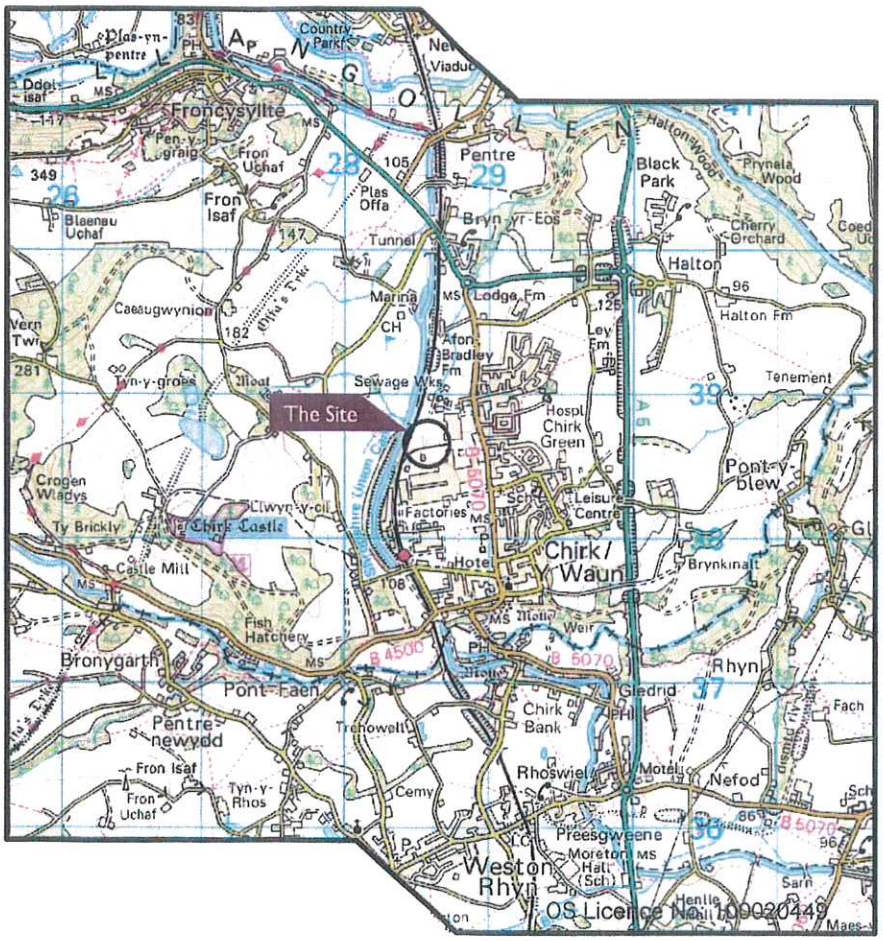
geotechnics

Ground Investigation Interpretive Report
for
PROPOSED LOG YARD IMPROVEMENTS, KRONOSPAN, CHIRK
for
Kronospan Limited



Engineer:
Tier Consult Limited

Project No: PN071425
March 2007

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Interpretive Report

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1.0 INTRODUCTION

A geotechnical and geo-environmental investigation was undertaken by Geotechnics Limited at the site of proposed log yard improvements at the Kronospan factory in Chirk. The investigation was carried out to the instructions of Tier Consult Limited on behalf of the Client, Kronospan. This report describes the work undertaken and presents the data obtained together with an evaluation of their significance in relation to the proposed development.

2.0 OBJECT AND SCOPE OF THE INVESTIGATION

The object of the investigation was to obtain information on ground and groundwater conditions relating to the design of the proposed works within the limitations posed by borehole numbers, locations, depths, methods adopted and the scope of approved in situ and laboratory testing. A geotechnical and geo-environmental interpretation and evaluation of the data obtained was also commissioned.

3.0 PRESENTATION

A description of the site and a summary of the procedures followed during the investigation process are presented in Sections 4 to 6. The factual data so obtained are presented in Appendices 2 to 7 of this report.

A formal desk study to seek information which may already exist about the site, its history, geology and ground conditions was not commissioned. However, reference was made to Geological Survey maps held within the Geotechnics Limited library. The findings are discussed in Section 7.

An interpretation of the data obtained is presented in Section 8 and an evaluation of its significance in relation to proposals available at the time of preparation of this report in Section 9.

Attention is drawn to the General Notes and Investigation Procedures presented in Appendix 8 to aid an understanding of the procedures followed and the context in which the report should be read.

4.0 THE SITE

4.1 Location

The site is located approximately 800 metres north of Chirk Railway Station. The approximate Ordnance Survey National Grid Reference for the site is SJ 286 387 and an extract from the relevant 1:50,000 Scale O.S. Map is included as Appendix 1.

4.2 Description

The site lies within the existing factory premises of Kronospan to the west of the B5070 in Chirk. The works were undertaken within the existing log yard.

The log yard is roughly square and covers an area of approximately 27,000m^2. The log yard is currently occupied by a large number of logs, heaps of wood chippings and large machinery, both stationary and mobile. The site is situated in the northern part of the factory complex. The surface of the northern half of the site comprises muddy fill with large amounts of surface water. The surface of the southern half of the site comprises concrete. The site surface is relatively level.

The western boundary is formed by the Chester to Shrewsbury railway line. The northern boundary is formed by a sewage treatment works and the eastern boundary by the B5070 and residential properties. The southern boundary of the site comprises factory buildings, offices and car park of the Kronospan complex.

5.0 PROCEDURE

5.1 General

The procedures followed in this site investigation are based on *BS 5930 (1999) - Code of Practice for Site Investigations.*

The approximate positions of the investigation points are shown on the Exploratory Hole Location Plan in Appendix 6.

The depths quoted on the Borehole Records are in metres below ground level.

5.2 Boreholes

Five (5 No.), initially 250mm diameter boreholes then subsequently 150mm diameter boreholes designated BH1 to BH5 were sunk by Cable Percussion Tool techniques to a depth of 15.00m below ground level. Difficulties progressing BH4 through compacted cobble fill from ground level resulted in the installation of a 3m length of 300mm plastic casing following excavation by a JCB 3CX mechanical excavator. Due to the nature of the materials encountered, earlier proposals to carry out a series of Window Sample Boreholes were abandoned.

The Borehole positions were selected by the Client. The work was carried out during the period between 29th January and 6th February 2007.

Representative disturbed and undisturbed (U100) samples of the soils encountered were obtained at regular intervals and Standard Penetration Tests (SPTs) undertaken in appropriate deposits, in order to allow inspection and obtain a measure of the engineering properties of the proved strata.

On encountering groundwater, boring operations were suspended for at least 20 minutes in order to record any rise in water level. Full details of groundwater observations during site work are included on the Borehole Records.

Long-term monitoring was made possible by the installation of gas monitoring standpipes as follows:-

BH1	Filter zone from 0.50 – 3.50m
BH2	Filtrer zone from 1.00 – 5.00m
BH3	Filter zone from 1.00 – 5.00m
BH4	Filter zone from 1.00 – 3.50m
BH5	Filter zone from 0.50 – 5.00m

Full details of the monitoring of the installations are included in Appendix 3.

6.0 LABORATORY TESTING

6.1 Geotechnical

The laboratory testing was scheduled by Geotechnics in order to relate to the proposed development. The tests, where appropriate, conform *to BS 1377 - Methods of Test for Soils for Civil Engineering Purposes (1990)* and were carried out in Geotechnics Limited's UKAS accredited Laboratory (Testing No. 1365). Any descriptions, opinions and interpretations are outside the scope of UKAS accreditation.

The tests undertaken can be summarised as follows:-

BS 1377 (1990) Test No.		**Test Description**
Part 2		
3.0	21 No.	Moisture Content Determination
4.0 & 5.0	14 No.	Liquid and Plastic Limit Determination
9.2 & 9.3	3 No.	Mechanical Analysis - Sieving
9.4	3 No.	Mechanical Analysis - Sedimentation
Part 3		
5.3	5 No.	Sulphate Analysis - Soluble Extract
9.0	5 No.	pH Determination
Part 4		
7.0	7 No.	California Bearing Ratio (CBR) Measurement re-compacted
Part 5		
3	2 No.	One-Dimensional Consolidation Test
Part 7		
9	16 No.	Shear Strength Measurement - 100mm diameter (Single Stage) Quick Undrained Triaxial Compression Test

The results of these tests are presented in Appendix 4.

6.2 Chemical/Contamination

Selected samples of soil were tested in external laboratories for a number of determinands in order to check on any potential site contamination. The determinands were selected by Geotechnics Limited. The following were analysed:-

Soil Screening Suite

Arsenic
Cadmium
Chromium
Mercury
Nickel
Selenium
Lead
Sulphate (water soluble)
pH

Organic Screening Suite

PAH 16
EPH
GRO
BTEX
MTBE
Phenol

Tests were also carried out on selected near surface samples for the Waste Acceptance Criteria (WAC) suite in order to classify these materials for possible off-site disposal.

The results of the chemical analyses are included in Appendix 5.

7.0 DESK STUDY

A formal desk study to seek information which may already exist about the site, its history, geology and ground conditions was not commissioned. However, reference was made to Geological Survey maps held within the Geotechnics Limited library. For this particular site, it has been possible to utilise the following:-

- Geological Survey Map of Wrexham (Sheet 121 – Solid and Drift Edition) at a scale of 1:50,000

The map indicates that the site lies in an area where superficial drift deposits of Glacial Till and Glacial Sand and Gravel are expected to be present. The solid strata are shown to comprise the Bettisfield Formation of the Westphalian Coal Measures. Abandoned mine shafts are indicated approximately 1km to the south-east and 1.5km to the north-east of the site.

8.0 INTERPRETATION

8.1 Ground Conditions Proved

The boreholes encountered the following major soil types:

- Made Ground
- Sand
- Clay/Silt

8.1.1 Made Ground

Made Ground was encountered below the surface at each of the borehole locations, the depth to the base of the Made Ground varying between 0.70m and 4.90m below ground level. The Made Ground typically comprised gravelly sand/sandy gravel or sandy gravelly clay with some ash, brick, concrete, timber, glass, pottery and slate.

8.1.2 Sand

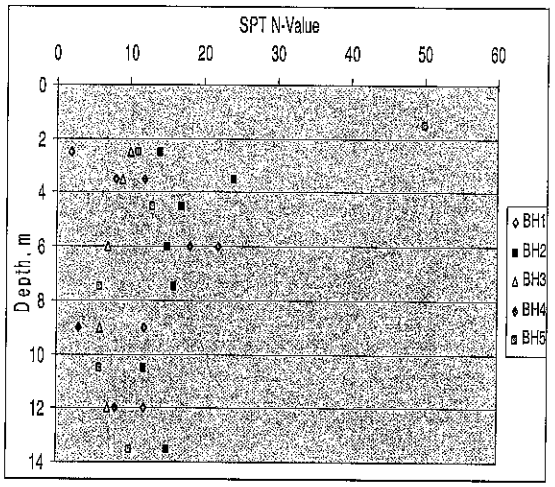
Brown/grey sand was encountered immediately below the Made Ground in Boreholes BH2 and BH5. This sand had varying gravel contents and was also either silty or clayey. The depth to the base of this sand stratum was 6.70m and 4.70m in BH2 and BH5, respectively. The sand stratum was absent in the remaining boreholes.

8.1.3 Clay/Silt

Below the sand stratum where present, and below the Made Ground in Boreholes BH1, BH3 and BH4, the boreholes encountered grey locally mottled brown clay and silt. This clay and silt was generally slightly sandy and typically firm but locally either stiff/very stiff or soft.

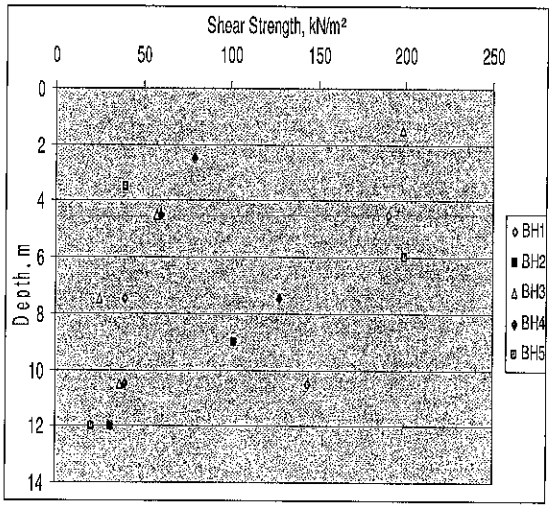
8.2 Soil Parameters

The plot below shows the variation in SPT N-value with depth for the five boreholes.



Above a depth of approximately 5.00m it is clear that there are wide variations in strength/relative density with SPT N-values ranging from only 2 to more than 50. This shows the variable nature of the Made Ground and inconsistency of the underlying sand where present. Below a depth of 5.00m, the SPT tests are generally within the clay/silt stratum. The SPT N-values here range from 3 to 22 with a mean typically around N = 10. The mean value is indicative of firm materials with the lowest and highest values typically indicating soft and stiff materials, respectively.

The plot below shows the variation in shear strength (from triaxial compression tests) against depth for samples from the boreholes. The plot shows a wide range in strengths from soft to very stiff. However, the mean value again appears to lie within the firm range.



Based on the results of visual inspection, in situ testing and laboratory testing, the following soil parameters are recommended for foundation design purposes:

Made Ground: Very variable and locally very low strength/relative density, probably high compressibility.

Sand: Inconsistent, medium dense relative density, low compressibility.

Clay/Silt: Generally firm but strength locally varying from soft to very stiff, low compressibility (mv = 0.07 m^2/MN to 0.09m^2/MN for 100 - 200kN/m^2 pressure range).

8.3 Groundwater

Groundwater was generally struck in the boreholes at depths of between 3.30m and 4.50m. Borehole BH1 also struck a low volume entry at a depth of 1.20m. Borehole BH5 appeared to remain dry.

Subsequent monitoring of groundwater levels in the pipes installed in the boreholes has shown standing water levels to vary between depths of 1.90m and 3.50m below ground level.

9.0 EVALUATION

9.1 Proposals

Proposals for the site are understood to include the construction of a reinforced concrete slab to the surface of the existing log yard. It is understood that the proposed finished slab level will be close to the existing site level in order to minimise the quantity of materials to be taken off site.

The log yard slab will be required to support the weight of stored materials as well as the weight of the log lifting machines. It is understood that the total weight of the log lifting machine is 52 Tonnes (unladen) and has a 13.5 Tonne lifting capacity. The wheel base is understood to be 5.20m.

It is understood that whilst settlements of the slab are required to be kept to a minimum, a zero-settlement super-flat performance slab is not required.

9.2 Slab Design

It is understood that the existing log yard has been in use for a number of years and the underlying Made Ground and natural soils will therefore have been subjected to loading from both stockpiled materials and traffic movements. As a result, the Made Ground although shown to be variable could support a reinforced concrete slab construction following heavy proof rolling of the formation surface. However, some non-quantifiable settlement (both total and differential) may occur due to variations in the materials present. All construction joints should therefore be dowelled to prevent steps forming between individual slab panels. Laboratory tests for California Bearing Ratio (CBR) on near surface samples from the site have shown the CBR value to vary between 0.47% and 67%. With such variations in CBR value it is recommended that without recourse to much more extensive testing, a conservative approach should be taken in designing the slab and sub-base construction. It is therefore recommended that the design CBR value is limited to a maximum of 0.5%. As a result, consideration may need to be given to the incorporation of a reinforcing geo-grid below and/or within the slab sub-base construction.

If the risk of some non-quantifiable settlements cannot be accepted then consideration needs to be given to alternative solutions. With the depths of Made Ground present, removal and replacement is not considered practical. Improvement of the Made Ground and underlying natural soils could be achieved by controlled surcharging but this can take months or even years to achieve the desired effect and requires very careful monitoring to determine when the required effect has been achieved.

An alternative though probably more costly solution would be to improve the load bearing and settlement characteristics of the Made Ground and immediately underlying natural drift using the 'vibro' ground improvement process. Should such techniques be considered financially viable, it is recommended that the specialist contractors are made aware of the potential for buried obstructions/compact layers and asked for assurances that their individual techniques can cater for such things. The specialist contractors should also be asked to provide adequate settlement performance guarantees for the finished slab.

9.3 Concrete

Laboratory testing has shown the characteristic water soluble sulphate concentration to lie within Design Sulphate Class DS-1 of BRE Special Digest 1 'Concrete in Aggressive Ground' (2005). The characteristic pH value is 6.47, the site is considered 'brownfield' and groundwater is considered to be mobile. The soils are not expected to be pyritic and the ACEC Class for the site is therefore AC-2z. It is recommended that all concrete used on this site meets the requirements of the above classification.

9.4 Excavatability

The soils encountered on this site would be considered 'easy digging' for normal backhoe excavation plant. However, local zones of compact materials may be encountered as may subsurface obstructions within the Made Ground and these may require the use of hydraulic breakers to assist in their removal.

For shallow unsupported excavations (less than 1.20m) it is anticipated that the excavation sides will remain relatively stable in the short term although some local spalling may occur. Where such excavations are to remain open for long periods and for deeper excavations it is recommended that the sides are supported using close boarding or trench sheets with appropriately spaced walings and props. Alternatively, where space permits, the sides should be trimmed to a batter no steeper than 1 (vertical) to 3 (horizontal).

Significant groundwater inflows into excavations of less than, say, 2.00m depth are not expected. In any deeper excavations, groundwater inflows should be anticipated and appropriate allowance made for dealing with these. It is anticipated that for the majority of such inflows, simple filtered sump pumping would be appropriate. However, where sand is present it may be necessary to use more specialist techniques such as well-pointing.

9.5 Contamination

9.5.1 Screening Suites

Selected samples from the boreholes were submitted to a specialist chemical testing laboratory for the screening suite analyses described in Section 6.2 above. The results have been compared with the CLEA Soil Guideline Values (SGVs) where these are available. Where no SGVs are available the results have been compared with the Generic

Assessment Criteria (GAC) values published by the Chartered Institute of Environmental Health (CIEH) or with Geotechnics own in-house screening values determined using CLEA UK.

SGVs are currently only available for the following contaminants:

Arsenic
Cadmium
Chromium
Mercury
Nickel
Selenium
Lead
Toluene
Ethylbenzene
Phenol

Using the CLEA methodology a Mean Value Test is used to determine the 95% confidence upper bound value of the measured concentrations and this is compared to the relevant SGV for the proposed end use. It is considered that the SGVs for commercial/industrial end use are appropriate for the proposed development. The 95% confidence upper bound values and relevant SGVs are tabulated below:

Determinand	95% confidence upper bound mg/kg	SGV mg/kg for commercial and industrial end use
Arsenic	13	500
Cadmium	29	1,400
Chromium	868	5,000
Mercury	<0.6	480
Nickel	24	5,000
Selenium	<3	8,000
Lead	76 *	750
Toluene	<0.01	680 **
Ethylbenzene	<0.01	48,000 **
Phenol	0.5	78,100 **

* Based on geometric mean.
** Assuming Soil Organic Matter (SOM) = 5%.

The 95% confidence upper bound concentration for each of these determinands is well below the relevant SGV for the proposed industrial end use and as such do not pose a hazard to the proposed development. The CLEA methodology also includes a Maximum Value Test to determine whether the highest value recorded for each determinand belongs to the same data set as the other values or whether it represents a statistical outlier (hotspot). Statistical outliers were recorded for Cadmium and Phenol. However, in both cases the highest recorded values were still well below the relevant SGV.

The following table shows the maximum values recorded for the non-SGV determinands together with the available corresponding CIEH GAC values.

Determinand	Maximum concentration recorded mg/kg	CIEH GAC Value SOM = 5% industrial / commercial use mg/kg
Copper	52	45,700 #
Zinc	170	188,000 #
Benzo(a)pyrene	0.48	29.9
Dibenzo(ah)anthracene	0.32	29.9
Flourene	0.29	59,500
Naphthalene	5	1,440

For Soil Organic Matter (SOM) = 1%

As can be seen from the above table, the maximum concentration recorded for each determinand is well below the relevant CIEH GAC value.

For those determinands where no SGVs or CIEH GAC values are available the following comments are made:

PAH(16)
Four of the Polyaromatic Hydrocarbons (PAHs) are addressed by the CIEH GAC values. For the twelve remaining PAHs comparison has been made with in-house screening values calculated using CLEA UK for commercial/industrial use and SOM = 5%. All of the measured concentrations for the twelve remaining PAHs lie well below these in-house screening values.

Benzene, Xylene, MTBE
The measured concentrations of Benzene, Xylene and MTBE are all below the 0.01mg/kg limit of detection of the analytical technique used.

EPH/GRO
The GRO results were generally below the 0.01mg/kg limit of detection but a single result for Borehole BH5 was recorded at 0.081mg/kg. This

result is considered to be very low. The EPH results varied between 110mg/kg and 3,500mg/kg. The interpretation for the three highest results were all "unknown pattern detected". Further analysis (speciated TPH) would be required to determine whether the recorded levels pose a risk to end users of the site.

Sulphate and pH

Comments regarding the Sulphate and pH results and their potential effect on concrete are made in Section 9.3 above.

9.5.2 Leachability Testing

The WAC suite of analysis includes testing of leachate prepared from the samples. Where there is an overlap, the results of the WAC leachate testing have been compared to the limiting values from the Water Supply (Water Quality) Regulations (WSR) and also the Environment Agency's Environmental Quality Standards (EQS). The table below shows the maximum values recorded to date together with the available WSR and EQS values. For ease of identification, where the WSR or EQS values are exceeded, these are coloured red.

Determinand	Maximum concentration recorded µg/l	Water Supply Regulations µg/l	EQS (freshwater) µg/l
Arsenic	5	10	50
Antimony	7	5	-
Boron	230	1,000	2,000
Cadmium	5.1	5	5
Chromium	240	50	5 – 50 *
Copper	120	2,000	1 – 28 *
Lead	6	25	4 – 250 *
Mercury	<0.05	1	1
Nickel	18	20	50 – 200 *
Selenium	3	10	-
Zinc	8	-	8 – 500 *
Chloride	22,000	250,000	-
Fluoride	800	1,500	-
Sulphate	190,000	250,000	-
pH value	11.1 pH units	6.5 – 10.0 pH units	6 – 9 pH units

* Depends on water hardness and suitability for fish.

As can be seen from the above table, the maximum recorded Antimony concentration in the leachate exceeds the WSR limit. However, the other results were all below the 5µg/l limit of detection. The single concentration recorded above the limit of detection therefore appears to be a local leachable 'hotspot'.

The maximum Cadmium concentration slightly exceeds both the WSR and EQS limits. However, the other results were all below the WSR/EQS limits. The single concentration recorded above the 5µg/l WSR/EQS limit therefore appears to be a local leachable 'hotspot'.

The maximum Chromium concentration in the leachate exceeds both the WSR and higher EQS limits. This maximum concentration was recorded in the sample from Borehole BH2. In the other boreholes the Chromium concentrations were all below the WSR limit. Borehole BH2 therefore appears to represent a local leachable 'hotspot'.

The maximum Copper concentration in the leachate exceeds both the lower and upper EQS limits but is well below the WSR limit. There appears to be an anomaly between the published WSR and EQS values for Copper, this possibly relating to some confusion over units as the WSR is several orders of magnitude higher than the EQS values.

The maximum Lead concentration in the leachate exceeds the lower EQS limit but is below both the higher EQS limit and WSR limit. The other measured Lead concentrations were either below or at the 1µg/l limit of detection and the mean value falls below the lower EQS limit.

The maximum pH value recorded exceeds both the WSR and EQS limits. However, the mean pH value lies below the WSR limit.

9.5.3 Risk Assessment

The existing legal framework for addressing contaminated land, in the context of new build development works, utilises the Source – Pathway - Receptor methodology, along with a Fit for Purpose Criterion.

This utilises the desk study and intrusive investigation processes to establish the presence of both a source and potential receptors. A risk is seen to be present if a significant Pollutant Linkage or Pathway exists between Source and Receptor.

The subsequent remediation recommendations are then based on breaking the pollutant pathway between source and receptor. This can be done by removing or immobilising the source, closing any pollutant pathway or by removing/isolating potential receptors.

This ground investigation has shown possible evidence of hydrocarbon contamination and local leachable 'hotspots' of contamination. Delineation of these 'hotspots' is likely to prove difficult and potentially expensive and their removal may not be practical. Although conservative, a more pragmatic approach would be to design for the 'hotspots' as though they occur across the site.

The construction of the reinforced concrete slab over the area of the log yard will isolate any end users from the soils. The pathway between end-users and any contaminated soils will therefore be removed. As a result, the remaining potential receptors are identified as construction workers, building elements and groundwater.

Construction Workers

As regards construction workers, it is recommended that appropriate PPE (gloves, overalls etc.) is made available and good hygiene is observed during construction of the proposed reinforced concrete slab. During any excavation works for the slab, it would be advisable to confine all eating, drinking and smoking to 'clean' areas.

As with all investigation work, there is always a risk that higher concentrations of contaminants might occur between the investigation points or at other depths to those tested. Construction personnel should be made aware of this. Should any materials suspected of being contaminated (strange colour or odour) be noted during excavation work, the work should be suspended and further sampling/analysis carried out.

Building Elements

Recommendations with respect to concrete mix design have been given in Section 9.3 above.

Groundwater

As discussed in Section 9.5.2 above, some of the contaminant concentrations in the leachate tests exceed either the WSR or EQS limits.

For leachate to be produced from the soils a supply of water needs to be available. It is understood that the proposed development will essentially cover the site surface with a reinforced concrete slab. This reinforced concrete slab will effectively prevent infiltration of surface water, thus minimising the potential for leaching from any unsaturated Made Ground. The low permeability of the natural clay/silt strata below the Made Ground will also act to minimise downward migration of any leachable contamination.

Particular attention should also be paid to the quality of drainage materials used and their installation to minimise the risk of any future leakage from the drainage system.

9.5.4 Disposal of Spoil

The comments made in Section 9.5.3 above relate to the materials remaining in situ and their effects on the identified potential receptors. Different criteria apply where materials are to be taken off site for disposal purposes and the criteria applied can have a significant impact on the cost of disposal. It is therefore recommended that an early dialogue is established with local landfill operators to determine how they would classify any excavated spoil from this site.

On the basis of the WAC testing carried out to date, the soils would generally appear to be suitable for disposal at an 'inert waste landfill' site. However, the Chromium eluate result for the sample from Borehole BH2 exceeds the 'inert waste landfill' limit but is well below the limit for 'stable non-reactive hazardous waste in non-hazardous landfill'. The classification of excavated spoil waste materials from this site should therefore be confirmed with the relevant landfill site operator and/or waste broker.

9.6 Landfill Gas

Monitoring for landfill gases has shown the presence of both methane (maximum 49%) and carbon dioxide (maximum 13.0%) together with some severely depleted oxygen concentrations (minimum 0.8%). The maximum outward flow of gas recorded from the monitoring wells was 1.3 litres per hour.

Based on the latest CIRIA guidance (C659 - Assessing risks posed by hazardous ground gases to buildings – 2006), the worst case monitoring results lie within 'characteristic situation' 2 (low risk). For industrial buildings on such sites, protective measures would typically include a reinforced concrete floor slab with minimum 1200 gauge DPM with all joints and penetrations sealed. However, as the proposed development involves the construction of a reinforced concrete slab only, and this will be

open to the atmosphere above, such measures seem inappropriate.

A greater concern would be that the construction of the slab will effectively seal the surface of the yard and as a result, gas could collect and affect adjacent buildings. Therefore, the more appropriate precaution would be to provide either sub-slab ventilation or a perimeter venting trench or a combination of the two. This would help to prevent the build up of gas and allow any gas to escape to the atmosphere.

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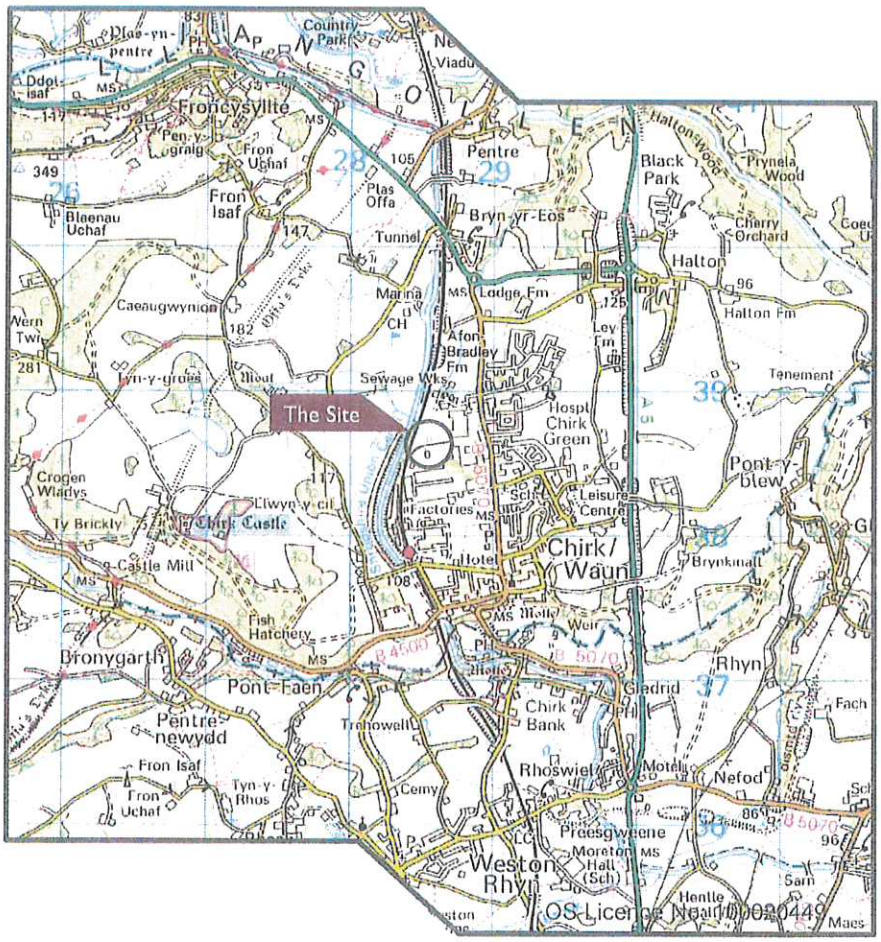
Principal Engineer
for GEOTECHNICS LIMITED - North West Office

APPENDIX I

SITE LOCATION PLAN

DATA SHEET – Site Location Plan

Project	: PROPOSED LOG YARD IMPROVEMENTS, KRONOSPAN, CHIRK
Project No	: PN071425



SITE LOCATION PLAN

GEOTECHNICS LIMITED

The Geotechnical Centre

Unit 1, Borders Industrial Estate

River Lane, Saltney, Chester

CH4 8RJ

APPENDIX 2

BOREHOLE RECORDS

DATA SHEET - Symbols and Abbreviations used on Records

Samples

B	Bulk disturbed sample
BLK	Block sample
C	Core sample
D	Small disturbed sample (tub/jar)
E	Environmental test sample
ES	Environmental soil sample
EW	Environmental water sample
G	Gas sample
L	Liner sample
P	Piston sample (PF - failed piston sample)
TW	Thin walled push in sample
U -	Open Tube - 102mm diameter with blows to take sample. (UF - failed U sample)
V	Vial sample
W	Water sample

Insitu Testing / Properties

S	Standard Penetration Test (SPT)
C	SPT with cone
VN	Strength from Insitu Vane
HV	Strength from Hand Vane
PP	Strength from Pocket Penetrometer
	(All other strengths from undrained triaxial testing)
w%	Water content
N	SPT Result
-/-	Blows/penetration (mm) after 150mm seating.
-*/-	Total blows/penetration (mm)
( )	Extrapolated value

Rotary Core

RQD	Rock Quality Designation (% of intact core >100mm)
FRACTURE INDEX	Fractures/metre
FRACTURE SPACING (mm)	Maximum Minimum

Groundwater

Water Strike

Highest recorded standing water level

Instrumentation

Inclinometer

Standpipe
Seal
Tip
Filter

Piezometer
Seal
Tip
Filter

Strata

Made Ground Type 1

Type 2

Topsoil

Cobbles and Boulders

Gravel

Sand

Silt

Clay

Peat

Note: Composite soil types shown by combined symbols

Chalk

Limestone

Sandstone

Coal

Mudstone

Siltstone

Metamorphic Rock

Igneous Rock

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN | Engineer TIER CONSULT LTD | Borehole BH1 | Project No PN071425

Client KRONOSPAN LTD

Scale 1:50

Sampling			Properties			Strata		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
0.00- 0.00							G.L.	
0.20	E					Grass over MADE GROUND: Brown ashy slightly silty gravelly fine to coarse sand. Gravel is fine to medium subangular to subrounded of various lithologies.	0.30	
0.30	D							
0.50- 1.00	B			5.9				
0.50	E					MADE GROUND: Grey-black slightly silty gravelly fine to medium sand. Gravel is fine to coarse angular to subrounded and occasionally tabular of slate.	1.00	
1.00	E							
1.30	D					MADE GROUND: Grey/black slightly gravelly sandy clay. Gravel is fine to medium subangular to subrounded of brick, wood, concrete and various lithologies.		
1.50- 2.00	B			36				
1.50- 1.77					C50/ 115			
2.30	D			25		At 2.30m: Locally slightly sandy gravelly silt with occasional gravel of very weak tabular slate with occasional coal traces.		
2.50- 3.00	B							
2.50	E							
2.50- 2.95					C2			
3.30	D							
3.30	W							
3.50- 4.00	B							
3.50- 3.95					C8			
						Firm grey mottled orange/brown slightly sandy locally slightly gravelly CLAY/SILT.	3.80	
4.30	D			25				
4.50- 5.00	U		190	20		At 4.50m: Locally very stiff.		
5.00	D							
5.50	D					Between 5.50-6.00m: Becoming light brown-yellow in colour.		
6.00- 6.50	B					At 6.00m: Locally stiff.		
6.00- 6.50	D							
6.00- 6.45					S22			
7.00	D							
7.50- 8.00	U		40	28				
8.00	D							
8.50	D							
9.00- 9.50	B							
9.00- 9.50	D							
9.00- 9.45					S12			
10.00	D							

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
15.00	0.20	Cable Percussion	DKK	G.L.			30/01/07	08:00	1.20		1.15	20	1.5	Slow flow.
				10.00			30/01/07	18:00	3.80	3.3		20	4	Moderate flow.
				10.00			31/01/07	08:00						
				15.00			31/01/07	15:30						

Remarks

Inspection pit hand excavated to 1.20m depth.
A 50mm standpipe was installed with a slotted section from 0.50m to 3.50m and with upright lockable protective cover. Detail as follows from base of hole: arisings up to 4.50m, bentonite seal up to 3.50m, gravel filter up to 0.50m, bentonite seal up to 0.10m, concrete up to ground level.
Chiselling: 1.80-2.00m for 30 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 1 of 2

21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN | Engineer TIER CONSULT LTD | Borehole BH1 | Project No PN071425

Client KRONOSPAN LTD

Sampling			Properties			Strata		Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
10.50-11.00	U		144	24		At 10.50m: Locally stiff.		
11.00	D			33				
11.50	D							
12.00-12.50	B							
12.00-12.50	D							
12.00-12.45					S12			
13.00	D							
13.50-14.00	U							
14.00	D							
14.50	D							
15.00	D					End of Borehole	15.00	

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 2 of 2

21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN | Engineer TIER CONSULT LTD | Borehole BH2 | Project No PN071425

Client KRONOSPAN LTD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth
							G.L.
0.20	E					Grass over MADE GROUND: Brown slightly silty gravelly fine to coarse sand. Gravel is fine to coarse subangular to subrounded of concrete, sandstone and various lithologies.	
0.30	D						
0.50- 1.00	B						
0.50	E						
0.50- 1.00	U			15			
1.00	E						
1.30	D						
1.50- 2.00	B			14			
1.50- 1.54					C50/25		
2.30	D						
2.50- 3.00	B					At 2.50m: Locally brown slightly sandy slightly gravelly clay.	
2.50- 2.95					C14		
3.30	D					Between 3.30-4.90m subangular to subrounded of various lithologies.	
3.50- 4.00	B						
3.50- 3.95		3.20			C24		
3.60	W						
4.30	D						
4.50- 5.00	B						
4.50- 4.95		4.50			C17		
						Medium dense grey slightly silty gravelly locally very gravelly fine to coarse SAND. Gravel is fine to medium subangular to subrounded with occasional gravel sized pockets of silt.	4.90
5.50	D						
6.00- 6.50	B						
6.00- 6.50	D						
6.00- 6.45		6.00			S15		
						Firm grey CLAY/SILT.	6.70
7.00	D						
7.50- 8.00	B						
7.50- 8.00	D						
7.50- 7.95		7.50			S16		
8.50	D			26			
9.00- 9.45	U		102	25		At 9.00m: Locally stiff.	
9.50	D						
10.00	D						

Boring

Depth	Dia	Technique	Crew
15.00		Cable Percussion	DKK

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.			31/01/07	15:30
3.00			31/01/07	18:00
3.00			01/02/07	08:00
15.00			01/02/07	18:00

Groundwater

Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
4.50	3.2	3.60	20	7.5	Moderate flow.

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth.
A 50mm standpipe was installed with a slotted section from 1.00m to 5.00m and with flush lockable protective cover. Detail as follows from base of hole: arisings up to 6.00m, bentonite seal up to 5.00m, gravel filter up to 1.00m, bentonite seal up to 0.10m, concrete up to ground level.
Chiselling: 1.20-1.70m for 90 minutes.

Logged by MD

Figure 1 of 2

21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN
Engineer TIER CONSULT LTD
Borehole BH2
Project No PN071425

Client KRONOSPAN LTD

Sampling			Properties			Strata		Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
10.50-11.00	B							
10.50-11.00	D							
10.50-10.95		10.50			S12			
11.50	D							
12.00	D					At 12.00m: Locally soft.		
12.00-12.45	U		32	27				
12.50	D			32				
13.00	D							
13.50-14.00	D							
13.50-13.95		13.50			S15			
14.50	D							
15.00	D					End of Borehole	15.00	

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 2 of 2

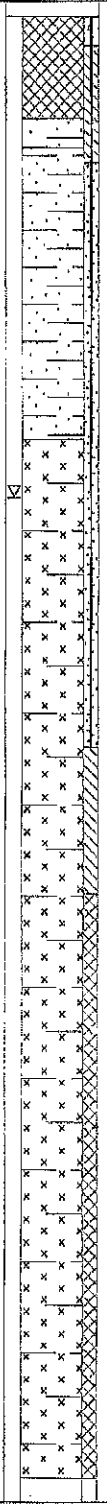
21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN
Engineer TIER CONSULT LTD
Borehole BH3
Project No PN071425
Client KRONOSPAN LTD
Scale 1:50

Sampling			Properties			Strata		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
0.00- 0.00	E					MADE GROUND: Brown slightly silty slightly gravelly fine to coarse sand. Gravel is fine to coarse angular to subrounded of pottery, slate and various lithologies.	G.L.	
0.20	D							
0.30	E							
0.50								
0.70- 1.20	B						0.70	
						Firm grey mottled brown slightly sandy CLAY.	0.90	
0.90- 1.20	B			22				
1.00	E					Firm brown slightly sandy CLAY.		
1.30	D			23				
1.50- 2.00	U		198	22		At 1.50m: Locally very stiff.		
2.00	D							
2.30	D							
2.50- 3.00	B					At 2.50m:Becoming sandy.		
2.50- 2.95		1.70			S10			
							2.90	
3.00	W					Firm grey slightly sandy CLAY/SILT.		
3.30	D							
3.50- 4.00	B							
3.50- 4.00	D							
3.50- 3.95		3.50			S9			
4.30	D			25				
4.50- 5.00	U		58	30				
5.00	D							
5.50	D							
6.00- 6.50	B							
6.00- 6.50	D							
6.00- 6.45		6.00 (3.50)			S7			
7.00	D							
7.50- 8.00	U		25	26		At 7.50m: Locally soft.		
8.00	D							
8.50	D							
9.00- 9.50	B							
9.00- 9.50	D							
9.00- 9.45		9.00 (4.10)			S6			
10.00	D							



Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
0.00		Cable Percussion	DKK	G.L.			01/02/07	13:00	3.30	3.0		20	3.5	Moderate flow.
				6.00			01/02/07	18:00						
				6.00			02/02/07	08:00						
				15.00			02/02/07	14:30						

Remarks

A 50mm standpipe was installed with a slotted section from 2.00m to 5.00m and with upright lockable protective cover. Detail as follows from base of hole: arisings up to 6.00m, bentonite seal up to 5.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 1 of 2

21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN
Engineer TIER CONSULT LTD
Borehole BH3
Project No PN071425

Client KRONOSPAN LTD

Scale 1:50

Sampling			Properties			Strata		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
10.50-11.00	U		37	25		At 10.50m: Locally soft.		
11.00	D			36				
11.50	D							
12.00-12.50	B							
12.00-12.50	D							
12.00-12.45		12.00 (5.10)			S7			
13.00	D							
13.50-14.00	U							
14.00	D							
14.50	D							
15.00	D						15.00	
						End of Borehole		

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 2 of 2

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geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN
Engineer TIER CONSULT LTD
Borehole BH4
Project No PN071425

Client KRONOSPAN LTD

Sampling			Properties			Strata		Scale 1:50
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
							G.L.	
0.20	E					MADE GROUND: Brown slightly clayey sandy fine to coarse subangular to subrounded gravel with many cobbles.		
0.30	D						0.40	
						** Filled and compacted grey slate.		
							1.40	
						**Filled ash, glass and refuse.		
2.50- 3.00	U		79	20		Firm to stiff grey mottled brown slightly sandy locally slightly gravelly CLAY.	2.30	
2.90	W							
3.00	D			18				
3.30	D							
3.50- 4.00	B							
3.50- 3.95		3.30 (2.90)			S12			
						Firm grey slightly sandy CLAY/SILT.	3.70	
4.30	D							
4.50- 5.00	U		60	31				
5.00	D			29				
5.50	D							
6.00- 6.50	B							
6.00- 6.45		6.00 (4.10)			S18			
7.00	D							
7.50- 8.00	U		128	25		At 7.50m: Locally stiff.		
8.00	D							
8.50	D							
9.00- 9.50	B							
9.00- 9.45		9.00 (3.50)			S3			
10.00	D							

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
0.00		Cable Percussion	DKK	G.L. 5.00 5.00 15.00			06/02/07 06/02/07 07/02/07 07/02/07	14:30 18:00 08:00 18:00	3.50	3.3			3.8	Moderate flow.

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth.
** Drillers description.
A 50mm standpipe was installed with a slotted section from 1.00m to 3.50m and with upright lockable protective cover. Detail as follows from base of hole: arisings up to 4.50m, bentonite seal up to 3.50m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.

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Figure 1 of 2
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geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Engineer TIER CONSULT LTD

Borehole BH4
Project No PN071425

Client KRONOSPAN LTD

Scale 1:50

Sampling			Properties			Strata		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
10.50-11.00	U		40	27				
11.00	D			34				
11.50	D							
12.00-12.50 12.00-12.45	B	12.50 (3.70)			S8			
13.00	D							
13.50-14.00	U							
14.00	D							
14.50	D							
15.00	D					End of Borehole	15.00	

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 2 of 2

21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN | Engineer TIER CONSULT LTD | Borehole BH5 | Project No PN071425

Client KRONOSPAN LTD

Scale 1:50

Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
							G.L.	
0.20	E					MADE GROUND: Brown slightly silty gravelly fine to coarse sand. Gravel is fine to coarse subangular to subrounded of various lithologies.		
0.30	D							
0.50- 1.00	B			10				
0.50	E							
1.00	E							
1.30	D					At 1.30m: Becoming clayey.		
1.50- 2.00	B			14		At 1.50m: Locally very silty very sandy gravel.		
1.50- 1.60		1.50			C50/15			
2.30	D					MADE GROUND: Firm brown mottled grey reworked slightly gravelly clay.	2.30	
2.50- 3.00	B							
2.50- 3.00	D			29				
2.50- 2.95		2.50			S11			
3.30	D							
3.50- 4.00	U		40	22				
4.00	D					Brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to medium subangular to subrounded of various lithologies. At 4.30m: Becoming slightly clayey.	3.90	
4.30	D							
4.50- 5.00	B							
4.50- 5.00	D							
4.50- 4.95		4.50			S13		4.70	
5.50	D					Firm grey slightly sandy CLAY/SILT.		
6.00- 6.50	U		199	24		At 6.00m: Locally very stiff.		
6.50	D			32				
7.00	D							
7.50- 8.00	B							
7.50- 8.00	D							
7.50- 7.95		7.50			S6			
8.50	D							
9.00- 9.50	U							
9.50	D							
10.00	D							

Boring

Depth	Dia	Technique	Crew

Progress

Depth of Hole	Depth Cased	Depth to Water	Date	Time
G.L.			05/02/07	08:00
7.50			05/02/07	18:00
7.50			06/02/07	08:00
15.00			06/02/07	13:00

Groundwater

Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
					None encountered during boring.

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Inspection pit hand excavated to 1.20m depth.
A 50mm standpipe was installed with a slotted section from 0.50m to 5.00m and with upright lockable protective cover. Detail as follows from base of hole: arisings up to 6.00m, bentonite seal up to 5.00m, gravel filter up to 0.50m, bentonite seal up to 0.10m, concrete up to ground level.
Chiselling: 1.40-1.80m for 90 minutes.

Logged by MD

Figure 1 of 2

21/03/2007

geotechnics

BOREHOLE RECORD - Cable Percussion

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN
Engineer TIER CONSULT LTD
Borehole BH5
Project No PN071425

Client KRONOSPAN LTD

Scale 1:50

Sampling			Properties			Strata		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT	Description	Depth	Legend
10.50-11.00	B							
10.50-11.00	D							
10.50-10.95		10.50 (4.90)			S6			
11.50	D							
12.00-12.50	U		21	26		At 12.00m: Locally soft.		
12.50	D			27				
13.00	D							
13.50-14.00	B							
13.50-14.00	D							
13.50-13.95		13.50 (4.70)			S10			
14.50	D							
15.00	D						15.00	
						End of Borehole		

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged by MD

Figure 2 of 2

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geotechnics

APPENDIX 3

MONITORING

FIELDWORK - *Insitu Gas Monitoring - Daily Record*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Project No PN071425
Date 15/02/2007
Sheet No. 1 (1 of 1)

Client TIER CONSULT LTD

Equipment Used

GI Infra Red Gas Analyser MK1 ☐ MK2 ☐ GA2000 ☐

Other Gas Data LMSxi

Weather / Site Conditions

Wind	Still ☐	Light ☐	Moderate [X]	Strong ☐
Cloud Cover	None ☐	Slight ☐	Cloudy [X]	Overcast ☐
Precipitation	Dry ☐	Slight [X]	Moderate ☐	Heavy ☐

Borehole	Depth to Base (m)	Depth to Water (m bgl)	Peak Explosive Gas CH4 (% VOL)	Carbon Dioxide CO2 (% VOL)	Oxygen O2 (% VOL)	Nitrogen N2 (% VOL)	Barometric Pressure (mBars)	Flow Rate (Peak/min) (l/hr)	Remarks
BH 1	3.50	2.46	3.2	2.4	15.1	82.6	995	-0.1	
BH 2	5.00	3.38	0.0	1.4	20.1	78.6	994	0.1	
BH 3	5.00	2.80	0.0	2.4	15.1	82.6	995	-0.1	
BH 4	3.50	1.95	0.0	0.9	19.5	79.9	995	0.0	
BH 5	5.00	2.60	0.2	1.3	19.7	78.7	994	0.0	

Remarks

geotechnics

Form 002/3

FIELDWORK - *Insitu Gas Monitoring - Daily Record*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Project No PN071425
Date 19/02/2007
Sheet No. 1 (1 of 1)

Client TIER CONSULT LTD

Equipment Used

GI Infra Red Gas Analyser MK1 ☐ MK2 ☐ GA2000 ☐

Other Gas Data LMSXi

Weather / Site Conditions

Wind	Still [X]	Light ☐	Moderate ☐	Strong ☐
Cloud Cover	None ☐	Slight ☐	Cloudy ☐	Overcast [X]
Precipitation	Dry [X]	Slight ☐	Moderate ☐	Heavy ☐

Borehole	Depth to Base (m)	Depth to Water (m bgl)	Peak Explosive Gas CH4 (% VOL)	Carbon Dioxide CO2 (% VOL)	Oxygen O2 (% VOL)	Nitrogen N2 (% VOL)	Barometric Pressure (mBars)	Flow Rate (Peak/min) (l/hr)	Remarks
BH 1	3.50	2.50	4.3	1.0	2.7	92.1	998	0.6	
BH 2	5.00	2.00	0.2	2.0	3.2	94.8	998	0.0	
BH 3	5.00	2.86	0.0	3.1	14.0	82.7	998	0.5	
BH 4	3.50	3.30	1.5	2.4	13.0	83.7	998	0.1	
BH 5	5.00	2.80	0.0	1.9	17.4	80.5	998	0.0	

Remarks

geotechnics

Form 002/3

FIELDWORK *- Insitu Gas Monitoring - Daily Record*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Project No PN071425
Date 28/02/2007
Sheet No. 1 (1 of 1)

Client TIER CONSULT LTD

Equipment Used

GI Infra Red Gas Analyser MK1 ☐ MK2 ☐ GA2000 ☐

Other Gas Data LMSxi

Weather / Site Conditions

Wind	Still ☐	Light ☐	Moderate [x]	Strong ☐
Cloud Cover	None ☐	Slight [x]	Cloudy ☐	Overcast ☐
Precipitation	Dry ☐	Slight ☐	Moderate [x]	Heavy ☐

Borehole	Depth to Base (m)	Depth to Water (m bgl)	Peak Explosive Gas CH4 (% VOL)	Carbon Dioxide CO2 (% VOL)	Oxygen O2 (% VOL)	Nitrogen N2 (% VOL)	Barometric Pressure (mBars)	Flow Rate (Peak/min) (l/hr)	Remarks
BH 1	3.50	2.70	7.0	0.9	0.8	91.5	969	1.3	
BH 2	5.00	3.40	0.7	6.1	6.4	86.1	969	0.2	
BH 3	5.00	2.78	0.0	0.7	19.7	79.3	969	1.3	
BH 4	3.50	2.00	0.3	1.5	15.0	83.1	969	0.2	
BH 5	5.00	2.40	0.4	0.5	20.2	78.8	969	0.3	

Remarks

geotechnics

Form 002/3

FIELDWORK - *Insitu Gas Monitoring - Daily Record*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Client TIER CONSULT LTD

Project No PN071425
Date 07/03/2007
Sheet No. 1 (1 of 1)

Equipment Used

GI Infra Red Gas Analyser MK1 ☐ MK2 ☐ GA2000 ☐

Other Gas Data LMSxi

Weather / Site Conditions

Wind	Still [x]	Light ☐	Moderate ☐	Strong ☐
Cloud Cover	None ☐	Slight ☐	Cloudy ☐	Overcast [x]
Precipitation	Dry [x]	Slight ☐	Moderate ☐	Heavy ☐

Borehole	Depth to Base (m)	Depth to Water (m bgl)	Peak Explosive Gas CH4 (% VOL)	Carbon Dioxide CO2 (% VOL)	Oxygen O2 (% VOL)	Nitrogen N2 (% VOL)	Barometric Pressure (mBars)	Flow Rate (Peak/min) (l/hr)	Remarks
BH 1	3.50	2.60	0.0	0.3	12.1	85.0	986	0.0	
BH 2	5.00	3.30	0.1	0.8	20.0	79.9	986	0.0	
BH 3	5.00	2.72	0.0	0.1	20.8	78.8	986	0.0	
BH 4	3.50	1.90	0.0	0.0	21.3	78.8	986	-0.1	
BH 5	5.00	2.50	0.0	1.0	16.3	80.6	986	0.1	

Remarks

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Form 002/3

FIELDWORK - *Insitu Gas Monitoring - Daily Record*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Client TIER CONSULT LTD

Project No PN071425
Date 15/03/2007
Sheet No. 1 (1 of 1)

Equipment Used

GI Infra Red Gas Analyser MK1 ☐ MK2 ☐ GA2000 ☐

Other Gas Data LMSxi

Weather / Site Conditions

Wind	Still ☐	Light ☐	Moderate ☒	Strong ☐
Cloud Cover	None ☐	Slight ☐	Cloudy ☒	Overcast ☐
Precipitation	Dry ☒	Slight ☐	Moderate ☐	Heavy ☐

Borehole	Depth to Base (m)	Depth to Water (m bgl)	Peak Explosive Gas CH4 (% VOL)	Carbon Dioxide CO2 (% VOL)	Oxygen O2 (% VOL)	Nitrogen N2 (% VOL)	Barometric Pressure (mBars)	Flow Rate (Peak/min) (l/hr)	Remarks
BH 1	3.50	2.80	2.6	1.1	5.2	92.6	1005	-1.4	
BH 2	5.00	3.50	0.0	1.5	17.1	81.5	1005	0.4	
BH 3	5.00	2.83	0.0	1.6	17.5	80.9	1005	0.4	
BH 4	3.50	-	-	-	-	-	1005	-	Unable to access.
BH 5	5.00	2.20	49.0	13.0	4.1	28.9	1005	0.2	

Remarks

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Form 002/3

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APPENDIX 4

LABORATORY TESTING - GEOTECHNICAL

DATA SHEET - Laboratory Test Symbols

Classification and Strength

Symbol	C - Clay M - Silt (0 - containing organic matter) Plasticity L - Low I - Intermediate H - High V - Very High E - Extremely High
Ip	Plasticity Index
%	% Retained on 425 µm sieve (shown over Ip value)
w_L	Liquid Limit
w_P	Plastic Limit
NP	Non-Plastic
w	Moisture Content
Test	**Quick undrained triaxial tests** SS Single stage - 102mm diameter. S3 Single stage - set of 3 38mm diameter. MS Multistage - 102mm diameter. D Drained Test
	HV Hand Vane
	PP Pocket Penetrometer (kg/cm²)
	UT Unsuitable for Test
γ_b	Bulk Density
σ_3	Triaxial Cell Pressure
$\sigma_1 - \sigma_3$	Deviator Stress
##	Excessive Strain
c_u	Undrained Cohesion
c	Cohesion Intercept
ϕ	Angle of Shearing Resistance

Chemical Analysis

Acid Soluble	Total sulphate in specimen (expressed as SO_3%)
Water Soluble	Soluble Sulphate in 2:1 water : soil extract (expressed as SO_3 g/L)
In Water	Sulphate content of groundwater (expressed as SO_3 g/L)
pH	pH value
Organic Content	Organic content expressed as a percentage of dry weight.
Chloride Content	Chloride Ion Content expressed as a percentage of dry weight.

Consolidation

Size	Size of specimen in mm (d = diameter, h = height)
w	Moisture Content
γ_b	Bulk Density
γ_d	Dry Density
ρ_s	Particle Density (A = Assumed, M = Measured)
S_r	Initial Degree of Saturation
p	Applied Pressure
e	Voids Ratio
m_v	Coefficient of Volume Compressibility
c_{v50}	Coefficient of Consolidation - Log t
c_{v90}	Coefficient of Consolidation - $\sqrt{t}$

MCV, Compaction, CBR

MCV	Moisture Condition Value at natural moisture content
MCC	Moisture Condition Calibration
CCV	Chalk Crushing Value

Compaction

Type	2.5 = BS 2.5 kg Rammer 4.5 = BS 4.5 kg Rammer V = BS Vibrating Hammer
γ_b	Bulk Density
γ_d	Dry Density

CBR California Bearing Ratio

Type	2.5 = Test on Specimen Recompacted using BS 2.5 kg Rammer 4.5 = As above but using BS 4.5 kg Rammer V = As above but using BS Vibrating Hammer M = Test on open drive mould specimen cut in field S = Soaked Specimen
Top	CBR at top of mould
Bottom	CBR at bottom of mould
ND	None Detected

All tests performed in accordance with BS 1377 : Parts 1-9 : 1990 incorporating amendments where appropriate.

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LABORATORY RESULTS - *Classification and Strength*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN **Project No:** PN071425

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH1	0.50-1.00 (0.50-1.00)	B	N04220	MADE GROUND: Grey/black slightly silty gravelly sand.					5.9						
BH1	1.50-2.00 (1.50-2.00)	B	N04221	MADE GROUND: Grey/black slightly gravelly sandy clay.					36						
BH1	2.30 (2.30)	D	N04216	MADE GROUND: Grey/black slightly sandy gravelly silt.	MH	23 (64%)	52	29	25						
BH1	4.30 (4.30)	D	N04217	Firm brown and grey slightly sandy SILT.		(3%)	33	NP	25						
BH1	4.50-5.00 (4.50-5.00)	U	N04222	Very stiff grey slightly sandy slightly gravelly CLAY/SILT.PP = 3.5,4.5					20	SS	2.11	100	380	190 ##	190
BH1	7.50-8.00 (7.50-8.00)	U	N04223	Firm grey CLAY/SILT.PP = 1.25,1.0					28	SS	2.03	150	79	40	40
BH1	10.50-11.00 (10.50-11.00)	U	N04224	Stiff grey slightly sandy CLAY/SILT.PP = 2.5,1.0					24	SS	1.94	220	288	144 ##	144
BH1	11.00 (11.00)	D	N04219	Firm grey CLAY/SILT.	CI	11 (NAT 0%)	35	24	33						
BH2	0.50-1.00 (0.50-1.00)	U	N04229	MADE GROUND: Brown slightly silty gravelly sand.					15						
BH2	1.50-2.00 (1.50-2.00)	B	N04230	MADE GROUND: Brown slightly silty gravelly sand.					14						
BH2	8.50 (8.50)	D	N04225	Firm grey CLAY/SILT.	CL	8 (NAT 0%)	30	22	26						
BH2	9.00-9.45 (9.00-9.45)	U	N04227	Stiff grey CLAY/SILT.PP = 1.0,1.25					25	SS	1.88	200	203	102	102

Remarks Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - Classification and Strength

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN **Project No:** PN071425

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH2	12.00-12.45 (12.00-12.45)	U	N04228	Soft grey CLAY/SILT.PP = .25,3.0					27	SS	1.89	250	64	32 ##	32
BH 2	12.50 (12.50)	D	N04226	Firm grey CLAY.	CL	13 (NAT 0%)	34	21	32						
BH3	0.90-1.20 (0.90-1.20)	B	N04237	Firm brown slightly sandy CLAY.					22						
BH3	1.30 (1.30)	D	N04233	Firm brown slightly sandy CLAY.	CI	22 (6%)	47	25	23						
BH3	1.50-2.00 (1.50-2.00)	U	N04238	Very stiff brown slightly sandy CLAY. = PP = 3.25,3.75					22	SS	2.09	160	397	198	198
BH3	4.30 (4.30)	D	N04234	Firm grey CLAY.	CL	8 (NAT 0%)	27	19	25						
BH3	4.50-5.00 (4.50-5.00)	U	N04239	Firm grey slightly sandy CLAY/SILT.PP = 2.25,2.25					30	SS	2.00	100	117	58 ##	58
BH3	7.50-8.00 (7.50-8.00)	U	N04240	Soft grey slightly sandy CLAY/SILT.PP = 1.25,3.75					26	SS	1.94	160	51	25	25
BH3	10.50-11.00 (10.50-11.00)	U	N04241	Soft grey slightly sandy CLAY/SILT.PP = 1.75,.25					25	SS	1.97	220	74	37	37
BH3	11.00 (11.00)	D	N04236	Firm grey CLAY.	CI	16 (NAT 0%)	37	21	36						
BH4	2.50-3.00 (2.50-3.00)	U	N04246	Stiff grey mottled brown slightly sandy CLAY.PP = 3.0,2.75					20	SS	2.17	60	158	79 ##	79
BH4	3.00 (3.00)	D	N04242	Firm to stiff grey mottled brown slightly sandy slightly gravelly CLAY.	CL	13 (10%)	34	21	18						

Remarks Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - *Classification and Strength*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN **Project No:** PN071425

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH4	4.50-5.00 (4.50-5.00)	U	N04247	Firm grey slightly sandy CLAY/SILT.PP = 1.5,2.25					31	SS	1.94	100	121	60	60
BH4	5.00 (5.00)	D	N04243	Firm grey CLAY.	Cl	13 (NAT 0%)	36	23	29						
BH4	7.50-8.00 (7.50-8.00)	U	N04244 8	Stiff grey slightly sandy CLAY/SILT.PP = 1.0,4.5					25	SS	2.11	160	256	128 ##	128
BH4	10.50-11.00 (10.50-11.00)	U	N04249	Firm grey slightly sandy CLAY/SILT.PP = .5,2.0					27	SS	1.97	220	79	40 ##	40
BH4	11.00 (11.00)	D	N04245	Firm grey CLAY.	Cl	15 (NAT 0%)	38	23	34						
BH5	0.50-1.00 (0.50-1.00)	B	N04254	MADE GROUND: Brown slightly silty gravelly sand.					10						
BH5	1.50-2.00 (1.50-2.00)	B	N04255	MADE GROUND: Brown very silty very sandy gravel.					14						
BH5	2.50-3.00 (2.50-3.00)	D	N04250	MADE GROUND: Brown mottled grey slightly gravelly clay.	Cl	21 (24%)	46	25	29						
BH5	3.50-4.00 (3.50-4.00)	U	N04256	MADE GROUND: Brown mottled grey slightly gravelly clay. PP = 1.0, 2.0					22	SS	1.92	80	81	40 ##	40
BH5	6.00-6.50 (6.00-6.50)	U	N04257	Very stiff grey slightly sandy CLAY/SILT.PP = 3.75,3.5					24	SS	2.06	130	398	199	199
BH5	6.50 (6.50)	D	N04252	Firm grey slightly sandy SILT.		(NAT 0%)	35	NP	32						

Remarks Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - *Classification and Strength*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN **Project No:** PN071425

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m^3	σ_3 kN/m^2	$\sigma_1-\sigma_3$ kN/m^2	c_u kN/m^2	c_{Avg} kN/m^2
BH5	12.00-12.50 (12.00-12.50)	U	N04258	Soft grey slightly sandy CLAY/SILT.PP = .75,.5					26	SS	1.98	250	41	21	21
BH5	12.50 (12.50)	D	N04253	Firm grey CLAY.	CL	13 (NAT 0%)	31	18	27						

Remarks Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - *Particle Size Distribution*

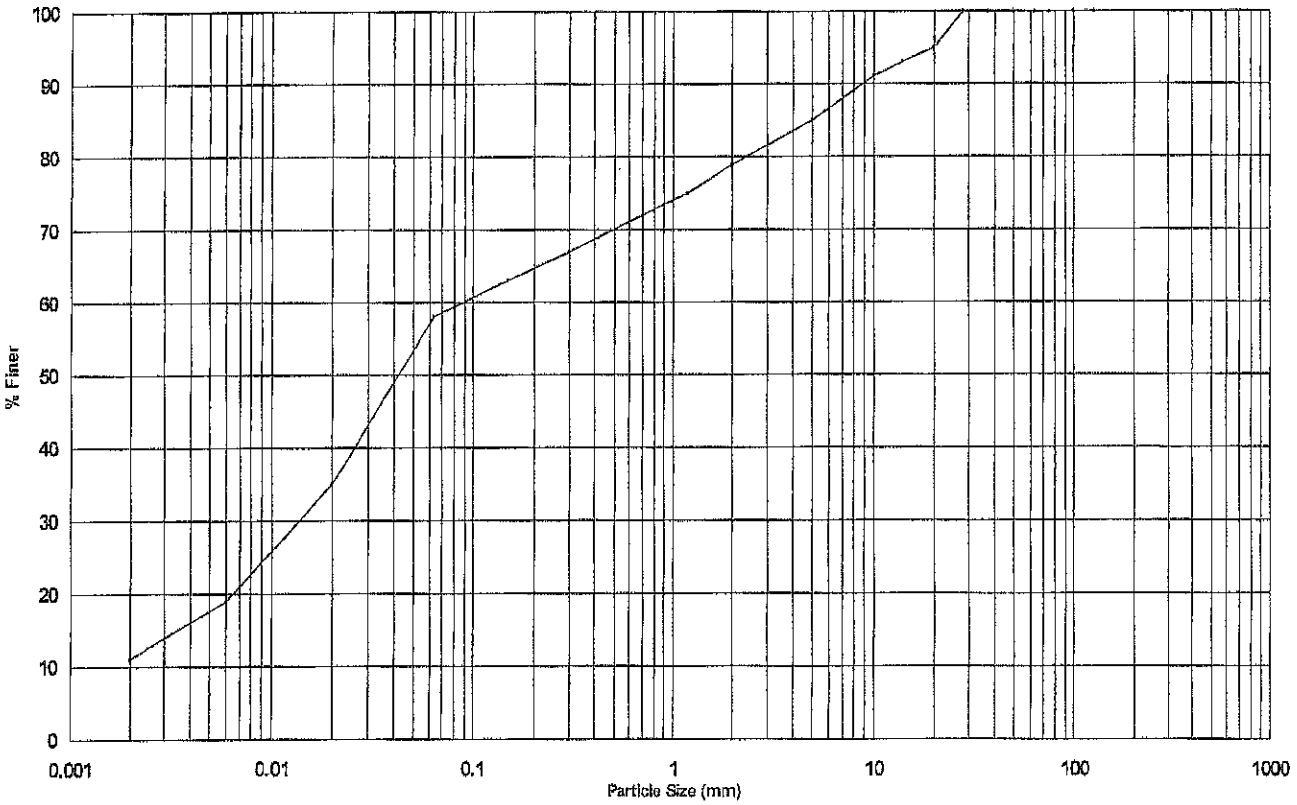
Project: PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Project No: PN071425

Hole	BH2
Sample Depth	2.50-3.00m
Sample Type	B
Sample Ref	N04231

Sample Description

MADE GROUND: Brown slightly sandy slightly gravelly clay.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	11
SILT	46
SAND	22
GRAVEL	21
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	95
14mm	93
10mm	91
6.3mm	-
5mm	85
3.35mm	-

Size	Percentage Finer
2mm	79
1.18mm	75
600μm	71
425μm	-
300μm	67
212μm	-
150μm	63
75μm	-
63μm	58
20μm	35
6μm	19
2μm	11

Uniformity Coefficient	
Not Available	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	11.23
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

22/03/2007

geotechnics

LABORATORY RESULTS - Particle Size Distribution

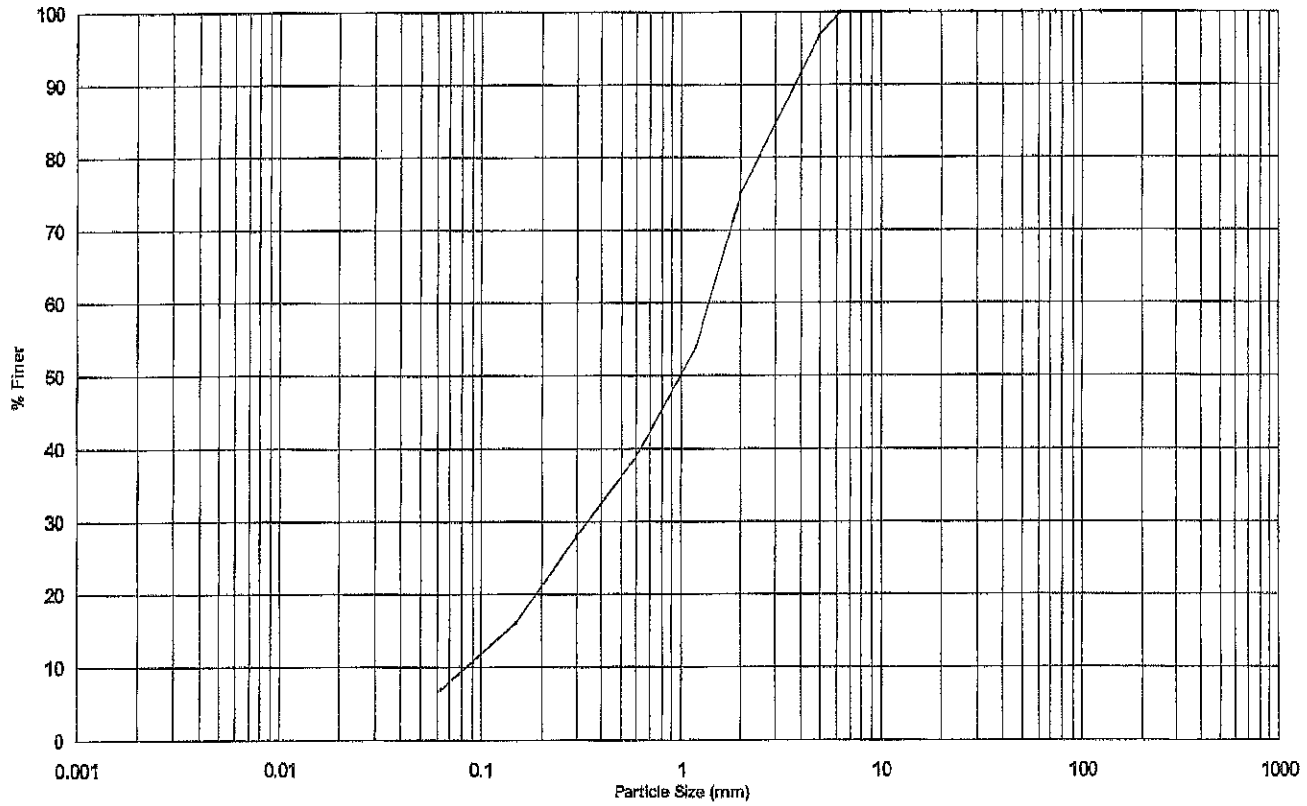
Project: PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Project No: PN071425

Hole	BH2
Sample Depth	6.00-6.50m
Sample Type	B
Sample Ref	N04232

Sample Description

Grey silty very gravelly SAND.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
SILT (including CLAY)	7
SAND	68
GRAVEL	25
COBBLES	0
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
28mm	100
20mm	100
14mm	100
10mm	100
6.3mm	100
5mm	97
3.35mm	-

Size	Percentage Finer
2mm	75
1.18mm	54
600μm	39
425μm	-
300μm	28
212μm	-
150μm	16
75μm	-
63μm	7
20μm	-
6μm	-
2μm	-

Uniformity Coefficient
20.63
Sieving Method
Wet sieve
Fine Particle Analysis

Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	0.00
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

22/03/2007

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LABORATORY RESULTS - *Particle Size Distribution*

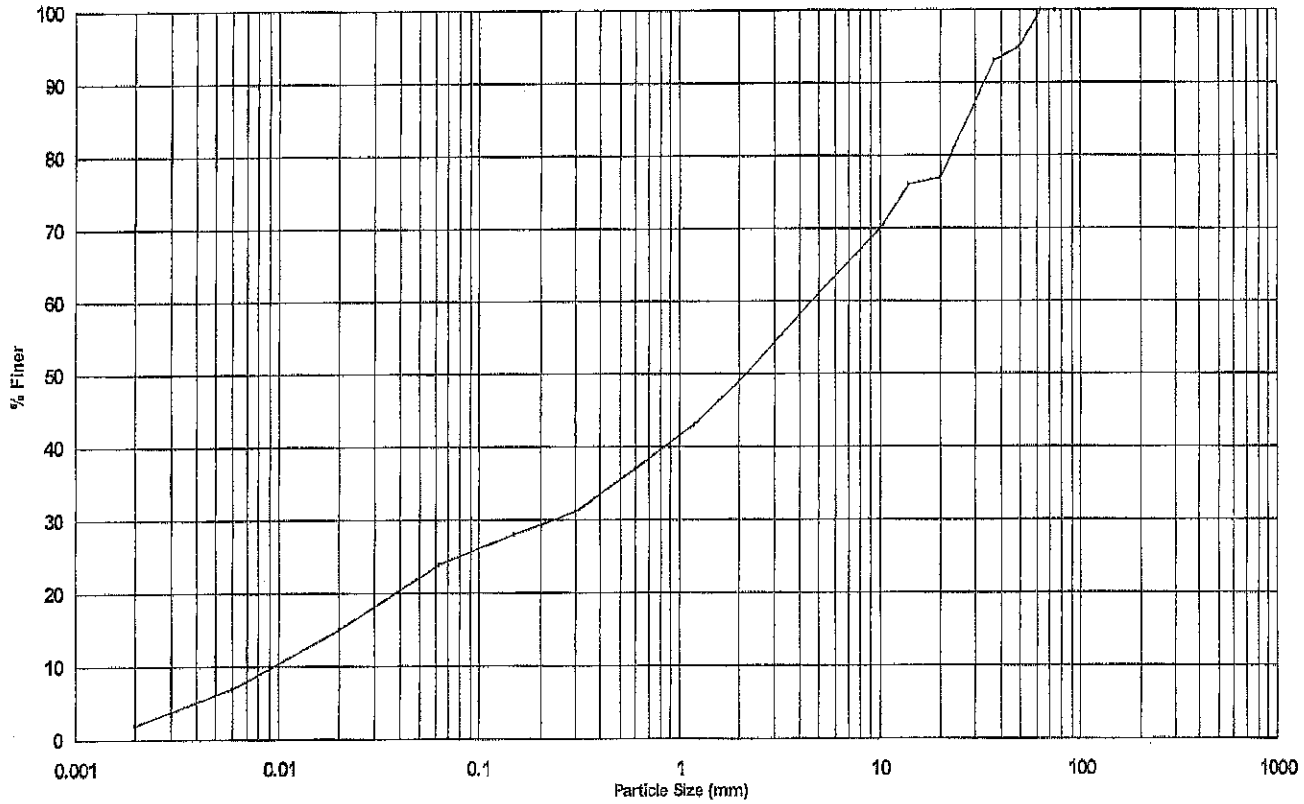
Project: PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN

Project No: PN071425

Hole	BH5
Sample Depth	1.50-2.00m
Sample Type	B
Sample Ref	N04255

Sample Description

MADE GROUND: Brown very silty very sandy gravel.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
CLAY	2
SILT	22
SAND	25
GRAVEL	50
COBBLES	1
BOULDERS	0

Size	Percentage Finer
125mm	100
100mm	100
75mm	100
63mm	100
50mm	95
37.5mm	93
28mm	-
20mm	77
14mm	76
10mm	70
6.3mm	-
5mm	61
3.35mm	-

Size	Percentage Finer
2mm	49
1.18mm	43
600μm	37
425μm	-
300μm	31
212μm	-
150μm	28
75μm	-
63μm	24
20μm	15
6μm	7
2μm	2

Uniformity Coefficient	
347.18	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	Pipette
Pre-treated with	Hydrogen Peroxide
% loss on Pre-treatment	2.05
Particle Density	2.65 (Assumed)

Remarks Test performed in accordance with BS 1377: Part 2: 1990

22/03/2007

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LABORATORY RESULTS - Chemical Analysis

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN **Project No:** PN071425

Sample					Sulphate			pH	Organic Content	Loss on Ignition	Chloride		
					In Soil						In Soil		
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Acid Soluble %	Water Soluble g/l	In Water g/l		%	%	Acid Soluble %	Water Soluble g/l	In Water g/l
BH1	5.50 (5.50)	D	N04218	Firm brown mottled grey slightly sandy CLAY/SILT.		0.21		6.94					
BH2	6.00-6.50 (6.00-6.50)	B	N04232	Grey silty very gravelly SAND.		0.05		6.03					
BH3	5.50 (5.50)	D	N04235	Firm grey slightly sandy CLAY/SILT.		0.08		7.88					
BH4	7.00 (7.00)	D	N04244	Firm grey slightly sandy CLAY/SILT.		0.10		7.80					
BH5	8.50 (8.50)	D	N04251	Firm grey CLAY/SILT.		0.12		7.40					

Remarks Tests performed in accordance with BS 1377: Part 3: 1990

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LABORATORY RESULTS - *MCV, Compaction, CBR*

Project PROPOSED LOG YARD IMPROVEMENTS - KRONOSPAN **Project No:** PN071425

Sample					MCV		Compaction					CBR				
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	MCV	w %	Type	w (Opt) %	ρ_d Mg/m³	γ_b Mg/m³	γ_d (Max) Mg/m³	Type	Top CBR %	Top w %	Bottom CBR %	Bottom w %
BH1	0.50-1.00 (0.50-1.00)	B	N04220	MADE GROUND: Grey/black slightly silty gravelly sand.						2.29	2.16	2.5kg	65	5.7	67	5.7
BH1	1.50-2.00 (1.50-2.00)	B	N04221	MADE GROUND: Grey/black slightly gravelly sandy clay.						1.84	1.37	2.5kg	0.58	36	0.47	33
BH2	0.50-1.00 (0.50-1.00)	U	N04229	MADE GROUND: Brown slightly silty gravelly sand.						2.07	1.76	2.5kg	3.4	18	4.4	17
BH2	1.50-2.00 (1.50-2.00)	B	N04230	MADE GROUND: Brown slightly silty gravelly sand.						2.21	1.96	2.5kg	6.1	13	7.1	13
BH3	0.90-1.20 (0.90-1.20)	B	N04237	Firm brown slightly sandy CLAY.						2.02	1.63	2.5kg	2.8	23	3.3	24
BH5	0.50-1.00 (0.50-1.00)	B	N04254	MADE GROUND: Brown slightly silty gravelly sand.						2.18	1.96	2.5kg	24	12	28	11
BH5	1.50-2.00 (1.50-2.00)	B	N04255	MADE GROUND: Brown very silty very sandy gravel.						2.25	2.00	2.5kg	5.9	13	9.0	12

Remarks Particle Density - a=assumed, m=measured
Tests performed in accordance with BS 1377: 1990

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LABORATORY RESULTS - *Consolidation e/logp Plot*

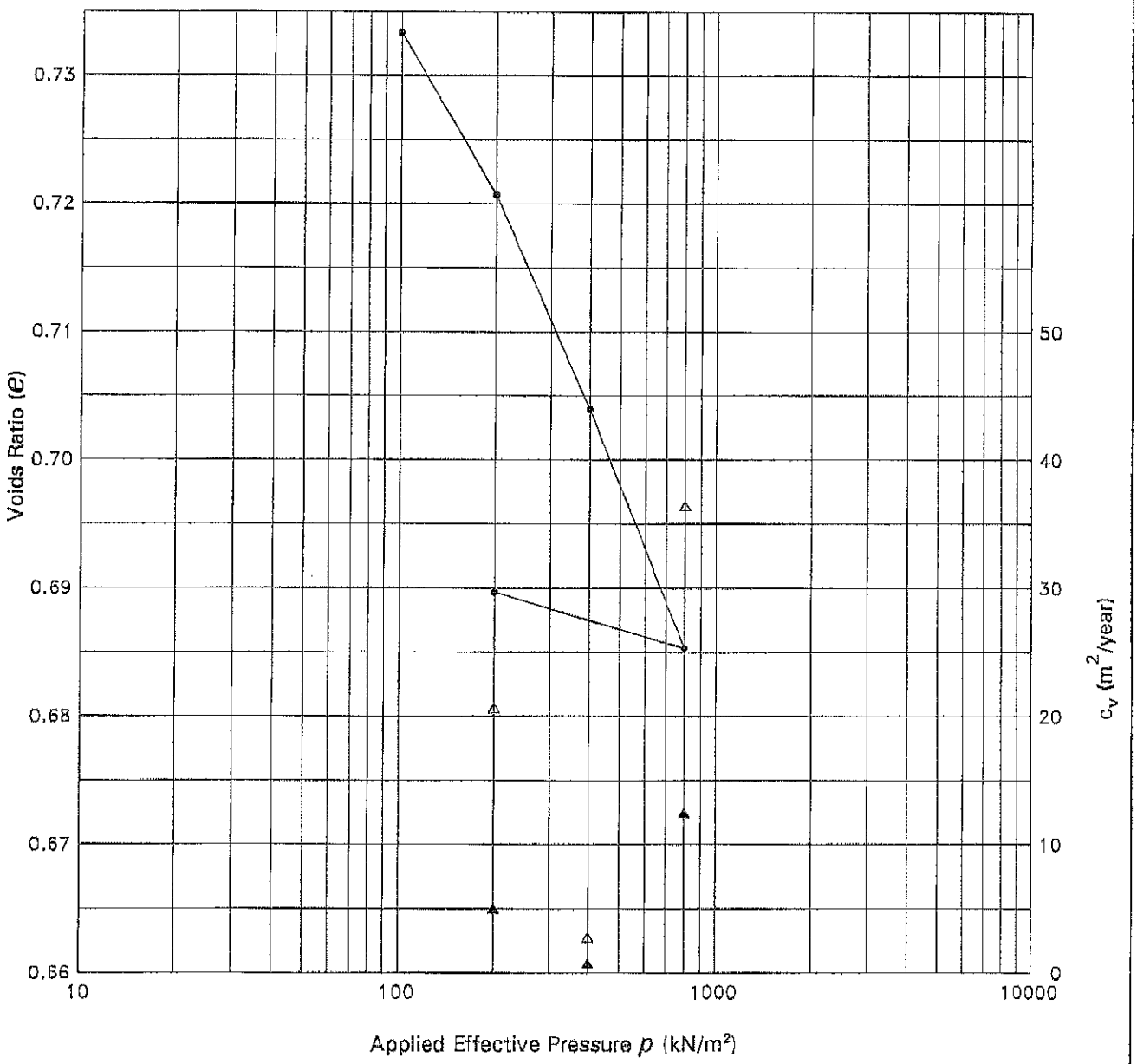
Project Proposed Log Yard Improvement Kronospan

Client

Project No PN071425
Borehole 2
Sample Depth 9.00 - 9.45 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-100	100-200	200-400	400-800	800-200					
m_v m²/MN	0.18	0.07	0.05	0.03	.00					
c_{v50} Log Time m²/yr	-	5.00	0.74	12.48	-					
c_{v90} Root Time m²/yr	-	20.64	2.77	36.40	-					
Voids Ratio	0.733	0.721	0.704	0.685	0.690					

Description
N04227 Stiff grey CLAY/SILT.PP = 1.0,1.25

Specimen Diameter	75.040	mm
Initial Height	18.960	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	0.765	

Initial Water Content	32.99	%
Final Water Content	24.42	%
Initial Saturation	100	%
Initial Bulk Density	2.00	Mg/m^3
Initial Dry Density	1.50	Mg/m^3

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

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LABORATORY RESULTS - *Consolidation e/logp Plot*

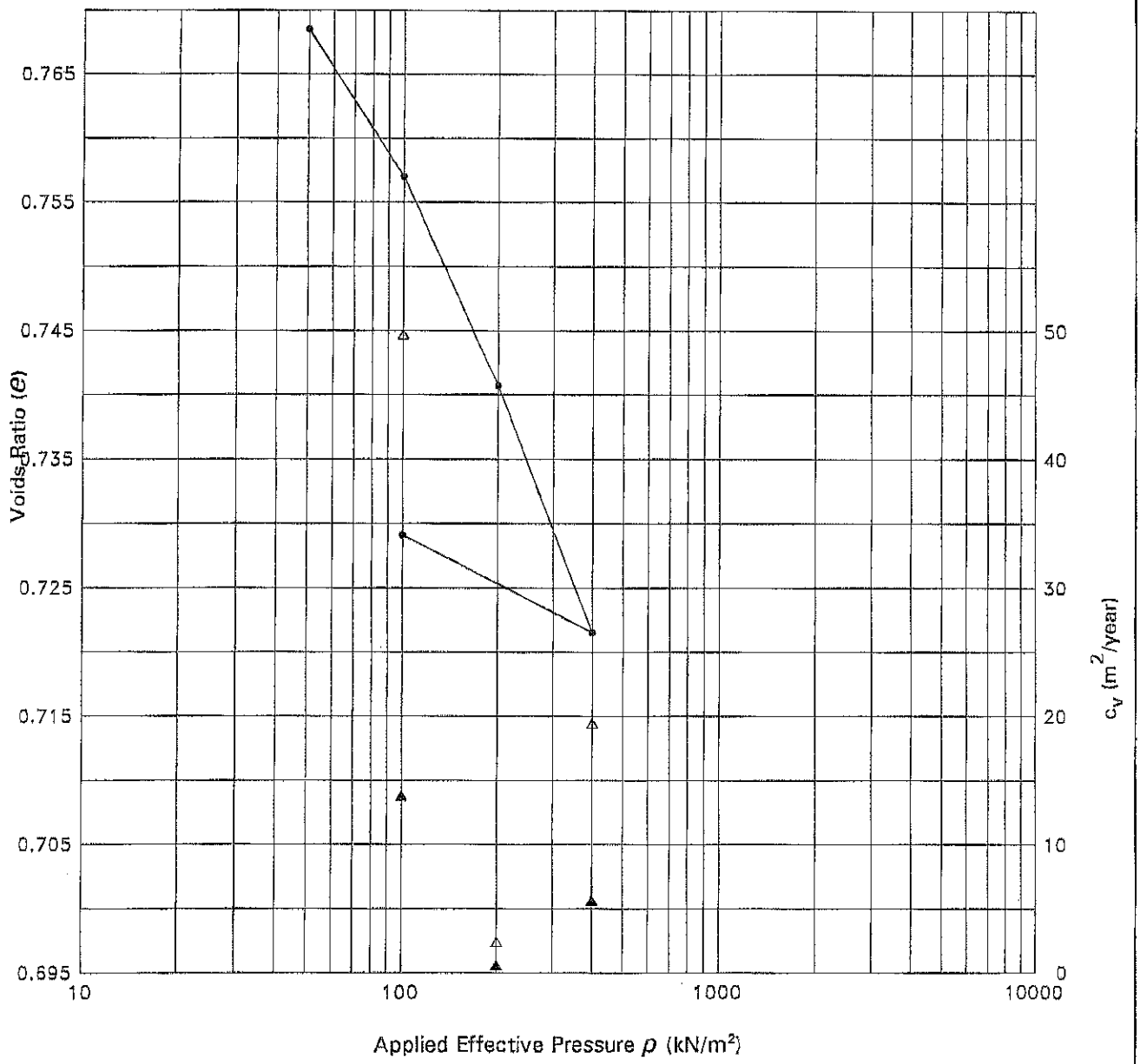
Project Proposed Log Yard Improvement Kronospan

Client

Project No PN071425
Borehole 4
Sample Depth 4.50 - 4.95 m
Sample Type U

The determination of one dimensional consolidation properties in accordance with Clause 3 of BS1377: Part 5: 1990

Symbols: Voids Ratio •, c_{v50} ▲, c_{v90} △



Applied Pressure kN/m²	0-50	50-100	100-200	200-400	400-100					
m_v m²/MN	0.39	0.13	0.09	0.06	0.01					
c_{v50} Log Time m²/yr	-	13.79	0.59	5.65	-					
c_{v90} Root Time m²/yr	-	49.70	2.41	19.42	-					
Voids Ratio	0.769	0.757	0.741	0.722	0.729					

Description
N04247 Firm grey slightly sandy CLAY/SILT.PP
= 1.5,2.25

Specimen Diameter	74.590	mm
Initial Height	19.000	mm
Particle Density	2.65 Assumed	
Initial Voids Ratio	0.804	

Initial Water Content	32.83	%
Final Water Content	29.74	%
Initial Saturation	100	%
Initial Bulk Density	1.95	Mg/m³
Initial Dry Density	1.47	Mg/m³

Remarks Laboratory temperature 20°C ± 4°C
Specimen cut vertically from base of sample

geotechnics

geotechnics

APPENDIX 5

LABORATORY TESTING - CHEMICAL/CONTAMINATION

ALcontrol Geochem

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.co.uk
website: www.alcontrol.co.uk

Geotechnics Ltd
The Geotechnical Centre
Unit 1
Borders Industrial Estate
River Lane
Saltney, Chester
CH4 8RJ ATTN: Colin Dodd

CERTIFICATE OF ANALYSIS

Date:	02 April, 2007
Our Reference:	07/03704/02/01
Your Reference:	PN071425
Location:	KRONOSPAN LOG YARD

A total of 15 samples was received for analysis between Tuesday, 27 February 2007 and Thursday, 01 March 2007 and completed on Monday, 02 April 2007. 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.

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	**Jane Seymour**	**David O'Hare**	**Caroline Suttie**
Customer Services	Customer Services	Customer Services	Customer Services

Valid if signed by any of the above signatories.

Compiled By

David O'Hare

MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING 1291

GROUP

ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 07/3704/02
CLIENT : Geotechnics Ltd
CONTACT : Colin Dodd
DATE OF RECEIPT : 27/02/07
LOCATION : KRONOSPAN LOG YARD

BATCH NUMBER : 1
CLIENT REF/CODE : PN071425
ORDER NUMBER : ON1561
TURNAROUND : 6 days

Numeric values indicate additional scheduling

* indicates test subcontracted

					UKAS Accredited ?	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓									
Sample Number	Sample Identity	P / V	Depth	Sample Type		Metals ICP. 9 (S)	pH (S)	Soil Organic Matter (S)	Sulphate Soluble Kone BRE 2:1 (S)	PAH Spec MS (S)	Phenols HPLC (S)	GRO BTEX MTBE GC (S)	EPH (DRO) (S)	TOC (S)	PCB 7 Congeners (S)	Mineral Oil C10-40 (S)	Acid Neutralising Capacity (S)	Coronene EZ (S)	Loss on Ignition (S)	CEN Leach 2:1	CEN Leach 8:1	Metals ICP-MS 9 (CEN 2:1)	Metals ICP-MS 9 (CEN 8:1)	Metals ICP-MS 9 (CEN 10:1C)	Barium (CEN 2:1) (ICP-MS)	Barium (CEN 8:1) (ICP-MS)	Barium (CEN 10:1C) (ICP-MS)	Molybdenum (CEN 2:1) (ICP-MS)	Molybdenum (CEN 8:1) (ICP-MS)
1	BH1	TUB 1kg	0.30	SOLID		X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2	2	2	2	2
2	BH1	JAR 250g	1.00	SOLID		X	X	X	X	X	X	X	X															
3	BH1	JAR 250g	2.50	SOLID		X	X	X	X	X	X	X	X															
4	BH2	JAR 250g	0.20	SOLID		X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2	2	2	2	2
5	BH2	JAR 250g	1.00	SOLID		X	X	X	X	X	X	X	X															
6	BH2	TUB 1kg	3.30	SOLID		X	X	X	X	X	X	X	X															
7	BH3	JAR 250g	0.20	SOLID		X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2	2	2	2	2
8	BH4	TUB 1kg	0.20	SOLID		X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2	2	2	2	2
9	BH5	JAR 250g	0.50	SOLID		X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2	2	2	2	2
10	BH5	TUB 1kg	2.30	SOLID		X	X	X	X	X	X	X	X															
					Total Number of Tests	10	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

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ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 07/3704/02
CLIENT : Geotechnics Ltd
CONTACT : Colin Dodd
DATE OF RECEIPT : 27/02/07
LOCATION : KRONOSPAN LOG YARD

BATCH NUMBER : 1
CLIENT REF/CODE : PN071425
ORDER NUMBER : ON1561
TURNAROUND : 6 days

Numeric values indicate additional scheduling

* indicates test subcontracted

			UKAS Accredited ?																										
Sample Number	Sample Identity	P / V	Depth	Sample Type	Molybdenum (CEN 10:1C) (ICP-MS)	Mercury (CEN 2:1) (CVAA)	Mercury (CEN 8:1) (CVAA)	Mercury (CEN 10:1C) (CVAA)	Antimony (CEN 2:1) (ICP-MS)	Antimony (CEN 8:1) (ICP-MS)	Antimony (CEN 10:1C) (ICP-MS)	Chloride Kone (CEN 2:1)	Chloride Kone (CEN 8:1)	Chloride Kone (CEN 10:1C)	Fluoride Kone (CEN 2:1)	Fluoride Kone (CEN 8:1)	Fluoride Kone (CEN 10:1C)	Sulphate Kone (CEN 2:1)	Sulphate Kone (CEN 8:1)	Sulphate Kone (CEN 10:1C)	Phenols HPLC (CEN 2:1)	Phenols HPLC (CEN 8:1)	Phenols HPLC (CEN 10:1C)	DOC (CEN 2:1)	DOC (CEN 8:1)	DOC (CEN 10:1C)	TDS (CEN 2:1)	TDS (CEN 8:1)
1	BH1	TUB 1kg	0.30	SOLID	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	BH1	JAR 250g	1.00	SOLID																									
3	BH1	JAR 250g	2.50	SOLID																									
4	BH2	JAR 250g	0.20	SOLID	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	BH2	JAR 250g	1.00	SOLID																									
6	BH2	TUB 1kg	3.30	SOLID																									
7	BH3	JAR 250g	0.20	SOLID	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	BH4	TUB 1kg	0.20	SOLID	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	BH5	JAR 250g	0.50	SOLID	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	BH5	TUB 1kg	2.30	SOLID																									
		Total Number of Tests			5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

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ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 07/3704/02
CLIENT : Geotechnics Ltd
CONTACT : Colin Dodd
DATE OF RECEIPT : 27/02/07
LOCATION : KRONOSPAN LOG YARD

BATCH NUMBER : 1
CLIENT REF/CODE : PN071425
ORDER NUMBER : ON1561
TURNAROUND : 6 days

Numeric values indicate additional scheduling

* indicates test subcontracted

			UKAS Accredited ?		
Sample Number	Sample Identity	P / V	Depth	Sample Type	TDS (CEN 10:1C)
1	BH1	TUB 1kg	0.30	SOLID	2
2	BH1	JAR 250g	1.00	SOLID	
3	BH1	JAR 250g	2.50	SOLID	
4	BH2	JAR 250g	0.20	SOLID	2
5	BH2	JAR 250g	1.00	SOLID	
6	BH2	TUB 1kg	3.30	SOLID	
7	BH3	JAR 250g	0.20	SOLID	2
8	BH4	TUB 1kg	0.20	SOLID	2
9	BH5	JAR 250g	0.50	SOLID	2
10	BH5	TUB 1kg	2.30	SOLID	
			Total Number of Tests		5

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ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 07/3704/02
CLIENT : Geotechnics Ltd
CONTACT : Colin Dodd
DATE OF RECEIPT : 01/03/07
LOCATION : KRONOSPAN LOG YARD

BATCH NUMBER : 2
CLIENT REF/CODE : PN071425
ORDER NUMBER :
TURNAROUND : 8 days

Numeric values indicate additional scheduling

* indicates test subcontracted

		UKAS Accredited ?																									
Sample Number	Sample Identity	P / V	Depth	Sample Type	CEN Leach 2:1	CEN Leach 8:1	Metals ICP-MS 9 (CEN 2:1)	Metals ICP-MS 9 (CEN 8:1)	Metals ICP-MS 9 (CEN 10:1C)	Barium (CEN 2:1) (ICP-MS)	Barium (CEN 8:1) (ICP-MS)	Barium (CEN 10:1C) (ICP-MS)	Molybdenum (CEN 2:1) (ICP-MS)	Molybdenum (CEN 8:1) (ICP-MS)	Molybdenum (CEN 10:1C) (ICP-MS)	Mercury (CEN 2:1) (CVAA)	Mercury (CEN 8:1) (CVAA)	Mercury (CEN 10:1C) (CVAA)	Antimony (CEN 2:1) (ICP-MS)	Antimony (CEN 8:1) (ICP-MS)	Antimony (CEN 10:1C) (ICP-MS)	Chloride Kone (CEN 2:1)	Chloride Kone (CEN 8:1)	Chloride Kone (CEN 10:1C)	Fluoride Kone (CEN 2:1)	Fluoride Kone (CEN 8:1)	Fluoride Kone (CEN 10:1C)	Sulphate Kone (CEN 2:1)
11	BH1	JAR 250g	0.20	SOLID	Sample on Hold																							
12	BH2	1KGTub	0.30	SOLID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13	BH3	1KGTub	0.30	SOLID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	BH4	1KGTub	0.30	SOLID	Sample on Hold																							
15	BH5	1KGTub	0.30	SOLID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Total Number of Tests			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

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ALcontrol Geochem
TEST SCHEDULE

JOB NUMBER : 07/3704/02
CLIENT : Geotechnics Ltd
CONTACT : Colin Dodd
DATE OF RECEIPT : 01/03/07
LOCATION : KRONOSPAN LOG YARD

BATCH NUMBER : 2
CLIENT REF/CODE : PN071425
ORDER NUMBER :
TURNAROUND : 8 days

Numeric values indicate additional scheduling

* indicates test subcontracted

		UKAS Accredited ?																																			
Sample Number	Sample Identity	P / V	Depth	Sample Type	Sulphate Kone (CEN 8:1)	Sulphate Kone (CEN 10:1C)	Phenols HPLC (CEN 2:1)	Phenols HPLC (CEN 8:1)	Phenols HPLC (CEN 10:1C)	DOC (CEN 2:1)	DOC (CEN 8:1)	DOC (CEN 10:1C)	TDS (CEN 2:1)	TDS (CEN 8:1)	TDS (CEN 10:1C)																							
11	BH1	JAR 250g	0.20	SOLID	Sample on Hold																																
12	BH2	1KGTub	0.30	SOLID	X	X	X	X	X	X	X	X	X	X	X																						
13	BH3	1KGTub	0.30	SOLID	X	X	X	X	X	X	X	X	X	X	X																						
14	BH4	1KGTub	0.30	SOLID	Sample on Hold																																
15	BH5	1KGTub	0.30	SOLID	X	X	X	X	X	X	X	X	X	X	X																						
		Total Number of Tests			3	3	3	3	3	3	3	3	3	3	3																						

Printed : 02/04/07 09:51:42

ISO 17025 Form	FORM NO:SQS 105
ALCONTROL LABORATORIES	SHEET 1 OF 1
	ISSUE NO: 2
	WRITTEN BY: DOH
Title of Form	ISSUE DATE: 27/01/05
Notification of NDP's (No determination possible).	APPROVED BY: DP

Job Number : 3704
Client : Geotechnics
Sample Type : Soil

Job No.	Sample No.	Sample ID.	Analyte(s)	Reason
3704	4	BH2	CEN 2:1 & 8:1	insufficient soil
3704	7	BH3	CEN 2:1 & 8:1	insufficient soil
3704	9	BH5	CEN 2:1 & 8:1	insufficient soil

ALcontrol Geochem

Extractable Petroleum Hydrocarbons (EPH) By GC-FID

Carbon Range C10-C40

Job Number : 07/03704/02/01
Client : Geotechnics Ltd
Client Ref : PN071425
Matrix [Units] : SOLID [mg/kg]

All results expressed on a dry weight basis.

Sample No	Sample Identity	Depth	EPH	Interpretation
1	BH1	0.3	120	used engine oil/humic acids
2	BH1	1.0	260	used engine oil/PAHs/humic acids
3	BH1	2.5	3500	unknown pattern detected
4	BH2	0.2	110	possible biodegraded diesel/humic acids
5	BH2	1.0	1300	unknown pattern detected
6	BH2	3.3	180	possible biodegraded diesel/humic acids
7	BH3	0.2	200	used engine oil/humic acids
8	BH4	0.2	890	unknown pattern detected
9	BH5	0.5	300	used engine oil/humic acids
10	BH5	2.3	160	used engine oil/humic acids

Extractable Petroleum Hydrocarbons (formally Diesel Range Organics) :- Any compound extractable in n-hexane within the carbon range C10-C40, includes Aliphatic (Min Oil), Aromatic (PAHs) and naturally occurring compounds.

ALcontrol Geochem Analytical Services
Sample Descriptions

Job Number: 07/03704/02/01
Client: Geotechnics Ltd
Client Ref : PN071425

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
BH1	0.3	Brown	0.1mm - 2mm	Clay with some Stones	1
BH1	1.0	Black	0.1mm - 0.063mm	Top Soil with some Stones	1
BH1	2.5	Brown	0.1mm - 2mm	Clay with some Stones	1
BH2	0.2	Brown	0.1mm - 2mm	Clay with some Stones	1
BH2	1.0	Black	0.1mm - 2mm	Clay with some Stones	1
BH2	3.3	Brown	0.1mm - 2mm	Clay with some Stones	1
BH3	0.2	Brown	0.1mm - 2mm	Clay with some Stones	1
BH4	0.2	Black	0.1mm - 2mm	Clay with some Stones	1
BH5	0.5	Brown	0.1mm - 2mm	Top Soil with some Stones	1
BH5	2.3	Brown	0.1mm - 2mm	Clay with some Stones	1

* 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: 07/03704/02/01 **Matrix:** SOLID
Client: Geotechnics Ltd **Location:** KRONOSPAN LOG YARD
Client Ref. No.: PN071425 **Client Contact:** Colin Dodd

Sample Identity	BH1	BH1	BH1	BH2	BH2	BH2	BH3	BH4	BH5	Method Code	LoD/Units
Depth (m)	0.3	1.0	2.5	0.2	1.0	3.3	0.2	0.2	0.5		
Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID		
Sampled Date	30.01.07	30.01.07	30.01.07	31.01.07	31.01.07	31.01.07	01.02.07		05.02.07		
Sample Received Date	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1	2	3	4	5	6	7	8	9		
Arsenic	<3	13	18	7	9	15	5	5	11	TM129#M	<3.0 mg/kg
Cadmium	<0.3	0.7	0.8	100	5.4	1.1	0.6	0.4	0.6	TM129	<0.3 mg/kg
Chromium	2200	24	15	53	15	33	25	1600	33	TM129#M	<4.5 mg/kg
Copper	52	37	31	19	22	8	33	36	17	TM129#M	<6 mg/kg
Lead	30	98	81	270	19	39	4	82	30	TM129#M	<2 mg/kg
Mercury	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	TM129#M	<0.6 mg/kg
Nickel	16	25	30	16	11	24	19	20	21	TM129#M	<0.9 mg/kg
Selenium	<3	<3	<3	<3	<3	<3	<3	<3	<3	TM129#M	<3 mg/kg
Zinc	87	130	130	170	56	84	66	130	54	TM129#M	<2.5 mg/kg
ANC at pH4	<0.03	-	-	<0.03	-	-	<0.03	<0.03	<0.03	TM159	<0.03 mol H+/kg
ANC at pH7	<0.03	-	-	<0.03	-	-	<0.03	<0.03	<0.03	TM159	<0.03 mol H+/kg
Soil Organic Matter	<0.35	4.2	55	3.0	0.72	11	2.5	0.80	4.4	TM050#	<0.35 %
Total Organic Carbon	<0.2	-	-	1.7	-	-	1.5	0.5	2.5	TM050#	<0.2 %
Phenols Monohydric	<0.15	<0.15	<0.15	<0.15	0.20	<0.15	<0.15	1.4	<0.15	TM062#M	<0.15 mg/kg
Loss on Ignition	2.2	-	-	3.4	-	-	3.1	16	3.1	TM018#M	<0.3 %
pH Value	10.77	7.61	6.44	7.91	7.62	7.90	7.88	7.90	8.24	TM133#M	<1.00 pH Units
Soluble Sulphate 2:1 Extract as SO4 BRE	0.030	0.53	0.15	0.005	0.026	0.057	0.034	0.16	0.33	TM098#	<0.003 g/l
EPH (DRO) (C10-C40)	120	260	3500	110	1300	180	200	890	300	TM061#M	<35 mg/kg
Mineral Oil	88	-	-	30	-	-	130	240	150	TM061#	<1 mg/kg
GRO (C4-C10)	<10	<10	<10	<10	<10	<10	<10	<10	81	TM089#M	<10 ug/kg
GRO (C10-C12)	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
Benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
Toluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
Ethyl benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
m & p Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
o Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
Sum m&p and o Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
Sum of BTEX	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#M	<10 ug/kg
MTBE	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Coronene	<2	-	-	<2	-	-	<2	<2	<2	TM154	<2 mg/kg

All results expressed on a dry weight basis.

Date 02.04.2007

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

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

Job Number: 07/03704/02/01 **Matrix:** SOLID
Client: Geotechnics Ltd **Location:** KRONOSPAN LOG YARD
Client Ref. No.: PN071425 **Client Contact:** Colin Dodd

Sample Identity	BH1	BH1	BH1	BH2	BH2	BH2	BH3	BH4	BH5	Method Code	LoD/Units
Depth (m)	0.3	1.0	2.5	0.2	1.0	3.3	0.2	0.2	0.5		
Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID		
Sampled Date	30.01.07	30.01.07	30.01.07	31.01.07	31.01.07	31.01.07	01.02.07		05.02.07		
Sample Received Date	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1	2	3	4	5	6	7	8	9		
PAH by GCMS											
Naphthalene	100	260	5000	21	60	31	41	130	230	TM074#M	<10 ug/kg
Acenaphthylene	10	22	180	<5	10	<5	<5	42	11	TM074#M	<5 ug/kg
Acenaphthene	<14	<28	130	<14	<14	<14	<14	29	20	TM074#M	<14 ug/kg
Fluorene	<12	41	290	<12	<12	<12	<12	49	39	TM074#M	<12 ug/kg
Phenanthrene	110	320	9300	52	110	45	44	190	230	TM074#M	<21 ug/kg
Anthracene	18	75	1100	17	34	<9	<9	55	36	TM074#M	<9 ug/kg
Fluoranthene	89	450	3500	44	100	36	27	300	140	TM074#M	<25 ug/kg
Pyrene	71	390	2500	44	120	36	27	250	130	TM074#M	<22 ug/kg
Benz(a)anthracene	55	280	1400	36	53	37	27	87	56	TM074#M	<12 ug/kg
Chrysene	46	340	1400	36	53	37	18	110	65	TM074#M	<10 ug/kg
Benzo(b)fluoranthene	37	340	690	36	38	37	18	67	47	TM074#M	<16 ug/kg
Benzo(k)fluoranthene	37	160	380	27	30	28	<25	58	47	TM074#M	<25 ug/kg
Benzo(a)pyrene	37	260	480	27	38	37	18	58	47	TM074#M	<12 ug/kg
Indeno(123cd)pyrene	31	160	420	29	45	31	30	36	31	TM074#M	<11 ug/kg
Dibenzo(ah)anthracene	20	45	320	19	36	21	20	36	21	TM074#M	<8 ug/kg
Benzo(ghi)perylene	41	200	810	39	63	41	30	60	52	TM074#M	<10 ug/kg
PAH 16 Total	700	3400	28000	430	790	420	300	1600	1200	TM074#M	<25 ug/kg

All results expressed on a dry weight basis.

Date 02.04.2007

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
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* Subcontracted test
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Job Number: 07/03704/02/01 **Matrix:** SOLID
Client: Geotechnics Ltd **Location:** KRONOSPAN LOG YARD
Client Ref. No.: PN071425 **Client Contact:** Colin Dodd

Sample Identity	BH1	BH1	BH1	BH2	BH2	BH2	BH3	BH4	BH5	Method Code	LoD/Units
Depth (m)	0.3	1.0	2.5	0.2	1.0	3.3	0.2	0.2	0.5		
Sample Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID		
Sampled Date	30.01.07	30.01.07	30.01.07	31.01.07	31.01.07	31.01.07	01.02.07		05.02.07		
Sample Received Date	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07	27.02.07		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1	2	3	4	5	6	7	8	9		
PCB 7 Congeners											
PCB congener 28	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
PCB congener 52	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
PCB congener 101	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
PCB congener 118	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
PCB congener 153	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
PCB congener 138	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
PCB congener 180	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg
Total of 7 Congener PCBs	<1	-	-	<1	-	-	<1	<5	<1	TM070	<1 ug/kg

All results expressed on a dry weight basis.

Date 02.04.2007

Validated ☑
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ALcontrol Geochem Analytical Services
Table Of Results

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Job Number: 07/03704/02/01 **Matrix:** SOLID
Client: Geotechnics Ltd **Location:** KRONOSPAN LOG YARD
Client Ref. No.: PN071425 **Client Contact:** Colin Dodd

Sample Identity	BH5									Method Code	LoD/Units
Depth (m)	2.3										
Sample Type	SOLID										
Sampled Date	05.02.07										
Sample Received Date	27.02.07										
Batch	1										
Sample Number(s)	10										
Arsenic	17									TM129#M	<3.0 mg/kg
Cadmium	<0.3									TM129	<0.3 mg/kg
Chromium	35									TM129#M	<4.5 mg/kg
Copper	<6									TM129#M	<6 mg/kg
Lead	16									TM129#M	<2 mg/kg
Mercury	<0.6									TM129#M	<0.6 mg/kg
Nickel	28									TM129#M	<0.9 mg/kg
Selenium	<3									TM129#M	<3 mg/kg
Zinc	87									TM129#M	<2.5 mg/kg
ANC at pH4	-									TM159	<0.03 mol H+/kg
ANC at pH7	-									TM159	<0.03 mol H+/kg
Soil Organic Matter	1.0									TM050#	<0.35 %
Total Organic Carbon	-									TM050#	<0.2 %
Phenols Monohydric	<0.15									TM062#M	<0.15 mg/kg
Loss on Ignition	-									TM018#M	<0.3 %
pH Value	7.74									TM133#M	<1.00 pH Units
Soluble Sulphate 2:1 Extract as SO4 BRE	0.021									TM098#	<0.003 g/l
EPH (DRO) (C10-C40)	160									TM061#M	<35 mg/kg
Mineral Oil	-									TM061#	<1 mg/kg
GRO (C4-C10)	<10									TM089#M	<10 ug/kg
GRO (C10-C12)	<10									TM089#M	<10 ug/kg
Benzene	<10									TM089#M	<10 ug/kg
Toluene	<10									TM089#M	<10 ug/kg
Ethyl benzene	<10									TM089#M	<10 ug/kg
m & p Xylene	<10									TM089#M	<10 ug/kg
o Xylene	<10									TM089#M	<10 ug/kg
Sum m&p and o Xylene	<10									TM089#M	<10 ug/kg
Sum of BTEX	<10									TM089#M	<10 ug/kg
MTBE	<10									TM089#	<10 ug/kg
Coronene	-									TM154	<2 mg/kg

All results expressed on a dry weight basis.

Date 02.04.2007

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ALcontrol Geochem Analytical Services
Table Of Results

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Job Number: 07/03704/02/01 **Matrix:** SOLID
Client: Geotechnics Ltd **Location:** KRONOSPAN LOG YARD
Client Ref. No.: PN071425 **Client Contact:** Colin Dodd

Sample Identity	BH5									Method Code	LoD/Units
Depth (m)	2.3										
Sample Type	SOLID										
Sampled Date	05.02.07										
Sample Received Date	27.02.07										
Batch	1										
Sample Number(s)	10										
PAH by GCMS											
Naphthalene	21									TM074#M	<10 ug/kg
Acenaphthylene	<5									TM074#M	<5 ug/kg
Acenaphthene	<14									TM074#M	<14 ug/kg
Fluorene	<12									TM074#M	<12 ug/kg
Phenanthrene	35									TM074#M	<21 ug/kg
Anthracene	<9									TM074#M	<9 ug/kg
Fluoranthene	26									TM074#M	<25 ug/kg
Pyrene	26									TM074#M	<22 ug/kg
Benz(a)anthracene	27									TM074#M	<12 ug/kg
Chrysene	18									TM074#M	<10 ug/kg
Benzo(b)fluoranthene	18									TM074#M	<16 ug/kg
Benzo(k)fluoranthene	<25									TM074#M	<25 ug/kg
Benzo(a)pyrene	18									TM074#M	<12 ug/kg
Indeno(123cd)pyrene	30									TM074#M	<11 ug/kg
Dibenzo(ah)anthracene	10									TM074#M	<8 ug/kg
Benzo(ghi)perylene	30									TM074#M	<10 ug/kg
PAH 16 Total	260									TM074#M	<25 ug/kg

All results expressed on a dry weight basis.

Date 02.04.2007

ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.18294	Moisture Content Ratio (%) =	4.31
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	95.86
Particle Size <4mm =	>95%		

Job Number	**200703704**	**Landfill Waste Acceptance Criteria Limits**		
Batch	**1**			
Sample Number(s)	**1**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**30/01/07**			
Sample Identity	**BH1**			
Depth (m)	**0.3**			
Solid Waste Analysis				
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	2.2	-	-	10
um of BTEX (mg/kg)	<0.01	6	-	-
Sum of 7 PCBs (mg/kg)	<0.001	1	-	-
Mineral Oil (mg/kg)	88	500	-	-
PAH Sum of 17(mg/kg)	-	100	-	-
pH (pH Units)	6.44	-	>6	-
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	<0.03	-	to be evaluated	to be evaluated

Eluate Analysis	**Conc^n in 2:1 eluate**	**Conc^n in 8:1 eluate**	**2:1 conc^n leached**	**Cumulative conc^n leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Arsenic	<0.001	0.002	<0.002	0.02	0.5	2	25
Barium	0.038	0.024	0.08	0.26	20	100	300
Cadmium	<0.0004	<0.0004	<0.0008	<0.004	0.04	1	5
Chromium	0.030	0.011	0.06	0.14	0.5	10	70
Copper	0.12	0.021	0.24	0.35	2	50	100
Mercury	<0.00005	<0.00005	<0.0001	<0.0005	0.01	0.2	2
Molybdenum	0.11	0.014	0.22	0.28	0.5	10	30
Nickel	0.018	0.004	0.04	0.06	0.4	10	40
Lead	<0.001	0.006	<0.002	0.05	0.5	10	50
ntimony	<0.005	<0.005	<0.01	<0.05	0.06	0.7	5
Selenium	<0.001	<0.001	<0.002	<0.01	0.1	0.5	7
Zinc	<0.003	0.004	<0.006	0.03	4	50	200
Chloride	17	2	34	41	800	15000	25000
Fluoride	0.6	<0.5	1	<5	10	150	500
Sulphate as SO_4	53	25	110	290	1000	20000	50000
Total Dissolved Solids	370	200	740	2200	4000	60000	100000
Phenols Monohydric	<0.01	<0.01	<0.02	<0.1	1	-	-
Dissolved Organic Carbon	21	5	42	73	500	800	1000

Leach Test Information		
Date Prepared	01/03/07	02/03/07
pH (pH Units)	11.10	11.0
Conductivity (µS/cm)	830	520
Temperature (°C)	19.8	19.1
Volume Leachant (Litres)	0.342	1.4
Volume of Eluate VE1 (Litres)	0.25	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	-	Moisture Content Ratio (%) =	16.36
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	85.94
Particle Size <4mm =	>95%		

Job Number	**200703704**	**Landfill Waste Acceptance Criteria Limits**		
Batch	**1**			
Sample Number(s)	**4**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**31/01/07**			
Sample Identity	**BH2**			
Depth (m)	**0.2**			
Solid Waste Analysis				
Total Organic Carbon (%)	1.7	3	5	6
Loss on Ignition (%)	3.4	-	-	10
Sum of BTEX (mg/kg)	<0.01	6	-	-
Sum of 7 PCBs (mg/kg)	<0.001	1	-	-
Mineral Oil (mg/kg)	30	500	-	-
PAH Sum of 17(mg/kg)	-	100	-	-
pH (pH Units)	7.90	-	>6	-
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	<0.03	-	to be evaluated	to be evaluated

Eluate Analysis	**Conc^n in 2:1 eluate**	**Conc^n in 8:1 eluate**	**2:1 conc^n leached**	**Cumulative conc^n leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Arsenic	NDP	NDP	NDP	NDP	0.5	2	25
Barium	NDP	NDP	NDP	NDP	20	100	300
Cadmium	NDP	NDP	NDP	NDP	0.04	1	5
Chromium	NDP	NDP	NDP	NDP	0.5	10	70
Copper	NDP	NDP	NDP	NDP	2	50	100
Mercury	NDP	NDP	NDP	NDP	0.01	0.2	2
Molybdenum	NDP	NDP	NDP	NDP	0.5	10	30
Nickel	NDP	NDP	NDP	NDP	0.4	10	40
Lead	NDP	NDP	NDP	NDP	0.5	10	50
ntimony	NDP	NDP	NDP	NDP	0.06	0.7	5
Selenium	NDP	NDP	NDP	NDP	0.1	0.5	7
Zinc	NDP	NDP	NDP	NDP	4	50	200
Chloride	NDP	NDP	NDP	NDP	800	15000	25000
Fluoride	NDP	NDP	NDP	NDP	10	150	500
Sulphate as SO_4	NDP	NDP	NDP	NDP	1000	20000	50000
Total Dissolved Solids	NDP	NDP	NDP	NDP	4000	60000	100000
Phenols Monohydric	NDP	NDP	NDP	NDP	1	-	-
Dissolved Organic Carbon	NDP	NDP	NDP	NDP	500	800	1000

Leach Test Information		
Date Prepared	-	-
pH (pH Units)	-	-
Conductivity (µS/cm)	-	-
Temperature (°C)	-	-
Volume Leachant (Litres)	-	-
Volume of Eluate VE1 (Litres)	-	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.19782	Moisture Content Ratio (%) =	13.33
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	88.24
Particle Size <4mm =	>95%		

Job Number	**200703704**
Batch	**2**
Sample Number(s)	**12**
Sampled Date	**-**
Sample Identity	**BH2**
Depth (m)	**0.3**

Solid Waste Analysis	
Total Organic Carbon (%)	1.7
Loss on Ignition (%)	3.4
um of BTEX (mg/kg)	<0.01
Sum of 7 PCBs (mg/kg)	<0.001
Mineral Oil (mg/kg)	30
PAH Sum of 17(mg/kg)	-
pH (pH Units)	7.90
ANC to pH 7 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	<0.03

Eluate Analysis	**Conc^n in 2:1 eluate** C_2 mg/l	**Conc^n in 8:1 eluate** C_8 mg/l	**2:1 conc^n leached** A_2 mg/kg	**Cumulative conc^n leached** A_{2-10} mg/kg
Arsenic	0.004	0.004	0.01	0.04
Barium	0.31	0.19	0.63	2.1
Cadmium	0.0051	0.0020	0.01	0.025
Chromium	0.24	0.12	0.47	1.3
Copper	0.009	0.009	0.02	0.09
Mercury	<0.00005	<0.00005	<0.0001	<0.0005
Molybdenum	0.033	0.015	0.07	0.18
Nickel	0.004	<0.001	0.01	0.01
Lead	0.003	0.002	0.01	0.02
ntimony	0.006	<0.005	0.01	<0.05
Selenium	0.002	<0.001	<0.002	<0.01
Zinc	0.007	<0.003	0.01	<0.03
Chloride	3	<1	6	<10
Fluoride	0.8	0.5	2	5
Sulphate as SO_4	11	<3	22	<30
Total Dissolved Solids	110	50	230	600
Phenols Monohydric	0.02	<0.01	<0.02	<0.1
Dissolved Organic Carbon	8	3	16	38

Leach Test Information		
Date Prepared	21/03/07	22/03/07
pH (pH Units)	8.221	8.607
Conductivity (µS/cm)	216	95.4
Temperature (°C)	19.6	20.1
Volume Leachant (Litres)	0.327	1.4
Volume of Eluate VE1 (Litres)	0.28	

Landfill Waste Acceptance Criteria Limits		
Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	to be evaluated	to be evaluated
-	to be evaluated	to be evaluated

Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15000	25000
10	150	500
1000	20000	50000
4000	60000	100000
1	-	-
500	800	1000

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	-	Moisture Content Ratio (%) =	6.53
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	93.87
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Batch	**1**			
Sample Number(s)	**7**			
Sampled Date	**01/02/07**			
Sample Identity	**BH3**			
Depth (m)	**0.2**			
Solid Waste Analysis				
Total Organic Carbon (%)	1.5	3	5	6
Loss on Ignition (%)	3.1	-	-	10
um of BTEX (mg/kg)	<0.01	6	-	-
Sum of 7 PCBs (mg/kg)	<0.001	1	-	-
Mineral Oil (mg/kg)	130	500	-	-
PAH Sum of 17(mg/kg)	-	100	-	-
pH (pH Units)	7.88	-	>6	-
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	<0.03	-	to be evaluated	to be evaluated

Eluate Analysis	Conc^{n} in 2:1 eluate	Conc^{n} in 8:1 eluate	2:1 conc^{n} leached	Cumulative conc^{n} leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Arsenic	NDP	NDP	NDP	NDP	0.5	2	25
Barium	NDP	NDP	NDP	NDP	20	100	300
Cadmium	NDP	NDP	NDP	NDP	0.04	1	5
Chromium	NDP	NDP	NDP	NDP	0.5	10	70
Copper	NDP	NDP	NDP	NDP	2	50	100
Mercury	NDP	NDP	NDP	NDP	0.01	0.2	2
Molybdenum	NDP	NDP	NDP	NDP	0.5	10	30
Nickel	NDP	NDP	NDP	NDP	0.4	10	40
Lead	NDP	NDP	NDP	NDP	0.5	10	50
ntimony	NDP	NDP	NDP	NDP	0.06	0.7	5
Selenium	NDP	NDP	NDP	NDP	0.1	0.5	7
Zinc	NDP	NDP	NDP	NDP	4	50	200
Chloride	NDP	NDP	NDP	NDP	800	15000	25000
Fluoride	NDP	NDP	NDP	NDP	10	150	500
Sulphate as SO_4	NDP	NDP	NDP	NDP	1000	20000	50000
Total Dissolved Solids	NDP	NDP	NDP	NDP	4000	60000	100000
Phenols Monohydric	NDP	NDP	NDP	NDP	1	-	-
Dissolved Organic Carbon	NDP	NDP	NDP	NDP	500	800	1000

Leach Test Information		
Date Prepared	-	-
pH (pH Units)	-	-
Conductivity (µS/cm)	-	-
Temperature (°C)	-	-
Volume Leachant (Litres)	-	-
Volume of Eluate VE1 (Litres)	-	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.18707	Moisture Content Ratio (%) =	7.10
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	93.37
Particle Size <4mm =	>95%		

Job Number	**200703704**
Batch	**2**
Sample Number(s)	**13**
Sampled Date	**-**
Sample Identity	**BH3**
Depth (m)	**0.3**

Solid Waste Analysis	
Total Organic Carbon (%)	1.5
Loss on Ignition (%)	3.1
Sum of BTEX (mg/kg)	<0.01
Sum of 7 PCBs (mg/kg)	<0.001
Mineral Oil (mg/kg)	130
PAH Sum of 17(mg/kg)	-
pH (pH Units)	7.88
ANC to pH 7 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	<0.03

Eluate Analysis	**Conc^{n} in 2:1 eluate**	**Conc^{n} in 8:1 eluate**	**2:1 conc^{n} leached**	**Cumulative conc^{n} leached**
	C_2	C_8	A_2	$A_{2\text{-}10}$
	mg/l		mg/kg	
Arsenic	0.003	0.004	0.01	0.04
Barium	0.056	0.009	0.11	0.17
Cadmium	<0.0004	<0.0004	<0.0008	<0.004
Chromium	0.001	0.001	<0.002	0.01
Copper	0.011	0.022	0.02	0.20
Mercury	<0.00005	<0.00005	<0.0001	<0.0005
Molybdenum	0.007	0.002	0.01	0.03
Nickel	0.002	0.001	<0.002	0.01
Lead	<0.001	<0.001	<0.002	<0.01
Antimony	<0.005	<0.005	<0.01	<0.05
Selenium	0.003	0.002	0.01	0.02
Zinc	<0.003	<0.003	<0.006	<0.03
Chloride	22	2	44	55
Fluoride	<0.5	<0.5	<1	<5
Sulphate as SO_4	52	<3	100	92
Total Dissolved Solids	270	58	540	960
Phenols Monohydric	0.01	<0.01	<0.02	<0.1
Dissolved Organic Carbon	10	3	20	42

Leach Test Information		
Date Prepared	21/03/07	22/03/07
pH (pH Units)	7.955	8.654
Conductivity (µS/cm)	627	108.3
Temperature (°C)	9.5	20.1
Volume Leachant (Litres)	0.338	1.4
Volume of Eluate VE1 (Litres)	0.31	

Landfill Waste Acceptance Criteria Limits		
Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	to be evaluated	to be evaluated
-	to be evaluated	to be evaluated

Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15000	25000
10	150	500
1000	20000	50000
4000	60000	100000
1	-	-
500	800	1000

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepencies with current legislation

ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.28809	Moisture Content Ratio (%) =	64.35
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	60.85
Particle Size <4mm =	>95%		

Job Number	**200703704**
Batch	**1**
Sample Number(s)	**8**
Sampled Date	**-**
Sample Identity	**BH4**
Depth (m)	**0.2**

Solid Waste Analysis	
Total Organic Carbon (%)	0.5
Loss on Ignition (%)	16
Sum of BTEX (mg/kg)	<0.01
Sum of 7 PCBs (mg/kg)	<0.005
Mineral Oil (mg/kg)	240
PAH Sum of 17(mg/kg)	-
pH (pH Units)	7.90
ANC to pH 7 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	<0.03

Eluate Analysis	**Conc^n in 2:1 eluate** C_2 mg/l	**Conc^n in 8:1 eluate** C_8 mg/l	**2:1 conc^n leached** A_2 mg/kg	**Cumulative conc^n leached** $A_{2\text{-}10}$ mg/kg
Arsenic	<0.001	0.002	<0.002	0.02
Barium	0.12	0.059	0.23	0.73
Cadmium	<0.0004	<0.0004	<0.0008	<0.004
Chromium	<0.001	0.006	<0.002	0.05
Copper	0.005	0.024	0.01	0.19
Mercury	<0.00005	<0.00005	<0.0001	<0.0005
Molybdenum	0.026	0.023	0.05	0.24
Nickel	0.005	0.002	0.01	0.03
Lead	<0.001	0.001	<0.002	0.01
Antimony	0.007	<0.005	0.01	<0.05
Selenium	<0.001	<0.001	<0.002	<0.01
Zinc	<0.003	0.008	<0.006	0.06
Chloride	18	2	36	60
Fluoride	<0.5	<0.5	<1	<5
Sulphate as SO_4	140	15	280	460
Total Dissolved Solids	370	150	730	2000
Phenols Monohydric	0.02	<0.01	<0.02	<0.1
Dissolved Organic Carbon	32	12	64	170

Leach Test Information		
Date Prepared	01/03/07	02/03/07
pH (pH Units)	8.10	8.6
Conductivity (µS/cm)	810	290
Temperature (°C)	19.6	19.1
Volume Leachant (Litres)	0.237	1.4
Volume of Eluate VE1 (Litres)	0.435	

Landfill Waste Acceptance Criteria Limits		
Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	to be evaluated	to be evaluated
-	to be evaluated	to be evaluated

Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15000	25000
10	150	500
1000	20000	50000
4000	60000	100000
1	-	-
500	800	1000

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	-	Moisture Content Ratio (%) =	9.65
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	91.20
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**			
Batch	**1**			
Sample Number(s)	**9**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**05/02/07**			
Sample Identity	**BH5**			
Depth (m)	**0.5**			

Solid Waste Analysis				
Total Organic Carbon (%)	2.5	3	5	6
Loss on Ignition (%)	3.1	-	-	10
Sum of BTEX (mg/kg)	<0.01	6	-	-
Sum of 7 PCBs (mg/kg)	<0.001	1	-	-
Mineral Oil (mg/kg)	150	500	-	-
PAH Sum of 17(mg/kg)	-	100	-	-
pH (pH Units)	7.74	-	>6	-
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	<0.03	-	to be evaluated	to be evaluated

Eluate Analysis	**Conc^n in 2:1 eluate**	**Conc^n in 8:1 eluate**	**2:1 conc^n leached**	**Cumulative conc^n leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	A_{2-10}			
	mg/l		mg/kg				
Arsenic	NDP	NDP	NDP	NDP	0.5	2	25
Barium	NDP	NDP	NDP	NDP	20	100	300
Cadmium	NDP	NDP	NDP	NDP	0.04	1	5
Chromium	NDP	NDP	NDP	NDP	0.5	10	70
Copper	NDP	NDP	NDP	NDP	2	50	100
Mercury	NDP	NDP	NDP	NDP	0.01	0.2	2
Molybdenum	NDP	NDP	NDP	NDP	0.5	10	30
Nickel	NDP	NDP	NDP	NDP	0.4	10	40
Lead	NDP	NDP	NDP	NDP	0.5	10	50
Antimony	NDP	NDP	NDP	NDP	0.06	0.7	5
Selenium	NDP	NDP	NDP	NDP	0.1	0.5	7
Zinc	NDP	NDP	NDP	NDP	4	50	200
Chloride	NDP	NDP	NDP	NDP	800	15000	25000
Fluoride	NDP	NDP	NDP	NDP	10	150	500
Sulphate as SO_4	NDP	NDP	NDP	NDP	1000	20000	50000
Total Dissolved Solids	NDP	NDP	NDP	NDP	4000	60000	100000
Phenols Monohydric	NDP	NDP	NDP	NDP	1	-	-
Dissolved Organic Carbon	NDP	NDP	NDP	NDP	500	800	1000

Leach Test Information		
Date Prepared	-	-
pH (pH Units)	-	-
Conductivity (µS/cm)	-	-
Temperature (°C)	-	-
Volume Leachant (Litres)	-	-
Volume of Eluate VE1 (Litres)	-	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.19265	Moisture Content Ratio (%) =	10.44
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	90.54
Particle Size <4mm =	>95%		

Job Number	**200703704**
Batch	**2**
Sample Number(s)	**15**
Sampled Date	**-**
Sample Identity	**BH5**
Depth (m)	**0.3**

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	2.5	3	5	6
Loss on Ignition (%)	3.1	-	-	10
Sum of BTEX (mg/kg)	<0.01	6	-	-
Sum of 7 PCBs (mg/kg)	<0.001	1	-	-
Mineral Oil (mg/kg)	150	500	-	-
PAH Sum of 17(mg/kg)	-	100	-	-
pH (pH Units)	7.74	-	>6	-
ANC to pH 7 (mol/kg)	<0.03	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	<0.03	-	to be evaluated	to be evaluated

Eluate Analysis	**Conc^n in 2:1 eluate**	**Conc^n in 8:1 eluate**	**2:1 conc^n leached**	**Cumulative conc^n leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Arsenic	0.005	0.003	0.01	0.03	0.5	2	25
Barium	0.065	0.013	0.13	0.21	20	100	300
Cadmium	<0.0004	<0.0004	<0.0008	<0.004	0.04	1	5
Chromium	<0.001	0.002	<0.002	0.02	0.5	10	70
Copper	0.017	0.007	0.03	0.09	2	50	100
Mercury	<0.00005	<0.00005	<0.0001	<0.0005	0.01	0.2	2
Molybdenum	0.030	0.009	0.06	0.12	0.5	10	30
Nickel	0.004	0.002	0.01	0.02	0.4	10	40
Lead	0.001	<0.001	<0.002	<0.01	0.5	10	50
Antimony	<0.005	<0.005	<0.01	<0.05	0.06	0.7	5
Selenium	0.001	0.002	<0.002	0.02	0.1	0.5	7
Zinc	0.006	<0.003	0.01	<0.03	4	50	200
Chloride	18	1	36	37	800	15000	25000
Fluoride	0.8	0.5	2	5	10	150	500
Sulphate as SO_4	190	12	380	400	1000	20000	50000
Total Dissolved Solids	320	87	640	1200	4000	60000	100000
Phenols Monohydric	0.03	<0.01	0.1	<0.1	1	-	-
Dissolved Organic Carbon	28	5	56	87	500	800	1000

Leach Test Information		
Date Prepared	21/03/07	22/03/07
pH (pH Units)	8.111	8.454
Conductivity (µS/cm)	751	164.6
Temperature (°C)	19.5	20.0
Volume Leachant (Litres)	0.332	1.4
Volume of Eluate VE1 (Litres)	0.28	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.18294	Moisture Content Ratio (%) =	4.31
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	95.86
Particle Size <4mm =	>95%		

Job Number	**200703704**	**Landfill Waste Acceptance Criteria Limits**		
Batch	1			
Sample Number(s)	1	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**30/01/07**			
Sample Identity	**BH1**			
Depth (m)	**0.3**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^n in 2:1 eluate**	**Conc^n in 8:1 eluate**	**2:1 conc^n leached**	**Cumulative conc^n leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Boron Dissolved (CEN 10:1C) (ICP-MS)	0.04	0.05	0.1	0.5	-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-
					-	-	-

Leach Test Information		
Date Prepared	01/03/07	02/03/07
pH (pH Units)	11.10	11.0
Conductivity (µS/cm)	830	520
Temperature (°C)	19.8	19.1
Volume Leachant (Litres)	0.342	1.4
Volume of Eluate VE1 (Litres)	0.25	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	-	Moisture Content Ratio (%) =	16.36
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	85.94
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**			
Batch	**1**			
Sample Number(s)	**4**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**31/01/07**			
Sample Identity	**BH2**			
Depth (m)	**0.2**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate**	**Conc^{n} in 8:1 eluate**	**2:1 conc^{n} leached**	**Cumulative conc^{n} leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Boron Dissolved (CEN 10:1C) (ICP-MS)	NDP	NDP	NDP	NDP	-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-

Leach Test Information		
Date Prepared	-	-
pH (pH Units)	-	-
Conductivity (µS/cm)	-	-
Temperature (°C)	-	-
Volume Leachant (Litres)	-	-
Volume of Eluate VE1 (Litres)	-	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.19782	Moisture Content Ratio (%) =	13.33
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	88.24
Particle Size <4mm =	>95%		

Job Number	**200703704**	**Landfill Waste Acceptance Criteria Limits**		
Batch	**2**			
Sample Number(s)	**12**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**-**			
Sample Identity	**BH2**			
Depth (m)	**0.3**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^n in 2:1 eluate**	**Conc^n in 8:1 eluate**	**2:1 conc^n leached**	**Cumulative conc^n leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		**mg/kg**				
Boron Dissolved (CEN 10:1C) (ICP-MS)	0.04	<0.01	0.1	0.1	-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-

Leach Test Information

Date Prepared	21/03/07	22/03/07
pH (pH Units)	8.221	8.607
Conductivity (µS/cm)	216	95.4
Temperature (°C)	19.6	20.1
Volume Leachant (Litres)	0.327	1.4
Volume of Eluate VE1 (Litres)	0.28	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	-	Moisture Content Ratio (%) =	6.53
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	93.87
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**			
Batch	**1**			
Sample Number(s)	**7**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**01/02/07**			
Sample Identity	**BH3**			
Depth (m)	**0.2**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	Conc^{n} in 2:1 eluate	Conc^{n} in 8:1 eluate	2:1 conc^{n} leached	Cumulative conc^{n} leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Boron Dissolved (CEN 10:1C) (ICP-MS)	NDP	NDP	NDP	NDP	-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-
					-	-	-

Leach Test Information		
Date Prepared	-	-
pH (pH Units)	-	-
Conductivity (µS/cm)	-	-
Temperature (°C)	-	-
Volume Leachant (Litres)	-	-
Volume of Eluate VE1 (Litres)	-	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.18707	Moisture Content Ratio (%) =	7.10
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	93.37
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**			
Batch	**2**			
Sample Number(s)	**13**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**-**			
Sample Identity	**BH3**			
Depth (m)	**0.3**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	Conc^{n} in 2:1 eluate	Conc^{n} in 8:1 eluate	2:1 conc^{n} leached	Cumulative conc^{n} leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Boron Dissolved (CEN 10:1C) (ICP-MS)	0.02	<0.01	<0.02	<0.1	-	-	-
					-	-	-
					-	-	-
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Leach Test Information		
Date Prepared	21/03/07	22/03/07
pH (pH Units)	7.955	8.654
Conductivity (µS/cm)	627	108.3
Temperature (°C)	9.5	20.1
Volume Leachant (Litres)	0.338	1.4
Volume of Eluate VE1 (Litres)	0.31	

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ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.28809	Moisture Content Ratio (%) =	64.35
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	60.85
Particle Size <4mm =	>95%		

Job Number	**200703704**	**Landfill Waste Acceptance Criteria Limits**		
Batch	**1**			
Sample Number(s)	**8**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**-**			
Sample Identity	**BH4**			
Depth (m)	**0.2**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate**	**Conc^{n} in 8:1 eluate**	**2:1 conc^{n} leached**	**Cumulative conc^{n} leached**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Boron Dissolved (CEN 10:1C) (ICP-MS)	0.23	0.13	0.4	1.5	-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-
					-	-	-
					-	-	-
					-	-	-

Leach Test Information		
Date Prepared	01/03/07	02/03/07
pH (pH Units)	8.10	8.6
Conductivity (µS/cm)	810	290
Temperature (°C)	19.6	19.1
Volume Leachant (Litres)	0.237	1.4
Volume of Eluate VE1 (Litres)	0.435	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepencies with current legislation

Supplemental Report

ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	-	Moisture Content Ratio (%) =	9.65
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	91.20
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**			
Batch	**1**			
Sample Number(s)	**9**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**05/02/07**			
Sample Identity	**BH5**			
Depth (m)	**0.5**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	Conc^{n} in 2:1 eluate	Conc^{n} in 8:1 eluate	2:1 conc^{n} leached	Cumulative conc^{n} leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	C_2	C_8	A_2	$A_{2\text{-}10}$			
	mg/l		mg/kg				
Boron Dissolved (CEN 10:1C) (ICP-MS)	NDP	NDP	NDP	NDP	-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-
					-	-	-
					-	-	-
					-	-	-

Leach Test Information		
Date Prepared	-	-
pH (pH Units)	-	-
Conductivity (µS/cm)	-	-
Temperature (°C)	-	-
Volume Leachant (Litres)	-	-
Volume of Eluate VE1 (Litres)	-	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepencies with current legislation

Supplemental Report

ALcontrol Geochem Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS REF:CEN12457-3

Mass Sample taken (kg) =	0.19265	Moisture Content Ratio (%) =	10.44
Mass of dry sample (kg) =	0.175	Dry Matter Content Ratio (%) =	90.54
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
Job Number	**200703704**			
Batch	**2**			
Sample Number(s)	**15**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sampled Date	**-**			
Sample Identity	**BH5**			
Depth (m)	**0.3**			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
...m of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17(mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 7 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate** C_2 mg/l	**Conc^{n} in 8:1 eluate** C_8 mg/l	**2:1 conc^{n} leached** A_2 mg/kg	**Cumulative conc^{n} leached** A_{2-10} mg/kg	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
Boron Dissolved (CEN 10:1C) (ICP-MS)	0.04	<0.01	0.1	0.1	-	-	-
					-	-	-
					-	-	-
					-	-	-
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					-	-	-
					-	-	-

Leach Test Information		
Date Prepared	21/03/07	22/03/07
pH (pH Units)	8.111	8.454
Conductivity (µS/cm)	751	164.6
Temperature (°C)	19.5	20.0
Volume Leachant (Litres)	0.332	1.4
Volume of Eluate VE1 (Litres)	0.28	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepencies with current legislation

Supplemental Report

ALcontrol Geochem Analytical Services
Table Of Results - Appendix

Job Number: 07/03704/02/01
Client: Geotechnics Ltd
Client Ref. No.: PN071425

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
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition	✓	✓	WET	
TM050	Method 5310B, AWWA/APHA, 20th Ed., 1999 / DIN EN 13137	Total Organic Carbon determination by combustion method	✓		DRY	
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)	✓		DRY	
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)	✓	✓	DRY	
TM062	MEWAM BOOK 124 1988.HMSO/ Method 17.7, Second Site property, March 2003	Determination of Phenolic compounds by HPLC with electro-chemical detection			NA	
TM062	MEWAM BOOK 124 1988.HMSO/ Method 17.7, Second Site property, March 2003	Determination of Phenolic compounds by HPLC with electro-chemical detection	✓	✓	WET	
TM070	Modified: US EPA Method 8250 & 625	Determination of Total Polychlorinated Biphenyls (PCB's) as Aroclor 1254 and the ICE 7 Congeners by GC-MS			DRY	
TM074	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS. MCERTS Accreditation on Soils for Naphthalene except when Kerosene present.	✓		DRY	
TM074	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS. MCERTS Accreditation on Soils for Naphthalene except when Kerosene present.	✓	✓	DRY	
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	✓		WET	
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	✓	✓	WET	
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water			NA	
TM097	Modified: US EPA Method 325.1 & 325.2	Determination of Chloride using the Kone Analyser			NA	
TM098	Method 4500E, AWWA/APHA, 20th Ed., 1999	Determination of Sulphate using the Kone Analyser			NA	

[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: 07/03704/02/01
Client: Geotechnics Ltd
Client Ref. No.: PN071425

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	
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser			NA	
TM123	BS 2690: Part 121:1981	The Determination of Total dissolved Solids in Water			NA	
TM127	Method 3112B, AWWA/APHA, 20th Ed., 1999	The Determination of Trace Level Mercury in Aqueous Media and Soil Extracts by Atomic Absorption Spectroscopy			NA	
TM129	Method 3120B, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 3050B	Determination of Metal Cations by IRIS Emission Spectrometer			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	
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS			NA	
TM154	In - house Method	Determination of Petroleum Hydrocarbons by EZ Flash GC-FID in the Carbon range C6- C40			WET	
TM159	EANEN 7371:2004 (Dutch translated EA method) version 1.0	Determination of the Acid Neutralisation Capacity			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: 07/03704/02/01
Client: Geotechnics Ltd
Client Ref. No.: PN071425

Summary of Coolbox temperatures

Batch No.	Coolbox Temperature (°C)
1	6
2	4.8

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for one month after analysis is completed (e-mailed) for both soil jars and tubs. All waters, volatile jars and vials will be discarded after one month of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Geochem reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, an asbestos screen is done in-house on soils and if no fibres are found will be reported as NFD – no fibres detected. If asbestos is detected, then identification is carried out by ALcontrol Shutler. If a sample is suspected of containing asbestos, then further preparation and analysis will be suspended on that sample until the asbestos result is known. If asbestos is present, then no further analysis will be undertaken.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. NDP – No determination possible due to insufficient/unsuitable sample.
9. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
10. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
11. **Surrogate recoveries** – Currently the only analyses, which are surrogate corrected, are EPH and PAHs on soils.
12. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
13. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).
14. Total of 8 speciated phenols by HPLC includes Resorcinol, Catechol, Phenol, Napthol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, cresols and xylenols (as detailed in 13).
15. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
16. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
17. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
18. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
19. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
20. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
21. 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 material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

ALCONTROL GEOCHEM - MCERTS UPDATE (March 2007)- Annex A (normative)

Table 1 - Performance characteristics (metals and organometallics)	UKAS	MCERTS
Antimony	yes	yes
Arsenic	yes	yes
Barium	yes	yes
Beryllium	yes	yes
Boron (water soluble)	yes	yes
Cadmium	yes	yes
Cobalt	yes	yes
Copper	yes	yes
Chromium	yes	yes
Iron	yes	yes
Lead	yes	yes
Manganese	yes	yes
Mercury	yes	yes
Molybdenum	yes	yes
Nickel	yes	yes
Organolead compounds	no	no
Organotin compounds	no	no
Selenium	yes	yes
Thallium	yes	p
Vanadium	yes	yes
Zinc	yes	yes

Table 2 - Performance characteristics (inorganics)	UKAS	MCERTS
Easily liberated cyanide	yes	yes
Complex cyanide	yes	yes
pH	yes	yes
LOI	yes	yes
Sulphide	yes	p
Sulphate	yes	yes
Sulphur	yes	yes
Thiocyanate	yes	yes
Exchangeable Ammonium	yes	yes

Tabel 3 - Performance characteristics (organics)	UKAS	MCERTS
Benzene (GC- FID & GC-MS)	yes	yes
Benzo[a]pyrene (GC-MS)	yes	yes
Chlorobenzene	yes	yes
Chloromethane	yes	p
Chlorophenol (2-chlorophenol)	yes	yes
Chlorotoluene(2-chlorotoluene, 4-chlorotoluene)	yes	p
1,2-dichloroethane	yes	p
Dichloromethane	yes	p
"Dioxins"	no	no
Ethylbenzene	yes	p
"Furans"	no	no
Hexachlorobutadiene (SVOC)	yes	yes
"Hydrocarbons"	yes	yes
"Nitroaromatics"	yes	no
Pentachlorophenol	p	p
"Phenols" - Phenol by HPLC	yes	yes
"Phthalate esters"	p	p
"Polyaromatic hydrocarbons" by GC-MS	yes	yes, exc naphthalene when Kerosene
"Polychlorinated biphenyls" (Aroclors)	yes	yes
Tetrachloroethane (1,1,1,2)	yes	yes
Tetrachloroethene	yes	p
Tetrachloromethane (carbon tetrachloride)	yes	yes
Toluene (GC-FID)	yes	yes
Trichloroethane	yes	yes
Trichloroethene	yes	yes
Trichloromethane (chloroform)	yes	yes
Vinyl chloride	yes	yes
Xylene (GC-FID)	yes	yes

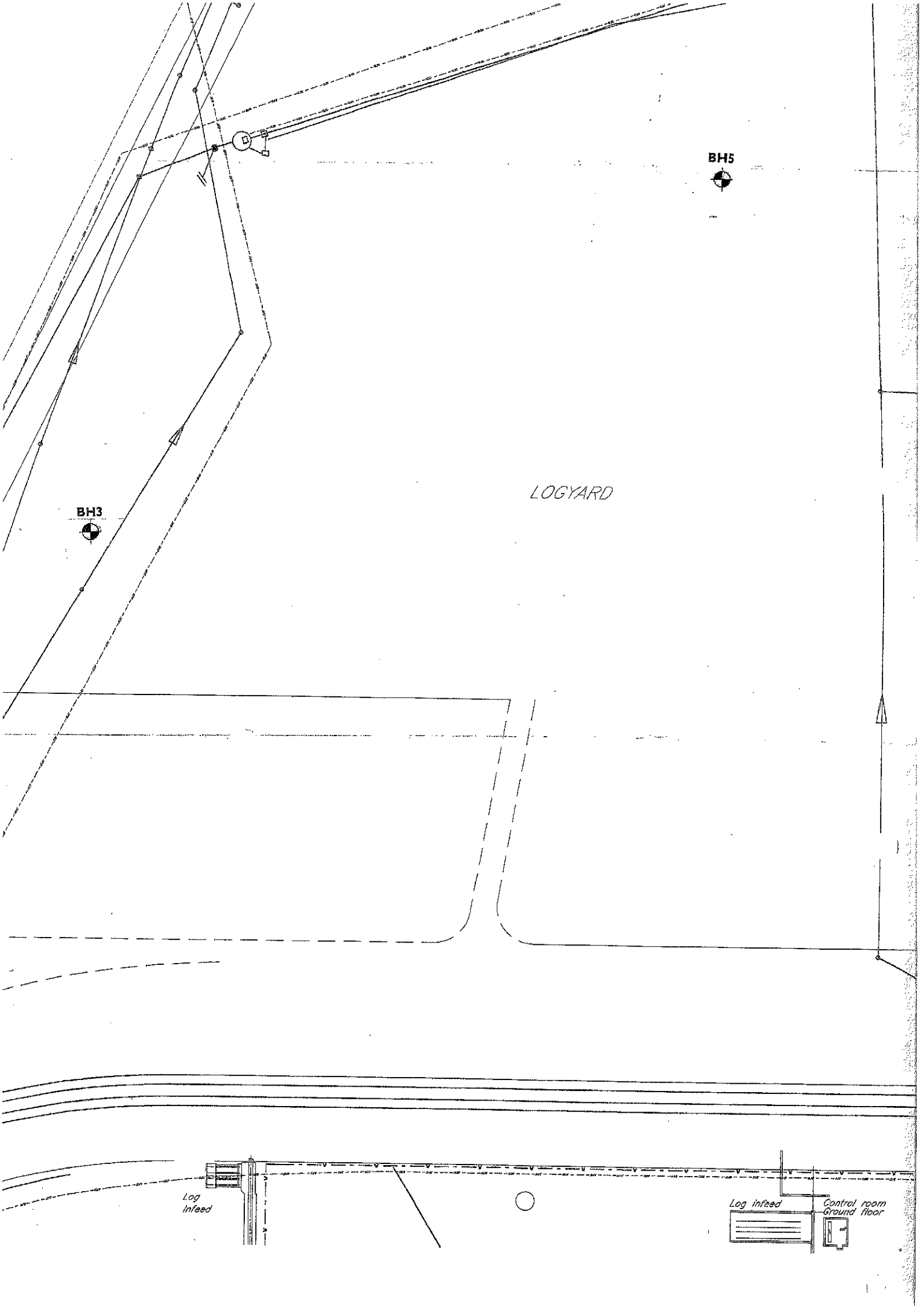
Last updated March 2007

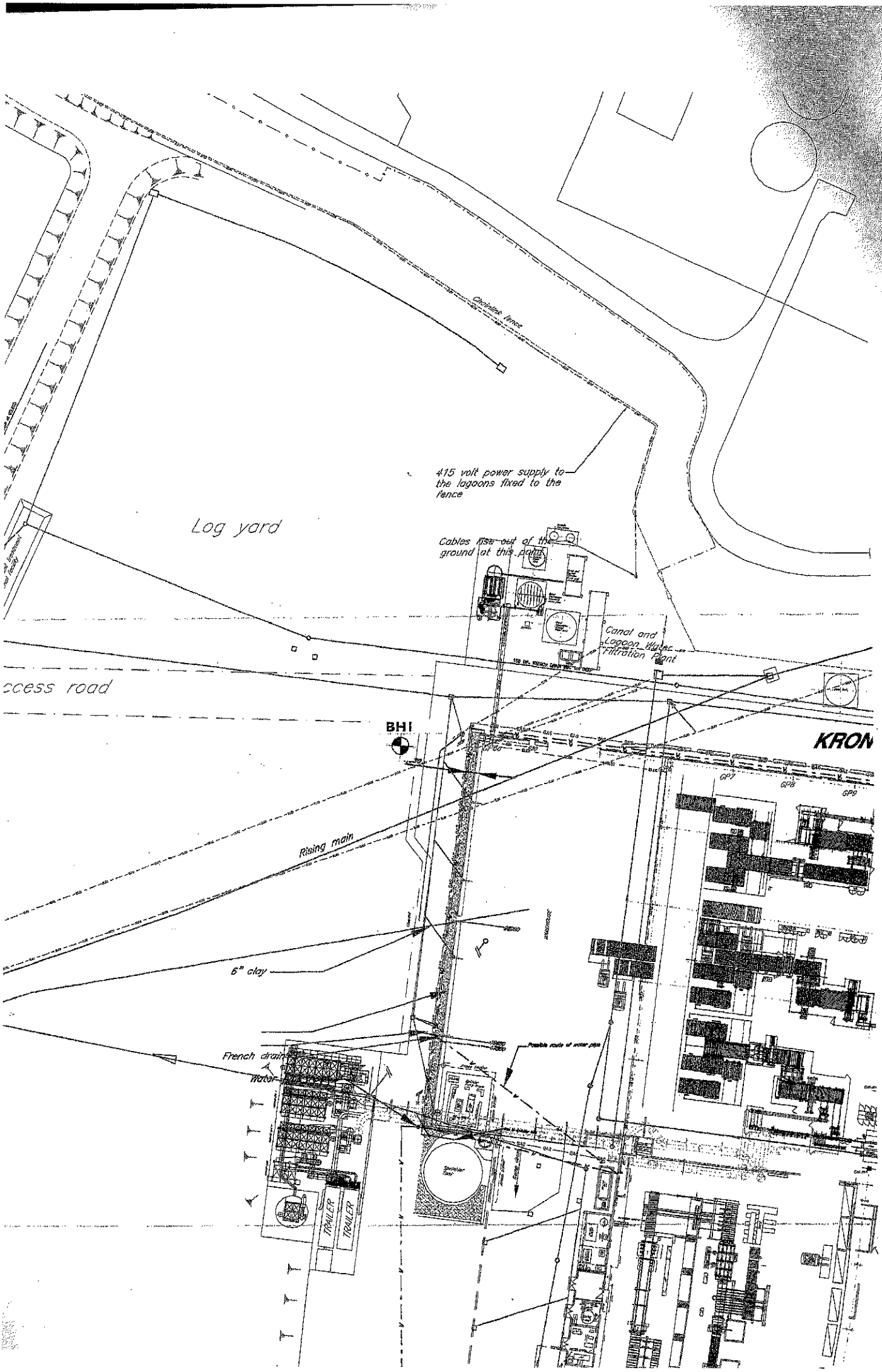
yes - accreditation awarded
p = pending - data meeting MCERTS criteria submitted to UKAS - awaiting certification
no = not being submitted in the near future

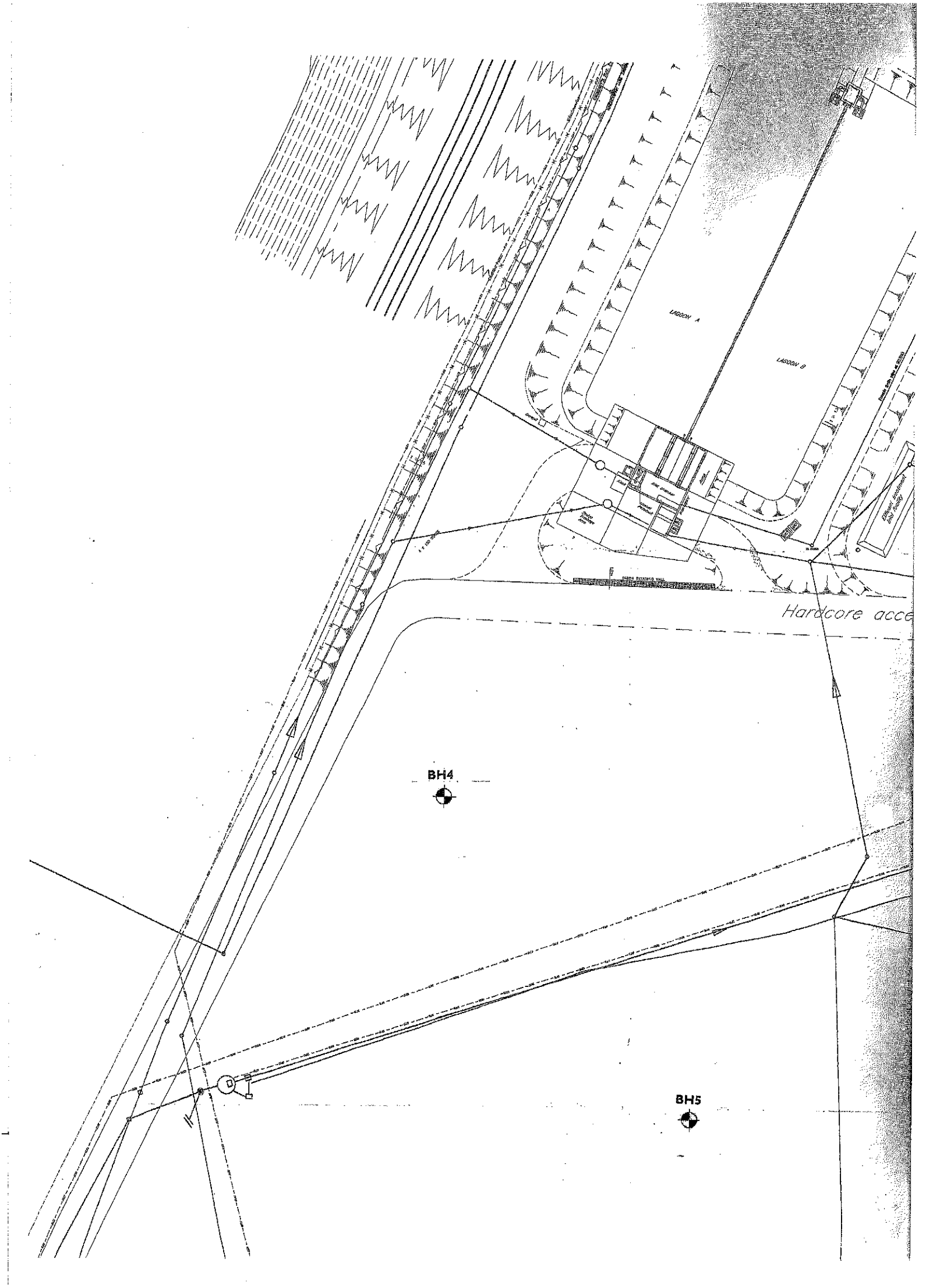
APPENDIX 6

EXPLORATORY HOLE LOCATION PLAN

Engineer:: TIER CONSULT LIMITED	
Client: KRONOSPAN LIMITED	
Project: PROPOSED LOG YARD IMPROVEMENTS, KRONOSPAN, CHIRK	
Drawing Title: EXPLORATORY HOLE LOCATION PLAN	
Scale: 1:500	**Date:** MARCH 2007
geotechnics	**Project No:** PN071425


BH5
BH3
LOGYARD
Log
Infeed
Log infeed
Control room
Ground floor


Chainlink fence
415 volt power supply to the lagoons fixed to the fence
Log yard
Cables rise out of the ground at this point
Canal and Lagoon Water Filtration Plant
ccess road
BHI
KRON
GP7
GP8
GP9
Rising main
6" clay
French drain
Water
Possible route of water pipe
TRAILER
TRAILER


LAGOON A
LAGOON B
Hardcore acce
BH4
BH5

APPENDIX 7

INVESTIGATION TECHNIQUES AND GENERAL NOTES

INVESTIGATION TECHNIQUES

INTRODUCTION

The following brief review of Ground Investigation techniques, generally used as part of most Site Investigations in the U.K., summarises their methodology, advantages and limitations. Detailed descriptions of the techniques are available and can be provided on request. This review should be read in conjunction with the accompanying General Notes.

TRIAL PITS

The trial pit is amongst the most simple yet effective means of identifying shallow ground conditions on a site. Its advantages include simplicity, speed, potential accuracy and cost-effectiveness. The trial pit is most commonly formed using a backacting excavator which can typically determine ground conditions to some 4 metres below ground level. Hand excavation is often used to locate, expose and detail existing foundations, features or services. In general, it is difficult to extend pits significantly below the water table in predominantly granular soils, where flows can cause instability. Unless otherwise stated, the Trial Pits will not have been provided with temporary side support during their construction. Under such circumstances ground conditions to some 1.2 metres can be closely inspected, subject to stability assessment, but below this depth, entrance into the pit is not permitted in the absence of shoring and hence observations will have been made from ground surface and samples taken from the excavator bucket.

Trends in strata type, level and thickness can be determined, shear surfaces identified and the behaviour of plant, excavation sides and excavated materials can be related to the construction process. They are particularly valuable in land slip investigations. Some types of insitu test can be undertaken in such pits and large disturbed or block samples obtained.

CABLE PERCUSSION BORING

The light Cable Percussion technique of soft ground boring, typically at a diameter of 150mm, is a well established simple and flexible method of boring vertical holes amd generally allows data to be obtained in respect of strata conditions other than rock. A tubular cutter (for cohesive soils) or shell with a flap valve (for granular soils) is repeatedly lifted and dropped using a winch and rope operating from an "A" frame. Soil which enters these tools is regularly removed and either sampled for subsequent examination or test, or laid to one side for backfilling. Steel casing will have been used to prevent collapse of the borehole sides where necessary. A degree of disturbance of soil and mixing of layers is inevitable and the presence of very thin layers of different soils within a particular stratum may not be identified. Changes in strata type can only be detected on recognition of a change in soil samples at surface, after the interface has been passed. For the foregoing reasons, depth measurements should not be considered to be more accurate than 0.1 metre.

In cohesive soils cylindrical samples are retrieved by driving or pushing in 100mm nominal diameter tubes. In soft soils, piston sampling or vane testing may be undertaken. In granular soils and often in cohesive materials, insitu Standard Penetration Tests (SPT's) are performed. The SPT records the number of standard blows required to drive a 50mm diameter open or cone ended probe for 300mm after an initial 150mm penetration. A modified method of recording is used in more dense strata. Small disturbed samples are obtained throughout.

The technique can determine ground conditions to depths in excess of 30 metres under suitable circumstances and usually causes less surface disturbance than trial pitting.

ROTARY DRILLING

Rotary Drilling to produce cores by rotating an annular diamond-impregnated tube or barrel into the ground is the technique most appropriate to the forming of site investigation boreholes through rock or other hard strata. It has the advantage of being able to be used vertically or at an angle. Core diameters of less than 100mm are most common for site investigation purposes. Core is normally retrieved in plastic lining tubes. A flushing fluid such as air, water or foam is used to cool the bit and carry cuttings to the surface.

Examination of cores allows detailed rock description and generally enables angled discontinuity surfaces to be observed. However, vertical holes do not necessarily reveal the presence of vertical or near-vertical fissures or joint discontinuities. The core can be subjected to test in the field or laboratory. Core recovery depends upon rock type and/or techniques used. Where open hole rotary drilling is employed, descriptions of strata result from examination at surface of small particles ejected from the borehole in the flushing medium. In consequence, no indication of fissuring, bedding, consistency or degree of weathering can be obtained. Small scale plant can be used for auger drilling to limited depth where access is constrained.

Depths in excess of 60 metres can be achieved under suitable circumstances using rotary techniques, with minimal surface disturbance.

WINDOW SAMPLING

This technique involves the driving of an open-ended tube into the ground and retrieval of the soil which enters the tube. The term "window sample" arose from the original device which had a "window" or slot cut into the side of the tube

through which samples were taken. This has now been superseded by the use of a thin-walled plastic liner within a sampler which has a solid wall. Diameters range from 36 to 86mm. Such samples can be used for qualitative logging, selection of samples for classification and chemical analysis and for obtaining a rudimentary assessment of strength.

Driving devices can be hand-held or machine-mounted and the drive tubes are typically in 1m lengths. The hole formed is not cased, however, and hence the success of this technique is limited when soils and groundwater conditions are such that the sides of the hole collapse on withdrawal of the sampler. Obstructions within the ground, the density of the material or its strength can also limit the depth and rate of penetration of this light-weight investigation technique. Nevertheless, it is a valuable tool where access is constrained such as within buildings or on embankments. Depths of up to 8m can be achieved in suitable circumstances but depths of 4m to 6m are more common.

EXPLORATORY HOLE RECORDS

The data obtained by these techniques are generally presented on Trial Pit, Borehole, Drillhole or Window Sample Records. The descriptions of strata result from information gathered from a number of sources which may include published geological data, preliminary field observations and descriptions, insitu test results, laboratory test results and specimen descriptions. A key to the symbols and abbreviations used accompanies the records. The descriptions on the exploratory hole records accommodate but may not necessarily be identical to those on any preliminary records or the laboratory summaries.

The records show ground conditions at the exploratory hole locations. The degree to which they can be used to represent conditions between or beyond such holes, however, is a matter for geological interpretation rather than factual reporting and the associated uncertainties must be recognised.

DYNAMIC PROBING

This technique typically measures the number of blows of a standard weight falling over a standard height to advance a cone-ended rod over sequential standard distances (typically 100mm). Some devices measure the penetration of the probe per standard blow. It is essentially a profiling tool and is best used in conjunction with other investigation techniques where site-specific correlation can be used to delineate the distribution of soft or loose soils or the upper horizon of a dense or strong layer such as rock.

Both machine-driven and hand-driven equipment is available, the selection depending upon access restrictions and the depth of penetration required. It is particularly useful where access for larger equipment is not available, disturbance is to be minimised or where there are cost constraints. No samples are recovered and some techniques leave a sacrificial cone head in the ground. As with other lightweight techniques, progress is limited in strong or dense soils. The results are presented both numerically and graphically. Depths of up to 10m are commonly achieved in suitable circumstances.

The hand-driven DCP probing device has been calibrated by the TRL to provide a profile of CBR values over a range of depths of up to 1.50m.

INSTRUMENTATION

The most common form of instrument used in site investigation is either the standpipe or else the standpipe piezometer which can be installed in investigation holes. They are used to facilitate monitoring of groundwater levels and water sampling over a period of time following site work. Normally a standpipe would be formed using rigid plastic tubing which has been perforated or slotted over much of its length whilst a standpipe piezometer would have a filter tip which would be placed at a selected level and the hole sealed above and sometimes below to isolate the zone of interest. Groundwater levels are determined using an electronic "dipmeter" to measure the depth to the water surface from ground level. Piezometers can also be used to measure permeability. They are simple and inexpensive instruments for long term monitoring but response times can limit their use in tidal areas and access to the ground surface at each instrument is necessary. Remote reading requires more sophisticated hydraulic, electronic or pneumatic equipment.

Settlement can be monitored using surface or buried target plates whilst lateral movement over a range of depths is monitored using slip indicator or inclinometer equipment.

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GENERAL NOTES

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4. The assessment of the significance of the factual data, where called for, is provided to assist the Client and his Engineer and/or Advisers in the preparation of their designs.

5. The report is based on the ground conditions encountered in the exploratory holes together with the results of field and laboratory testing in the context of the proposed development. The data from any commissioned desk study and site reconnaissance are also drawn upon. There may be special conditions appertaining to the site, however, which are not revealed by the investigation and which may not be taken into account in the report.

6. Methods of construction and/or design other than those proposed by the designers or referred to in the report may require consideration during the evolution of the proposals and further assessment of the geotechnical and any geoenvironmental data would be required to provide discussion and evaluations appropriate to these methods.

7. The accuracy of results reported depends upon the technique of measurement, investigation and test used and these values should not be regarded necessarily as characteristics of the strata as a whole (see accompanying notes on Investigation Techniques). Where such measurements are critical, the technique of investigation will need to be reviewed and supplementary investigation undertaken in accordance with the advice of the Company where necessary.

8. The samples selected for laboratory test are prepared and tested in accordance with the relevant Clauses of BS 1377 Parts 1 to 8, where appropriate, in Geotechnics Limited's UKAS accredited Laboratory, where possible. A list of tests is given.

9. Tests requiring the use of another laboratory having UKAS accreditation where possible are identified.

10. Any unavoidable variations from specified procedures are identified in the report.

11. Specimens are cut vertically, where this is relevant and can be identified, unless otherwise stated.

12. All the data required by the test procedures are recorded on individual test sheets but the results in the report are presented in summary form to aid understanding and assimilation for design purposes. Where all details are required, these can be made available.

13. Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes, or on the possible presence of features based on either visual, verbal, written, cartographical, photographic or published evidence, this is for guidance only and no liability can be accepted for its accuracy.

14. Classification of materials as Made Ground is based on the inspection of retrieved samples or exposed excavations. Where it is obvious that foreign matter such as paper, plastic or metal is present, classification is clear. Frequently, however, for fill materials that arise from the adjacent ground or from the backfilling of excavations, their visual characteristics can closely resemble those of undisturbed ground. Other evidence such as site history, exploratory hole location or other tests may need to be drawn upon to provide clarification. For these reasons, classification of soils on the exploratory hole records as either Made Ground or naturally occurring strata, the boundary between them and any interpretation that this gives rise to should be regarded as provisional and subject to re-evaluation in the light of further data.

15. Ground conditions should be monitored during the construction of the works and the report should be re-evaluated in the light of these data by the supervising geotechnical engineers.

16. Any comments on groundwater conditions are based on observations made at the time of the investigation, unless specifically stated otherwise. It should be noted, however, that the observations are subject to the method and speed of boring, drilling or excavation and that groundwater levels will vary due to seasonal or other effects.

17. Any bearing capacities for conventional spread foundations which are given in the report and interpreted from the investigation are for bases at a minimum depth of 1m below finished ground level in naturally occurring strata and at broadly similar levels throughout individual structures, unless otherwise stated. The foundations should be designed in accordance with the good practice embodied in BS 8004:1986 - Foundations, supplemented for housing by NHBC Standards. Foundation design is an iterative process and bearing pressures may need adjustment or other measures may need to be taken in the context of final layouts and levels prior to finalisation of proposals.

18. Unless specifically stated, the investigation does not take account of the possible effects of mineral extraction or of gases from fill or natural sources within, below or outside the site.

19. The costs or economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, will depend on very many factors in addition to geotechnical or geoenvironmental considerations and hence their evaluation is outside the scope of the report.

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