'outlier') of 0.00253 mg/kg. For the site as a whole, the four highest Total PAH values exceeding the relevant guideline value were widely distributed both laterally and with depth.

One Nickel result exceeded the SGV (Water Supply Guidelines 2000) guidance, but this was assessed as an 'outlier', so the data set as a whole was determined to be below the US95 value.

The two water samples that were taken had Magnesium results of 63 and 68 mg/kg, which were higher than the Water Supply Guideline 1989 threshold of 50 mg/kg.

The two water samples also had Ammonia results of 0.6 and 0.7 mg/kg, which were higher than the Water Supply Guideline 2000 threshold of 0.5 mg/kg.

The conclusion to be drawn from the leachate testing is that the potential contaminants in the Made Ground deposits on this site have only very low water-solubility.

6.5 Groundwater

Monitoring of standpipes installed in eighteen of the twenty eight boreholes has recorded 'standing water' at depths of between 1.2m and 7.5m below existing ground level. In view of the large variation of ground levels across the site, expressing groundwater levels in relation to the depth below ground may be misleading and hence consideration of groundwater levels in terms of mAOD is vital.

The shallowest groundwater was encountered in BH12, towards the north of the site at 1.2m below the surface. When expressed in terms of mAOD the groundwater levels were lower towards the south of the site. A summary of the groundwater levels in depth below existing ground levels and mAOD of the monitored boreholes is provided in Table 6.5 below.

Table 6.5 – Summary of Shallowest Groundwater Levels

Location	Shallowest Reading (mbgl)	Shallowest Reading (mAOD)
BH3	dry to 2.78m	below 71.85
BH6	dry to 5.45m	below 68.32
BH8	dry to 2.44m	below 64.82
BH9	dry to 4.45m	below 66.17
BH12	1.2	76.42
BH16	dry to 10.0m	below 64.9
BH17	5.25	67.89
BH18	2.4	74.38
BH19	4.15	76.5
BH20	6.11	67.75
BH21	4.3	70.16
BH22	7.42	65.91
BH23	7.45	66.20
BH24	dry to 5.00m	69.37
BH25	3.12	71.77
BH26	7.4	66.74
BH27	dry to 4.50m	below 68.17
BH28	dry to 4.50m	below 66.15

mbgl – metres below existing ground level

mAOD – metres Above Ordnance Datum.

6.6 Ground Gases

Ground gas monitoring has been undertaken in eighteen standpipes installed during the investigation. Monitoring has been undertaken on four occasions to date, the results are included within Appendix G.

Methane has been recorded in eight of the installations, with a maximum concentration of 0.5% by volume recorded in BH27 on the third of the monitoring visits. BH27 is within the southern licenced area, at a location not proposed at this stage for housing development. The seven other installations with positive readings recorded methane only on the first visit, at a maximum concentration of 0.2% by volume, and have recorded no methane subsequently. The other ten installations monitored did not record any methane during the monitoring period.

Carbon dioxide was recorded in twelve of the installations at slightly elevated concentrations (above 1.5% volume). The maximum measured carbon dioxide was 5.3% volume within BH17 on the third monitoring visit. BH17 is within the eastern part of the site currently zoned as green belt.

Levels of oxygen remained generally high and near to normal atmospheric concentrations during the monitoring period. A drop in oxygen concentration was typically noted in association with an increase in the carbon dioxide level. The oxygen content was particularly depleted in three of the holes in the southern licenced part of the site, with a Nil reading recorded in BH27 on the second monitoring visit.

Carbon Monoxide was recorded at a maximum level of 3 ppm (parts per million) in BH21 on the first monitoring visit. The levels of carbon monoxide detected have been at consistently low level during the monitoring period, and should have no influence on the proposed development.

No hydrogen sulphide was detected in any of the standpipes on any of the monitoring visits.

None of the holes have recorded significant flow rates either out or in any of the monitoring occasions. That would be consistent with no active generation of landfill gases.

7.0 GENERAL

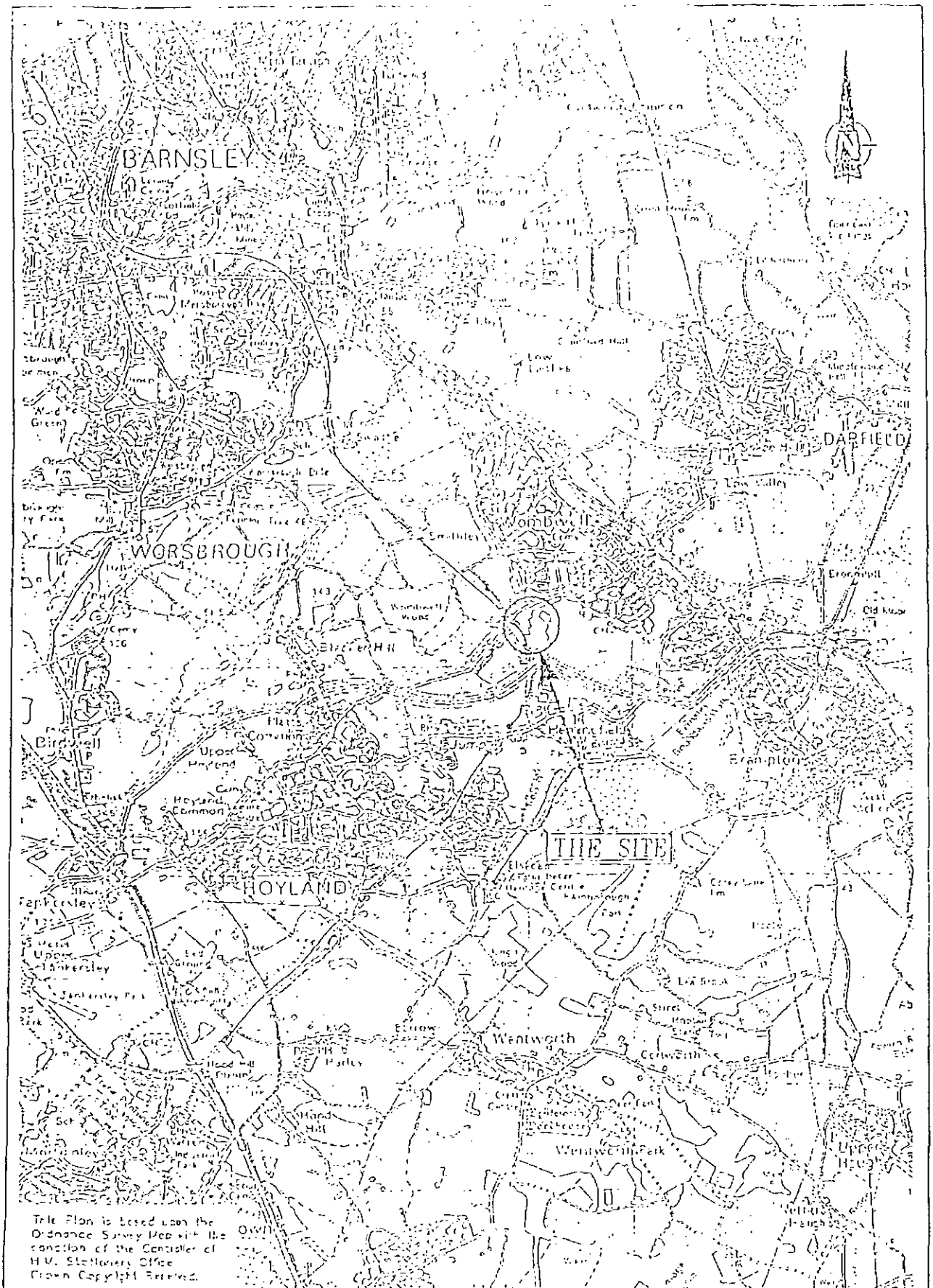
7.1 Whilst confident in the findings of our report we are unable to give an assurance that they will be accepted by other authorities without question. We therefore advise that where appropriate our report and associated matters are submitted to approving bodies and approval obtained or sought before detailed design, site works or other irrevocable action is embarked upon.

7.2 The conclusions reached are directly related to the information available. Such conclusions may change in the light of more data or information becoming available. The recommendations contained in this report do not constitute any form of specification for the undertaking of the works required.

7.3 We trust that this report fulfils your present requirements, but if there is any matter, about which you require elaboration, do not hesitate to contact the undersigned

Simon Weatherley BEng FGS
Senior Geotechnical Engineer

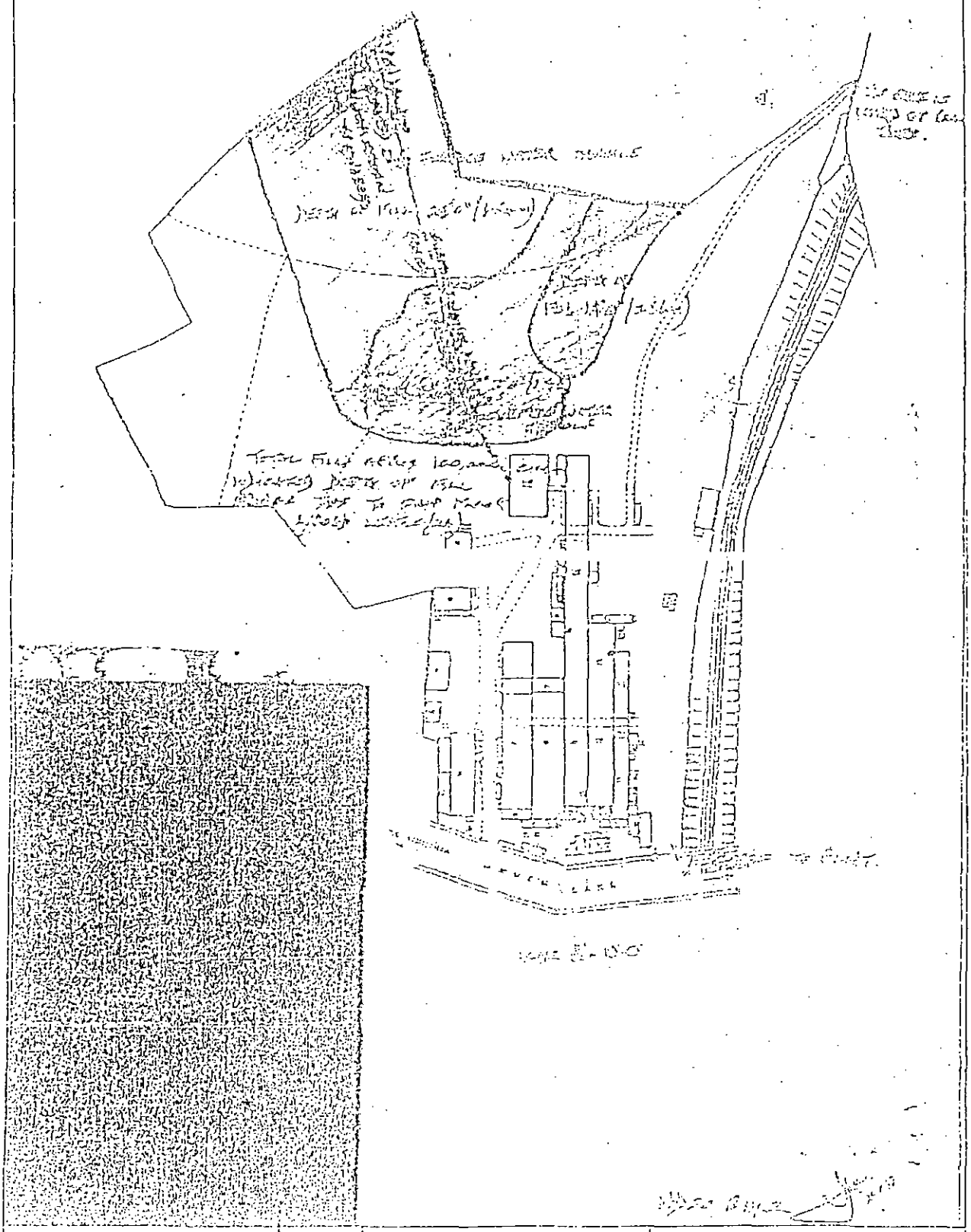
Colin Knipe BSc CEng CGeol
Senior Partner



TOWNSON POOLE & BLOOMER	Engineer SW	Client HILL AND SMITH HOLDINGS	Title GENERAL SITE LOCATION
	Checked MM	Project WORSBRO' FOUNDRY, WORSBRO'	
	Approved	Date 30/10/03	Scale 1:10,000
			Drawing DS074/01

WOMBWELL FOUNDRY & ENGINEERING Co LTD

WOMBWELL - Nr BARNSLEY



JOHNSON POOLE & BLOOMER LAND CONSULTANTS	Engineer	Client HILL & SMITH HOLDINGS LIMITED	Title COPY OF ORIGINAL LICENCE AREA DATED 24/11/87
	Checked	Project WOMBWELL FOUNDRY	
	Approved	Date 05/03/04 Scale N.T.S @ A4	Drawing DS074/01

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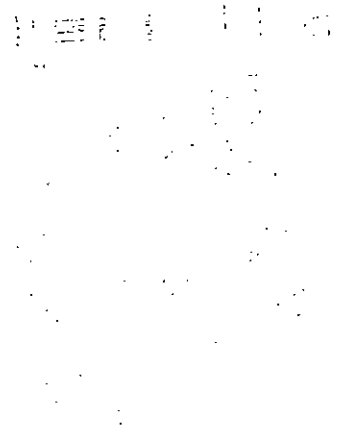


APPENDIX A

Windowless Sampler Borehole Logs.

Johnson Poole & Bloomer

BOREHOLE LOG

Client: Hill & Smith Holdings	Borehole No: BH1
Project: Woodwell Foundry	
Job No: D5071 / Date: 29-9-05 / Ground Level (m): 78.45 / Co-ordinates:	Full Depth: 4.38m
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument/ Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.20	D1				78.23		0.26	Grass Over MADE GROUND : Brown slightly silty sandy fine to coarse angular to subangular GRAVEL of limestone and clay	
0.20-0.45	D2				77.98		0.45		
0.45-0.80	D3				77.65		0.80	MADE GROUND : Black silty slightly gravelly fine to coarse SAND. Gravel is of fine to medium brick, slag and brick	
1.00-1.45	CPT	5						MADE GROUND : Light brown slightly sandy SILT	
2.00-2.45	CPT	6					(3.59)	MADE GROUND : No Recovery below 1m although the sampling barrels were dirty when removed from the borehole indicating made ground	
3.00-3.45	CPT	9							
4.00-4.39	CPT	25 blows for 150mm / 50 blows for 235mm			74.05		4.39		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Poor sand 1m and no recovery below

All dimensions in metres	Contractor:	Method: WINDOWLESS SAMPLING	Logged By: AL
Scale 1:50	JETG	Machine: COMPETITOR 130 RIG	

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH2
Project: Wombwell Foundry	Full Depth: 3.11m
Job No: DS074 / Date: 29-09-03 / Ground Level (m): 74.70 / Co-Ordinates:	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
					74.65		0.05	MADE GROUND : Concrete	
0.50-0.65	B1				74.65		(0.60) 0.65	MADE GROUND : Light brown slightly clayey sandy fine to coarse subrounded to rounded GRAVEL of Quartzite and sandstone with some dark staining and occasional fire to medium angular gravel of slag	
0.50-0.65	D1								
0.98-1.50	B2	4						Soft Light brown sandy CLAY (Possibly reworked)	
0.98-1.50	D2								
1.09-1.45	CPT						(2.05)		
								... Stiff at 2.00m	
2.08-2.45	CPT	22							
					72.60		2.70		
2.70-3.00	D3				71.59		(0.41) 3.11	Very weak light brown/grey SILTSTONE. Distinctly weathered.	
3.08-3.11	CPT	25 Blows for 50mm 50 Blows for 55mm							

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: HETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 150 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH3
Project: Wombwell Foundry	Full Depth: 2.78m
Job No: DS074	Date: 29-03-03
Ground Level (m): 71.63	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument/Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.30	D1				74.33		0.30	MADE GROUND : White sandy fine to coarse angular GRAVEL of limestone sub base	
0.30-0.45	D2				74.18		0.45	MADE GROUND : Black slightly silty sandy fine angular GRAVEL of slag, clinker and occasional sandstone	
0.45-1.20	D3							Loose to medium dense Light brown slightly silty slightly sandy fine to coarse angular GRAVEL of silty sandstone	
1.00-1.45	CPT	10					(2.05)		
1.20-2.50	B1							... Medium dense below 2.00m	
2.00-2.45	CP1	26			72.13		2.50		
2.50-2.70	D4				71.85		2.78	Very weak light brown light grey silty SANDSTONE Distinctly weathered	
2.70-2.78	CPT	25 Blows for 30mm / 50 blows for 50mm							

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 EIG	Logged By JL

Form CF-SA-L-2 10-12-03

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings				Borehole No: BH4
Project: Wombwell Foundry				Full Depth: 3.17m
Job No: D5074	Date: 29-09-03	Ground Level (m): 74.98	Co-Ordinates:	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument/ Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.25	D1				74.73		0.25	MADE GROUND : Brown slightly silty sandy fine to coarse angular to subangular GRAVEL of limestone sub-base and clinker	
0.25-0.50	D2				74.48		0.50		
0.50-0.90	B1				74.08		(0.40) 0.90	MADE GROUND : Black slightly silty sandy fine to coarse angular to subangular GRAVEL of clinker, coke, coal and mudstone	
0.50-0.90	D3								
1.00-1.45	CPT	15						Brown sandy slightly gravelly CLAY/SILT. Gravel is fine to medium subangular to subrounded silty sandstone (probably reworked)	
1.20-1.80	D4						(1.30)	Light brown slightly silty slightly sandy fine to coarse angular to subangular GRAVEL of silty sandstone. (destructured bedrock)	
					72.78		2.20		
2.00-2.45	CPT	30						Very weak light brown light grey silty SANDSTONE. Distinctly weathered	
2.20-2.70	D5						(0.97)		
					71.81		3.17		
3.00-3.17	CPT	25 blows for 75mm / 50 blows for 95mm							

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: JETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged By JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH6
Project: Woodwell Foundry	Full Depth: 5.45m
Job No: DS074 / Date: 29-9-03 / Ground Level (m): 73.77 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument	Backfill	STRATA				Geology
Depth	Type No	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
						73.67		0.15	MADE GROUND : Concrete	
0.15-0.50	D1					73.27		0.50	MADE GROUND : White slightly silty slightly sandy fine to coarse angular GRAVEL of clinker and concrete	
0.50-1.10	D2					72.67		(0.60) 1.10	MADE GROUND : Loose black silty SAND/GRAVEL. Sand is fine to coarse, gravel is of fine to coarse angular to subrounded slag and clinker with a slight hydrocarbon odour	
1.00-1.45	CPT	9				72.27		(0.40) 1.50	MADE GROUND : Loose light grey sandy fine to coarse angular to rounded GRAVEL of broken up concrete and organic aggregate (clean material)	
1.50-2.50	D3								MADE GROUND : Loose black Silty SAND / GRAVEL. Sand is fine to coarse, gravel is fine to coarse angular to subrounded slag and clinker. (Wet below around 2.50m)	
2.00-2.45	CPT	8	½					(2.30)		
2.50-3.80	D4									
3.00-3.45	CPT	8				69.97		3.80		
									Soft dark grey slightly sandy CLAY	
3.80-4.50	D5									
4.00-4.45	CPT	6						(1.65)		
5.00-5.45	CPT	12				68.32		5.45		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Poor recovery from 3.50m to 4.50m
29/9/03		2.50		4.00					

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged By: JI

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH7
Project: Woodwell Foundry	Full Depth: 5.37m
Job No: DS074	Date: 29-09-03
Ground Level (m): 74.12	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument/ Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
					74.02		0.10	MADE GROUND : Limestone subbase	
0.10-0.50	D1							MADE GROUND : Medium dense dark brown slightly gravelly fine to coarse SAND. Gravel is of fine to medium angular slag and chalker, a nibble of chalker was also encountered within this strata (Foundry sand)	
0.50-1.00	B1								
1.00-1.45	CPT	12							
								... Loose from 2.00m to 4.50m	
1.70-2.00	D2								
2.00-2.45	CPT	6					(4.70)		
3.00-3.45	CPT	5							
3.50-4.00	D3								
4.00-4.45	CPT	7							
					69.32		4.80		
4.80-5.00	D4						(0.57)	Very stiff light brown SILT	
5.00-5.37	CPT	25 blows for 150mm / 50 blows for 220mm			68.75		5.37		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: [illegible]

Project: [illegible]

Job No: [illegible]

Borehole No: BH8

Full Depth: 2.[illegible]m

Sheet: [illegible]

SAMPLES & [illegible]						STRATA			
Depth	Type [illegible]	[illegible]				Reduced Level		Depth (Thickness)	DESCRIPTION
0.00-0.30	D1					[illegible]		[illegible]	[illegible]
						[illegible]		[illegible]	Topsoil
0.30-1.00	D1							(0.[illegible])	[illegible]
						[illegible]		1.[illegible]	
1.00-1.15 1.20-1.50	[illegible] D2	[illegible]						(1.[illegible])	[illegible] SANDSTO[illegible]
2.00-2.[illegible]	[illegible]	[illegible]				[illegible]		2.[illegible]	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Stable	Standing	Time	To	Hours	

All dimensions in mm

Scale 1:50

Contractor: [illegible]

Method: WINDOWLESS SAMPLING

Machine: COMPETITOR [illegible]

Logged: [illegible]

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH9
Project: Worsbrough Foundry	Full Depth: 4.45 m
Job No: DS071	Date: 30.08.03
Ground Level (m): 70.62	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument Backfill	STRATA				Geology
Depth	Type No.	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
					70.22		0.20	MADE GROUND Black fine to coarse SAND (Foundry sand)	
0.30-0.50	D1				69.82		(0.60) 0.80	Stiff orange mottled grey CLAY/SILT	
1.00-1.45 1.20-1.40	CP1 D2	20					(1.70)	Very weak light brown sandy SILTSTONE. Distinctly weathered.	
2.00-2.45	CP1	23			68.12		2.50		
3.00-3.45	CP1	31					(1.95)	Very weak light brown silty SANDSTONE	
4.00-4.45	CP1	41			66.17		4.45		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Hole installed at 2.50m due to collapse

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 150 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH10
Project: Wondywell Foundry	Full Depth: 5.45m
Job No: DS071 / Date: 30-09-03 / Ground Level (m): 71.59 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument/ Bark (B)	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.30	D1				71.29		0.30	MADE GROUND : Dark brown slightly dry sandy fine to coarse angular to subrounded GRAVEL of clinker and slag (old stream surface)	
0.30-0.40	D2				71.19		0.40		
0.55-0.70	D3				71.04		0.55	MADE GROUND : Black slightly silty very sandy fine to medium angular GRAVEL of clinker and coke & slightly hydrocarbon odour was noted	
1.00-1.45	CPT	6			72.89		0.70	MADE GROUND : Dark brown slightly dry sandy fine to coarse angular to subrounded GRAVEL of clinker and slag	
								MADE GROUND : Black fine to medium SAND (from bay sand)	
2.00-2.20	D4							MADE GROUND : Loose dark brown slightly silty sandy fine to coarse angular to subrounded GRAVEL of clinker and slag.	
2.00-2.45	CPT	5					(3.70)		
3.00-3.45	CPT	9							
4.00-4.45	CPT	7			70.19		4.40		
4.40-4.60	D5						(1.05)	Very stiff light brown slightly sandy CLAY (probably reworked)	
5.00-5.45	CPT	35			69.14		5.45		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Poor recovery between 1m and 3m

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 150 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH11
Project: Woodwell Foundry	Full Depth: 4.44m
Job No: DS071	Date: 30.06.05
Ground Level (m): 73.55	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.30	D1				73.15		(0.40) 0.40	MADE GROUND : Brown dark brown slightly silty sandy fine to coarse angular to subrounded GRAVEL of clinker and slag with sandstone	
					73.05		0.50	MADE GROUND : Brick	
0.60-0.80	D2						(1.35)	MADE GROUND : Medium dense thick bed dark brown to black slightly silty sandy fine to coarse angular to subrounded GRAVEL of clinker and slag	
1.00-1.45	CPT	16			73.70		1.85		
					73.55		2.00	MADE GROUND : Red silty fine to coarse SAND	
2.00-2.45	CPT	15			73.15		(0.40) 2.40	MADE GROUND : Medium Dense black slightly silty sandy fine to coarse angular to subrounded GRAVEL of clinker and slag	
2.40-2.55	D3				72.75		(0.40) 2.80	Soft to firm light brown light grey slightly sandy SILT (becoming firm at 2.60m and stiff at 3.80m)	
3.00-3.45	CPT	42					(1.64)	Very weak light brown sandy SANDSTONE Distinctly weathered	
3.50-4.00	D4								
4.00-4.44	CPT	25 blows for 150mm / 50 blows for 295mm			71.11		4.44		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged by: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH12
Project: Wordswell Foundry	Full depth: 4.18m
Job No: DS073 / Date: 30/06/03 / Ground Level (m): 77.61 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument	Backfill	STRATA				Geology
Depth	Type No	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
						77.51		0.10	MADE GROUND: Limestone rubble	
0.20-0.30	B1					77.31		0.30	MADE GROUND: Red black slightly sandy CLAY with occasional fine to medium angular GRAVEL of brick and chalk	
0.50-0.70	B2								Firm orange mottled light grey slightly sandy CLAY. (becoming stiff below 0.70m)	
0.70-1.00	B3							(1.20)		
1.00-1.45	CP1	9				76.11		1.30		
1.60-1.80	B4								Very weak light brown light grey sandy SILTSTONE. Distinctly weathered	
2.00-2.45	CP1	15						(2.20)		
3.00-3.45	CP1	20				73.91		3.70		
3.70-3.90	B5					73.71		3.90	COAL	
4.00-4.18	CP1	25 blows for 80mm / 50 blows for 95mm				73.43		4.18	Very weak light brown silty SILTSTONE. Distinctly weathered	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: JETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No. BH13
Project: Wombwell Foundry	Full Depth: 3.88m
Job No: DS071 / Date: 30-09-03 / Ground Level (m): 79.68 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument Backfill	STRATA				Geology
Depth	Type No.	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.20	D1				79.28		0.20	MADE GROUND: Dark grey slightly sandy fine to coarse angular to subangular GRAVEL of limestone sub-base	
0.40-0.55	D2						(0.75)	Stiff orange mottled grey slightly sandy CLAY	
					78.33		0.95		
1.00-1.45	CPT	12						Very weak light brown silty SANDSTONE Distinctly weathered	
1.20-1.30	D3								
2.00-2.45	CPT	22					(2.95)		
2.50-3.00	B1								
3.00-3.45	CPT	44							
3.50-3.88	CPT	25 blows for 145mm / 50 blows for 230mm			75.80		3.88		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH14
Project: Woodwall Foundry	Co-ords: 0.00
Job No: 05/974	Date: 30/9/05
Ground Level (m): 90.97	Co-ordinates: 0.00
Hole Depth: 5.17m	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument Backfill	STRATA				Geology
Depth	Type / No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.20-0.60	D1				90.12		(0.95) 0.85	MADE GROUND: Dark brown slightly silty sandy fine to coarse angular to sub-angular GRAVEL of clinker and slag	
					89.77		1.20	Firm mottled grey slightly sandy CLAY. Obstruction at 1.20m	
1.00-1.45	CPT	S						Very weak light grey silty SILTSTONE. Intensely weathered.	
1.88-1.90	D2								
2.00-2.45	CPT	26							
2.50-2.70	B1						(2.75)		
3.00-3.45	CPT	33							
					87.02		3.95		
					86.97		4.00	COAL: Very weak light grey silty SILTSTONE Medium weathered, closely	
4.00-4.45	CPT	28							
4.10-4.30	D3						(1.17)		
5.00-5.17	CPT	25 Blows for 170mm 150 Blows for 95mm			85.80		5.17		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Duration	
30/9/05		4.40		4.00					

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPACTHOR 120 RIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings	Borehole No: BH15
Project: Wombwell Foundry	Full Depth: 0.65m
Job No: DS074	Date: 30-09-03
Ground Level (m): 79.40	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.30-0.65	D1				78.75		(0.65) 0.65	MADE GROUND. Dark brown slightly silty sandy fine to coarse angular to sub-angular GRAVEL of clinker and slag.	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Bore hole abandoned due to obstruction, possible service pipe

All dimensions in metres Scale 1:50	Contractor: IETG	Method: WINDOWLESS SAMPLING Machine: COMPETITOR 130 RIG	Logged By: JL

APPENDIX B

Rotary Open Hole Drillhole Logs

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	HOLLHOLE No. BH 16
Project: Woodwell Foundry	Fill Depth: 30m
Job No: 05071	Date: 1-10-03
Ground Level (m): 74.90	Co-Ordinates:
	Sheet: 1 of 4

RUN DETAILS				Test Result/ Water	Instrument	Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
							74.1		(0.80) 0.80	Foundry SAND**	
							70.4		(3.70) 4.50	Weathered yellow SANDSTONE**	
										Grey SANDSTONE with yellow sandstone and mudstone bands.**	

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout. Slight groundwater at 24m - dried out.

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: TORRERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

Client: Hill & Smith Holdings Ltd				Drillhole No: BH 16
Project: Wombwell Foundry				Full Depth: 30m
Job No: 15801	Date: 1-10-02	Ground Level (m): 74.00	Co-ordinates ():	Sheet: 2 of 4

BOREHOLES				Test Result Water	Instrument Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
								(28.50)		

GENERAL REMARKS: Standpipe installed to 6m depth from surface, beneath 10m backfilled with bentonite grout. Slight groundwater at 24m - dried out.

* Indicates drillers description

All dimensions in metres	Contractor:	Method: ROTARY OPEN HOLE, Air Flush	Logged
Scale 1:50	FORDERS Ltd	Machine: ELEMM	by Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	PIPE HOLE No. BH 16
Project: Wombwell Foundry	Fill Depth: 30m
Job No: D5074 / Date: 1-10-05 / Ground Level (m): 74.93 / Co-ordinates ():	Sheet: 3 of 4

RUN DETAILS				Test Result Water	Instrument/ Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
						51.7		23.20		
									Yellow SANDSTONE - Grey bands**	

GENERAL REMARKS

Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout
Slight groundwater at 24m - dried out

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: HEB & Smith Holdings Ltd	DRILLHOLE No BH 16
Project: Wombwell Foundry	Full Depth: 30m
Job No: DS074	Date: 1-10-05
Ground Level (m): 74.90	Co-Ordinates ():
	Sheet: 4 of 4

RUN DETAILS				Test Result/ Water	Instrument/ Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
						46.0		(4.80) 28.00		
						46.2		(0.70) 28.70	Black SHALE**	
						44.0		(1.30) 30.00	Grey SHALE**	

GENERAL REMARKS

Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout.
Slight groundwater at 24m - dried out

* denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Logged By Driller Machine: KLEMM

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd				DRILLHOLE No BH 17
Project: Woodwell Foundry				Full Depth: 30m
Job No: 08074	Date: 2-10-08	Ground Level (m) 73.14	Co-Ordinates ()	Sheet: 1 of 1

RUN DETAILS				Test Result/ Water	Instrument	Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
							72.64		(0.50) 0.50	Made stone FILL**	
									(2.20)	Weathered yellow SANDSTONE**	
							70.44		2.70		
									(7.10)	Yellow / grey MUDSTONE - Sandstone beds **	

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout. No groundwater encountered.

** denotes drillers description

All dimensions in mm | Contractor: | Method: ROTARY OPEN HOLE, Air Flush | Machine: KLEMM | Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd			DRILLHOLE No BH 17
Project: Wombwell Foundry			Full Depth: 30m
Job No: 05074	Date: 2-10-05	Ground Level (m) 73.14	Co-Ordinates ()	Sheet: 2 of 4

RUN DETAILS				Test Result/ Water	Instrument Det. Left	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
						63.34		9.80		
								(2.78)	Yellow/grey SANDSTONE - Mudstone Beds**	
						60.63		12.59		
									Grey SANDSTONE - Shale beds**	

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout.
No groundwater encountered.

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	DRILLHOLE No BH 17
Project: Wombwell foundry	Full Depth: 30m
Job No: DS074	Date: 2-10-03
Ground Level (m) 73.11	Co-Ordinates ()
	Sheet: 3 of 4

RUN DETAILS				Test Result/ Water	Instrument/ Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
								(17.50)		

GENERAL REMARKS

Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout.
No groundwater encountered.

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORVERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: *Hill & Smith Holdings Ltd*				DRILLHOLE No: BH 17
Project: Wombwell Foundry				Full Depth: 30m
Job No: DS071	Date: 2-10-03	Ground Level (m) 73.14	Co-Ordinates ()	Sheet: 4 of 4

RQD DETAILS				Test Result/ Water	Instrumentation (Backfill)	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
						43.14		30.00		

GENERAL REMARKS: Standpipe installed to 18m depth from surface, beneath 18m backfilled with bentonite grout. No groundwater encountered.

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	DRILLHOLE No BH 18
Project: Wombwell Foundry	Full Depth: 30m
Job No: 05074	Date: 2-10-03
Ground Level (m): 76.78	Co-Ordinates ():
Shot: 1 of 4	

RUN DETAILS				Test Result/ Water	Instrument/ Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
								(5.00)	Yellow / grey MUDSTONE**	
						71.78		5.00	Grey MUDSTONE - Sandstone bands**	
								(3.40)		

GENERAL REMARKS

Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout.
No groundwater encountered.

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Dill & Sons Holdings Ltd	DRILLHOLE No: BH 18
Project: Wordsworth Foundry	Full Depth: 30m
Job No: DS074	Date: 2-10-03
Ground Level (m): 76.78	Co-Ordinates: ()
	Sheet: 2 of 4

CORE DETAILS						STRATA				
Core Depth	TCR %	SCR %	RQD %	Test Result/ Water	Instrumentation / Backfill	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Geology
						68.78		8.40		
								(4.00)	Grey SANDSTONE - thinly bedded**	
						64.38		12.40		
						61.53		12.55	Firm COAL**	
								(6.35)	Grey SHALE - Sandstone Bands**	

GENERAL REMARKS: Standpipe installed to 10m depth from surface. Beneath 10m backfilled with bentonite grout. No groundwater encountered.

** denotes driller's description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	DRILLHOLE No: BH 18
Project: Woodwell Foundry	Full Depth: 30m
Job No: DS071	Date: 2-10-03
Ground Level (m): 76.78	Co-Ordinates ():
Sheet: 3 of 4	

RUN DETAILS				Test Result/ Water	Instrument Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %			Bedrock Level	Legend	Depth (Thickness)	DESCRIPTION	
						57.98		18.80	Grey SANDSTONE**	

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout. No groundwater encountered.

**denotes drillers description

All dimensions in inches Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: HBB & Smith Hobbings Ltd			DRILLHOLE No. BH 18
Project: Wombwell Foundry			Drill Depth: 30m
Job No: DS074	Date: 2-10-03	Ground Level (m): 76.58	Co-Ordinates: () Sheet: 4 of 4

RUN DETAILS				Field Records	Instrumentation/ Backfill	STRATA				Geology
Date Depth	TCR %	SCR %	RQD %	Water		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
								(11.20)		
						46.78		30.00		

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m backfilled with bentonite grout.
No groundwater encountered

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	DRILLHOLE No: BH 19
Project: Wombwell Foundry	Full Depth: 15m
Job No: D5074 / Date: 2-10-03 / Ground Level (m): 80.65 / Co-Ordinates ()	Sheet: 1 of 2

RQD DETAILS: Date / Depth	TCR %	SCR %	RQD %	Test Result/ Water	Instrument: Backfill	STRATA: Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Geology
						80.15		(0.50) 0.50	Made ground: Mudstone FILL**	
						72.15		(11.00) 1.50	Yellow MUDSTONE - Clay bands**	
						76.75		(2.10) 3.60	Yellow / grey MUDSTONE - Dark bands**	
						74.65		5.70	Firm dark COAL**	
								(6.80)	Grey MUDSTONE**	

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m backfilled with Bentonite grout.
Damp at 13.00m, medium groundwater inflow at 13.80m.

** denotes drillers description

All dimensions in metres	Contractor:	Method: ROTARY OPEN HOLE, Air Flush	Logged By: Driller
Scale 1:50	FORKERS Ltd	Machine: KLEMM	

Johnson Poole & Bloomer

DRILLHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	DRILLHOLE No. BH 19
Project: Wombwell Foundry	Full Depth: 15m
Job No: 05074	Date: 2.10.03
Ground Level (m): 80.65	Co-Ordinates:
	Sheet: 2 of 2

RUN DETAILS: Date Depth	TCR %	SCR %	RQD %	Test Result/ Water	Instrument Backfill	STRATA: Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Geology
						70.65		10.00		
						70.5		10.15	Firm COAL**	
						70.35		10.30	Grey MUDSTONE**	
						69.15		(1.20) 11.50	Black SHALE**	
						67.65		(1.50) 13.00	Firm shaky COAL - Shale bands**	
						66.85		(0.80) 13.80	Black SHALE**	
						65.65		(1.20) 15.00	Grey SANDSTONE**	

GENERAL REMARKS: Standpipe installed to 10m depth from surface, beneath 10m back filled with bentonite grout. Damp at 13.00m, medium groundwater inflow at 13.80m.

** denotes drillers description

All dimensions in metres Scale 1:50	Contractor: FORKERS Ltd	Method: ROTARY OPEN HOLE, Air Flush Machine: KLEMM	Logged By: Driller

APPENDIX C

Light Cable Percussive Borehole Logs

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Sean Holdings Ltd	Borehole No. BH 20
Project: Woodwell Foundry	Full Depth: 6.5m
Job No: DS03 / Date: 13.10.03 / Ground Level (m): 73.86 / Co-Ordinates:	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrumentation	Backfill	STRATA				Geology
Depth	Type No.	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.60	B1								MADE GROUND: Medium dense, brown dark brown slightly silty gravelly fine to coarse SAND. Gravel is of fine to coarse angular to subangular dolerite and slag. (Foundry sand)	
1.00-1.00	B2									
1.00-1.45	CPT	9								
2.00-2.00	B3	No Progress								
2.00-2.00	CPT									
3.00-3.00	B4							(6.10)		
3.00-3.45	CPT	14								
4.00-4.00	B5									
4.00-4.45		17								
5.00-5.00	B6									
5.00-5.45		10								
6.00-6.00	B7					67.36		6.10		
6.00-6.33		25 blows for 150mm / 50 blows for 175mm				67.36		6.30	Very weak light brown / grey SANDSTONE. Distinctly weathered	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 6.30m. No groundwater encountered
13/10/03		6.30	6.00			5.00	6.30	1.00	

All dimensions in metres. Scale 1:50	Contractor: A.C. SOILS	Method: CABLE PERCUSSIVE BORING. Machine: DANDO 150 KIG	Logged By: JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	Borehole No: BH 21
Project: Woodwell Foundry	Full Depth: 5.5m
Job No: D8071	Date: 11-10-03
Ground Level (m): 71.46	Co-ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrumentation	Backfill	STRATA				Geology
Depth	Type No	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
									MADE GROUND: Medium dense black/dark brown slightly silty gravelly fine to coarse SAND (travel is of fine to coarse angular to subangular coke and slag. (Foundry sand)	
1.00-1.00	B1									
1.00-1.45		18								
2.00-2.00	B2									
2.00-2.45		11						(5.20)		
3.00-3.00	B3	20 blows for no progress								
3.00-3.00										
4.00-4.00	B4									
4.00-4.45		27								
5.00-5.00	B5					69.26		5.20		
5.00-5.20		7 blows for 150mm / 50 blows for 150mm				68.96		5.50	Soft light brown mottled grey slightly sandy (LA)	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00 to 5.50m No groundwater encountered
11/10/03		5.50	5.20			5.20	5.50	1.00	

All dimensions in metres Scale 1:50	Contractor: A.C. SOILS	Method: CABLE PERCUSSIVE BORING Machine: DANDO 150 RIG	Logged By JL

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: [illegible] & Smith Holdings Ltd	Borehole No. BH 22
Project: Woodwich Foundry	Full Depth: 9m
Job No: 125074 / Date: 10-10-03 / Ground Level (m): [illegible] / Co-ordinates: [illegible]	Sheet: 1 of 2

SAMPLES & TESTS			Water	Instruments	Backfill	STRATA				
Depth	Type No.	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Geology
0.00-0.00	B1								MADE GROUND: Loose to medium dense black dark brown slightly silty gravelly fine to coarse SAND. Gravel is of fine to coarse angular subangular clinker and slag. (Foundry sand)	
1.00-1.00	B2									
1.00-1.45	CPT	9								
2.00-2.00	B3									
2.00-2.45	CPT	19								
3.00-3.00	B4									
3.00-3.45	CPT	12							Very loose to loose at 6.0m	
								(7.50)		
4.00-4.00	B5									
4.00-4.45	CPT	8								
5.00-5.00	B6									
5.00-5.45	CPT	35								
6.00-6.00	B7									
6.00-6.45	SPT	4								
7.00-7.00	B8									
7.00-7.45	SPT	7				65.53		7.50		
7.50-7.50	B9							(0.50)	Soft light brown mottled grey slightly sandy CLAY	
						65.33		8.00		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 9.00m. No groundwater encountered during drilling

All dimensions in metres. Scale 1:50	Contractor: A.C. SOILS	Method: CABLE PERCUSSIVE BORING Machine: DANDO 150 RIG	Logged: [illegible]

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	Borehole No: BH 22
Project: Wombwell Foundry	Full Depth: 9m
Job No: DS071 / Date: 10-10-03 / Ground Level (m): 73.33 / Co-Ordinates ():	Sheet: 2 of 2

SAMPLES & TESTS			Water	Instrument	Backfill	STRATA				Geology
Depth	Type No	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
8.00-8.00 8.00-8.45	BH CPT	34				64.73		(0.60) 8.60	Dense light brown slightly silty slightly sandy fine to coarse angular GRAVEL of silty sand ice	
						64.33		(0.40) 9.00	Yellow rusty brown SANDSTONE	
9.00-9.00 9.00-9.07	BH CPT	25blows for 25mm 50 blows for 50mm								

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 9.00m No groundwater encountered during drilling
11/10/03		9.00	9.00			8.60	9.00	1.00	

All dimensions in metres Scale 1:50	Contractor: A.C. SOILS	Method: CABLE PERCUSSIVE BORING Machine: DANDO 150 RIG	Logged By: JL

Form OF-SA-1-2 8-1-01

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd			Borehole No: BH 23
Project: Wombwell Foundry			Full depth: 9m
Job No: DS074	Date: 8-10-03	Ground Level (m): 73.65	Co-Ordinates (): Sheet: 1 of 2

SAMPLES & TESTS			Water	Instrumentation	Backfill	STRATA				Geology
Depth	Type No	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.60	B1					73.65		0.00	TARMAC	
						73.15		(0.50) 0.50	MADE GROUND : White sandy fine to coarse angular GRAVEL of limestone subbase	
1.00-1.45 1.00-1.09	CPT B2	11							MADE GROUND : Medium dense black brown slightly silty gravelly fine to coarse SAND fine is of fine to coarse angular to subangular clinker and slag with some bricklends, ([foundry sand])	
2.00-2.45 2.00-2.09	CPT B3	18								
3.00-3.45 3.00-3.09	CPT B4	13						(7.00)		
4.00-4.45 4.00-4.09	CPT B5	13								
5.00-5.45 5.00-5.09	CPT B6	15								
6.00-6.45 6.00-6.09	CPT B7	16								
7.00-7.45 7.00-7.09	CPT B8	17				66.15		7.50		
									MADE GROUND : Medium dense black fine to coarse SAND with occasional fragments of fine to	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 9.00m No groundwater encountered
8/10/03		9.00	7.50						
9/10/03		7.50	9.00						

All dimensions in metres	Contractor:	Method: CABLE PERCUSSIVE BORING	Logged By: JL
Scale 1:50	A.C. SOILS	Machine: DANDO 150RIG	

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	Borehole No: BH 23
Project: Woodwell Foundry	Full Depth: 9m
Job No: D5034	Date: 8-10-03
Ground Level (m): 73.65	Co-Ordinates:
	Sheet: 2 of 2

SAMPLES & TESTS			Water	Instrument	Backfill	STRATA				Geology
Depth	Type No	Test Result				Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
8.00-8.45 8.00-8.00	CPT B9	11				64.85		(1.50) 8.50	coarse angular clinker, (Foundry sand)	
8.80-8.80	B10								Very stiff light brown mottled grey slightly sandy CLAY.	
9.00-9.18 9.00-9.00	SPT B11	25 blows for 75mm / 50 blows for 100mm				64.20		(0.65) 9.45		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 9.00m No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: A.C. SOILS	Method: CABLE PERCUSSIVE BORING Machine: DANDO 150 RIG	Logged By JL

Form OC.SA 1.2 R 1.61

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: HBF & Smith Holdings Ltd	Borehole No: BH 24
Project: Wombwell Foundry	Full Depth: 5m
Job No: D5074 / Date: 07-10-03 / Ground Level (m): 72.57 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument / Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.00	B1						(1.50)	MADE GROUND : Firm to stiff yellow brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular rubble concrete and slag	
1.00-1.45	SPT	15			72.57				
1.00-1.00	B2								
2.00-2.45	SPT	11						Firm grey slightly sandy CLAY	
2.00-2.00	B3						(3.00)	... becoming very stiff towards base.	
3.00-3.45	SPT	39							
3.00-3.00	B4								
4.00-4.45	SPT	52			69.57		4.50		
4.00-4.00	B5						(0.50)	Very weak light brown / grey SILTSTONE. Distinctly weathered.	
5.00-5.14	SPT	25 blows for 75mm / 50 blows for 65mm			69.57		5.00		
5.00-5.00	B6								

Dowing Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 5.00m
07/10/03		0.00	3m			4.50	5.00	1.00	No groundwater encountered.
08/10/03		3.00	3.00						

All dimensions in metres	Contractor:	Methods: CABLE PERCUSSIVE BORING	Logged
Scale 1:50	A.C. SOILS	Machine: DANDO 150 RIG	By JL

Form QESA/12 10/03/03

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: HBH & Smith Fieldings Ltd	Borehole No: BH 25
Project: Woodwall Foundry	Full Depth: 7m
Job No: D5074 / Date: 7-10-03 / General Level (m): 74.87 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrumentation / Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.05	B1							MADE GROUND: Topsoil over. Loose black light grey sandy fine to coarse GRAVEL of red brick, concrete and stone	
							(1.50)		
1.00-1.45	SPT	9			73.37		1.50		
1.00-1.00	B2								
1.50-1.50	B3							Firm light brown mottled grey slightly sandy CLAY	
2.00-2.45	SPT	14						. becomes very stiff by 3.00m	
2.00-2.00	B4								
3.00-3.45	SPT	25							
3.00-3.00	B5								
							(4.95)		
4.00-4.45	SPT	47							
4.00-4.00	B6								
5.00-5.45	SPT	50							
5.00-5.00	B7								
6.00-6.05	SPT	50 blows for 75mm							
6.00-6.00	B8				68.42		6.45		
							(0.50)	Very weak light brown/grey SANDSTONE. Distinctly weathered.	
					67.92		7.00		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Seals	Standing	From	To	Hours	Standpipe installed from 6.0m to 7.00m
7/10/03		7.00	1.50			5.50	7.00	1.00	No groundwater encountered.

All dimensions in metres	Contractor:	Method: CABLE PERCUSSIVE BORING	Logged By: AL
Scale 1:50	A.C. SOILS	Machine: DANDO 150 RIG	

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	Borehole No: BH 26
Project: Woodwell Foundry	Full Depth: 8.2m
Job No: D8051 / Date: 6-10-05 / Ground Level (m): 74.14 / Co-ordinates ():	Sheet: 1 of 2

SAMPLES & TESTS			Water	Instruments	Backfill	STRATA				Geology
Depth	Type / No	Test Result				Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00-0.00	B1								MADE GROUND: Gravelly dense Red Brown and orange slightly silty sandy fine to coarse angular GRAVEL of demolition rubble and fine/foundry sand	
1.00-1.25 1.00-1.00	CPT D2	25 blows for 150mm / 50 blows for 100mm								
2.00-2.45 2.00-2.00	SPT B3	16						(5.50)		
3.00-3.45 3.00-3.00	SPT B4	13								
4.00-4.45 4.00-4.00	SPT B5	9								
5.00-5.45 5.00-5.00 5.50-5.50	SPT B6 B7	7				68.64		5.50		
6.00-6.00	B8								Soft to firm light brown mottled grey slightly sandy CLAY/SILT ...becomes very stiff by 6.50m	
6.50-6.95 6.50-6.50	SPT B9	38						(2.65)		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 8.20m No groundwater encountered during drilling.

All dimensions in metres	Contractor:	Method: CABLE PERCUSSIVE BORING	Logged By:
Scale 1:50	A.C. SOILS	Machine: DANDO 150 RIG	

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: BBE & Smith Holdings Ltd				Borehole No: BH 26
Project: Wombwell Foundry				
Job No: 05674	Date: 6-10-05	Ground Level (mOD): 74.13	Co-Ordinates:	Full Depth: 8.2m
				Sheet: 2 of 2

SAMPLES & TESTS			Water	Instrumentation / Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
					65.60		8.53		
8.00-8.23 8.00-8.09	SPT P10	25 blows for 75mm / 50 blows for 155mm			65.94		8.20	Very weak light brown / grey SANDSTONE. Distinctly weathered.	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.65m to 8.20m. No groundwater encountered during drilling.
6/10/05		8.20	8.60			8.15	8.20	1.00	

All dimensions in metres | Contractor: | Method: CABLE PERCUSSIVE BORING | Logged

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	Borehole No: BH 27
Project: Wombwell Foundry	Full Depth: 4.5m
Job No: DS074	Date: 10-10-05
Ground Level (m): 72.67	Co-ordinates ():
Sheet: 1 of 1	

SAMPLES & TESTS			Water	Instrument/ Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.60	B1							MADE GROUND : Medium dense black dark brown slightly silty gravelly fine to coarse SAND Gravel is of fine to coarse angular to subangular flaker and slag with some brickends (Foundry sand)	
1.00-1.45 1.00-1.60	CPT B2	16							
2.00-2.45 2.00-2.60	CPT B3	13					(4.50)		
3.00-3.45 3.00-3.60	CPT B4	16							
4.00-4.45 4.00-4.60	CPT B5	27			68.17		4.50		

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	Standpipe installed from 0.00m to 4.50m No groundwater encountered No progress possible past 4.50m
10/10/10		4.50	4.50			4.50	4.50	1.00	

All dimensions in metres	Contractor:	Method: CABLE PERCUSSIVE BORING	Logged

Johnson Poole & Bloomer

BOREHOLE LOG

Client: Bill & Smith Holdings Ltd	Borehole No: BH 28
Project: Woodwell Foundry	
Job No: 05854 / Date: 9-10-05 / Ground Level (mOD): 70.65 / Co-Ordinates (E,N):	Full Depth: 4.50m / Sheet: 1 of 1

Samples & Tests			Water	Instrument / Backfill	Strata				Geology
Depth	Type No	Test Result			Reduced Level	Level	Depth Thickness	Description	
0.00-0.90	B1							MADE GROUND: Loose to mid brown and black dark brown slightly silty gravelly fine to coarse SAND. Gravel is of fine to coarse angular subangular clinker and slag with some bricks (Foundry sand)	
1.50-1.55 1.60-1.90	CPT B2	10							
2.40-2.45 2.60-2.69	CPT B3	9					(4.50)		
3.60-3.65 3.80-3.89	CPT B4	10							
4.06-4.15 4.60-4.69 4.80-4.90	CPT B5 B6	31			66.15		4.50		

Boring Progress and Water Observations						Clay Slag			General Remarks
Date	Time	Depth	Casing	Sludge	Standing	From	To	Hours	Standpipe installed from 0mm to 4.50m
5/10/05		4.50	4.50			4.00	4.50	2.50	No groundwater encountered No progress possible past 4.50m

All dimensions in metres	Contractor	Method: CABLE PERCUSSION BORING	Logged
Scale 1:50	A.C. SOILS		

Johnson Poole & Bloomer

BOREHOLE LOG

JPB

Client: Hill & Smith Holdings Ltd	Borehole No: BH 28a
Project: Wombwell Foundry	Full Depth: 1.5m
Job No: DS074 / Date: 09-10-03 / Ground Level (m): / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water	Instrument/ Backfill	STRATA				Geology
Depth	Type No	Test Result			Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
							(1.50) 1.50	MADE GROUND: Black, dark brown & dark silty gravelly fine to coarse SAND. Gravel is of fine to coarse angular to subangular clinker and slag with some brickends. (Foundry sand)	

Boring Progress and Water Observations						Chiselling			GENERAL REMARKS
Date	Time	Depth	Casing	Strike	Standing	From	To	Hours	No groundwater encountered
09/10/03		1.50	1.50			1.50	1.50	1.50	

All dimensions in metres Scale 1:50	Contractor:	Method: CABLE PERCUSSIVE BORING	Logged

APPENDIX D

Machine Excavated Trial Pit Logs

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

Client: Hall & Smith Holdings Ltd				Trial Pit No: TP1
Project: Woodbridge Foundry				Full Depth: 3.80m
Job No: D5074	Date: 7-10-05	Ground Level (m): 24.39	Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS				STRATA				
Depth	Type No	Insitu PSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Age
0.30-0.29	B1					0.20	MADE GROUND: Limestone subbase	
0.40-1.00	B2						MADE GROUND: Dark brown - black slightly silty slightly sandy gravelly angular COBBLES of sandstone with occasional Boulder of sandstone. Gravel is fine to coarse angular to subangular sandstone	
1.60-2.20	B3					(3.30)		
				20.89		3.50		
3.50-3.70	B4						Soft light grey very sandy CLAY	
				20.59		3.80		

SKETCH OF FACES (as required)

PLAN

Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By:

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

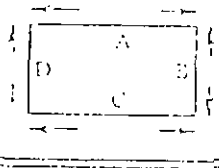
Client: Hill & Smith Holdings Ltd	Trial Pit No. TP2
Project: Woodwell Foundry	Full Depth: 4.6m
Job No: D5074	Date: 7-10-03
Ground Level (m): 73.85	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS				STRATA				
Depth	Type No.	In situ HSV result	Water	Removal Level	Legend	Depth (Thickness)	DESCRIPTION	Fig.
				73.85		0.30	Concrete	
0.40-0.60	B1						MADE GROUND: Dark brown silty sandy gravelly angular COBBLES of brick and sandstone gravel is fine to coarse angular to subangular brick and sandstone	
1.00-1.40	B2					(3.40)		
				70.15		3.70		
3.70-3.85	B3					(0.70)	Firm brown pseudo fibrous PEAT	
				69.45		4.40		
4.40-4.60	B4					4.60	Soft light grey very sandy CLAY	

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged by

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

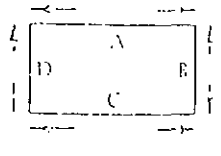
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP3
Project: Woodwell Lounary	Full Depth: 1.5m
Job No: DS071 / Date: 7-10-03 / Ground Level (m): 77.75 / Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS						STRATA		
Depth	Type No	Insitu HSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	No.
				77.45		0.3	Concrete	
0.30-0.50	B1			76.95		(0.70) 0.80	MADE GROUND: Dark brown silty slightly sandy fine to coarse angular GRAVEL of brick and sandstone with occasional cobble of subangular brick	
0.80-1.20	B2			76.25		(0.70) 1.50	Firm orange mottled grey CLAY	

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Sub-day: Stable

Excavation:

Ground Water & Remarks
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By:

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

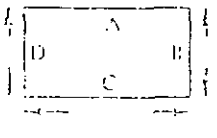
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP4
Project: Woodwell Foundry	Full Depth: 4.2m
Job No: DS071 / Date: 7-10-05 / Ground Level (m): 71.80 / Co-Ordinates: ()	Sheet: 1 of 1

SAMPLES & TESTS				STRATA				
Depth	Type No	In situ HSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	No.
						0.25	Concrete	
0.30-0.60	B1						MADE GROUND: Dark brown silty slightly sandy fine to coarse angular GRAVEL of brick and sandstone with occasional cobbles of angular brick.	
1.00-1.30	B2					(3.15)		
				71.40		3.40		
							Firm light grey mottled orange very sandy CLAY	
3.80-4.20	B3					(0.80)		
				70.60		4.20		

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged by: JL

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

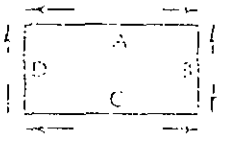
Client: Hill & Smith Holdings Ltd				Trial Pit No: TP5
Project: Wombwell Foundry				Full Depth: 4m
Job No: DS074	Date: 24/8/05	Ground Level (m AOD): 75.49	Co-Ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS			Water			STRATA		
Depth	Type No	In-situ DPSP result		Reduced Level	Legend	Depth (Thick ness)	DESCRIPTION	Ref.
0.40-0.70	B1					(3.20)	MADE GROUND: Dark brown silty sandy fine to coarse angular GRAVEL of clinker, brick and subbase stone	
2.20-2.50	B2			72.29		3.20		
3.50-3.70	B3					(0.80)	Firm grey becoming light brown slightly sandy CLAY.	
				71.49		4.00		

SKETCH OF FACES (as required)

D C B A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres
Scale 1:50

Contractor:
Broadbent & Sons Ltd

Plant: JCB 3CX

Logged

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

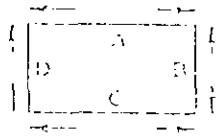
Client: Dill & Smith Holdings Ltd	Trial Pit No. TP6
Project: Woodwell Foundry	Trial Depth: 4.2m
Job No. DS074	Date: 7-10-13
Ground Level: 33.5	Cold Water Level:
	Sheet: 1 of 1

SAMPLES & TESTS						STRATA		
Depth	Type No.	Insitu DSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Sheet
				33.5		6.0	MADE GROUND: Ash and subbase soil	
0.50-0.50	B1						MADE GROUND: Dark brown slightly gravelly SAND with some cobbles. Gravel is fine to coarse angular brick and clinker. Cobbles are of the same. (Foundry sand)	
1.20-1.30	B2							
						(3.90)		
3.00-3.50	B3							
				29.36		4.20		

SKETCH OF FACES (as required)

A	B	C	D

PLAN



Orientation

Stability: Stable

Excavation

Ground water & Pressures: No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Burnett & Evans Ltd	Plant: JCB 3CX	Logged By:

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

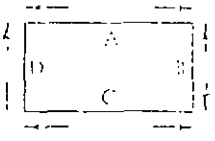
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP7
Project: Wombwell Foundry	Full Depth: 3.2m
Job No: DS074 · Date: 8-10-03 · Ground Level (m): 72.99 · Co-ordinates ():	Sheet: 1 of 1

SAMPLES & TESTS				STRATA				
Depth	Type No.	In situ HSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	No.
0.50-1.00	B1			72.59		(1.40) 1.40	MADE GROUND: Black slightly silty sandy slightly gravelly COBBLES of fused foundry sand moulds, brick and clinker. Gravel is fine to coarse angular to subangular of the same. Many plastic bags present.	
1.60-2.00	B2			70.79		(1.86) 3.20	Firm orange slightly gravelly CLAY. Gravel is of fine to coarse angular to subangular sandstone. By 3.20m becoming sandstone bedrock.	

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Brett Bond & Sons Ltd	Plant: JCB 3CX	Logged by

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

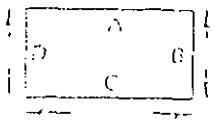
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP8
Project: Wombwell Foundry	Full Depth: 4m
Job No: DS074	Date: 8-10-03
Ground Level (m): 73.23	Co-ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS						STRATA		
Depth	Type No.	In situ HSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Sub.
0.50-0.70	B1						MADE GROUND: Black, slightly silty sandy slightly gravelly COBBLES of fused foundry sand moulds brick and clinker. Gravel is fine to coarse angular to subangular of the same. Many plastic bags present.	
1.50-1.70	B2					(4.00)		
3.50-4.00	B3			69.23		4.00		

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By: JI

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

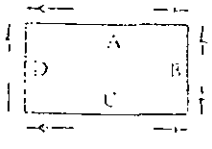
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP9
Project: Wombwell Foundry	Full Depth: 4m
Job No: D5071	Date: 5-10-05
Ground Level (m): 72.11	Cost (minutes): 0
	Sheet: 1 of 1

SAMPLES & TESTS						STRATA		
Depth	Type No.	In situ HPV (kPa)	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Sy
0.00-0.40	B1			72.04		(0.40) 0.40	MADE GROUND: Very silty slightly gravelly fine to coarse angular to subrounded GRAVEL of brick, coarse and general demolition rubble	
0.60-0.85	B2			71.14		(0.90) 1.30	MADE GROUND: Orange sandy fine to coarse angular to subangular GRAVEL of clinker and slag with occasional angular cobbles of clinker	
1.50-2.00	B3			60.52		(1.60) 2.90	MADE GROUND: Soft to firm grey wildly tubular patches of black sand, sandy CLAY (Reworked natural)	
3.00-3.40	B4			68.44		(1.10) 4.00	Firm to stiff orange mottled grey slightly sandy CLAY	

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By:

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

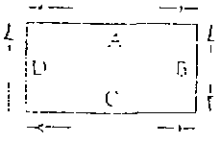
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP10
Project: Woodwell Foundry	Full Depth: 2.8m
Job No: DS074	Date: 8-10-03
Ground Level (m): 7.0	Co-Ordinates ():
Sheet: 1 of 1	

SAMPLES & TESTS						STRATA		
Depth	Type No	In situ HSV result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Sec
						0.20	Long grass over : Topsoil	
0.50-0.80	B1					(2.10)	Firm becoming stiff after 0.40m depth compounded grey slightly sandy CLAY	
				75.80		2.30		
2.40-2.60	B2					(0.50)	Grey slightly clayey slightly sandy fine to coarse angular GRAVEL of siltstone, with occasional cobble of siltstone	
				75.30		2.80		

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By

Johnson Poole & Bloomer

TRIAL PIT LOG

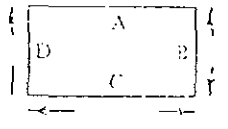
JPB

Client: Hill & Smith Holdings Ltd				Trial Pit No: TP11
Project: Woodwell Foundry				
Job No: D5874	Date: 8-10-95	Ground Level (mOD): 25.55	Co-Ordinates ():	Full Depth: 3.3m
				Sheet: 1 of 1

SAMPLES & TESTS			Water			STRATA	
Depth	Type No	In-situ BSV reading		Reduced Level	Legend	Depth (Thickness)	DESCRIPTIONS
B 0.00-0.50	B1			24.55		(1.00) 1.00	MADE GROUND: Black gravelly fine to coarse SAND. Gravel is of fine to coarse angular to rounded clinker and fired clay. (Foundry ash)
B 1.20-1.50	B2			23.85		(0.70) 1.70	Firm to stiff orange mottled grey slightly sandy CLAY
B 2.50-2.60	B3			22.25		(1.60) 3.30	Light grey clayey fine to coarse angular to subangular GRAVEL of sandy sandstone (Bedrock: regolith)

SKETCH OF FACES (as required)

PLAN



Orientation

Stability: Stable

Excavation

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres	Contractor:	Plant:	Logged
Scale 1:50	Broadhead & Sons Ltd	JCB 3CX	By: D

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

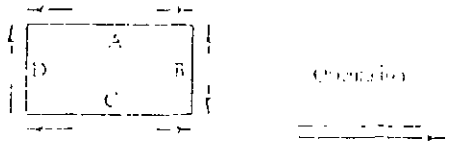
Client: HBB & Smith Holdings Ltd	Trial Pit No: TP12
Project: Woodwell Country	Full Depth: 1.6m
Job No: 128071 / Date: 8-10-15 / Ground Level (m): 87.56 / Co-ordinates:	Sheet: 1 of 1

SAMPLES & TESTS						STRATA		
Depth	Type No	In situ HPA result	Water	Ground Level	Legend	Depth (Thickness)	DESCRIPTION	Notes
						0.2m	Grass over MADE GROUND. Black, slightly gravelly SAND, [illegible] of fine to medium [illegible]	
1.00-1.40	P			80.2m		(1.40) 1.60	Light grey [illegible] fine to coarse angular to sub-angular GRAVEL of very weak silt [illegible]	

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Stability: Stable

Excavation:

Groundwater & Remarks: No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By: JL

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

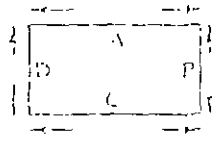
Client: [illegible] Hollings Ltd	Trial Pit No: TP13
Project: [illegible]	Full Depth: 3.6m
Job No: [illegible] / Date: [illegible] / Ground Level: [illegible] / Co-Ordinates: [illegible]	Sheet: 1 of 1

SAMPLES & TESTS				STRATA				
Depth	Doc No	Insitu PSV Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	No
0.10-0.60	B1						Concrete	
				[illegible]		(0.50) [illegible]	MADE GROUND: Slightly silty very sandy fine to coarse angular to subangular GRAVEL [illegible]	
0.70-1.20	B2			[illegible]		(1.00) 1.60	MADE GROUND: Slightly silty sandy fine to coarse subangular to subrounded GRAVEL of [illegible] with occasional sandstone cobbles	
				[illegible]		(1.50) [illegible]	MADE GROUND: Soft to firm grey slightly sandy CLAY with many house bricks	
3.10-3.50	B3			[illegible]		(0.50) 3.60	Stiff orange mottled grey slightly sandy CLAY with some fine to coarse subangular gravels of sandstone	

SKETCH OF FACES (as required)

0	1	2	3	4

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks:
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Son Ltd	Plant: JCB 3CX	Logged by:

Johnson Poole & Bloomer

TRIAL PIT LOG

JPB

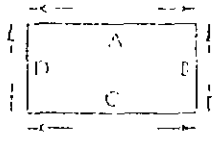
Client: Hill & Smith Holdings Ltd	Trial Pit No: TP14
Project: Woodwell Foundry	Full Depth: 2.7m
Job No: DS074	Date: 8-10-05
Ground Level (m): 77.12	Co-Ordinates ():
	Sheet: 1 of 1

SAMPLES & TESTS			Water	Retained Level	Legend	STRATA		
Depth	Type No	In situ DSV result				Depth (Thickness)	DESCRIPTION	No.
0.50-0.70	B1					(2.70)	Grass over Brown slightly silty sandy fine to coarse angular to subangular GRAVEL of Sandstone. ... By 2.10m becoming very weak orange mottled grey SILTSTONE. Highly weathered (disturbed)	
2.60-2.70	B2			74.42		2.70		

SKETCH OF FACES (as required)

D	C	B	A

PLAN



Orientation

Stability: Stable

Excavation:

Groundwater & Remarks
No groundwater encountered

All dimensions in metres Scale 1:50	Contractor: Broadhead & Sons Ltd	Plant: JCB 3CX	Logged By:

APPENDIX E

Physical Laboratory Test Results

CONTRACT: Wombwell Foundry.

CLIENT Johnson Poole & Bloomer,
Copthall House,
New Road,
Stourbridge,
West Midlands,
DY8 1PH.

GIP
Devonshire House, Ettingshall Road
Wolverhampton WV2 2JT
Phone 01902 450536, Fax 01902 450535

REF:- L/5150 | PAGE NO:- 1 of 2
DATE RECEIVED:- 21.10.03 | DATE ISSUED:- 11.11.03

SAMPLE DETAILS			TEST DATE	INDEX PROPERTIES				CHEMICAL						% PASSING BS SIEVE SIZE		SAMPLE DESCRIPTION	REMARKS
TYP No	DEPTH m	SAMPLE TYPE		W %	WL %	WP %	IP	*TOTAL SO4 %	Soluble SO4 g/L	pH Value	*L.O.I %	*ORG %	*CI %	2.00 mm	0.425 mm		
1	0.40-1.00m	B	24.10.03	16												MADE GROUND: Dark brown slightly silty slightly gravelly SAND. Gravel is clinker.	
1	1.60-2.20m	B	24.10.03	# 13												MADE GROUND: Grey slightly clayey gravelly SAND. Gravel is siltstone with occasional glass.	
2	0.40-0.60m	B	24.10.03	8.7												MADE GROUND: Dark brown slightly silty slightly gravelly SAND. Gravel is clinker with occasional glass and brick.	
2	1.00-1.40m	B	24.10.03	# 11												MADE GROUND: Brown silty slightly sandy GRAVEL. Gravel is slag, clinker and occasionally concrete.	
2	3.20-3.85m	B	24.10.03	135	239	108	131								57	MADE GROUND: Dark brown clayey SAND with occasional roots and rootlets and firm clay pockets	
2	4.40-4.60m	B	24.10.03	30												Soft light brown/grey and occasionally light grey sandy CLAY.	
3	0.80-1.20m	B	24.10.03	31	71	27	44								96	Firm to stiff light brown/orange and occasionally light grey CLAY.	
4	1.00-1.30m	B	24.10.03	34												Firm orange brown and occasionally light grey and dark grey CLAY.	

Sample type		Test abbreviations		Test methods - Unless otherwise stated.	
D	Disturbed	W	Moisture Content	W%	BS1377:PART2:1990:3
B	Bulk disturbed	WL	Liquid limit	WL	BS1377:PART2:1990:4.3/4.4
U	Undisturbed	WP	Plastic limit	WP	BS1377:PART2:1990:5.3
S	SPT split spoon	IP	Index property	IP	BS1377:PART2:1990:5.4
W	Ground water	L.O.I	Loss on ignition	LOI	BS1377:PART3:1990:4
		ORG	Organic content	ORG	BS1377:PART3:1990:3
		CI	Soluble chloride	CI	BS1377:PART3:1990:7.2/7.3

Total SO4 *BS1377:PART3:1990:5.5 | pH Value BS1377:PART3:1990:9
Soluble S BS1377:PART3:1990:5.5

Approved signatories:-

A.L.Pearce, Laboratory director.....

F.H.Lesson, Laboratory manager.....

1597

Tests marked * are not UKAS accredited

The reported results relate only to samples received.

= Sample mass smaller than BS1377 requirements

Opinions and interpretations are outside the scope of UKAS accreditation

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CONTRACT: Wombwell Foundry

CLIENT: Johnson Poole & Bloomer,
Copthall House,
New Road,
Stourbridge,
West Midlands
DY8 1PH

GIP
Devonshire House, Pilsgate Road
Billingham TS22 5QE
Tel: 01642 552211 Fax: 01642 560228

REF: L 5153 | PAGE NO: 2 of 2
DATE RECEIVED: 21.10.03 | DATE ISSUED: 11.11.03

SAMPLE DETAILS			TEST DATE	ROCK PROPERTIES				CHEMICAL						% PASSING BS SIEVE SIZE		SAMPLE DESCRIPTION	REMARKS
TP No	DEPTH m	SAMPLE TYPE		W %	WL (g) %	WP %	Ip	*TOTAL SO3 %	Soluble SO3 g/L	pH Value	*LOI %	*ORG %	*Cl %	2.00 mm	0.425 mm		
5	0.40-0.70m	B	24.10.03	10												MADE GROUND: Orange brown slightly silty slightly gravelly SAND. Gravel is mudstone with occasional slag.	
5	2.20-2.50m	B	24.10.03	9.1												MADE GROUND: Green brown clayey slightly sandy GRAVEL. Gravel is mudstone with occasional clinker.	
6	1.30-1.40m	B	24.10.03	10												MADE GROUND: Dark brown slightly silty slightly gravelly SAND. Gravel is clinker with occasional slag.	
6	3.00-3.50m	B	24.10.03	11												MADE GROUND: Dark brown slightly silty slightly gravelly SAND. Gravel is clinker.	
8	1.50-1.70m	B	24.10.03	9.8												MADE GROUND: Dark brown slightly silty GRAVEL with occasional cobbles. Gravel is clinker with occasional brick. Cobble is clinker.	
11	1.20-1.50m	B	24.10.03	20	54	24	30								85	Stiff light orange brown and occasionally light grey slightly sandy CLAY.	
12	1.00-1.40m	B	24.10.03	12												Light brown slightly sandy GRAVEL. Gravel is siltstone.	
13	0.70-1.20m	B	24.10.03	# 11												MADE GROUND: Brown slightly silty very sandy GRAVEL. Gravel is sandstone.	

Sample type		Test abbreviations		Test methods - Unless otherwise stated.			
D	Disturbed	W	Moisture Content	W%	BS1377:PART2:1990:3	Total SO4	*BS1377:PART3:1990:5.5
B	Bulk disturbed	WL	Liquid limit	WL	BS1377:PART2:1990:4.3/4.4	Soluble S	BS1377:PART3:1990:5.5
U	Undisturbed	Wp	Plastic limit	Wp	BS1377:PART2:1990:5.3	pH Value	BS1377:PART3:1990:9
S	SPT split spoon	Ip	Index property	Ip	BS1377:PART2:1990:5.4		
W	Ground water	LOI	Loss on ignition	LOI	BS1377:PART3:1990:4		
		ORG	Organic content	ORG	BS1377:PART3:1990:3		
		Cl	Soluble chloride	Cl	BS1377:PART3:1990:7.2/7.3		

Approved signatories:

A L Pearce, Laboratory director

B H Lewing, Laboratory manager

1807

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Tests marked * are not UKAS accredited

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This reported results relate only to samples received

= Sample mass smaller than BS1377 requirements

GROUND INVESTIGATION & PILING LIMITED

COMPACTION TEST REPORT

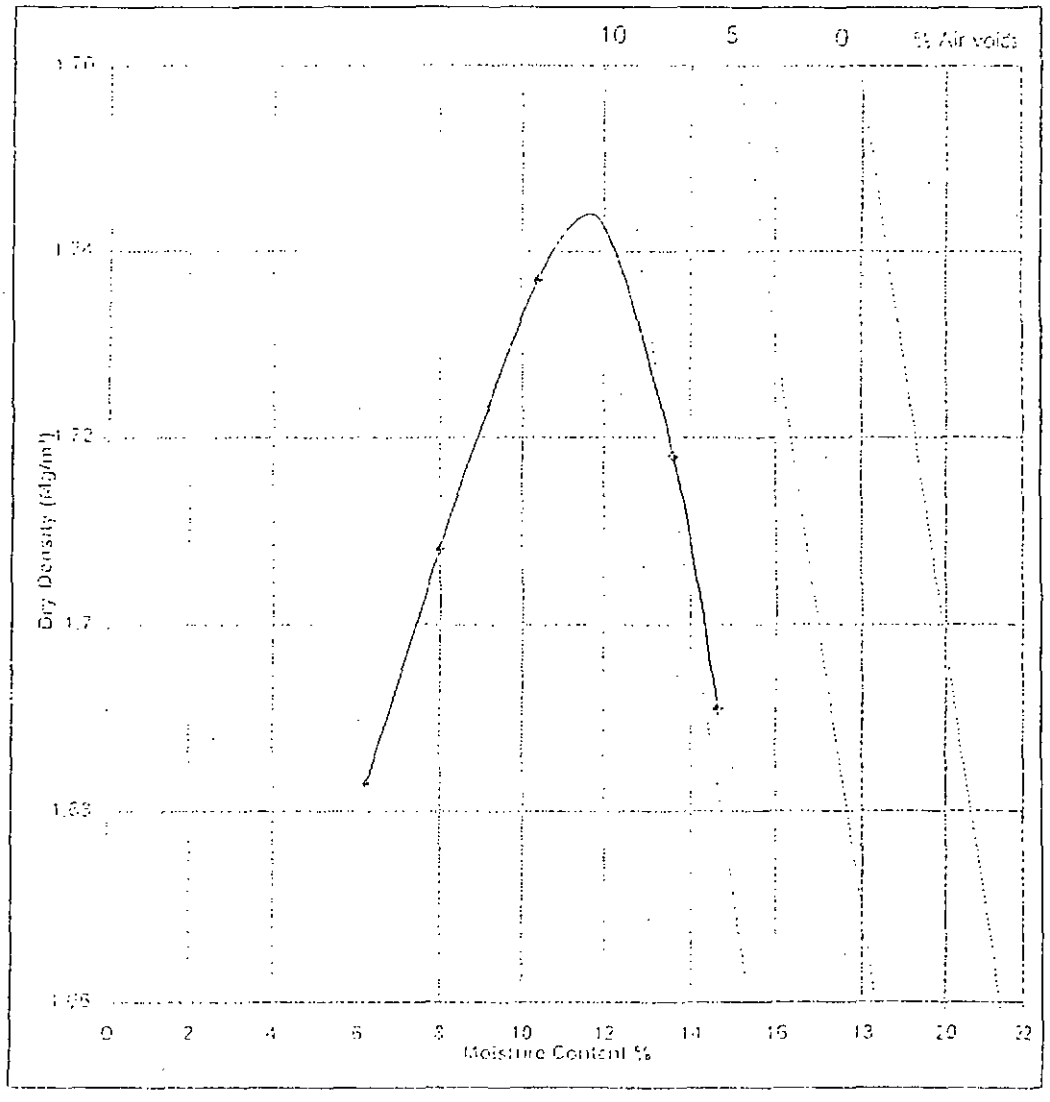
BH 22

Depth:- 1.0,2.0,4.0m

Job No:- L/5170
Received:- 21.10.03
Tested:- 31.10.03
Report:- 05.11.03

Location:- Wombwell Foundry.
Client:- Johnson Poole & Bloomer
Copthall House, New Road,
Stourbridge, West Midlands. DY8 1PH.

TEST METHOD:- Compaction BS1377 Part 1990 Clause 3.4	Optimum Moisture Content:	12 %
	Maximum Dry Density:	1.74 Mg/m³
	Natural Moisture Content:	15 %
	Measured Particle Density:	2.57 Mg/m³
	Material > 20.0mm:	23 %
Particle Density: BS1377 Part2 1990 Clause 8.2	Material > 37.5mm:	30 %
	If material is cohesive then broken down to pass sieve size:	20 mm
	Type of Compaction Rammer.	2.5 kg
Sample Preparation BS1377 Part1 1990 Clause 7.5	Sample Description: MADE GROUND: Brown slightly silty slightly gravelly SAND with occasional cobbles. Gravel is sandstone with occasional ash and clinker. Cobbles are sandstone.	Authorised by E.Keeling Laboratory Manager



Initial sample mass = BS1377 requirements

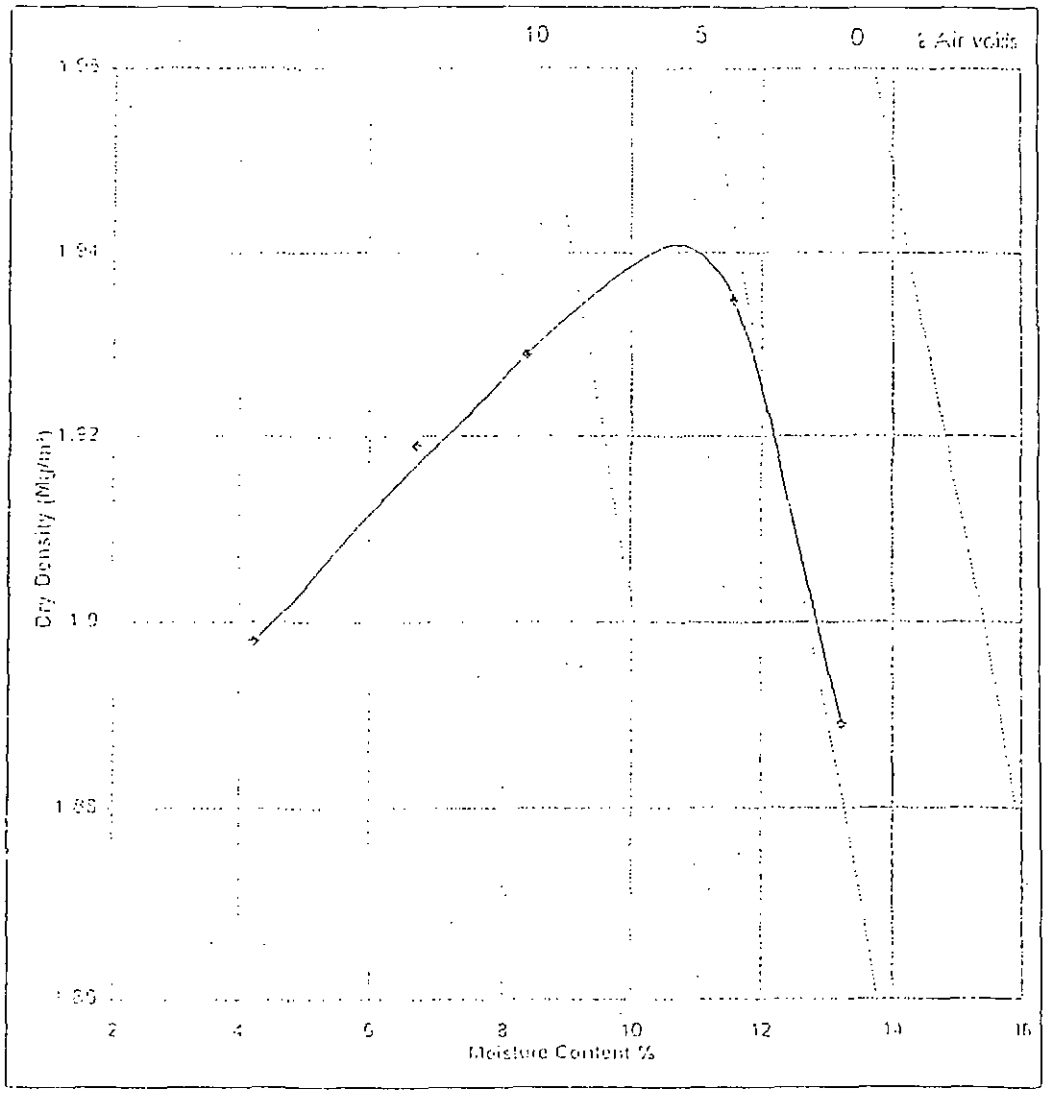
		TP -21, 20, 26
		Depth:- 0.0+1.0m

GROUND INVESTIGATION & PILING LIMITED

COMPACTION TEST REPORT

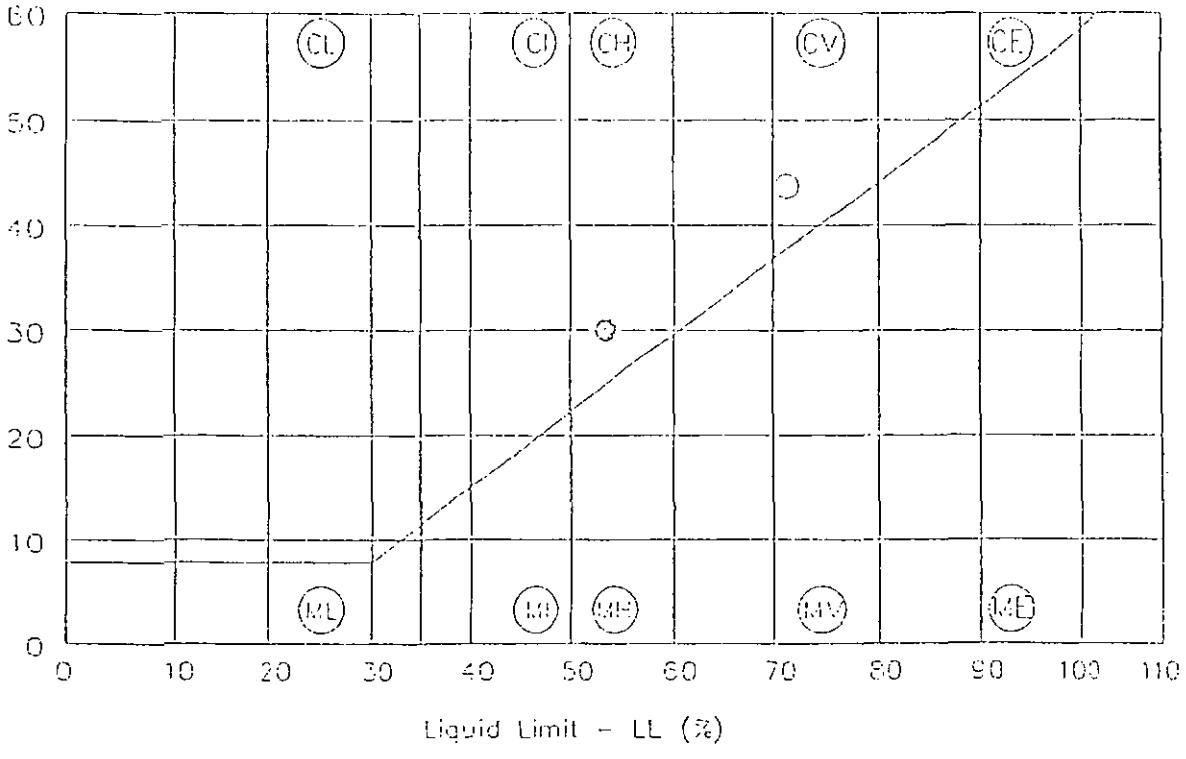
Job No:- L/5150	Location:- Wombwell Foundry.	
Received - 21.10.03	Client:- Johnson Poole & Bloomer	
Tested.- 31.10.03	Copthall House, New Road,	
Report - 05.11.03	Stourbridge, West Midlands, DY8 1PH	Page 2 of 2

TEST METHODS:-	Optimum Moisture Content:	11 %
Compactions:	Maximum Dry Density:	1.94 Mg/m³
BS1377 Part4,1990	Natural Moisture Content:	9.6 %
Clause 3.4	Measured Particle Density:	2.68 Mg/m³
	Material > 20.0mm:	9 %
Particle Density:	Material > 37.5mm:	5 %
BS1377,Part2,1990.	If material is cohesive then broken down to pass sieve size:	20 mm
Clause 3.2	Type of Compaction Rammer:	2.5 kg
Sample Preparations:	Sample Description: MADE GROUND: Dark brown slightly silty slightly gravelly SAND. Gravel is clinker with occasional ash and sandstone	Authorized by E Lovring Laboratory Manager
BS1377 Part1 1990		
Clause 7.6		



Initial sample mass < BS1377 requirements

ATTERBERG LINE PLOT



	BH/TP No. depth (m)	LL	PL	PI	Remarks
○	BH03 @ 0.80-1.20	71	27	44	
⊙	BH11 @ 1.20-1.50	54	24	30	
⊕	BH02 @ 3.20-3.85	239	108	131	PSEUDO PEAT LOSS ON IGNITION 51 % PLOTS OFF THE ABOVE SCALE

JENSON POOLE & GEOMEX LAND CONSULTANTS	Engineer	Client HILL & SMITH HOLDINGS PLC.	Title "ATTERBERG LIMIT A - LINE"
	Checked	Project WOMBWELL FOUNDRY, WOMBWELL	
	Approved	Date Scale	Drawing

GROUND INVESTIGATION & PILING LIMITED

TEST REPORT FOR PARTICLE SIZE DISTRIBUTION

BH 22

Depth 1.0,2.0,4.0m

Page 1 of 2

Job No:- 1/5150 Site:- Wombwell Foundry.

Received:- 21.10.03 Client:- Johnsen Poole & Bloomer

Tested:- 28.10.03 Copthall House, New Road,

Report:- 04.11.03 Stourbridge, West Midlands DY8 1PH

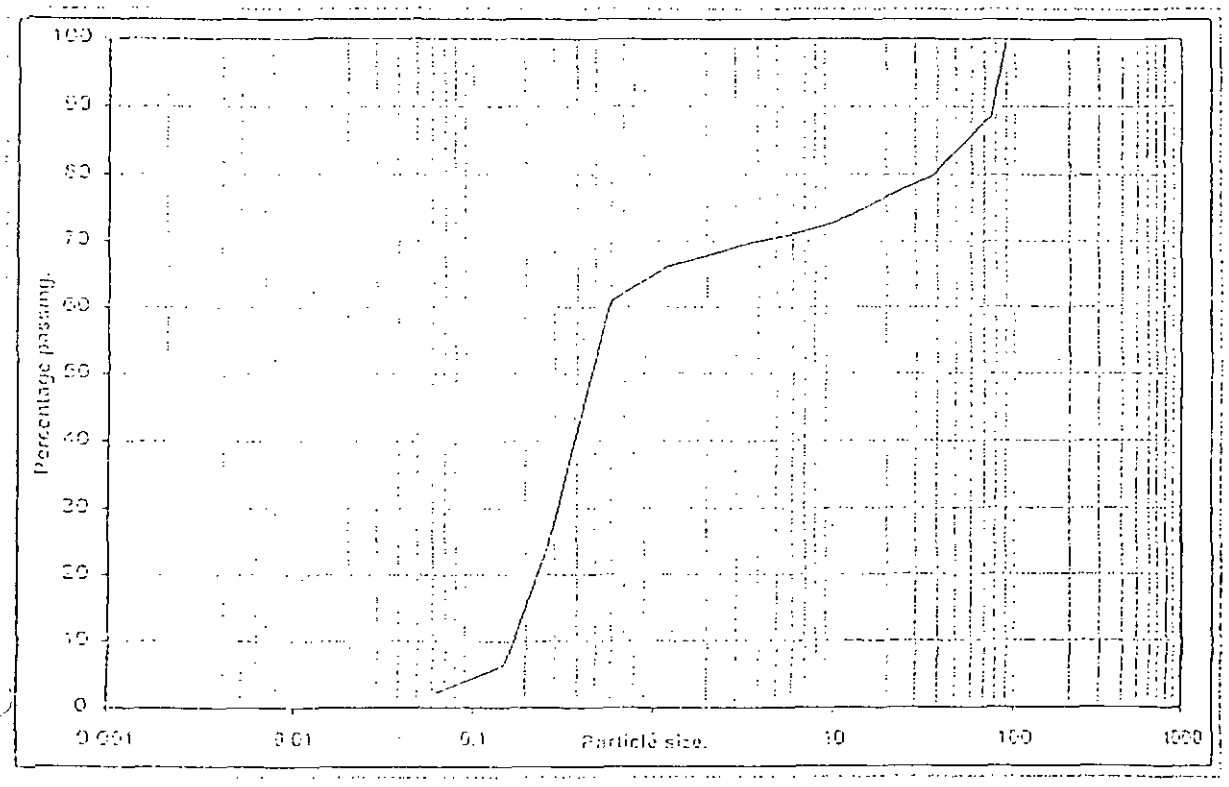
TEST METHODS:- Particle Size Distribution BS 1377 Part 2 1990 Clause 9.2 & 9.3

Sedimentation:- BS 1377, Part 2 1990 Clause 9.4

Sample Description:- MADE GROUND: Brown slightly silty slightly gravelly SAND with occasional cobbles. Gravel is sandstone with occasional ash and clinker. Cobbles are sandstone.

TEST METHODS:- Sample Preparation BS1377 Part1,1990. Clause 7.2 & 7.4.5

Authorised by E Loving Laboratory Manager



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		
CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS

Sieve Size mm	% Passing
150	100
125	100
90	100
75	89
63	87
37.5	80
20	77
10	73
6.3	71

Sieve Size mm	% Passing
3.35	69
2	68
1.18	66
0.6	61
0.3	28
0.15	6
0.063	2

% Clay & Silt	2
% Sand	65
% Gravel	19
% Cobbles	13

1897

GROUND INVESTIGATION & PILING LIMITED

TEST REPORT FOR PARTICLE SIZE DISTRIBUTION

Job No:-	L/5150	Site:-	Wombwell Foundry.
Received:-	21.10.03	Client:-	Johnson Poole & Bloomer
Tested:-	28.10.03		Copthall House, New Road,
Report:-	04.11.03		Stourbridge, West Midlands. DY8 1PH.

BH 21, 20, 26

Depth:- 0.0-1.0m

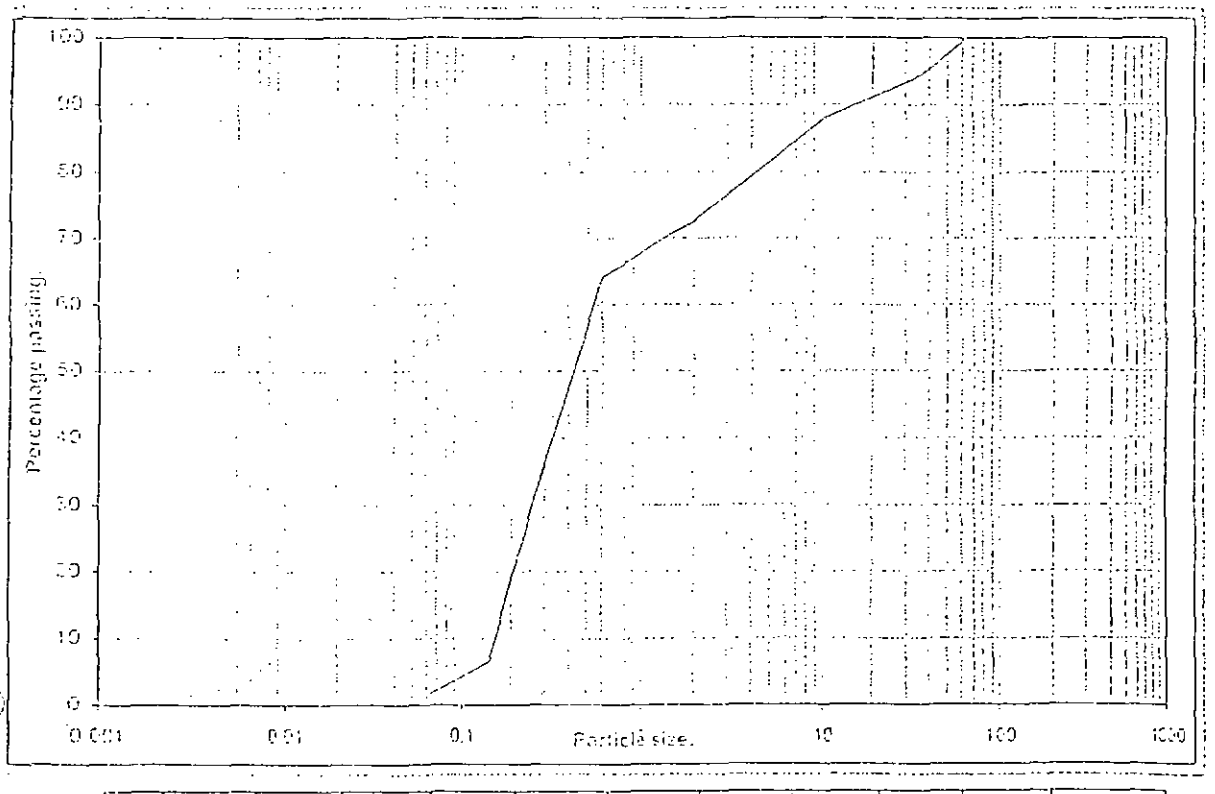
TEST METHODS -
Particle Size Distribution -
BS 1377 Part 2 1990
Clause 9.2 & 9.3

Sedimentation -
BS 1377 Part 2, 1990
Clause 9.4

Sample Description. MADE GROUND: Dark brown slightly silty slightly gravelly SAND. Gravel is clinker with occasional ash and sandstone.

TEST METHODS:-
Sample Preparation.
BS1377,Part1,1990.
Clause 7.3 & 7.4.5

Authorised by E.Lawley
Laboratory Manager



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve Size mm	% Passing
150	100
125	100
90	100
75	100
63	100
37.5	95
20	91
10	88
6.3	84
3.35	78
2	73
1.18	69
0.6	64
0.3	36
0.15	7
0.063	2

% Clay & Silt	2
% Sand	71
% Gravel	27
% Cobbles	0

1997

APPENDIX F

Contamination Analysis Test Results and Statistical Analysis

Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2968535

			Method	H058	H119	H120	H121	H122	H125	H128	H133	H133
Sample ID Number	Description	Date Received	Date Started	pH	Sulphate (Total) mg/kg	Chloride mg/kg	Cyanide (Total) mg/kg	Sulphide mg/kg	Chromium VI mg/kg	Phenolics (as phenol) mg/kg	Arsenic mg/kg	Cadmium mg/kg
921133	TP1 0.4 - 1.0	17/10/2003	17/10/2003	9.7	1100	28	<0.40	390	<1.0	<1.0	26	<0.60
921134	TP1 1.6 - 2.2	17/10/2003	17/10/2003	10.7	1700	65	0.70	20	<1.0	<1.0	<9.0	<0.60
921135	TP2 3.70 - 3.85	17/10/2003	17/10/2003									
921136	TP3 0.3 - 0.5	17/10/2003	17/10/2003	10.5	1400	110	<0.40	33	<1.0	<1.0	41	<0.60
921137	TP4 1.0 - 1.3	17/10/2003	17/10/2003	7.8	270	12	<0.40	<2.0	<1.0	<1.0	18	<0.60
921138	TP5 2.2 - 2.5	17/10/2003	17/10/2003	7.8	720	12	<0.40	2.0	<1.0	<1.0	21	<0.60
921139	TP5 3.3 - 3.5	17/10/2003	17/10/2003	5.5	350	17	<0.40	<2.0	<1.0	<1.0	10	<0.60
921140	TP6 0.3 - 0.5	17/10/2003	17/10/2003	7.0	930	30	<0.50	19	<1.0	<1.0	57	<0.60
921141	TP7 0.5 - 1.0	17/10/2003	17/10/2003	7.1	640	<10	<0.40	35	<1.0	<1.0	13	<0.60
921142	TP7 1.6 - 2.0	17/10/2003	17/10/2003	5.2	320	11	<0.40	2.0	<1.0	<1.0	<9.0	<0.60
921143	TP8 0.5 - 0.7	17/10/2003	17/10/2003	7.3	1300	12	<0.40	10	<1.0	<1.0	21	<0.60

Authorised by: Brian Gardner

Brian Gardner, Analytical Manager

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17/10/03 - 25/11/03

Analytical Report

No. 1161

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2963535

				Method	H058	H119	H120	H121	H122	H125	H128	H133	H133
Sample ID Number	Description		Date Received	Date Started	pH	Sulphate (Total) mg/kg	Chloride mg/kg	Cyanide (Total) mg/kg	Sulphide mg/kg	Chromium VI mg/kg	Phenolics (as phenol) mg/kg	Arsenic mg/kg	Cadmium mg/kg
921145	TP10 0.5 - 0.8		17/10/2003	17/10/2003	4.8	360	7.2	<0.40	7.0	<1.0	<1.0	9.0	<0.60
921146	TP11 0.3 - 0.5		17/10/2003	17/10/2003	6.3	1400	110	<0.40	5.0	<1.0	<1.0	30	<0.60
921148	TP14 0.5 - 0.7		17/10/2003	17/10/2003	7.3	180	6.8	<0.40	<2.0	<1.0	<1.0	18	<0.60
921149	BH1 0.2 - 0.45		17/10/2003	17/10/2003	7.6	3000	27	3.0	5.0	<1.0	<1.0	55	<0.60
921150	BH2 0.3 - 0.65		17/10/2003	17/10/2003	11.7	1700	110	<0.40	21	<1.0	<1.0	13	<0.60
921151	BH2 0.9 - 1.5		17/10/2003	17/10/2003	8.3	<100	11	<0.40	<2.0	<1.0	<1.0	<9.0	<0.60
921152	BH3 0.3 - 0.45		17/10/2003	17/10/2003	8.1	840	41	<0.40	64	<1.0	<1.0	23	<0.60
921153	BH3 0.45 - 1.2		17/10/2003	17/10/2003	8.1	<100	<10	<0.40	5.0	<1.0	<1.0	<9.0	<0.60
921154	BH4 0.0 - 0.25		17/10/2003	17/10/2003	9.4	2000	12	<0.40	2000	<1.0	<1.0	16	<0.60
921155	BH4 0.5 - 0.9		17/10/2003	17/10/2003	6.8	1300	<10	<0.40	59	<1.0	<1.0	<9.0	<0.60
921156	BH5 0.6 - 1.0		17/10/2003	17/10/2003	7.1	210	<10	<0.40	9.0	<1.0	<1.0	<9.0	<0.60

Authorised by: Brian Gardner Brian Gardner , Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel: 0191 2968500 Fax: 0191 2968533

				Method	H058	H119	H120	H121	H122	H125	H128	H133	H133
Sample ID Number	Description	Date Received	Date Started		pH	Sulphate (Total) mg/kg	Chloride mg/kg	Cyanide (Total) mg/kg	Sulphide mg/kg	Chromium VI mg/kg	Phenolics (as phenol) mg/kg	Arsenic mg/kg	Cadmium mg/kg
921157	BH5 1.7 - 2.5	17/10/2003	17/10/2003		8.0	410	11	<0.40	30	<1.0	<1.0	18	<0.60
921158	BH6 0.5 - 1.0	17/10/2003	17/10/2003										
921159	BH7 0.1 - 0.5	17/10/2003	17/10/2003		8.0	560	34	0.40	20	<1.0	<1.0	29	<0.60
921160	BH7 1.7 - 2.0	17/10/2003	17/10/2003		8.4	250	13	0.7	11	<1.0	<1.0	<9.0	<0.60
921161	BH8 0.5 - 1.0	17/10/2003	17/10/2003		4.6	360	<10	<0.40	3.0	<1.0	<1.0	10	<0.60
921162	BH10 0.0 - 0.3	17/10/2003	17/10/2003										
921163	BH10 0.55 - 0.7	17/10/2003	17/10/2003		7.0	180	13	<0.40	4.0	<1.0	<1.0	11	<0.60
921164	BH11 0.0 - 0.3	17/10/2003	17/10/2003		8.1	370	36	<0.40	22	<1.0	<1.0	18	<0.60
921165	BH12 0.2 - 0.3	17/10/2003	17/10/2003		6.6	440	30	<0.40	6.0	<1.0	<1.0	32	<0.60
921166	BH13 0.4 - 0.55	17/10/2003	17/10/2003		6.5	290	51	<0.40	<2.0	<1.0	<1.0	9.0	<0.60
921169	BH22 1.0 - 1.45	17/10/2003	17/10/2003		7.3	<100	10	<0.40	14	<1.0	<1.0	<9.0	<0.60

Authorised by: Brian Gardner

Brian Gardner, Analytical Manager

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Analytical Report

No. 1151

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2968535

				Method	H058	H119	H120	H121	H122	H125	H128 *	H133	H133
Sample ID Number	Description		Date Received	Date Started	pH	Sulphate (Total) mg/kg	Chloride mg/kg	Cyanide (Total) mg/kg	Sulphide mg/kg	Chromium VI mg/kg	Phenolics (as phenol) mg/kg	Arsenic mg/kg	Cadmium mg/kg
921170	BH22 4.0 - 4.45		17/10/2003	17/10/2003	8.2	1500	25	<0.40	120	<1.0	<1.0	37	<0.60
921171	BH22 7.0 - 7.45		17/10/2003	17/10/2003	9.1	220	17	<0.40	31	<1.0	<1.0	<9.0	<0.60
921172	BH23 2.0 - 2.45		17/10/2003	17/10/2003	9.9	670	29	0.60	48	<1.0	<1.0	12	<0.60
921174	BH23 4.0 - 4.45		17/10/2003	17/10/2003	8.2	800	20	0.40	62	<1.0	<1.0	23	<0.60
921178	BH24 1.0 - 1.45		17/10/2003	17/10/2003	7.9	990	11	<0.40	25	<1.0	<1.0	16	<0.60
921179	BH25 1.0 - 1.45		17/10/2003	17/10/2003	7.7	450	14	<0.40	12	<1.0	<1.0	<9.0	<0.60
921180	BH26 1.0 - 1.45		17/10/2003	17/10/2003	7.8	1000	100	<0.40	30	<1.0	<1.0	<9.0	<0.60
921181	BH26 3.0 - 3.45		17/10/2003	17/10/2003	8.0	320	17	<0.40	13	<1.0	<1.0	<9.0	<0.60
921182	BH26 5.0 - 5.45		17/10/2003	17/10/2003	7.7	310	20	<0.40	39	<1.0	<1.0	13	<0.60
921183	BH27 2.0 - 2.45		17/10/2003	17/10/2003	6.8	4700	54	<0.40	370	<1.0	<1.0	20	<0.60
921184	BH28 3.0 - 3.45		17/10/2003	17/10/2003	6.9	5500	51	<0.40	180	<1.0	<1.0	20	<0.60

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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17/10/03 - 11/03

Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel: 0191 2968500 Fax: 0191 2968535

				Method	H058	H119	H120	H121	H122	H125	H128 *	H133	H133
Sample ID Number	Description		Date Received	Date Started	pH	Sulphate (Total)	Chloride	Cyanide (Total)	Sulphide	Chromium VI	Phenolics (as phenol)	Arsenic	Cadmium
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
924506	TP9 0.6-0.85		27/10/2003	27/10/2003	7.5	550	18	<0.40	17	<1.0	<1.0	<9.0	<0.60
924507	BH15 0.3-0.65		27/10/2003	27/10/2003	7.4	1200	160	48	21	<1.0	<1.0	70	<0.60

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel: 0191 2968500 Fax: 0191 2968535

			Method	H133	H133	H133	H133	H133	H145	H150	H151	H159
Sample ID Number	Description	Date Received	Date Started	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/kg	Zinc mg/kg	Selenium mg/kg	Mercury mg/kg	Thiocyanate mg/kg	Sulphur mg/kg
921133	TP1 0.4 - 1.0	17/10/2003	17/10/2003	24	160	210	18	170	0.92	0.27	1.5	1800
921134	TP1 1.6 - 2.2	17/10/2003	17/10/2003	28	26	29	20	75	0.24	0.078	<1.0	1400
921135	TP2 3.70 - 3.85	17/10/2003	17/10/2003									
921136	TP3 0.3 - 0.5	17/10/2003	17/10/2003	151	160	720	56	110	0.30	0.10	<1.0	910
921137	TP4 1.0 - 1.3	17/10/2003	17/10/2003	37	95	37	38	79	0.47	<0.020	1.6	220
921138	TP5 2.2 - 2.5	17/10/2003	17/10/2003	27	97	86	29	87	0.72	0.10	1.6	450
921139	TP5 3.3 - 3.5	17/10/2003	17/10/2003	29	12	29	14	67	0.42	0.063	2.0	260
921140	TP5 0.3 - 0.5	17/10/2003	17/10/2003	260	230	160	250	110	0.31	0.20	<1.0	990
921141	TP7 0.5 - 1.0	17/10/2003	17/10/2003	54	49	110	39	69	0.33	0.066	1.8	1100
921142	TP7 1.6 - 2.0	17/10/2003	17/10/2003	23	15	32	23	110	0.21	<0.020	1.5	190
921143	TP8 0.5 - 0.7	17/10/2003	17/10/2003	350	96	28	1100	61	0.10	<0.020	<1.0	1400

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD

Tel. 0191 2968500 Fax. 0191 2968535

			Method	H133	H133	H133	H133	H133	H145	H150	H151	H169
Sample ID Number	Description	Date Received	Date Started	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/kg	Zinc mg/kg	Selenium mg/kg	Mercury mg/kg	Thiocyanate mg/kg	Sulphur mg/kg
921145	TP10 0.5 - 0.8	17/10/2003	17/10/2003	39	25	16	37	67	0.26	0.048	1.2	170
921146	TP11 0.3 - 0.5	17/10/2003	17/10/2003	78	110	32	89	44	0.24	<0.020	<1.0	900
921148	TP14 0.5 - 0.7	17/10/2003	17/10/2003	16	23	18	15	42	0.38	0.12	<1.0	130
921149	BH1 0.2 - 0.45	17/10/2003	17/10/2003	530	130	460	78	250	0.54	0.26	1.2	2000
921150	BH2 0.3 - 0.65	17/10/2003	17/10/2003	20	33	32	29	65	0.21	<0.020	1.3	800
921151	BH2 0.9 - 1.5	17/10/2003	17/10/2003	20	11	20	18	59	0.37	<0.020	2.9	88
921152	BH3 0.3 - 0.45	17/10/2003	17/10/2003	25	120	130	54	65	0.58	0.21	1.6	1300
921153	BH3 0.45 - 1.2	17/10/2003	17/10/2003	13	10	13	24	34	<0.10	0.032	<1.0	47
921154	BH4 0.0 - 0.25	17/10/2003	17/10/2003	42	89	43	29	85	1.7	0.037	1.6	5300
921155	BH4 0.5 - 0.9	17/10/2003	17/10/2003	12	6.0	34	7.0	37	0.40	0.044	<1.0	730
921156	BH5 0.6 - 1.0	17/10/2003	17/10/2003	3.0	<3.0	<4.0	7.0	<3.0	<0.10	<0.020	<1.0	190

Authorised by: Brian Gardiner Brian Gardner., Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD

Tel. 0191 2968500 Fax. 0191 2968535

			Method	H133	H133	H133	H133	H133	H145	H150	H151	H169
Sample ID Number	Description	Date Received	Date Started	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/kg	Zinc mg/kg	Selenium mg/kg	Mercury mg/kg	Thiocyanate mg/kg	Sulphur mg/kg
921157	BH5 1.7 - 2.5	17/10/2003	17/10/2003	620	82	82	130	79	0.21	0.055	2.2	430
921158	BH6 0.5 - 1.1	17/10/2003	17/10/2003									
921159	BH7 0.1 - 0.5	17/10/2003	17/10/2003	130	210	550	63	110	0.30	0.082	<1.0	550
921160	BH7 1.7 - 2.0	17/10/2003	17/10/2003	66	36	96	68	46	0.12	0.25	1.7	210
921161	BH8 0.5 - 1.0	17/10/2003	17/10/2003	31	26	24	32	110	0.35	0.035	2.0	250
921162	BH10 0.0 - 0.3	17/10/2003	17/10/2003									
921163	BH10 0.55 - 0.7	17/10/2003	17/10/2003	39	71	23	43	43	0.19	<0.020	<1.0	300
921164	BH11 0.0 - 0.3	17/10/2003	17/10/2003	65	130	1400	81	220	0.30	0.052	1.7	510
921165	BH12 0.2 - 0.3	17/10/2003	17/10/2003	36	74	320	54	240	0.70	0.25	<1.0	560
921166	BH13 0.4 - 0.55	17/10/2003	17/10/2003	38	33	19	61	91	0.20	<0.040	1.2	180
921169	BH22 1.0 - 1.45	17/10/2003	17/10/2003	15	13	<4.0	27	<3.0	<0.10	<0.020	<1.0	130

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Brian Gardner, Analytical Manager

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17/10/03 5/11/03

Analytical Report

No. 1191

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
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Northumberland Dock Road
Wallsend
Tyne & Wear
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Tel. 0191 2968500 Fax. 0191 2968535

			Method	H133	H133	H133	H133	H133	H145	H150	H151	H169
Sample ID Number	Description	Date Received	Date Started	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/kg	Zinc mg/kg	Selenium mg/kg	Mercury mg/kg	Thiocyanate mg/kg	Sulphur mg/kg
921170	BH22 4.0 - 4.45	17/10/2003	17/10/2003	160	63	6.0	94	21	0.15	<0.020	2.1	1100
921171	BH22 7.0 - 7.45	17/10/2003	17/10/2003	93	23	5.0	100	13	<0.10	<0.020	<1.0	190
921172	BH23 2.0 - 2.45	17/10/2003	17/10/2003	110	65	59	82	100	0.21	0.073	<1.0	530
921174	BH23 4.0 - 4.45	17/10/2003	17/10/2003	310	120	73	240	74	0.25	0.10	<1.0	790
921178	BH24 1.0 - 1.45	17/10/2003	17/10/2003	50	120	89	82	65	0.18	0.034	2.8	740
921179	BH25 1.0 - 1.45	17/10/2003	17/10/2003	150	52	29	200	110	0.20	0.053	1.5	340
921180	BH26 1.0 - 1.45	17/10/2003	17/10/2003	97	30	20	160	290	0.22	<0.90	1.7	700
921181	BH26 3.0 - 3.45	17/10/2003	17/10/2003	78	21	10	62	14	<0.10	<0.020	3.2	190
921182	BH26 5.0 - 5.45	17/10/2003	17/10/2003	120	39	<4.0	150	12	<0.10	<0.020	<1.0	320
921183	BH27 2.0 - 2.45	17/10/2003	17/10/2003	190	140	23	270	130	0.31	<0.020	<1.0	4100
921184	BH28 3.0 - 3.45	17/10/2003	17/10/2003	370	100	29	970	160	0.39	<0.020	1.1	3400

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Brian Gardner , Analytical Manager

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Analytical Report

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Contract: JOHNSPOOLE-8039

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				Method	H133	H133	H133	H133	H133	H145	H150	H151	H169
Sample ID Number	Description		Date Received	Date Started	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/kg	Zinc mg/kg	Selenium mg/kg	Mercury mg/kg	Thiocyanate mg/kg	Sulphur mg/kg
924506	TP9 0.6-0.85		27/10/2003	27/10/2003	53	17	9.0	14	14	<0.10	0.020	≤1.0	420
924507	BH15 0.3-0.65		27/10/2003	27/10/2003	52	2500	1100	13	3600	1.0	1.3	<1.0	1700

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Contract: JOHNSPOOLE-8039

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			Method	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	C027	C027	C027	C027
				*	*	*	*	*				
Sample ID Number	Description	Date Received	Date Started	Cyanide (Complex) mg/kg	Iron mg/kg	Loss on Ignition mg/kg	Manganese mg/kg	Nitrate mg/kg	Acenaphthene mg/kg	Acenaphthylene mg/kg	Anthracene mg/kg	Benz(a)anthracene mg/kg
921133	TP1 0.4 - 1.0	17/10/2003	17/10/2003	<0.40	51000		2000	3.0	<1.0	1.1	7.7	16
921134	TP1 1.6 - 2.2	17/10/2003	17/10/2003	0.70	31000		1700	<3.0	<1.0	<1.0	<1.0	<1.0
921135	TP2 3.70 - 3.85	17/10/2003	17/10/2003			510000						
921136	TP3 0.3 - 0.5	17/10/2003	17/10/2003	<0.40	96000		1600	<3.0	<1.0	<1.0	<1.0	1.0
921137	TP4 1.0 - 1.3	17/10/2003	17/10/2003	<0.40	55000		1000	<3.0	<1.0	<1.0	<1.0	1.0
921138	TP5 2.2 - 2.5	17/10/2003	17/10/2003	<0.40	40000		370	<3.0	<1.0	<1.0	<1.0	<1.0
921139	TP5 3.3 - 3.5	17/10/2003	17/10/2003	<0.40	39000		1300	<3.0	<1.0	<1.0	<1.0	<1.0
921140	TP6 0.3 - 0.5	17/10/2003	17/10/2003	0.50	140000		2300	<3.0	<1.0	<1.0	<1.0	<1.0
921141	TP7 0.5 - 1.0	17/10/2003	17/10/2003	<0.40	33000		1000	<3.0	<1.0	<1.0	<1.0	<1.0
921142	TP7 1.6 - 2.0	17/10/2003	17/10/2003	<0.40	37000		660	<3.0	<1.0	<1.0	<1.0	<1.0
921143	TP8 0.5 - 0.7	17/10/2003	17/10/2003	<0.40	95000		2100	<3.0	<1.0	<1.0	<1.0	<1.0

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Brian Gardner , Analytical Manager

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			Method	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	O027	O027	O027	O027
				*	*	*	*	*				
Sample ID Number	Description	Date Received	Date Started	Cyanide (Complex) mg/kg	Iron mg/kg	Loss on Ignition mg/kg	Manganese mg/kg	Nitrate mg/kg	Acenaphthene mg/kg	Acenaphthylene mg/kg	Anthracene mg/kg	Benz(a)anthracene mg/kg
921145	TP10 0.5 - 0.8	17/10/2003	17/10/2003	<0.40	40000		270	<3.0	<1.0	<1.0	<1.0	<1.0
921146	TP11 0.3 - 0.5	17/10/2003	17/10/2003	<0.40	90000		740	<3.0	<1.0	<1.0	<1.0	<1.0
921148	TP14 0.5 - 0.7	17/10/2003	17/10/2003	<0.40	24000		370	<3.0	<1.0	<1.0	<1.0	<1.0
921149	BH1 0.2 - 0.45	17/10/2003	17/10/2003	2.7	100000		930	5.0	<1.0	<1.0	<1.0	2.4
921150	BH2 0.3 - 0.65	17/10/2003	17/10/2003	<0.40	37000		650	<3.0	<1.0	<1.0	<1.0	<1.0
921151	BH2 0.9 - 1.5	17/10/2003	17/10/2003	<0.40	29000		530	<3.0	<1.0	<1.0	<1.0	<1.0
921152	BH3 0.3 - 0.45	17/10/2003	17/10/2003	<0.40	53000		1300	<3.0	<1.0	<1.0	<1.0	<1.0
921153	BH3 0.45 - 1.2	17/10/2003	17/10/2003	<0.40	24000		730	<3.0	<1.0	<1.0	<1.0	<1.0
921154	BH4 0.0 - 0.25	17/10/2003	17/10/2003	<0.40	39000		6300	<3.0	<1.0	<1.0	<1.0	1.1
921155	BH4 0.5 - 0.9	17/10/2003	17/10/2003	<0.40	25000		570	<3.0	<1.0	<1.0	<1.0	<1.0
921156	BH5 0.6 - 1.0	17/10/2003	17/10/2003	<0.40	3200		31	<3.0	<1.0	<1.0	<1.0	<1.0

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Brian Gardner , Analytical Manager

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Contract: JOHNSPOOLE-8039

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Sample ID Number	Description	Date Received	Date Started	Method	IN_HOUSE * Cyanide (Complex) mg/kg	IN_HOUSE * Iron mg/kg	IN_HOUSE * Loss on Ignition mg/kg	IN_HOUSE * Manganese mg/kg	IN_HOUSE * Nitrate mg/kg	O027 Acenaphthene mg/kg	O027 Acenaphthylene mg/kg	O027 Anthracene mg/kg	O027 Benz(e)anthracene mg/kg
921157	BH5 1.7 - 2.5	17/10/2003	17/10/2003		<0.40	56000		3200	<3.0	<1.0	<1.0	<1.0	<1.0
921158	BH6 0.5 - 1.1	17/10/2003	17/10/2003										
921159	BH7 0.1 - 0.5	17/10/2003	17/10/2003		<0.40	66000		1400	<3.0	<1.0	<1.0	<1.0	<1.0
921160	BH7 1.7 - 2.0	17/10/2003	17/10/2003		7.7	23000		700	<3.0	<1.0	<1.0	<1.0	<1.0
921161	BH8 0.5 - 1.0	17/10/2003	17/10/2003		<0.40	38000		1200	<3.0	<1.0	<1.0	<1.0	<1.0
921162	BH10 0.0 - 0.3	17/10/2003	17/10/2003										
921163	BH10 0.55 - 0.7	17/10/2003	17/10/2003		<0.40	32000		650	<3.0	<1.0	<1.0	<1.0	<1.0
921164	BH11 0.0 - 0.3	17/10/2003	17/10/2003		<0.40	52000		930	<3.0	<1.0	<1.0	<1.0	<1.0
921165	BH12 0.2 - 0.3	17/10/2003	17/10/2003		<0.40	70000		4400	12	<1.0	<1.0	<1.0	<1.0
921166	BH13 0.4 - 0.55	17/10/2003	17/10/2003		<0.40	43000		730	<3.0	<1.0	<1.0	<1.0	<1.0
921169	BH22 1.0 - 1.45	17/10/2003	17/10/2003		<0.40	9400		240	<3.0	<1.0	<1.0	<1.0	<1.0

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Brian Gardner , Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
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				Method	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	O027	O027	O027	O027
					*	*	*	*	*				
Sample ID Number	Description	Date Received	Date Started		Cyanide (Complex) mg/kg	Iron mg/kg	Loss on Ignition mg/kg	Manganese mg/kg	Nitrate mg/kg	Acenaphthene mg/kg	Acenaphthylene mg/kg	Anthracene mg/kg	Benz(a)anthracene mg/kg
921170	BH22 4.0 - 4.45	17/10/2003	17/10/2003		<0.40	93000		2200	<3.0	<1.0	<1.0	<1.0	<1.0
921171	BH22 7.0 - 7.45	17/10/2003	17/10/2003		<0.40	18000		1100	<3.0	<1.0	<1.0	<1.0	<1.0
921172	BH23 2.0 - 2.45	17/10/2003	17/10/2003		0.80	42000		1200	<3.0	<1.0	<1.0	<1.0	<1.0
921174	BH23 4.0 - 4.45	17/10/2003	17/10/2003		<0.40	79000		2600	<3.0	<1.0	<1.0	<1.0	<1.0
921178	BH24 1.0 - 1.45	17/10/2003	17/10/2003		<0.40	69000		1400	<3.0	<1.0	<1.0	<1.0	<1.0
921179	BH25 1.0 - 1.45	17/10/2003	17/10/2003		<0.40	40000		760	<3.0	<1.0	<1.0	<1.0	<1.0
921180	BH26 1.0 - 1.45	17/10/2003	17/10/2003		<0.40	23000		1100	<3.0	<1.0	<1.0	<1.0	<1.0
921181	BH26 3.0 - 3.45	17/10/2003	17/10/2003		<0.40	19000		820	<3.0	<1.0	<1.0	<1.0	<1.0
921182	BH26 5.0 - 5.45	17/10/2003	17/10/2003		<0.40	34000		720	<3.0	<1.0	<1.0	<1.0	<1.0
921183	BH27 2.0 - 2.45	17/10/2003	17/10/2003		<0.40	90000		4900	<3.0	<1.0	<1.0	<1.0	<1.0
921184	BH28 3.0 - 3.45	17/10/2003	17/10/2003		<0.40	98000		2900	<3.0	<1.0	<1.0	<1.0	<1.0

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Contract: JOHNSPOOLE-8039

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				Method	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	IN_HOUSE	O027	O027	O027	O027
					*	*	*	*	*				
Sample ID Number	Description	Date Received	Date Started		Cyanide (Complex) mg/kg	Iron mg/kg	Loss on Ignition mg/kg	Manganese mg/kg	Nitrate mg/kg	Acenaphthene mg/kg	Acenaphthylene mg/kg	Anthracene mg/kg	Benz(a)anthracene mg/kg
924506	TP9 0.6-0.65	27/10/2003	27/10/2003		<0.40	62000		6000	<3.0	<1.0	<1.0	<1.0	<1.0
924507	BH15 0.3-0.65	27/10/2003	27/10/2003		46	130000		1700	4.0	<1.0	<1.0	3.0	6.9

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			Method	O027	O027	O027	O027	O027	O027	O027	O027	O027
Sample ID Number	Description	Date Received	Date Started	Benzo(a)pyrene mg/kg	Benzo(b)fluoranthene mg/kg	Benzo(ghi)perylene mg/kg	Benzo(k)fluoranthene mg/kg	Chrysene mg/kg	Dibenz(ah)anthracene mg/kg	Fluoranthene mg/kg	Fluorene mg/kg	Indenopyrene mg/kg
921133	TP1 0.4 - 1.0	17/10/2003	17/10/2003	13	11	8.5	10	15	2.4	35	1.3	8.3
921134	TP1 1.6 - 2.2	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921135	TP2 3.70 - 3.85	17/10/2003	17/10/2003									
921136	TP3 0.3 - 0.5	17/10/2003	17/10/2003	1.2	1.2	<1.0	1.0	1.2	<1.0	1.7	<1.0	<1.0
921137	TP4 1.0 - 1.3	17/10/2003	17/10/2003	1.1	1.1	<1.0	<1.0	1.2	<1.0	2.1	<1.0	<1.0
921138	TP5 2.2 - 2.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921139	TP5 3.3 - 3.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921140	TP6 0.3 - 0.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0	<1.0
921141	TP7 0.5 - 1.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921142	TP7 1.6 - 2.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921143	TP8 0.5 - 0.7	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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Sample ID Number	Description	Date Received	Date Started	Method	O027 Benzo(a)pyrene mg/kg	O027 Benzo(b)fluoranthene mg/kg	O027 Benzo(ghi)perylene mg/kg	O027 Benzo(k)fluoranthene mg/kg	O027 Chrysene mg/kg	O027 Dibenz(ah)anthracene mg/kg	O027 Fluoranthene mg/kg	O027 Fluorene mg/kg	O027 Indenopyrene mg/kg
921145	TP10 0.5 - 0.8	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921146	TP11 0.3 - 0.5	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921148	TP14 0.5 - 0.7	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921149	BH1 0.2 - 0.45	17/10/2003	17/10/2003		1.9	1.9	<1.4	2.0	3.0	<1.0	4.5	<1.0	1.0
921150	BH2 0.3 - 0.65	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921151	BH2 0.9 - 1.5	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921152	BH3 0.3 - 0.45	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	1.6	<1.0	2.0	<1.0	<1.0
921153	BH3 0.45 - 1.2	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921154	BH4 0.0 - 0.25	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	1.0	1.5	<1.0	1.7	<1.0	<1.0
921155	BH4 0.5 - 0.9	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921156	BH5 0.6 - 1.0	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
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			Method	O027	O027	O027	O027	O027	O027	O027	O027	O027
Sample ID Number	Description	Date Received	Date Started	Benzo(a)pyrene mg/kg	Benzo(b)fluoranthene mg/kg	Benzo(ghi)perylene mg/kg	Benzo(k)fluoranthene mg/kg	Chrysene mg/kg	Dibenz(ah)anthracene mg/kg	Fluoranthene mg/kg	Fluorene mg/kg	Indenopyrene mg/kg
921157	BH5 1.7 - 2.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	2.2	<1.0	<1.0
921158	BH6 0.5 - 1.1	17/10/2003	17/10/2003									
921159	BH7 0.1 - 0.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921160	BH7 1.7 - 2.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921161	BH8 0.5 - 1.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921162	BH10 0.0 - 0.3	17/10/2003	17/10/2003									
921163	BH10 0.55 - 0.7	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921164	BH11 0.0 - 0.3	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921165	BH12 0.2 - 0.3	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	<1.0
921166	BH13 0.4 - 0.55	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921169	BH22 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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No. 1181

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Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
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			Method	O027	O027	O027	O027	O027	O027	O027	O027	O027
Sample ID Number	Description	Date Received	Date Started	Benzo(a)pyrene mg/kg	Benzo(b)fluoranthene mg/kg	Benzo(ghi)perylene mg/kg	Benzo(k)fluoranthene mg/kg	Chrysene mg/kg	Dibenz(ah)anthracene mg/kg	Fluoranthene mg/kg	Fluorene mg/kg	Indenopyrene mg/kg
921170	BH22 4.0 - 4.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921171	BH22 7.0 - 7.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921172	BH23 2.0 - 2.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921174	BH23 4.0 - 4.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921178	BH24 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921179	BH25 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921180	BH26 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921181	BH26 3.0 - 3.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921182	BH26 5.0 - 5.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921183	BH27 2.0 - 2.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
921184	BH28 3.0 - 3.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0

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Contract: JOHNSPOOLE-8039

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Sample ID Number	Description	Date Received	Date Started	Method	O027 Benzo(a)pyrene mg/kg	O027 Benzo(b)fluoranthene mg/kg	O027 Benzo(ghi)perylene mg/kg	O027 Benzo(k)fluoranthene mg/kg	O027 Chrysene mg/kg	O027 Dibenz(ah)anthracene mg/kg	O027 Fluoranthene mg/kg	O027 Fluorene mg/kg	O027 Indenopyrene mg/kg
924506	TP9 0.6-0.85	27/10/2003	27/10/2003		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
924507	BH15 0.3-0.65	27/10/2003	27/10/2003		6.9	9.1	4.6	3.4	7.7	1.2	15	<1.0	4.5

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			Method	O027	O027	O027	O027	O081	O081	O081	O081
Sample ID Number	Description	Date Received	Date Started	Naphthalene mg/kg	PAH TOTAL mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	C10 to C12 hydrocarbons mg/kg	C10 to C28 hydrocarbons (DRO range) mg/kg	C28 to C34 hydrocarbons mg/kg	Total Petroleum Hydrocarbons mg/kg
921133	TP1 0.4 - 1.0	17/10/2003	17/10/2003	3.3	187.6	28	27				
921134	TP1 1.6 - 2.2	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921135	TP2 3.70 - 3.85	17/10/2003	17/10/2003								
921136	TP3 0.3 - 0.5	17/10/2003	17/10/2003	<1.0	8.7	<1.0	1.4				
921137	TP4 1.0 - 1.3	17/10/2003	17/10/2003	<1.0	8.3	<1.0	1.8				
921138	TP5 2.2 - 2.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921139	TP5 3.3 - 3.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921140	TP6 0.3 - 0.5	17/10/2003	17/10/2003	<1.0	1.3	<1.0	<1.0				
921141	TP7 0.5 - 1.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921142	TP7 1.5 - 2.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921143	TP8 0.5 - 0.7	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				

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			Method	O027	O027	O027	O027	O081	O081	O081	O081
Sample ID Number	Description	Date Received	Date Started	Naphthalene mg/kg	PAH TOTAL mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	C10 to C12 hydrocarbons mg/kg	C10 to C28 hydrocarbons (DRO range) mg/kg	C28 to C34 hydrocarbons mg/kg	Total Petroleum Hydrocarbons mg/kg
921145	TP10 0.5 - 0.8	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921146	TP11 0.3 - 0.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921148	TP14 0.5 - 0.7	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921149	BH1 0.2 - 0.45	17/10/2003	17/10/2003	7.4	36.4	6.6	4.3				
921150	BH2 0.3 - 0.65	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921151	BH2 0.9 - 1.5	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921152	BH3 0.3 - 0.45	17/10/2003	17/10/2003	4.6	14	3.4	2.4				
921153	BH3 0.45 - 1.2	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921154	BH4 0.0 - 0.25	17/10/2003	17/10/2003	1.8	10.8	1.4	2.3				
921155	BH4 0.5 - 0.9	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921156	BH5 0.6 - 1.0	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				

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				Method	O027	O027	O027	O027	O081	O081	O081	O081
Sample ID Number	Description	Date Received	Date Started		Naphthalene mg/kg	PAH TOTAL mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	C10 to C12 hydrocarbons mg/kg	C10 to C28 hydrocarbons (DRO range) mg/kg	C28 to C34 hydrocarbons mg/kg	Total Petroleum Hydrocarbons mg/kg
921157	BH5 1.7 - 2.5	17/10/2003	17/10/2003		<1.0	6.2	1.1	1.8				
921158	BH6 0.5 - 1.1	17/10/2003	17/10/2003						<70	<70	<70	<70
921159	BH7 0.1 - 0.5	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				
921160	BH7 1.7 - 2.0	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				
921161	BH8 0.5 - 1.0	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				
921162	BH10 0.0 - 0.3	17/10/2003	17/10/2003						<70	<70	<70	<70
921163	BH10 0.55 - 0.7	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				
921164	BH11 0.0 - 0.3	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				
921165	BH12 0.2 - 0.3	17/10/2003	17/10/2003		<1.0	3.1	<1.0	1.4				
921166	BH13 0.4 - 0.55	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				
921169	BH22 1.0 - 1.45	17/10/2003	17/10/2003		<1.0	<1.0	<1.0	<1.0				

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			Method	O027	O027	O027	O027	O081	O081	O081	O081
Sample ID Number	Description	Date Received	Date Started	Naphthalene mg/kg	PAH TOTAL mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	C10 to C12 hydrocarbons mg/kg	C10 to C28 hydrocarbons (DRO range) mg/kg	C28 to C34 hydrocarbons mg/kg	Total Petroleum Hydrocarbons mg/kg
921170	BH22 4.0 - 4.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921171	BH22 7.0 - 7.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921172	BH23 2.0 - 2.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921174	BH23 4.0 - 4.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921178	BH24 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921179	BH25 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921180	BH26 1.0 - 1.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921181	BH26 3.0 - 3.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921182	BH26 5.0 - 5.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921183	BH27 2.0 - 2.45	17/10/2003	17/10/2003	<1.0	<1.0	<1.0	<1.0				
921184	BH28 3.0 - 3.45	17/10/2003	17/10/2003	1.7	2.0	<1.0	<1.0				

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				Method	O027	O027	O027	O027	O081	O081	O081	O081
Sample ID Number	Description		Date Received	Date Started	Naphthalene mg/kg	PAH TOTAL mg/kg	Phenanthrene mg/kg	Pyrene mg/kg	C10 to C12 hydrocarbons mg/kg	C10 to C28 hydrocarbons (DRO range) mg/kg	C28 to C34 hydrocarbons mg/kg	Total Petroleum Hydrocarbons mg/kg
924506	TP9 0.6-0.85		27/10/2003	27/10/2003	<1.0	<1.0	<1.0	<1.0				
924507	BH15 0.3-0.65		27/10/2003	27/10/2003	7.6	93.9	12	12				

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				Method	H027	H027	H027	H031	H041	H042	H045
Sample ID Number	Description		Date Received	Date Started	Ammonia mg/l as N	Nitrate mg/l as N	Nitrite mg/l as N	pH	Sulphide mg/l	BOD (ATU) 5 Day mg/l	Phosphate (Total) mg/l as P
927597	BH17 W		10/11/2003	10/11/2003	0.60	<0.50	<0.011	7.4	<0.020	3.0	<0.80
927598	BH25 W		10/11/2003	10/11/2003	0.70	<0.50	<0.011	7.3	<0.020	9.0	2.1
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003		<0.50		7.8	0.060		
927609	TP6 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003		<0.50		7.2	<0.020		
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003		<0.50		7.7	0.022		
927611	BH11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003		<0.50		7.8	0.020		
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003		<0.50		8.0	<0.020		
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003		<0.50		6.6	<0.020		
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003		<0.50		7.0	<0.020		
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003		<0.50		7.4	0.038		
927616	BH26 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003		<0.50		7.5	<0.020		

Authorised by: Brian Gardner

Brian Gardner, Analytical Manager

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17/10/03 - 25/11/03

Analytical Report

No. 1161

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
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Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2968535

				Method	H047	H090	H090	H101	H102	H105	H105
Sample ID Number	Description		Date Received	Date Started	Cyanide (Free) mg/l	Chloride mg/l	Sulphate mg/l	Arsenic mg/l	Selenium mg/l	Cadmium mg/l	Chromium mg/l
927597	BH17 W		10/11/2003	10/11/2003	<0.020	74	200	0.0019	<0.00050	<0.0020	0.0076
927598	BH25 W		10/11/2003	10/11/2003	<0.020	62	190	0.0023	<0.00050	<0.0020	0.0075
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003		1.4	8.9	0.011	<0.00050	<0.0020	<0.0030
927609	TP6 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003		1.2	10	<0.00030	<0.00050	<0.0020	<0.0030
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003		1.3	4.3	0.0032	<0.00050	<0.0020	<0.0030
927611	BH11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003		2.0	10	0.0011	<0.00050	<0.0020	<0.0030
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003		8.0	28	0.00090	<0.00050	<0.0020	<0.0030
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003		1.2	4.3	<0.00030	<0.00050	<0.0020	<0.0030
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003		1.4	9.2	<0.00030	<0.00050	<0.0020	<0.0030
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003		1.1	4.5	0.0014	<0.00050	<0.0020	<0.0030
927616	BH28 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003		5.8	25	0.0016	<0.00050	<0.0020	<0.0030

Authorised by: Brian Gardner

Brian Gardner, Analytical Manager

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Analytical Report

No 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
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STOURBRIDGE

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NE28 0QD
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				Method	H106	H106	H106	H106	H106	H106	H107
Sample ID Number	Description		Date Received	Date Started	Copper mg/l	Iron mg/l	Lead mg/l	Manganese mg/l	Nickel mg/l	Zinc mg/l	Magnesium mg/l
927597	BH17 W		10/11/2003	10/11/2003	<0.0030	1.3	0.019	0.48	0.0068		68
927598	BH25 W		10/11/2003	10/11/2003	0.020	2.0	0.040	1.0	0.019		63
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003	0.011	0.41	0.023	0.076	<0.0050	0.011	
927609	TP6 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003	<0.0030	0.22	<0.013	0.0048	<0.0050	<0.0040	
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003	<0.0030	0.35	<0.013	0.018	<0.0050	0.017	
927611	BH 11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003	<0.0030	0.62	0.040	0.0079	<0.0050	0.0055	
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003	0.017	0.13	<0.013	0.10	<0.0050	0.037	
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003	<0.0030	0.43	<0.013	0.0034	<0.0050	<0.0040	
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003	<0.0030	0.46	<0.013	<0.0030	<0.0050	<0.0040	
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003	<0.0030	0.86	<0.013	0.027	0.0059	<0.0040	
927616	BH26 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003	<0.0030	0.29	<0.013	0.14	0.0084	0.021	

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Brian Gardner , Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
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Northumberland Dock Road
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Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2968535

				Method	H108	H127	H128	H141	H162	IN_HOUSE	IN_HOUSE
									*	*	*
Sample ID NumSer	Description		Date Received	Date Started	Mercury mg/l	Cyanide (Total) mg/l	Phenolics (as phenol) mg/l	Boron mg/l	Thiocyanate mg/l	Chromium VI mg/l	Cyanide (FeII/FeIII) mg/l
927597	BH17 W		10/11/2003	10/11/2003	<0.000080	<0.020	<0.020	0.060		<0.020	
927598	BH25 W		10/11/2003	10/11/2003	<0.000080	<0.020	<0.020	0.060		<0.020	
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927609	TP6 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		0.37	<0.020	<0.030
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003	<0.000080	0.10	<0.020		<0.16	<0.020	<0.030
927611	BH 11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927616	BH26 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		0.17	<0.020	<0.030

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Brian Gardner , Analytical Manager

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Analytical Report

No. 1151

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

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Northumberland Dock Road
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Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2968535

				Method	IN_HOUSE	C044	C044	C044	C044	C044	C044
Sample ID Number	Description		Date Received	Date Started	Sulphur mg/l	Acenaphthene ug/l	Acenaphthylene ug/l	Anthracene ug/l	Benz(A)Anthracene ug/l	Benzo(A)Pyrene ug/l	Benzo(B)Fluoranthene ug/l
927597	BH17 W		10/11/2003	10/11/2003							
927598	BH25 W		10/11/2003	10/11/2003							
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003	2.7	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927609	TP5 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003	3.3	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003	1.3	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927611	BH 11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003	3.4	<0.12	<0.10	<0.10	<0.10	<0.10	<0.10
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003	9.7	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003	1.3	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003	3.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003	1.4	0.18	<0.10	<0.10	<0.10	<0.10	<0.10
927616	BH26 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003	8.6	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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17/10/03 : 25/11/03

Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
CORTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
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NE28 0QD
Tel. 0191 2968500 Fax. 0191 2958535

					Method	O044	O044	O044	O044	O044	O044	O044
Sample ID Number	Description		Date Received	Date Started		Benzo(Ghi)Perylene ug/l	Benzo(K)Fluoranthene ug/l	Chrysene ug/l	Dibenz(Ah)Anthracene ug/l	Fluoranthene ug/l	Fluorene ug/l	Indenopyrene ug/l
927597	BH17 W		10/11/2003	10/11/2003								
927598	BH25 W		10/11/2003	10/11/2003								
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927609	TP6 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927611	BH11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003		<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	0.13	<0.10
927616	BH23 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

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Brian Gardner., Analytical Manager

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
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Tyne & Wear
NE28 0QD

Tel. 0191 2968500 Fax. 0191 2968535

				Method	O044	O044	O044	O044	O082
Sample ID Number	Description		Date Received	Date Started	Naphthalene ug/l	PAH TOTAL ug/l	Phenanthrene ug/l	Pyrene ug/l	C10 to C28 hydrocarbons (DRO range) mg/l
927597	BH17 W		10/11/2003	10/11/2003					0.020
927598	BH25 W		10/11/2003	10/11/2003					0.020
927608	TP1 0.4 - 1.0	LEACHATE 921133	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927609	TP6 0.3 - 0.5	LEACHATE 921140	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927610	BH7 1.7 - 2.0	LEACHATE 921160	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927611	BH 11 0.0 - 0.3	LEACHATE 921164	10/11/2003	10/11/2003	<0.10	0.28	0.14	<0.10	
927612	BH15 0.3 - 0.65	LEACHATE 924507	10/11/2003	10/11/2003	<0.12	<0.12	<0.12	<0.12	
927613	BH22 1.0 - 1.45	LEACHATE 921169	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927614	BH22 4.0 - 4.10	LEACHATE 921170	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927615	BH22 7.0 - 7.45	LEACHATE 921171	10/11/2003	10/11/2003	<0.10	0.31	<0.10	<0.10	
927616	BH26 1.0 - 1.45	LEACHATE 921180	10/11/2003	10/11/2003	0.19	0.19	<0.10	<0.10	

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Brian Gardner , Analytical Manager

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Contract: JOHNSPOOLE-8039

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Tel. 0191 2968500 Fax. 0191 2968535

				Method	H027	H027	H027	H031	H041	H042	H045
Sample ID Number	Description		Date Received	Date Started	Ammonia mg/l as N	Nitrate mg/l as N	Nitrite mg/l as N	pH	Sulphide mg/l	BOD (ATU) 5 Day mg/l	Phosphate (Total) mg/l as P
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003		<0.50		6.6	<0.020		
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003		<0.50		7.1	<0.020		
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003		0.50		7.9	<0.020		

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Analytical Report

No. 1181

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Contract: JOHNSPOOLE-8039

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				Method	H047	H090	H090	H101	H102	H105	H106
Sample ID Number	Description		Date Received	Date Started	Cyanide (Free) mg/l	Chloride mg/l	Sulphate mg/l	Arsenic mg/l	Selenium mg/l	Cadmium mg/l	Chromium mg/l
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003		212	160	<0.00030	<0.00050	<0.0020	<0.0030
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003		31	170	<0.00030	<0.00050	<0.0020	<0.0030
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003		117	21	<0.00030	<0.00050	<0.0020	<0.0030

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				Method	H106	H106	H106	H106	H106	H106	H107
Sample ID Number	Description		Date Received	Date Started	Copper mg/l	Iron mg/l	Lead mg/l	Manganese mg/l	Nickel mg/l	Zinc mg/l	Magnesium mg/l
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003	<0.0030	0.017	<0.013	2.8	0.092	0.079	
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003	<0.0030	0.049	<0.013	1.4	0.019	<0.0040	
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003	<0.0030	0.032	<0.013	<0.0030	<0.0050	<0.0040	

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Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-6039

WOMBWELL FOUNDRY

JAMES LAWRENCE
JOHNSON POOLE & BLOOMER
COPTHALL HOUSE
NEW ROAD
STOURBRIDGE

Analytical & Environmental Services Ltd
Northumberland Dock Road
Wallsend
Tyne & Wear
NE28 0QD
Tel. 0191 2968500 Fax. 0191 2968535

				Method	H108	H127	H128	H141	H162	IN_HOUSE	IN_HOUSE
									*	*	*
Sample ID Number	Description		Date Received	Date Started	Mercury	Cyanide (Total)	Phenolics (as phenol)	Boron	Thiocyanate	Chromium VI	Cyanide (FeII/FeIII)
					mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		<0.16	<0.020	<0.030
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		0.23	<0.020	<0.030
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003	<0.000080	<0.020	<0.020		0.27	<0.020	<0.030

Authorised by: Brian Gardner

Brian Gardner, Analytical Manager

: Tests marked "*" in this report are NOT included in the UKAS accreditation schedule for this laboratory.

Printed 25/11/03

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Results relate only to the items tested

17/10/03 - 25/11/03

Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

Contract: JOHNSPOOLE-8039

WOMBWELL FOUNDRY

JAMES LAWRENCE
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STOURBRIDGE

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				Method	IN_HOUSE	O044	O044	O044	O044	O044	O044
Sample ID Number	Description		Date Received	Date Started	Sulphur mg/l	Acenaphthene ug/l	Acenaphthylene ug/l	Anthracene ug/l	Benz(A)Anthracene ug/l	Benzo(A)Pyrene ug/l	Benzo(B)Fluoranthene ug/l
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003	64	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003	60	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003	7.2	<0.10	<0.10	0.22	<0.10	<0.10	<0.10

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Brian Gardner , Analytical Manager

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17/10/03 25/11/03

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Contract: JOHNSPOOLE-8039

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Tel 0191 2968500 Fax. 0191 2968535

Sample ID Number	Description		Date Received	Date Started	Method	O044 Benzo(Ghi)Perylene ug/l	O044 Benzo(K)Fluoranthene ug/l	O044 Chrysene ug/l	O044 Dibenz(Ah)Anthracene ug/l	O044 Fluoranthene ug/l	O044 Fluorene ug/l	O044 Indenopyrene ug/l
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003		<0.10	<0.10	<0.10	<0.10	0.45	0.15	<0.10

Authorised by: Brian Gardner

Brian Gardner , Analytical Manager

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17/10/03 - 25/11/03

Analytical Report

No. 1181

Client: JOHNSON POOLE AND BLOOMER

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				Method	O044	O044	O044	O044	O082
Sample ID Number	Description		Date Received	Date Started	Naphthalene ug/l	PAH TOTAL ug/l	Phenanthrene ug/l	Pyrene ug/l	C10 to C28 hydrocarbons (DRO range) mg/l
927617	BH27 2.0 - 2.45	LEACHATE 921183	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927618	BH28 3.0 - 3.45	LEACHATE 921184	10/11/2003	10/11/2003	<0.10	<0.10	<0.10	<0.10	
927619	BH1 0.2 - 0.45	LEACHATE 921149	10/11/2003	10/11/2003	0.29	2.53	1.1	0.32	

Authorised by: Brian Gardner Brian Gardner , Analytical Manager

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17/10/03 - 25/11/03

APPENDIX G

Gas and Groundwater Monitoring Results

JJB	Client: [illegible]	Equipment: GA 2000 Gfmeter	Reference: US674															
	Premises: [illegible]		Atmospheric: [illegible]															
			Steady (Q): [illegible]															
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	27/01/04													
3	CH4 % LEL	2	0	0	0													
	CH4 % VOL	0.1	0	0	0													
	CO2 %	0	0.4	0.9	1.2													
	O2 %	19.7	20	19.2	11.8													
	H2S PPM	0	0	0	0													
	CO PPM	0	0	0	0													
	BOREHOLE PRESSURE (mb)	0.7	-0.23	n/a	0													
	TEMPERATURE °C inlet/	n/a	n/a	n/a	n/a													
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a													
	AVERAGE FLOW (l/hr)	0	0.3	0	0													
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992													
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	27/01/04													
6	CH4 % LEL	0	0	0	n/a													
	CH4 % VOL	0	0	0	n/a													
	CO2 %	2.4	0	0.5	n/a													
	O2 %	9.6	20.1	8.6	n/a													
	H2S PPM	0	0	0	n/a													
	CO PPM	0	0	2	n/a													
	BOREHOLE PRESSURE (mb)	-0.15	-0.37		n/a													
	TEMPERATURE °C inlet/	n/a	n/a	n/a	n/a													
	WATER LEVEL (mbgl)	dry	dry		n/a													
	AVERAGE FLOW (l/hr)	0	0	0	n/a													
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992													
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	27/01/04													
8	CH4 % LEL	2	0	0	0													
	CH4 % VOL	0.1	0	0	0													
	CO2 %	2.8	2.7	3.6	0													
	O2 %	15.6	17.2	14.2	20.9													
	H2S PPM	0	0	0	0													
	CO PPM	0	0	1	1													
	BOREHOLE PRESSURE (mb)	-0.15	0.3	n/a	0													
	TEMPERATURE °C inlet/	n/a	n/a	n/a	n/a													
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a													
	AVERAGE FLOW (l/hr)	0	0	0	0													
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992													

BOREHOLE NO	TEST	19/10/21	05/11/21	10/12/21	23/01/22								
9	CH4 % LEL	0	0	n/a	0								
	CH4 % VOL	0.1	0	n/a	0								
	CO2 %	3.2	2.6	n/a	0								
	O2 %	15.6	16.7	n/a	20.9								
	H2S PPM	0	0	n/a	0								
	CO PPM	0	0	n/a	0								
	BOREHOLE PRESSURE (mb)	-0.06	-0.01	n/a	0								
	TEMPERATURE °C (wbgt)	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a								
	AVERAGE FLOW (l/hr)	0.1	0	n/a	0								
	ATMOSPHERIC PRESSURE (mb)	1021	1013	1003	992								
BOREHOLE NO	TEST	19/10/21	05/11/21	10/12/21	27/01/22								
12	CH4 % LEL	-	0	0	damaged								
	CH4 % VOL	-	0	0									
	CO2 %	-	0.3	0.5									
	O2 %	-	19.4	17.8									
	H2S PPM	-	0	0									
	CO PPM	-	0	0									
	BOREHOLE PRESSURE (mb)	-	-1.55	n/a									
	TEMPERATURE °C (wbgt)	-	n/a	n/a									
	WATER LEVEL (mbgl)	-	1.2	n/a									
	AVERAGE FLOW (l/hr)	-	0	0									
	ATMOSPHERIC PRESSURE (mb)	-	1013	1003	992								
BOREHOLE NO	TEST	19/10/21	05/11/21	10/12/21	27/01/22								
16	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0	0	0	0								
	CO2 %	2.6	2.9	4.1	2.6								
	O2 %	17.6	16.4	12	17.3								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	-0.27	-0.31	n/a	2								
	TEMPERATURE °C (wbgt)	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0	0	1								
	ATMOSPHERIC PRESSURE (mb)	1021	1013	1003	992								

BOREHOLE NO	TEST	15/10/03	05/11/03	10/12/03	27/01/04								
17	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0	0	0	0								
	CO2 %	2.2	0.1	5.3	0								
	O2 %	17.4	20.9	13	20.9								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	-0.07	0.02	n/a	0								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	5.35	5.25	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0	3	0								
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992								
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	27/01/04								
18	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0	0	0	0								
	CO2 %	3	0	1.1	0.6								
	O2 %	19	20	14.8	19.1								
	H2S PPM	0	0	0	0								
	CO PPM	6	0	1	0								
	BOREHOLE PRESSURE (mb)	0.03	0	n/a	0								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	2.5	2.4	n/a	n/a								
	AVERAGE FLOW (l/hr)	0.1	0	1	0								
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992								
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	27/01/04								
19	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0	0	0	0								
	CO2 %	1	0.7	2.1	1.9								
	O2 %	17.8	17.5	10.1	10.5								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	-0.12	-0.1	n/a	-2								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	4.15	4.15	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0.3	2	0								
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992								

BOREHOLE NO.	TEST	[illegible]	[illegible]	[illegible]	[illegible]								
20	[illegible]	0	0	[illegible]									
	[illegible]	0	0	0	0								
	CO2 %	[illegible]	0.6	[illegible]	[illegible]								
	O2 %	[illegible]	[illegible]	[illegible]	[illegible]								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	0.02	0.07	[illegible]	0								
	TEMPERATURE °C in/out	n/a	n/a	[illegible]	n/a								
	WATER LEVEL (mbgl)	6.15	6.11	n/a	n/a								
	AVERAGE FLOW (l/hr)	[illegible]	[illegible]	0	[illegible]								
	ATMOSPHERIC PRESSURE (mb)	1024	[illegible]	[illegible]	[illegible]								
BOREHOLE NO.	TEST	[illegible]	[illegible]	[illegible]	[illegible]								
21	[illegible]	2	0	0	0								
	[illegible]	0.1	0	0	0								
	CO2 %	[illegible]	[illegible]	[illegible]	[illegible]								
	O2 %	17	[illegible]	[illegible]	[illegible]								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	0.17	0.59	n/a	0								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	1.2	1.7	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0	2	0								
	ATMOSPHERIC PRESSURE (mb)	1024	1011	[illegible]	[illegible]								
BOREHOLE NO.	TEST	[illegible]	[illegible]	[illegible]	[illegible]								
22	[illegible]	2	0	0	0								
	[illegible]	[illegible]	0	0	0								
	CO2 %	1	[illegible]	2.6	[illegible]								
	O2 %	17.9	17.8	16.9	[illegible]								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	0.22	[illegible]	n/a	2								
	TEMPERATURE °C in/out	n/a	n/a	n/a	[illegible]								
	WATER LEVEL (mbgl)	7.42	7.58	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0	1	1								
	ATMOSPHERIC PRESSURE (mb)	1024	1013	[illegible]	[illegible]								

BOREHOLE NO.	TEST	[illegible]	[illegible]	[illegible]	[illegible]								
23	CH4 % LEL	0	0	0	Inaccessible								
	CH4 % VOL	0	0	0									
	CO2 %	0	0	0.3									
	O2 %	20	20.1	6.8									
	H2S PPM	0	0	0									
	CO PPM	0	0	0									
	BOREHOLE PRESSURE (mbr)	-0.01	-0.1										
	TEMPERATURE °C inlet	n/a	n/a	n/a									
	WATER LEVEL (mbgl)	-	7.45										
	AVERAGE FLOW (l/hr)	-0.2	0.1	0									
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992								
BOREHOLE NO.	TEST	[illegible]	[illegible]	[illegible]	[illegible]								
24	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0	0	0	0								
	CO2 %	1.0	1.2	1.3	0.8								
	O2 %	19.8	18.6	17.4	13.7								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	2	1								
	BOREHOLE PRESSURE (mbr)	0	-0.05	n/a	2								
	TEMPERATURE °C inlet	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a								
	AVERAGE FLOW (l/hr)	0.2	0.1	0	0								
	ATMOSPHERIC PRESSURE (mb)	1024	1013	1003	992								
BOREHOLE NO.	TEST	[illegible]	[illegible]	[illegible]	[illegible]								
25	CH4 % LEL	3	0	0	Ignited								
	CH4 % VOL	0.1	0	0									
	CO2 %	1.7	1.3	2.3									
	O2 %	18.3	17.7	12.5									
	H2S PPM	0	0	0									
	CO PPM	0	0	2									
	BOREHOLE PRESSURE (mbr)	0.7	-0.05										
	TEMPERATURE °C inlet	n/a	n/a	n/a									
	WATER LEVEL (mbgl)	3.1	3.17										
	AVERAGE FLOW (l/hr)	0.2	0.1	0									
	ATMOSPHERIC PRESSURE (mb)	1024	1012	1003	992								

BOREHOLE NO	TEST	15/10/03	05/11/03	10/12/03	2/01/04								
26	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0	0	0	0								
	CO2 %	2.6	3.2	2.6	2.6								
	O2 %	5.1	7.0	9.8	10.1								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	0	0								
	BOREHOLE PRESSURE (mb)	-0.01	-0.1	n/a	0								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	7.4	8.17	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0	0	0								
	ATMOSPHERIC PRESSURE (mb)	1025	1010	1001	995								
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	2/01/04								
27	CH4 % LEL	4	2	10	6								
	CH4 % VOL	0.2	0.1	0.5	0.3								
	CO2 %	0.2	0.2	0.2	0.1								
	O2 %	1.5	0	0.2	0.2								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	2	0								
	BOREHOLE PRESSURE (mb)	0.03	0	n/a	2								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a								
	AVERAGE FLOW (l/hr)	0	0.2	2	2								
	ATMOSPHERIC PRESSURE (mb)	1024	1010	1003	992								
BOREHOLE NO.	TEST	15/10/03	05/11/03	10/12/03	2/01/04								
28	CH4 % LEL	0	0	0	0								
	CH4 % VOL	0.2	0	0	0								
	CO2 %	0.9	3.6	1	3.3								
	O2 %	0.7	1.1	2.6	0.9								
	H2S PPM	0	0	0	0								
	CO PPM	0	0	1	1								
	BOREHOLE PRESSURE (mb)	-0.01	-0.04	n/a	-1								
	TEMPERATURE °C in/out	n/a	n/a	n/a	n/a								
	WATER LEVEL (mbgl)	dry	dry	n/a	n/a								
	AVERAGE FLOW (l/hr)	0.1	0.1	1	2								
	ATMOSPHERIC PRESSURE (mb)	1024	1010	1003	992								

APPENDIX II

Envirocheck Report
Referenced 36993 and dated 12th October 2001

Envirocheck

Envirocheck Report On :

Wombwell Foundry Ltd
Hough Lane
Wombwell
Barnsley
South Yorkshire
S73 0LT

National Grid Reference :

439063, 402325

Prepared For :

Your Reference :

33993

Prepared By :

Martha McBarron

Summary

Details

Useful Contacts

BGS Borehole Order Form

Introduction

The Environment Act 1995 has made site sensitivity a key issue as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does to the potential sources of contamination. For this reason, Landmark's Site Sensitivity Data Sheet places great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency, it also incorporates data from English Nature (and the Scottish and Welsh equivalents), the Environment Agency (and the Scottish equivalent) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. The data sheet is produced by querying the legend database to 1000m from the site polygon provided by the client.

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Agency & Hydrological	50m	250m	500m	1000m
Air Pollution Controls ("APC")	1			
Discharge Consents to Controlled Waters				2
Enforcement and Prohibition Notices				
Integrated Pollution Controls ("IPC")				
Nearest Surface Water Feature	Yes			
Pollution Incidents to Controlled Waters				2
Prosecutions relating to Authorised Processes				
Prosecutions to Controlled Waters				
Red List Discharge Consents				
Radioactive Substance Authorisations ("RSA")				6
River Quality Data				
Water Abstractions				
Groundwater Vulnerability	2			
Drift Deposits				
Fluvial Indicative Flood Plain	1			
Tidal Indicative Flood Plain	1			
Source Protection Zones				

Waste	50m	250m	500m	1000m
BGS Recorded Landfill Sites				1
Integrated Pollution Control registered Waste Sites				
Registered Waste Transfer Sites				
Registered Waste Treatment or Disposal Sites			1	
Registered Landfill Sites	3			3

Hazardous Substances	50m	250m	500m	1000m
COMAH Sites				
Explosive Sites				
NIHHS Sites				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				

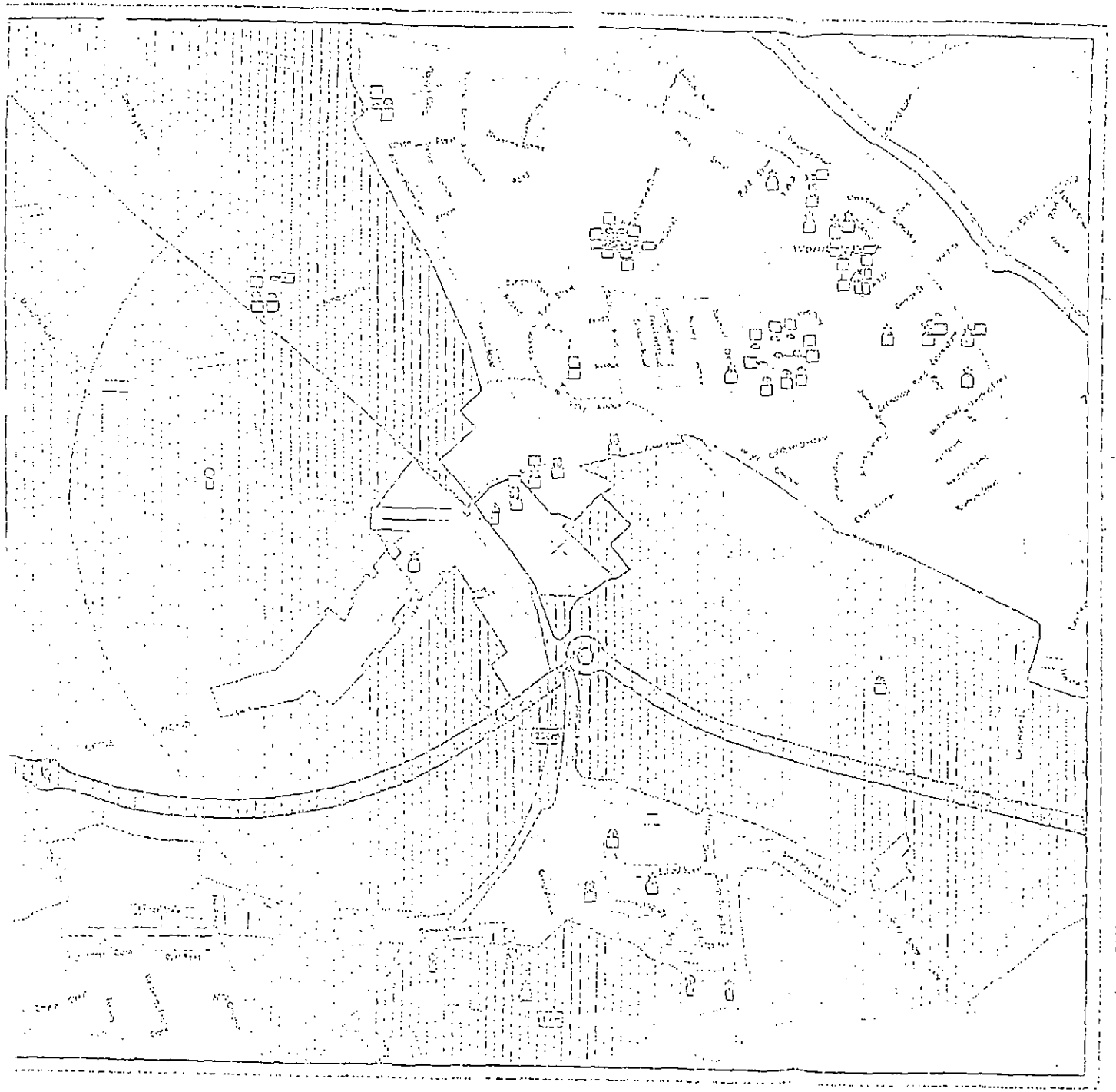
Geological	50m	250m	500m	1000m
BGS Boreholes				34
BGS Recorded Mineral Sites				
BGS 1:625 000 Surface Geology	1			
Coal Mining Affected Areas	1			
Shallow Mining Hazards	1			
Natural Subsidence Hazard	1			
Radon Affected Area	1			
Radon Protection Measures	1			

Industrial Land Use	50m	250m	500m	1000m
Contemporary Trade Directory Entries (of possible contaminative use)	2	1	1	15
Fuel Station Entries				
Post 1995 Planning Applications (of possible contaminative use)	2	2		2
Potentially Contaminative Uses (Past Use)	5		6	14
Potentially Contaminative Uses (Non-Water Related)			5	3
Potentially Contaminative Uses (Water Related)		1	2	3
Nearest Overhead Transmission Line			Yes	

Sensitive Land Use	50m	250m	500m	1000m
Adopted Green Belt				
Unadopted Green Belt	1			
Areas of Outstanding Natural Beauty				
Environmentally Sensitive Areas				
Forest Parks				
Local Nature Reserves				
Marine Nature Reserves				
National Nature Reserves				
National Parks				
National Scenic Areas				

Nitrate Sensitive Areas
Nitrate Vulnerable Zones
RAMSAR Sites
Sites of Special Scientific Interest ("SSSI")
Special Areas of Conservation
Special Protection Areas

Water Abstractions identified, whose centres are more than 1000 meters (but less than 2000 meters) from the centre of the site 4
Please refer to Contacts section of report for information on data currency



Envirocheck

Wombwell Foundry Ltd

35993

Hough Lane
Wombwell
Barnsley
South Yorkshire
S73 0LT

Easting:439363
Northing:400325

1:10000 approx.

Castings Technology

Centre of Search

Registered radioactive substances

Water Abstractions

BGS Boreholes

Pollution Incidents Relating to Controlled Waters

Potentially Contaminative Industrial Land Use

Post 1988 Planning Applications

Registered Waste Treatment or Disposal Site

Discharge Consents

Unadopted Green Belt

Air Pollution Controls

Value Added Reseller

Map ID		Details	Compass Direction	Estimated Distance from site	Source	NGR
	APC					
1	Name	Wombwell Foundry Ltd		0	1	On Site
	Location	Rough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0ET				
	Authority	Barnsley Metropolitan Borough Council				
	Permit Reference	Not Given				
	Dated	5 Apr 1995				
	Process Type	Local Authority Air Pollution Control				
	Description	PG3/1 Furnaces for the extraction of non-ferrous metal from scrap				
	Status	Application has been authorised and any conditions apply to the operator				
	Positional Quality	Automatically located to the address				
	Discharge Consent to Controlled Waters					
2	Operator	P Hepworth	S	554	2	438750 401260
	Property Type	Mixed Farming				
	Location	Low Farm, Off Cemetery Road, HEMINGFIELD, South Yorkshire				
	Authority	North East Region - Environment Agency				
	Catchment Area	Dearne				
	Discharge Reference	C5027				
	Permit Version	Not given				
	Effective Date	Not given				
	Issued	Not given				
	Revocation Date	Not given				
	Discharge Type	Sewage Effluent				
	Discharge Environment	Specified Underground				
	Receiving Water	Underground Waters/Land				
	Status	Not given				
	Positional Quality	Located by supplier to within 100 m				
	Discharge Consent to Controlled Waters					
3	Operator	Yorkshire Water Services Ltd	S	955	2	439500 401150
	Property Type	Pumping Station				
	Location	Tingledridge Lane, Ps Near, Hoyland Nether, South Yorkshire				
	Authority	North East Region - Environment Agency				
	Catchment Area	Dearne				
	Discharge Reference	WSDC427				
	Permit Version	Not given				
	Effective Date	Not given				
	Issued	Not given				
	Revocation Date	Not given				
	Discharge Type	Storm sewage overflow discharge				
	Discharge Environment	Freshwater Stream/River				
	Receiving Water	Knoll Beck				
	Status	Not given				
	Positional Quality	Located by supplier to within 100 m				

Pollution Incident to Controlled Waters

4	Property Type	Water Company Sewage Storm Overflow	S	947	2	430400 401200
	Location	Elsecar Canal At, HEMINGFIELD				
	Authority	North East Region - Environment Agency				
	Pollutant	Sewage - Storm Overflow				
	Note	No Fish Kills				
	Incident Date	27 Sep 1997				
	Incident Reference	SW970525				
	Catchment Area	Dearne Tributaries				
	Received Water	Freshwater Stream/River				
	Cause of Incident	Not Given				
	Severity of Incident	Category 3 - Minor Incident				
	Positional Quality	Located by supplier to within 100 m				

Pollution Incident to Controlled Waters

5	Property Type	Miscellaneous Premises Unknown	W	696	2	430200 402540
	Location	Dearne/Source Dove(S) Afo				
	Authority	North East Region - Environment Agency				
	Pollutant	Oils - Unknown				
	Note	Not given				
	Incident Date	21 Dec 1991				
	Incident Reference	120321				
	Catchment Area	Not Given				
	Received Water	Freshwater Stream/River				
	Cause of Incident	Not Given				
	Severity of Incident	Category 3 - Minor Incident				
	Positional Quality	Located by supplier to within 100 m				

RSA

6	Name	Medaract Radiographic Services Ltd	NE	955	2	439200 402540
	Location	Melville Street, DARFIELD, South Yorkshire, S73 9RJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	BB9697				
	Dated	6 Jan 1999				
	Process Type	Registration under S10 RSA for the keeping and use of mobile Radioactive sources (was RSA60 93)				
	Description	Minor variation to a registration under the Act for 1 or more mobile sources other than a transit test source				
	Status	Application has been authorised and any conditions apply to the operator				
	Positional Quality	Automatically located to postal within address				

RSA

7	Name	Medaract Radiographic Services Ltd	NE	957	2	439830 403020
	Location	Medaract House, Melville Street, Wombwell, DARFIELD, South Yorkshire, S73 0RJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	AB7892				
	Dated	23 Jun 1993				
	Process Type	Registration under S10 RSA for the keeping and use of mobile Radioactive sources (was RSA60 93)				
	Description	Minor variation to a registration under the Act for 1 or more mobile sources other than a transit test source				
	Status	Authorisation superseded by a substantial or non substantial variation				

	Positional Quality	Unknown

RSA

6	Name	Medirest Radiographic Services Ltd	NE	674	2	439630 403040
	Location	Medirest House, Melville Street, Wombwell, BARNSLEY, South Yorkshire, S73 8HJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	AT9211				
	Dated	18 Dec 1996				
	Process Type	Registration under S10 RSA for the keeping and use of mobile Radioactive sources (was RSA93 S2)				
	Description	Substantial variation to a registration under the Act for 1 or more mobile sources other than a tracer test source				
	Status	Authorisation superseded by a substantial or non substantial variation				
	Positional Quality	Unknown				

RSA

9	Name	Medirest Radiographic Services Ltd	NE	353	2	439630 403040
	Location	Medirest House, Melville Street, Wombwell, BARNSLEY, South Yorkshire, S73 8HJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	AT9211				
	Dated	20 Feb 1998				
	Process Type	Registration under S10 RSA for the keeping and use of mobile Radioactive sources (was RSA93 S2)				
	Description	Minor variation to a registration under the Act for 1 or more mobile sources other than a tracer test source				
	Status	Authorisation superseded by a substantial or non substantial variation				
	Positional Quality	Unknown				

RSA

10	Name	Medirest Radiographic Services Ltd	NE	366	2	439630 403040
	Location	Melville Street, BARNSLEY, South Yorkshire, S73 8HJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	AY4825				
	Dated	11 Jun 1997				
	Process Type	Registration under S10 RSA for the keeping and use of mobile Radioactive sources (was RSA93 S2)				
	Description	Substantial variation to a registration under the Act for 1 or more mobile sources other than a tracer test source				
	Status	Authorisation superseded by a substantial or non substantial variation				
	Positional Quality	Automatically located to postal address				

RSA

11	Name	Medirest Radiographic Services Ltd	NE	673	1	439630 403040
	Location	Medirest House, Melville Street, Wombwell, BARNSLEY, South Yorkshire, S73 8HJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	AT9937				
	Dated	31 Mar 1999				
	Process Type	Not Supplied				
	Description	Registration under the Act for 1 or more mobile sources other than a tracer test source				
	Status	Authorisation superseded by a substantial or non substantial variation				
	Positional Quality	Unknown				

	RSA					
12	Name	Medcrest Inspection Services Ltd	NE	957	2	439820 403040
	Location	Medcrest House, Melville Street, Wombwell, BARNSLEY, South Yorkshire, S73 8HJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	AT4554				
	Dated	4 Oct 1995				
	Process Type	Registration under S7 RSA for the keeping and use of Radioactive materials (was RSA60 S1)				
	Description	Registration under S7 or S10 RSA for 1 or more closed sources >< 4 Tembequerels also for storage in transit				
	Status	Authorisation either revoked or cancelled				
	Positional Quality	Unknown				

	RSA					
13	Name	Medcrest Ndt Ltd	NE	932	2	439820 [illegible]
	Location	Medcrest House, Melville Street, Wombwell, Barnsley, South Yorkshire, S73 8HJ				
	Authority	North East Region - Environment Agency				
	Permit Reference	BK6347				
	Dated	Not given				
	Process Type	Registration under S10 RSA for the keeping and use of mobile Radioactive sources (was RSA60 S3)				
	Description	Registration under the Act for 1 or more mobile sources other than a trace/test source				
	Status	Application has met the requirements for authorisation (but not yet authorised)				
	Positional Quality	Automatically located to the address				

Groundwater Vulnerability

Geological Classification	Minor Aquifer (Variably permeable) - These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers	-	D	3	On Site
Soil Classification	Soils of Low Leaching Potential - Soils in which pollutants are unlikely to penetrate the soil layer because water movement is largely horizontal or they have large ability to attenuate diffuse pollutants. Lateral flow from these soils contribute to groundwater recharge elsewhere in the catchment				
Map Sheet	Derived from Sheet 11 South Pennines				
Scale	1:100,000				

Groundwater Vulnerability

Geological Classification	Minor Aquifer (Variably permeable) - These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers	-	D	3	On Site
Soil Classification	Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise				
Map Sheet	Derived from Sheet 11 South Pennines				
Scale	1:100,000				

Fluvial Indicative Flood Plain

-	None	-	-	3	On Site

Tidal Indicative Flood Plain

-	None	-	-	3	On Site

BGS Recorded Landfill Site

-	Site Name	Quarry Tip	NW	553	4	435270 402770
	Location	WOMBWELL WOOD, South Yorks				
	Ground Water	Threat to ground water doubtful				
	Surface Water	Threat to surface water				
	Geology	N/A				
	Boundary Quality	Moderate				
	Positional Quality	Located By Supplier				

Registered Waste Treatment or Disposal Site

14	Licence Holder	K & I Autos	N	325	5	439100 403300
	Licence Reference	WD20 B 521				
	Site Location	St Mary's Road, Wombwell, BARNSLEY, South Yorkshire, S73 8LQ				
	Licence Holder Address	as site address				
	Authority	Ridings Area - Environment Agency - North East Region				
	Site Category	Scrapyard				
	Maximum Input Rate	Very Small (<10,000 tonnes/year)				
	Waste Source Restrictions	No known restriction on source of waste				
	Licence Status	Licence lapsed/cancelled/defunct/not applicable/surrendered				

Date	1 Apr 1995
Preceded By Licence	Not Given
Superceded By Licence	Not Given
Positional Quality	Approximate location provided by supplier
Waste Types on Site	
Authorised Waste	Batteries Max Stor
	Cooking Oil Max Stor
	Non-Ferrous Metal Scrap Max Stor
	Ferrous Metal Scrap Max Stor
	Cars/Light Comm'L Veh. Max Stor

Registered Landfill Site

Licence Holder	Wombwell Foundry Ltd	0	5	On Site
Licence Reference	WD20 B 142 MOD 4			
Site Location	Hough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0LT			
Licence Holder Address	as site address			
Authority	Ridings Area - Environment Agency - North East Region			
Site Category	Landfill			
Maximum Input Rate	Very Small (<10,000 tonnes/year)			
Waste Source Restrictions	No known restriction on source of waste			
Licence Status	Record superseded			
Date	1 Dec 1977			
Preceded By Licence	Not Given			
Superceded By Licence	WD20 B 142 MOD 6			
Positional Quality	Manually located to road within address			
Boundary Quality	Not Applicable			
Waste Types on Site				
Authorised Waste	Detergent/Oily Waste From Mach.Cleans			
	Foundry Slag			
	Boiler Clinker			
	Broken Asbestos Sheets			
	Ind. Non-Haz. Waste Including			
	Refractory Bricks			
	Sand			
	General Foundry Debris			
	Max Waste Permitted By Licence			
Prohibited Waste	Liq/Slurry In Drum/Cont'Rs > 4 L Dep'Y			

Registered Landfill Site

Licence Holder	Wombwell Foundry Ltd	0	5	On Site
Licence Reference	WD20 B 142 MOD 6			
Site Location	Hough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0LT			
Licence Holder Address	as site address			
Authority	Ridings Area - Environment Agency - North East Region			
Site Category	Landfill			
Maximum Input Rate	Very Small (<10,000 tonnes/year)			
Waste Source Restrictions	Only waste produced on site			
Licence Status	Operational as far as is known			
Date	1 Mar 1997			
Preceded By Licence	WD20 B 142 MOD 4			
Superceded By Licence	Not Given			

Positional Quality	Approximate location provided by supplier
Boundary Quality	Not Applicable
Waste Types on Site	
Authorised Waste	Boiler Clinker
	Ind. Non-Haz. Waste Including
	Refractory Bricks
	Sand
	General Foundry Debris
	Max.Waste Permitted By Licence
	Foundry Slag
Prohibited Waste	Liq/Slurry In Drum/Cont Rs > 4 L Cap/Y
	Waste N O S

Registered Landfill Site

Licence Holder	J.L.F. Civil Engineering Ltd	NE	608	S	439670 402830
Licence Reference	WD20 B 609 (WD2 B17)				
Site Location	Dis.Canal Station Road', Littlefield Lane, Wombwell, BARNSLEY, South Yorkshire				
Licence Holder Address	Stanney Mill Road, Little Stanney, CHESTER, Cheshire, CH2 4HX				
Authority	Ridings Area - Environment Agency - North East Region				
Site Category	Landfill				
Maximum Input Rate	Undefined				
Waste Source Restrictions	Waste produced/controlled by licence holder				
Licence Status	Licence lapsed/cancelled/defunct not applicable/surrendered				
Date	1 Mar 1998				
Preceded By Licence	Not Given				
Superceded By Licence	Not Given				
Positional Quality	Approximate location provided by supplier				
Boundary Quality	Not Applicable				
Waste Types on Site					
Authorised Waste	Clean Excavation Spoil Ex R/Ly Embankt.				

Registered Landfill Site

Licence Holder	Barnsley M.B.C.	NE	607	S	439670 402830
Licence Reference	WD 2 B17				
Site Location	Wombwell Canal & Aldham Embankment, Wombwell, BARNSLEY, South Yorkshire				
Licence Holder Address	Central Offices, Kendray Street, BARNSLEY, South Yorkshire				
Authority	Ridings Area - Environment Agency - North East Region				
Site Category	Landfill				
Maximum Input Rate	Undefined				
Waste Source Restrictions	No known restriction on source of waste				
Licence Status	Licence lapsed/cancelled/defunct/not applicable/surrendered				
Date	1 Mar 1998				
Preceded By Licence	Not Given				
Superceded By Licence	Not Given				
Positional Quality	Manually located to road within address				
Boundary Quality	Not Applicable				
Waste Types on Site					
Authorised Waste	Clean Excav.Spoil Ex Aldham Embankment				

Registered Landfill Site

Licence Holder	P Ronde	SE	701	0	438750 401840
Licence Reference	WD20 B 95				
Site Location	Landfill Road, Woodwell, BARNSLEY, South Yorkshire				
Licence Holder Address	14A Woodroyd Road, Deepcar, SHEFFIELD, South Yorkshire, S30 5TA				
Authority	Ridings Area - Environment Agency - North East Region				
Site Category	Landfill				
Maximum Input Rate	Medium (< 75,000 tonnes/year)				
Waste Source Restrictions	No known restriction on source of waste				
Licence Status	Licence lapsed/cancelled/defunct/not applicable/surrendered				
Date	1 Nov 1977				
Preceded By Licence	Not Given				
Superceded By Licence	Not Given				
Positional Quality	Approximate location provided by supplier				
Boundary Quality	Not Applicable				
Waste Types in Site					
Authorised Waste	Excavation Waste,Soil,Subsoil				
	Construction And Demolition Wastes				
	Ind. Non-Haz. Inert, Non Flammable				
	Ind. Non-Haz. Potentially Combustible				
	House. + Com. Untreated Waste				
Prohibited Waste	Asbestos				
	Liquids In Containers Over 4l Cap				
	Slurry In Containers Over 4l Cap.				

BGS Borehole

16	BGS Reference	Se30se103	N	838	S	438520 402460
	Drilled Length	2 metres				
	Borehole Name	Wombwell Jn Sch Bh 3				

BGS Borehole

16	BGS Reference	Se30se104	NE	836	S	438560 402810
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh 4				

BGS Borehole

17	BGS Reference	Se30se91	N	883	S	439210 403120
	Drilled Length	3 metres				
	Borehole Name	Wombwell Moore Bh 2				

BGS Borehole

18	BGS Reference	Se30se70	NW	752	S	438360 403000
	Drilled Length	22 metres				
	Borehole Name	Wombwell 2				

BGS Borehole

19	BGS Reference	Se30se88	N	849	S	439160 402910
	Drilled Length	3 metres				
	Borehole Name	Wombwell Moore Bh 7				

BGS Borehole

20	BGS Reference	Se30se93	NE	862	S	439840 402780
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh 6				

BGS Borehole

21	BGS Reference	Se30se81	NE	838	S	438[illegible]0 402860
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh 1				

BGS Borehole

22	BGS Reference	Se30se8	E	681	S	439880 400310
	Drilled Length	199 metres				
	Borehole Name	Landfill Colliery				

BGS Borehole

23	BGS Reference	Se30se82	N	873	S	439200 402940
	Drilled Length	2 metres				
	Borehole Name	Wombwell Moore Bh 3				

	BGS Borehole					
[illegible]	BGS Reference	[illegible]	NE	[illegible]	5	[illegible]
	Drilled Length	[illegible] metres				
	Borehole Name	Kings Road School Bh [illegible]				
	BGS Borehole					
[illegible]	BGS Reference	[illegible]	NW	[illegible]	5	[illegible]
	Drilled Length	[illegible] metres				
	Borehole Name	Wombwell Main Colliery Bh [illegible]				
	BGS Borehole					
26	BGS Reference	[illegible]	NE	[illegible]	5	[illegible]
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh 9				
	BGS Borehole					
27	BGS Reference	[illegible]	NE	[illegible]	5	[illegible]
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh 2				
	BGS Borehole					
28	BGS Reference	[illegible]	NE	[illegible]	5	[illegible]
	Drilled Length	[illegible] metres				
	Borehole Name	Kings Road School Bh 5				
	BGS Borehole					
29	BGS Reference	[illegible]	N	[illegible]	5	[illegible]
	Drilled Length	2 metres				
	Borehole Name	Wombwell Hamm Bh 4				
	BGS Borehole					
30	BGS Reference	[illegible]	NW	[illegible]	5	[illegible]
	Drilled Length	2 metres				
	Borehole Name	Wombwell M Sch Bh [illegible]				
	BGS Borehole					
31	BGS Reference	[illegible]	NW	[illegible]	5	[illegible]
	Drilled Length	[illegible] metres				
	Borehole Name	Wombwell [illegible]				
	BGS Borehole					
32	BGS Reference	[illegible]	NW	[illegible]	5	[illegible]
	Drilled Length	38 metres				
	Borehole Name	Wombwell Main Colliery Hg Sch 3				
	BGS Borehole					

33	BGS Reference	Se30se53	NE	625	5	429000 402000
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh3				
	BGS Borehole					
34	BGS Reference	Se30se50	N	591	5	429200 403150
	Drilled Length	2 metres				
	Borehole Name	Wombwell Home Bh1				
	BGS Borehole					
35	BGS Reference	Se30se139	S	564	5	429300 401600
	Drilled Length	7 metres				
	Borehole Name	Dearne Valley Highway Bh3				
	BGS Borehole					
36	BGS Reference	Se30se55	N	665	5	429[illegible] 402100
	Drilled Length	2 metres				
	Borehole Name	Wombwell Home Bh5				
	BGS Borehole					
37	BGS Reference	Se30se57	NE	613	5	429600 402750
	Drilled Length	3 metres				
	Borehole Name	Kings Road School Bh7				
	BGS Borehole					
38	BGS Reference	Se30se54	N	554	5	429150 402150
	Drilled Length	3 metres				
	Borehole Name	Wombwell Home Bh6				
	BGS 1:625000 Surface Geology					
-	Geology	Lower Westphalian (mainly Productive Coal Measures)	-	0	5	On Site
	Coal Mining Affected Area					
-		In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	-	0	7	On Site
	Shallow Mining Hazard					
-	Risk	Moderate	-	0	5	On Site
	Source	Information Services Group - British Geological Survey				
	Natural Subsidence Hazard					
-	Risk	Low	-	-	5	On Site

	Radon Affected Area					
-		Less than 1% of homes are above the Action Level	-	0	5	On Site
	Radon Protection Measures					
-	Type	Basic radon protective measures should be installed	-	0	5	On Site
	Source	Information Services Group - British Geological Survey				
	Contemporary Trade Directory Entry (of possible contaminative use)					
39	Name	Galglass Industrial	N	41	10	439000 402500
	Location	331 Hough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0LR				
	Classification	Tank and Vat Manufacture & Installation				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to the address				
	Contemporary Trade Directory Entry (of possible contaminative use)					
40	Name	Larry'S Tyres & Exhaust Centre	NE	572	10	439000 403000
	Location	Littlefield Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0DF				
	Classification	Exhaust Replacement				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

41	Name	Mion Electronics	NE	474	10	439500 402800
	Location	Waterside Park, Valley Way, Wombwell, BARNSLEY, South Yorkshire, S73 0PB				
	Classification	Electronic Component Manufacture				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to postcode unit				

Contemporary Trade Directory Entry (of possible contaminative use)

42	Name	Chris Bell Haulage	S	914	10	439950 401100
	Location	Primrose House Farm, New Street, BARNSLEY, South Yorkshire, S73 0QE				
	Classification	Haulage Contractors				
	Premises Type	Branch Office				
	Status	Active				
	Positional Quality	Unknown				

Contemporary Trade Directory Entry (of possible contaminative use)

43	Name	Murco Service Station	NE	943	10	440100 403500
	Location	91 Park Street, Wombwell, BARNSLEY, South Yorkshire, S73 0HS				
	Classification	Petrol Filling Stations				
	Premises Type	Franchise				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

44	Name	Dgs Auto Safety Centre	NE	910	10	439700 403200
	Location	Ford House, Barnsley Road, Wombwell, BARNSLEY, South Yorkshire, S73 5DD				
	Classification	Exhaust Replacement				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

45	Name	Wombwell Clinic	N	866	10	439330 403110
	Location	Summer Lane, Wombwell, BARNSLEY, South Yorkshire, S73 8QH				
	Classification	Medical Clinics & Centres				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to the address				

Contemporary Trade Directory Entry (of possible contaminative use)

46	Name	C Hague & Son	S	645	10	439300 401490
	Location	27 School Street, Hemingfield, BARNSLEY, South Yorkshire, S73 0PS				
	Classification	Coal Merchants				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to the address				

Contemporary Trade Directory Entry (of possible contaminative use)

47	Name	Snazzys Dry Cleaners	NE	513	10	440000 402900
	Location	7 High Street, Wombwell, BARNSLEY, South Yorkshire, S73 0BA				
	Classification	Dry Cleaning - Retail				
	Premises Type	Head Office				
	Status	Active				
	Positional Quality	Automatically located to the address				

Contemporary Trade Directory Entry (of possible contaminative use)

48	Name	R F Shipping & Transport Services	NE	512	10	440300 402900
	Location	Unit 3, Low Valley Industrial Estate, Wombwell, BARNSLEY, South Yorkshire, S73 0AG				
	Classification	Haulage Contractors				
	Premises Type	Head Office				
	Status	Active				
	Positional Quality	Automatically located to postcode unit				

Contemporary Trade Directory Entry (of possible contaminative use)

49	Name	Acorn Concrete Products	NE	899	10	439500 403100
	Location	Acorn House, Mitchells Industrial Park, Wombwell, BARNSLEY, South Yorkshire, S73 0HR				
	Classification	Concrete Precast Manufacture				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to postcode unit				

Contemporary Trade Directory Entry (of possible contaminative use)

50	Name	Thornby Printers	NE	935	10	440100 402900
	Location	Central Printing Works, Prospect Terrace, Wombwell, BARNSLEY, South Yorkshire, S73 0AR				
	Classification	Lithographic Printers				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Unknown				

Contemporary Trade Directory Entry (of possible contaminative use)

51	Name	Colin Bell	NE	933	10	439700 403300
	Location	Rimington Garage, Rimington Road, BARNSLEY, South Yorkshire, S73 0DD				
	Classification	Car Servicing & Repair				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

52	Name	Golglass	W	41	10	439000 402500
	Location	331 Hough Lane, Wombwell, Barnsley, South Yorkshire, S73 0LE				
	Classification	Tank and Vat Manufacture & Installation				
	Premises Type	Single Site				
	Status	Active				

	Positional Quality	Automatically located to the address				

Contemporary Trade Directory Entry (of possible contaminative use)

53	Name	Prestige Bodycare	NE	943	10	439600 403300
	Location	Little Field Lane, Wombwell, BARNSLEY, South Yorkshire, S73 8DG				
	Classification	Car Body Repairs				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

54	Name	Superior Interiors	W	205	10	435700 403300
	Location	The Hut, Wood Walk, BARNSLEY, South Yorkshire, S73 0NG				
	Classification	Fireplace Equipment Manufacture				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

55	Name	T M Thornsby & Son	NE	995	10	440100 403900
	Location	Central Printing Works, Wombwell, BARNSLEY, South Yorkshire, S73 0AR				
	Classification	Printers - General				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to postcode unit				

Contemporary Trade Directory Entry (of possible contaminative use)

56	Name	Smith P Commercials	NE	941	10	439770 403190
	Location	7 Cemetery Road, Wombwell, BARNSLEY, South Yorkshire, S73 0HZ				
	Classification	Commercial Vehicle Servicing & Repair				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to the address				

Contemporary Trade Directory Entry (of possible contaminative use)

57	Name	Wombwell Medical Centre	NE	530	10	439300 403900
	Location	George Street, Wombwell, BARNSLEY, South Yorkshire, S73 0DD				
	Classification	Medical Clinics & Centres				
	Premises Type	Single Site				
	Status	Active				
	Positional Quality	Automatically located to road within address				

Contemporary Trade Directory Entry (of possible contaminative use)

58	Name	Thornhill Silicones	NE	898	10	439800 403100
	Location	Mitchells Industrial Park, Bradbury Ball Lane, Wombwell, BARNSLEY, South Yorkshire, S73 8HR				
	Classification	Rubber Manufacture				
	Premises Type	Single Site				

	Status	Active				
	Positional Quality	Automatically located to [illegible]				

Post 1995 Planning Application (of possible contaminative use)

59	Name	Industrial (Extension)	NE	[illegible]	1	[illegible]
	Location	[illegible] South Yorkshire, [illegible]				
	Authority	[illegible]				
	Description	Light Industrial				
	Application Reference	B/00/[illegible]				
	Dated	29 Jun 2000				
	Status	Detailed Plans Submitted				
	Site Area	Not given				
	Positional Quality	Manually located to road [illegible] address				

Post 1995 Planning Application (of possible contaminative use)

60	Name	Foundry (Alterations)	-	0	1	On Site
	Location	Hough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0LT				
	Authority	Barnsley Metropolitan Borough Council				
	Description	Heavy Industrial Projects				
	Application Reference	955				
	Dated	29 Jul 1998				
	Status	Detailed Plans Submitted				
	Site Area	0.00 hectares				
	Positional Quality	Unknown				

Post 1995 Planning Application (of possible contaminative use)

61	Name	Vehicle Workshop (Conversion)	S	633	1	439140 401460
	Location	18 Cemetery Road, Hemingfield, BARNSLEY, South Yorkshire, S73 0PU				
	Authority	Barnsley Metropolitan Borough Council				
	Description	Vehicle Maintenance				
	Application Reference	BDD/0004/WW				
	Dated	5 Jan 2000				
	Status	Detailed Plans Submitted				
	Site Area	Not given				
	Positional Quality	Automatically located to the address				

Post 1995 Planning Application (of possible contaminative use)

62	Name	Galvanizing Works/Offices	-	0	1	On Site
	Location	Hough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0DP				
	Authority	Barnsley Metropolitan Borough Council				
	Description	Heavy Industrial Projects				
	Application Reference	98/185				
	Dated	13 Feb 1998				
	Status	Detailed Plans Submitted				
	Site Area	1.00 hectares				
	Positional Quality	Unknown				

Post 1995 Planning Application (of possible contaminative use)

63	Name	Security Fence	NE	957	1	[illegible]
	Location	Barnsley Road, Wombwell, BARNSLEY, South Yorkshire, S73				
	Authority	Barnsley Metropolitan Borough Council				
	Description	Light Industrial				
	Application Reference	1127				
	Dated	2 Oct 1998				
	Status	Detailed Plans Submitted				
	Site Area	Not given				
	Positional Quality	Manually located to estate within address				

Post 1995 Planning Application (of possible contaminative use)

64	Name	Manufacturing (ecu)	N	101	1	439530 402540
	Location	307 Hough Lane, Wombwell, BARNSLEY, South Yorkshire, S73 0LR				
	Authority	Barnsley Metropolitan Borough Council				
	Description	Light Industrial				
	Application Reference	1403				
	Dated	25 Nov 1999				

Status	Detailed Plans Submitted
Site Area	Not given
Positional Quality	Automatically located to the address

Potentially Contaminative Use (Past Use)					
	General quarrying	NE	254	11	439990 402990
Mapping Date(s)	1885				
Potentially Contaminative Use (Past Use)					
	Mineral railway	E	713	11	439900 401930
Mapping Date(s)	1893				
Potentially Contaminative Use (Past Use)					
	General quarrying	S	465	11	439900 401600
Mapping Date(s)	1905				
Potentially Contaminative Use (Past Use)					
	Railways	W	2	11	438890 402360
Mapping Date(s)	1905, 1938, 1956, 1989				
Potentially Contaminative Use (Past Use)					
	Sewage	NW	494	11	438880 402380
Mapping Date(s)	1938, 1953				
Potentially Contaminative Use (Past Use)					
	General quarrying	W	725	11	438180 402180
Mapping Date(s)	1885, 1893				
Potentially Contaminative Use (Past Use)					
	Mineral railway	NW	953	11	438930 403180
Mapping Date(s)	1907, 1938				
Potentially Contaminative Use (Past Use)					
	Railways	NW	914	11	438180 402930
Mapping Date(s)	1907, 1938, 1956, 1989				
Potentially Contaminative Use (Past Use)					
	Heap, unknown constituents	SE	715	11	439980 401910
Mapping Date(s)	1905				
Potentially Contaminative Use (Past Use)					
	Factory or works - use not specified	SW	20	11	439900 402180
Mapping Date(s)	1989				

Potentially Contaminative Use (Past Use)					
-	Cemetery or Graveyard	SW	591	11	438510 401350
Mapping Dates(s)	1905, 1938, 1956, 1959				
Potentially Contaminative Use (Past Use)					
-	Heap, unknown constituents	W	504	11	438340 402540
Mapping Dates(s)	1938				
Potentially Contaminative Use (Past Use)					
-	Mining of coal & lignite	NW	335	11	438510 402550
Mapping Dates(s)	1855, 1894, 1907, 1938, 1956				
Potentially Contaminative Use (Past Use)					
-	General quarrying	SE	935	11	[illegible] 401480
Mapping Dates(s)	1855, 1893				
Potentially Contaminative Use (Past Use)					
-	Metal casting/foundries	-	0	11	On Site
Mapping Dates(s)	1938, 1956				
Potentially Contaminative Use (Past Use)					
-	General quarrying	NW	673	11	438340 402720
Mapping Dates(s)	1855, 1893, 1905, 1938				
Potentially Contaminative Use (Past Use)					
-	General quarrying	N	343	11	438150 402530
Mapping Dates(s)	1905				
Potentially Contaminative Use (Past Use)					
-	Railways	-	0	11	On Site
Mapping Dates(s)	1905, 1938, 1956				
Potentially Contaminative Use (Past Use)					
-	Clay bricks & tiles (manufacture)	NW	452	11	438540 402550
Mapping Dates(s)	1893				
Potentially Contaminative Use (Past Use)					
-	Mineral railway	NW	756	11	438340 402540
Mapping Dates(s)	1854, 1894, 1907, 1938, 1956				
Potentially Contaminative Use (Past Use)					
-	Mineral railway	NW	661	11	438320 402530
Mapping Dates(s)	1855, 1893, 1905, 1938				

Potentially Contaminative Use (Past Use)					
-	Mining of coal & lignite	E	439	11	403000 403000
Mapping Date(s)	1893				
Potentially Contaminative Use (Past Use)					
-	Factory or works - use not specified	-	0	11	On Site
Mapping Date(s)	1893				
Potentially Contaminative Use (Past Use)					
-	General quarrying	W	555	11	403000 403000
Mapping Date(s)	1893				
Potentially Contaminative Use (Past Use)					
-	Cemetery or Graveyard	N	531	11	403000 403000
Mapping Date(s)	1894, 1907, 1933, 1956, 1959				

Potentially Contaminative Use (Non-Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	E	455	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non-Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	NW	329	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non-Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	N	343	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	NE	954	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	S	455	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non-Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	NW	452	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non-Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	SE	903	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Non-Water Related)					
	Unknown Filled Ground (Pit, quarry etc)	W	555	11	[illegible]
Mapping Date(s)	1989				
Potentially Contaminative Use (Water Related)					
	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	SE	494	11	[illegible]
Mapping Date(s)	1989				

Potentially Contaminative Use (Water Related)					
-	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	SE	582	11	440000 401500
Mapping Date(s)	1955				
Potentially Contaminative Use (Water Related)					
-	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	W	570	11	438000 402100
Mapping Date(s)	1953				
Potentially Contaminative Use (Water Related)					
-	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	SE	505	11	439700 401950
Mapping Date(s)	1953				
Potentially Contaminative Use (Water Related)					
-	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	SE	361	11	439500 402000
Mapping Date(s)	1953				
Potentially Contaminative Use (Water Related)					
-	Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	N	191	11	438900 402700
Mapping Date(s)	1955				
Unadopted Green Belt					
- Plan name	Barnsley Metropolitan Borough Council Unitary Development Plan	-	0	1	On Site
Status	Deposit Draft				
Plan Date	30 Nov 1994				

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Some of the organisations who provide data which is used within the report

Ordnance Survey Licensed Partner	Ordnance Survey
Environment Agency	Environment Agency
SEPA	Scottish Environment Protection Agency
Centre for Ecology & Hydrology	Centre for Ecology and Hydrology (Natural Environment Research Council)
British Geological Survey Value Added Reseller	British Geological Survey
CYNGOR CEFN GWLAD CYMRU COUNTRYSIDE COUNCIL FOR WALES	Countryside Council For Wales
SCOTTISH NATURAL HERITAGE	Scottish Natural Heritage
ENGLISH NATURE	English Nature

Site of Special Scientific Interest, National Nature Reserve, RAMSAR, Special Protection Area, Special Conservation Area, Marine Nature Reserve data (derived from Ordnance Survey 1:10000 raster) is provided by, and used with the permission of, English Nature who retain the copyright and Intellectual Property Rights for the data.

	The Coal Authority

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NRPB

National Radiological Protection Board

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Contact	Name and Address	
1	Barnsley Metropolitan Borough Council	
	Central Offices, Kendray Street, Barnsley, South Yorkshire, S70 2TN	Telephone 01226 772000 Fax 01226 772[illegible] Website www.barnsley.gov.uk
	Air Pollution Controls ("APC")	*Last Update 1 Mar 2000*
	Post 1995 Planning Applications (of possible contaminative use)	*Last Update 28 Feb 2001*
	Unadopted Green Belt	*Last Update 1 Nov 1994*
2	Environment Agency - North East Region	
	Rivers House, 21 Park Square South, Leeds, West Yorkshire, LS1 2QG	Telephone 0113 244 0191 Fax 0113 231 2375
	Pollution Incidents to Controlled Waters	*Last Update 31 Dec 1998*
	Radioactive Substance Authorisations ("RSA")	*Last Update 22 Mar 2001*
	Water Abstractions	*Last Update 6 Apr 2000*
	Discharge Consents to Controlled Waters	*Last Update 31 Dec 2000*
3	Environment Agency - Head Office	
	Rio House, Waterside Drive, Aztec West, Almonsbury, Bristol, Avon, BS12 4UD	Telephone 01454 62[illegible] Fax 01454 624[illegible]
	Groundwater Vulnerability	*Last Update 31 Jan 1999*
4	British Geological Survey - Information Services Group	
	Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone 0115 936 3100 Fax 0115 936 3200 Website www.bgs.ac.uk
	BGS Recorded Landfill Sites	*Last Update 17 Jun 1996*
	BGS 1:625 000 Surface Geology	*Last Update 31 Aug 1996*
	Radon Protection Measures	*Last Update 11 Dec 2000*
	Shallow Mining Hazards	*Last Update 2 Oct 2000*
5	Environment Agency - North East Region - Ridings Area	
	Phoenix House, Global Avenue, Leeds, West Yorkshire, LS11 8PG	Telephone 0113 244 0191 Fax 0113 246 1829
	Registered Waste Treatment or Disposal Sites	*Last Update 31 Mar 2001*
	Registered Landfill Sites	*Last Update 31 Mar 2001*
6	British Geological Survey - National Geological Records Centre	
	Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone 0115 936 3100 Fax 0115 936 3[illegible] Website www.bgs.[illegible] Email ngic@bgs.ac.uk
	BGS Boreholes	*Last Update 3 Jan 2001*
7	The Coal Authority - Mining Report Service	
	200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone 0845 7626848 DX 716176 Mansfield 5
	Coal Mining Affected Areas	*Last Update 23 May 2001*
8	British Geological Survey - Information Services Group	
	Kingsley Dunham Centre, Keyworth, Nottingham, Notts, NG12 5GG	Telephone 0115 936 3100 Fax 0115 936 3200
9	National Radiological Protection Board	
	Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone 01235 831600 Fax 01235 833891
	Radon Affected Area	*Last Update 16 Sep 1999*
10	Red Volcano	
	Contemporary Trade Directory Entries (of possible contaminative use)	*Last Update 17 Nov 2000*
11	Landmark Information Group Limited	

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Potentially Contaminative Uses (Past Use)	*Last Update 1 Sep 2003*
Potentially Contaminative Uses (Water Related)	*Last Update 1 Sep 2003*
Potentially Contaminative Uses (Non-Water Related)	*Last Update 1 Sep 2003*

Please note that the Environment Agency/SEPA have a charging policy in place for enquiries.

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Other Contacts

Contact *Name and Address*

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Romsey Road, Southampton, Hampshire, SO16 4GU

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Fax 023 8079 2615
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Telephone 01392 441702
Fax 01392 441709
Website www.landmark-information.co.uk
Email mailbox@landmark-information.co.uk

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Envirocheck® Report On:

Report on:

Wombwell Foundry Ltd.
Hough Lane
Wombwell
Barnsley
South Yorkshire
S73 0LT

National Grid Reference :

439050, 402300

Prepared For :

Historical Maps from CD Products

Your Reference

Martha McBarron,36993

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Ordnance Survey County Series Published 1892

County	Mapsheet	Scale	Year
Yorkshire	283_01	1:2,500	1892

Ordnance Survey County Series Published 1903

County	Mapsheet	Scale	Year
Yorkshire	283_01	1:2,500	1903

Ordnance Survey County Series Published 1930

County	Mapsheet	Scale	Year
Yorkshire	283_01	1:2,500	1930

Ordnance Survey Plan Published 1952

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE3801	1:2,500	1952
Ordnance Survey Plan	SE3802	1:2,500	1952
Ordnance Survey Plan	SE3901	1:2,500	1952
Ordnance Survey Plan	SE3902	1:2,500	1952

Ordnance Survey Plan Published 1982

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE3802NE	1:1,250	1982
Ordnance Survey Plan	SE3902NW	1:1,250	1982

Ordnance Survey County Series Published 1854 to 1855

County	Mapsheet	Scale	Year
Yorkshire	275_00	1:10,560	1854
Yorkshire	283_00	1:10,560	1855

Ordnance Survey County Series Published 1893 to 1894

County	Mapsheet	Scale	Year
Yorkshire	275_SW	1:10,560	1894
Yorkshire	283_NW	1:10,560	1893

Ordnance Survey County Series Published 1905 to 1907

County	Mapsheet	Scale	Year
Yorkshire	275_SW	1:10,560	1907
Yorkshire	283_NW	1:10,560	1905

Ordnance Survey County Series Published 1933

County	Mapsheet	Scale	Year
Yorkshire	275_SW	1:10,560	1933
Yorkshire	283_NW	1:10,560	1933

Ordnance Survey Plan Published 1956

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30SE	1:10,560	1956
Ordnance Survey Plan	SE40SW	1:10,560	1956

Ordnance Survey Plan Published 1966 to 1967

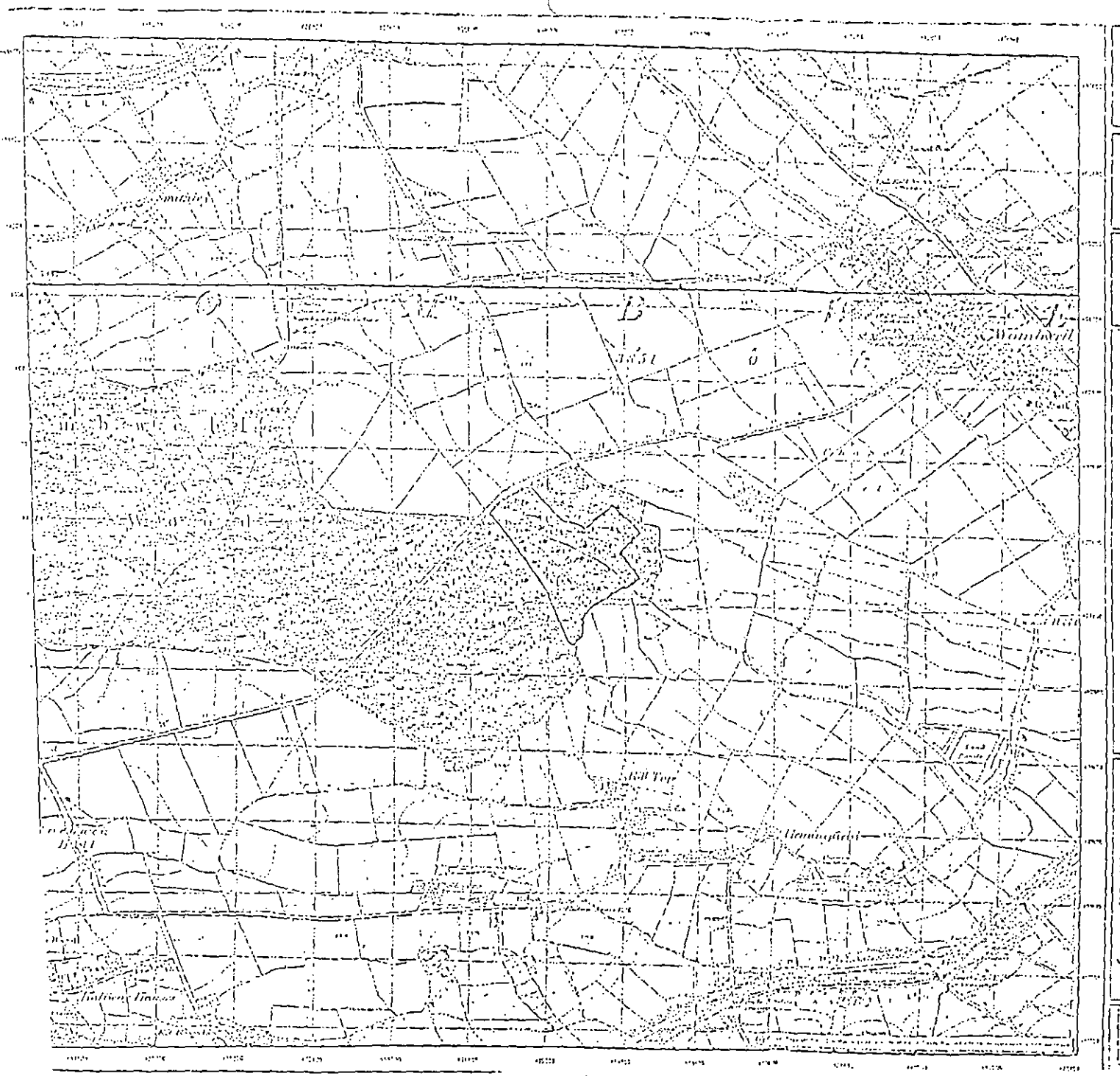
National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30SE	1:10,560	1966
Ordnance Survey Plan	SE40SW	1:10,560	1967

Ordnance Survey Plan Published 1980

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30SE	1:10,000	1980
Ordnance Survey Plan	SE40SW	1:10,000	1980

Ordnance Survey Plan Published 1989

National Grid Series	Mapsheet	Scale	Year
Ordnance Survey Plan	SE30SE	1:10,000	1989
Ordnance Survey Plan	SE40SW	1:10,000	1989



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CLIENT DETAILS

Envirocheck Order No. EC[illegible]

SITE DETAILS

Grid Reference

Quarry

Sheepfe

Railway over Road

Road over Railway

Railway over River

Gravel Pit

Sand Pit

Level Crossing

Other Pits

Road over River or Canal

Road over Stream

Mixed Wood

Rough Pasture

Road over Stream

Marsh

Sunken Road

Raised Road

Watched Contour

Instrumental Contour

Arrow denotes flow of water

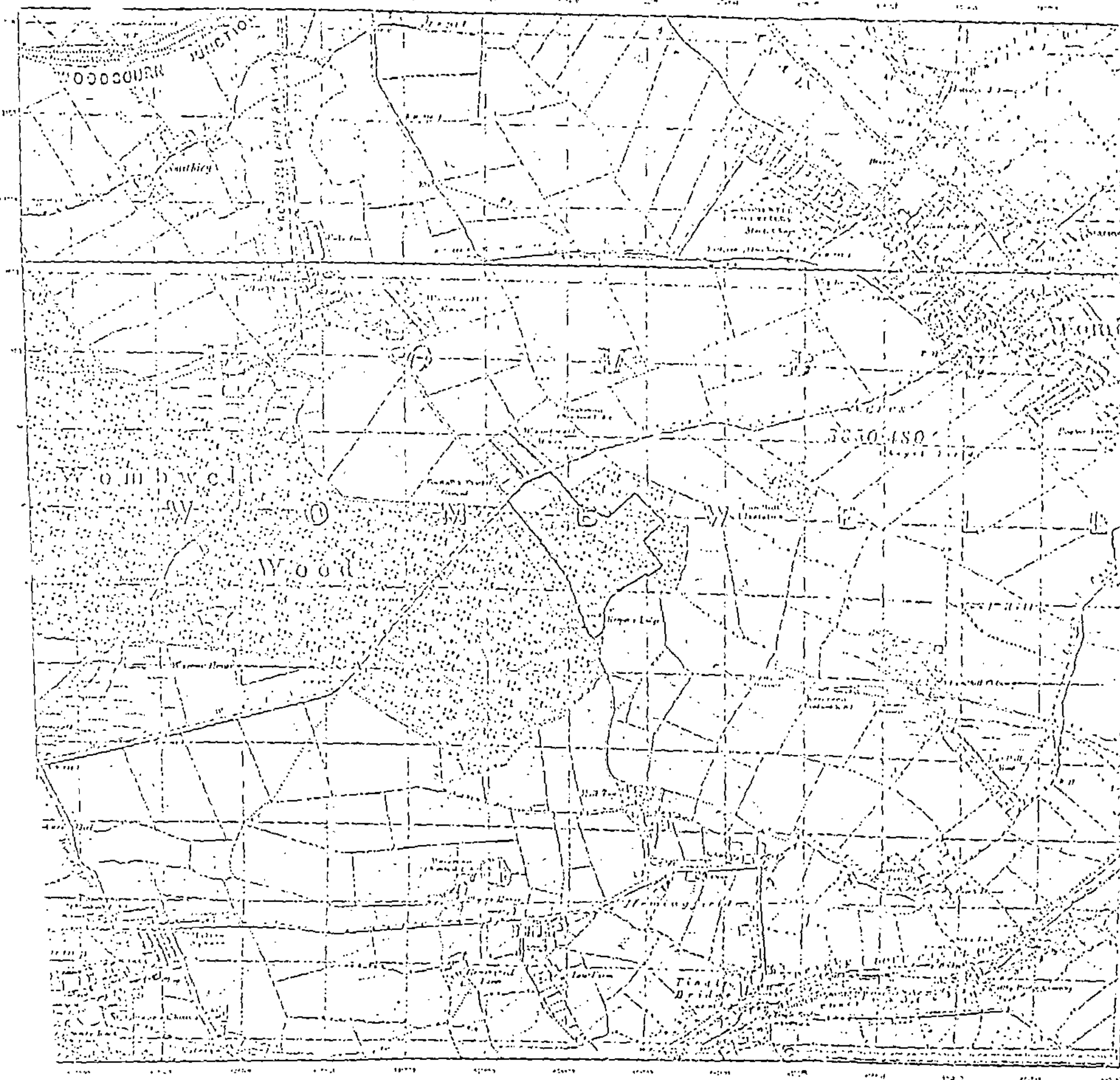
VIEWSHIRE

NORTH

MAP SIGNATURES

Ordnance Survey

LANDMARK



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CLIENT DETAILS

Envirocheck Order No.

SITE DETAILS

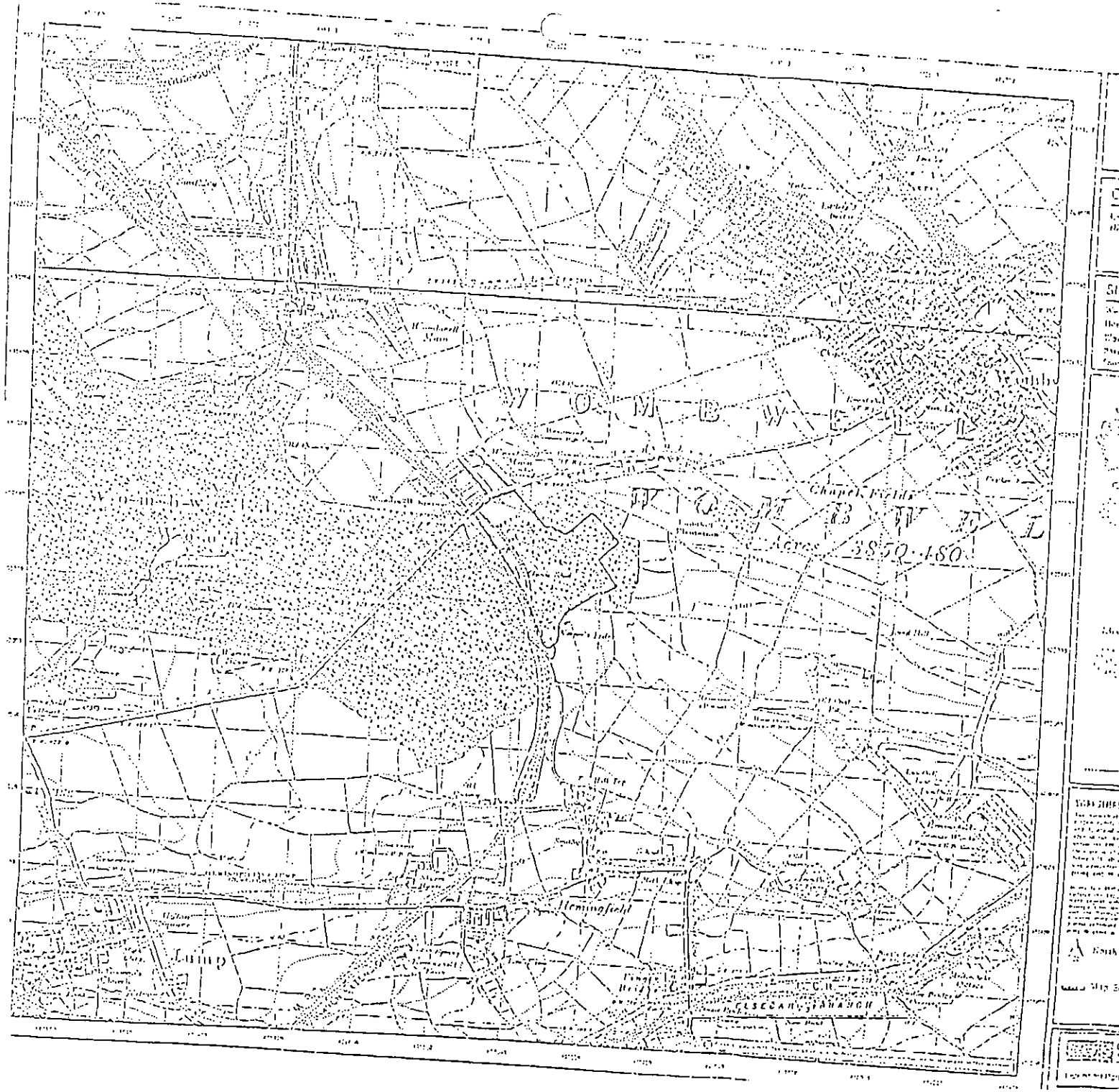
Grid Reference

Historical Map Legend

Quarry
Gravel Pit
Chalk Pit
Sand Pit
Mixed Wood
Rough Pasture
Marsh
Railway over Road
Road over Railway
Railway over River
Level Crossing
Road over Stream
Road over Stream
Stepping Stones
Ford
Footbridge
Sluice
Lock
Instrumental Contour

Important
Map Publication
Details of Publication

Ordnance Survey
LANDMARK



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CLIENT DETAILS

Envirocheck Order No. EC02000_1_1

SITE DETAILS

Grid Reference

Historical Map Legend

Quarry

Shaft

Railway over Road

Road over Railway

Gravel Pit

Sand Pit

Level Crossing

Railway over River

Other Pits

Road over River or Canal

Road over Stream

Mixed Wood

Rough Pasture

Road over Stream

Marsh

Sunken Road

Raised Road

Matched Contour

Instrumental Contour

Arrow denotes flow of water

YORKSHIRE

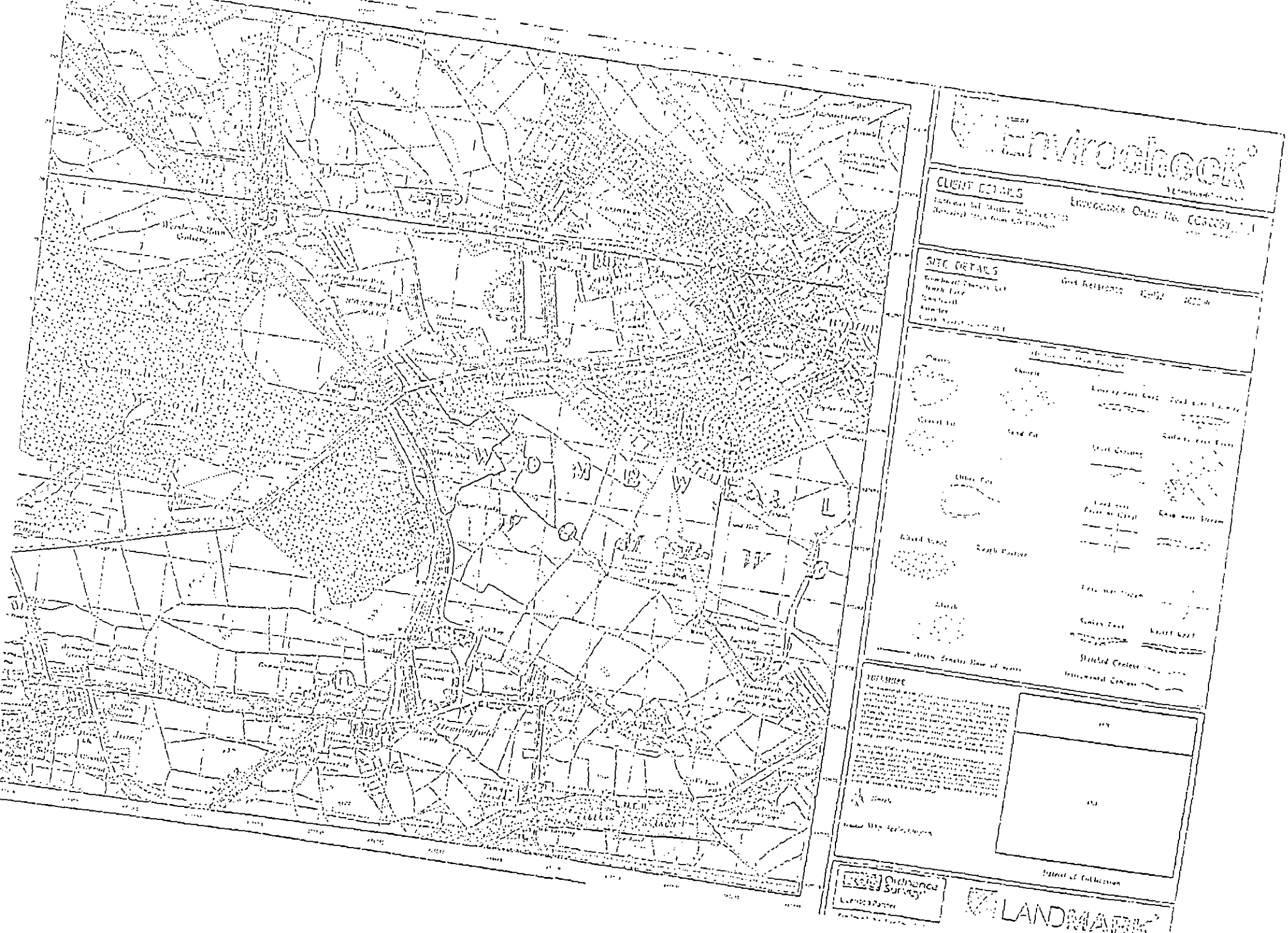
North

Map Scale 1:10,000

Original Publication

Ordnance Survey

LANDMARK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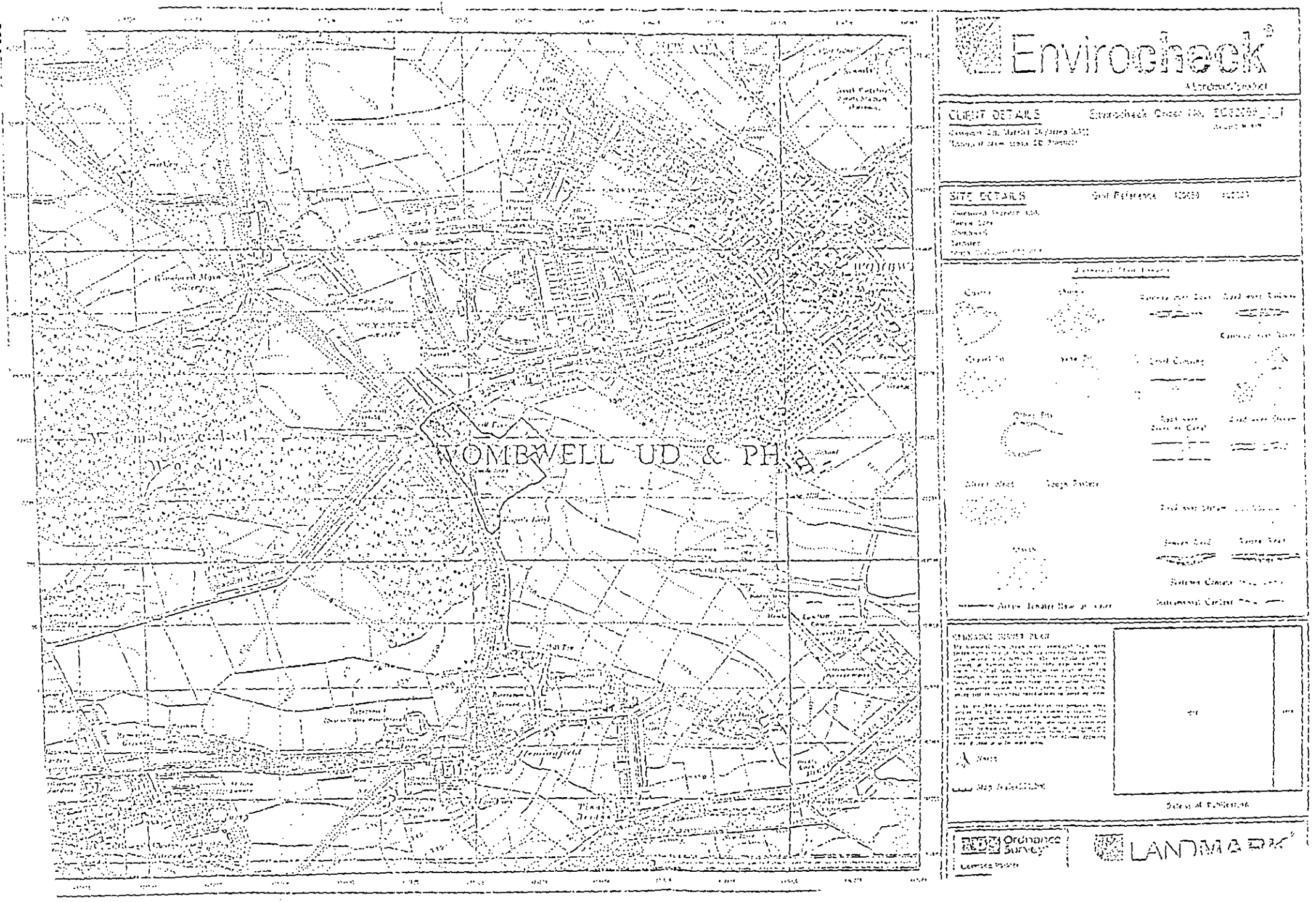
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SITE DETAILS
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CLIENT DETAILS

SITE DETAILS

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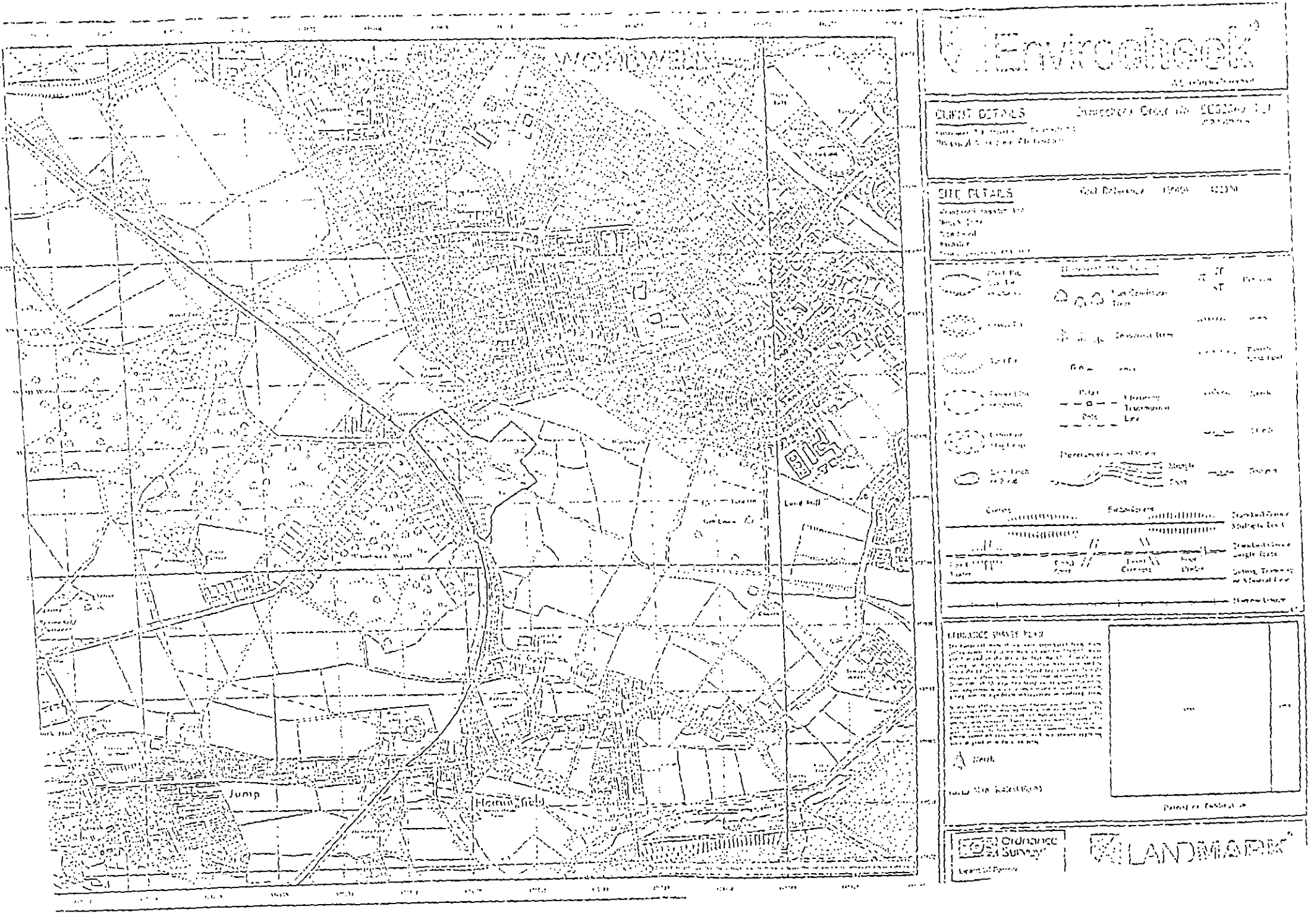
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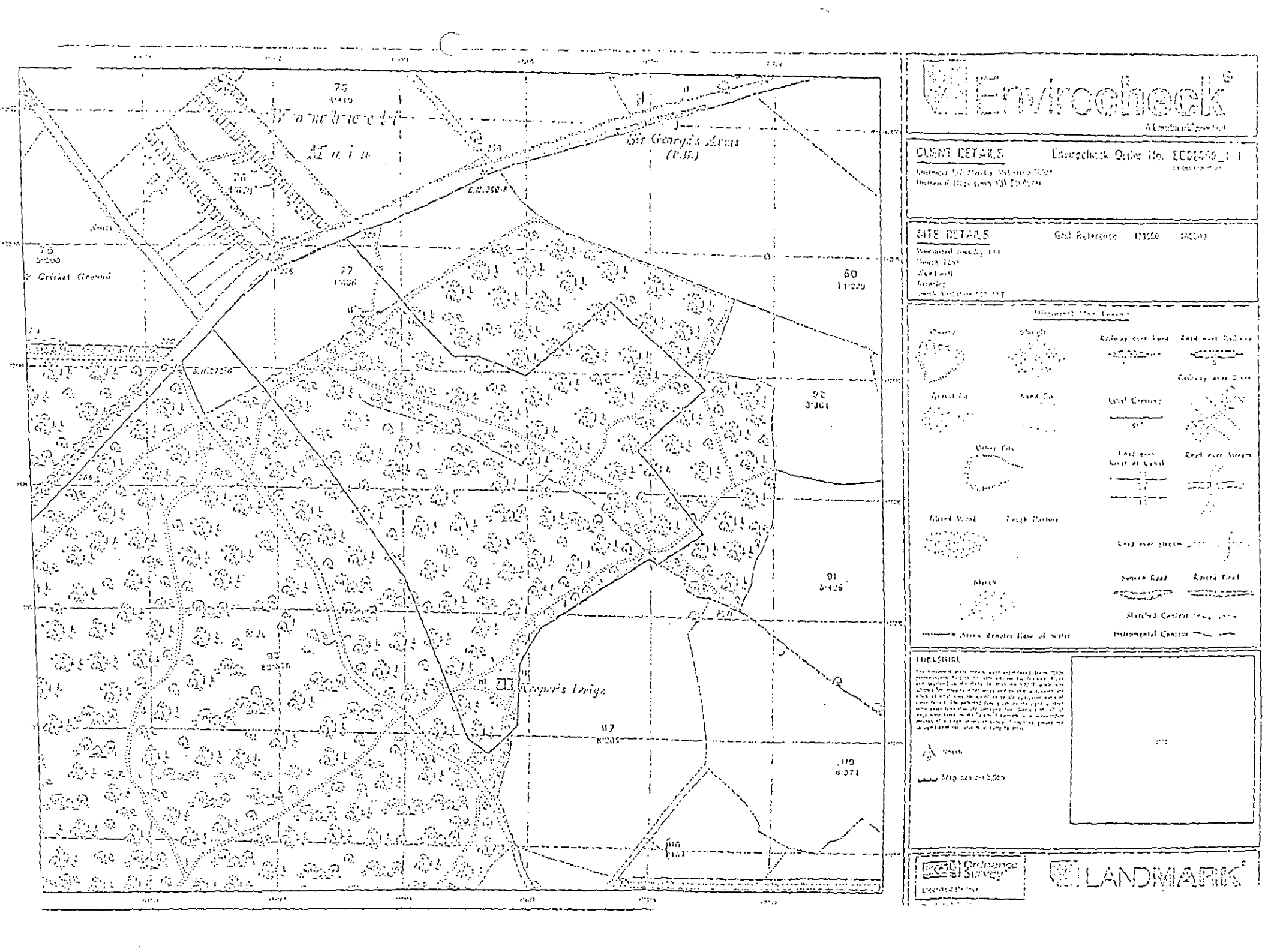
SITE DETAILS
Jump
Lund Hill
Ordnance Survey
LANDMARK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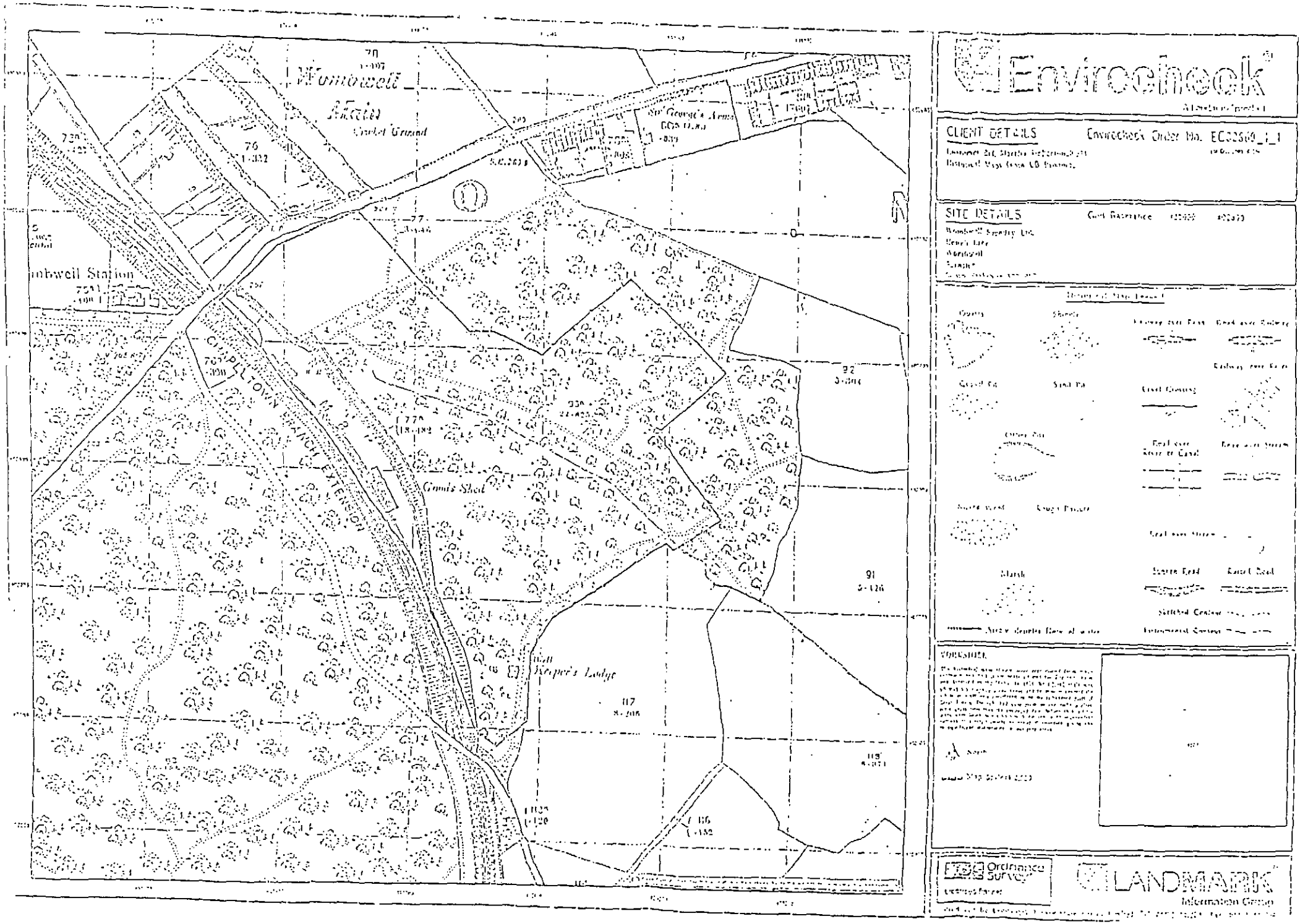
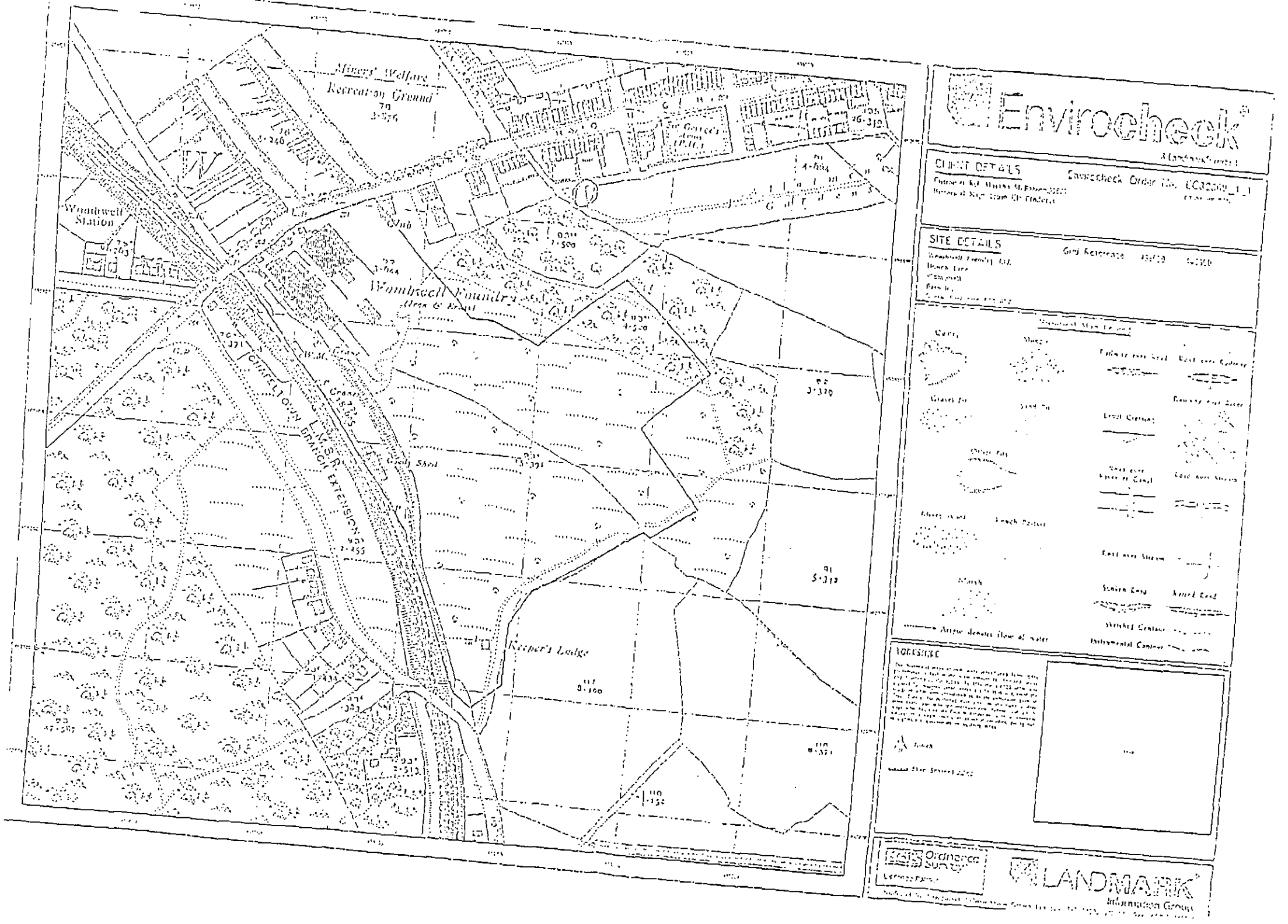
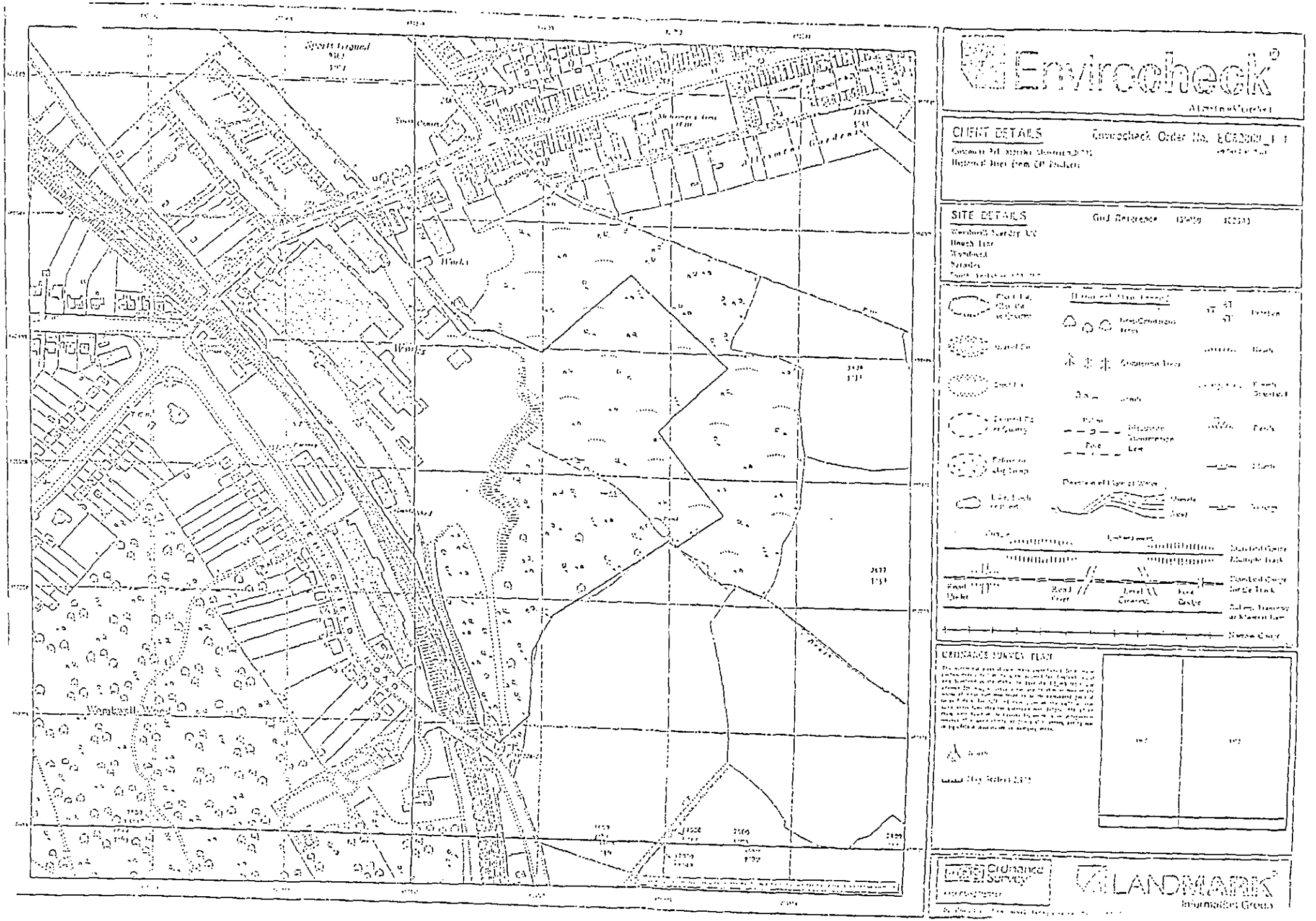
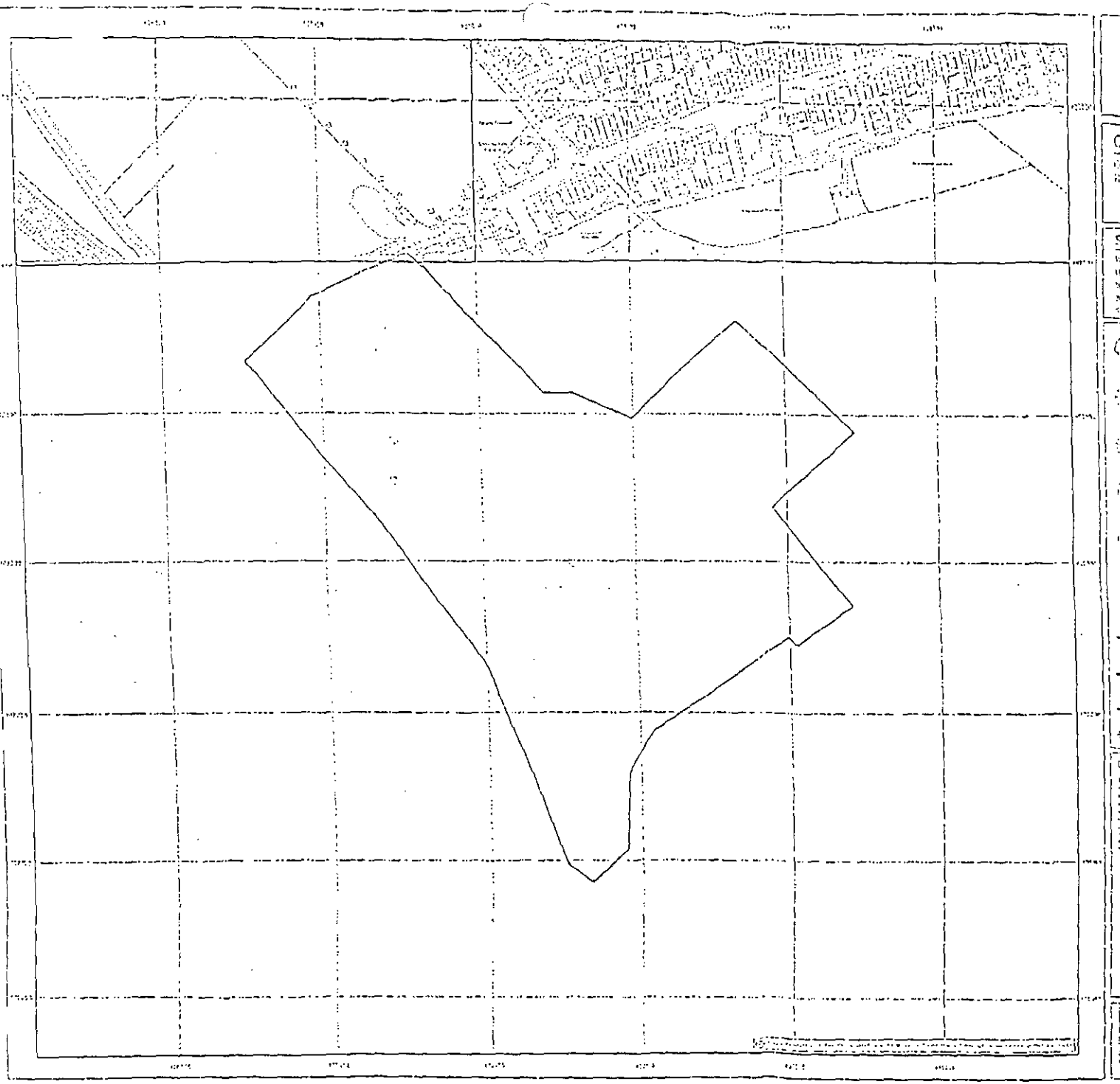
SITE DETAILS
Sir George's Arms
Cricket Ground
Kroper's Lodge
Ordnance Survey
LANDMARK


Wombwell Main
Cricket Ground
Wombwell Station
CHAPELTOWN BRANCH EXTENSION
Goods Shed
Keeper's Lodge
Envirocheck
CLIENT DETAILS
Envirocheck Order No. EC22569_1_1
SITE DETAILS
Wombwell Foundry Ltd.
Ordnance Survey
LANDMARK
Information Group


Miners' Welfare
Recreation Ground
Woodhwell Station
Woodhwell Foundry
Keeper's Lodge
CHAPELTOWN BRANCH EXTENSION
L.M.S.R.
Goods Shed
Envirocheck
CLIENT DETAILS
SITE DETAILS
Grid Reference
Arrow denotes flow of water
Ordnance Survey
LANDMARK
Information Group


Envirocheck
CLIENT DETAILS
SITE DETAILS
Grid Reference
ORDNANCE SURVEY TILE
Ordnance Survey
LANDMARK
Information Group



Envirocheck®

CLIENT DETAILS — Envirocheck Order No. [illegible]

SITE DETAILS — Grid Reference [illegible]

ORDNANCE SURVEY PLAN

Ordnance Survey

LANDMARK Information Group

APPENDIX I

Coal Authority Mining Report

The Coal Authority,
Mining Reports Office,
200 LICHFIELD LANE,
BERRY HILL,
MANSFIELD,
NOTTINGHAMSHIRE,
NG18 4RG
Telephone: 0845 762 6848
DX 716176 MANSFIELD 5
On Line Service: www.coalmining.com

The
COAL AUTHORITY

The Coal Authority
Cost: [illegible]
Plus V.A.T.: [illegible]
Total Received: [illegible]
V.A.T. Reg Number: [illegible]

CASTINGS TECHNOLOGY INTERNATIONAL
7 EAST BANK ROAD,
SHEFFIELD,
SOUTH YORKSHIRE,
S2 3PT

This matter is being dealt with by Darren Moody

Our Ref: 369985-01

Your Ref: 65603

Date: 22 October 2001

Dear Sir,

Coal Mining Report

SITE OFF, HEMINGFIELD ROAD, WOMBWELL, BARNSLEY, SOUTH YORKSHIRE

I refer to the enquiry dated 11th October 2001, received 19th October 2001, in connection with the above.

This report is based on and limited to the records in the possession of The Coal Authority at the time the search is answered.

Past Underground Mining

The property is within the likely zone of influence on the surface from workings in 14 seams of coal at 90m to 530m depth, the last date of working being 1980.

Ground movement from the above mentioned past coal workings should by now have ceased.

In addition you may wish to know that the property is in an area where coal is believed to exist at or close to the surface that may have been worked at some time in the past.

Present Underground Mining

The property is not within the zone of likely physical influence on the surface from any present underground coal workings.

Future Underground Mining

The property is not within a geographical area for which a licence to extract coal by underground methods is awaiting determination by the Coal Authority.

The property is not within a geographical area for which a licence to extract coal by underground methods has been granted.

The property is not within the zone of likely physical influence at the surface from plans of future workings in our possession.

However reserves of coal exist in the locality which could be worked at some time in the future subject to feasibility, licences, and planning consents.

We have no record of any notice of the risk of the land being affected by subsidence being given under S.46 of the Coal Mining Subsidence Act 1991.

Shafts and Adits

We have no knowledge of any mine entries within, or within 20 metres of, the boundary of the property.

The records held by the Coal Authority may be incomplete. Consequently, there may exist in this locality mine entries of which we have no knowledge.

Surface Geology

Records in our possession do not disclose any fault or other line of weakness at the surface as having affected the stability of the property.

Past Opencast Mining

The property is not located within the geographical boundary of an opencast site from which coal has been extracted by opencast methods.

Present Opencast Mining

The property does not lie within 200 metres of the geographical boundary of an opencast site within which coal is being extracted by opencast methods.

Future Opencast Mining

The property is not within 800 metres of the geographical boundary of an opencast site for which a licence to extract coal by opencast methods is awaiting determination.

The property is not within 800 metres of the geographical site boundary of an opencast site for which a licence to extract coal by opencast methods has been granted.

Subsidence

The records in our possession do not disclose any damage notice or claim having been given, made or pursued in respect of the property since 1 January 1984.

The records in our possession do not disclose any current "Stop Notice" affecting the property.

The records in our possession do not show any request having been made to execute preventative works under S.53 of the Coal Mining Subsidence Act 1991.

Withdrawal of Support

The property lies within a geographical area in respect of which a notice of entitlement to withdraw support was published in 1983.

The property does not lie within a geographical area in respect of which a notice has been given under S.41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not within a geographical area that is the subject of an Order made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not within an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Additional Remarks

In view of the mining circumstances a prudent developer would seek appropriate technical advice before works are undertaken on site. All proposals should have regard to good engineering practice in mining areas as identified in authoritative publications on mining stability problems. In any event, no activities should be undertaken that intersect, disturb, or interfere with any coal or mines of coal without permission of the Coal Authority.

We acknowledge the receipt of your remittance in payment of our fee.

Yours faithfully

A Schofield

Albert Schofield

Director of Operations

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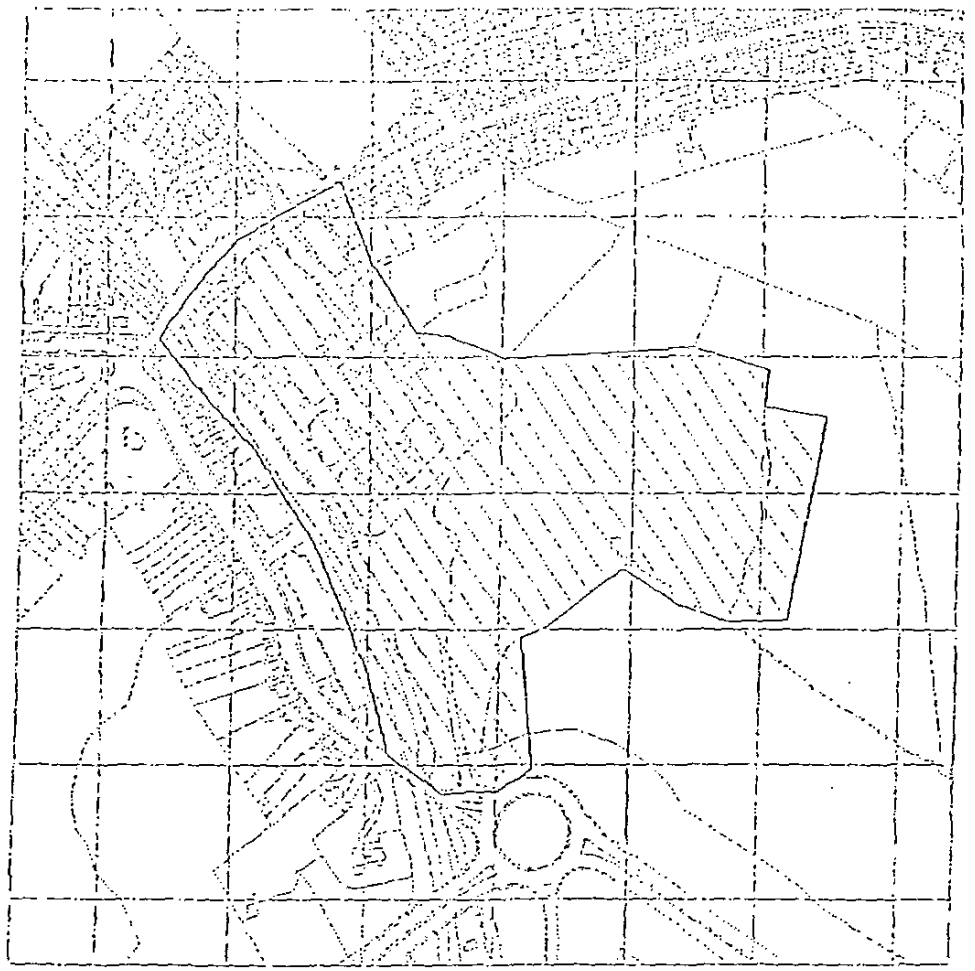

Crown Copyright. Quoted scale is approximate.

SCALE: 1:5000

This map is reproduced from the Ordnance Survey material by The Coal Authority [or division thereof] with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. License Number: AL5105C/001.

This is a plan of the boundaries of the property in respect of which this report has been prepared. It is the responsibility of the user to ensure that the boundaries shown correspond with those of the property.

APPROXIMATE POSITION OF ENQUIRY BOUNDARY SHOWN

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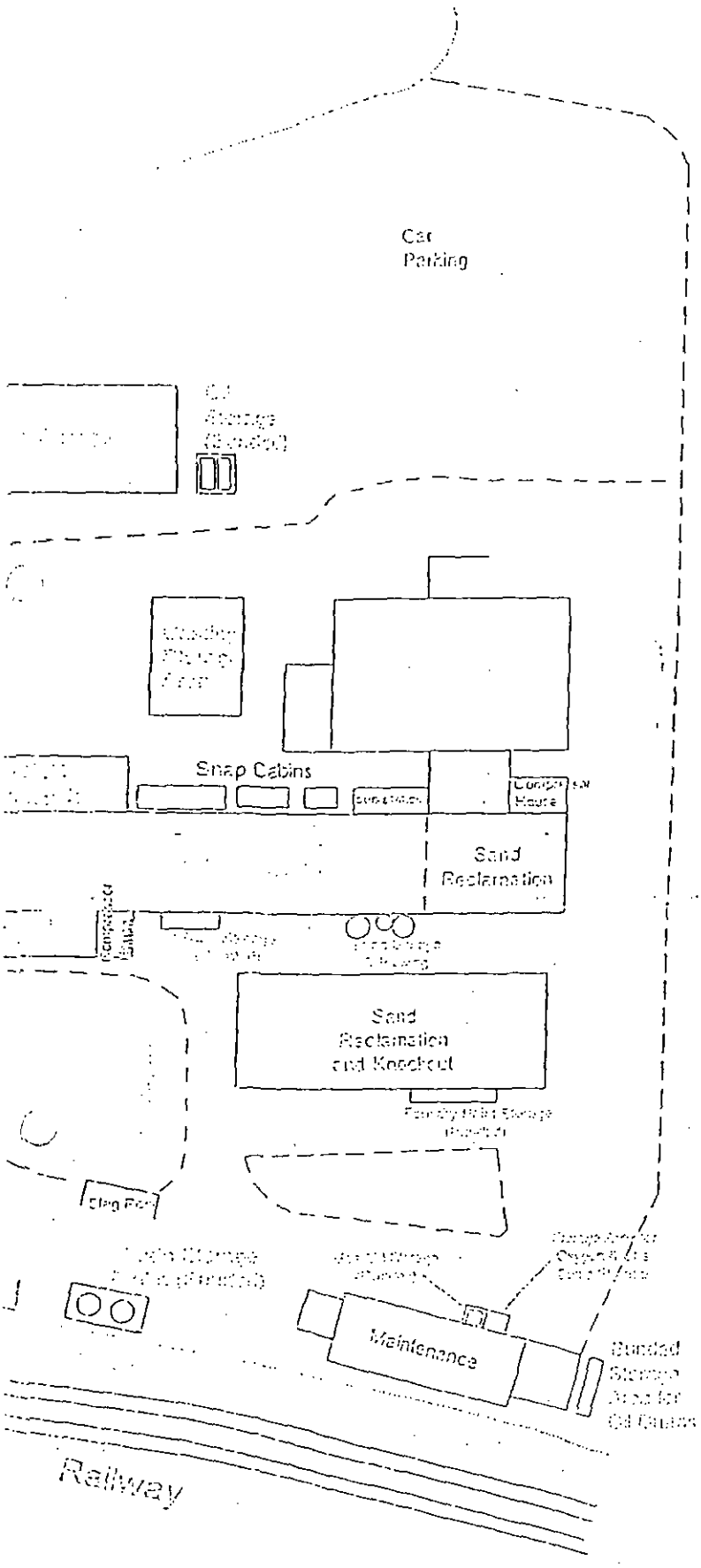
APPENDIX J

Historical Site Use Plans



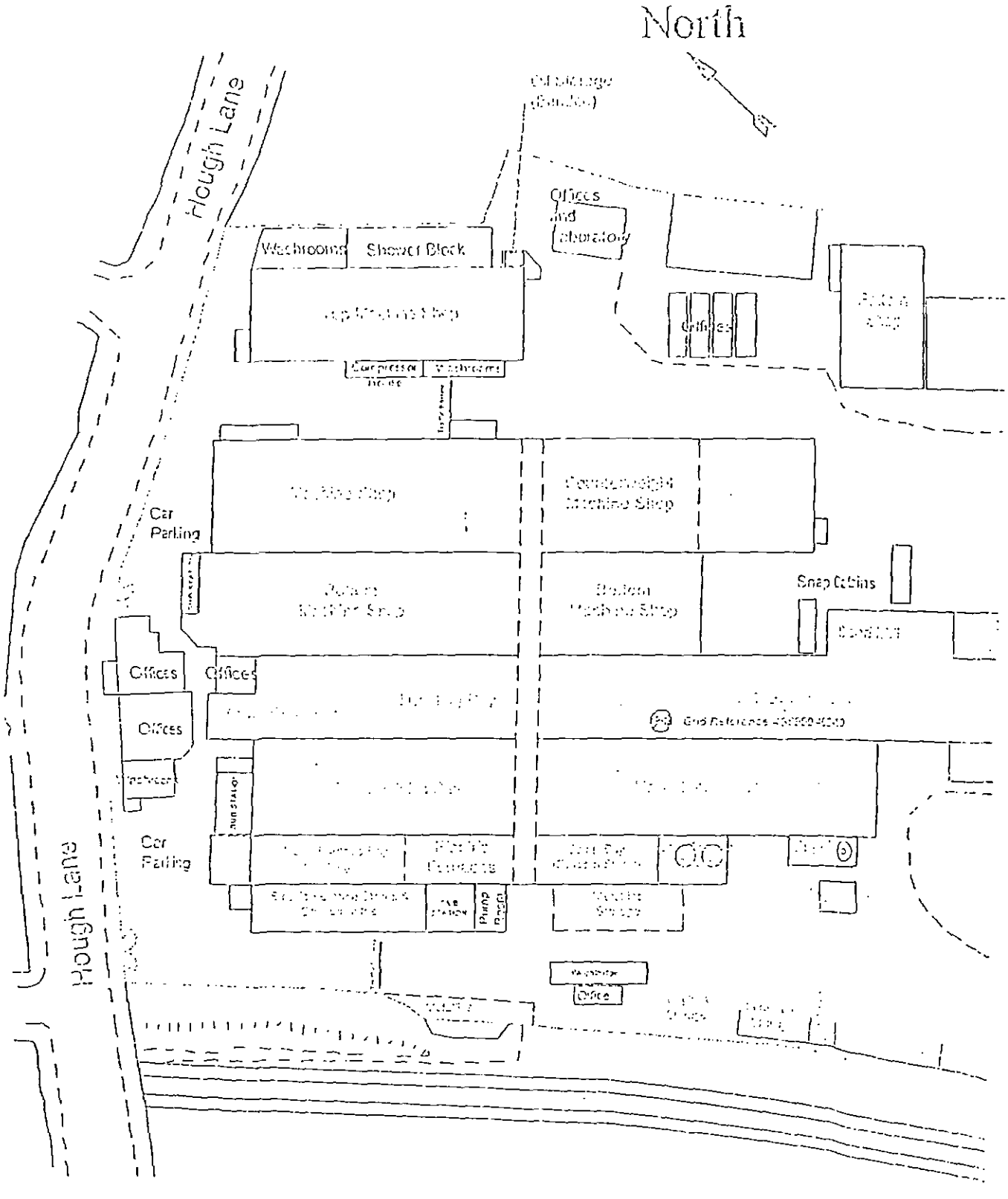
COLOUR KEY

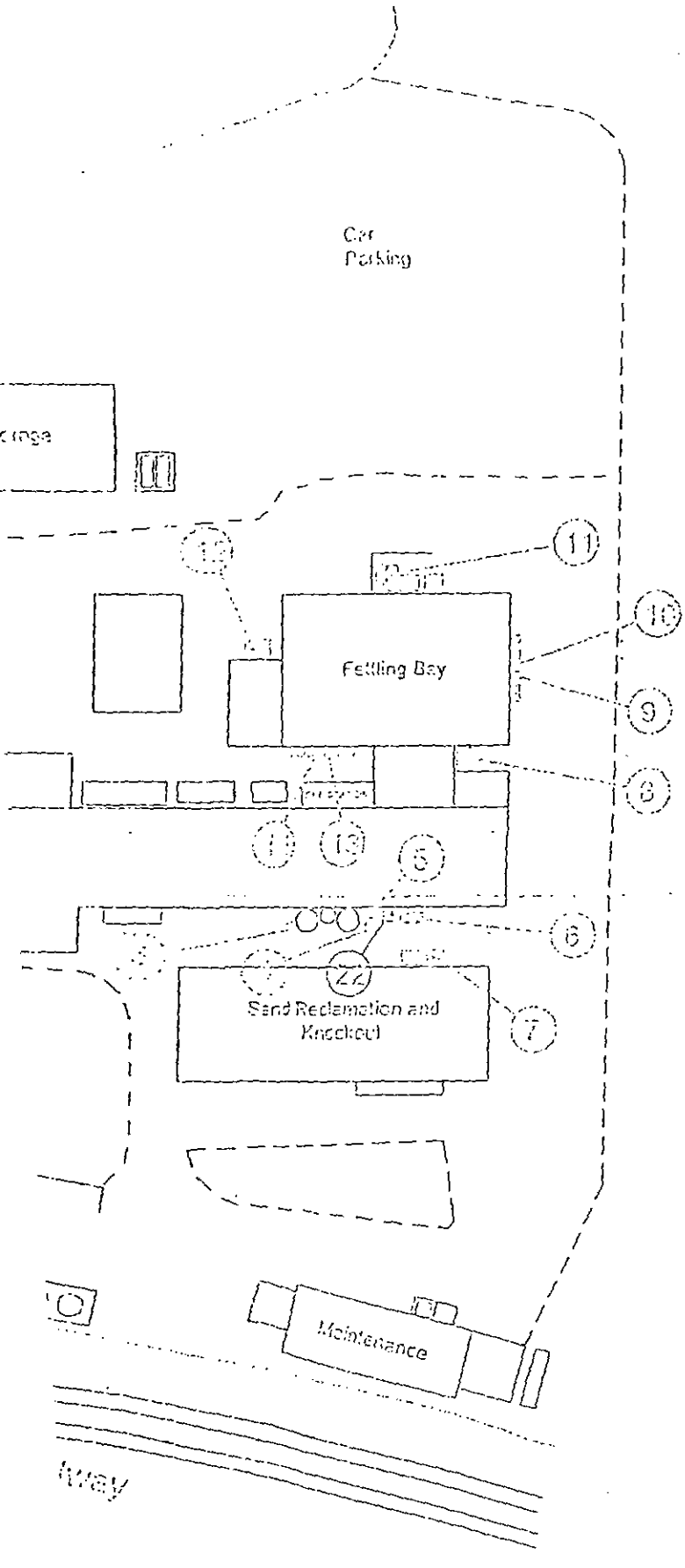
- Storage Buildings & Areas
- Mould & Core Making
- Metal Melting
- Sand Reclamation
- Fettling, Grinding & Shotblast
- Heat Treatment
- Pattern Making
- Casting Painting
- Casting Machining
- Non Production Ancillaries

Burden Engineering and Environmental Services Ltd.

Customer WOMBWELL FOUNDRY LTD

Title
Layout of works showing production areas


North
Hough Lane
Offices and laboratory
Washrooms
Shower Block
Offices
Car Parking
Offices
Offices
Offices
Car Parking
Snap Cabins
Hough Lane
Office
40
20
0
40
60
Metres

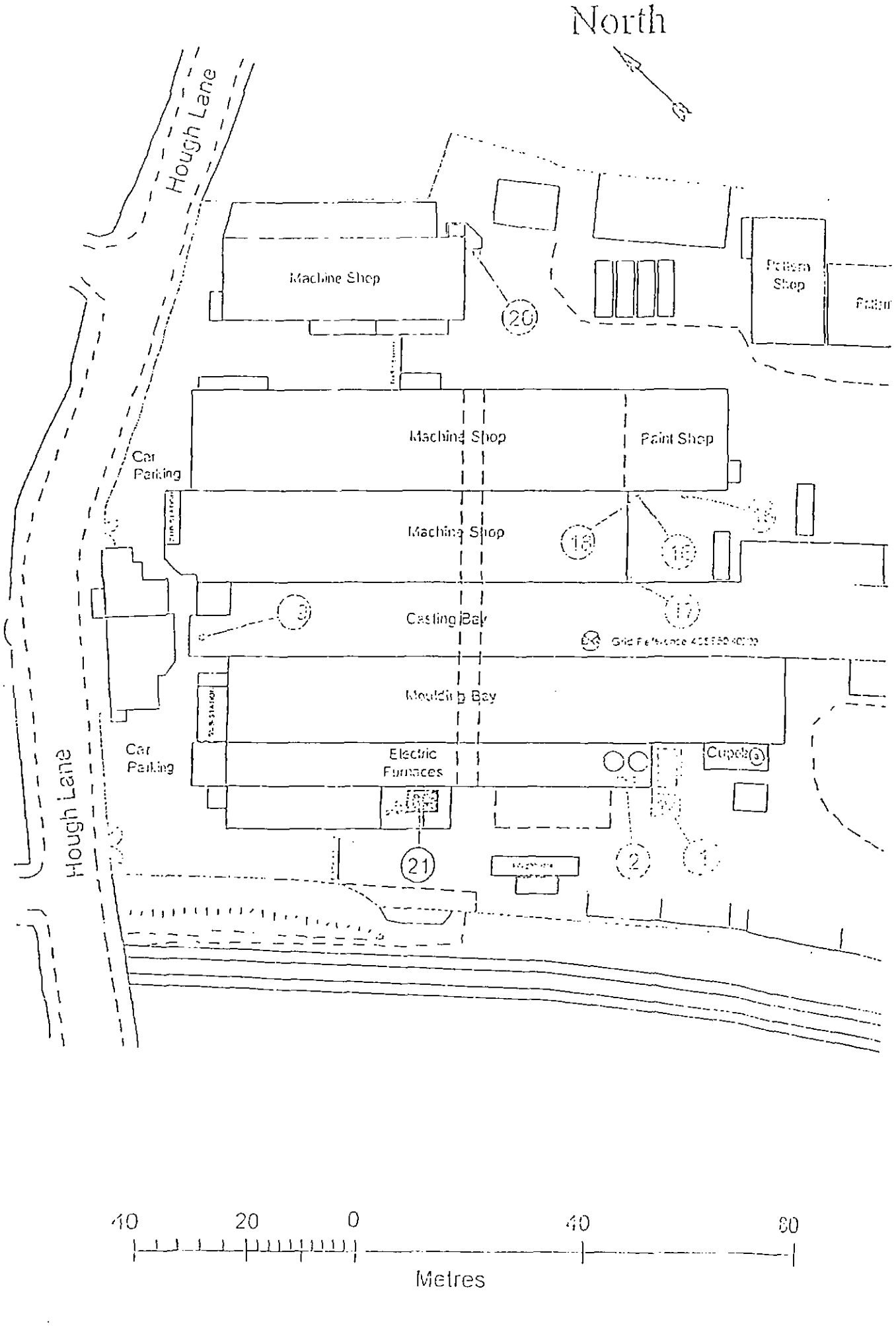


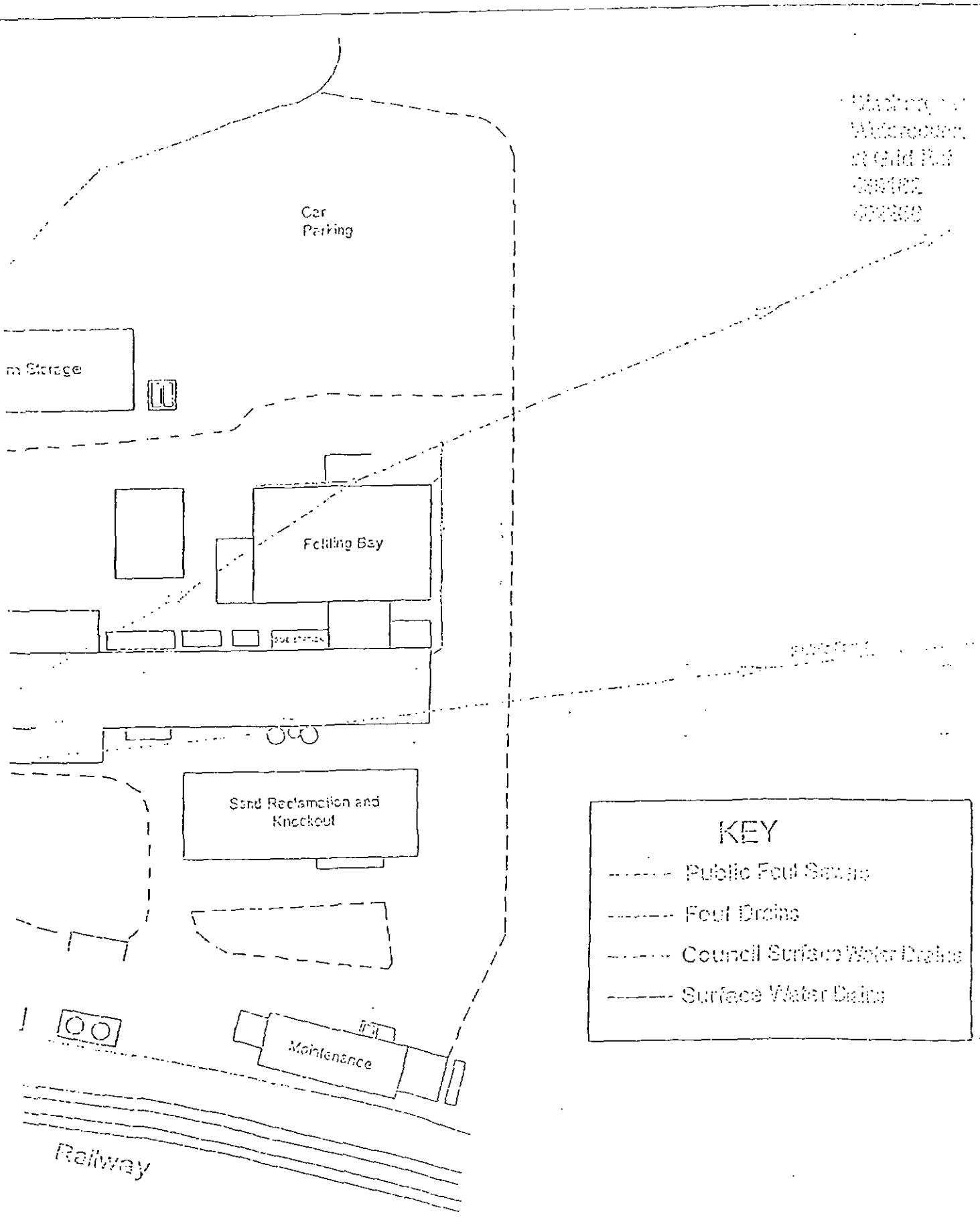
No	Type	Discharge Point
1	Dry Bag Filter	[illegible]
2	Dry Bag Filter	[illegible]
3	Dry Bag Filter	[illegible]
4	Dry Bag Filter	[illegible]
5	Dry Bag Filter	[illegible]
6	Dry Bag Filter	[illegible]
8	Dry Bag Filter	[illegible]
9	Dry Bag Filter	[illegible]
10	Dry Bag Filter	[illegible]
11	Dry Bag Filter	[illegible]
12	Dry Bag Filter	[illegible]
13	Dry Bag Filter	[illegible]
14	Dry Bag Filter	[illegible]
15	Vent	[illegible]
16	Vent	[illegible]
17	Vent	[illegible]
18	Vent	[illegible]
19	Vent	[illegible]
20	Dry Bag Filter	[illegible]
21	Vent	Cooling Tower
22	Vent	Cooling Tower

Burdett
Engineering and
Environmental
Services Ltd.

Customer WOMBWELL FOUNDRY LTD

Title
Layout of works showing
discharge points to atmosphere


North
Hough Lane
Machine Shop
Pattern Shop
Machine Shop
Paint Shop
Car Parking
Machine Shop
Casting Bay
Moulding Bay
Car Parking
Electric Furnaces
Cupola
Hough Lane
20
15
16
17
3
21
2
1
10
20
0
40
80
Metres

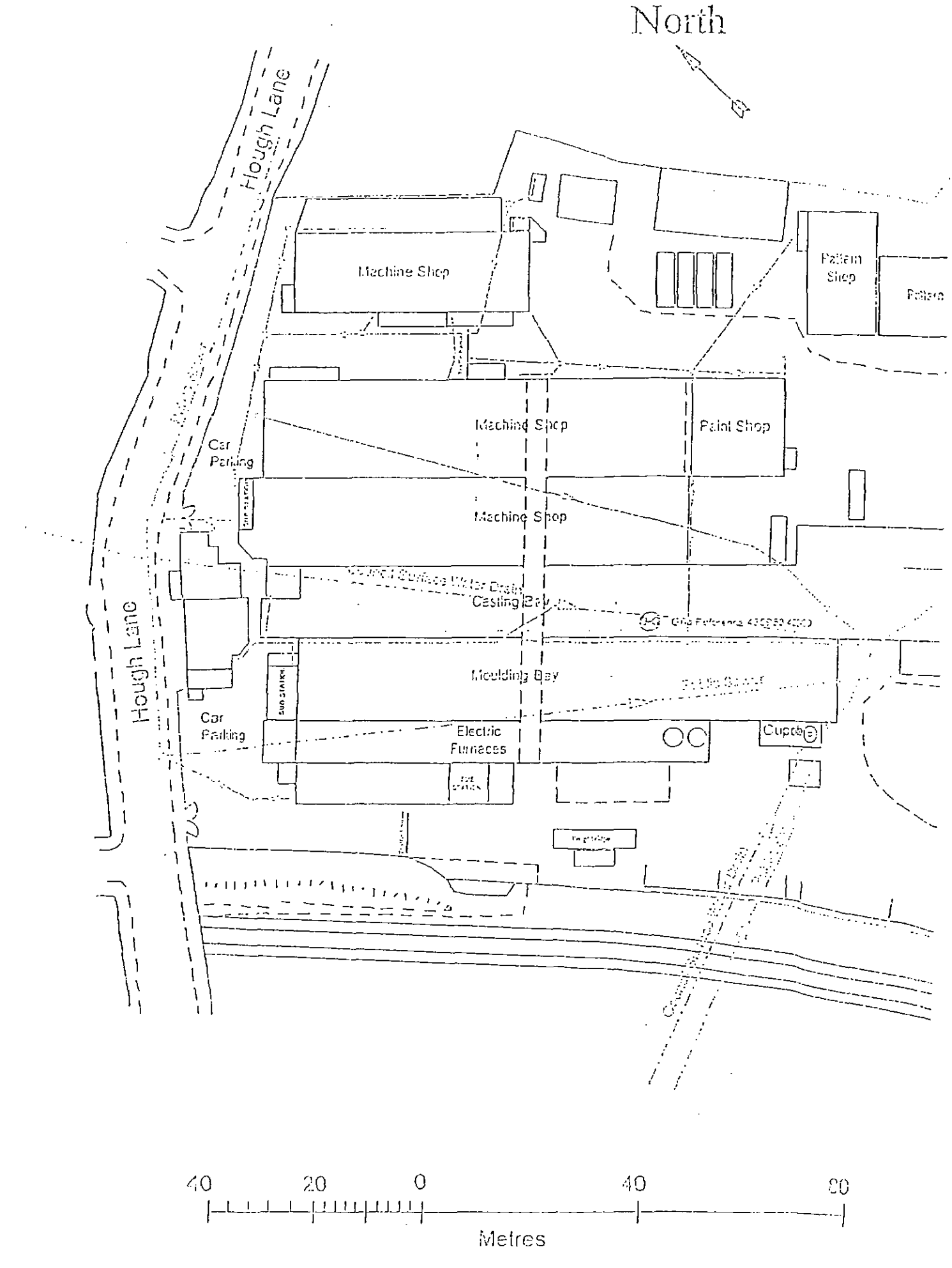


Burdett
Engineering and
Environmental
Services Ltd.

Customer WOMBWELL FOUNDRY LTD

Title
Layout of works showing foul
and surface water drainage

Drawn by R.F.B. | Date | Drawing Number


North
Hough Lane
Hough Lane
Machine Shop
Pattern Shop
Pattern
Machine Shop
Paint Shop
Car Parking
Machine Shop
Casting Bay
Moulding Bay
Car Parking
Electric Furnaces
Cupola
40
20
0
40
80
Metres

APPENDIX B
Trial Pit Logs

Trial Pit ID	Client	Sheet
TP1A	Ben Bailey Homes Limited.	Sheet 1 of 1
Job No: 232095	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Excavation Equipment:	Co-ords	Field Records	Logged	Chkd	Appr.
360 degree excavator	Ground Level	DRS05/03	DRS	DJS	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Reinforced concrete.	0.20						
MADE GROUND: Firm orange brown silty clay.	0.40						
MADE GROUND: Medium dense black sandy gravel of ash, clinker, slag and brick fragments.							
Firm to stiff orange brown mottled silty CLAY becoming increasingly stiff with depth.	1.20						
End of Trial Pit at 2.30 m	2.30						

Remarks:

1. Excavated through concrete base.
2. No groundwater encountered.
3. Sides remained stable throughout excavation.
4. Pit terminated at 2.30m (begl).

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Spot Non Representative

W - Water

PID - PID Reading

Trial Pit ID: TP2A

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

Field Records: DRS05/03

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Ground Level:

Logged: DRS

Chkd: DRS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Tarmac.	0.05						
MADE GROUND: Medium dense dark brown sand with gravel of clinker, slag and brick becoming dense with depth.	0.60						
MADE GROUND: Medium dense to dense black ash	0.85						
MADE GROUND: Dense orange brown gravelly sandstone up to 0.2m in size.	1.35						
MADE GROUND: Firm to stiff orange brown sandy gravelly clay. Gravel is of sandstone.	1.80						
Firm to orange brown slightly mottled grey silty CLAY.	2.35						
End of Trial Pit at 2.35 m							

Remarks:

1. Excavation down the edge of the weighbridge.
2. No groundwater encountered.
3. Sides remained stable throughout excavation.
4. Pit terminated at 2.35m (begl)

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Spot Non-Representative

W - Water

PID - PID Reading

Trial Pit ID: TP3A

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Field Records: DRS05/03

Ground Level:

Logged: DRS

Chkd: DRS

Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Concrete with reinforcement.	0.30						
MADE GROUND: Medium dense black gravelly sand. Gravel is of ash and clinker.	1.30						
MADE GROUND: Firm orange brown slightly sandy gravelly clay. Gravel is of angular sandstone.	2.30						
Firm to stiff orange brown mottled silty CLAY becoming gravelly with angular mudstone with depth.	3.50						
End of Trial Pit at 3.50 m							

Remarks

1. Excavation carried out adjacent to the stantions to determine foundations.
2. No groundwater encountered.
3. Sides remained stable throughout excavation.
4. Pit terminated at 3.5m (begl) due to concrete base.

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Spot Non-Representative

W - Water

PID - PID Reading

Trial Pit ID: TP4A

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Field Records: DRS05/03

Ground Level:

Logged: DRS

Chkd: DRS

Type:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Concrete.	0.25						
MADE GROUND: Medium dense cream limestone gravel.	0.60						
MADE GROUND: Medium dense black red gravelly sand Gravel is of ash, clinker and brick.							
End of Trial Pit at 4.00 m	4.00						

Remarks

1. Excavation down the edge of the concrete base.
2. No groundwater encountered.
3. Sides remained stable throughout excavation.
4. Pit terminated at 4.0m (begl).

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Spot Non Representative

W - Water

PID - PID Reading

Trial Pit ID	Client	Sheet
TP5A	Ben Bailey Homes Limited.	Sheet 1 of 1
Job No	Site	Date
232095	Land at Wombwell Foundry, off Hough Lane, Wombwell	23/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Excavation Equipment	Co-ords	Field Records	Logged	Chkd	Age
360 degree excavator	Ground Level	DRS05/03	DRS	DJ2S	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND Dense black sand with occasional brick.							
MADE GROUND: Medium dense red crushed brick and sand with very frequent slag and clinker.	1.00						
End of Trial Pit at 3.50 m	3.50						

Remarks
1. Pit excavated down the side of the railtrack base.
2. No groundwater encountered.
3. Sides slightly unstable during excavation.
4. Pit terminated at 3.5m (begl) due to concrete base.

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
PID - PID Reading

Trial Pit ID	Client	Sheet
TP6A	Ben Bailey Homes Limited	Sheet 1 of 1
Job No: 232095	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	Date: 23/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Excavation Equipment	Contractor	Field Records	Logged	Chkd	Appr.
360 degree excavator		DRS05/03	DRS	DJS	

Ground Level

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Medium dense white limestone gravel	0.10						
MADE GROUND: Medium dense black sand with very occasional clay inclusions.							
End of Trial Pit at 3.80 m	3.80						

Remarks

1. Excavation carried out down the side of the concrete base with the concrete locally deepended to 2.0m on the gable end.
2. No groundwater encountered.
3. Sides remained stable throughout excavation.
4. Pit terminated at 3.8m (begl).

Sample Type Key

D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
PID - PID Reading

Trial Pit
TP7A

JPA JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Job No
232095

Client
Ben Bailey Homes Limited.

Site
Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet
Sheet 1 of 1

Date
24/11/2005

Excavation Equipment
360 degree excavator

Co-ords

Field Records
DRS05/03

Ground Level

Logged
DRS

Chkd
DRS

Scale
1:25

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Concrete							
MADE GROUND: Very dense red brick	0.25 0.30						
MADE GROUND: Dense red brick.	0.80						
Firm orange brown friable sandy gravelly clay. Gravel is of angular mudstone.	1.10						
Firm grey brown friable laminated silty CLAY becoming stiff with depth.	2.20						
Stiff grey brown friable gravelly CLAY. Gravel is of mudstone	2.80						
Weak grey MUDSTONE becoming moderately strong	3.00						
End of Trial Pit at 3.00 m							

Notes
No groundwater encountered.
Sides slightly unstable during excavation
Pit terminated at 3.0m (begl)

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
PID - PID Reading

Trial Pit ID	Client	Sheet	
TP8A	Ben Bailey Homes Limited	Sheet 1 of 1	JPA JOYNES PIKE & ASSOCIATES LTD
Job No. 232095	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	Date: 24/11/2005	www.joynespike.co.uk

Excavation Equipment	Coords	Field Records		
360 degree excavator		DRS05/03		
	Ground Level	Logged: DRS	Chkd: DJS	Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Loose to medium dense red brown gravelly sand with ash, clinker and brick							
End of Trial Pit at 4.00 m	4.00						

Notes

Excavation to determine the concrete base around pits
No groundwater encountered.
Sides unstable during excavation
Pit terminated at 4.0m (begl)

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Split Non-Representative
W - Water
PID - PID Reading

Trial Pit No: TP9A

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Contract:

Field Records: DRS05/03

Ground Level:

Logged: DRS | Chkd: DJS | Appr:

Stratum Description	Depth (m)	Level (mAD)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Concrete							
MADE GROUND: Medium dense black red gravelly sand Gravel is of ash, clinker and brick.	0.30						
End of Trial Pit at 0.50 m	0.50						

Remarks

Shallow excavation to determine thickness of adjacent concrete.
No groundwater encountered.
Sides remained stable throughout excavation.
Pit terminated at 0.5m (begl)

Sample Type Key

D - Disturbed Representative

B - Bulk Disturbed Representative

S - Split Run Representative

W - Water

PID - PID Reading

Trial Pit ID: TP10A

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Ground Level:

Field Records: DRS05/03

Logged: DRS

Chkd: DRS

Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND Concrete							
MADE GROUND Very dense black brown red gravelly sand with ash, clinker and brick	0.20						
End of Trial Pit at 0.60 m	0.60						

Notes:
Concrete base stands 0.3m above ground level, base is 0.5m thick in total
No groundwater encountered
Sides remained stable throughout excavation
Pit terminated at 0.6m (begl) due to dense ground.

Sample Type Key:
D - Disturbed Representative
B - Bulk Representative
S - Split Tube Representative
W - Water
PID - PID Reading

Trial Pit No: TP11A

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Ground Level:

Field Records: DRS05/03

Logged: DRS

Chkd: CJS

Appd:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Loose to medium dense orange sand							
MADE GROUND: Loose to medium dense gravelly sand with ash, clinker and brick	0.50						
End of TrialPit at 3.00 m	3.00						

Remarks:

No groundwater encountered.
Sides remained stable throughout excavation
Pit terminated at 3.0m (begl)
Adjacent concrete base is 0.2m thick.

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Small Non Representative

W - Water

PID - PID Reading

Trial Pit ID	Client	Sheet	
TP12A	Ben Bailey Homes Limited	Sheet 1 of 1	JPA JOYNES PIKE & ASSOCIATES LTD
Site	Land at Wombwell Foundry, off Hough Lane, Wombwell	Date	
Job No. 232095		24/11/2005	

Excavation Equipment	Co-ords	Field Records	
360 degree excavator		NLM0503	www.joynespike.co.uk
	Ground Level	Logged: NMcC	Chkd: DBS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND Sandy topsoil with whole brick and brick fragments							
Firm orange brown CLAY with rootlets	1.60						
End of Trial Pit at 1.90 m	1.90						

Notes
No groundwater encountered.
Sides remained stable throughout excavation.
Pit terminated at 1.90m (begl) due to base of concrete

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
PID - PID Reading

Trial Pit ID

TP13A

Job No.

232095

Client

Ben Bailey Homes Limited

Site

Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet

Sheet 1 of 1

Date

24/11/2005

Field Records

DLM0504

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment

360 degree excavator

Co-ords

Ground Level

Logged

DMcC

Chkd

DCS

App

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Medium dense black ashy sand with whole brick and brick fragments, scarp metal, plastic and metal pipes, plastic and metal sheeting, corrugated plastic, wood and occasional boulders of foundary sand, concrete and clinker boulders							
End of Trial Pit at 4.50 m	4.50						

Notes

Groundwater encountered at 3.50m (begl)
Sides very unstable in MADE GROUND.
Pit terminated at 4.0m (begl) due to concrete base

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Split Tube Representative

W - Water

PID - PID Reading

Trial Pit ID: TP14A

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Contractor:

Ground Level:

Field Records: NLM0505

Logged: NMcC

Checked: DRS

Scale:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Black ashy sand with very frequent concrete and clinker boulders, metal, whole brick and brick fragments and occasional metal pipe, wood and mesh.							
End of Trial Pit at 2.00 m	2.00						

Notes:
Groundwater encountered at 2.0m (begl).
Sides slightly unstable in excavation.
Pit terminated at 2.0m (begl) due to large obstructions

Sample Type Key:
D - Disturbed Representative
B - Bulk Representative
S - Specific Representative
W - Water
PID - PID Reading

Trial Pit ID: TPE	Client: Ben Bailey Homes Limited	Sheet: Sheet 1 of 1	JPA JOYNES PIKE & ASSOCIATES LTD
Job No: 232095	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	Date: 23/11/2005	www.joynespike.co.uk
Excavation Equipment: 360 degree excavator	Co-ords:	Field Records: DRS05/03	
	Ground Level:	Logged: DRS	Chkd: DRS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Dense black sand with brick and wood. Becoming increasingly dense with depth.							
End of Trial Pit at 2.50 m	2.50						

Notes:
Excavation carried out within the pit.
Groundwater encountered at 1.1m (begl).
Sides remained stable throughout excavation.
Pit terminated at 2.5m (begl) due to concrete base.

Sample Type Key:
D - Disturbed Representative
B - Bulk Representative
S - Small Non Representative
W - Water
PID - PID Reading

Trial Pit ID: TPF

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 23/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Co-ords:

Ground Level:

Field Records: DRS05/03

Logged: DRS

Chkd: MRS

App:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Medium dense dark reddish black brown sand with brick and concrete blocks up to 0.4m in size and occasional sandstone							
End of Trial Pit at 3.80 m	3.80						

Notes:

Excavation carried out within the pit
No groundwater encountered
Sides slightly unstable during excavation
Pit terminated at 3.8m (begl) due to difficult digging

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Spot Non Representative

W - Water

PID - PID Reading

Trial Pit ID: TPG

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 23/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Field Records: DRS05/03

Ground Level:

Logged: DRS

Chkd: DJS

Appd:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND. Medium dense to dense black sand							
End of Trial Pit at 2.00 m	2.00						

Notes:

Excavation carried out within the pit
Groundwater encountered at 0.5m (begl)
Sides remained stable throughout excavation
Pit terminated at 2.0m (begl) due to concrete base.

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Specimen Representative

W - Water

PID - PID Reading

Test
Card
TPH
Job No
232095

Client
Ben Bailey Homes Limited.

Site
Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet
Sheet 1 of 1

Date
23/11/2005

JPA
JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Excavation Equipment
360 degree excavator

Coords

Ground Level

Field Records
DRS05/03

Logged	Chkd	Appd
DRS	DJS	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Loose red brick							
	0.50						
End of Trial Pit at 0.50 m							

Notes
Excavation carried out within the pit.
No groundwater encountered
Sides remained stable during excavation.
Pit terminated at 0.5m (begl) due to concrete base

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Split Non-Representative
W - Water
PID - PID Reading

Trial ID: TPK

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Field Records: DRS05/03

Ground Level:

Logged: DRS

Checked: DCJ

Type:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Brick, wood, metal and plastic with a loose red brown sandy matrix							
	0.90						
End of Trial Pit at 0.90 m							

Remarks:

Excavation carried out within the pit
No groundwater encountered.
Sides remained stable throughout excavation
Pit terminated at 0.90m (begl) due to concrete base.

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Small Non Representative

W - Water

PID - PID Reading

Trial Pit ID: TPL

Job No: 232095

Client: Ben Bailey Homes Limited

Site: Land at Wombwell Foundry, off Rough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 23/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Ground Level:

Field Records: DRS05/03

Logged: DRS

Chkd: DLS

Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Loose to medium dense red and black brick, metal and occasional wood with a slight sand matrix							
	0.60						
End of Trial Pit at 0.60 m							

Notes:

Excavation carried out within the pit.
No groundwater encountered.
Sides remained stable throughout excavation.
Pit terminated at 0.6m (begl) due to concrete base

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Small Non Representative

W - Water

PID - PID Reading

Trial Pit ID	Client	Sheet	JPA
TPM	Ben Bailey Homes Limited.	Sheet 1 of 1	JOYNES PIKE & ASSOCIATES LTD
Job No	Site	Date	www.joynespike.co.uk
232095	Land at Wombwell Foundry, off Hough Lane, Wombwell	23/11/2005	

Excavation Equipment	Co-ords	Field Records	
360 degree excavator		DRS05/03	

Ground Level	Logged	Chkd	Appr.
	DRS	DCS	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Loose red brick with breeze blocks and metal							
End of Trial Pit at 1.80 m	1.80						

Remarks

1. Excavation carried out within the pit.
   Groundwater encountered at 0.1m (begl).
   Sides remained stable throughout excavation
   Pit terminated at 1.8m (begl) due to concrete base.

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Spot Non-Representative

W - Water

PID - PID Reading

Trial Pit ID	Client	Sheet	JPA
TPN	Ben Bailey Homes Limited.	Sheet 1 of 1	JOYNES PIKE & ASSOCIATES LTD
Job No 232095	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	Date 24/11/2005	www.joynespike.co.uk

Excavation Equipment	Coords	Field Records	Logged	Chkd	Appd
360 degree excavator	Ground Level	DRS05/03	DRS	DCS	

Strata Description	Depth (m)	Level (mAD)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Brick and concrete with a medium dense grey sandy matrix.							
	0.40						
MADE GROUND: Soft red, very sandy clay.							
	1.50						
MADE GROUND: Dark grey black shale.							
	2.50						
Dark grey brown CLAY.							
	2.80						
Strong grey MUDSTONE.							
	3.20						
End of Trial Pit at 3.20 m							

Remarks

Excavation carried out within the pit.
Groundwater encountered at 1.5m (begl).
Sides unstable throughout madeground.
Pit terminated at 3.2m (begl) due to solid rock.

Sample Type Key

D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
PID - PID Reading

Trial Pit No: TPJ

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Field Records: NLM10502

Ground Level:

Logged: NMcC

Chkd: DJPS

Appd:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Topsoil with frequent whole bricks and brick fragments, metal and rope.							
	0.30						
Weathered grey brown MUDSTONE excavated as gravel. Gravel is coarse of angular tabular grey mudstone. Becoming coarser with depth							
	3.10						
End of Trial Pit at 3.10 m							

Notes:

No groundwater encountered.
Sides remained stable throughout excavation.
Pit terminated at 3.10m (Legd).

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Spot Non-Representative

W - Water

PID - PID Reading

Trial Pit ID: TPJA

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Sheet: Sheet 1 of 1

Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment: 360 degree excavator

Coords:

Field Records: ULL/0501

Ground Level:

Logged: NMcC

Chkd: D.J.S

App:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND: Very frequent whole brick and brick fragments, wood debris and occasional metal.							
	0.50						
End of Trial Pit at 0.50 m							

Remarks:

. Pit flooded.
Sides remained stable throughout excavation.
. Pit terminated at 0.50m (begl) due to concrete base.

Sample Type Key:

D - Disturbed Representative

B - Bulk Representative

S - Spot Non-Representative

W - Water

PID - PID Reading

Trial Pit ID	Client	Sheet
TPO	Ben Bailey Homes Limited.	Sheet 1 of 1
Job No	Site	Date
232095	Land at Wombwell Foundry, off Hough Lane, Wombwell	24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Excavation Equipment	Co-ords	Field Records		
360 degree excavator		DRS05/03		
	Ground Level	Logged	Chkd	Appd
		DRS	DJS	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
MADE GROUND. Brown black sandy clay.	0.10						
End of Trial Pit at 0.10 m							

Notes:

Excavation carried out within the pit
No groundwater encountered.
Sides remained stable throughout excavation.
Pit terminated at 0.10m (begl) due to concrete base.

Sample Type Key

D - Disturbed Representative

B - Bulk Representative

S - Small Non Representative

W - Water

PID - PID Reading

Trial Pit ID	Client	Sheet	JPA
TPO	Ben Bailey Homes Limited.	Sheet 1 of 1	JOYNES PIKE & ASSOCIATES LTD
Job No: 232095	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	Date: 24/11/2005	www.joynespike.co.uk

Excavation Equipment	Co-ords	Field Records		
		DRS05/03		
	Ground Level	Logged: DRS	Chkd: DRS	Appr: [illegible]

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Test Results	Groundwater Records
End of Trial Pit at 0.10 m							

Remarks

Excavation carried out within the pit
No groundwater encountered.
Sides remained stable throughout excavation.
Pit terminated at 0.10m (begl) due to concrete base.

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non Representative
W - Water
PID - PID Reading

APPENDIX C
Borehole Logs

Borehole ID: BH1A

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Start Date: 24/11/2005

End Date: 24/11/2005

Logging Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Drilling Equipment: SOIL MECH 405 AND COMP

Co-ords:

Ground Level:

Field Records: DRILLERS

Logged: DRILLERS

Chkd: OLS

Appd:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete.	0.10							
Mudstone.								
Sandstone.	4.00							
Dark mudstone.	10.60							
Coal.	12.00							
Sandstone.	13.40							
End of Borehole at 20.00 m	20.00							

Remarks:
Hole terminated at 20.00m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot (Non-Representative)
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet: Sheet 1 of 1

Borehole ID: BH2A

Job No: 232095

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Start Date: 24/11/2005

End Date: 24/11/2005

Logged Date: 24/11/2005

Field Records: DRILLERS

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Drilling Equipment: SOIL MECH 405 AND COMP

Co-ords:

Ground Level:

Logged: DRILLERS

Chkd: DRS

Page: 2.

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND Concrete.	0.20							
Clay.								
Mudstone	1.40							
Dark mudstone.	10.70							
Sandstone.	13.20							
End of Borehole at 14.70 m	14.70							

Notes:
Hole terminated at 14.70m (bgl)

Sample Type Key:
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet:
Sheet 1 of 1

Borehole ID	Client	Start Date	
BH3A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Backfill Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Chiefs	Field Records: DRILLERS	www.joynespike.co.uk
	Ground Level	Logged: DRILLERS	Chkd: DAS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND Concrete	0.10							
Clay								
Mudstone	1.30							
andstone.	4.00							
Dark mudstone.	10.50							
Coal.	12.00							
Sandstone.	13.00							
End of Borehole at 14.00 m	14.00							

Notes
Hole terminated at 14.00m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID: BH4A

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Job No: 232095

Start Date: 24/11/2005

End Date: 24/11/2005

Record Date: 24/11/2005

JPA JOYNES PIKE & ASSOCIATES LTD

www.joynespike.co.uk

Drilling Equipment: SOIL MECH 405 AND COMP

Contractor:

Ground Level:

Field Records: DRILLERS

Logged: DRILLERS

Checked: DJS

Sheet: 1

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND. Concrete.	0.10							
Clay								
ndstone.	4.20							
Dark mudstone.	10.30							
Sandstone.	13.00							
End of Borehole at 14.00 m	14.00							

Notes:
Hole terminated at 14.00m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Split Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Split SPT

Sheet: Sheet 1 of 1

Borehole ID: H5A

JPA JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Client: Ben Bailey Homes Limited.

Site: Land at Wombwell Foundry, off Hough Lane, Wombwell

Job No: 232095

Start Date: 24/11/2005

End Date: 24/11/2005

Logged Date: 24/11/2005

Field Records: DRILLERS

Drilling Equipment: SOIL MECH 405 AND COMP

Coords:

Ground Level:

Logged: DRILLERS

Chkd: DJS

Rev:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Clay.								
Mudstone.	2.00							
Sandstone.	3.50							
Dark mudstone.	10.30							
Mudstone.	12.00							
End of Borehole at 13.60 m	13.50							

Remarks:
Hole terminated at 13.60m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Core SPT
(S) - Spoon SPT

Sheet: Sheet 1 of 1

Borehole ID	Client	Start Date	
3H6A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		End Fill Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Co-ords:	Field Records: DRILLERS	www.joynespike.co.uk
	Ground Level:	Logged: DRILLERS / Chkd: ARS / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Clay								
Sandstone.	2.60							
Dark mudstone.	7.00							
Sandstone.	9.30							
End of Borehole at 14.00 m	14.00							

Remarks:
Hole terminated at 14.00m (bgl)

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet:
Sheet 1 of 1

Borehole ID	Client	Start Date	
H7A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Backfill Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Co-ords	Field Records: DRS05/03	www.joynespike.co.uk
	Ground Level	Logged: DRS	Chkd: DRS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete.	0.10							
MADE GROUND: Dark grey sand with occasional firing.								
Grey brown MUDSTONE.	3.00							
Light grey very hard SILTSTONE.	12.50							
Orange brown SANDSTONE.	15.50							
Strong light grey MUDSTONE	16.50							
End of Borehole at 20.00 m	20.00							

Remarks
Hole terminated at 20.0m (begl)

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID	Client	Start Date	
H8A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Parallel Date: 24/11/2005	www.joynespike.co.uk
Drilling Equipment: SOIL MECH 405 AND COMP	Co-ords:	Field Records: DRS05/03	
	Ground Level:	Logged: DRS	Chkd: [illegible]

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND Brick, wood metal and plastic with a loose red brown sandy matrix	0.90							
MADE GROUND Concrete.								
End of Borehole at 1.20 m	12.00							

Remarks
. Hole terminated at 12.0m (beg)

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID	Client	Start Date	
BH9A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Backfill Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Coords:	Field Records: DRS05/03	www.joynespike.co.uk
	Ground Level:	Logged: DRS	Chkd: CRS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND. Soft drilling.								
MADE GROUND. Concrete.	1.00							
MADE GROUND. No returns.	1.20							
	1.40							
End of Borehole at 1.40 m								

Remarks:
Drilled to determine thickness of concrete.
Hole terminated at 1.4m (begl)

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet:
Sheet 1 of 1

Borehole ID	Client	Start Date	
H10A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Bad Mt Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Coords	Field Records: DRS05/03	www.joynespike.co.uk
	Ground Level	Logged: DRS	Chkd: DRS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete	0.30							
MADE GROUND: Orange sandy clay	2.00							
Black Coal	2.50							
Moderatley strong brown MUDSTONE.	3.00							
End of Borehole at 3.00 m								

Remarks
Drilled to determine thickness of concrete.
Hole terminated at 3.0m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID	Client	Start Date	
H11A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Backfill Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Coords	Field Records: DRS05/03	www.joynespike.co.uk
	Ground Level	Logged: DRS	Chkd: DRS / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND Red brick								
MUDSTONE.	2.50							
End of Borehole at 3.30 m	3.30							

Remarks
Hole terminated at 3.3m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID	Client	Start Date	
TH12A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
Job No: 232095		Backfill Date: 24/11/2005	
Drilling Equipment: SOIL MECH 405 AND COMP	Co-ords:	Field Records: DRS05/03	www.joynespike.co.uk
	Ground Level:	Logged: DRS	Chkd: DRS

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete	0.05							
MADE GROUND: Black dense sand.	1.00							
MADE GROUND: Orange brown clay with poor returns.	2.00							
Black Coal	2.50							
Moderatley strong grey brown MUDSTONE.	3.00							
End of Borehole at 3.30 m								

Remarks
Hole terminated at 3.0m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID
TH13A

Job No
232095

Client
Ben Bailey Homes Limited.

Site
Land at Wombwell Foundry, off Hough Lane, Wombwell

Start Date
24/11/2005

End Date
24/11/2005

Logged Date
24/11/2005

Field Records
DRS05/03

JPA JOYNES PIKE & ASSOCIATES LTD
www.joynespike.co.uk

Drilling Equipment
SOIL MECH 405 AND COMP

Co-ords

Ground Level

Logged
DRS

Chkd
DRS

Type

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete	0.30							
MADE GROUND: Black dense sand	0.50							
MADE GROUND: Orange brown clay with poor returns.	2.00							
Black Coal	2.30							
Moderately strong grey brown MUDSTONE	3.00							
End of Borehole at 3.00 m								

Remarks
1. Hole terminated at 3.0m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Core SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID
TH14A

Job No
232095

Client
Ben Bailey Homes Limited.

Site
Land at Wombwell Foundry, off Hough Lane, Wombwell

Start Date
24/11/2005

End Date
24/11/2005

Logging Date
24/11/2005

Field Records
DRS05/03

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www.joynespike.co.uk

Drilling Equipment
SOIL MECH 405 AND COMP

Co-ords

Ground Level

Logged
DRS

Chkd
CW2S

Page
1

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Black ashy sand with very frequent concrete and clinker boulders, metal, whole brick and brick fragments and occasional metal pipe, wood and mesh.								
MADE GROUND: Concrete.	2.00							
MADE GROUND: No returns	2.30							
End of Borehole at 5.50 m	5.50							

Remarks
Hole terminated at 5.5m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

Borehole ID	Client	Date	
..115A	Ben Bailey Homes Limited.	24/11/2005	JPA JOYNES PIKE & ASSOCIATES LTD
	Site: Land at Wombwell Foundry, off Hough Lane, Wombwell	End Date: 24/11/2005	
No: 232095		Backfill Date: 24/11/2005	
Drilling Equipment: OIL MECH 405 AND COMP	Coords:	Field Records: DRS05/03	www.joynespike.co.uk
	Ground Level:	Logged: DRS	Chkd: D.L.I.

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND. Black ashy sand with very frequent concrete and clinker boulders, metal, whole brick and brick fragments and occasional metal pipe, wood and mesh								
..DE GROUND. Very hard concrete	4.00							
MADE GROUND. No returns.	4.30							
End of Borehole at 4.40 m	4.40							

Remarks:
Hole terminated at 4.4m (begl).

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample
(C) - Cone SPT
(S) - Spoon SPT

Sheet
Sheet 1 of 1

APPENDIX D
JPA Contamination Assessment Criteria

Methodology for the Screening of Soils in Terms of the Risk to Human Health (Including the JPA Methodology for Calculating Tier 1 Screening Values)

The legislative framework for the regulation of contaminated land is contained in Part IIA of the Environmental Protection Act 1990, which was implemented in the Contaminated Land (England) Regulations 2000. This legislation allows for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment. The basis of the UK contaminated land policy is the 'Suitable for Use' approach, which states that land should be suitable for its current use and made suitable for any new use as official permission (through the planning process) is given for that use.

Under Part IIA of the Environmental Protection Act 1990, contaminated land is defined as land where significant harm is being caused or there is a significant possibility of such harm being caused or where pollution of controlled waters is being, or is likely to be caused. For significant harm to occur, a pollutant linkage must exist i.e. there must be a contamination source, a relevant receptor and a plausible migration pathway by which the contaminant can cause significant harm to the receptor.

As part of the regulatory framework discussed above, the UK Government published; on 14th March 2002, the Contaminated Land Exposure Assessment model (CLEA). This presents Soil Guideline Values, which are "generic" values for assessing the risks to human health from chronic exposure to contaminated soils. The Soil Guideline Values represent 'intervention values' above which the levels of soil contamination may represent an unacceptable risk to the health of site-users such that further investigation and/or remediation is required. The Soil Guideline Values are not intended to represent binding standards or statutory objectives.

The Soil Guideline Values have been derived bearing in mind particular proposed land uses. Currently, three types of 'standard' land use have been considered, namely residential allotments; and commercial / industrial. For each standard land use there are a number of different exposure routes which may or may not be active depending on the site-specific scenario. The Soil Guideline Values generally utilised in this report (unless otherwise specifically stated) represent worst case exposure scenarios with all exposure routes active for residential with plant uptake.

Currently, Soil Guideline Values have only been prepared for arsenic, cadmium, chromium, inorganic mercury, nickel, selenium, lead, toluene and ethylbenzene. The Soil Guideline Values have replaced the trigger concentrations formerly prescribed by ICRCL document 59/83, which has been withdrawn. In the absence of existing United Kingdom guidelines for certain contaminants (i.e. where UK Soil Guideline Values have not been published), Joynes Pike & Associates have calculated of Tier 1 screening values for various contaminants, currently utilising version 5 dated September 2005.

The methodology employed to calculate these values is as follows:

Where available, United Kingdom based toxicological data, presented in the appropriate Environment Agency CLR TOX series of reports has been used. When new TOX reports are issued, the Tier 1 values are updated accordingly.

However, where a TOX report is not available, reference has again been made to the Risk Assessment Information System (RAIS) database (http://rais.ornl.gov) for

toxicological information, with the exception of banded TPH where reference is made to the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) documents, which contain both toxicological information and physio-chemical properties. These documents are utilised for "threshold" (i.e. non-carcinogenic) contaminants only, with the toxicological data adjusted for average UK bodyweight (70kg). This exercise generates a Tolerable Daily Intake (TDI).

It is noted that the Environment Agency publication P5-080/TR3 (The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils), identifies three carbon bands at the "heavy" end of the spectrum, which would be characterised by immobile highly unreactive compounds. However, since no toxicological data exists currently for these additional bands, Joynes Pike & Associates have continued to utilise the data contained within the TPHCWG publications until such time that new data is released.

To model the Tier 1 values, JPA have used a variety of appropriate software models including SNIFFER, CLEA 2002 and RISC 4.0. The CLEA 2002 software has been utilised to model benzo (a) pyrene since this is an original contaminant within the model and is also noted to be a non volatile compound. The SNIFFER model (LOM01) has been used for non-organic contaminants, whilst the RISC 4.0 model has been utilised for the remaining organic contaminants. RISC 4.0 uses the Johnson & Ettinger model with respect to the volatilisation of compounds from soil.

The default parameters are accepted when running the model at a Tier 1 level to give the most conservative model except that the SOM is calculated with a range from adjusted to 1.0% to 5% (to be inline with the SOM values utilised in the recently published Toluene SGV report).

APPENDIX E
BGS Radon Report

Report prepared for:

Jeremy Powell
Joynes Pike & Associates
1-2 AireHouse
Richmond Business Park
Sidings Court
Doncaster
DN4 5 NL

Radon Protective Measures Site Report – Standard

Advisory report on the requirement for radon protective measures in new dwellings and extensions including a BR211 (1999) Stage 2 Geological Assessment

JPA - Doncaster
Project Number: 232095
Review: MTM Yorke
17 JAN 2006
JSP
BMB
File:

Client's Reference:

232095

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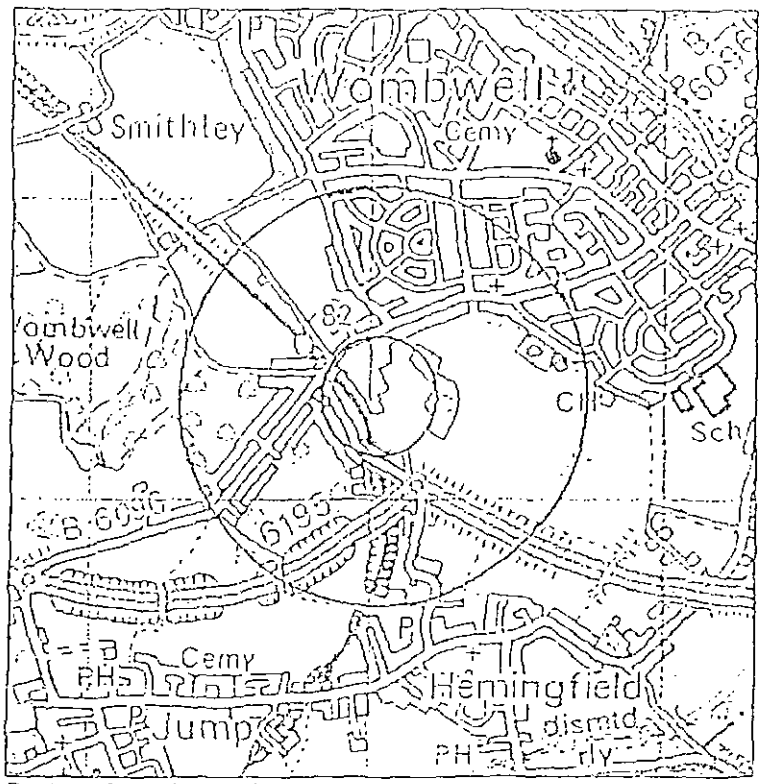
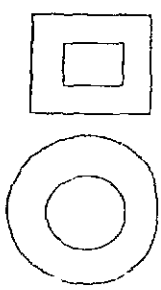
Section 1: Location and extent of report area

Area centred at: 439032,402342
Radius of site area: 200 metres



Scale: 1:25000 (1cm = 250m)

KEY:



INNER RECTANGLE or CIRCLE defines site area (details provided by client).

OUTER LINE shows extent of TOTAL SEARCH AREA comprising the site area and automatically generated buffer zone. The requirement for radon protective measures indicated in Section 2 is based on a geological assessment of the Total Search Area.

Please see Section 4 for details of how the search is carried out

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Section 2: Requirement for radon protective measures

The determination below follows the two stages described in *BR211 Radon: Guidance on protective measures for new dwellings (1999 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Stage 1

Stage 1 (Annex A) of the BR211 (1999) procedure indicates that the minimum level of protection for the report area is NO radon protective measures.

Stage 2

The Stage 2 geological assessment carried out for this report indicates BASIC radon protective measures are required for the report area. This assessment was derived automatically from the BGS Radon Protective Measures GIS (RPM-GIS) from 1:250,000 scale digital data. Results of the geological search are described in Section 3, and more detail on the assessment procedure is outlined in Section 4.

Result

The BR211 (1999) two-stage procedure indicates that BASIC protective measures are required for the site. This is the higher of the two levels of protection indicated by Stage1 and Stage 2.

The BGS is not able to provide advice on the technical specifications of 'basic' and 'full' radon protective measures. This information is detailed in BRE Report BR211 :Radon: Protective measures for new dwellings which may be purchased from brebookshop.com. BR211 offers guidance on the technical solutions that are required to satisfy Building Regulations requirements. Summary guidance is available on the web at: http://www.bre.co.uk/radon/project.html.

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Contact 020 7944 5745 or Email: partscdgh.br@odpm.gsi.gov.uk for advice on the interpretation of guidance contained in BRE Report BR211.

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NATURAL ENVIRONMENT RESEARCH COUNCIL

Section 3: Geological units within the search area

Below is a listing, if available, of the possible combinations of Bedrock (Solid) Geology units and overlying Superficial (Drift) Geology units within the total search area derived automatically by the RPM-GIS.

These have been derived (as indicated) from searches of either:

a) Combined 1:250,000 Bedrock (Solid) and 1:625,000 Superficial (Drift) geology maps

b) 1:50,000 Bedrock (Solid), Superficial (Drift) and Artificial geology maps

1:250,000 data

1. MIDDLE COAL MEASURES (FORMATION)(SANDSTONE 3D00); No drift
2. MIDDLE COAL MEASURES (FORMATION)(ARGILLACEOUS ROCKS, UNDIFFERENTIATED); No drift

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Section 4: Determining the level of radon protection.

BR 211 (1999) sets out a two-stage procedure to help determine the level of radon protection required in new dwellings and extensions.

In Stage 1 of the procedure, the 5 km grid square radon potential maps (Annex A, BR211,1999) produced by the National Radiological Protection Board (NRPB) are used to make the primary determination of the level of radon protection needed. The NRPB maps are based on the average estimated proportion of homes exceeding the radon Action Level for each 5 km square of the Ordnance Survey National Grid.

In Stage 2, a second series of maps produced by the BGS (Annex B, BR211,1999) is used to decide whether it is necessary to consider upgrading the requirement for protection indicated by Stage 1. This procedure has the objective of avoiding cases of underprotection that might occur had the guidance depended solely on the average radon level in the 5 km grid square indicated by the NRPB maps. The BGS maps in Annex B (BR211, 1999) show those 5 km grid squares that are underlain, completely or in part, by geological units that require either basic or full protection to be installed in new dwellings.

A geological assessment may need to be carried out where the site falls within a shaded grid square on the BGS map in Annex B of BR211 (1999). The geological assessment checks whether a site is on or close to a geological unit which potentially exceeds the action levels for either basic or full radon protection. Consideration must be given to installing basic or full radon protection if the geological assessment shows that this is indicated. If a site falls within one of the shaded squares, it does not necessarily mean that it must have radon protection. This is because some of the grid squares contain bed rocks and unconsolidated (drift) deposits with lower radon potential than the maximum levels shown on the 5 km grid maps in Annex B (BR211, 1999).

In many cases the geological radon potential varies considerably within a grid square. In other cases, only a very small area (sometimes only a few hundred square metres) with a radon potential exceeding the thresholds for basic or full protection occurs within the shaded grid square. The level of protection that might be required is thus site specific, and can be determined by reference to the relevant radon potential map in BR211 (1999) followed by a geological assessment of the site.
(Please note, the NRPB is now the Radiation Protection Division of the Health Protection Agency)

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The geological assessment in this report is produced by the BGS Radon Protective Measures Geographical Information System (RPM GIS), which has been developed to provide Stage 2 Geological Assessments (RPM Site Reports). The assessment is derived from a geologically based interpretation of radon measurements in dwellings which were provided to the BGS by the NRPB without prejudicing confidentiality undertakings to householders and the Department of the Environment, Food and Rural Affairs (DEFRA). The reliability of a geological radon potential assessment is approximately proportional to the number of radon measurements available and the scale of the geological maps.

The RPM GIS currently comprises 1:250,000 scale data with more detailed information for twenty 1:50,000 scale geological map sheets covering the most radon-prone parts of Derbyshire, Northamptonshire, Nottinghamshire, Leicestershire, Lincolnshire, Oxfordshire, Shropshire, Somerset and Yorkshire. The RPM-GIS is being upgraded to 1:50,000 scale as new digital maps become available through the BGS DiGMapGB programme.

The search area (circle or rectangle) for a site is increased by a buffer zone of 50 m in areas with 1:50,000 scale data and 500m in areas with 1:250,000 scale data. This is to allow for potential inaccuracies in the position of the geological boundaries. In many cases a number of combinations of bed rock and drift with differing geological radon potentials will occur within the total search area. Following the precautionary principle, the requirement for protective measures is derived from the highest geological radon potential encountered within the total search area.

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Section 5: Follow-up Detailed Radon Protective Measures site report

For most parts of the UK, a higher resolution assessment of radon protective measures requirements can also be provided by BGS. This will comprise:

i. Assessment by a qualified geologist of the relevant 10,000, 1:10,560 or 1:50,000 scale geological map(s) covering the total search area from BGS archives.
ii. Identification of the level of radon protective measures indicated for all geological units encountered within the site and the immediately surrounding area.

The basic charge for a Detailed Radon Protective Measures Report is £210 (incl. VAT & Delivery). Reports for very large or geologically complex sites may, however, have to be supplemented with additional charge – in such cases, enquiry staff will confirm the charge with the client before proceeding.

The Radon follow-up reports can be ordered from:-
Geological Enquiries, British Geological Survey, Keyworth, Nottingham NG12 5GG; Tel: 0115-936-3192; Fax: 0115-936-3192; e-mail: gechelp@bgs.ac.uk. An on-line ordering facility is available on the BGS Website: www.bgs.ac.uk/geoindex.

Section 6: What is radon ?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters poorly ventilated enclosed spaces such as some basements, buildings, caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level exceeds the Action Level, measures should be taken to reduce the concentration.

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Section 7: Radon in workplaces

The Ionising Radiation Regulations, 1999, require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): Radon in the workplace.

BRE publications may be obtained from The BRE Bookshop, I H S Technical Indexes Ltd., Willoughby Road, Bracknell, Berkshire RG12 8DW. Tel: 01344 404407, Fax: 01344 714440, website: www.brebookshop.com

Section 8: Radon in existing dwellings

Useful information is given in the following free publications which can be obtained by writing to: Radon Studies, Radiation Protection Division, Health Protection Agency, Chilton, Didcot, Oxfordshire OX11 0RQ

Radon - A Householder's Guide
Radon - You Can Test for it
Radon - A Guide for Homebuyers and Sellers
Radon - A Guide to Reducing Levels in Your Home
Information in the booklets is also available on the DEFRA website at:
http://www.defra.gov.uk/environment/radioactivity/radon/index.htm

Householders are recommended to follow advice in Radon - a householder's guide. The guide outlines simple solutions for dealing with the radon problem depending on whether or not the home has been tested for radon. In radon affected homes, the problem of radon can usually be tackled with simple, effective and relatively inexpensive measures. These measures are comparable in cost to work such as damp-proofing and timber treatment. You can get practical advice about construction work to reduce radon levels from the Building Control Officer at your local council.

Advice about radon, its health risks and details of how to order the radon test may be obtained from the Radon Freephone on 0800 614529 or Tel: 01235 822622, website: www.hpa.org.uk or by writing to Radon Studies at the Health Protection Agency, address above.

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Section 9: Terms & Conditions

General

This report is supplied in accordance with the GeoReports Terms & Conditions available on the BGS website at www.bgs.ac.uk/georeports and also available from the BGS Central Enquiries Desk at the below address.

Important notes about this report

- The data, information and related records supplied in this report by BGS can only be indicative and should not be taken as a substitute for specialist interpretations, professional advice and/or detailed site investigations. You must seek professional advice before making technical interpretations on the basis of the materials provided.
- Geological observations and interpretations are made according to the prevailing understanding of the subject at the time. The quality of such observations and interpretations may be affected by the availability of new data, by subsequent advances in knowledge, improved methods of interpretation, and better access to sampling locations.
- Raw data may have been transcribed from analogue to digital format, or may have been acquired by means of automated measuring techniques. Although such processes are subjected to quality control to ensure reliability where possible, some raw data may have been processed without human intervention and may in consequence contain undetected errors.
- Detail, which is clearly defined and accurately depicted on large-scale maps, may be lost when small-scale maps are derived from them.
- Although samples and records are maintained with all reasonable care, there may be some deterioration in the long term.
- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
- Data may be compiled from the disparate sources of information at BGS's disposal, including material created for BGS by third parties, and may not originally have been subject to any verification or other quality control process.
- Data, information and related records, which have been donated to BGS, have been produced for a specific purpose, and that may affect the type and completeness of the data recorded and any interpretation. The nature and purpose of data collection, and the age of the resultant material may render it unsuitable for certain applications/uses. You must verify the suitability of the material for your intended usage.
- If a report or other output is produced for you on the basis of data you have provided to BGS, or your own data input into a BGS system, please do not rely on it as a source of information about other areas or geological features, as the report may omit important details.
- The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.

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Report issued by: BGS Enquiries Service

For further information, please contact:

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Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Tel: 0115 936 3143
Fax: 0115 936 3276
Email: enquiries@bgs.ac.uk

APPENDIX C
NHBC Conditions

55847882

NHBC Services
NHBC House, Davy Avenue, Knowlhill, Milton Keynes, Bucks MK5 8FP
Tel: 0870 241 4302 Fax: 0870 241 4759 www.nhbcbuilder.co.uk

Ben Bailey Homes Ltd
Elizabeth House
Cliff Street
Mexborough
South Yorkshire, S64 9HQ

OG Ref: ENGPROJ/121299
Your Ref:
Date: 9th March 2006

JPA - Domestic
Project Number: 232095
Review: MTM AHM
20 MAR 2006
DRS MM
JRF
File: MTM

Dear Sirs

Site address: Wombwell Foundry Hough Lane Wombwell S73 0
Site ref. no:
Builder : Ben Bailey Homes Ltd

Thank you for the following information received in relation to your application for Buildmark Warranty on this project:

- Joynes Pike Associates letter dated 15 February 2006
- site investigation report

NHBC Engineering have assessed these documents against the requirements of our Standards and the additional information shown in the table below will be required to enable us to complete our appraisal of the site.

In view of the above, we confirm that conditions have been applied to the project and those identified as **RED will prevent NHBC from finalling properties** thereby delaying the availability of mortgage funds in accordance with the Council of Mortgage Lenders (CML) rules. NHBC Engineering have set the conditions listed in the table below which identify the outstanding information required in relation to land quality (contamination) and/or warranty (foundation/structural) issues related to the site.

Please note that where NHBC is aware of contamination issues on site, a copy of the planning conditions and your correspondence with the local Environmental Health Officer and/or Environment Agency detailing your proposals to manage contamination will be required. You will be aware that Approved Document C requires the discovery of possible contamination to be reported to the local Environmental Health Officer.

We would be grateful for your continued assistance in ensuring that all requested information is sent in good time and **before construction** to allow sufficient time for the necessary assessment and clearance of conditions that would prevent the finalling of properties and issue of the Buildmark Warranty cover note.

Copy to
Tim Major (JPA)
16/3/06

NHBC Services Limited Registered No. 3067703. Registered office: Buildmark House, Chiltern Avenue, Amersham, Bucks HP6 5AP.
INVESTOR IN PEOPLE

To help us to keep our response times to a minimum please quote our Engineering Project reference ENGPROJ/121299 in all correspondence to enable faster processing of your submissions.

We look forward to receiving your prompt response.

Yours faithfully

pp Pam Pooley

D Travis
Senior Engineer

Direct line number: 01756 795819
Fax number: 0870 241 3889

Copies to: -B Moffatt -Building Inspector

NHBC Engineering
SCHEDULE OF OUTSTANDING CONDITIONS

Issue Date: 9th March 2006

Site address: Wombwell Foundry Hough Lane Wombwell S73 0
Site ref. no:
Builder : Ben Bailey Homes Ltd

The current conditions applied to this project by NHBC Engineering, which will prevent NHBC from finalling properties, are as follows:

Sequence No.	Condition	Red Condition Y/N	Plot Numbers
Engineering Warranty Conditions (Foundation/Structural Issues)			
1	Tree Survey drawing required, including off site trees within influencing distance of foundations.	Y	All
2	Substructure drawings and details required.	Y	All
4	Supplementary gas test results and Gas Risk Assessment report required	Y	All
5	Gas protection strategy and details required.	Y	All
6	Radon: Substructure proposals required.	Y	All
7	Foundation Depths required.	Y	All
Land Quality Conditions (Contamination)			
1	Copy of Planning Conditions required.	Y	All
2	Supplementary contamination testing required for PCB's when electricity sub station is decommissioned	Y	All
3	Remediation Report/Strategy including Verification Plan (Validation Plan) required in accordance with NHBC Standards Chapter 4.1	Y	All
4	Validation of capping layer required in accordance with NHBC Standards Chapter 4.1	Y	All
5	Chemical Analysis/Test results and/or Supplier Certification for the imported topsoil is required to confirm the soil is uncontaminated and/or suitable for its intended location on the site.	Y	All
6	Supplementary contamination testing required for hydrocarbon contamination upon removal of oil interceptor	Y	All