

Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA8	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776616
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown and black loam with occasional gravel		

Method	Determination	Result	Units	Date of analysis
307	^M anthracene	< 0.50	mg/kg	23/12/2005
307	^M fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M pyrene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)anthracene	< 0.50	mg/kg	23/12/2005
307	^M chrysene	< 0.50	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)pyrene	< 0.50	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	< 0.50	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	< 0.50	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	< 0.50	mg/kg	23/12/2005
307	^M PAH (Total)	< 2	mg/kg	23/12/2005
70	Asbestos Identification	ND		05/01/2006
70	Description of Sample*	SOIL		05/01/2006
Comments				

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA9	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776617
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
30/30C	^M Arsenic (Total)	41	mg/kg	04/01/2006
30	^M Cadmium (Total)	0.67	mg/kg	03/01/2006
30	^M Chromium (Total)	19	mg/kg	03/01/2006
30	^M Copper (Total)	190	mg/kg	03/01/2006
30	Lead (Total)	200	mg/kg	03/01/2006
30C	Mercury (Total)	< 0.20	mg/kg	03/01/2006
30	^M Nickel (Total)	36	mg/kg	03/01/2006
30C	^M Selenium (Total)	1.1	mg/kg	03/01/2006
30	^M Zinc (Total)	120	mg/kg	03/01/2006
39	^M pH	6.0	pH units	30/12/2005
	>> TPH SUITE <<	.		20/12/2005
	>>TPH RISK ASSESSMENT<<	.		21/12/2005
317R	>C6 to C8 aliphatic	1.1	mg/kg	29/12/2005
317R	>C8 to C10 aliphatic	2.2	mg/kg	29/12/2005
317R	>C10 to C12 aliphatic	1.6	mg/kg	29/12/2005
317R	>C12 to C16 aliphatic	3.5	mg/kg	29/12/2005
317R	>C16 to C21 aliphatic	< 5.0	mg/kg	29/12/2005
317R	>C21 TO C40 aliphatic	31	mg/kg	29/12/2005
317R	Total Aliphatic	40	mg/kg	29/12/2005
317R	>C5 to C7 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C7 to C8 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C8 to C10 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C10 to C12 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C12 to C16 aromatic	3.0	mg/kg	29/12/2005
317R	>C16 to C21 aromatic	6.8	mg/kg	29/12/2005
317R	>C21 TO C40 aromatic	37	mg/kg	29/12/2005
317R	Total Aromatic	47	mg/kg	29/12/2005
317R	Total EPH aliphatic/aromatic	87	mg/kg	29/12/2005
	^M >> PAH SUITE <<	.		21/12/2005
307	^M naphthalene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthylene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthene	< 0.50	mg/kg	23/12/2005
307	^M fluorene	< 0.50	mg/kg	23/12/2005
307	^M phenanthrene	< 0.50	mg/kg	23/12/2005

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA9	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776617
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
307	^M anthracene	< 0.50	mg/kg	23/12/2005
307	^M fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M pyrene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)anthracene	< 0.50	mg/kg	23/12/2005
307	^M chrysene	< 0.50	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)pyrene	< 0.50	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	< 0.50	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	< 0.50	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	< 0.50	mg/kg	23/12/2005
307	^M PAH (Total)	2	mg/kg	23/12/2005

Comments

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA10	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776618
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
30/30C	^M Arsenic (Total)	14	mg/kg	04/01/2006
30	^M Cadmium (Total)	< 0.50	mg/kg	03/01/2006
30	^M Chromium (Total)	9.9	mg/kg	03/01/2006
30	^M Copper (Total)	55	mg/kg	03/01/2006
30	Lead (Total)	140	mg/kg	03/01/2006
30C	Mercury (Total)	< 0.20	mg/kg	03/01/2006
30	^M Nickel (Total)	23	mg/kg	03/01/2006
30C	^M Selenium (Total)	0.68	mg/kg	03/01/2006
30	^M Zinc (Total)	130	mg/kg	03/01/2006
39	^M pH	6.6	pH units	30/12/2005
	>> TPH SUITE <<	.		20/12/2005
317	TPH by GC (>C6-C10)	< 50	mg/kg	23/12/2005
317	TPH by GC (>C10 - C20)	71	mg/kg	23/12/2005
317	TPH by GC (>C20-C40)	84	mg/kg	23/12/2005
317	^M TPH by GC (>C6 - C40)	155	mg/kg	23/12/2005
	^M >> PAH SUITE <<	.		21/12/2005
307	^M naphthalene	8.6	mg/kg	23/12/2005
307	^M acenaphthylene	0.62	mg/kg	23/12/2005
307	^M acenaphthene	5.6	mg/kg	23/12/2005
307	^M fluorene	2.4	mg/kg	23/12/2005
307	^M phenanthrene	17	mg/kg	23/12/2005
307	^M anthracene	3.0	mg/kg	23/12/2005
307	^M fluoranthene	40	mg/kg	23/12/2005
307	^M pyrene	31	mg/kg	23/12/2005
307	^M benzo(a)anthracene	20	mg/kg	23/12/2005
307	^M chrysene	24	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	13	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	11	mg/kg	23/12/2005
307	^M benzo(a)pyrene	22	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	1.8	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	17	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	14	mg/kg	23/12/2005
307	^M PAH (Total)	230	mg/kg	23/12/2005

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA10	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776618
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
Comments				

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1510



Business of the Year
Winner 2001



Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA11	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776619
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
30/30C	^M Arsenic (Total)	39	mg/kg	04/01/2006
30	^M Cadmium (Total)	1.2	mg/kg	03/01/2006
30	^M Chromium (Total)	14	mg/kg	03/01/2006
30	^M Copper (Total)	94	mg/kg	03/01/2006
30	Lead (Total)	640	mg/kg	03/01/2006
30C	Mercury (Total)	0.27	mg/kg	03/01/2006
30	^M Nickel (Total)	17	mg/kg	03/01/2006
30C	^M Selenium (Total)	0.98	mg/kg	03/01/2006
30	^M Zinc (Total)	130	mg/kg	03/01/2006
39	^M pH	6.6	pH units	30/12/2005
	>> TPH SUITE <<	.		20/12/2005
	>>TPH RISK ASSESSMENT<<	.		21/12/2005
317R	>C6 to C8 aliphatic	< 1.0	mg/kg	29/12/2005
317R	>C8 to C10 aliphatic	1.0	mg/kg	29/12/2005
317R	>C10 to C12 aliphatic	< 1.0	mg/kg	29/12/2005
317R	>C12 to C16 aliphatic	1.6	mg/kg	29/12/2005
317R	>C16 to C21 aliphatic	< 5.0	mg/kg	29/12/2005
317R	>C21 TO C40 aliphatic	< 10	mg/kg	29/12/2005
317R	Total Aliphatic	< 20	mg/kg	29/12/2005
317R	>C5 to C7 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C7 to C8 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C8 to C10 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C10 to C12 aromatic	< 1.0	mg/kg	29/12/2005
317R	>C12 to C16 aromatic	1.9	mg/kg	29/12/2005
317R	>C16 to C21 aromatic	14	mg/kg	29/12/2005
317R	>C21 TO C40 aromatic	35	mg/kg	29/12/2005
317R	Total Aromatic	51	mg/kg	29/12/2005
317R	Total EPH aliphatic/aromatic	53	mg/kg	29/12/2005
	^M >> PAH SUITE <<	.		21/12/2005
307	^M naphthalene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthylene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthene	< 0.50	mg/kg	23/12/2005
307	^M fluorene	< 0.50	mg/kg	23/12/2005
307	^M phenanthrene	9.1	mg/kg	23/12/2005

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA11	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776619
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
307	^M anthracene	1.3	mg/kg	23/12/2005
307	^M fluoranthene	18	mg/kg	23/12/2005
307	^M pyrene	15	mg/kg	23/12/2005
307	^M benzo(a)anthracene	8.0	mg/kg	23/12/2005
307	^M chrysene	10	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	5.0	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	5.0	mg/kg	23/12/2005
307	^M benzo(a)pyrene	9.5	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	0.77	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	8.5	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	7.2	mg/kg	23/12/2005
307	^M PAH (Total)	98	mg/kg	23/12/2005

Comments

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA12	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776620
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
30/30C	^M Arsenic (Total)	120	mg/kg	10/01/2006
30	^M Cadmium (Total)	0.95	mg/kg	10/01/2006
30	^M Chromium (Total)	24	mg/kg	10/01/2006
30	^M Copper (Total)	530	mg/kg	10/01/2006
30	Lead (Total)	1200	mg/kg	10/01/2006
30C	Mercury (Total)	8.9	mg/kg	10/01/2006
30	^M Nickel (Total)	68	mg/kg	10/01/2006
30C	^M Selenium (Total)	1.7	mg/kg	10/01/2006
30	^M Zinc (Total)	320	mg/kg	10/01/2006
39	^M pH	6.4	pH units	30/12/2005
	>> TPH SUITE <<	.		20/12/2005
	^M >> PAH SUITE <<	.		21/12/2005
307	^M naphthalene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthylene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthene	< 0.50	mg/kg	23/12/2005
307	^M fluorene	< 0.50	mg/kg	23/12/2005
307	^M phenanthrene	< 0.50	mg/kg	23/12/2005
307	^M anthracene	< 0.50	mg/kg	23/12/2005
307	^M fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M pyrene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)anthracene	< 0.50	mg/kg	23/12/2005
307	^M chrysene	< 0.50	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)pyrene	< 0.50	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	< 0.50	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	< 0.50	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	< 0.50	mg/kg	23/12/2005
307	^M PAH (Total)	< 2	mg/kg	23/12/2005

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA13	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776621
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
30/30C	^M Arsenic (Total)	130	mg/kg	04/01/2006
30	^M Cadmium (Total)	1.3	mg/kg	03/01/2006
30	^M Chromium (Total)	31	mg/kg	03/01/2006
30	^M Copper (Total)	510	mg/kg	03/01/2006
30	Lead (Total)	1400	mg/kg	03/01/2006
30C	Mercury (Total)	5.5	mg/kg	03/01/2006
30	^M Nickel (Total)	80	mg/kg	03/01/2006
30C	^M Selenium (Total)	1.9	mg/kg	03/01/2006
30	^M Zinc (Total)	350	mg/kg	03/01/2006
39	^M pH	6.0	pH units	30/12/2005
	>> TPH SUITE <<	.		20/12/2005
	^M >> PAH SUITE <<	.		21/12/2005
307	^M naphthalene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthylene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthene	< 0.50	mg/kg	23/12/2005
307	^M fluorene	< 0.50	mg/kg	23/12/2005
307	^M phenanthrene	< 0.50	mg/kg	23/12/2005
307	^M anthracene	< 0.50	mg/kg	23/12/2005
307	^M fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M pyrene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)anthracene	< 0.50	mg/kg	23/12/2005
307	^M chrysene	< 0.50	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	< 0.50	mg/kg	23/12/2005
307	^M benzo(a)pyrene	< 0.50	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	< 0.50	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	< 0.50	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	< 0.50	mg/kg	23/12/2005
307	^M PAH (Total)	< 2	mg/kg	23/12/2005
Comments				

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA14	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776622
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
30/30C	^M Arsenic (Total)	35	mg/kg	04/01/2006
30	^M Cadmium (Total)	< 0.50	mg/kg	03/01/2006
30	^M Chromium (Total)	18	mg/kg	03/01/2006
30	^M Copper (Total)	97	mg/kg	03/01/2006
30	Lead (Total)	160	mg/kg	03/01/2006
30C	Mercury (Total)	0.60	mg/kg	03/01/2006
30	^M Nickel (Total)	20	mg/kg	03/01/2006
30C	^M Selenium (Total)	0.95	mg/kg	03/01/2006
30	^M Zinc (Total)	75	mg/kg	03/01/2006
39	^M pH	7.1	pH units	30/12/2005
	>> TPH SUITE <<	.		20/12/2005
317	TPH by GC (>C6-C10)	< 50	mg/kg	23/12/2005
317	TPH by GC (>C10 - C20)	56	mg/kg	23/12/2005
317	TPH by GC (>C20-C40)	74	mg/kg	23/12/2005
317	^M TPH by GC (>C6 - C40)	131	mg/kg	23/12/2005
	^M >> PAH SUITE <<	.		21/12/2005
307	^M naphthalene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthylene	< 0.50	mg/kg	23/12/2005
307	^M acenaphthene	12	mg/kg	23/12/2005
307	^M fluorene	4.7	mg/kg	23/12/2005
307	^M phenanthrene	7.0	mg/kg	23/12/2005
307	^M anthracene	2.0	mg/kg	23/12/2005
307	^M fluoranthene	8.1	mg/kg	23/12/2005
307	^M pyrene	6.4	mg/kg	23/12/2005
307	^M benzo(a)anthracene	1.4	mg/kg	23/12/2005
307	^M chrysene	1.2	mg/kg	23/12/2005
307	^M benzo(b)fluoranthene	0.93	mg/kg	23/12/2005
307	^M benzo(k)fluoranthene	1.1	mg/kg	23/12/2005
307	^M benzo(a)pyrene	3.1	mg/kg	23/12/2005
307	^M dibenzo(ah)anthracene	< 0.50	mg/kg	23/12/2005
307	^M benzo(ghi)perylene	2.4	mg/kg	23/12/2005
307	^M indeno(123cd)pyrene	2.0	mg/kg	23/12/2005
307	^M PAH (Total)	52	mg/kg	23/12/2005

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Site	Buckley Wells	Sample Type	SOIL
Sample ID:	HA14	Job:	LKA/D0921
Other ID:	0.00m	Sample No:	776622
Your Ref:	JB578	Your Order:	1309
Received:	19/12/2005		
Description	Brown loam with some gravel and occasional organic matter		

Method	Determination	Result	Units	Date of analysis
Comments				

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Synopses of Analytical Methods

Reference	Method Text
30	Metals are extracted from land samples by boiling with hydrochloric/nitric acids (3:1 ratio). The measurement of metal concentrations is determined directly on an ICP-OES at defined wavelengths.
30/30C	Metals are extracted from land samples by boiling with hydrochloric/nitric acids (3:1 ratio). For the measurement of metal concentrations is determined on an ICP-OES at defined wavelengths. Where a result is 25mg/kg or above results are obtained directly. Otherwise results are obtained via hydride generation.
307	PAH's are extracted from land samples using acetone. The samples are shaken mechanically and then centrifuged. An aliquot of the supernatant liquid is then transferred to a separate vial and analysed by HPLC using a variable wavelength programme.
309	PCB's are extracted from land samples using hexane. The samples are shaken mechanically, sonicated, centrifuged and cleaned up using sulphuric acid. The collected eluent is reanalysed by GC-ECD. This analysis is carried out on an as received portion of sample.
30C	Metals are extracted from land samples by boiling with hydrochloric/nitric acid (3:1 ratio). The measurement of metal concentrations is determined by means of hydride generation / atomic vapour on an ICP-OES at defined wavelengths
317	Hydrocarbons are extracted from land samples using pentane. The samples are shaken mechanically, sonicated, before being centrifuged. After separation an aliquot of the pentane layer is transferred to a separate vial and spiked with internal standard. Hydrocarbon content of this extract is then determined by GC- flame ionisation (FID). This analysis is carried out on an as received portion of sample.
39	The test is carried out by extraction using deionised water with agitation. The pH of this suspension is read directly from an electronic pH meter.

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APPENDIX K

CHEMICAL CERTIFICATES OF ANALYSIS - CRH

FESC/28217

BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 02/03/99
YOUR REFERENCE SJR/SJR/sjr-12/4452
YOUR ORDER NO

CAS

ANALYTICAL

CAS SAMPLE No	1	2	3	4	5	6	7	8
SAMPLE No	BHC1	BHC2	BHC2	BHC2	BHC3	BHC4	BHC5	BHC5
DEPTH(m)	0.30	2.20	3.20	5.20	0.00	6.70	0.50	5.20
Method	units							
30C Arsenic (total)	As	mg/kg	24	49	59	25	24	32
06 Boron (water soluble)	B	mg/kg	0.13	0.58	0.71	0.53	0.44	0.74
30 Cadmium (total)	Cd	mg/kg	0.83	2.2	1.5	0.76	0.89	1.2
30B Chromium (hexavalent)	Cr	mg/kg						
30 Chromium (total)	Cr	mg/kg	6.4	17	10	6.8	6.1	6.5
30 Copper (total)	Cu	mg/kg	60	170	160	83	74	210
15* Cyanide (free)	CN ⁻	mg/kg						
* Cyanide (total)	CN ⁻	mg/kg	0.21	0.20	0.19	0.19	<0.1	0.12
30 Lead (total)	Pb	mg/kg	230	1600	2400	170	35	210
30C Mercury (total)	Hg	mg/kg	0.32	0.49	0.54	0.18	<0.1	0.23
30 Nickel (total)	Ni	mg/kg	11	23	19	17	27	21
307 PAH (total)		mg/kg	83	290	310	470	<10	37
39 pH	pH units		7.3	7.7	7.8	7.5	6.1	7.5
40A Phenols (total)	PhOH	mg/kg	4.3	6.1	61	6.8	2.8	2.0
30C Selenium (total)	Se	mg/kg	0.37	0.61	0.75	1.0	0.15	0.74
45 Sulphate (total)	SO ₃	%	0.16	0.14	0.21	0.18	0.62	0.16
47 Sulphide	S	mg/kg	16	8.0	20	28	12	20

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 02/03/99
YOUR REFERENCE SJR/SJR/sjr-12/4452
YOUR ORDER NO

CAS

CITY ANALYTICAL PLC
CITY ANALYTICAL PLC
CITY ANALYTICAL PLC

CAS SAMPLE No
SAMPLE No
DEPTH (m)

Method

				1	2	3	4	5	6	7	8
51	Sulphur (elemental)	as	units	BHC1 0.30	BHC2 2.20	BHC2 3.20	BHC2 5.20	BHC3 0.00	BHC4 6.70	BHC5 0.50	BHC5 5.20
16*	Thiocyanate	S	mg/kg	110	<100	400	1800	<100	1800	260	150
30	Zinc (total)	CN ⁻	mg/kg								
40	BTEX	Zn	mg/kg	84	410	300	63	30	25	91	89
303*	Chlorinated Solvents			see separate sheet							
04-S*	Asbestos		presence			ND	ND		ND		

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 02/03/99
YOUR REFERENCE SJR/SJR/sjr-12/4452
YOUR ORDER NO

CAS

CAS SAMPLE No

SAMPLE No

DEPTH (m)

Method

		as		units		9		10		11		12		13		14	
		BH1		BH2		BH3		BH4		BH5		BH6		BH7		BH8	
30C	Arsenic (total)	As	17	28	30	36	18										
06	Boron (water soluble)	B	0.35	0.33	0.83	0.34	0.95										
30	Cadmium (total)	Cd	0.94	2.2	2.9	2.0	0.51										
30B	Chromium (hexavalent)	Cr															
30	Chromium (total)	Cr	8.0	21	19	19	<5										
30	Copper (total)	Cu	150	190	380	220	60										
15*	Cyanide (free)	CN ⁻															
40	Cyanide (total)	CN ⁻	0.13	0.15	0.35	<0.1	<0.1										
30	Lead (total)	Pb	330	94	290	190	99										
30C	Mercury (total)	Hg	0.23	<0.1	0.31	0.30	0.11										
30	Nickel (total)	Ni	9.6	39	34	29	6.0										
307	PAH (total)		25	28	17	27	11										
39	pH																
40A	Phenols (total)	PhOH	8.0	7.3	7.4	7.2	6.2										
30C	Selenium (total)	Se	0.21	0.74	0.76	0.93	0.34										
45	Sulphate (total)	SO ₃	0.13	0.13	0.14	0.16	0.15										
47	Sulphide	S	<5	12	<5	<5	12										

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 02/03/99
YOUR REFERENCE SJR/SJR/sjr-12/4452
YOUR ORDER NO



CAS SAMPLE No		SAMPLE No		DEPTH(m)		9		10		11		12		13		14	
Method		as		units		BHG1		BHG2		BHG3		BHG4		BHG4		BHC4	
51	Sulphur (elemental)	S		mg/kg		<100		140		230		<100		1500			
16*	Thiocyanate	CN ⁻		mg/kg													
30	Zinc (total)	Zn		mg/kg		160		81		210		140		28			
303*	Chlorinated Solvents					see separate sheet											
04-S*	Asbestos			presence													
CHECKED AND ISSUED BY:		DATE:		15.3.99													
				ND													

CAS

ETIYANALICAL SERVICES, INC.

DEPTH (m)	Method	as	1 TP 1 0.10	2 TP 1 1.50	3 TP 3 0.30	4 TP 4 0.00	5 TP 6 0.10	6 TP 7 1.00	7 TP 7 1.70	8 TP 8 0.80
30C	Arsenic (total)	As	50	4.0	5.0	97	24	3.6	2.7	43
06	Boron (water soluble)	B	0.54	0.20	0.34	0.36	0.37	0.21	0.32	0.46
30	Cadmium (total)	Cd	1.1	<0.5	<0.5	2.1	0.73	<0.5	<0.5	1.6
30B	Chromium (hexavalent)	Cr								
30	Chromium (total)	Cr	8.1	<5	5.7	<5	<5	5.1	<5	11
30	Copper (total)	Cu	110	12	15	93	47	4.4	12	620
15*	Cyanide (free)	CN ⁻								
**	Cyanide (total)	CN ⁻	0.27	0.12	<0.1	0.40	0.11	<0.1	<0.1	0.19
30	Lead (total)	Pb	260	17	19	780	85	8.8	8.6	290
30C	Mercury (total)	Hg	0.54	<0.1	<0.1	1.0	0.19	<0.1	<0.1	0.37
30	Nickel (total)	Ni	9.6	2.3	4.7	8.0	4.7	2.3	9.0	28
307	Alkalinity		95	<10	<10	160	44	<10	<10	72
39	pH	pH units	6.8	7.3	6.2	5.8	5.8	5.6	5.8	7.5
40A	Phenols (total)	PhOH	1.1	1.5	2.0	1.6	1.5	0.96	2.4	1.9
30C	Selenium (total)	Se	0.72	0.17	0.17	0.11	0.38	<0.1	<0.1	<0.1
45	Sulphate (total)	SO ₃	0.13	0.05	0.08	0.63	0.10	0.08	0.07	0.08
47	Sulphide	S								

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3, FAIRFIELD COURT, WHE-

DATE: 5/3/99

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 01203 639012 FAX: 01203 639710 Registered in England No. 02033474, TEL: 07000 CAS PLC (27752)

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
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YOUR ORDER NO



CAS SAMPLE No		CRYSTAL ANALYTICAL PLC							
SAMPLE No									
DEPTH (m)									
Method		1	2	3	4	5	6	7	8
51	Sulphur (elemental)	TP 1 0.10	TP 1 1.50	TP 3 0.30	TP 4 0.00	TP 6 0.10	TP 7 1.00	TP 7 1.70	TP 8 0.80
16*	Thiocyanate	as							
		units							
		mg/kg	<100	<100	260	<100	<100	<100	310
30	Zinc (total)	CN ⁻							
		mg/kg							
303*	Chlorinated Solvents	Zn	66	10	25	33	4.7	20	150
	BTEX								
	Herbicides		see separate sheet						
	Triazine Herbicides		see separate sheet						
04-S*	Asbestos		see separate sheet						
		presence							ND

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 19/02/99
YOUR REFERENCE 4452
YOUR ORDER NO



CAS SAMPLE No		25	
SAMPLE No		TP14	
DEPTH (m)		3.10	
Method		as	units
30C	Arsenic (total)	As	mg/kg
06	Boron (water soluble)	B	mg/kg
30	Cadmium (total)	Cd	mg/kg
30B	Chromium (hexavalent)	Cr	mg/kg
30	Chromium (total)	Cr	mg/kg
30	Copper (total)	Cu	mg/kg
15*	Cyanide (free)	CN ⁻	mg/kg
15	Cyanide (total)	CN ⁻	mg/kg
30	Lead (total)	Pb	mg/kg
30C	Mercury (total)	Hg	mg/kg
30	Nickel (total)	Ni	mg/kg
307	PAH (total)		mg/kg
39	pH		pH units
40A	Phenols (total)	PhOH	mg/kg
30C	Selenium (total)	Se	mg/kg
45	Sulphate (total)	SO ₃	%
47	Sulphide	S	mg/kg

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 19/02/99
YOUR REFERENCE 4452
YOUR ORDER NO

CAS

ANALYSIS

ANALYSIS SERVICE

CAS SAMPLE No		9	10	11	12	13	14	15	16
SAMPLE No		TP 9	TP 9	TP 9	TP10	TP10	TP11	TP11	TP12
DEPTH (m)		1.80	1.00	3.00	0.40	2.50	0.10	1.20	0.90
Method	as	units							
30C	Arsenic (total)	As	mg/kg	35	45	46	59	34	42
06	Boron (water soluble)	B	mg/kg	0.41	0.54	0.68	0.51	0.66	0.32
30	Cadmium (total)	Cd	mg/kg	1.4	3.8	1.7	2.4	2.1	2.8
30B	Chromium (hexavalent)	Cr	mg/kg						
30	Chromium (total)	Cr	mg/kg	7.3	6.3	5.2	12	9.1	19
30	Copper (total)	Cu	mg/kg	300	280	480	200	250	240
15*	Cyanide (free)	CN ⁻	mg/kg						
*-	Cyanide (total)	CN ⁻	mg/kg	0.12	0.24	0.85	0.37	0.21	0.23
30	Lead (total)	Pb	mg/kg	250	340	280	540	220	160
30C	Mercury (total)	Hg	mg/kg	<0.1	0.41	0.49	0.14	<0.1	0.16
30	Nickel (total)	Ni	mg/kg	21	24	22	27	26	36
307	PAH (total)		mg/kg	100	24	23	23	270	22
39	pH		pH units	7.6	7.6	7.6	7.7	7.6	6.2
40A	Phenols (total)	PhOH	mg/kg	2.0	1.5	2.3	2.1	3.0	1.6
30C	Selenium (total)	Se	mg/kg	0.30	0.39	0.25	0.43	0.37	0.68
45	Sulphate (total)	SO ₃	%	0.10	0.08	0.11	0.10	0.12	0.09
47	Sulphide	S	mg/kg	16	12	8.0	12	8.0	12
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BUCKLEY LLS BURY LANCASHIRE
FOUND/TON EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 19/02/99
YOUR REFERENCE 4452
YOUR ORDER NO

CAS

ANALYTICAL SERVICES LTD

CAS SAMPLE No		SAMPLE No		DEPTH (m)		9		10		11		12		13		14		15		16	
Method		as		units		TP 8		TP 9		TP 9		TP10		TP10		TP11		TP11		TP12	
51	Sulphur (elemental)	S		mg/kg		1.80		1.00		3.00		0.40		2.50		0.10		1.20		0.90	
16*	Thiocyanate	CN ⁻		mg/kg																	
30	Zinc (total)	Zn		mg/kg																	
303*	Chlorinated Solvents																				
S	Herbicides																				
4-	Triazine Herbicides																				
04-S*	Asbestos																				

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presence ND

FESC/28067
BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 19/02/99
YOUR REFERENCE 4452
YOUR ORDER NO



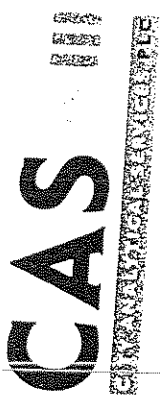
CAS SAMPLE NO		17		18		19		20		21		22		23		24	
SAMPLE No		TP12		TP13		TP13		TP14		TP14		TP15		TP 9		TP10	
DEPTH (m)		3.50		0.20		1.20		0.10		2.10		0.10		2.50		1.50	
Method	as	units															
30C	Arsenic (total)	As	mg/kg	21	100	9.9	36	54	17	17	17	17	17	17	17	17	17
06	Boron (water soluble)	B	mg/kg	0.55	0.31	0.63	0.39	0.47	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
30	Cadmium (total)	Cd	mg/kg	1.8	11	0.93	1.6	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
30B	Chromium (hexavalent)	Cr	mg/kg		3.7												
30	Chromium (total)	Cr	mg/kg	6.5	220	5.6	7.9	13	13	13	13	13	13	13	13	13	13
30	Copper (total)	Cu	mg/kg	330	1500	140	190	810	190	190	190	190	190	190	190	190	190
15*	Cyanide (free)	CN ⁻	mg/kg														
30	Cyanide (total)	CN ⁻	mg/kg	0.25	0.11	<0.1	0.21	0.14	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
30	Lead (total)	Pb	mg/kg	330	3700	120	110	310	100	100	100	100	100	100	100	100	100
30C	Mercury (total)	Hg	mg/kg	0.38	<0.1	<0.1	<0.1	0.85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
30	Nickel (total)	Ni	mg/kg	20	77	11	25	24	27	27	27	27	27	27	27	27	27
307	PAH (total)		mg/kg	18	<10	16	68	20	10	10	10	10	10	10	10	10	10
39	pH		pH units	6.8	7.0	7.2	7.2	7.5	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
40A	Phenols (total)	PhOH	mg/kg	3.4	6.9	2.7	3.3	1.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
30C	Selenium (total)	Se	mg/kg	0.17	41	0.54	0.54	<0.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
45	Sulphate (total)	SO ₃	%	0.11	0.08	0.09	0.10	0.12	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
47	Sulphide	S	mg/kg	16	96	20	12	<5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 19/02/99
YOUR REFERENCE 4452
YOUR ORDER NO



CAS SAMPLE NO		SAMPLE No		DEPTH (m)		17		18		19		20		21		22		23		24	
Method		as		units		TP12		TP13		TP13		TP14		TP14		TP15		TP 9		TP10	
51	Sulphur (elemental)	S		mg/kg		3.50		0.20		1.20		0.10		2.10		0.10		2.50		1.50	
16*	Thiocyanate	CN ⁻		mg/kg		2000		<100		160		240		360		<100					
30	Zinc (total)	Zn		mg/kg		87		17000		110		74		65		85					
303*	Chlorinated Solvents					see separate sheet															
S	Herbicides					see separate sheet															
-W-	Triazine Herbicides					see separate sheet															
04-S*	Asbestos					see separate sheet															
				presence						ND								ND		ND	

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DATE: 15/3/99

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BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SOILS RECEIVED 19/02/99
YOUR REFERENCE 4452
YOUR ORDER NO



CAS SAMPLE No 25
SAMPLE No TP14
DEPTH (m) 3.10

Method	as	units	
51 Sulphur (elemental)	S	mg/kg	see separate sheet
16* Thiocyanate	CN ⁻	mg/kg	see separate sheet
30 Zinc (total)	Zn	mg/kg	see separate sheet
40 BTEX			
303* Chlorinated Solvents			
S Herbicides			see separate sheet
44 Triazine Herbicides			see separate sheet
04-S* Asbestos			see separate sheet

presence ND

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DATE: 5/3/99



FESC 28421

BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 15/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

TPH ANALYSIS								
CAS SAMPLE No	1	2	3	4	5	6	7	8
SAMPLE No	TP1	TP1	TP3	TP4	TP6	TP7	TP7	TP8
DEPTH (m)	0.1	1.5	0.3	0.00	0.1	1.0	1.7	0.8
	units							
TPH by GC (C6-C10)	<50	<50	<50	<50	<50	<50	<50	<50
TPH by GC (C10-C20)	<50	<50	<50	<50	<50	<50	<50	<50
TPH by GC (C20-C40)	<50	<50	<50	<50	<50	<50	<50	<50
TPH by GC (C6-C40)	<50	<50	<50	<50	<50	<50	<50	<50

CHECKED & ISSUED BY:

P. J. Mahoney

DATE: 19/4/99.



FESC 28421

BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 15/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

TPH ANALYSIS

CAS SAMPLE No	9	10	11	12	13	14	15	16
SAMPLE No	TP 8	TP 9	TP 9	TP 10	TP 10	TP 11	TP 11	TP 12
DEPTH (m)	1.8	1.0	3.0	0.4	2.5	0.1	1.2	0.9
	units							
TPH by GC (C6-C10)	<50	<50	<50	<50	<50	<50	<50	<50
TPH by GC (C10-C20)	<50	<50	<50	<50	<50	<50	<50	<50
TPH by GC (C20-C40)	95	<50	<50	180	130	670	<50	<50
TPH by GC (C6-C40)	95	<50	<50	180	130	670	<50	<50

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R. J. Hudson

DATE: 19/4/99.

CAS

ANALYTICAL

PLC

FESC 28421

BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 15/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

TPH ANALYSIS									
CAS SAMPLE No	17	18	19	20	21	22			
SAMPLE No	TP 12	TP 13	TP 13	TP 14	TP 14	TP 15			
DEPTH (m)	3.5	0.2	1.2	0.1	2.1	0.1			
	units								
TPH by GC (C6-C10)	<50	<50	<50	<50	<50	<50			
TPH by GC (C10-C20)	<50	<50	<50	<50	<50	<50			
TPH by GC (C20-C40)	<50	<50	<50	<50	<50	<50			
TPH by GC (C6-C40)	<50	<50	<50	180	82	<50			
				180	82	<50			

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P. Water

DATE: 19/4/99.

CAS

ANALYTICAL
PLC

FESC/28067

BUCKLEY WELLS BURRY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SAMPLES RECEIVED: 19/2/99
REFERENCE No.: 4452
ORDER No.:

BTEX ANALYSIS

CAS SAMPLE No	5	7	12	16	20
SAMPLE No	TP 6	TP 7	TP 10	TP 12	TP 14
DEPTH (m)	0.10	1.70	0.40	0.90	0.10
	units				
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1
m&p-Xylene	mg/kg	<0.1	<0.1	<0.1	<0.1
o-Xylene	mg/kg	<0.1	<0.1	<0.1	<0.1

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DATE: 5/3/99.

FESC 28421

BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 15/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

CAS

PLC

TPH ANALYSIS										
CAS SAMPLE No		26	27	28	29	30	31	32		
SAMPLE No		BHC1	BHC2	BHC2	BHC2	BHC3	BHC4	BHC5		
DEPTH (m)		0.3	2.2	3.2	5.2	0.0	6.7	0.5		
	units									
TPH by GC (C6-C10)	mg/kg	<50	<50	<50	<50	<50	<50	<50		
TPH by GC (C10-C20)	mg/kg	<50	<50	63	200	<50	<50	<50		
TPH by GC (C20-C40)	mg/kg	78	310	460	510	<50	<50	120		
TPH by GC (C6-C40)	mg/kg	78	310	520	710	<50	68	430		
						<50	68	550		

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PJ *water*

CHECKED & ISSUED BY:

R. J. Wadley

DATE: 19/4/99.

CAS

ANALYTICAL PLC

FESC 28421

BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 15/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

TPH ANALYSIS

CAS SAMPLE No	33	34	35	36	37	38
SAMPLE No	BHC5	BHG1	BHG2	BHG3	BHG4	BHG4
DEPTH (m)	5.2	1.2	0.5	0.0	0.0	3.0
	units					
TPH by GC (C6-C10)	<50	<50	<50	<50	<50	<50
TPH by GC (C10-C20)	<50	<50	<50	200	120	<50
TPH by GC (C20-C40)	69	460	230	5400	640	82
TPH by GC (C6-C40)	69	460	230	5600	760	82

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DATE: 19/4/99.



FESC 28217
BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 02/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

BTEx ANALYSIS				
CAS SAMPLE No		11		
SAMPLE No		BHG3		
DEPTH (m)		0.00		
	units			
Benzene	mg/kg	<0.1		
Toluene	mg/kg	<0.1		
Ethylbenzene	mg/kg	<0.1		
m&p-Xylene	mg/kg	<0.1		
o-Xylene	mg/kg	<0.1		

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DATE: 16.3.99.

FESC/28067

BUCKLEY WELLS BURRY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
SAMPLES RECEIVED: 19/2/99
REFERENCE No.: 4452
ORDER No.:

HALOCARBONS ANALYSIS									
CAS SAMPLE No	5	7	12	16	20				
SAMPLE No	TP 6	TP 7	TP 10	TP 12	TP 14				
DEPTH (m)	0.10	1.70	0.40	0.90	0.10				
Chloroform	units								
1,1,1-trichloroethane	mg/kg	<0.1	<0.1	<0.1	<0.1				
Carbon Tetrachloride	mg/kg	<0.1	<0.1	<0.1	<0.1				
Trichloroethylene	mg/kg	<0.1	<0.1	<0.1	<0.1				
Bromodichloromethane	mg/kg	<0.1	<0.1	<0.1	<0.1				
Trans-1,3-dichloropropene	mg/kg	<0.1	<0.1	<0.1	<0.1				
cis-1,3-dichloropropene	mg/kg	<0.1	<0.1	<0.1	<0.1				
1,1,2-trichloroethane	mg/kg	<0.1	<0.1	<0.1	<0.1				
Tetrachloroethylene	mg/kg	<0.1	<0.1	<0.1	<0.1				
Dibromochloromethane	mg/kg	<0.1	<0.1	<0.1	<0.1				
Bromoform	mg/kg	<0.1	<0.1	<0.1	<0.1				
1,1,2,2-tetrachloroethane	mg/kg	<0.1	<0.1	<0.1	<0.1				
1,3-dichlorobenzene	mg/kg	<0.1	<0.1	<0.1	<0.1				
1,4-dichlorobenzene	mg/kg	<0.1	<0.1	<0.1	<0.1				
1,2-dichlorobenzene	mg/kg	<0.1	<0.1	<0.1	<0.1				

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DATE: 5/3/99

FESC 28217

BUCKLEYS WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 02/03/99
REFERENCE No.: SJR/SJR/sjr-12/4452
ORDER No.:

HALOCARBONS ANALYSIS

CAS SAMPLE No			HALOCARBONS ANALYSIS		
SAMPLE No		11			
DEPTH (m)		BHG3			
		0.00			
Chloroform	units				
1,1,1-trichloroethane	mg/kg	<0.1			
Carbon Tetrachloride	mg/kg	<0.1			
Trichloroethylene	mg/kg	<0.1			
Bromodichloromethane	mg/kg	<0.1			
Trans-1,3-dichloropropene	mg/kg	<0.1			
cis-1,3-dichloropropene	mg/kg	<0.1			
1,1,2-trichloroethane	mg/kg	<0.1			
Tetrachloroethylene	mg/kg	<0.1			
Dibromochloromethane	mg/kg	<0.1			
Bromoform	mg/kg	<0.1			
1,1,2,2-tetrachloroethane	mg/kg	<0.1			
1,3-dichlorobenzene	mg/kg	<0.1			
1,4-dichlorobenzene	mg/kg	<0.1			
1,2-dichlorobenzene	mg/kg	0.11			
	mg/kg	<0.1			

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CHECKED & ISSUED BY:

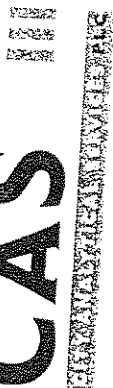
DATE: 10-3-99

CAS SAMPLE No		12	16	20
SAMPLE No		TP10	TP12	TP14
DEPTH(m)	units	0.40	0.90	0.10
COMBINE ACID HERBS				
Benazolin	mg/kg	<0.020	<0.020	<0.020
Bentazone	mg/kg	<0.020	<0.020	<0.020
Bromoxynil	mg/kg	<0.020	<0.020	<0.020
Clopyralid	mg/kg	<0.020	<0.020	<0.020
4-CPA	mg/kg	<0.020	<0.020	<0.020
2,4-D	mg/kg	<0.020	<0.020	<0.020
2,4-DB	mg/kg	<0.020	<0.020	<0.020
Dicamba	mg/kg	<0.020	<0.020	<0.020
Dichlorprop	mg/kg	<0.020	<0.020	<0.020
Dicofop	mg/kg	<0.020	<0.020	<0.020
Fenoprop	mg/kg	<0.020	<0.020	<0.020
Flamprop-m-isopropyl	mg/kg	<0.020	<0.020	<0.020
Flamprop	mg/kg	<0.020	<0.020	<0.020
Ioxynil	mg/kg	<0.020	<0.020	<0.020
NCPA	mg/kg	<0.020	<0.020	<0.020
MCPB	mg/kg	<0.020	<0.020	<0.020
MCPB	mg/kg	<0.020	<0.020	<0.020
PCP	mg/kg	<0.020	<0.020	<0.020
Picloram	mg/kg	<0.020	<0.020	<0.020
2,4,5-T	mg/kg	<0.020	<0.020	<0.020
2,3,6-TBA	mg/kg	<0.020	<0.020	<0.020
Triclopyr	mg/kg	<0.020	<0.020	<0.020
NPD DETECTOR PESTICIDES				
Fenpropidin	mg/kg	<0.10	<0.10	<0.10
Fenpropimorph	mg/kg	<0.10	<0.10	<0.10
Fluazifop-butyl	mg/kg	<0.10	<0.10	<0.10
Flutriafol	mg/kg	<0.10	<0.10	<0.10
Flusilazole	mg/kg	<0.10	<0.10	<0.10
Metribusin	mg/kg	<0.10	<0.10	<0.10
CARBAMATES				
Carbaryl	mg/kg	<2.0	<2.00	<2.00
Carbetamide	mg/kg	<1.20	<1.20	<1.20
Chlorbufam	mg/kg	<0.80	<0.80	<0.80
Chlorpropham	mg/kg	<0.80	<0.80	<0.80
Methiocarb	mg/kg	<0.80	<0.80	<0.80
Pirimicarb	mg/kg	<1.20	<1.20	<1.20
Propham	mg/kg	<0.80	<80	<0.80
UREA TYPE HERBICIDES				
Chlortoluron	mg/kg	<0.10	<0.10	<0.10
Diuron	mg/kg	<0.10	<0.10	<0.10
Isoproturon	mg/kg	<0.10	<0.10	<0.10
Linuxon	mg/kg	<0.10	<0.10	<0.10
Methabenzthiazuron	mg/kg	<0.10	<0.10	<0.10
Menuro	mg/kg	<0.10	<0.10	<0.10

Results of Chemical Analyses on Leachates
Prepared from Soil Samples

FIGURES CT2/1 and CT2/2

CAS



FESC/28067
 BUCKLEY WELLS BURRY LANCASHIRE
 FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
 SAMPLES RECEIVED: 19/2/99
 REFERENCE No.: 4452
 ORDER No.:

TRIAZINE HERBICIDE ANALYSIS

CAS SAMPLE No	12	16	20	
SAMPLE No	TP 10	TP 12	TP 14	
DEPTH (m)	0.40	0.90	0.10	
	units			
Simazine				
Prometon	<1	<1	<1	
Atrazine	<1	<1	<1	
Propazine	<1	<1	<1	
Ametryn	<1	<1	<1	
Prometryn	<1	<1	<1	
Terbutryn	<1	<1	<1	

CHECKED & ISSUED BY: *EFH*

DATE: 5/3/99

CAS

SECRET

5/3/99

FESC/28217

BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
LEACHATES RECIEVED 02/03/99
YOUR REFERENCE SJR/SJR/SJR-12/4452
YOUR ORDER NO



CAS SAMPLE NO SAMPLE NO DEPTH(m)		15 BHC2 2.20		16 BHC2 5.20		17 BHC4 6.70		18 TP 4 0.00		19 TP 7 1.00		20 TP15 0.10	
Method		units											
25C-L* Arsenic (soluble)		as											
07-L* Boron (soluble)		As	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
25-L* Cadmium (soluble)		B	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25-L* Chromium (soluble)		Cd	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
25-L* Copper (soluble)		Cr	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
25-L* Lead (soluble)		Cu	µg/l	<10	<10	<10	10	10	10	<10	<10	<10	<10
25X-L* Mercury (soluble)		Pb	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
25-L* Nickel (soluble)		Hg	µg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
25C-L* Selenium (soluble)		Ni	µg/l	<10	<10	<10	100	100	<10	<10	<10	<10	<10
25-L* Zinc (soluble)		Se	µg/l	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
		Zn	µg/l	<10	<10	<10	120	120	<10	<10	<10	<10	<10

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DATE: _____

CHECKED AND ISSUED BY:

DATE: 16.3.99.

Results of Chemical Analyses on Groundwater Samples
FIGURES CT3/1 to CT3/9

FESC/28271

BUCKLEY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
WATERS RECEIVED 05/03/99
YOUR REFERENCE SJR/SJR/sjr-3/4452
YOUR ORDER NO

CAS

CAS SAMPLE NO
SAMPLE NO
DEPTH (m)

		1 2 3 4 5 6					
		BHC1	BHC3	BHC4	BHC5	BHG4	BHG1
Method	as	units					
25C-W* Arsenic (soluble)	As	µg/l	<10	<10	<10	<10	<10
07-W* Boron (soluble)	B	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
25-W* Cadmium (soluble)	Cd	µg/l	<5	<5	<5	<5	<5
13-W* Chromium (hexavalent)	Cr	µg/l					
25-W* Chromium (soluble)	Cr	µg/l	<10	<10	<10	<10	<10
25-W* Copper (soluble)	Cu	µg/l	<10	<10	<10	<10	<10
15B-W* Cyanide (free)	CN ⁻	mg/l					
14B-W* Cyanide (total)	CN ⁻	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
25-W* Lead (soluble)	Pb	µg/l	<10	<10	<10	<10	<10
25X-W* Mercury (soluble)	Hg	µg/l	<1	<1	<1	<1	<1
25-W* Nickel (soluble)	Ni	µg/l	10	10	<10	<10	10
308-W* PAH (total)		µg/l	<20	<20	<20	<20	<20
31-W pH		pH units	6.6	6.5	6.7	6.8	7.3
32A-W* Phenols (total)	PhOH	mg/l	0.07	<0.05	0.10	<0.05	<0.05
25C-W* Selenium (soluble)	Se	µg/l	<2	<2	<2	<2	<2
37-W Sulphate	SO ₃	g/l	0.06	0.23	0.16	0.02	0.06
38-W* Sulphide	S	mg/l	0.80	<0.5	<0.5	<0.5	<0.5

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FEEDBACK
E. J. BARRY WELLS BURY LANCASHIRE
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
WATERS RECEIVED 05/03/99
YOUR REFERENCE SJR/SJR/sjr-3/4452
YOUR ORDER NO

CAS

CHESHIRE ANALYTICAL PLC

CAS SAMPLE NO
SAMPLE NO
DEPTH (m)

Method	1	2	3	4	5	6
	BHC1	BHC3	BHC4	BHC5	BHG4	BHG1
						1.54
* Thiocyanate	as	units				
318-W* TPH's by GC (C6 to C40)	CN ⁻	mg/l				
25-W* Zinc (soluble)	Zn	µg/l				

see separate sheet

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DATE:

11/3/99

Results for Groundwater Samples
Collected During the First Event

FIGURES CT3/1 to CT3/3

CAS

ANALYTICAL
PLC

FESC 28271
BUCKLEY WELLS, BURY, LANCASHIRE
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 05/03/99
REFERENCE No.: SJR/SJR/sjr-3/4452
ORDER No.:

Waters Analysis

TPH ANALYSIS						
CAS SAMPLE No	1	2	3	4	5	6
SAMPLE No	BHC1	BHC3	BHC4	BHC5	BHG4	BHG1
DEPTH (m)						1.54
Gasoline Range (C ₆ - C ₁₀)						
Diesel Range (C ₁₁ - C ₂₀)						
Mineral Oils Range (C ₂₁ - C ₄₀)						
Total Petroleum Hydrocarbons						
units						
µg/l	<600	<600	<600	<600	<600	<600
µg/l	<600	<600	<600	<600	<600	<600
µg/l	<600	<600	<600	<600	<600	<600
µg/l	<600	<600	<600	<600	<600	<600

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DATE: 11/3/99

Results for Groundwater Samples
Collected During the Second Event

FIGURES CT3/4 to CT3/9

RESU/28394
F. LEY
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
WATERS RECEIVED 12/03/99
YOUR REFERENCE 4452
YOUR ORDER NO

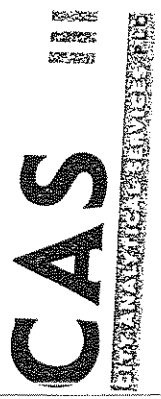
CAS

CAS SAMPLE NO
SAMPLE NO
DEPTH (m)

Method	1 BHG1 1.82	2 BHG4 7.72	3 BHC1 1.03	4 BHC3 0.87	5 BHC4 7.80	6 BHC5 7.85
25C-W* Arsenic (soluble)	as	units				
07-W* Boron (soluble)	As	µg/l	<10	<10	<10	<10
302-W* BTEX	B	mg/l	0.06	0.11	<0.05	0.14
25-W* Cadmium (soluble)	Cd	µg/l	see separate sheet	see separate sheet	see separate sheet	see separate sheet
304-W* Chlorinated Solvents						
13-W* Chromium (hexavalent)	Cr	µg/l	<5	<5	<5	<5
25-W* Chromium (soluble)	Cr	µg/l	see separate sheet	see separate sheet	see separate sheet	see separate sheet
25-W* Copper (soluble)	Cu	µg/l	<10	<10	<10	<10
15B-W* Cyanide (free)	CN ⁻	mg/l	<10	<10	<10	<10
14B-W* Cyanide (total)	CN ⁻	mg/l	see separate sheet	see separate sheet	see separate sheet	see separate sheet
25-W* Lead (soluble)	Pb	µg/l	<0.01	<0.01	<0.01	<0.01
25X-W* Mercury (soluble)	Hg	µg/l	<10	<10	<10	<10
25-W* Nickel (soluble)	Ni	µg/l	<1	<1	<1	<1
308-W* PAH (speciated)			<10	<10	<10	<10
308-W* PAH (total)			see separate sheet	see separate sheet	see separate sheet	see separate sheet
31-W pH	pH	units	<20	<20	<20	<20
32A-W* Phenols (total)	PhOH	mg/l	6.7	6.7	6.4	6.7

CHECKED AND ISSUED BY: *W. J. L. L.* DATE: 18 March 99

FESC/28391
BUCKLEY WELLS
FOUNDATION & EXPLORATION SERVICES (CHESHIRE)
WATERS RECEIVED 12/03/99
YOUR REFERENCE 4452
YOUR ORDER NO



CAS SAMPLE NO		12/03/99					
SAMPLE NO		1					
DEPTH (m)		1.82					
Method		BHG1	BHG4	BHC1	BHC3	BHC4	BHC5
25C-W* Selenium (soluble)	as						
37-W Sulphate	Se	$\mu\text{g/l}$	<2	<2	<2	<2	<2
38-W* Sulphide	SO ₃	g/l	0.08	0.02	0.06	0.18	0.30
* Thiocyanate	S	mg/l	<5	<5	<5	<5	<5
318-W* TPH's by GC (C6 to C40)	CN ⁻	mg/l					
25-W* Zinc (soluble)	Zn	$\mu\text{g/l}$	10	<10	10	20	40
CHECKED AND ISSUED BY:		see separate sheet					
DATE:		18 March 99					

CAS

ANALYTICAL PLC

FESC 28391
 BUCKLEY WELLS
 FOUNDATION & EXPLORATION SERVICES
 SAMPLES RECEIVED: 12/03/99
 REFERENCE No.: 4452
 ORDER No.:

Waters Analysis

TPH ANALYSIS						
CAS SAMPLE No	1	2	3	4	5	6
SAMPLE No	BHG1	BHG4	BHC1	BHC3	BHC4	BHC5
DEPTH (m)	1.82	7.72	1.03	0.87	7.80	7.85
Gasoline Range (C ₆ - C ₁₀)						
Diesel Range (C ₁₁ - C ₂₀)	<600	<600	<600	<600	<600	<600
Mineral Oils Range (C ₂₁ - C ₄₀)	<600	<600	<600	<600	<600	<600
Total Petroleum Hydrocarbons	<600	<600	<600	<600	<600	<600

CHECKED & ISSUED BY: *W. R. Long*

DATE: 18 March 99



FESC 28391
BUCKLEY WELLS
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 12/03/99
REFERENCE No.: 4452
ORDER No.:

Waters Analysis

BTEX ANALYSIS

CAS SAMPLE No	1	2	3	4	5	6
SAMPLE No	BHG1	BHG4	BHC1	BHC3	BHC4	BHC5
DEPTH (m)	1.82	7.72	1.03	0.87	7.80	7.85
	units					
Benzene						
Toluene	µg/l	<10	N/R	<10	<10	<10
Ethylbenzene	µg/l	<10	N/R	<10	<10	<10
m&p-Xylene	µg/l	<10	N/R	<10	<10	<10
o-Xylene	µg/l	<10	N/R	<10	<10	<10

CHECKED & ISSUED BY: *Car B. L...*

DATE: 18 March 99

CAS

FESC/28391

BUCKLEY WELLS

FOUNDATION & EXPLORATION SERVICES (CHESHIRE)

SAMPLES RECEIVED: 12/3/99

REFERENCE No.: 4452

ORDER No.:

Waters Analysis

CAS SAMPLE No		PAH ANALYSIS (HPLC)					
SAMPLE No		1	2	4	5	6	
DEPTH (m)		BHCA-D	BH 1	BH 1A	BH 1D	BH 3	
Naphthalene	units						
Acenaphthylene	µg/l	<2	<2	<2	<2	<2	
Acenaphthene	µg/l	<2	<2	<2	<2	<2	
Fluorene	µg/l	<2	<2	<2	<2	<2	
Phenanthrene	µg/l	<2	<2	<2	<2	<2	
Anthracene	µg/l	<2	<2	<2	<2	<2	
Pyrene	µg/l	<2	<2	<2	<2	<2	
Benzo(a)anthracene	µg/l	<2	<2	<2	<2	<2	
Chrysene	µg/l	<2	<2	<2	<2	<2	
Benzo(b)fluoranthene	µg/l	<2	<2	<2	<2	<2	
Benzo(k)fluoranthene	µg/l	<2	<2	<2	<2	<2	
Benzo(a)pyrene	µg/l	<2	<2	<2	<2	<2	
Dibenzo(ah)anthracene	µg/l	<2	<2	<2	<2	<2	
Benzo(ghi)perylene	µg/l	<2	<2	<2	<2	<2	
Indeno(123cd)pyrene	µg/l	<2	<2	<2	<2	<2	

CHECKED & ISSUED BY: *W. M. L. L.*

DATE: 18 March 99

CAS

ANALYTICAL PLC

FESC 28391
BUCKLEY WELLS
FOUNDATION & EXPLORATION SERVICES
SAMPLES RECEIVED: 12/03/99
REFERENCE No.: 4452
ORDER No.:

Waters Analysis

HALOCARBONS ANALYSIS						
CAS SAMPLE No	1	2	3	4	5	6
SAMPLE No	BHG1	BHG4	BHC1	BHC3	BHC4	BHC5
DEPTH (m)	1.82	7.72	1.03	0.87	7.80	7.85
Chloroform	units					
1,1,1-trichloroethane	µg/l	<2	N/R	<2	<2	<2
Carbon Tetrachloride	µg/l	<2	N/R	<2	<2	<2
Trichloroethylene	µg/l	<2	N/R	<2	<2	<2
Bromodichloromethane	µg/l	<2	N/R	<2	<2	<2
Trans-1,3-dichloropropene	µg/l	<10	N/R	<2	<2	<2
cis-1,3-dichloropropene	µg/l	<10	N/R	<10	<10	<10
1,1,2-trichloroethane	µg/l	<2	N/R	<10	<10	<10
Tetrachloroethylene	µg/l	<2	N/R	<2	<2	<2
Dibromochloromethane	µg/l	<2	N/R	<2	<2	<2
Bromoform	µg/l	<2	N/R	<2	<2	<2
1,1,2,2-tetrachloroethane	µg/l	<5	N/R	<2	<2	<2
1,3-dichlorobenzene	µg/l	<5	N/R	<5	<5	<5
1,4-dichlorobenzene	µg/l	<5	N/R	<5	<5	<5
1,2-dichlorobenzene	µg/l	<5	N/R	<5	<5	<5
	µg/l	<5	N/R	<5	<5	<5

CHECKED & ISSUED BY: *W. J. Kelly*

DATE: 18 March 99

APPENDIX L

GEOTECHNICAL CERTIFICATES OF ANALYSIS -LKA

Laboratory Report Page 1 of 3

Report For : Buckley Wells
Job Number : 4811
Issue Date : 25th January 2006
Appendix Number of Tables Attached 0

Issued By :



Issued By : J M Jones
Laboratory Manager
Ian Farmer Associates
11-12 Skinnerburn Road
Newcastle upon Tyne
NE1 3RH

Issued To : Adam Latimer
Internal Client
Ian Farmer Associates
17 Rivington Court
Warrington
Cheshire
WA1 4RT

Laboratory Testing

Job Number : Buckley Wells

Job Name : 4811

Laboratories testing of soil samples taken from the site were tested between 9th January and 25th January 2006 in accordance with BS1377: 1990. Summaries of the test results are provided in the attached tables. All bulk samples were prepared in accordance with BS1377: Part One: 1990 and representative sub samples were taken for testing. All samples taken for testing from sampling tubes were taken from the top of the tube, unless otherwise stated, in the laboratory testing explained below. Oven temperatures for drying moisture contents were set at 105-110 degrees C, though the temperature may vary outside these limits from time to time.

Classification Tests

Moisture Content

The Moisture Content of 10 samples was determined using the oven drying method detailed in BS1377: Part 2:1990 Clause 3.2. If a comparison with Atterberg limits is required the measured moisture content will be corrected to give the equivalent moisture content of the fraction passing the 425 micron sieve.

Liquid and Plastic Limits

The Liquid and Plastic limits of 4 samples was determined using the cone penetrometer method detailed in BS1377: Part 2:1990 Clause 4.3 and the definitive method detailed in BS1377: Part 2:1990 Clause 5.3. Samples were prepared in their Natural state in accordance with Clause 4.2.1 where possible or wet sieved in accordance with Clause 4.2.4. Any samples wet sieved are marked with an S underneath the percentage passing the 425 micron sieve on the laboratory summary sheets in the attached tables. For classification purposes results falling close to the "A" line will be reported as silts/clays to account for variations in repeatability.

Occasionally it may be due to insufficient sample available to carry out the definitive method (4-point test). On these occasions the one point method clause 4.4 will be used and as such indicated by 1P under the liquid limit result.

Particle Size Distribution

The Particle Size Distribution of 2 samples was determined using the wet sieving method detailed in BS1377: Part 2:1990 Clause 9.2. The samples were prepared in accordance with BS1377: Part 1:1990 Clause 7.3 and 7.4.5. Particle size distribution curves are plotted in the corresponding figures as cumulative percentage passing British Standard Test Sieves. Oven temperatures for drying gradings were set at 105-110 degrees C, though the temperature may vary outside these limits from time to time.

Bulk Density

The Bulk Density of 4 samples was determined using the Linear measurement method detailed in BS 1377: Part 2:1990 Clause 7.2. The samples were prepared in accordance with clause 7.2.3.

Laboratory Testing

Job Number : Buckley Wells

Job Name : 4811

Chemical Tests

All sulphate contents are expressed as So_4 concentrations.

PH

The pH of 12 samples was determined using the electrometric method detailed in BS1377: Part 3:1990 Clause 9.5. The samples were prepared in accordance with Clause 9.4. The results are expressed to 0.1 PH units. The samples were air-dried.

Water Soluble Sulphate

The water-soluble Sulphate content of 12 samples was determined using the gravimetric method detailed in BS1377: Part 3:1990 Clause 5.5. The samples were prepared in accordance with Clause 5.3. and the results are expressed in grams per litre as detailed in clause 5.5.4.1.3. (Method 1). Oven temperatures for drying sulphates were set at 75-80 degrees C, though the temperature may vary outside these limits from time to time.

Compaction Related Tests

CBR

The California Bearing Ratio of 8 samples was determined using the penetration test procedure detailed in BS1377: Part 4:1990 Clause 7.4. The samples were prepared in accordance with BS1377: Part 4:1990 Clause 7.2.4.4. Method 5 using a 2.5kg/4.5Kg rammer / intermediate effort. The force penetration curves are given in the corresponding figures. The curves include the percentage retained on the 20mm test sieve.

Shear Strength Tests (Total Stress)

Triaxial Multi Stage

The undrained shear strength of 1 samples was determined using the method detailed in BS1377: Part 7:1990 Clause 9. The samples were prepared in accordance with Clause 8.3. Remoulded samples (if any) were prepared in accordance with Clause 8.3.3. Any remoulded samples are identified as such on the attached tables. The rate of strain applied during the test was 4mm/min. Rubber membranes of high density latex were used and were 0.5 mm thick. Clause 8.2.7. Suggests that the membrane thickness for specimen diameters larger than 50mm should be greater than 0.2mm, but less than 1% of the sample diameter. Therefore a thickness of 0.5mm is suitable. A correction to allow for the restraining effect of the membrane was applied in accordance with Clause 8.5.1.4 and the deviator stress was adjusted accordingly. Plots for corrected deviator stress against percentage strain are given in the corresponding figures.

Hand Vane

The Hand Vane was used to determine the equivalent shear strength of 1 samples in accordance with Ian Farmer Associate's standard procedure no.102 (available on request)

UKAS ACCREDITED TESTS

Tests listed below are **NOT UKAS ACCREDITED** in this report and are not included in the UKAS accreditation schedule for our laboratory.

Handvane

Site : Buckley Wells Locomotive Works[®] Bury

Job Number

4811

Client : Leyden Kirby Associates

Sheet

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

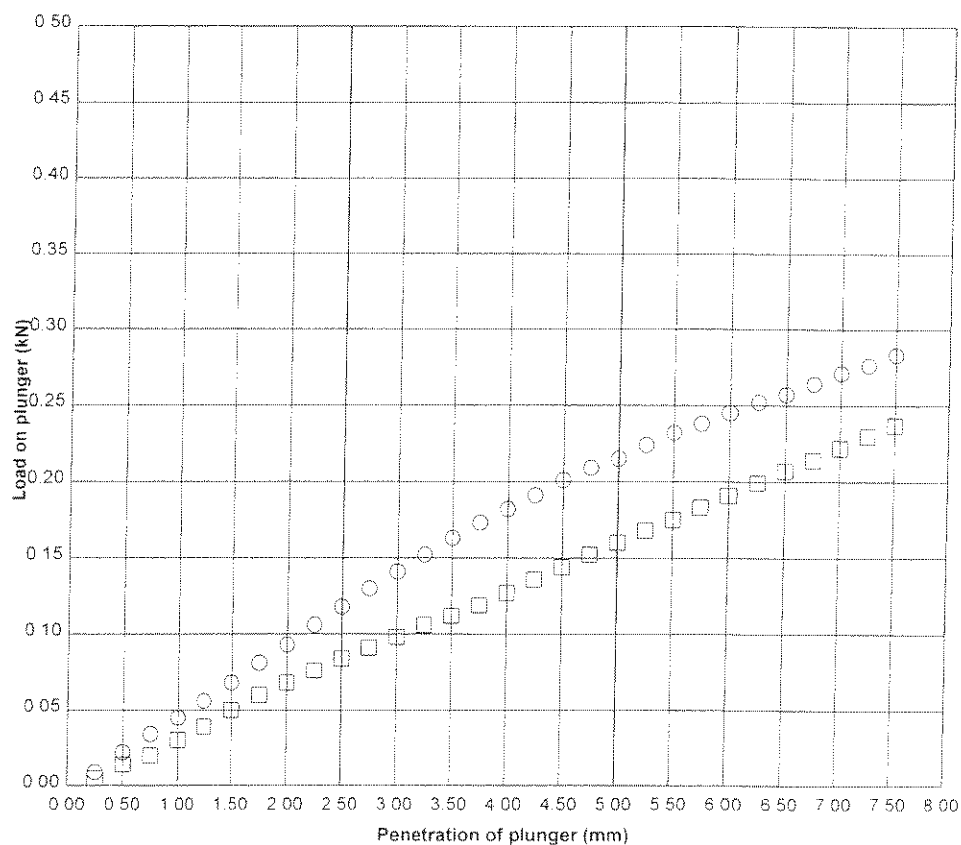
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-06	0.00	B1	100 %	Black very organic TOPSOIL

Moisture Content %	
Bulk Density Mg/m ³	1.62
Dry Density Mg/m ³	1.13
Soaked Test	No

Test on	☐ TOP
Moisture Content %	43
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.08 0.16
Corrected CBR %	0.64 0.81

Test on	☐ BOTTOM
Moisture Content %	43
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.12 0.22
Corrected CBR %	0.94 1.1

Test on	TOP	BOTTOM
Reported CBR %	0.73	1.0


Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377:PART 1:1990:7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377:PART 4:1990:7.2 Preparation of test sample

Method of Test : BS 1377:PART 4:1990:7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works[^] Bury

Client : Leyden Kirby Associates

Job Number
4811

Sheet
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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

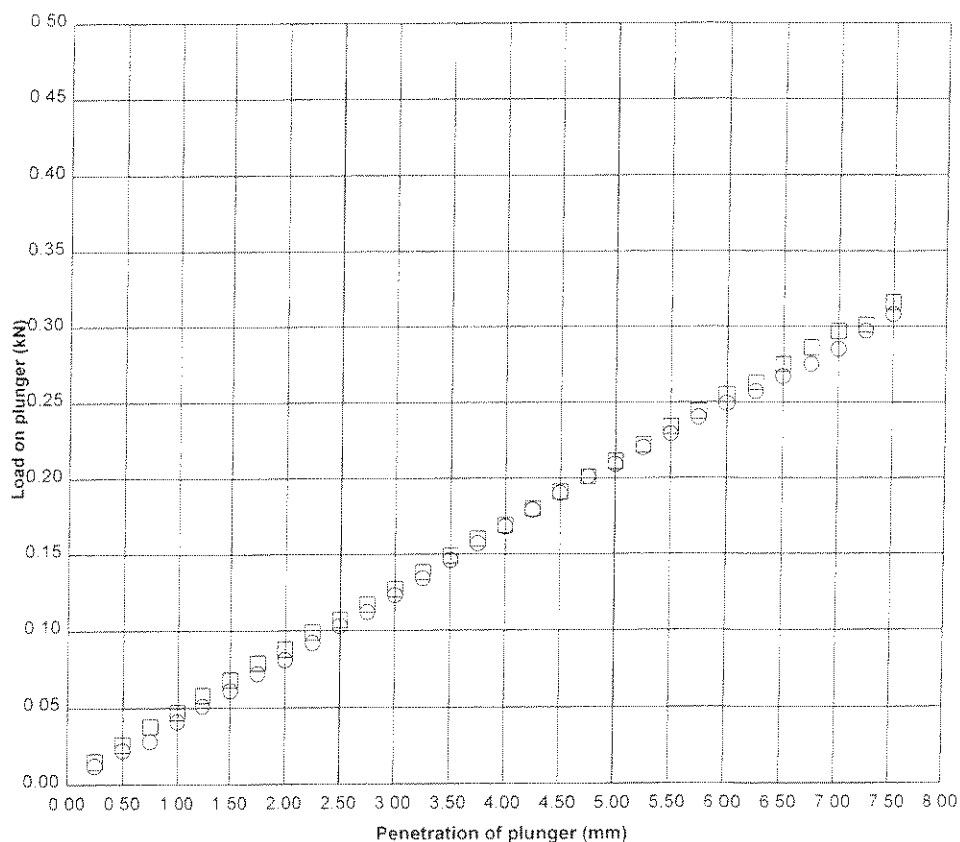
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-07	0.00	B1	99 %	Black organic slightly gravelly TOPSOIL

Moisture Content %	
Bulk Density Mg/m ³	1.66
Dry Density Mg/m ³	1.22
Soaked Test	No

Test on	☐ TOP
Moisture Content %	35
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.11 0.21
Corrected CBR %	0.83 1.0

Test on	☐ BOTTOM
Moisture Content %	36
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.10 0.21
Corrected CBR %	0.78 1.1

Test on	TOP	BOTTOM
Reported CBR %	0.93	0.92
Mean CBR %	0.93	



Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377 PART 1:1990 7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377 PART 4:1990 7.2 Preparation of test sample

Method of Test : BS 1377 PART 4:1990:7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works[^] Bury

Client : Leyden Kirby Associates

Job Number

4811

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

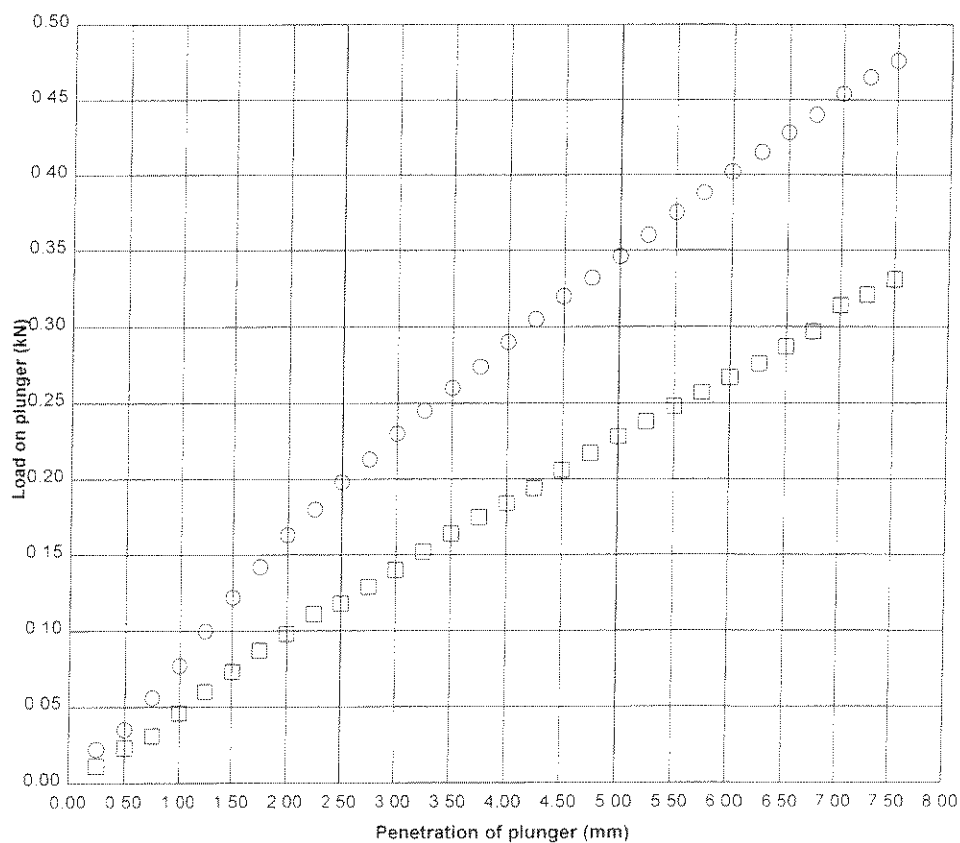
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-G1	0.00	B1	100 %	Black very organic TOPSOIL.

Moisture Content %	
Bulk Density Mg/m ³	1.71
Dry Density Mg/m ³	1.26
Soaked Test	No

Test on	☐ TOP
Moisture Content %	35
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.12 0.23
Corrected CBR %	0.89 1.1

Test on	☐ BOTTOM
Moisture Content %	36
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.20 0.35
Corrected CBR %	1.5 1.7

Test on	TOP	BOTTOM
Reported CBR %	1.0	1.6



Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377 PART 1:1990:7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377 PART 4 1990:7.2 Preparation of test sample

Method of Test : BS 1377 PART 4:1990:7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Job Number

4811

Client : Leyden Kirby Associates

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

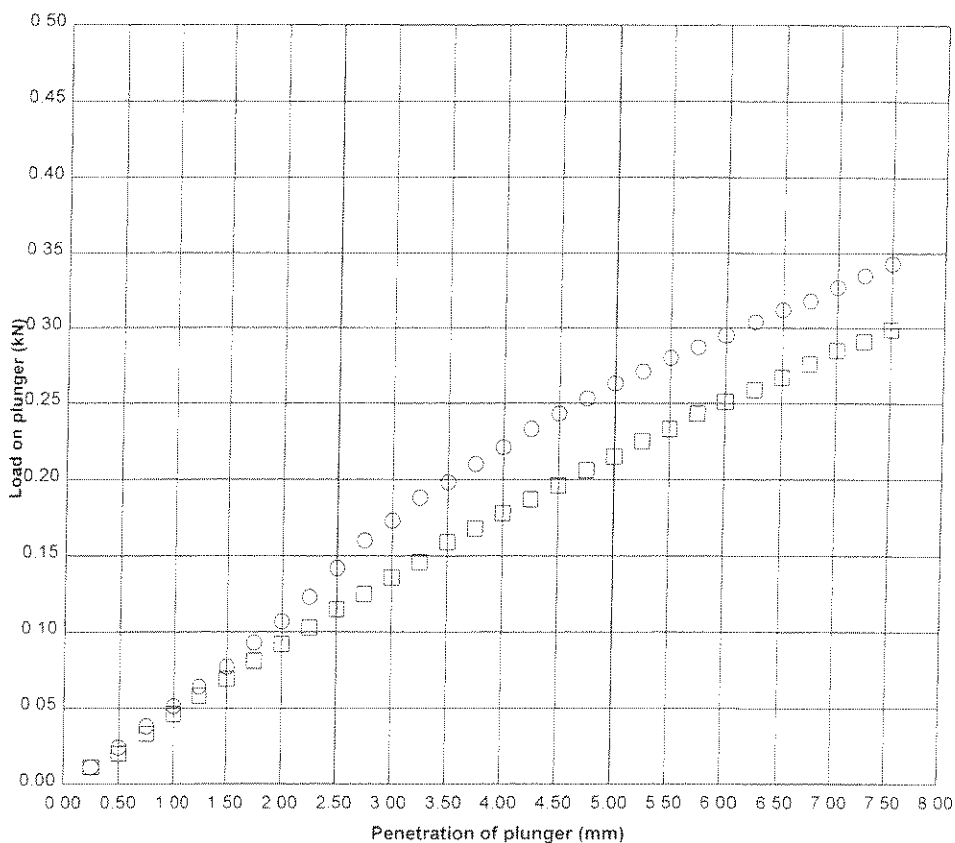
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-G2	0.00	B1	100 %	Black very organic slightly gravelly TOPSOIL

Moisture Content %	
Bulk Density Mg/m³	1.75
Dry Density Mg/m³	1.29
Soaked Test	No

Test on	☐ TOP
Moisture Content %	35
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.12 0.22
Corrected CBR %	0.90 1.1

Test on	☐ BOTTOM
Moisture Content %	36
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.14 0.26
Corrected CBR %	1.1 1.3

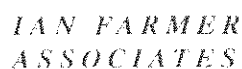
Test on	TOP	BOTTOM
Reported CBR %	1.0	1.2
Mean CBR %	1.1	



Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377:PART 1:1990:7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377:PART 4:1990:7.2 Preparation of test sample

Method of Test : BS 1377:PART 4:1990:7.4 Penetration test procedure

Remarks :



Laboratory Test Results

Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

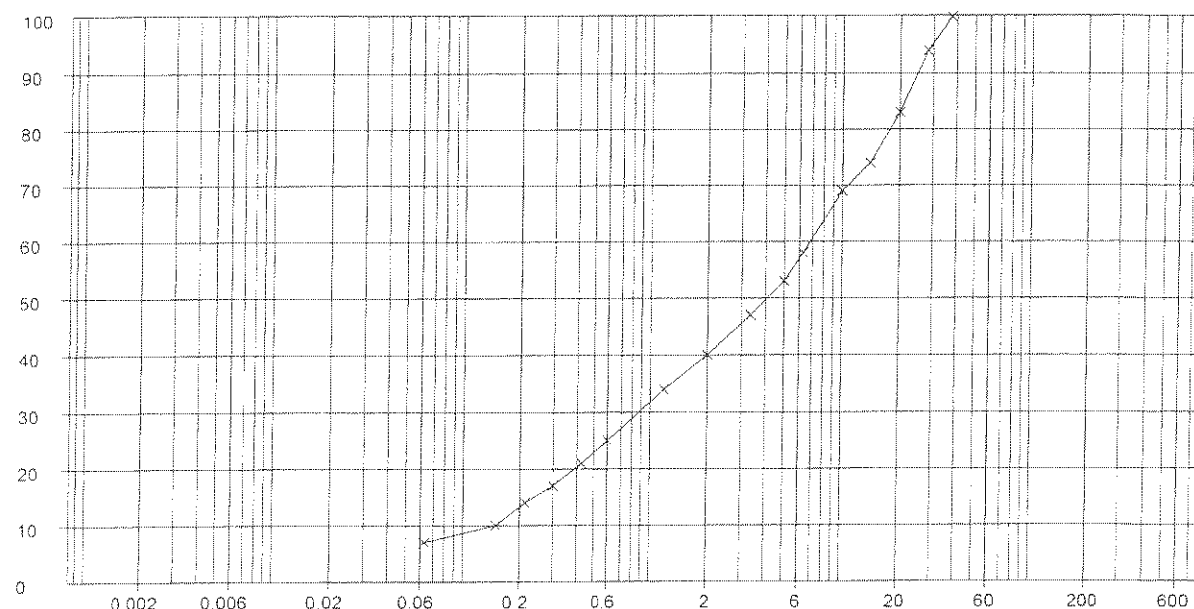
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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
WS-BH1	1.50	B1	N/A	Brown gravelly SAND Gravel is fine to medium

[illegible]

CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	21.3 mm
D60	6.9 mm
D10	200.0 μ m
Uniformity Coefficient	45.7

Particle Proportions	
Cobbles + Boulders	0%
Gravel	60%
Sand	33%
Silt/Clay	7%

Method of Preparation : BS 1377 PART 1:1990.7.3 Initial preparation 1990.7 4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Job Number

4811

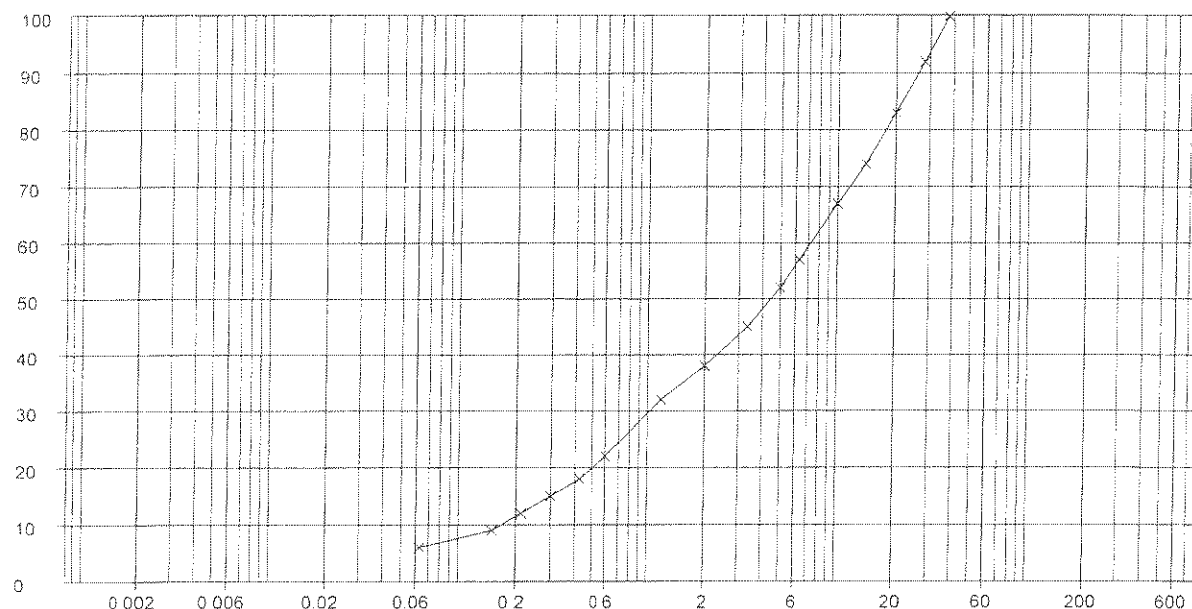
Client : Leyden Kirby Associates

Sheet

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
WS-BH1	2.50	B2	N/A	Brown sandy GRAVEL with traces of silt



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve /
Particle
Size%
Passing

200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
28 mm	92
20 mm	83
14 mm	74
10 mm	67
6.3 mm	57
5 mm	52
3.35 mm	45
2 mm	38
1.18 mm	32
600 µm	22
425 µm	18
300 µm	15
212 µm	12
150 µm	9
63 µm	6

Grading Analysis

D85	21.6 mm
D60	7.2 mm
D10	200.0 µm
Uniformity Coefficient	43.0

Particle Proportions

Cobbles + Boulders	0%
Gravel	62%
Sand	32%
Silt/Clay	6%

Method of Preparation : BS 1377 PART 1:1990 7.3 Initial preparation 1990:7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377 PART 2:1990 9 Determination of particle size distribution

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

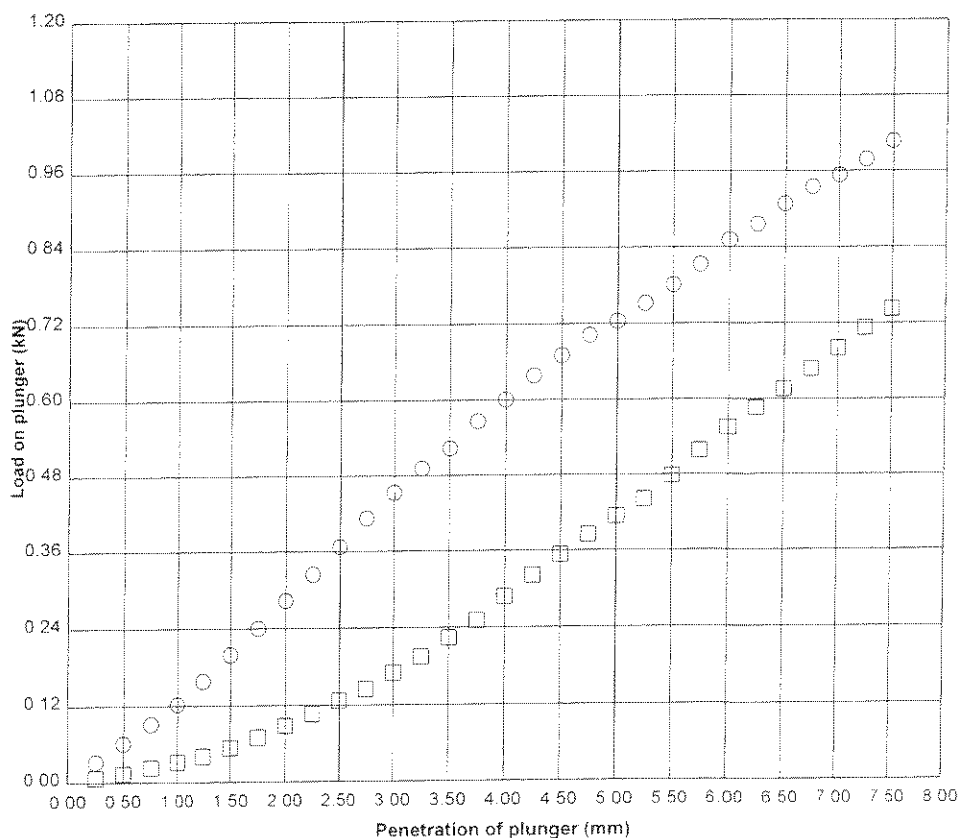
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-G3	0.00	B1	90 %	Black organic gravely SAND

Moisture Content %	
Bulk Density Mg/m³	1.82
Dry Density Mg/m³	1.53
Soaked Test	No

Test on	☐ TOP
Moisture Content %	18
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.13 0.41
Corrected CBR %	0.96 2.1

Test on	☐ BOTTOM
Moisture Content %	20
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.37 0.72
Corrected CBR %	2.8 3.6

Test on	TOP	BOTTOM
Reported CBR %	1.5	3.2



Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377:PART 1:1990:7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377:PART 4:1990:7.2 Preparation of test sample

Method of Test : BS 1377 PART 4:1990:7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number
4811

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

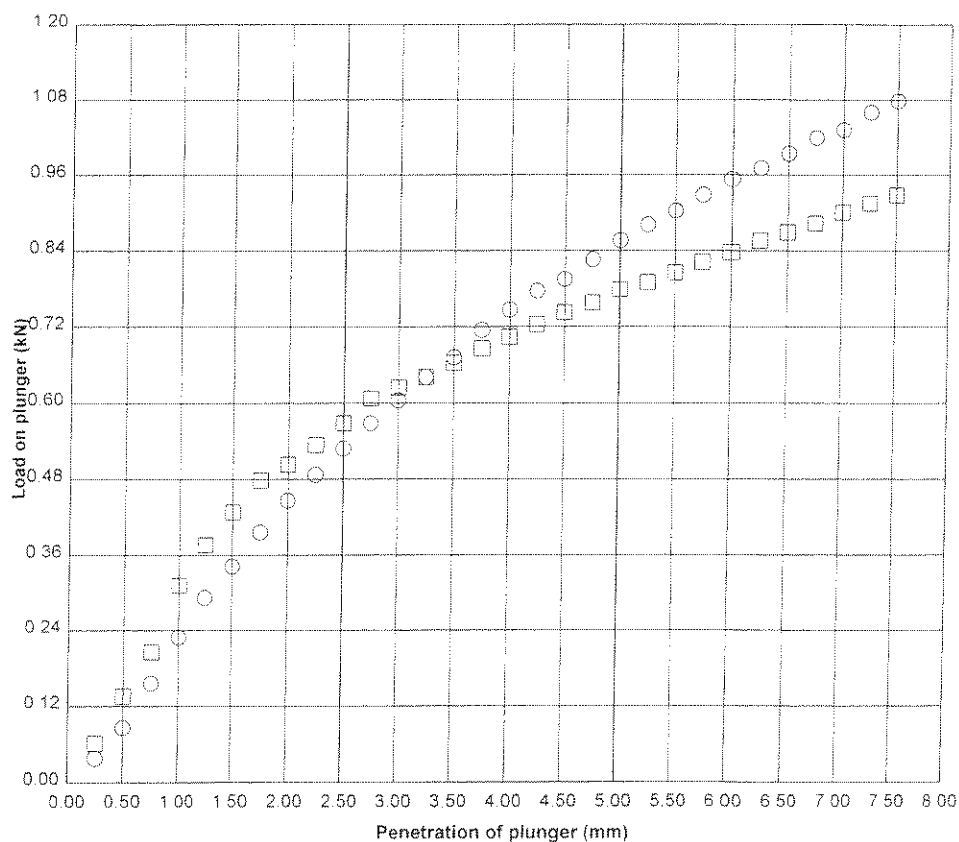
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-G4	0.00	B1	85 %	Black organic gravelly SAND

Moisture Content %	
Bulk Density Mg/m ³	1.70
Dry Density Mg/m ³	1.42
Soaked Test	No

Test on	☐ TOP
Moisture Content %	20
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.57 0.78
Corrected CBR %	4.3 3.9

Test on	☐ BOTTOM
Moisture Content %	20
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.53 0.86
Corrected CBR %	4.0 4.3

Test on	TOP	BOTTOM
Reported CBR %	4.1	4.1
Mean CBR %	4.1	



Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377:PART 1:1990:7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377:PART 4:1990:7.2 Preparation of test sample

Method of Test : BS 1377:PART 4:1990:7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

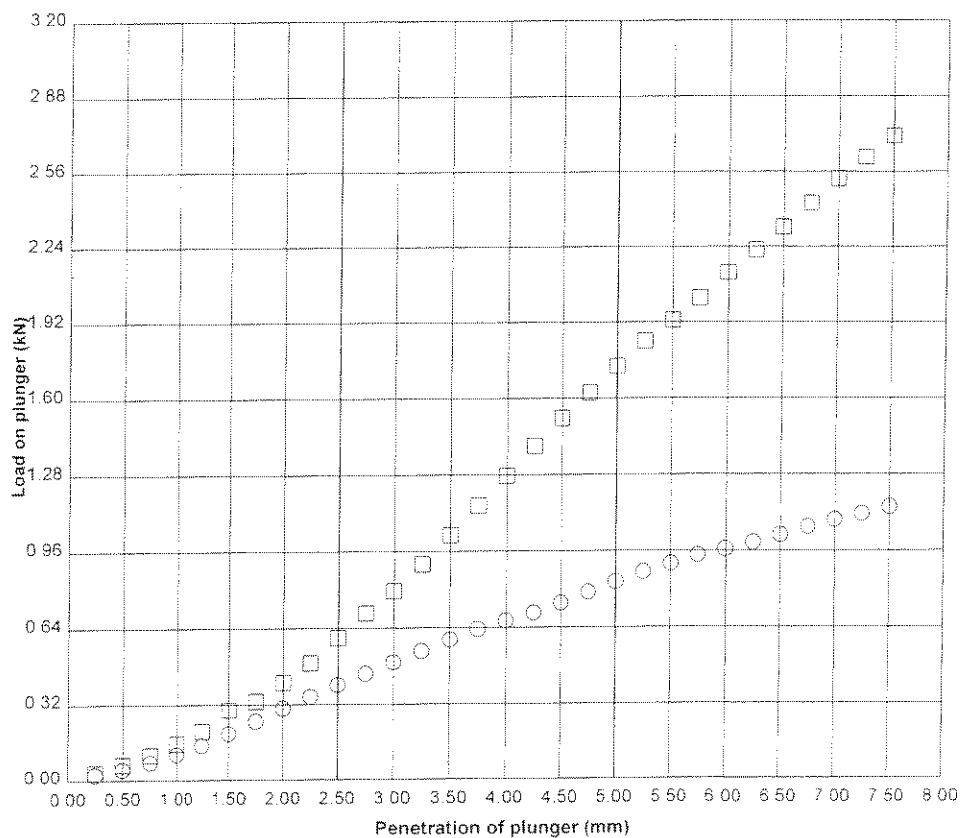
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-G5	0.00	B1	89 %	Brown gravely slightly clayey slightly organic SAND

Moisture Content %	
Bulk Density Mg/m ³	1.84
Dry Density Mg/m ³	1.54
Soaked Test	No

Test on	☐ TOP	
Moisture Content %	19	
Surcharge weight kg		
Penetration mm	2.5	5.0
Force kN	0.60	1.7
Corrected CBR %	4.6	8.7

Test on	☐ BOTTOM	
Moisture Content %	19	
Surcharge weight kg		
Penetration mm	2.5	5.0
Force kN	0.40	0.83
Corrected CBR %	3.0	4.2

Test on	TOP	BOTTOM
Reported CBR %	6.6	3.6



Method of Preparation : The specimen was prepared by Dynamic compression using a 4.5 kg Rammer
BS 1377:PART 1:1990:7.6.1 General 1990:7.6.5 California bearing ratio test BS 1377:PART 4:1990:7.2 Preparation of test sample

Method of Test : BS 1377:PART 4:1990:7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

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DETERMINATION OF CALIFORNIA BEARING RATIO (CBR)

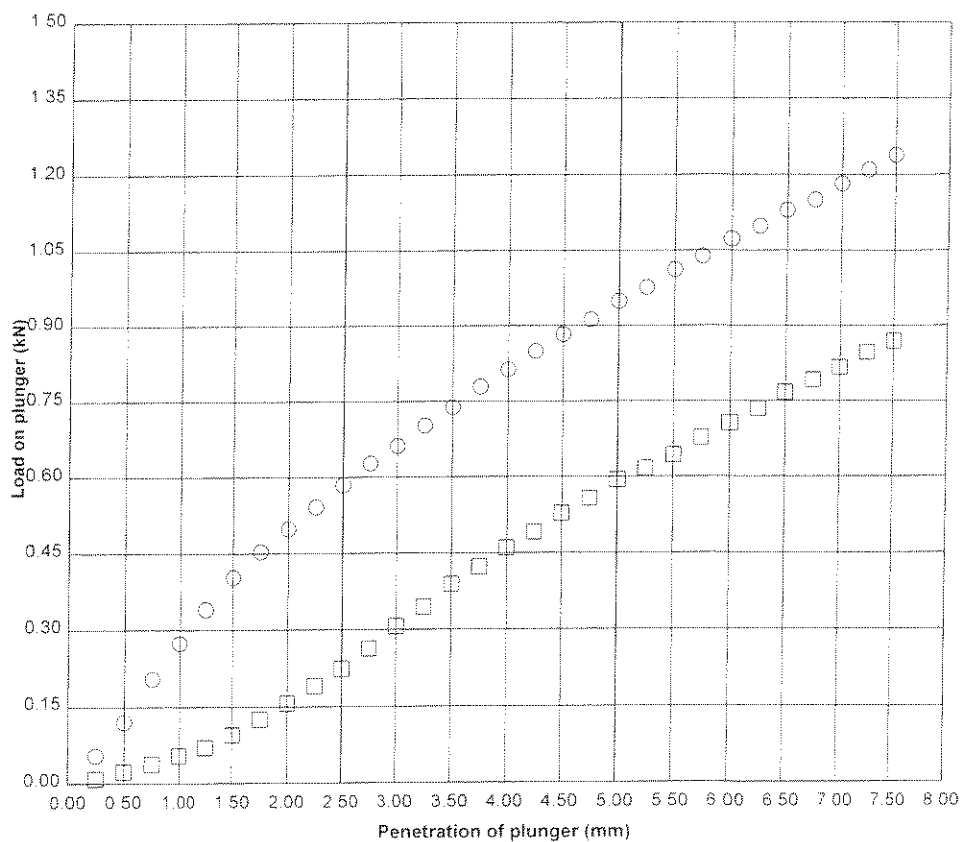
Borehole / Trial Pit	Depth (m)	Sample	% Passing 20 mm Sieve	Description
TP-G6	0.00	B1	88 %	Black organic gravelly CLAY

Moisture Content %	
Bulk Density Mg/m ³	1.50
Dry Density Mg/m ³	1.24
Soaked Test	No

Test on	☐ TOP
Moisture Content %	21
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.22 0.59
Corrected CBR %	1.7 3.0

Test on	☐ BOTTOM
Moisture Content %	21
Surcharge weight kg	
Penetration mm	2.5 5.0
Force kN	0.58 0.95
Corrected CBR %	4.4 4.8

Test on	TOP	BOTTOM
Reported CBR %	2.3	4.6



Method of Preparation : The specimen was prepared by Dynamic compression using a 2.5 kg Rammer
BS 1377 PART 1:1990 7.6.1 General 1990.7.6.5 California bearing ratio test BS 1377 PART 4:1990 7.2 Preparation of test sample

Method of Test : BS 1377 PART 4:1990 7.4 Penetration test procedure

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Job Number

4811

Client : Leyden Kirby Associates

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DETERMINATION OF NATURAL MOISTURE CONTENT

Borehole/ Trial Pit	Depth (m)	Sample	Moisture Content %	Description
BH-01	9.20	U18	21	Grey brown SAND with occasional cobbles
BH-01	9.70	D19	25	Grey SILT
BH-02	10.00	U14	12	Brown gravely CLAY Gravel is fine to coarse
BH-02	11.00	B18	14	Brown gravely CLAY Gravel is coarse to fine
BH-02	13.00	U23	9.8	Stiff grey gravely CLAY
BH-03	9.00	U10	27	Soft brown very sandy CLAY
BH-03	10.00	B12	15	Brown gravely CLAY Gravel is fine to medium
BH-03	12.00	U15	22	Brown very sandy CLAY
BH-03	12.50	D16	14	Brown gravely CLAY Gravel is fine to medium
WS-BH1	1.50	B1	8.1	Brown gravely SAND Gravel is fine to medium

Method of Preparation : BS 1377 PART 1:1990:7.4 Preparation of samples for classification tests BS 1377 PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377 PART 2:1990:3.2 Determination of moisture content

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

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**DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT
AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX**

Borehole/ Trial Pit	Depth (m)	Sample	Natural / Sieved	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Class	Description
					Percentage %	Moisture Content %						
BH-01	9.20	U18	Natural	20								Grey brown SAND with occasional cobbles
BH-01	9.70	D19	Natural	25	100	25		NP				Grey SILT
BH-02	10.00	U14	Natural	12								Brown gravely CLAY Gravel is fine to coarse
BH-02	11.00	B18	Natural	14	90	14	26	15	11	-0.08	CL	Brown gravely CLAY Gravel is coarse to fine
BH-02	13.00	U23	Natural	9.8								Stiff grey gravely CLAY
BH-03	9.00	U10	Natural	27								Soft brown very sandy CLAY
BH-03	10.00	B12	Natural	15	15	74		NP				Brown gravely CLAY Gravel is fine to medium
BH-03	12.00	U15	Natural	22								Brown very sandy CLAY
BH-03	12.50	D16	Natural	14	51	23	24	13	11	0.91	CL	Brown gravely CLAY Gravel is fine to medium

Method of Preparation : BS 1377 PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :



Site : Buckley Wells Locomotive Works^a Bury

Client : Leyden Kirby Associates

Job Number

4811

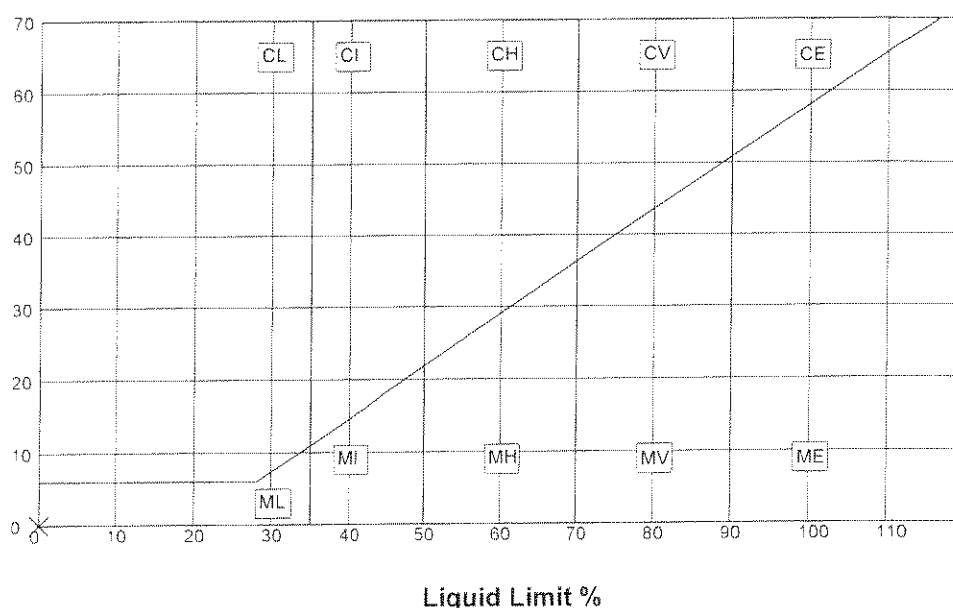
Sheet

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DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT
AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole / Trial Pit	Depth (m)	Sample	Natural/ Sieved	Description
BH-01	9.70	D19	Natural	Grey SILT

Plasticity
Index %



Casagrande
Plasticity
Chart

Liquid Limit	0 %	Plastic Limit	0 %
Liquidity Index	0.00	Plasticity Index	0 %
Natural Moisture Content	25 %	Classification	

Material Passing 425µm sieve			
Percentage passing	100 %	Corrected Moisture Content	25 %

Method of Preparation : BS 1377 PART 1:1990 7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index



Site : Buckley Wells Locomotive Works^ Bury

Job Number

4811

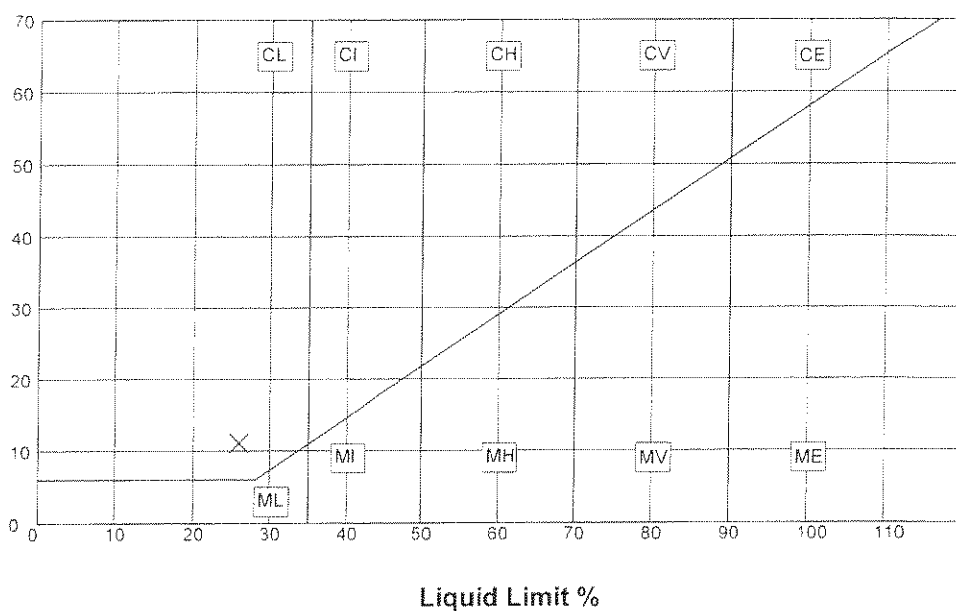
Client : Leyden Kirby Associates

Sheet

2 / 4

**DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT
AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX**

Borehole / Trial Pit	Depth (m)	Sample	Natural/ Sieved	Description
BH-02	11.00	B18	Natural	Brown gravelly CLAY. Gravel is coarse to fine

Plasticity
Index %Casagrande
Plasticity
Chart

Liquid Limit	26 %	Plastic Limit	15 %
Liquidity Index	-0.08	Plasticity Index	11 %
Natural Moisture Content	14 %	Classification	CL

Material Passing 425µm sieve			
Percentage passing	90 %	Corrected Moisture Content	14 %

Method of Preparation : BS 1377 PART 1 1990:7.4 Preparation of samples for classification tests BS 1377 PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377 PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377 PART 2:1990:5 Determination of the plastic limit and plasticity index



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

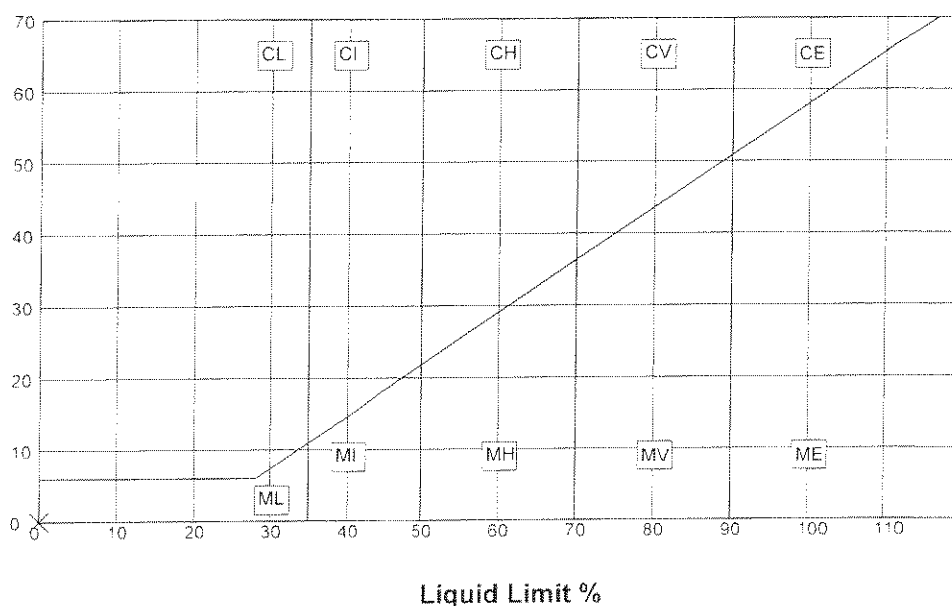
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3 / 4

**DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT
AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX**

Borehole / Trial Pit	Depth (m)	Sample	Natural/ Sieved	Description
BH-03	10.00	B12	Natural	Brown gravelly CLAY Gravel is fine to medium

Plasticity
Index %



Casagrande
Plasticity
Chart

Liquid Limit	0 %	Plastic Limit	0 %
Liquidity Index	0.00	Plasticity Index	0 %
Natural Moisture Content	15 %	Classification	

Material Passing 425µm sieve			
Percentage passing	15 %	Corrected Moisture Content	74 %

Method of Preparation : BS 1377 PART 1:1990 7.4 Preparation of samples for classification tests BS 1377 PART 2:1990 4.2 & 5.2 Sample preparations

Method of Test : BS 1377 PART 2:1990 3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377 PART 2 1990:5 Determination of the plastic limit and plasticity index



Site : Buckley Wells Locomotive Works^ Bury

Job Number

4811

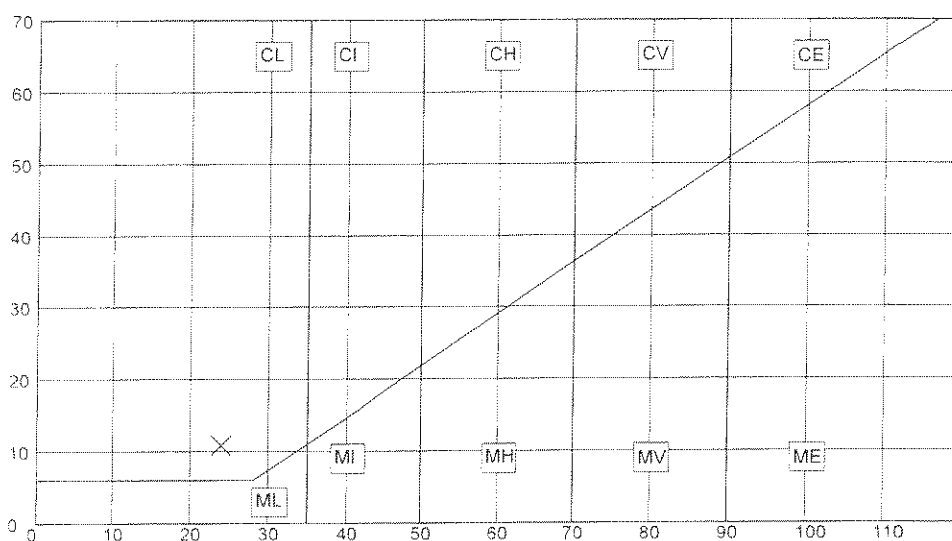
Client : Leyden Kirby Associates

Sheet

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**DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT
AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX**

Borehole / Trial Pit	Depth (m)	Sample	Natural/ Sieved	Description
BH-03	12.50	D16	Natural	Brown gravelly CLAY Gravel is fine to medium

Plasticity
Index %Casagrande
Plasticity
Chart

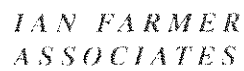
Liquid Limit %

Liquid Limit	24 %	Plastic Limit	13 %
Liquidity Index	0.91	Plasticity Index	11 %
Natural Moisture Content	14 %	Classification	CL

Material Passing 425µm sieve			
Percentage passing	51 %	Corrected Moisture Content	23 %

Method of Preparation : BS 1377:PART 1:1990 7.4 Preparation of samples for classification tests BS 1377:PART 2:1990 4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990 3 Determination of moisture content 1990 4 Determination of the liquid limit BS 1377:PART 2:1990 5 Determination of the plastic limit and plasticity index



Laboratory Test Results

Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

Sheet

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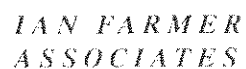
DETERMINATION OF MOISTURE CONTENT / BULK DENSITY / DRY DENSITY

[illegible]

Method of Preparation: BS 1377:PART 1:1990 8.2.8.3.8.4

Method of Test : BS 1377 PART 2:1990:7 Determination of Density

Remarks :



Laboratory Test Results

Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Engineer :

Job Number

4811

Sheet

year
month
week

DETERMINATION OF EQUIVALENT SHEAR STRESS BY HAND VANE

Borehole/ Trial Pit	Depth (m)	Sample	Type	Location	Readings	Equivalent Shear Stress kN/m²	Description
BH-02	13.00	U23		Top	4.00 4.00 4.00	98	Stiff grey gravelly CLAY

Method of Preparation :

Method of Test :

Remarks :



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

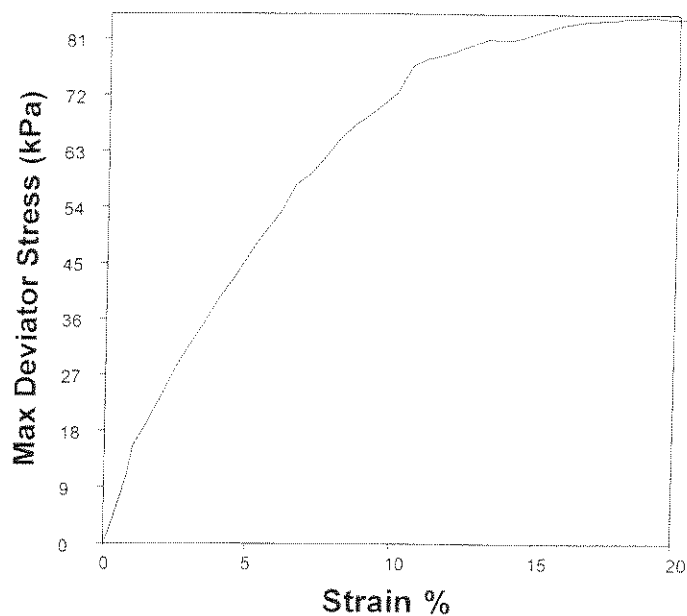
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DETERMINATION OF DENSITY, MOISTURE CONTENT AND UNDRAINED SHEAR STRENGTH
IN TRIAXIAL COMPRESSION WITHOUT THE MEASUREMENT OF PORE PRESSURE

Borehole / Trial Pit	Depth (m)	Sample	Description
BH-03	9.00	U10	Soft brown very sandy CLAY

Initial Specimen		Length of Sample (mm)		450	
		Depth from top of sample (mm)		30	
		Condition of Sample:		Undisturbed	
		Orientation:		Vertical	
Test Type			Multistage		
Length of Specimen (mm)			197.6		
Diameter of Specimen (mm)			102.9		
Moisture Content (%)			27		
Bulk Density (Mg/m³)			2.11		
Dry Density (Mg/m³)			1.66		
Membrane Thickness (mm)			0.2		
Membrane Type			Latex		
Rate of Strain (%/min)			1.52		
Test Results	Measured Cell Pressure (kPa)		90	180	360
	Strain at Failure (%)		6.1	10.1	19.2
	Membrane Correction (kPa)		0.3	0.4	0.7
	Corrected Deviator Stress (kPa)		53	72	84
	Shear Stress (kPa)		27	36	42
	Mode of Failure (B/P/C)		Plastic		



Method of Preparation : BS 1377 PART 1 1990:7 4 2 Moisture content 1990: Preparation of undisturbed samples for testing BS 1377 PART 2 1990:7 2

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:7 Determination of density BS 1377 PART 7 1990:8 Undrained shear strength 1990:9 Multistage loading

Remarks : Membrane Type: Latex



Site : Buckley Wells Locomotive Works^ Bury

Client : Leyden Kirby Associates

Job Number

4811

Sheet

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DETERMINATION OF THE pH VALUE AND THE SULPHATE CONTENT OF SOIL AND GROUNDWATER

Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Soluble Sulphate			Percentage of sample passing 2mm Sieve %	pH	Description
			Soil		Groundwater g /l			
			Total SO4 %	SO4 in 2:1 water:soil g /l				
BH-01	3.00	B7		0.1		89	7.5	Brown slightly gravelly sandy CLAY
BH-01	7.00	B14		0.2		77	6.8	Brown slightly gravelly sandy CLAY
BH-01	9.20	U18		<0.1		87	6.9	Grey brown SAND with occasional cobbles
BH-02	1.00	B2		0.2		70	7.2	Brown sandy gravelly CLAYwith traces of silt Gravel is fine to coarse
BH-02	8.00	B10		0.1		89	7.2	Brown gravelly CLAY.Gravel is fine to coarse
BH-02	10.00	U14		<0.1		81	5.1	Brown gravelly CLAY.Gravel is fine to coarse
BH-03	5.00	B5		0.1		87	7.0	Brown very sandy CLAY
BH-03	9.00	U10		0.1		94	6.1	Soft brown very sandy CLAY
BH-03	10.00	B12		0.1		90	6.4	Brown gravelly CLAY.Gravel is fine to medium
BH-03	12.00	U15		<0.1		94	6.2	Brown very sandy CLAY
WS-BH1	1.50	B1		<0.1		83	6.8	Brown gravelly SAND.Gravel is fine to medium
WS-BH1	2.50	B2		<0.1		85	7.1	Brown sandy GRAVEL with traces of silt

Method of Preparation : BS 1377 PART 1:1990 7.5 Preparation of soil for chemical tests BS 1377 PART 3:1990 5.2, 5.3, 5.4 & 9.4

Method of Test : BS 1377 PART 3:1990 5 Determination of the sulphate content of soil and ground water BS 1377 PART 3:1990 9 Determination of the pH value

Remarks :

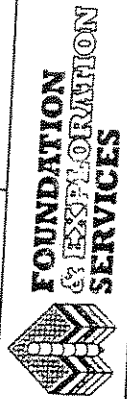
APPENDIX M

GEOTECHNICAL CERTIFICATES OF ANALYSIS - CRH

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

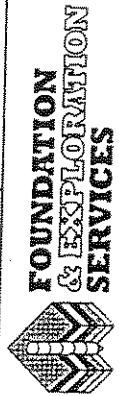
Hole	Type	Depth	Sample No.	Classification Tests								Method	Description
				Bulk Density (Mg/m³)	Moisture Content (%)	Dry Density (Mg/m³)	Particle Density (Mg/m³)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 µm		
BHC1A	U	5.80	6				2.61						Brown CLAY with a little sand and a little gravel
BHC1A	D	6.30	7		15			36	18	18	86	HP	Brown CLAY with a little sand and a little gravel
BHC1A	U	3.70	10		11								Grey CLAY with a little sand and a little gravel
BHC2	U	6.60	13				2.63						Brown CLAY with a little sand and a little gravel
BHC2	B	6.60	15		37			35	23	12	90	WS	Brown CLAY/SILT with a little sand and a little gravel
BHC2	B	8.70	19		17			31	21	10	27	WS	Brown green CLAY/SILT with some gravel and a little sand
BHC2	D	9.50	20		10								Brown CLAY with a little sand and a little gravel
Input by MB				Date	01/04/1999	Checked by [Signature]		Date	01/04/1999				
Project				BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE									
				Contract No 4452									
				Figure No LT11/1									
				102/02									



SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

Hole	Type	Depth	Sample No.	Classification Tests								Method	Description
				Bulk Density (Mg/m ³)	Moisture Content (%)	Dry Density (Mg/m ³)	Particle Density (Mg/m ³)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 µm		
BHC2	D	10.10	22		11								Brown CLAY with some gravel and a little sand
BHC2	B	11.00	23		17			23	15	8	73	HP	Brown CLAY with a little sand and a little gravel
BHC2	U	12.50	25		11								Brown CLAY with a little sand and a little gravel
BHC2	D	12.90	26		17			22	16	6	78	HP	Brown CLAY/SILT with a little sand and a little gravel
BHC3	B	4.40	9		25			31	18	13	64	WS	Grey CLAY with a little sand and a little gravel
BHC3	D	5.00	11		13								Brown CLAY with a little sand and a little gravel
BHC4	D	7.60	14		27			40	27	13	90	HP	Brown CLAY/SILT with a little sand and a little gravel
				Input by MG	Date	01/04/1999	Checked by 	Date	01/04/1999				
				Project									
				BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE									
									Contract No 4452				
									Figure No LT1/2				
102/02													



SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

BS 1377: Part 2: 1990														
FOUNDATION & EXPLORATION SERVICES														
SOIL CLASSIFICATION TESTS														
Hole	Type	Depth	Sample No.	Classification Tests								Method	Description	
				Bulk Density (Mg/m ³)	Moisture Content (%)	Dry Density (Mg/m ³)	Particle Density (Mg/m ³)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 μm			
BHC4	D	3.20	16		30				33	24	9	100	AR	Brown CLAY/SILT with a little sand
BHC4	B	12.70	29		14				25	17	8	37	WS	Brown CLAY with some gravel and a little sand
BHC5	D	5.90	12		17				29	18	11	78	HP	Brown CLAY with a little sand and a little gravel
BHC5	D	7.80	16		22				35	24	11	98	HP	Brown CLAY/SILT with a little sand and a little gravel
BHC5	D	12.50	26		13				23	16	7	70	HP	Brown CLAY/SILT with a little sand and a little gravel
BHG1	D	2.80	5		11				23	14	9	82	HP	Brown CLAY with a little sand and a little gravel
BHG1	D	6.70	12		17				38	20	18	86	HP	Brown CLAY with a little sand and a little gravel
Input by MB				Date	01/04/1999	Checked by	Date		01/04/1999					
Project				BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE										
				Contract No 4452										
				Figure No LT1/3										
				102/02										

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

Hole	Type	Depth	Sample No.	Classification Tests								Method	Description
				Bulk Density (Mg/m³)	Moisture Content (%)	Dry Density (Mg/m³)	Particle Density (Mg/m³)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 µm		
BHG4	U	10.10	26	2.22	14	1.94							Brown SILT with a little sand and a little gravel
BHG4	D	12.00	31		12			32	18	14	78	HP	Brown CLAY with a little sand and a little gravel
TP2	D	2.20	6		11			23	14	9	72	HP	Brown CLAY with a little sand and a little gravel
TP3	D	0.80	2		38								Brown CLAY with a little sand and a little gravel
TP7	CD	0.50	2		41			47	29	18	97	HP	Brown CLAY/SILT with a little sand and a little gravel
TP7	D	2.20	5		37			35	27	8	95	HP	Brown SILT with some sand and a little gravel
TP12	B	1.50	3		21			30	19	11	57	WS	Brown CLAY with a little sand and some gravel
				Input by MB	Date 01/04/1999	Checked by [Signature]	Date 01/04/1999						
				Project									
				BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE									
				Contract No 4452									
				Figure No LT1/5									
				102/02									

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377: Part 2: 1990

Hole	Type	Depth	Sample No.	Classification Tests								Method	Description	
				Bulk Density (Mg/m ³)	Moisture Content (%)	Dry Density (Mg/m ³)	Particle Density (Mg/m ³)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing 425 μ m			
TP13	D	2.10	5		19				35	21	14	53	WS	Brown CLAY with a little sand and a little gravel
TP15	D	2.60	6		13				24	14	10	70	HP	Brown CLAY with a little sand and a little gravel

Input by	MB	Date	01/04/1999	Checked by	(Signature)	Date	01/04/1999
Project				BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE			
FOUNDATION & EXPLORATION SERVICES				Contract No 4452			
				Figure No LT1/6			

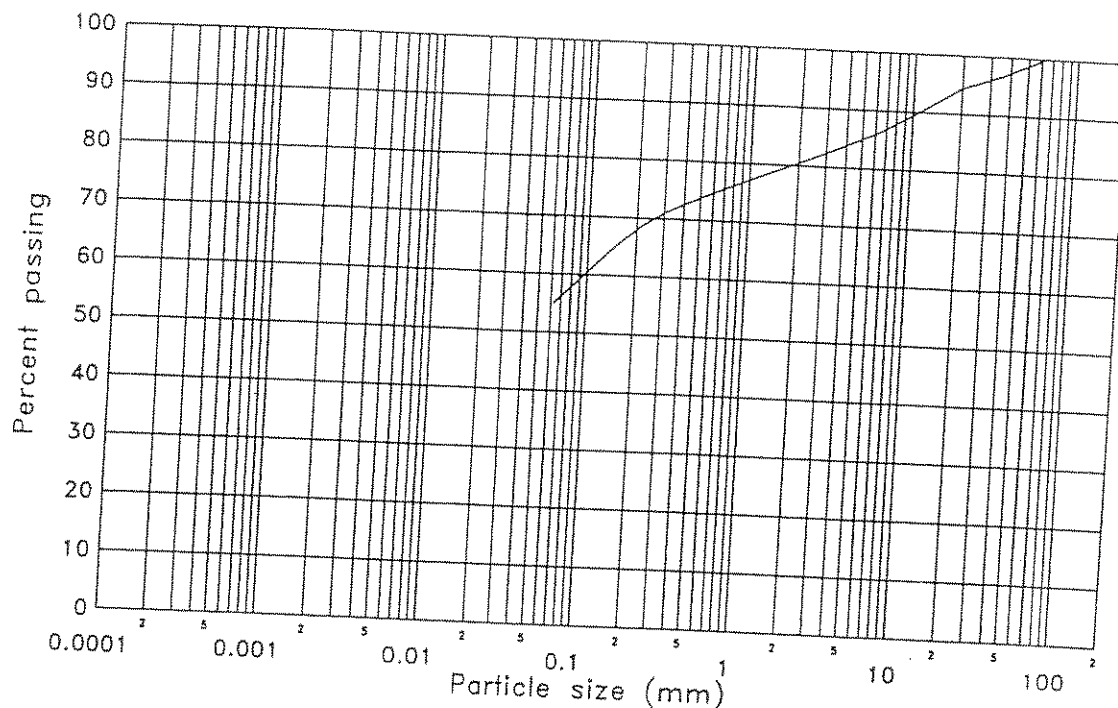
Particle Size Distribution Curves

FIGURES LT2/1 to LT2/35

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC1A	Sample No: 4	Sample Type: B	Depth: 5.30



CLAY	SILT			SAND			GRAVEL			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	55	25	20	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with a little sand and a little gravel	
Test Date:	22/03/1999			
Uniformity Coefficient:	3.9			



Input by *MB*
Project

Date
24/03/1999

Checked by *[Signature]*

Date
16/04/99

BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY,
LANCASHIRE

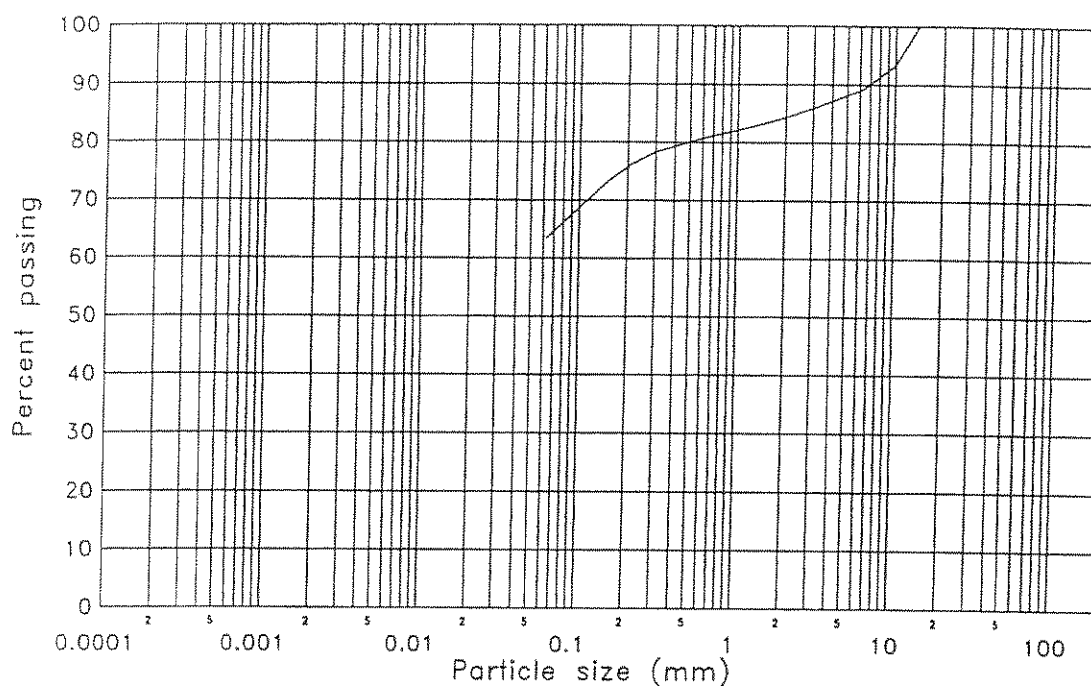
Contract No
4452

Figure No
LT2/ 1

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC1A	Sample No: 8	Sample Type: B	Depth: 7.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

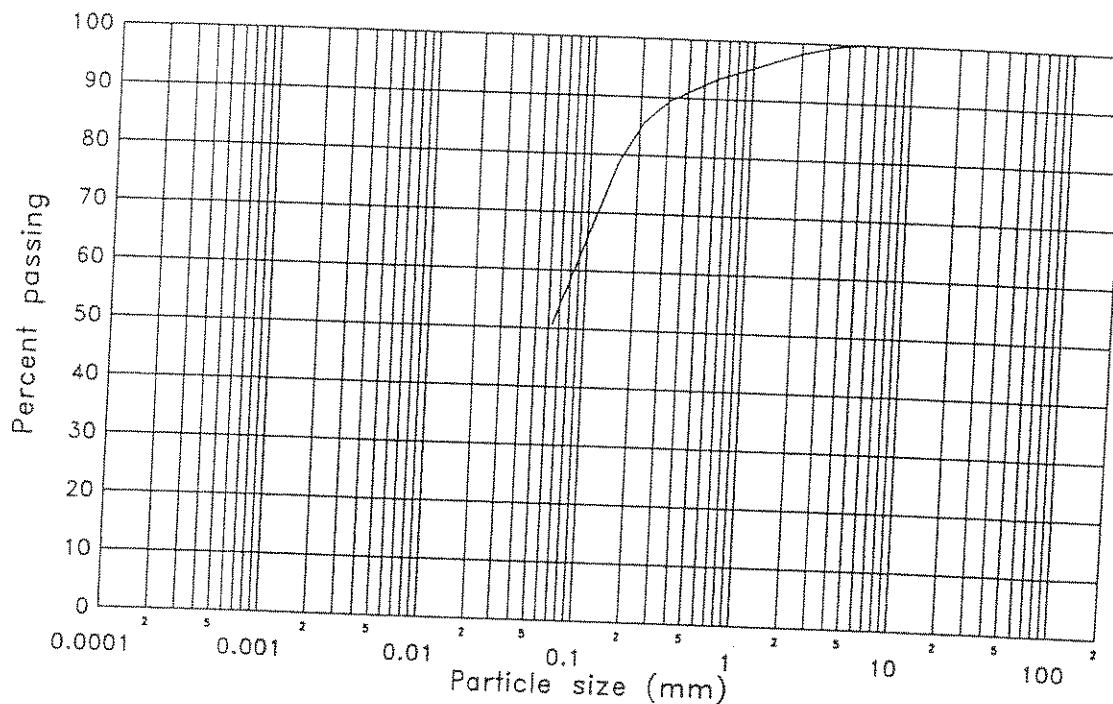
SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	64	20	16	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with a little sand and a little gravel	
Test Date:	08/03/1999			
Uniformity Coefficient:	2.5			

		Input by MB	Date 10/03/1999	Checked by	Date 26.3.99		
 FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/ 2	

PARTICLE SIZE DISTRIBUTION B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC2	Sample No: 15	Sample Type: B	Depth: 6.60



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

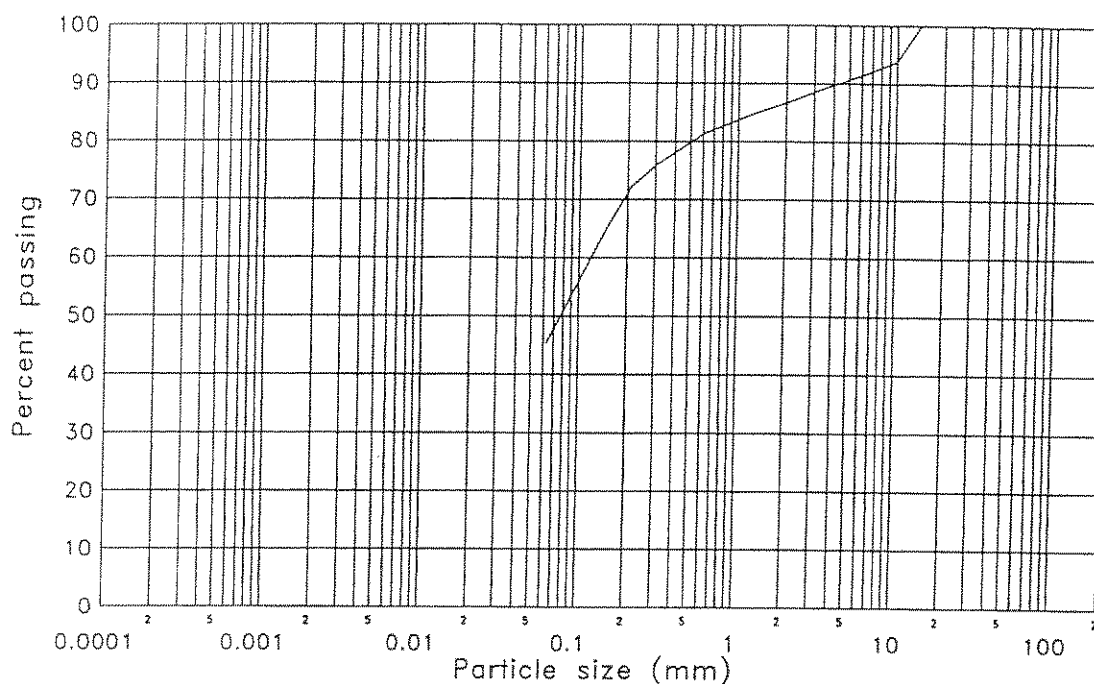
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	51	47	2	0
Loss on Pretreatment:	Not Applicable		Description Brown black CLAY with some sand and a little gravel	
Test Date:	08/03/1999			
Uniformity Coefficient:	3.4			

FOUNDATION & EXPLORATION SERVICES	Input by: AB	Date: 10/03/1999	Checked by: [Signature]	Date: 26.3.99	
	Project: BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No: 4452
					Figure No: LT2/ 3

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC2	Sample No: 23	Sample Type: 8	Depth: 11.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

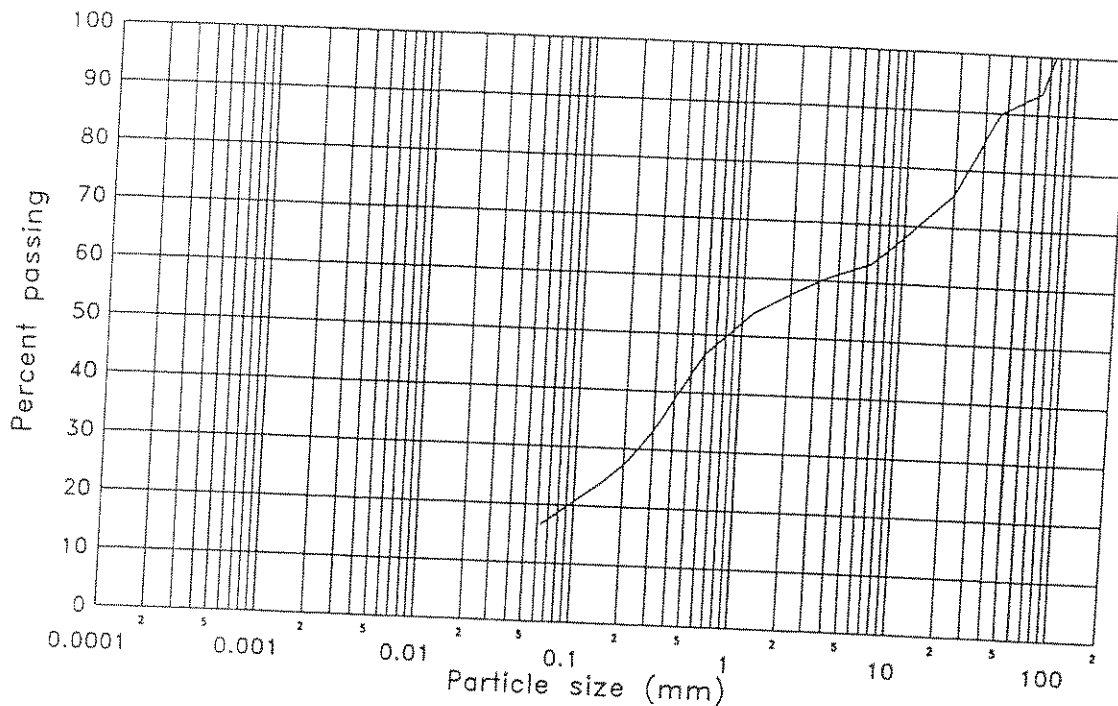
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	45	42	13	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with some sand and a little gravel	
Test Date:	08/03/1999			
Uniformity Coefficient:	4.6			

		Input by <i>MB</i>	Date 10/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99	
 FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					Contract No 4452
						Figure No LT2/ 4

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC3	Sample No: 2	Sample Type: B	Depth: 0.60



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

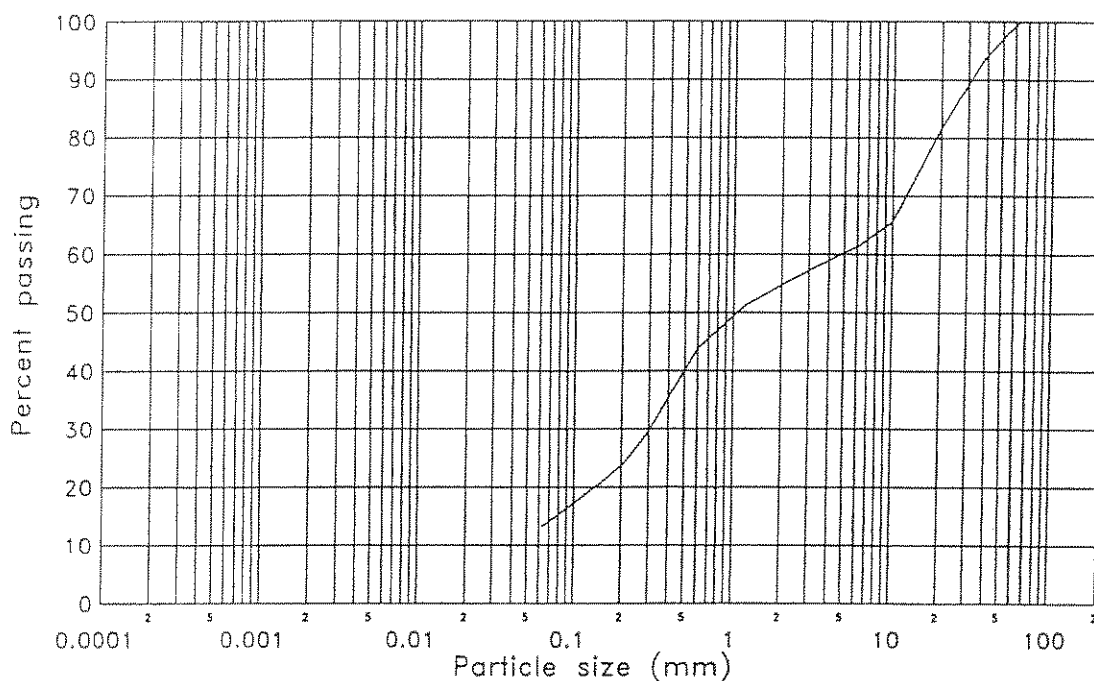
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	17	40	37	6
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much gravel some clay and some cobbles	
Test Date:	08/03/1999			
Uniformity Coefficient:	78.3			

	Input by MB	Date 10/03/1999	Checked by	Date 26.3.99	
	Project				
	BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				
	Contract No 4452				
					Figure No LT2/ 5

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC3	Sample No: 3	Sample Type: B	Depth: 1.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	13	42	45	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with some clay	
Test Date:	08/03/1999			
Uniformity Coefficient:	88.1			

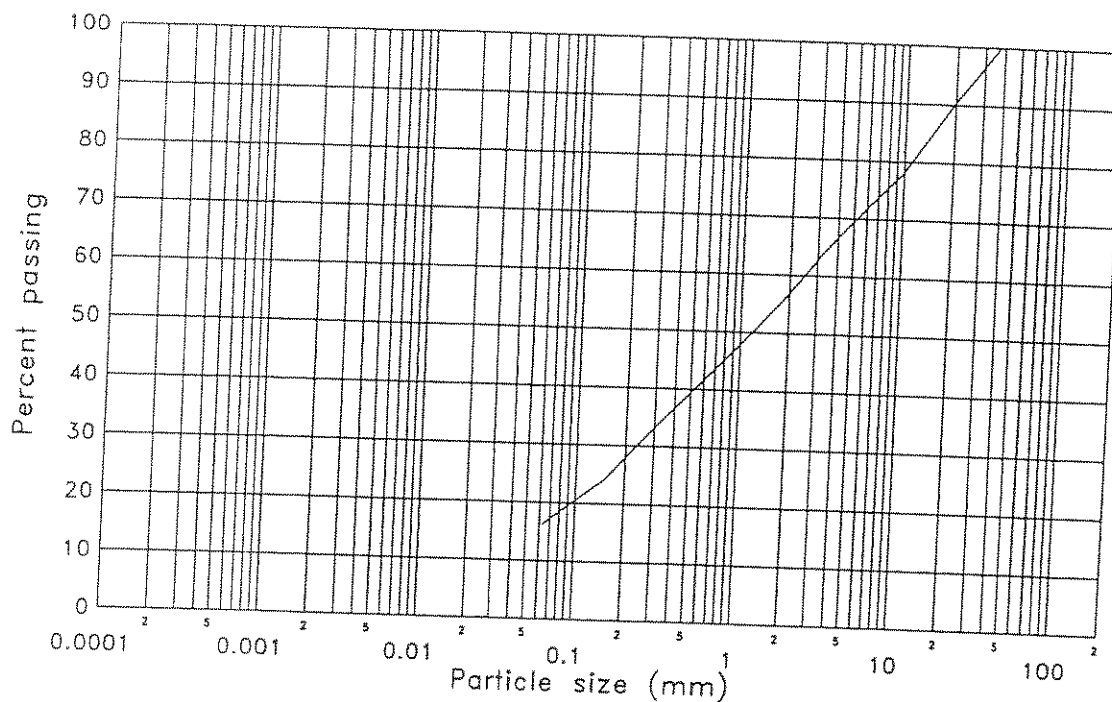
		Input by MB	Date 10/03/1999	Checked by	Date 26.3.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/ 6	

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC4	Sample No: 2	Sample Type: B	Depth: 1.20



CLAY	FINE SILT			MEDIUM SAND			COARSE GRAVEL			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	

SUMMARY

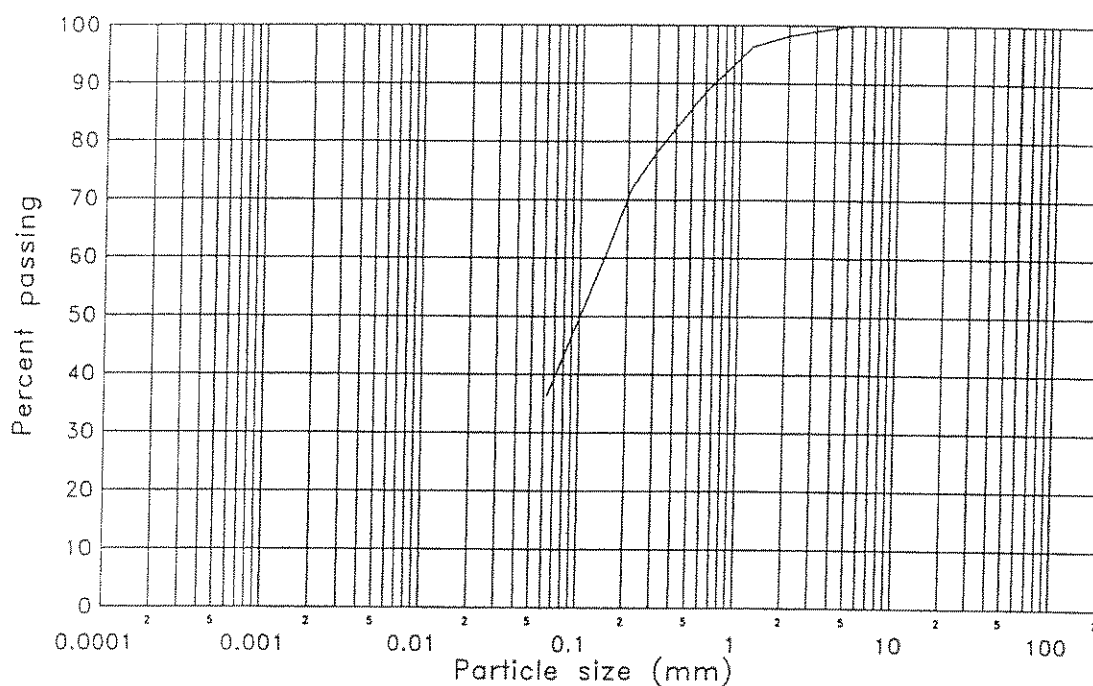
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	16	41	43	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with some silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	61.6			

		Input by <i>FR</i>	Date 21/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/ 7	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC4	Sample No: 22	Sample Type: B	Depth: 10.40



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	36	62	2	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much silt and a little gravel	
Test Date:	19/03/1999			
Uniformity Coefficient:	5.2			

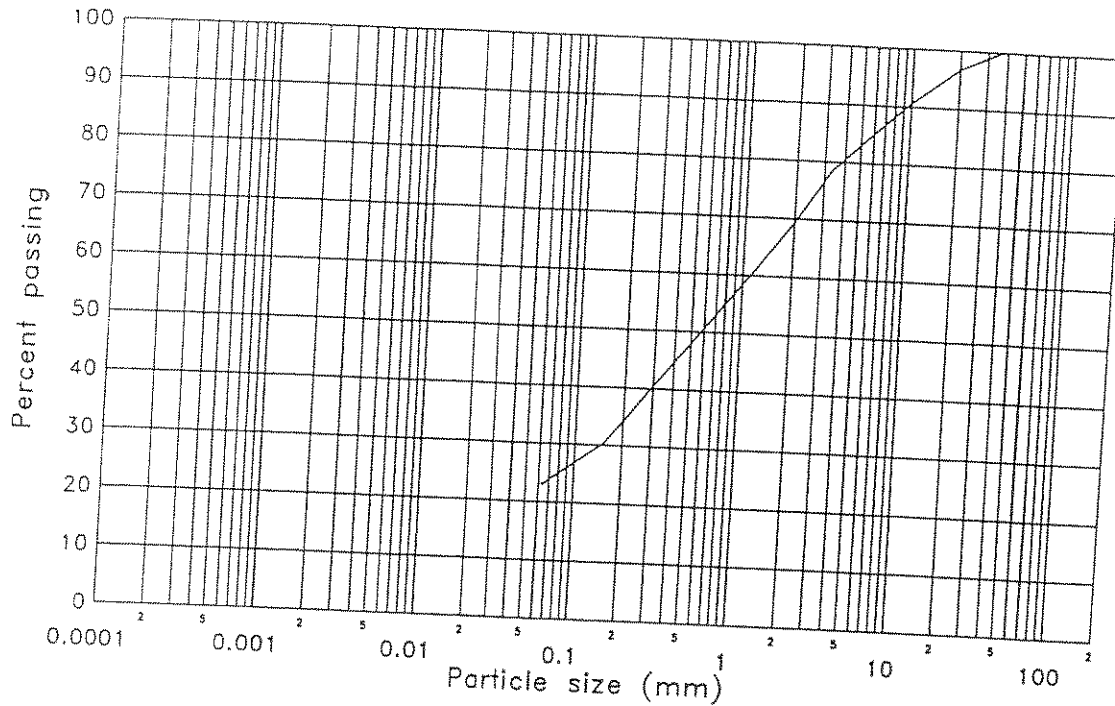
		Input by <i>MB</i>	Date 21/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99	
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452
						Figure No LT2/ 8

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC5	Sample No: 2	Sample Type: B	Depth: 1.20



CLAY	FINE			MEDIUM			COARSE			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			

SUMMARY

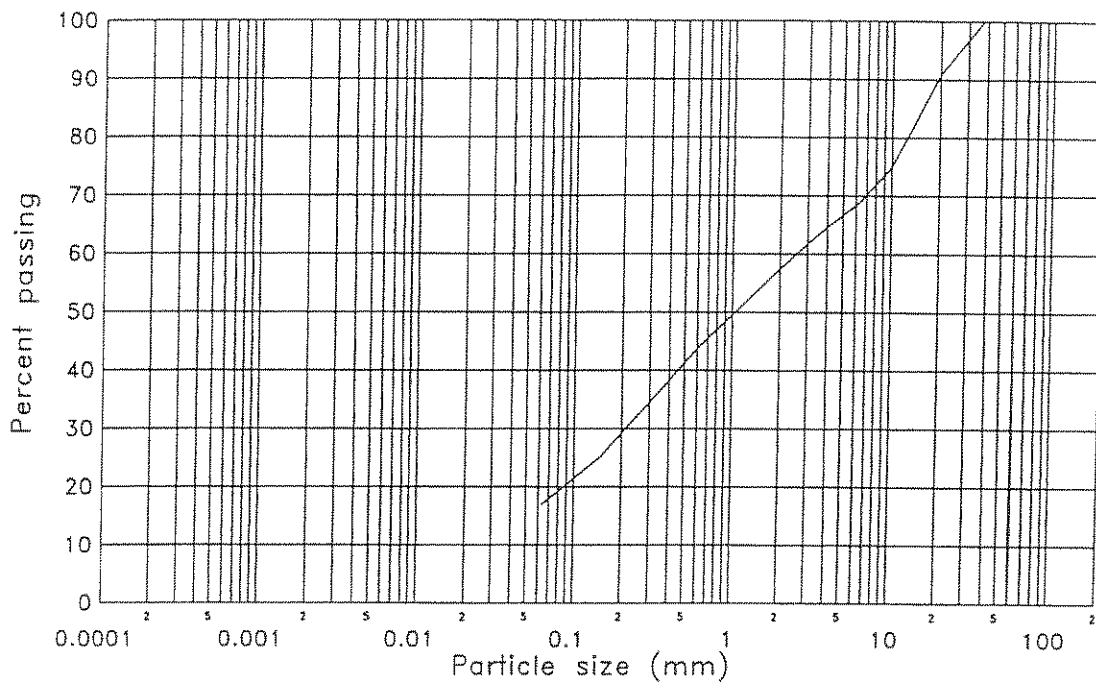
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	23	46	31	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much gravel and much silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	33.8			

FOUNDATION & EXPLORATION SERVICES	Input by <i>MB</i>	Date 21/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99	
	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				
	Contract No 4452				
					Figure No LT2/ 9

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC5	Sample No: 4	Sample Type: 8	Depth: 2.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	17	40	43	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with some silt	
Test Date:	22/03/1999			
Uniformity Coefficient:	64.7			

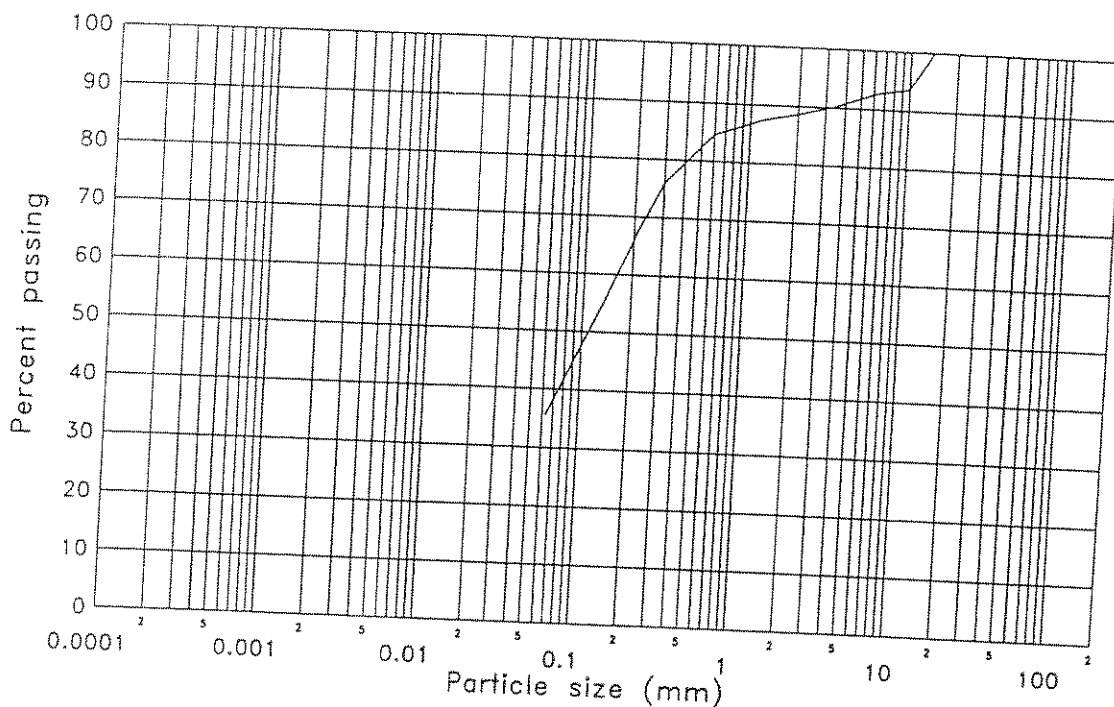
		Input by MB	Date 24/03/1999	Checked by	Date 1.4.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/ 10	

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC5	Sample No: 19	Sample Type: B	Depth: 8.50



CLAY	FINE			MEDIUM			COARSE			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			

SUMMARY

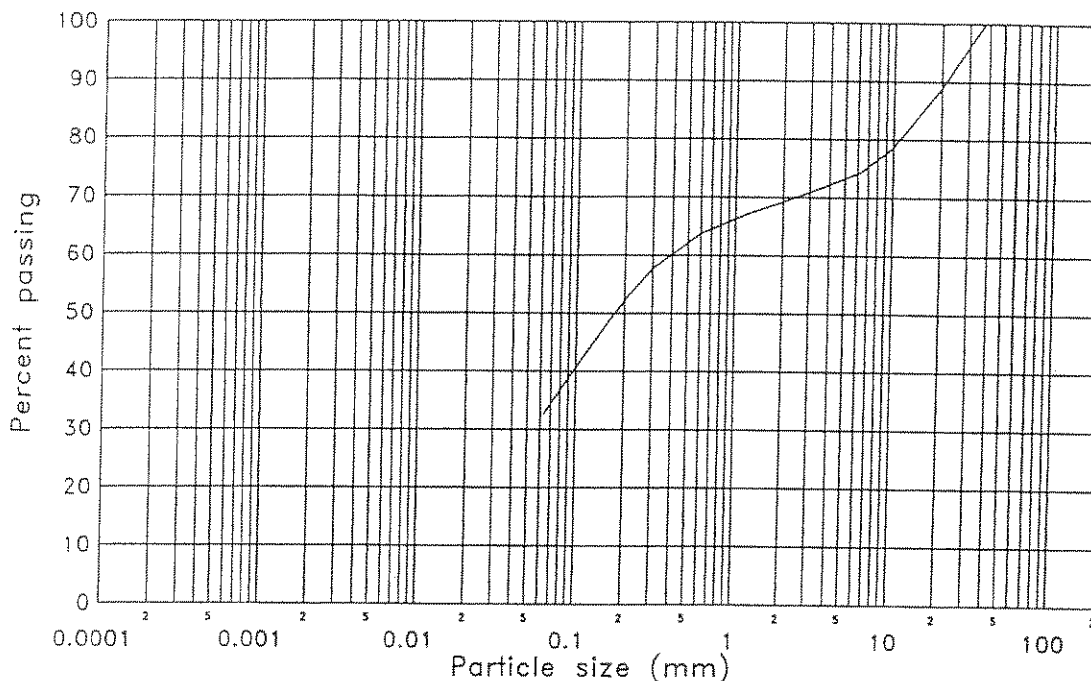
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	36	53	11	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much silt and some gravel	
Test Date:	19/03/1999			
Uniformity Coefficient:	5.9			

	Input by <i>MB</i>	Date 21/03/1999	Checked by <i>[Signature]</i>	Date <i>26.3.99</i>	
FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No
					4452
					LT2/ 11

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHC5	Sample No: 22	Sample Type: B	Depth: 10.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	33	36	31	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much clay and much gravel	
Test Date:	08/03/1999			
Uniformity Coefficient:	12.1			

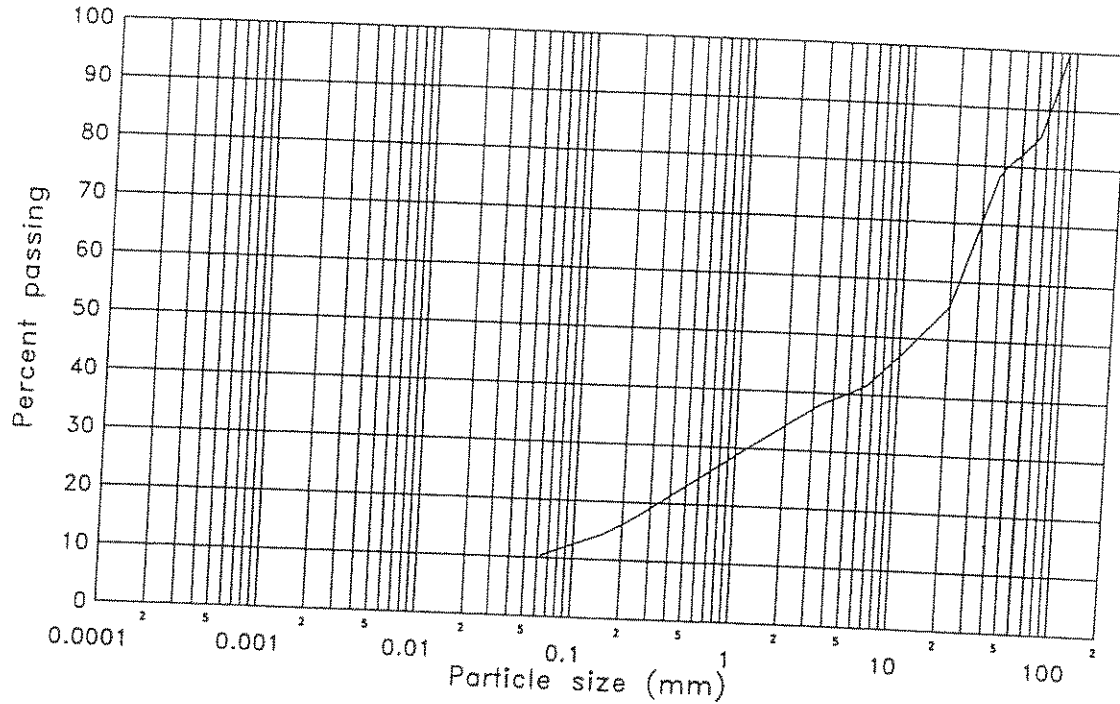
		Input by <i>MB</i>	Date 10/03/1999	Checked by <i>[Signature]</i>	Date <i>26.3.99</i>	
FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					Contract No 4452
						Figure No LT2/ 12

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG1	Sample No: 1+2+3	Sample Type: B	Depth: 0.00



CLAY	FINE			MEDIUM			COARSE			COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	10	24	51	15
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand some cobbles and some silt	
Test Date:	26/03/1999			
Uniformity Coefficient:	374.1			

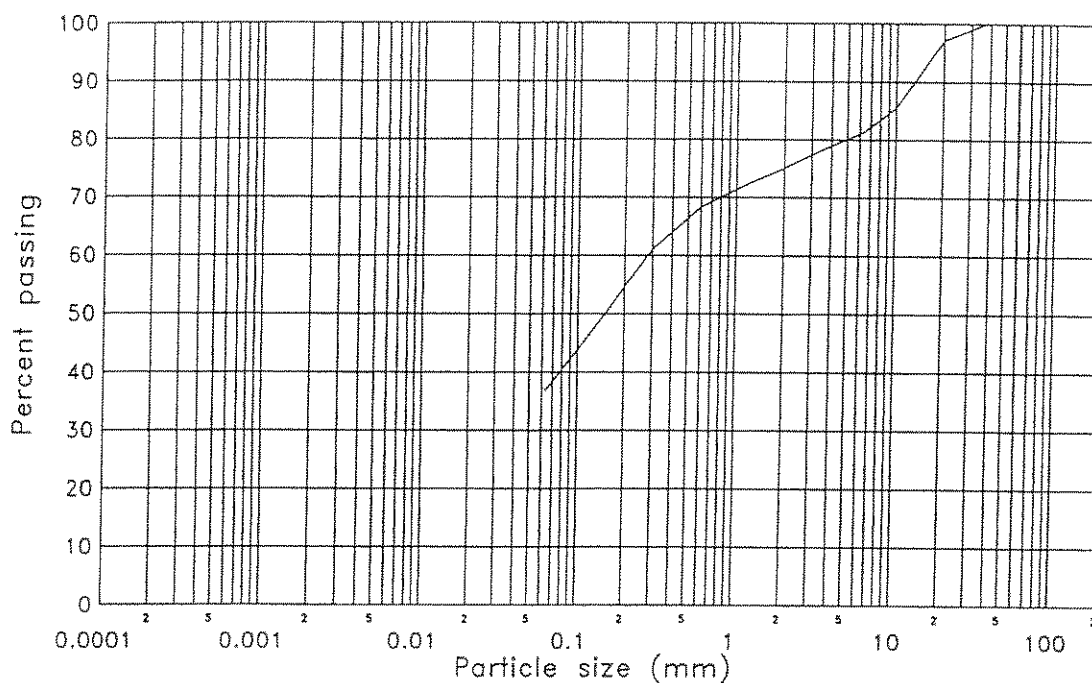
FOUNDATION & EXPLORATION SERVICES	Input by MB	Date 26/03/1999	Checked by	Date 26/03/1999		
	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					
	Contract No 4452					Figure No LT2/13

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG1	Sample No: 7	Sample Type: B	Depth: 3.80



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

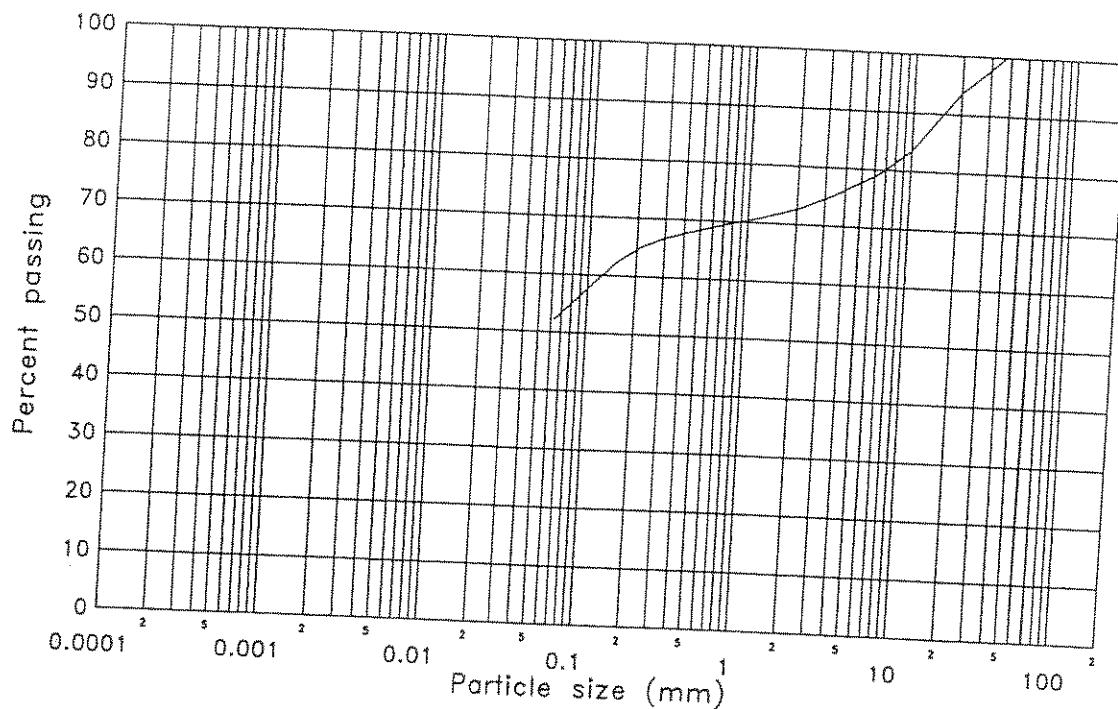
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	37	38	25	0
Loss on Pretreatment:	Not Applicable	Description Brown CLAY with some sand and some gravel		
Test Date:	22/03/1999			
Uniformity Coefficient:	10.2			

	Input by MB	Date 24/03/1999	Checked by [Signature]	Date 1.4.99		
	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
					Figure No LT2/14	105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG1	Sample No: 15	Sample Type: B	Depth: 8.20



CLAY	FINE			MEDIUM			COARSE			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			

SUMMARY

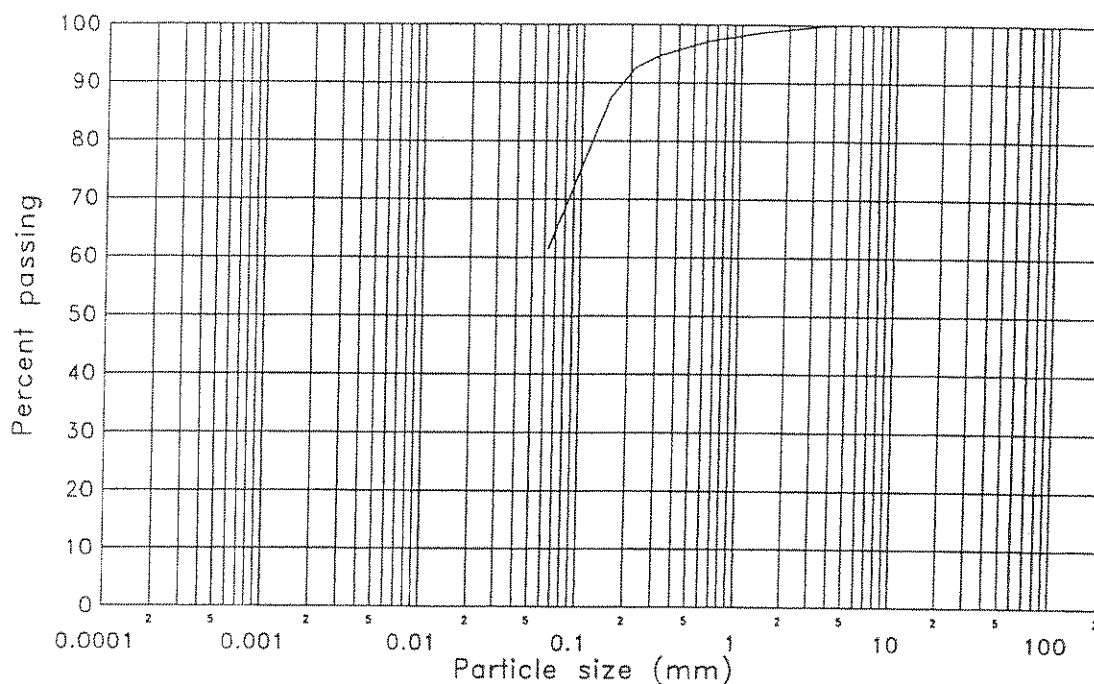
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	52	21	27	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with a little gravel and a little sand	
Test Date:	22/03/1999			
Uniformity Coefficient:	4.9			

FOUNDATION & EXPLORATION SERVICES	Input by <i>MB</i>	Date 24/03/1999	Checked by <i>[Signature]</i>	Date 1.4.99		
	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					
					Contract No 4452	
				Figure No LT2/15		105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG1	Sample No: 20	Sample Type: B	Depth: 10.20



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

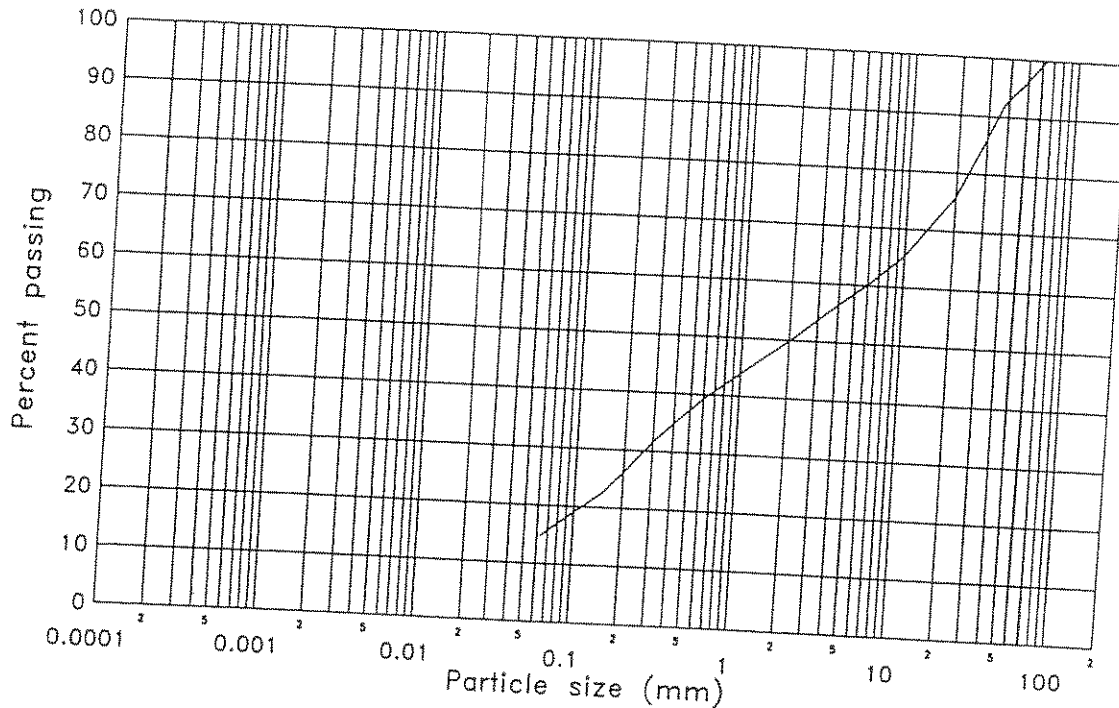
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	61	38	1	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with some sand and a little gravel	
Test Date:	08/03/1999			
Uniformity Coefficient:	2.5			

		Input by <i>AB</i>	Date 10/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99	
 FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					Contract No 4452
						Figure No LT2/ 16

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG2	Sample No: 1	Sample Type: B	Depth: 0.50



CLAY	FINE SILT			MEDIUM SAND			COARSE GRAVEL			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	

SUMMARY

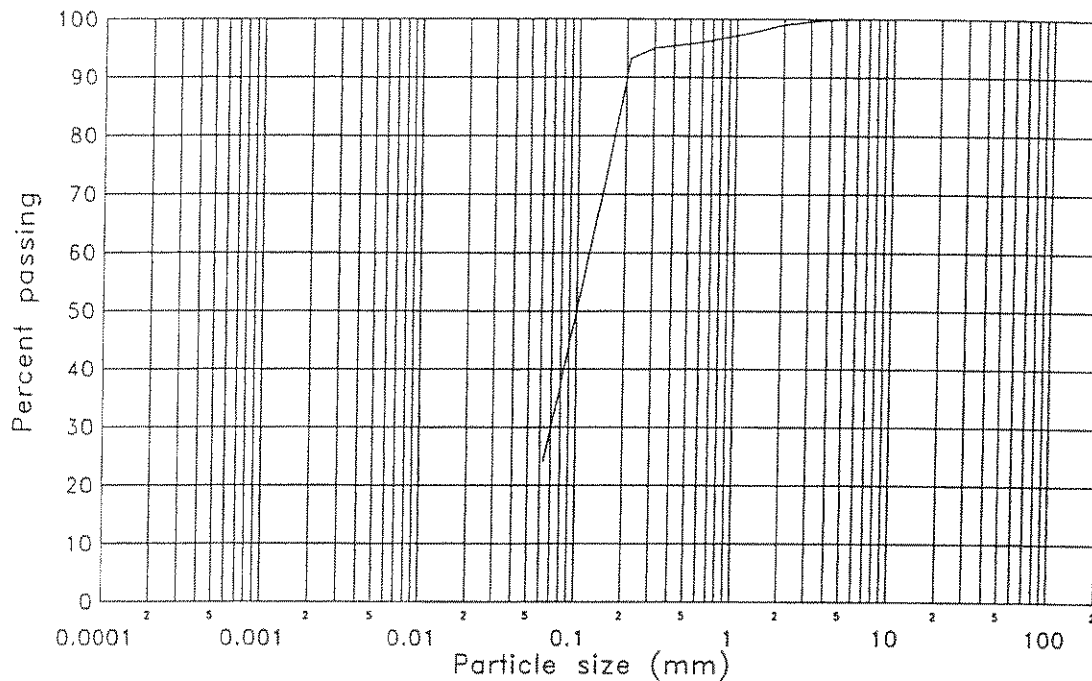
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	15	35	50	0
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand and some silt	
Test Date:	22/03/1999			
Uniformity Coefficient:	110.5			

FOUNDATION & EXPLORATION SERVICES	Input by	Date	Checked by	Date		
	Project	BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No
						4452
					Figure No	LT2/17

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG2	Sample No: 22	Sample Type: D	Depth: 11.45



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

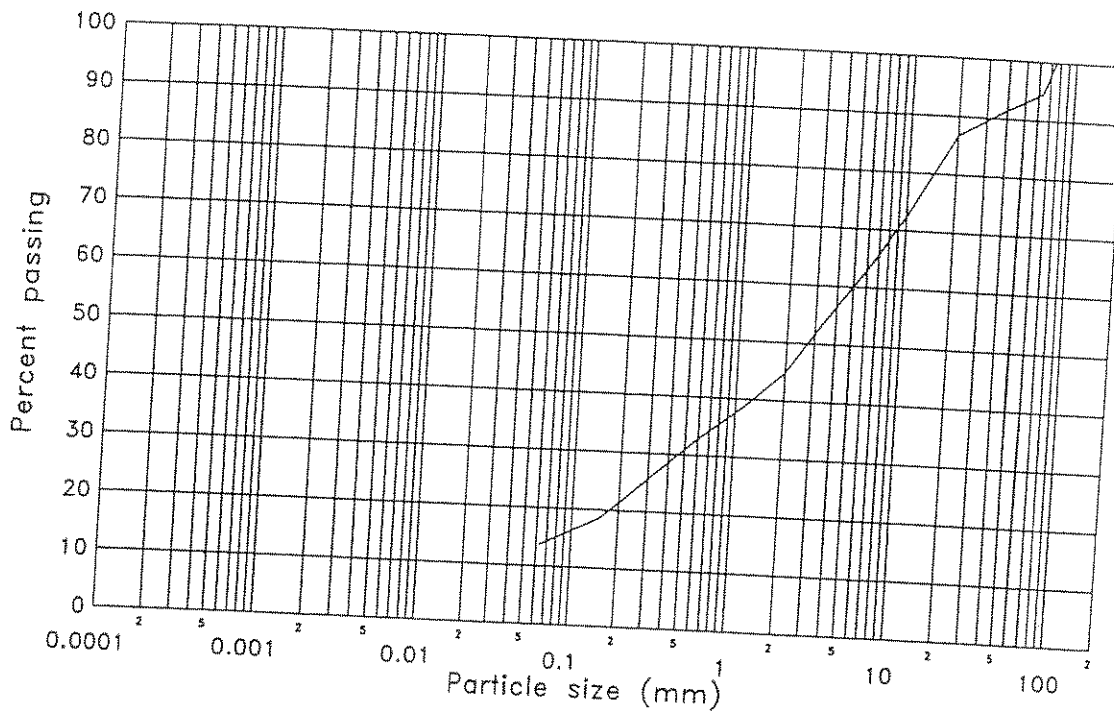
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	24	75	1	0
Loss on Pretreatment:	Not Applicable		Description Brown grey SAND with much silt and a little gravel	
Test Date:	05/03/1999			
Uniformity Coefficient:	3.7			

		Input by MB	Date 07/03/1999	Checked by [Signature]	Date 26/3/99	
 FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					Contract No 4452
						Figure No LT2/18

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: B463	Sample No: 1	Sample Type: B	Depth: 0.00



CLAY	FINE			MEDIUM			COARSE			COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

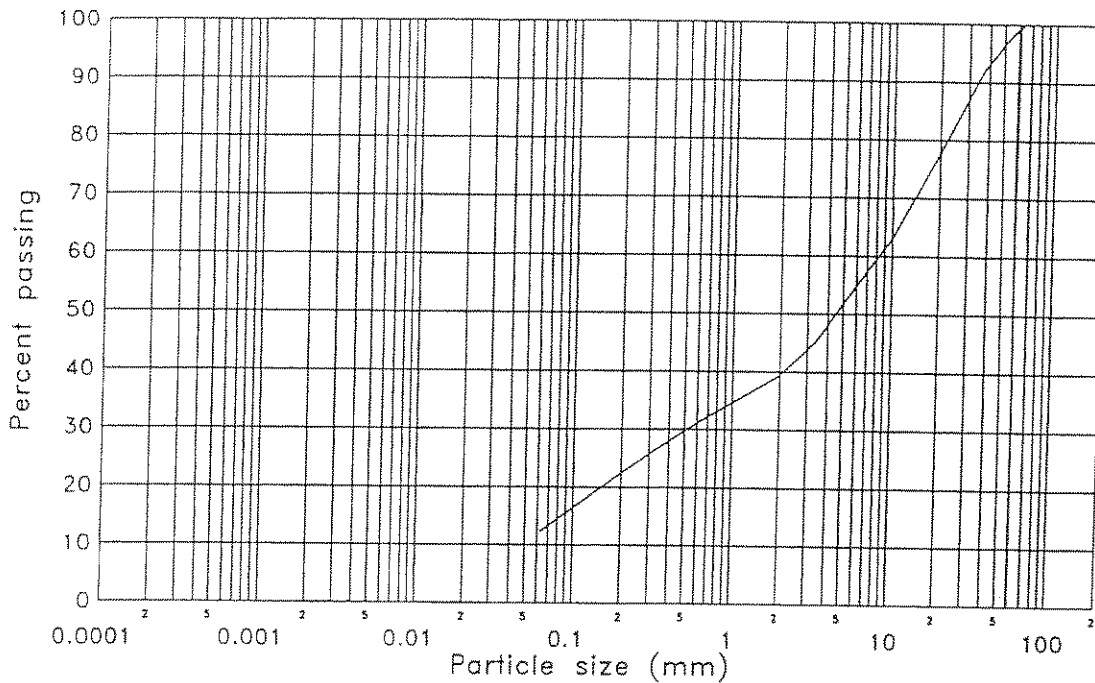
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	14	31	50	5
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand some silt and some cobbles	
Test Date:	19/03/1999			
Uniformity Coefficient:	93.6			

FOUNDATION & EXPLORATION SERVICES	Input by: <i>MB</i>	Date: 21/03/1999	Checked by: <i>[Signature]</i>	Date: 1.4.99	
	Project: BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				
					Contract No: 4452
					Figure No: LT2/19
					105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG3	Sample No: 6	Sample Type: B	Depth: 4.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

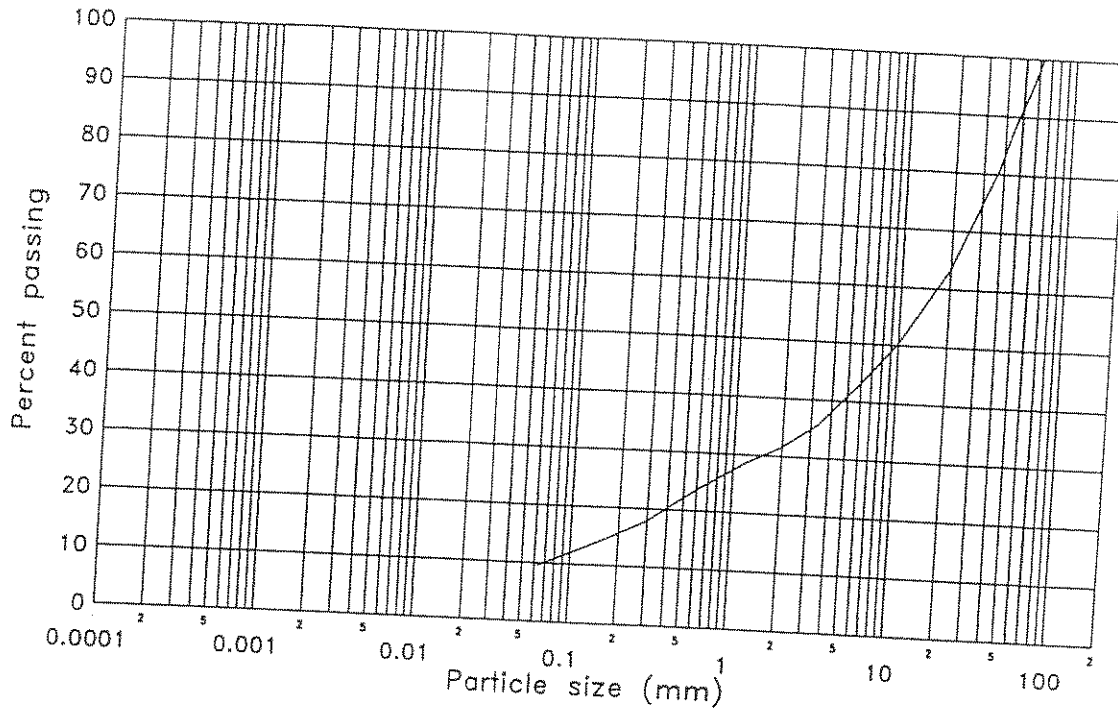
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	12	27	61	0
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand and some silt	
Test Date:	08/03/1999			
Uniformity Coefficient:	164.3			

		Input by <i>MB</i>	Date 10/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/20	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG3	Sample No: 7	Sample Type: B	Depth: 5.00



CLAY	FINE SILT			MEDIUM SAND			COARSE SAND			GRAVEL			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	

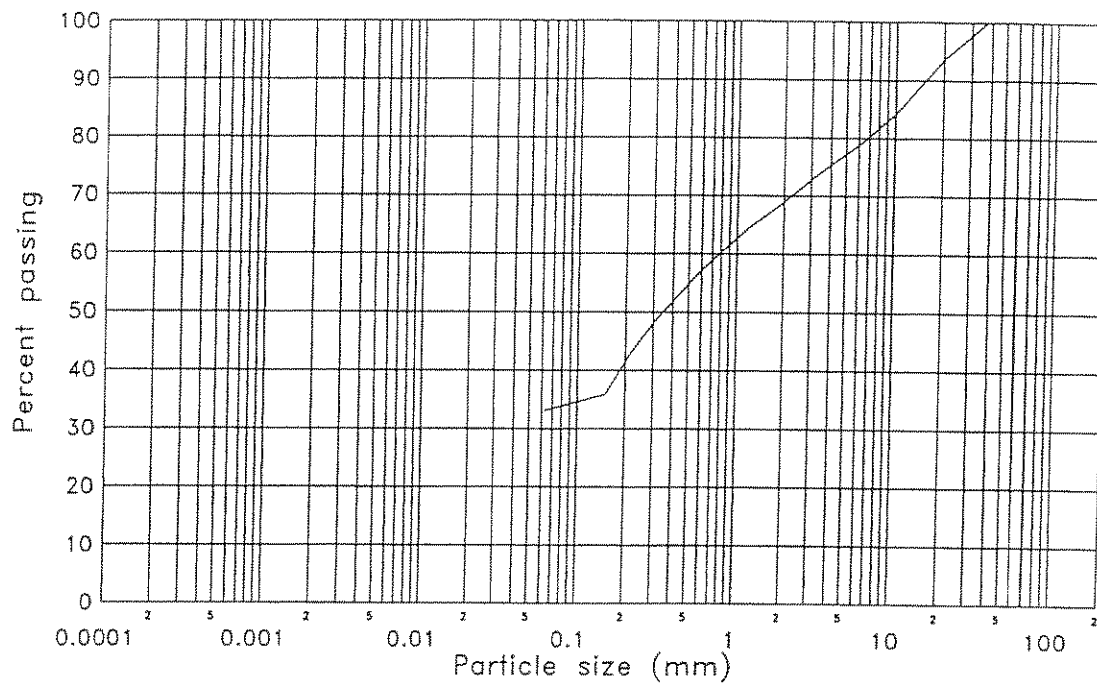
SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	10	22	68	0
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand and some silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	187.8			

		Input by <i>MB</i>	Date 21/03/1999	Checked by <i>[Signature]</i>	Desig. <i>[Signature]</i>		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No	
						4452	
						LT2/21	

PARTICLE SIZE DISTRIBUTION B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BH63	Sample No: 12	Sample Type: B	Depth: 7.30



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

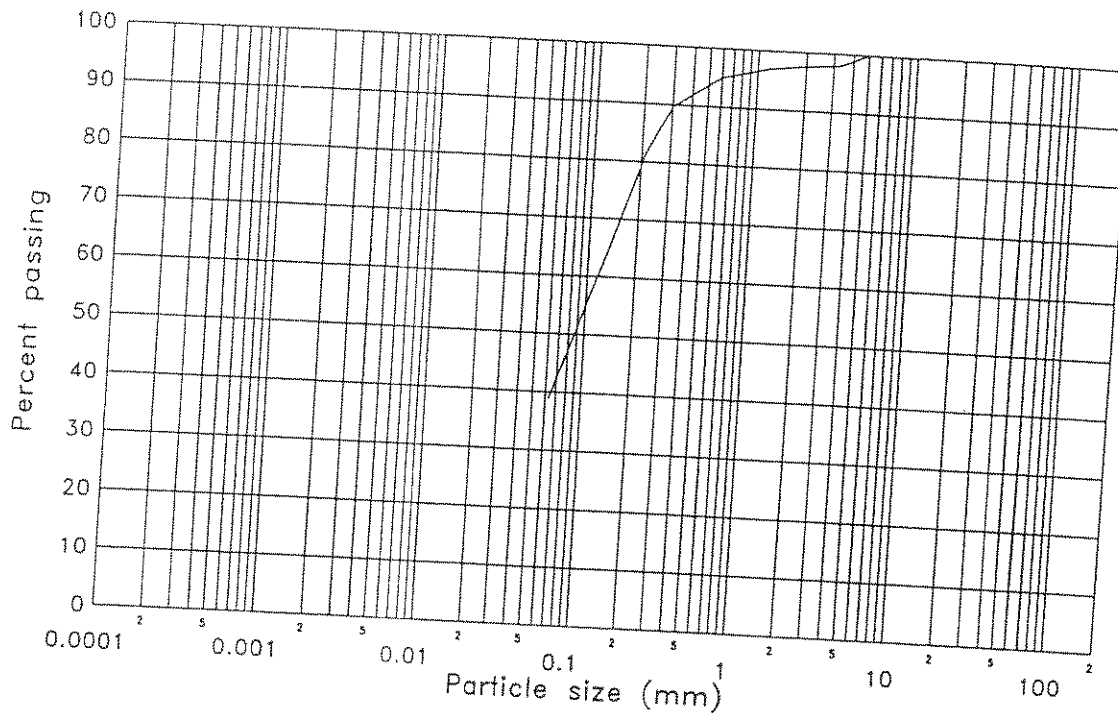
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	33	36	31	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much silt and much gravel	
Test Date:	19/03/1999			
Uniformity Coefficient:	27.6			

	Input by MB	Date 21/03/1999	Checked by	Date 1.4.99	
FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE			Contract No 4452	
				Figure No LT2/22	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: 8HG4	Sample No: 17	Sample Type: 8	Depth: 6.70



CLAY	FINE			MEDIUM			COARSE			FINE			MEDIUM			COARSE			COBBLES
	SILT									SAND						GRAVEL			

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	39	59	2	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with some sand and a little gravel	
Test Date:	08/03/1999			
Uniformity Coefficient:	4.3			

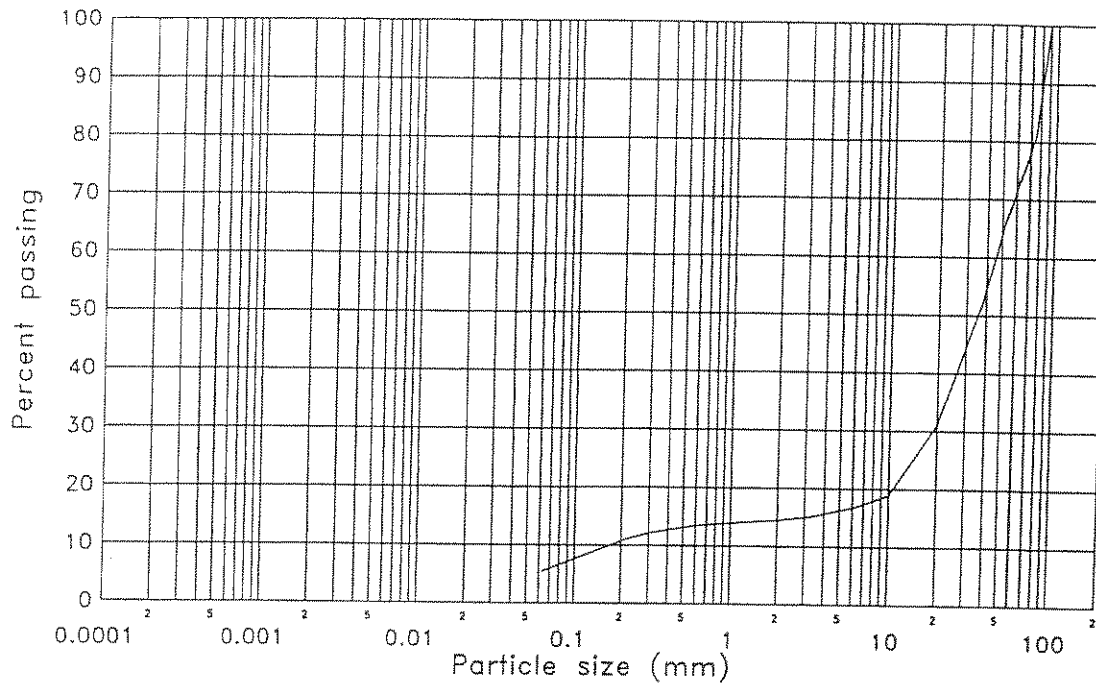
FOUNDATION & EXPLORATION SERVICES	Input by: <i>[Signature]</i>	Date: 10/03/1999	Checked by: <i>[Signature]</i>	Date: 26/3/99	
	Project: BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				
	Contract No: 4452				
					Figure No: LT2/ 23

105/03

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: BHG4	Sample No: 23	Sample Type: B	Depth: 8.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

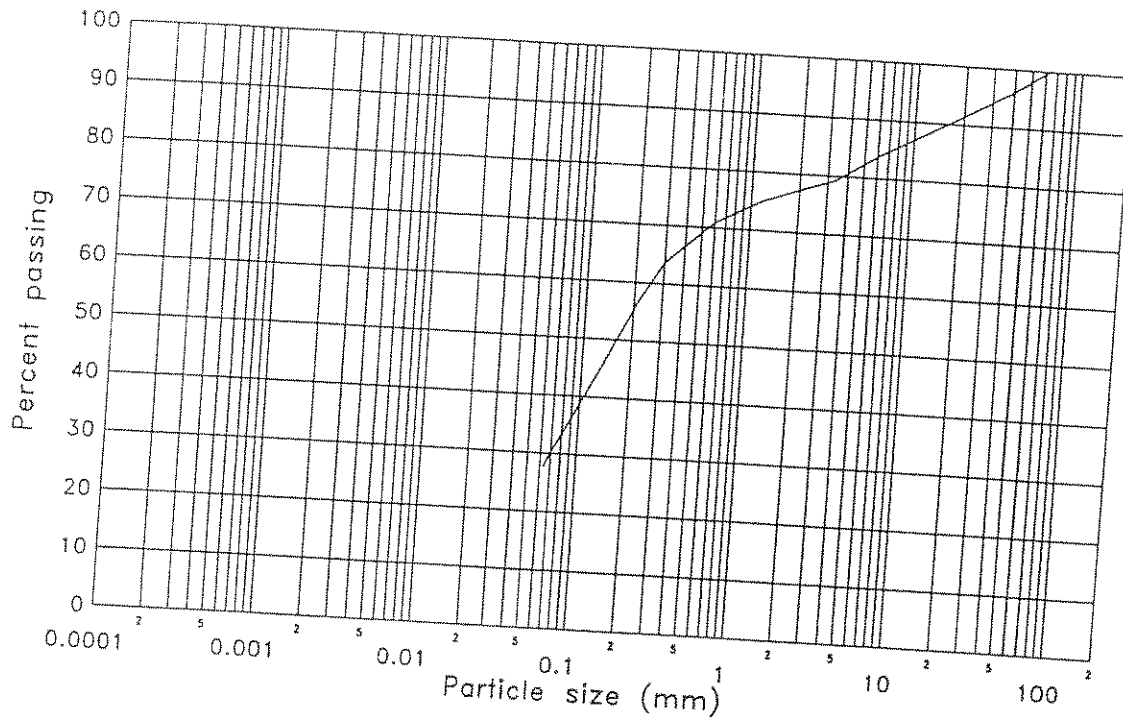
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	6	9	66	19
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with many cobbles some sand and some silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	254.2			

		Input by <i>MB</i>	Date 21/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/24	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP1	Sample No: 4	Sample Type: D	Depth: 2.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

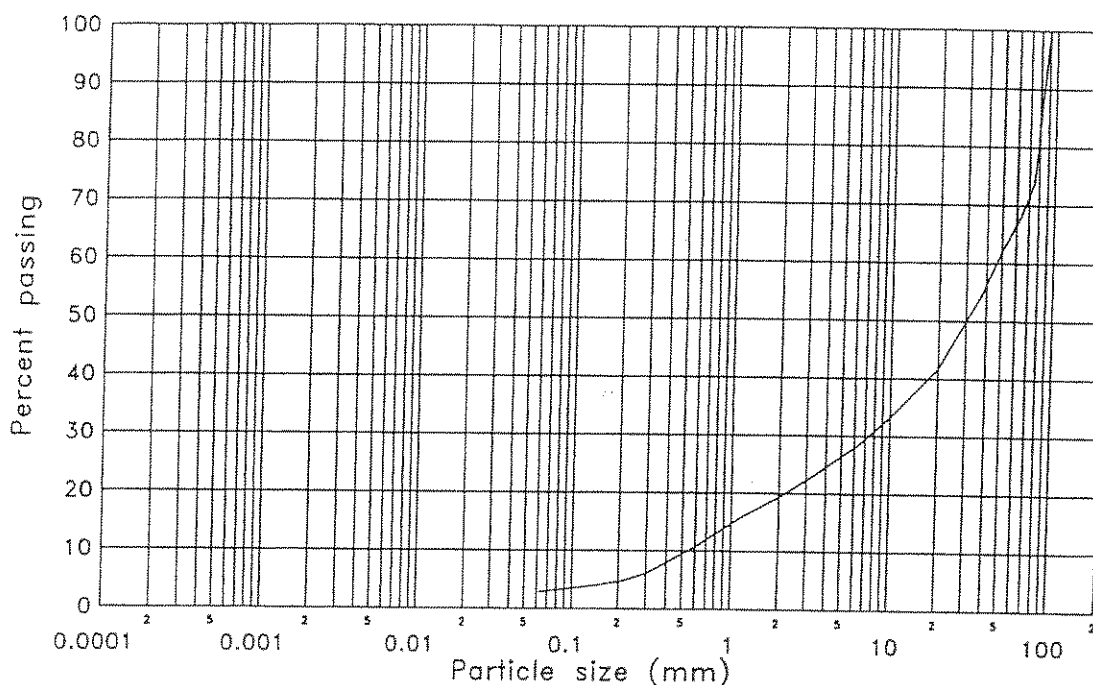
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	28	49	23	0
Loss on Pretreatment:	Not Applicable		Description Dark grey SAND with much clay and much gravel	
Test Date:	05/03/1999			
Uniformity Coefficient:	8.3			

	Input by	Date	Checked by	Date		
	Project	BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE			Contract No	4452
					Figure No	LT2/25

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP2	Sample No: 4	Sample Type: B	Depth: 1.40



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

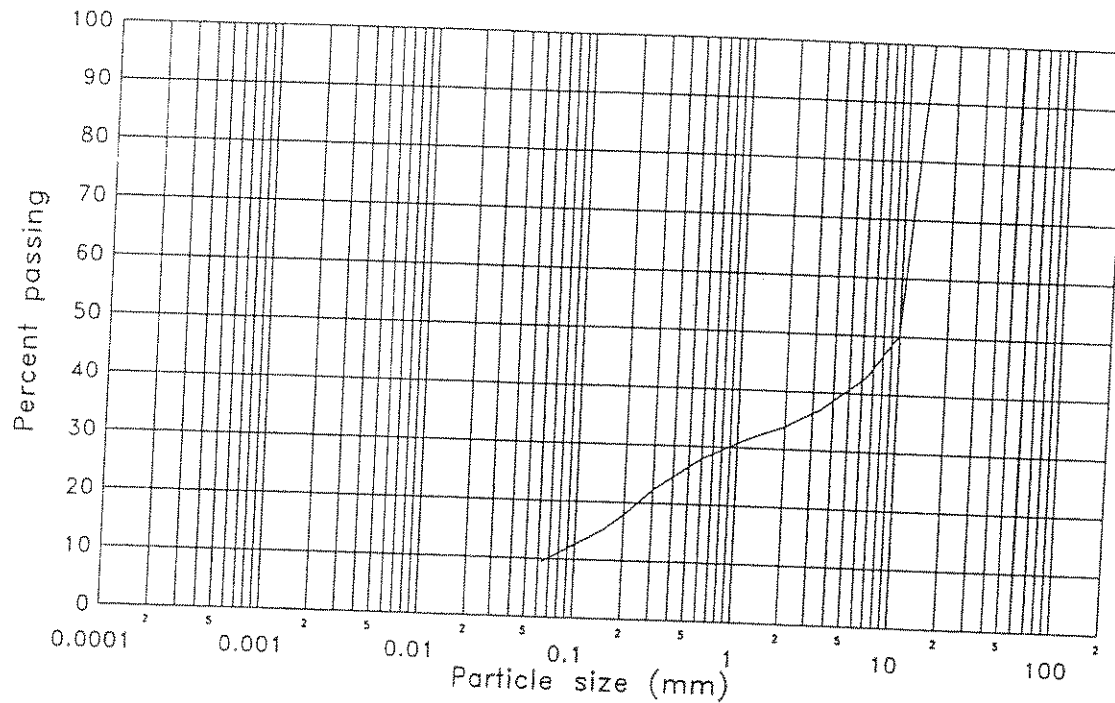
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	3	16	49	32
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with some cobbles and a little silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	114.9			

		Input by <i>MB</i>	Date 21/03/1999	Checked By <i>[Signature]</i>	Date 1.4.99		
 FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/26	

PARTICLE SIZE DISTRIBUTION

B.S 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP4	Sample No: 3	Sample Type: D	Depth: 1.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

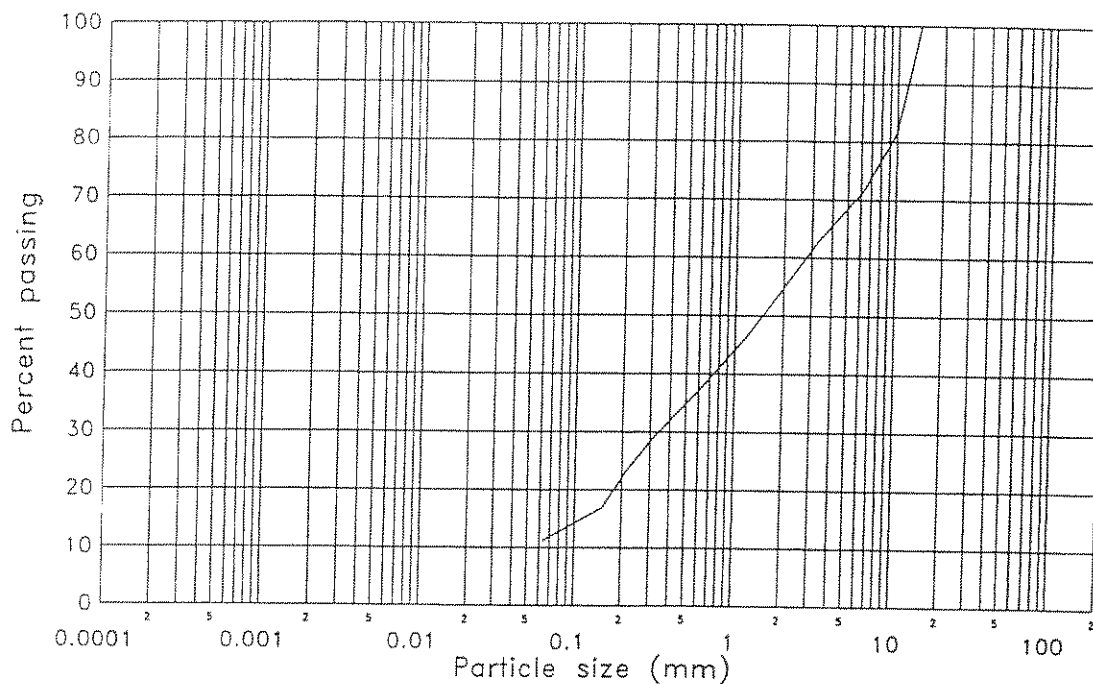
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	10	24	66	0
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand and some clay	
Test Date:	05/03/1999			
Uniformity Coefficient:	157.4			

	Input by <i>MB</i>	Date 07/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99	
FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452
					Figure No LT2/27

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP8	Sample No: 3	Sample Type: B	Depth: 1.30



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

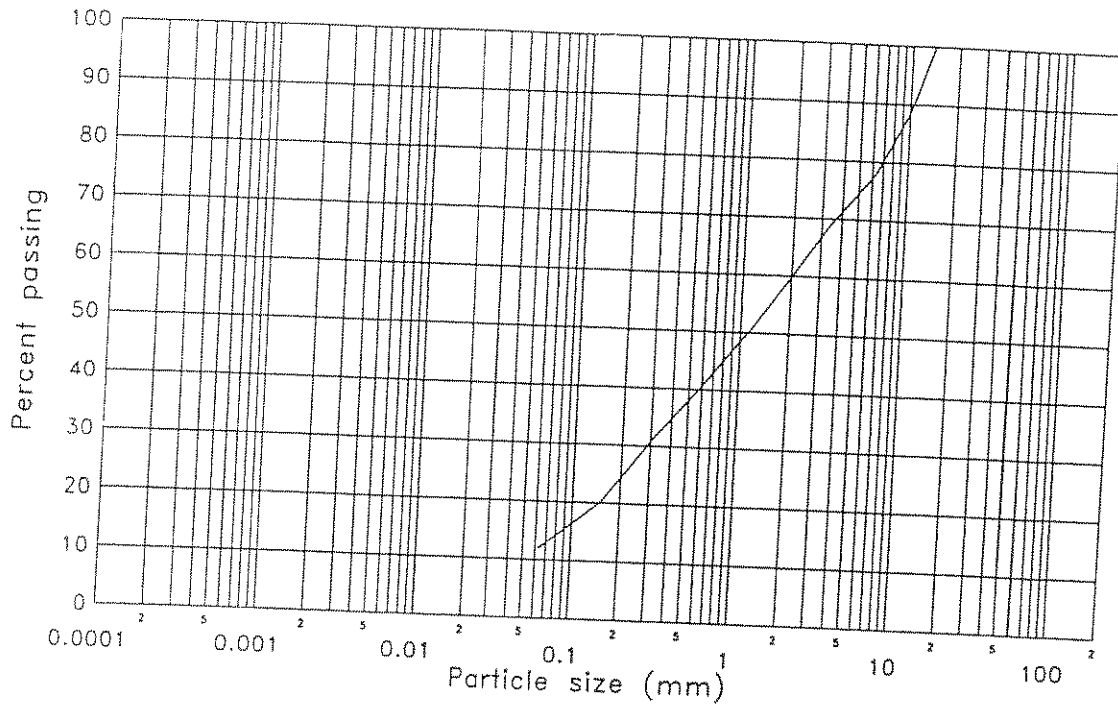
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	11	44	45	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with some silt	
Test Date:	08/03/1999			
Uniformity Coefficient:	49.7			

	Input by <i>MB</i>	Date 10/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99		
FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
					Figure No LT2/28	
	105/03					

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP9	Sample No: 3	Sample Type: B	Depth: 1.00



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

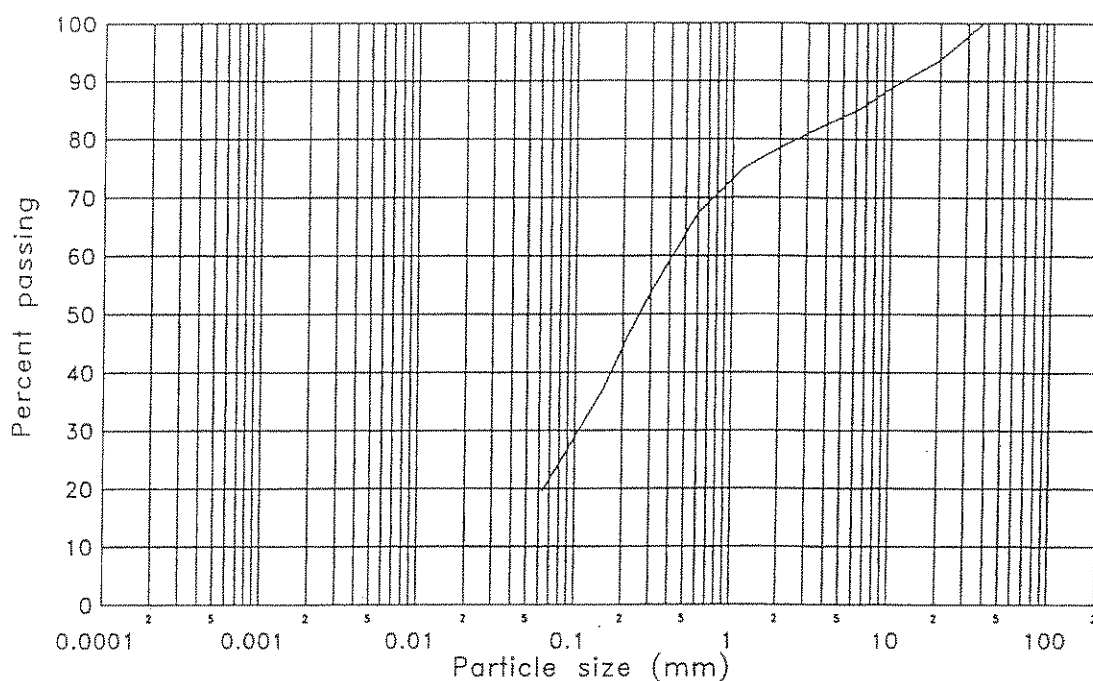
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	12	48	40	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with much silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	39.1			

		Input by MB	Date 21/03/1999	Checked by [Signature]	Date 26.3.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/ 29	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP11	Sample No: 4	Sample Type: 8	Depth: 1.70



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

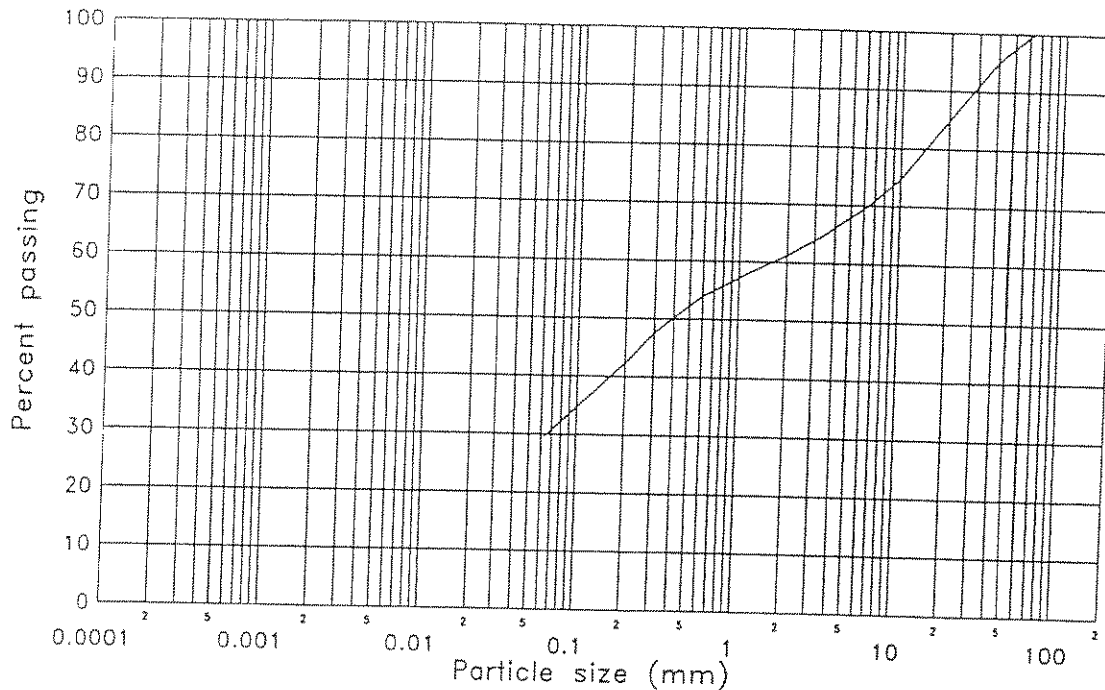
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	20	59	21	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND with much gravel and some silt	
Test Date:	31/03/1999			
Uniformity Coefficient:	9.8			

		Input by <i>MB</i>	Date 02/04/1999	Checked by <i>[Signature]</i>	Date 13.4.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/30	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP12	Sample No: 3	Sample Type: B	Depth: 1.50



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

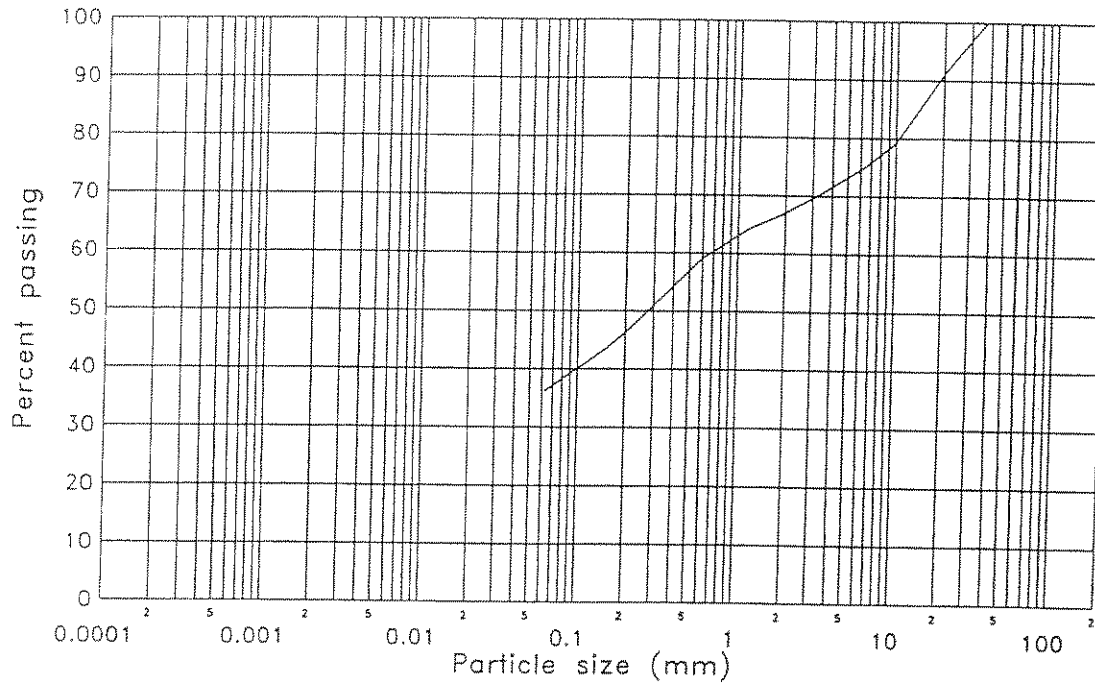
SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	30	31	39	0
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand and much clay	
Test Date:	04/03/1999			
Uniformity Coefficient:	55.0			

	Input by <i>MB</i>	Date 06/03/1999	Checked by <i>[Signature]</i>	Date 26.3.99	
	Project				Contract No
	BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				4452
Figure No					
				LT2/31	

PARTICLE SIZE DISTRIBUTION
B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP13	Sample No: 6	Sample Type: D	Depth: 2.60



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

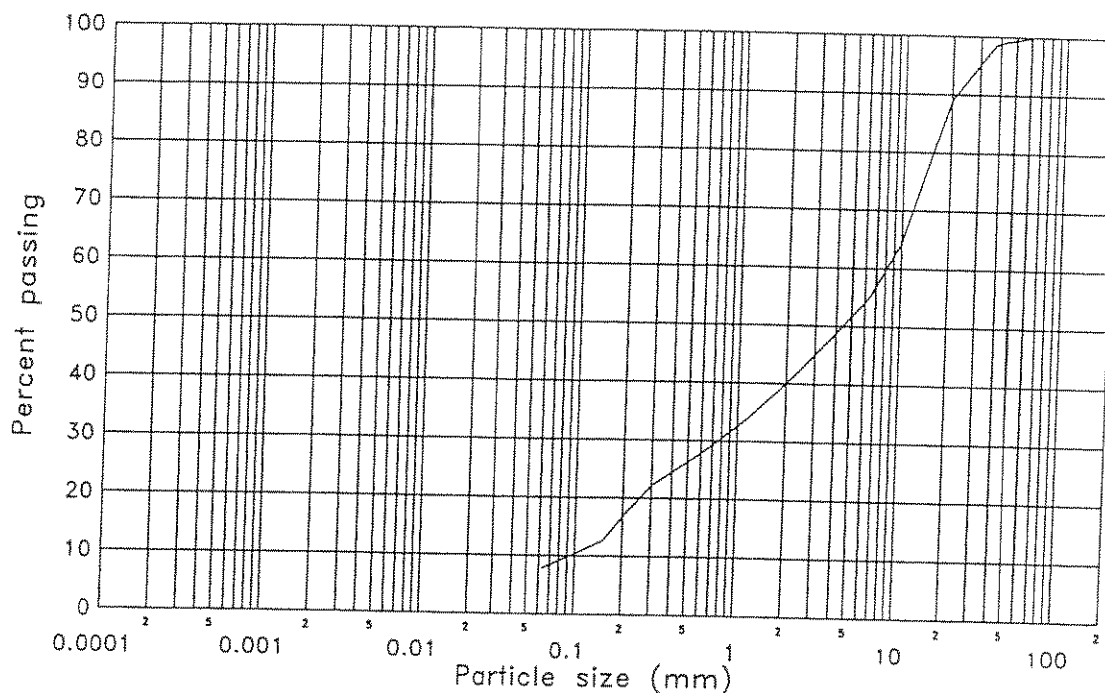
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	36	31	33	0
Loss on Pretreatment:	Not Applicable		Description Brown CLAY with some gravel and some sand	
Test Date:	05/03/1999			
Uniformity Coefficient:	24.6			

	Input by	MB	Date	07/03/1999	Checked by	[Signature]	Date	26.3.99
	Project							Contract No
	BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE							4452
							Figure No	LT2/ 32

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP14	Sample No: 2	Sample Type: B	Depth: 0.60



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

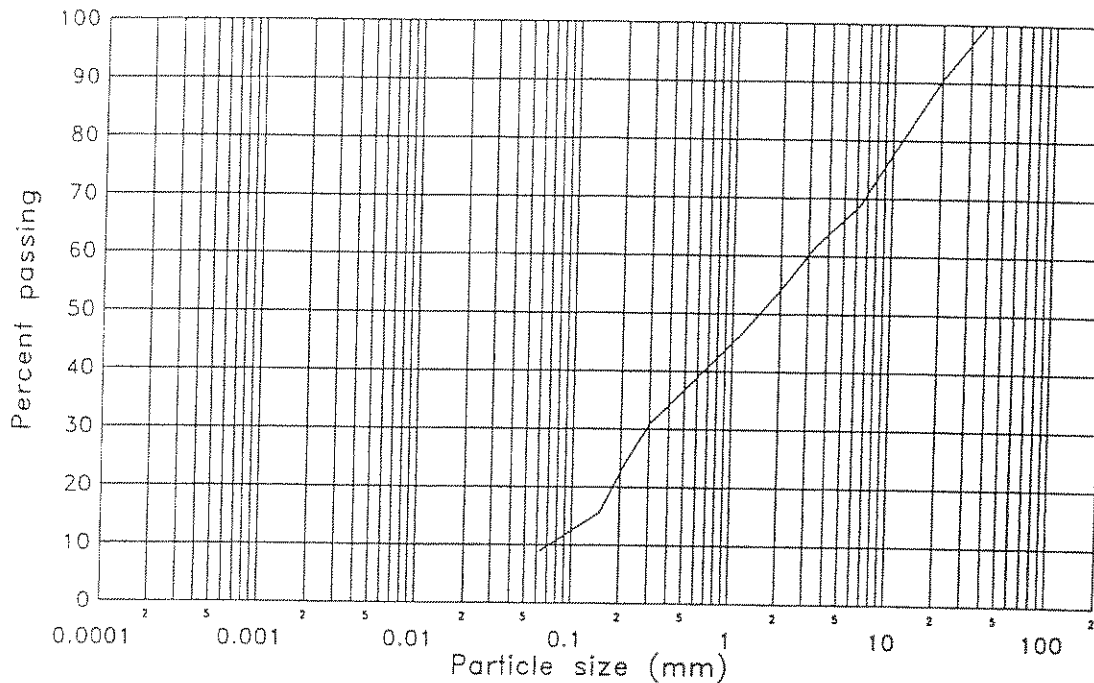
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	8	32	60	0
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand and some silt	
Test Date:	19/03/1999			
Uniformity Coefficient:	86.7			

		Input by MB	Date 21/03/1999	Checked by [Signature]	Date 1.4.99		
FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No LT2/33	

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP14	Sample No: 5	Sample Type: B	Depth: 2.10



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SUMMARY

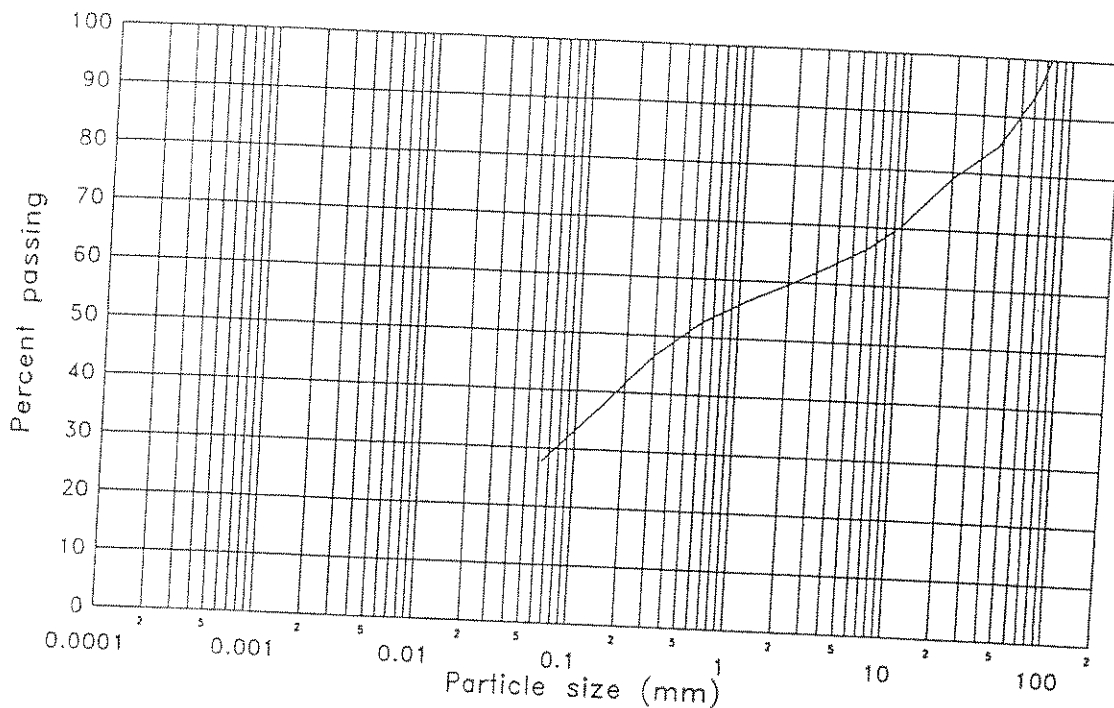
%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	9	45	46	0
Loss on Pretreatment:	Not Applicable		Description Brown SAND and GRAVEL with some silt	
Test Date:	05/03/1999			
Uniformity Coefficient:	41.4			

	Input by <i>MB</i>	Date 07/03/1999	Checked by <i>[Signature]</i>	Date 20.3.99		
FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
					Figure No LT2/ 34	
	105/03					

PARTICLE SIZE DISTRIBUTION

B.S. 1377: Part 2: 1990: 9.2/9.3/9.4/9.5

Sample Details			
Borehole No: TP15	Sample No: 2	Sample Type: B	Depth: 0.40



CLAY	SILT			SAND			GRAVEL			COBBLES
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	

SUMMARY

%CLAY	%SILT	%SAND	%GRAVEL	%COBBLES
Incl. with silt	28	32	35	5
Loss on Pretreatment:	Not Applicable		Description Brown GRAVEL with much sand much silt and occasional cobbles	
Test Date:	05/03/1999			
Uniformity Coefficient:	72.1			



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SERVICES**

Input by **MB**

Date
07/03/1999

Checked by **[Signature]**

Date
26.3.99

Project

BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY,
LANCASHIRE

Contract No

4452

Figure No

LT2/35

Consolidation Test Results

FIGURES LT4/1 to LT4/4

DETERMINATION OF THE ONE - DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : Part 5 : 1990. Method 3

Borehole/Sample No. : BHC1A / 6
 Sample Depth (m) : 5.80 - 6.25
 Specimen Details
 Sample Type : U100

Date : March 1999
 Specimen Depth (m) : 5.86

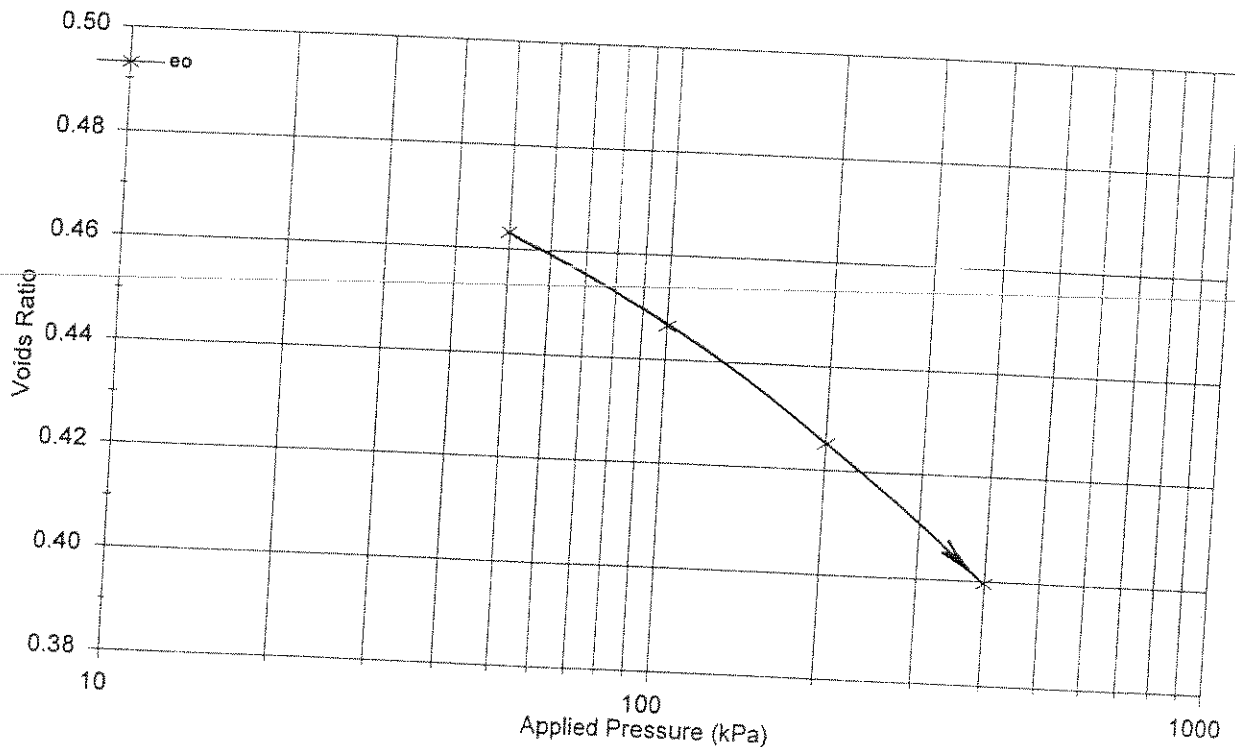
Sample Description : Brown CLAY with a little sand and a little gravel

Sample Axis Orientation : Vertical
 Preparation Method : Extruded and hand trimmed
 Test Temperature (° C) : 19.3

INITIAL PROPERTIES	Sample Height	mm	18.95	Pressure Range (kPa)	Mv (m ² /MN)	Cv (ROOT) (m ² /year)
	Sample Diameter	mm	74.97			
	Moisture Content	%	19			
	Bulk Density	Mg/m ³	2.08			
	Dry Density	Mg/m ³	1.75			
	Particle Density (measured)	Mg/m ³	2.61			
	Voids Ratio		0.4932			
	Degree of Saturation	%	100			
	Swelling Pressure	kPa	—			
	Moisture Content	%	18			
FINAL PROPERTIES	Voids Ratio		0.3997			

Variation from BS 1377 and reason :

Remarks on testing :



Prepared By	<i>[Signature]</i>	Date	16.3.99	Approved By		For Contractor	Date		For Engineer	Date
Checked By	<i>[Signature]</i>	Date	22.3.99							



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BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE

CONTRACT : M4452

FIGURE : LT4/1

DETERMINATION OF THE ONE - DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : Part 5 : 1990. Method 3

Borehole/Sample No. : BHC2 / 13

Sample Depth (m) : 6.60 - 7.05

Specimen Details

Sample Type : U100

Sample Description : Brown CLAY with a little sand

Date : March 1999

Specimen Depth (m) : 6.64

Sample Axis Orientation : Vertical

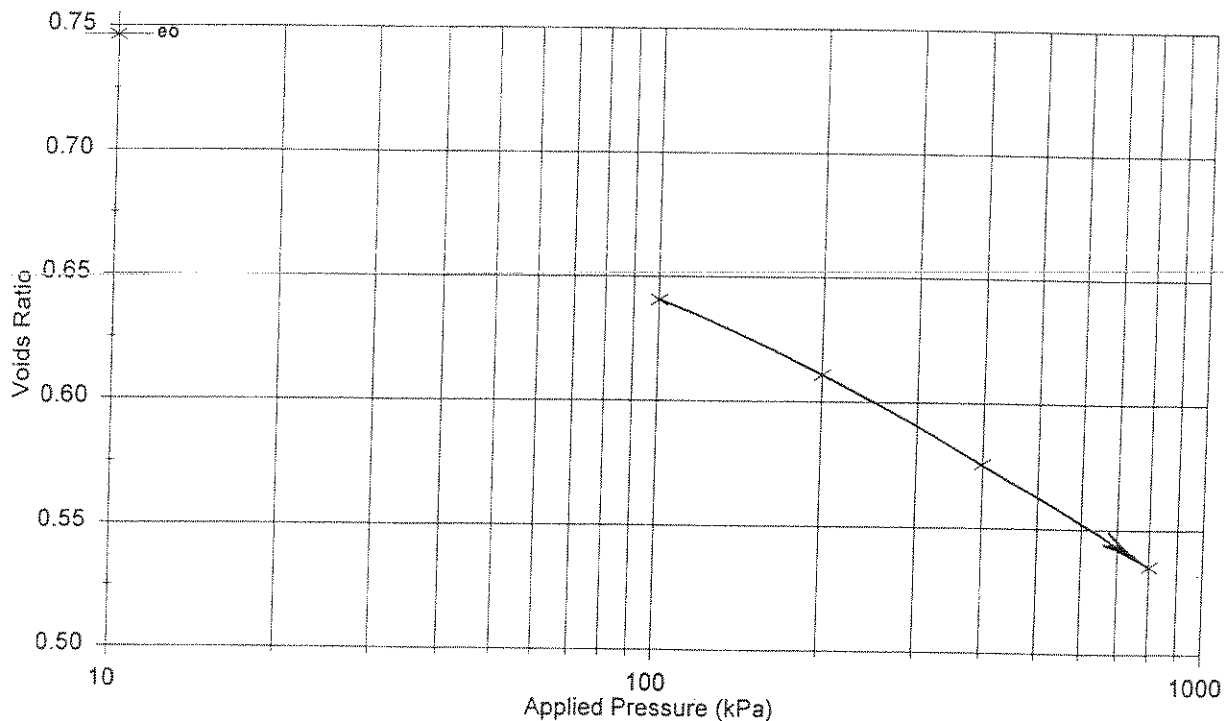
Preparation Method : Extruded and hand trimmed

Test Temperature (° C) : 19.5

INITIAL PROPERTIES	Sample Height	mm	18.93	Pressure Range (kPa)	Mv (m ² /MN)	Cv (ROOT) (m ² /year)
	Sample Diameter	mm	74.94			
	Moisture Content	%	33			
	Bulk Density	Mg/m ³	2.00			
	Dry Density	Mg/m ³	1.51			
	Particle Density (measured)	Mg/m ³	2.63			
	Voids Ratio		0.7466			
	Degree of Saturation	%	115			
	Swelling Pressure	kPa	-----			
FINAL PROPERTIES	Moisture Content	%	24	2 - 100	0.62	10
	Voids Ratio		0.5353			
				100 - 200	0.18	6.5
				200 - 400	0.11	23
				400 - 800	0.064	26

Variation from BS 1377 and reason :

Remarks on testing :



Prepared By		Date	16.3.99	Approved By	For Contractor	Date	For Engineer	Date
Checked By		Date	29.3.99					

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CONTRACT : M4452

FIGURE: LT4/2

DETERMINATION OF THE ONE - DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : Part 5 : 1990. Method 3

Borehole/Sample No. : BHG2 / 5
 Sample Depth (m) : 1.90 - 2.35
 Specimen Details
 Sample Type : U100

Date : March 1999
 Specimen Depth (m) : 1.95

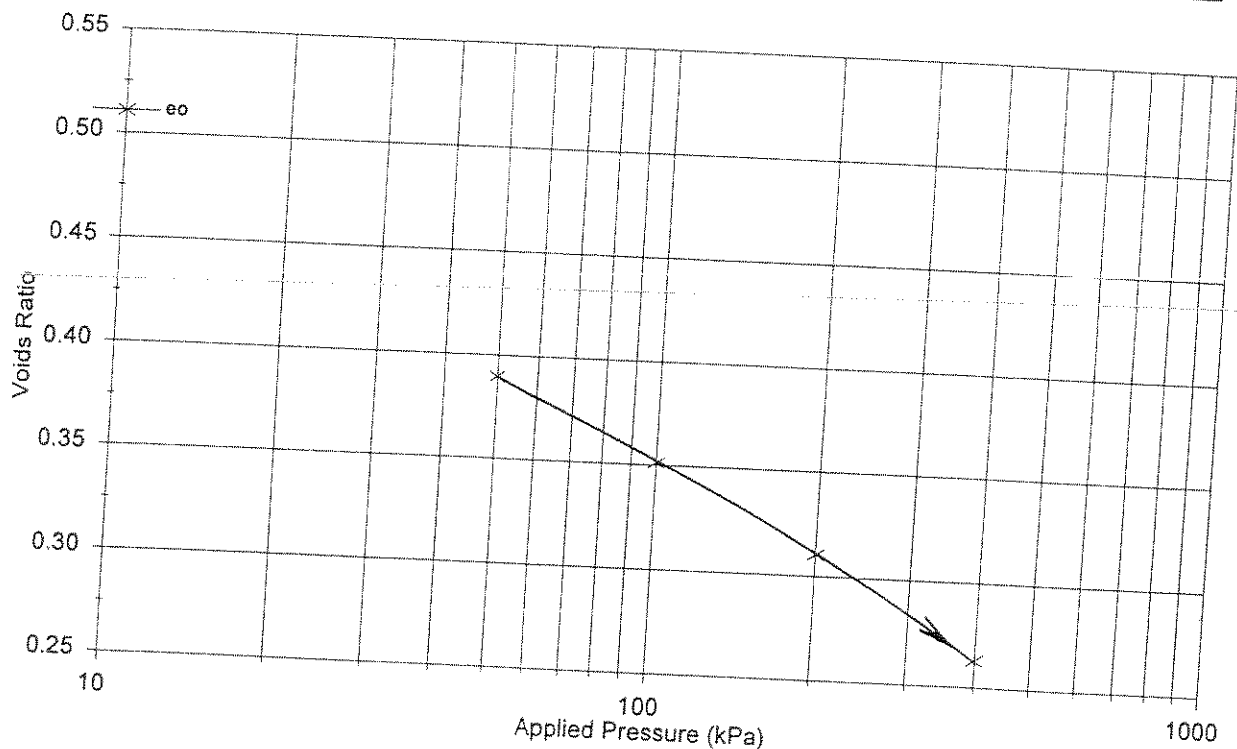
Sample Description : Brown CLAY with a little sand and a little gravel

Sample Axis Orientation : Vertical
 Preparation Method : Extruded and hand trimmed
 Test Temperature (° C) : 19.5

INITIAL PROPERTIES	Sample Height	mm	19.01	Pressure Range (kPa)	Mv (m ² /MN)	Cv (ROOT) (m ² /year)
	Sample Diameter	mm	75.00			
	Moisture Content	%	26			
	Bulk Density	Mg/m ³	1.87			
	Dry Density	Mg/m ³	1.49			
	Particle Density (measured)	Mg/m ³	2.25			
	Voids Ratio		0.5109			
	Degree of Saturation	%	114			
	Swelling Pressure	kPa	—			
	Moisture Content	%	15			
FINAL PROPERTIES	Voids Ratio		0.2630			

Variation from BS 1377 and reason :

Remarks on testing :



Prepared By		Date	16.3.99	Approved By		For Contractor	Date		For Engineer	Date	
Checked By		Date	29.3.99								

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CONTRACT: M4452

FIGURE: LT4/3

DETERMINATION OF THE ONE - DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : Part 5 : 1990. Method 3

Borehole/Sample No. : BHG2 / 7
 Sample Depth (m) : 2.60 - 3.05
 Specimen Details
 Sample Type : U100

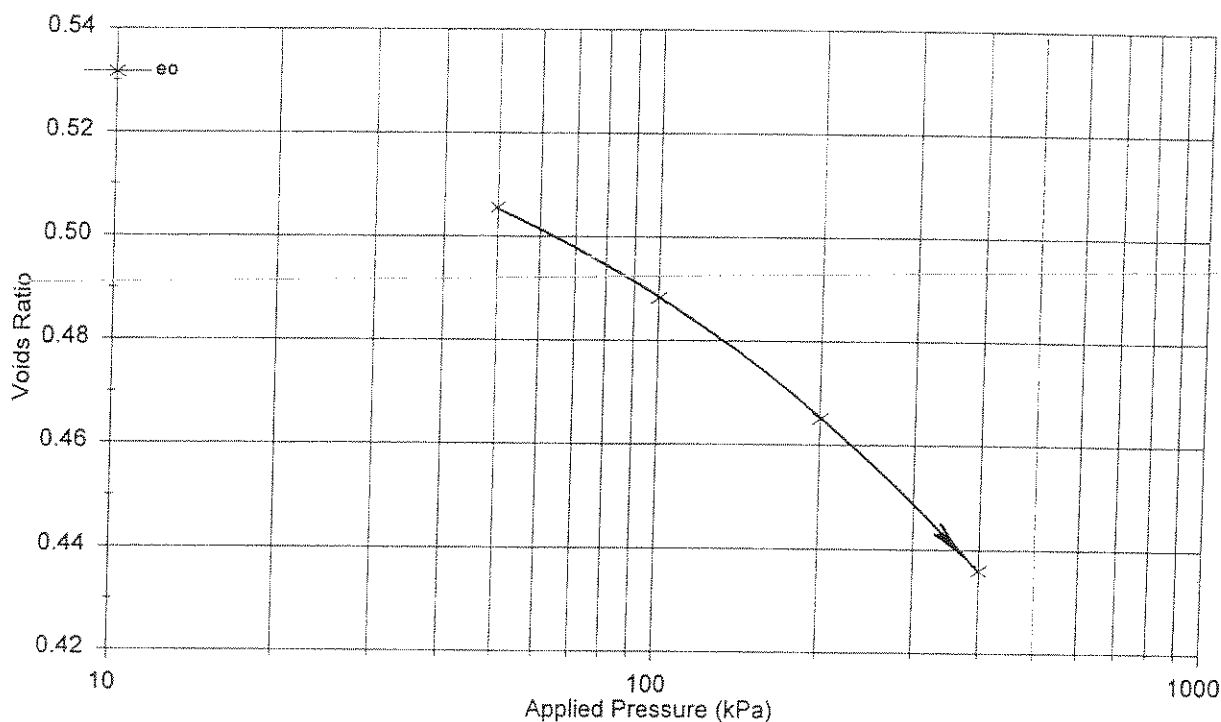
Date : March 1999
 Specimen Depth (m) : 2.66
 Sample Axis Orientation : Vertical
 Preparation Method : Extruded and hand trimmed
 Test Temperature (° C) : 19.5

Sample Description : Brown CLAY with a little sand

INITIAL PROPERTIES	Sample Height	mm	18.93	Pressure Range (kPa)	Mv (m ² /MN)	Cv (ROOT) (m ² /year)
	Sample Diameter	mm	74.99			
	Moisture Content	%	21			
	Bulk Density	Mg/m ³	2.07			
	Dry Density	Mg/m ³	1.70			
	Particle Density (measured)	Mg/m ³	2.61			
	Voids Ratio		0.5317			
	Degree of Saturation	%	105			
	Swelling Pressure	kPa	-----			
FINAL PROPERTIES	Moisture Content	%	19	2 - 50	0.35	4.3
	Voids Ratio		0.4360			
				50 - 100	0.23	1.8
				100 - 200	0.16	2.7
				200 - 400	0.099	4.9

Variation from BS 1377 and reason :

Remarks on testing :



Prepared By	<i>[Signature]</i>	Date	16.3.99	Approved By		For Contractor	Date	For Engineer	Date
Checked By	<i>[Signature]</i>	Date	24.3.99						

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CONTRACT : M4452

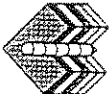
FIGURE : LT4/4

Summary Of Undrained Triaxial (Total Stress)
Compression Tests

FIGURES LT5/1 to LT5/3

SUMMARY OF UNDRAINED SHEAR STRENGTH TESTS IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF POREWATER PRESSURE

BS 1377: Part 7: 1990: Tests 8 & 9

Specimen Details										Undrained Triaxial Compression Results (Total Stress)									
Hole	Type	Depth	Sample No.	Specimen Depth mm	Test Type	Preparation	Initial Properties				Rate of Strain %/min	Membrane Thickness mm	Cell Pressure kPa	Membrane Correction kPa	Maximum Deviator Stress kPa	Failure Strain %	Mode of Failure	Cohesion (Avg) kPa	Description
							Dimensions mm	w %	γ_b Mg/m ³	γ_d Mg/m ³									
BHC1A	U	5.80	6	180	UU	U	199,103	17	2.18	1.87	2.00	0.24	110.0	0.90	253	19.60	C	127	Stiff brown CLAY with a little sand and a little gravel
BHC2	U	6.60	13	90	UU	U	198,101	26	2.04	1.62	1.51	0.24	120.0	0.78	73	15.60	P	37	Soft brown CLAY with some silt and a little sand
BHC2	U	9.60	21	50	UU	U	179,102	12	2.27	2.03	2.23	0.24	190.0	0.90	746	19.50	C	373	Hard brown CLAY with a little sand and a little gravel
BHC4	U	7.75	15	90	UU	U	196,103	26	1.98	1.57	1.53	0.24	150.0	0.92	53	19.90	C	27	Soft brown CLAY with a little sand and a little gravel
BHC4	U	12.50	27	10	UU	U	154,102	11	2.28	2.05	2.58	0.24	250.0	0.92	531	20.10	C	266	Very stiff brown CLAY with a little sand and a little gravel Short specimen tested
BHC5	U	8.00	17	30	UU	U	179,102	27	1.96	1.54	2.23	0.24	150.0	0.92	52	20.10	C	26	Soft brown CLAY with a little sand and a little gravel
Key: Preparation: REM - remoulded U - undisturbed							Test Type: UU - unconsolidated undrained UUM - unconsolidated undrained multistage				Mode of Failure: B - Brittle C - Combined P - Plastic				* Latex Membranes used				
Input by MB							Date 29/03/1999				Checked by [Signature]				Date 29/03/1999				
Project							BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE												
							Contract No 4452												
							Figure No LT5/1												

BS 1377: Part 7: 1990: Tests 8 & 9

104/03

SUMMARY OF UNDRAINED SHEAR STRENGTH TESTS IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF POREWATER PRESSURE

BS 1377: Part 7: 1990: Tests 8 & 9

Specimen Details										Undrained Triaxial Compression Results (Total Stress)									
Hole	Type	Depth	Sample No.	Specimen Depth mm	Test Type	Preparation	Initial Properties				Rate of Strain %/min	Membrane Thickness mm	Cell Pressure kPa	Membrane Correction kPa	Maximum Deviator Stress kPa	Failure Strain %	Mode of Failure	Cohesion (Avg) kPa	Description
							Dimensions mm	w %	γ_b Mg/m ³	γ_d Mg/m ³									
BHG1	U	2.80	6	40	UU	U	199, 103	11	2.31	2.08	2.01	0.24	50.0	0.92	342	20.10	C	171	Very stiff brown CLAY with a little sand and a little gravel
BHG1	U	6.80	13	40	UU	U	179, 102	16	2.19	1.89	2.23	0.24	125.0	0.90	373	19.50	C	186	Very stiff brown CLAY with a little sand and a little gravel
BHG2	U	2.60	7	120	UU	U	200, 103	20	2.09	1.74	2.00	0.24	50.0	0.92	118	20.00	C	59	Firm brown CLAY with a little sand and a little gravel
BHG2	U	4.50	12	100	UU	U	199, 103	19	2.14	1.79	2.00	0.24	100.0	0.62	149	11.50	C	74	Firm brown CLAY with a little sand and a little gravel
BHG2	U	8.00	17	70	UU	U	163, 102	17	2.14	1.83	1.83	0.24	160.0	0.92	215	20.20	C	108	Stiff brown CLAY with a little sand and a little gravel
BHG2	U	12.50	26	70	UU	U	200, 101	13	2.28	2.02	2.00	0.24	250.0	0.92	554	20.00	C	277	Very stiff brown CLAY with a little sand and a little gravel
Preparation: REM - remoulded U - undisturbed					Test Type: UU - unconsolidated undrained UUM - unconsolidated undrained multistage					Mode of Failure: B - Brittle C - Combined P - Plastic					* Latex Membranes used				
Input by					Date					Checked by					Date				
Project					29/03/1999					29/03/1999					29/03/1999				
FOLNDA™ ON & EXPLORATION SERVICES					BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE					Contract No					4452				
										Figure No					LT5/2				
															104/03				

SUMMARY OF UNDRAINED SHEAR STRENGTH TESTS IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF POREWATER PRESSURE

BS 1377: Part 7: 1990: Tests 8 & 9

Specimen Details										Undrained Triaxial Compression Results (Total Stress)																			
Hole	Type	Depth	Sample No.	Specimen Depth mm	Test Type	Preparation	Initial Properties				Rate of Strain %/min	Membrane Thickness mm	Cell Pressure kPa	Membrane Correction kPa	Maximum Deviator Stress kPa	Failure Strain %	Mode of Failure	Cohesion (Avg) kPa	Description										
							Dimensions mm	w %	γ_b Mg/m ³	γ_d Mg/m ³																			
BHG3	U	8.80	14	100	UU	U	199, 102	14	2.26	1.99	2.00	0.24	170.0	0.92	451	20.10	C	226	Very stiff brown CLAY with a little sand and a little gravel										
BHG3	U	11.70	22	70	UU	U	199, 102	18	2.16	1.83	2.00	0.24	240.0	0.66	178	12.50	C	89	Stiff brown CLAY with a little sand and a little gravel										
BHG4	U	5.60	14	80	UU	U	200, 102	15	2.20	1.91	2.00	0.24	110.0	0.92	126	20.00	C	63	Firm brown CLAY with a little sand and a little gravel										
BHG4	U	7.00	18	60	UU	U	196, 103	25	2.04	1.63	2.03	0.24	140.0	0.71	46	13.70	P	23	Soft brown CLAY with some sand										
Key: Preparation: REM - remoulded U - undisturbed										Test Type: UU - unconsolidated undrained UUM - unconsolidated undrained multistage										Mode of Failure: B - Brittle C - Combined P - Plastic									
Input by MB										Date 29/03/1999										Checked by [Signature] Date 29/03/1999									
Project										BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE										Contract No 4452									
FOUNDATION & EXPLORATION SERVICES										Figure No LT5/3										104/03									

Key: Preparation: REM - remoulded
U - undisturbed

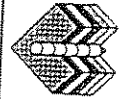
Test Type: UU - unconsolidated undrained
UUM - unconsolidated undrained with porewater measurement

Input by: MB Date: 29/03/1999

Mode of Failure: B - Brittle C - Combined P - Plastic

Checked by: [Signature] Date: 29/03/1999

* Latex Membranes used



**FOUNDATION
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Project

BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY,
LANCASHIRE

Contract No

4452

Figure No

LT5/3

104/03

Shear Box Test Results
FIGURES LT6/1 and LT6/2

DETERMINATION OF THE SHEAR STRENGTH BY DIRECT SHEAR

Large Shearbox Apparatus : BS 1377 : Part 7 : 1990. Method 5

Borehole/Sample Nos. : TP10 / 2, 4 and 7 Combined

Date : April 1999

Sample Depths (m) : 0.40 - 3.00

Specimen Depth (m) : 0.40 - 3.00

Specimen Details

Sample Types : Bults - Remoulded

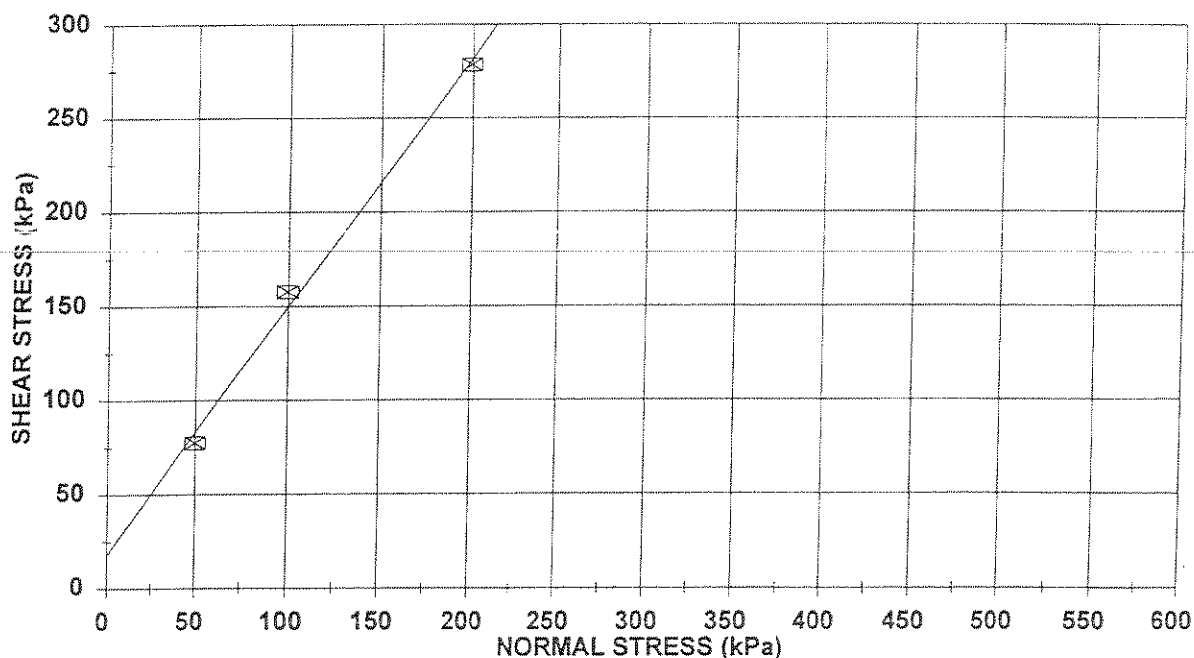
Sample Orientation : Not applicable

Preparation Method : Remoulded using a vibrating hammer
Clause 5.4.5

Sample Description : Black sandy fine to coarse GRAVEL
(Sieved to pass a 20 mm B.S. test sieve)

			Sample 1	Sample 2	Sample 3
INITIAL PROPERTIES	Sample Height	mm	150.4	149.0	148.5
	Sample Width	mm	300.0	300.0	300.0
	Sample Length	mm	300.0	300.0	300.0
	Moisture Content	%	26	27	23
	Bulk Density	Mg/m ³	1.60	1.61	1.62
	Dry Density	Mg/m ³	1.27	1.27	1.31
	Particle Density (assumed)	Mg/m ³	2.70		
	Degree of Saturation	%	62	64	59
	Voids Ratio		1.126	1.123	1.060
	Test Conditions		Submerged		
CONSOLIDATION	Applied Normal Stress	kPa	50	100	200
	Consolidated Height	mm	149.3	146.6	145.2
	Consolidated Dry Density	Mg/m ³	1.27	1.28	1.33
SHEARING	Rate of Displacement	mm/min	0.12	0.12	0.12
	Maximum Shear Stress	kPa	78	158	278
	Horizontal Displacement at Maximum Shear Stress	mm	6.4	13.5	11.8

PEAK STRENGTH	Eff. cohesion (c')	17 kPa	Eff. angle of friction (ø')	52.8 degrees
---------------	--------------------	--------	-----------------------------	--------------



Variation from BS 1377 and reason :

Remarks on testing :

Prepared By	D Hill	Date	20/04/99	Approved By	For Contractor	Date	For Engineer	Date
Checked By	AP [Signature]	Date	23/04/99					



**FOUNDATION
& EXPLORATION
SERVICES**

BUCKLEY WELLS, BURY

CONTRACT : M4452

FIGURE: LT6/1

DETERMINATION OF THE SHEAR STRENGTH BY DIRECT SHEAR

Large Shear Box Apparatus : BS 1377 : Part 7 : 1990 : Method 5

Borehole/Sample No.

BH C2 / 1, 2, 4, 6, 8 and 10 Combined

Sample Depth (m) :

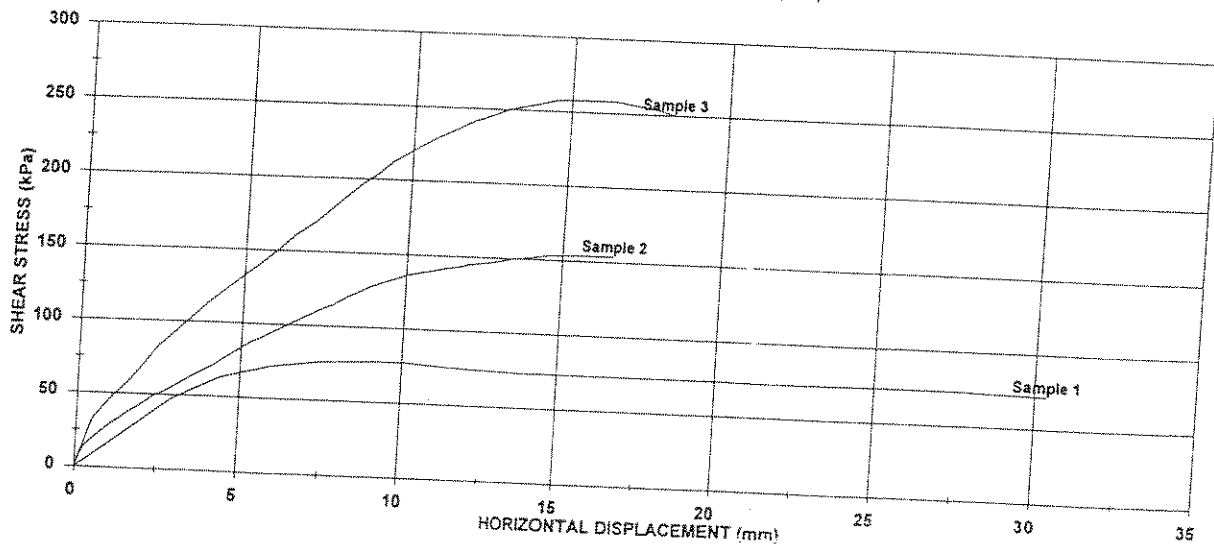
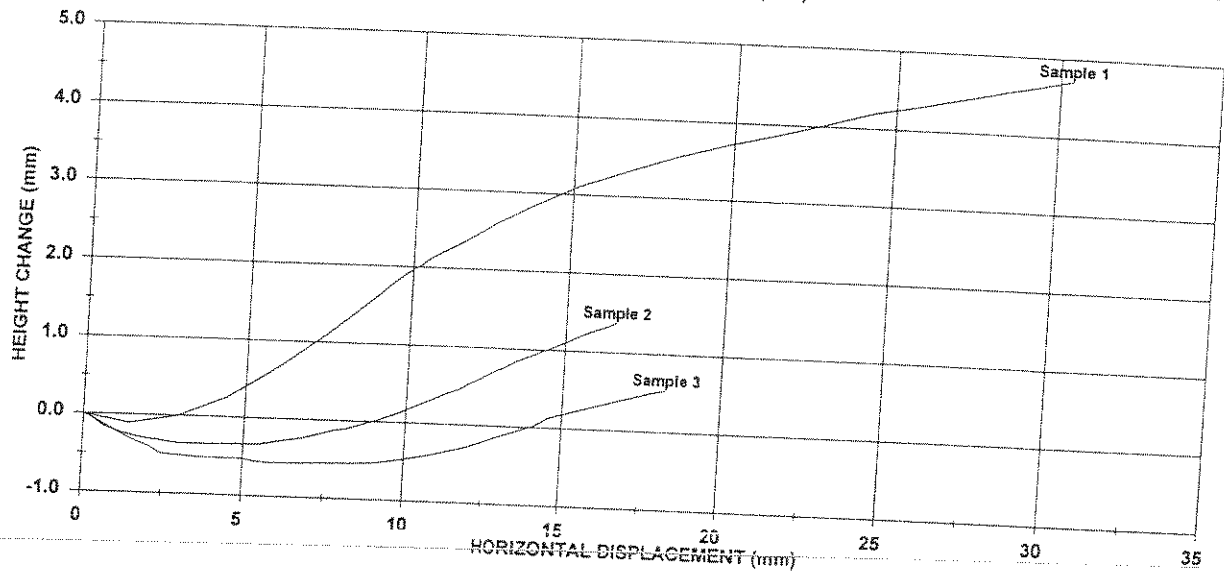
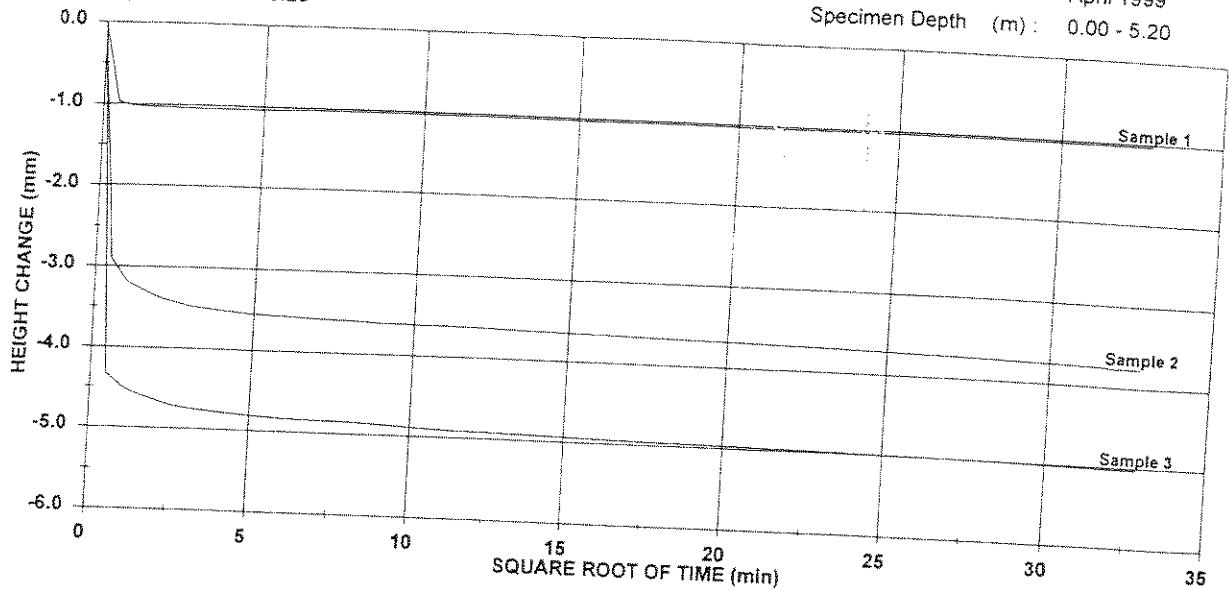
0.00 - 5.20

Date

April 1999

Specimen Depth (m) :

0.00 - 5.20



Prepared By	D Hill	Date	23/04/99	Approved By		For Contractor	Date	For Engineer	Date
Checked By	<i>A. D. Hill</i>	Date	23/04/99						



**FOUNDATION
& EXPLORATION
SERVICES**

BUCKLEY WELLS, BURY

CONTRACT : M4452

FIGURE: LT6/1

DETERMINATION OF THE SHEAR STRENGTH BY DIRECT SHEAR

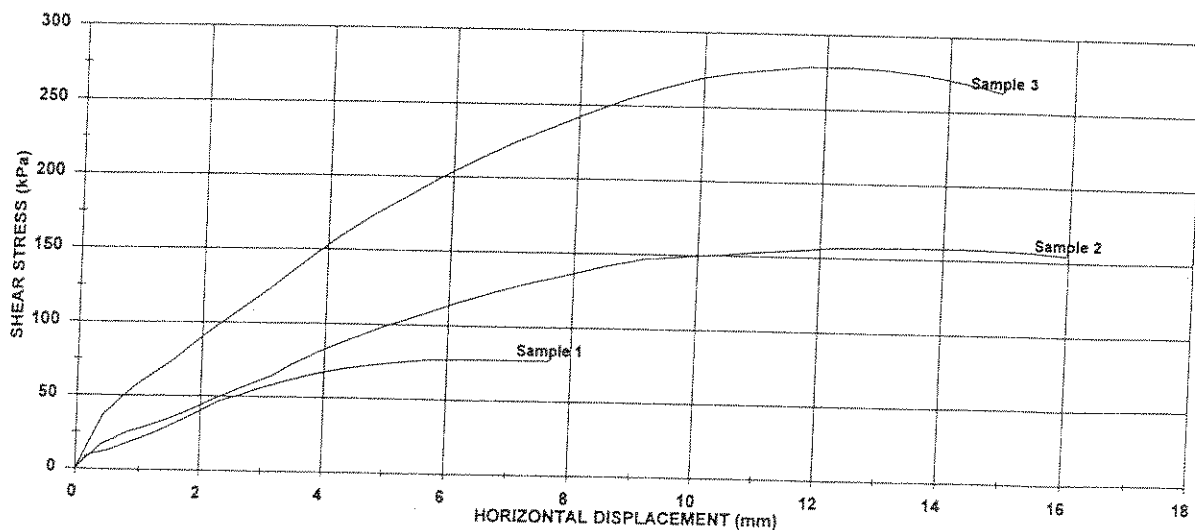
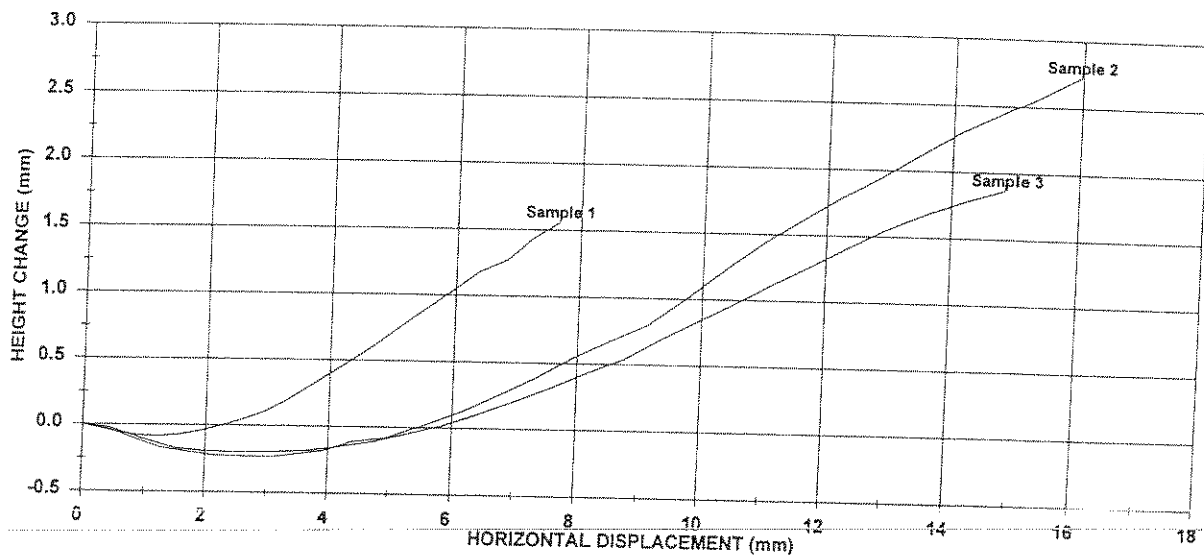
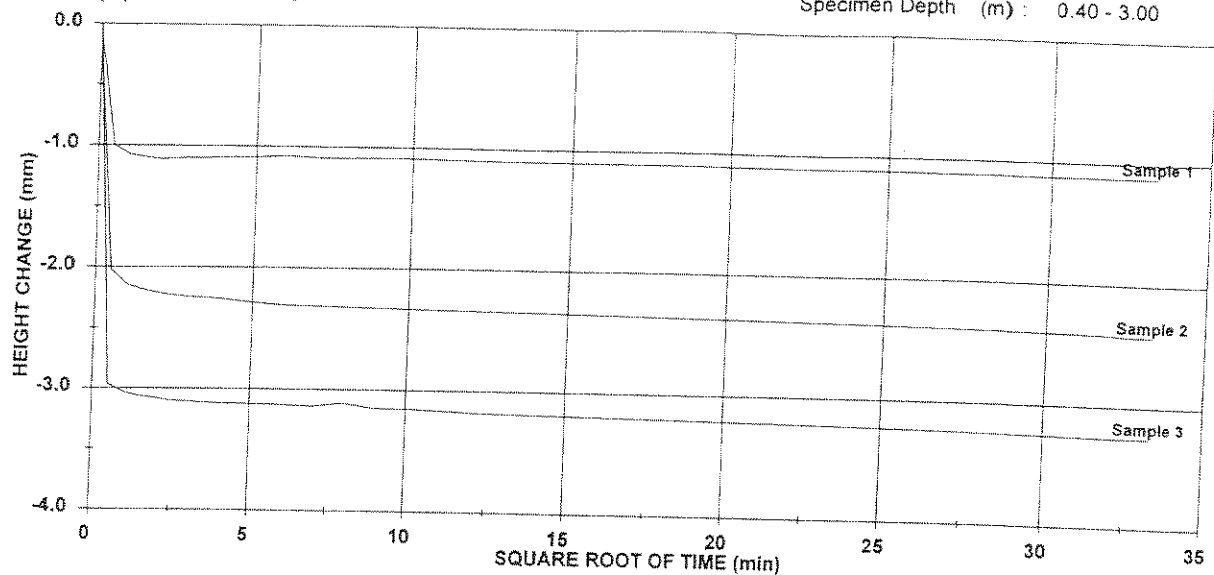
Large Shear Box Apparatus : BS 1377 : Part 7 : 1990 : Method 5

Borehole/Sample No. TP10 / 2, 4 and 7 Combined

Date : April 1999

Sample Depth (m) : 0.40 - 3.00

Specimen Depth (m) : 0.40 - 3.00



Prepared By	D Hill	Date	20/04/99	Approved By		For Contractor	Date		For Engineer	Date
Checked By	APD	Date	23/04/99							



**FOUNDATION
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SERVICES**

BUCKLEY WELLS, BURY

CONTRACT : M4452

FIGURE: LT6/2

DETERMINATION OF THE SHEAR STRENGTH BY DIRECT SHEAR

Large Shearbox Apparatus : BS 1377 : Part 7 : 1990. Method 5

Borehole/Sample Nos. : BH C2 / 1, 2, 4, 6, 8 and 10 Combined

Sample Depths (m) : 0.00 - 5.20

Specimen Details

Sample Types : Bults - Remoulded

Date : April 1999

Specimen Depth (m) : 0.00 - 5.20

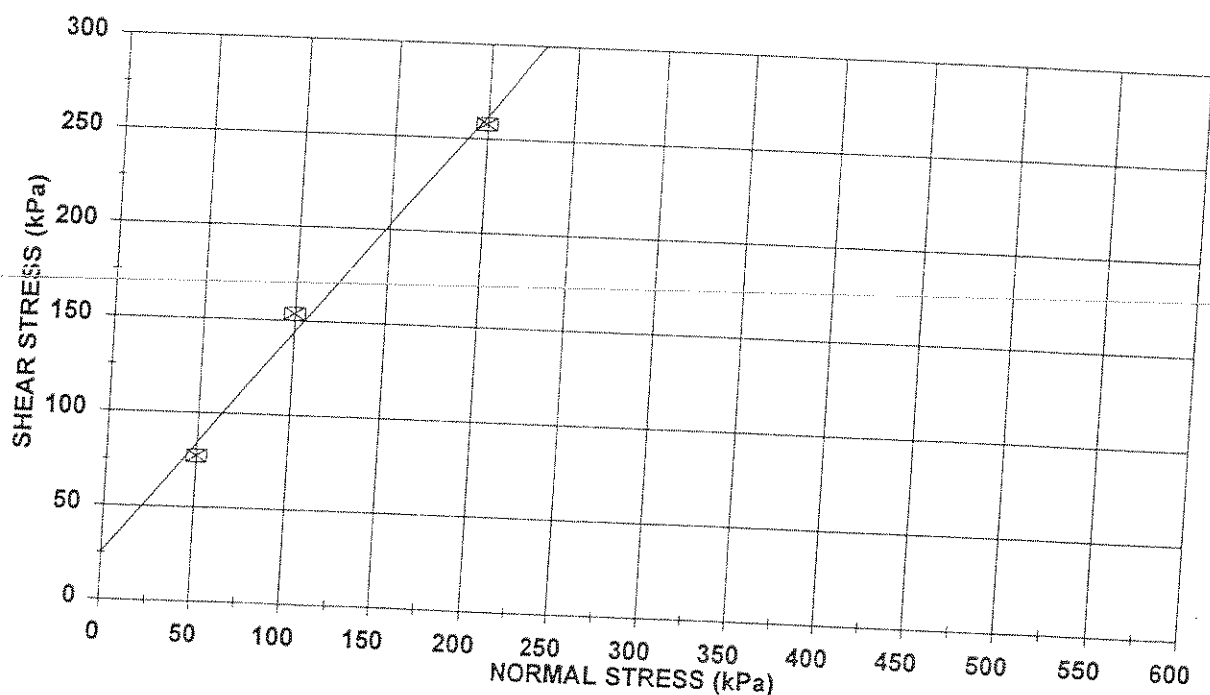
Sample Orientation : Not applicable

Preparation Method : Remoulded using a vibrating hammer
Clause 5.4.5

Sample Description : Black sandy fine to coarse GRAVEL
(Sieved to pass a 20 mm B.S. test sieve)

INITIAL PROPERTIES	Sample Height	Sample 1	Sample 2	Sample 3
	Sample Width mm	150.3	145.0	144.4
	Sample Length mm	300.0	300.0	300.0
	Moisture Content mm	300.0	300.0	300.0
	Bulk Density %	29	26	30
	Dry Density Mg/m ³	1.50	1.55	1.55
	Particle Density (assumed) Mg/m ³	1.16	1.23	1.19
	Degree of Saturation	2.70		
	Voids Ratio %	59	58	65
	Test Conditions	1.327	1.188	1.261
CONSOLIDATION	Applied Normal Stress	Submerged		
	Consolidated Height kPa	50	100	200
	Consolidated Dry Density mm	149.2	141.2	139.4
SHEARING	Consolidated Dry Density Mg/m ³	1.16	1.25	1.21
	Rate of Displacement mm/min	0.30	0.075	0.059
	Maximum Shear Stress kPa	77	154	258
	Horizontal Displacement at Maximum Shear Stress mm	9.3	15.5	16.4

PEAK STRENGTH	Eff. cohesion (c')	25 kPa	Eff. angle of friction (ø')	49.8 degrees
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Variation from BS 1377 and reason :

Remarks on testing :

Prepared By	D Hill	Date	23/04/99	Approved By	For Contractor	Date	For Engineer	Date
Checked By	<i>AP</i>	Date	23/04/99					



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& EXPLORATION
SERVICES**

BUCKLEY WELLS, BURY

CONTRACT : M4452

FIGURE: LT6/2

SUMMARY OF CHEMICAL ANALYSIS

BS 1377: Part 3: 1990

Hole	Depth (m)	Sample Number	Sample Type	Laboratory Reference Number	Organic Content Test 3 (% dry mass)	Loss on Ignition Test 4 (% dry mass)	Sulphate Content as SO ₄ (as SO ₄) Test 5.5			Carbonate Content (as CO ₂) Test 6.3 † (% dry mass)	Chloride Content (as Cl) Test 7.2		pH Value Test 9	pH Value *
							Soil (% dry mass)	2:1 Water: Soil Extract (g/l)	Groundwater (g/l)		Soil (% dry mass)	Groundwater (g/l)		
BHC1A	3.15	2	W	CN 1635/1					0.11 (0.13)					
BHC1A	5.70	5	D	CN 1635/2			0.01 (0.01)						7.1	6.3
BHC2	14.10 - 14.55	28	D	CN 1635/4			0.02 (0.02)							6.8
BHC3	1.60	4	W	CN 1635/5					0.01 (0.01)				6.6	
BHC4	8.35	24	W	CN 1635/6					0.12 (0.14)				7.2	
BHC4	12.30	26	D	CN 1635/7			0.01 (0.01)							
BHC5	7.00 - 7.45	15	D	CN 1635/8			0.04 (0.05)							7.0
BHC5	10.50 - 10.95	23	D	CN 1635/9			0.02 (0.02)							7.2
BHG1	3.60	9	W	CN 1635/10					0.13 (0.16)				6.9	
BHG1	4.81	18	W	CN 1635/11					0.13 (0.16)				7.1	
BHG2	3.10	8	D	CN 1635/12			< 0.01							
BHG2	9.00	23	W	CN 1635/13			0.03 (0.04)		0.07 (0.08)				7.1	6.8
BHG3	0.60 - 1.20	2	B	CN 1635/14										
BHG3	7.20	20	W	CN 1635/15					0.07 (0.08)				7.0	7.3
BHG4	6.10	15	D	CN 1635/16			0.02 (0.02)							
BHG4	7.42	22	W	CN 1635/17					0.13 (0.16)				7.0	7.3
TP1	2.00	4	CD	CN 1635/18	5.4		0.01 (0.01)							6.0

Key: D - disturbed sample; B - bulk disturbed sample; U - undisturbed sample

* in house method on Sample as received and not dried ground powder
† denotes tests not included in the accreditation schedule of the laboratory

Delete as applicable

Input by	RP	Date	18/03/1999	Checked by	MM	Date	
Project				BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE			
FOUNDATION & EXPLORATION SERVICES				Contract No 4452			
				Figure No LTG/1			
				109/01			

Summary of Chemical Analyses

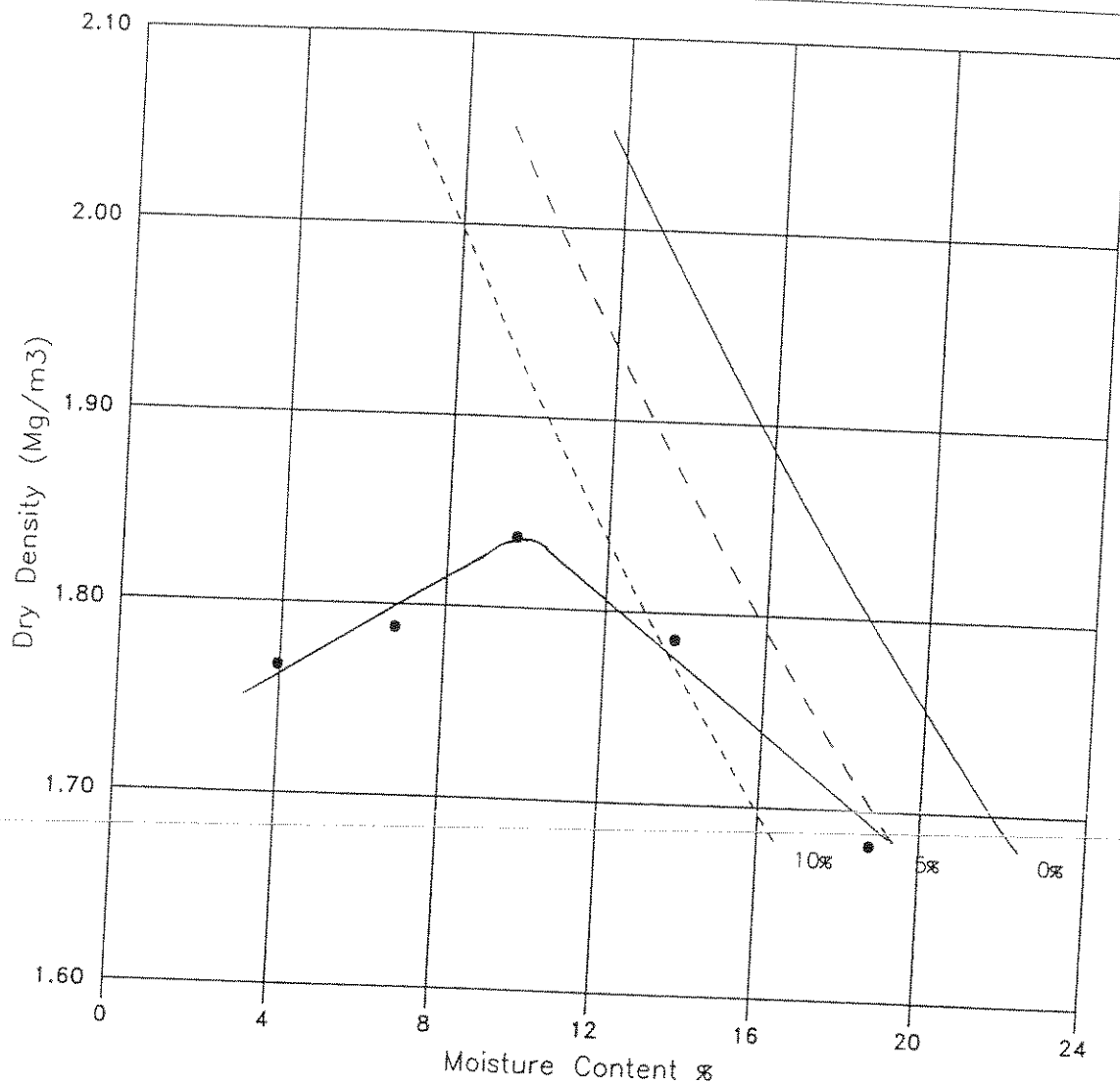
FIGURES LT9/1 to LT9/3

Compaction Related Test Results

FIGURES LT3/1 and LT3/2

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP TEST B.S. 1377: Part 4: 1990: 3.3/3.4/3.5/3.6/3.7

Sample Details			
Borehole No: TP12	Sample No: 3	Sample Type: B	Depth: 1.50



SUMMARY

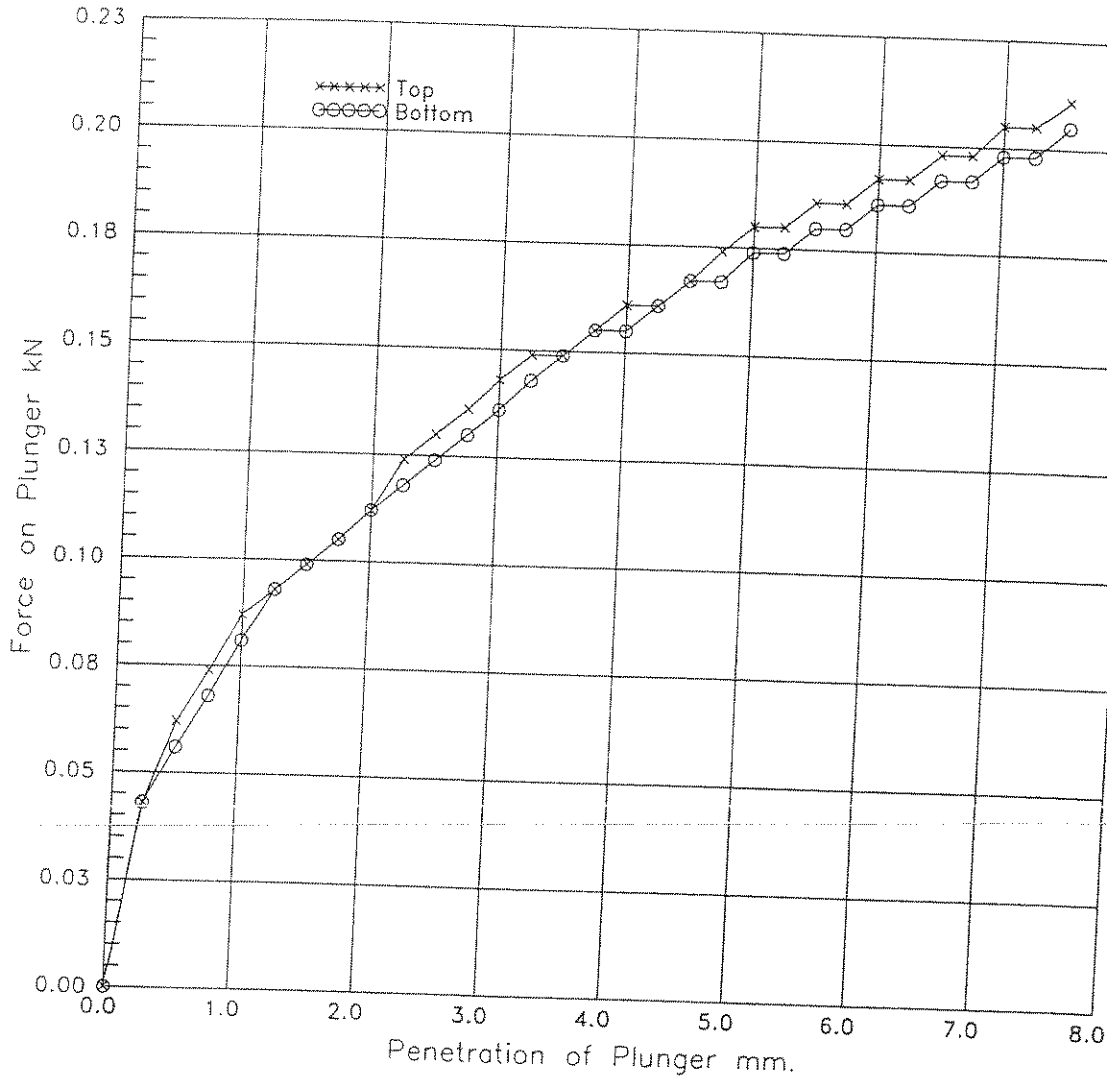
Test Date	04/03/1999	Type of Compaction	2.5kg Compaction
Sample Preparation	Single sample	Maximum Dry Density	1.83 Mg/m³
Particle Density (assumed)	(2.70) Mg/m³	Optimum Moisture Content	10 %
Moisture Content	19 %	Description	Brown GRAVEL with much sand and much clay
Material retained on			
37.5mm sieve	7 %		
20mm sieve	17 %		

	Input by	Date	Checked by	Date		
	MB	06/03/1999	[Signature]	29.3.99		
	Project				Contract No	
BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE				4452		
				Figure No		
				LT3/1		106/01

CALIFORNIA BEARING RATIO TEST

B.S. 1377: Part 4: 1990: 7.4

Sample Details			
Borehole No: BHC3	Sample No: 2	Sample Type: B	Depth: 0.60



SUMMARY

Compaction Method	2.5Kg	Rammer	Final	w%	CBR%
Preparation	7.2.4		TOP	18	0.98
Surcharge	5.0	kg	BASE	18	0.91
Soaking Time		days	AVERAGE		0.95
Swelling		mm	Description Brown SAND with much gravel some clay and some cobbles		
Initial Bulk Density	2.07	Mg/m ³			
Initial Dry Density	1.74	Mg/m ³			
Initial Moisture Content	19	%			
Material retained on 20mm sieve	26	%			

FOUNDATION & EXPLORATION SERVICES	Input by	<i>MB</i>	Date	10/03/1999	Checked by	<i>[Signature]</i>	Date	29.3.99
	Project							Contract No
	BUCKLEY WELLS, LOCOMOTIVE DEPOT, BURY, LANCASHIRE							4452
							Figure No	LT3/2

ENVIRONMENTAL ANALYSIS LTD

15 Burgess Road, Ivyhouse Lane Industrial Estate, Hastings, East Sussex. TN35 4NR
Fax: 01424 442299 Tel: 01424 444433

ANALYTICAL REPORT No. R39808

Location: Buckley Wells, Bury

CLIENT: Foundation & Exploration Services

Armstrong House, Unit 43, No. 1 Ind. Est.,
Medomsley Rd, Consett. DH8 6TW

F.A.O: P Cook

Your Order No: C27103
Your Contract No: 4452
Reporting Date: 26/03/99

Soils

TP/BH	TP8/1
Depth (m)	G.L.
Our ref	76352
Calorific Value	(cal/g)
	5449

Methods of Analysis & Performance data available on request

V4
AM

Checked by: 

C.P.V. Knight

Environmental Analysis Ltd. Registered in England no. 2369445. Reg. Office 13 Station Road London N3 2SB.
Directors: C.P.V. Knight BSc EurChem CChem FRSC, C.A. Knight, S.M.V. Knight, B.M. Perry.

ENVIRONMENTAL ANALYSIS LTD

15 Burgess Road, Ivyhouse Lane Industrial Estate, Hastings, East Sussex, TN35 4NR

Fax: 01424 442299

Tel: 01424 444433

Sample Receipt and Test Dates

CLIENT:**Foundation & Exploration Services**

Armstrong House, Unit 43, No.1 Ind. Est.,

Medomsley Rd, Consett. DH8 6TW

Your Contract No: 4452

Your Order No: C27103

Sample Receipt Date: 20/03/99

Reporting Date: 26/03/99

ANALYTICAL REPORT No. R39808

Location: Buckley Wells, Bury

Soil Samples**Determinand****Date of Test**

Calorific Value

24/03/99

Soil samples: Stones (inert flints and inorganic minerals) >2 mm are removed prior to analysis and results corrected accordingly

ENVIRONMENTAL ANALYSIS LTD

15 Burgess Road, Ivyhouse Lane Industrial Estate, Hastings, East Sussex. TN35 4NR
Fax: 01424 442299 Tel: 01424 444433

ANALYTICAL REPORT No. R39458

Location: Buckley Wells, Bury

CLIENT: Foundation & Exploration Services
Brunel House, Stephenson Road, Houndmills Estate,
Basingstoke, Hampshire. RG21 2XR

Your Order No: C27079
Your Contact No: 4452
Reporting Date: 10/03/99

Soils

TP/BH	TP10/5	TP14/3
Depth (m)	2.00	1.10
Our ref	73233	73234
Calorific Value	2038	<500
(cal/g)		

Methods of Analysis & Performance data available on request.

V4
SKT

Checked by: 

C.P.V. Knight

Environmental Analysis Ltd. Registered in England no. 2369445. Reg. Office 13 Station Road London N3 2SB.
Directors: C.P.V. Knight BSc EurChem CChem FRSC, C.A. Knight, S.M.V. Knight, B.M. Perry.

ENVIRONMENTAL ANALYSIS LTD

15 Burgess Road, Ivyhouse Lane Industrial Estate, Hastings, East Sussex, TN35 4NR

Fax: 01424 442299

Tel: 01424 444433

Sample Receipt and Test Dates

CLIENT:**Foundation & Exploration Services**

Brunel House, Stephenson Road, Houndmills Estate,
Basingstoke, Hampshire. RG21 2XR

ANALYTICAL REPORT No. R39458

Location: Buckley Wells, Bury

Your Order No: C27079

Sample Receipt Date: 04/03/99

Reporting Date: 10/03/99

Soils**Determinand****Date of Test**

Calorific Value

09/03/99

Soil samples: Stones (inert flints and inorganic minerals) >2 mm are removed prior to analysis and results corrected accordingly

APPENDIX N

GAS MONITORING RESULTS

Landfill Gas Monitoring on 4th January 2006

Weather: raining Surface ground conditions: wet

Monitoring Equipment: GA2000

Ambient concentrations (% Volume) CH4: 0%, CO2: 0%, O2: 20.2%.

Barometric pressure: Start of visit 1010mb, end of visit 1024mb.

DataField CS - GA Mode Data Output

Device ID	Date/Time dd/mm/yy	CH4(%)	CO2(%)	O2(%)	PEAKCH4(%)	PEAKCO2(%)	MIN O2(%)	BARO(mb)	.PRESSURE	FLOW POD(l/h)	Dipmeter
JB578CP2	1/4/2006 12:16	0	4	17.1	0	4	17.2	1023	-0.2	0.7	3.1
JB578CP3	1/5/2006 14:24	0	0.5	20.4	0	0.5	20.3	1010	0.1	0.7	2.5
JB578BH1	1/5/2006 14:40	0	4.3	18.1	0	4.3	17.9	1010	0.07	0.9	0.8
JB578BH3	1/4/2006 12:08	0	0	20.3	0	0	20	1023	-0.12	0.5	0.9
JB578BH4	1/4/2006 12:03	0	0	19.1	0	0	19	1024	-0.16	0.3	0.8
JB578BH7	1/5/2006 14:20	0	3.8	18	0	3.8	18	1010	-0.08	0.3	4.7

RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C1A
Date of Installation	08/02/1999
Depth of Installation	10.00 m *

Date	03/03/1999	03/03/1999	03/03/1999	03/03/1999		
Time	15:10:00	15:11:00	15:12:00	15:13:00		
Instrument No and Type	GA90 (1240)					
Atmospheric Pressure (millibars)	967	967	967	967		
Depth to Sampling Point (m)	0.00					
Depth to Water (m)	0.78					
Flow Rate (m/sec)	0.03 max 0.02 ave 0.01 min (1st min)	0.01 (3rd min)				
In-situ Differential Pressure (mm H2O) millibars	-0.4					
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	
	% VOL	<0.1	<0.1	<0.1	<0.1	
Oxygen (O2)	% VOL	16.4	16.7	17.0	17.2	
Carbon Dioxide (CO2)	% VOL	5.5	4.9	4.5	4.2	
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	
Gas Sample Taken	No					
Operator	IRK					
Ambient Temp. (Deg C)	5					
Downhole Temp. (Deg C)	N/A					
Weather	Overcast, showers, cool, moderate breeze.					
Remarks	Tap closed.			Gas analyser drawing water after 270 seconds - unable to continue.		

KEY: 'LEL' = Lower Explosive Limit '*' = depth to base as installed
'-' = not measured / not recorded '**' = depth to base as measured

112/01

		Input by SJR	Date 16/03/1999	Checked by SJR	Date 16/03/1999		
 FOUNDATION & EXPLORATION SERVICES		Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
						Figure No FT2/1 pg 1	

RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C1A
Date of Installation	08/02/1999
Depth of Installation	10.00 m *

Date	03/03/1999	03/03/1999	03/03/1999	03/03/1999	03/03/1999	
Time	16:15:00	16:16:00	16:17:00	16:18:00	16:19:00	
Instrument No and Type	GA90 (1240)					
Atmospheric Pressure (millibars)	968	968	968	968	968	
Depth to Sampling Point (m)	0.00					
Depth to Water (m)	0.78					
Flow Rate (m/sec)	-					
In-situ Differential Pressure (mm H2O) millibars	-					
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	<1
	% VOL	<0.1	<0.1	<0.1	<0.1	<0.1
Oxygen (O2)	% VOL	6.0	9.8	12.8	15.5	17.1
Carbon Dioxide (CO2)	% VOL	<0.1	<0.1	0.1	0.1	0.1
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	-
Gas Sample Taken	Yes					
Operator	IRK					
Ambient Temp. (Deg C)	-					
Downhole Temp. (Deg C)	-					
Weather	Overcast, showers, cool, moderate breeze.					
Remarks	Readings taken 1hr after pruging with nitrogen.					

KEY: 'LEL' = Lower Explosive Limit
 - = not measured / not recorded
 ** = depth base as installed
 *** = depth base as measured

Input by SJR	Date 16/03/1999	Checked by SJR	16/03/1999	112/01
Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE			Contract No 4452	
			Figure No FT2/1 pg 2	



RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C1A
Date of Installation	08/02/1999
Depth of Installation	10.00 m *

Date	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	
Time	10:00:00	10:01:00	10:02:00	10:03:00	10:04:00	
Instrument No and Type	GA90 (1240)					
Atmospheric Pressure (millibars)	1005	1005	1005	1005	1005	
Depth to Sampling Point (m)	0.00					
Depth to Water (m)	1.03					
Flow Rate (m/sec)	<0.01 (1st min)					
In-situ Differential Pressure (mm H2O) millibars	-0.4					
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	
	% VOL	<0.1	<0.1	<0.1	<0.1	
Oxygen (O2)	% VOL	18.8	19.1	19.2	19.3	
Carbon Dioxide (CO2)	% VOL	1.4	1.2	0.7	0.4	
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	
Gas Sample Taken	No					
Operator	IRK					
Ambient Temp. (Deg C)	5					
Downhole Temp. (Deg C)	N/A					
Weather	Clear skies, bright, dry, cool, still.					
Remarks	Tap closed.					

KEY: 'LEL' = Lower Explosive Limit '*' = depth to base as installed
'-' = not measured / not recorded '**' = depth to base as measured

112/01

	Input by SJR	Date 16/03/1999	Checked by SJR	Date 16/03/1999		
 FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
					Figure No FT2/1 pg 3	

RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C3
Date of Installation	09/02/1999
Depth of Installation	5.00 m *

Date	03/03/1999		11/03/1999	11/03/1999		
Time	15:40:00		11:25:00	11:26:00		
Instrument No and Type	GA90 (1240)		GA90 (1240)			
Atmospheric Pressure (millibars)	968		1005	1005		
Depth to Sampling Point (m)	0.00		0.00			
Depth to Water (m)	0.73		0.87			
Flow Rate (m/sec)	-		0.02 max 0.01 ave <0.01 min (1st min)	<0.01 (3rd min)		
In-situ Differential Pressure (mm H2O) millibars	-		+0.7			
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1		
	% VOL	<0.1	<0.1	<0.1		
Oxygen (O2)	% VOL	19.5	19.3	19.3		
Carbon Dioxide (CO2)	% VOL	<0.1	1.1	1.1		
Hydrogen Sulphide (H2S)	ppm	-	-	-		
Gas Sample Taken	No		No			
Operator	IRK		IRK			
Ambient Temp. (Deg C)	5		7			
Downhole Temp. (Deg C)	N/A		N/A			
Weather	Overcast, showers, cool, moderate breeze.		Overcast, dry, cool, still.			
Remarks	Tap open. Stopcock box cover vandalised (removed).	Gas analyser drawing water after 111 seconds - unable to continue.	Tap closed.	Gas analyser drawing water after 125 seconds - unable to continue.		

KEY:

'LEL' = Lower Explosive Limit

'-' = not measured / not recorded

'*' = depth to base as installed

'***' = depth to base as measured

Input by SJR	Date 16/03/1999	Checked by SJR	Date 16/03/1999			12/01
Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452		
				Figure No FT2/2 pg 1		



RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C4
Date of Installation	11/02/1999
Depth of Installation	14.00 m *

Date	03/03/1999	03/03/1999	03/03/1999	03/03/1999	03/03/1999	
Time	14:36:00	14:37:00	14:38:00	14:39:00	14:40:00	
Instrument No and Type	GA90 (1240)					
Atmospheric Pressure (millibars)	967	967	967	967	967	
Depth to Sampling Point (m)	0.00					
Depth to Water (m)	7.64					
Flow Rate (m/sec)	1.83 max 1.53 ave 1.23 min (1st min)	1.79 max 1.65 ave 1.50 min (3rd min)	1.55 max 1.50 ave 1.45 min (5th min)	Too Windy		
In-situ Differential Pressure (mm H2O) millibars	+0.0					
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	
	% VOL	<0.1	<0.1	<0.1	<0.1	
Oxygen (O2)	% VOL	18.4	18.4	18.4	18.4	
Carbon Dioxide (CO2)	% VOL	1.1	1.1	1.2	1.2	1.3
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	
Gas Sample Taken	No					
Operator	IRK					
Ambient Temp. (Deg C)	5					
Downhole Temp. (Deg C)	8					
Weather	Overcast, showers, cool, moderate breeze.					
Remarks	Tap closed.					

KEY: 'LEL' = Lower Explosive Limit
'-' = not measured / not recorded

'*' = depth to base as installed
'**' = depth to base as measured

112/01

	Input by SJR	Date 16/03/1999	Checked by SJR	Date 16/03/1999		
 FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452	
					Figure No FT2/3 pg 1	

RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C4
Date of Installation	11/02/1999
Depth of Installation	14.00 m *

Date	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	
Time	15:10:00	15:11:00	15:12:00	15:13:00	15:14:00	
Instrument No and Type	GA90 (1240)					
Atmospheric Pressure (millibars)	1002	1002	1002	1002	1002	
Depth to Sampling Point (m)	0.00					
Depth to Water (m)	7.80					
Flow Rate (m/sec)	0.71 max 0.54 ave 0.36 min (1st min)	0.48 max 0.42 ave 0.33 min (3rd min)	0.44 max 0.39 ave 0.34 min (5th min)	0.34 max 0.33 ave 0.31 min (7th min)		
In-situ Differential Pressure (mm H2O) millibars	+0.1					
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	
	% VOL	<0.1	<0.1	<0.1	<0.1	
Oxygen (O2)	% VOL	18.8	18.8	18.7	18.7	
Carbon Dioxide (CO2)	% VOL	1.1	1.1	1.1	1.1	
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	
Gas Sample Taken	No					
Operator	IRK					
Ambient Temp. (Deg C)	9					
Downhole Temp. (Deg C)	-					
Weather	Overcast, dry, cool, still.					
Remarks	Tap closed.					

KEY:

'LEL' = Lower Explosive Limit

'-' = not measured / not recorded

'*' = depth to base as installed

'**' = depth to base as measured

Input by SJR	Date 16/03/1999	Checked by SJR	Date 16/03/1999	112/01
Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE				Contract No 4452
				Figure No FT2/3 pg 2



RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C5
Date of Installation	12/02/1999
Depth of Installation	15.00 m *

Date		03/03/1999	03/03/1999	03/03/1999	03/03/1999	03/03/1999	
Time		13:35:00	13:36:00	13:37:00	13:38:00	13:39:00	
Instrument No and Type		GA90 (1240)					
Atmospheric Pressure (millibars)		967	967	967	967	967	
Depth to Sampling Point (m)		0.00					
Depth to Water (m)		7.65					
Flow Rate (m/sec)		2.32 max 2.29 ave 2.26 min (1st min)	2.66 max 2.44 ave 2.21 min (3rd min)	2.98 max 2.85 ave 2.71 min (5th min)	Too Windy		
In-situ Differential Pressure (mm H2O) millibars							
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	<1	
	% VOL	<0.1	<0.1	<0.1	<0.1	<0.1	
Oxygen (O2)	% VOL	19.4	19.4	19.4	19.4	19.4	
Carbon Dioxide (CO2)	% VOL	0.4	0.4	0.4	0.4	0.4	
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	-	
Gas Sample Taken		No					
Operator		IRK					
Ambient Temp. (Deg C)		6					
Downhole Temp. (Deg C)		7					
Weather		Overcast, showers, cool, moderate breeze.					
Remarks		Tap open.					

KEY: 'LEL' = Lower Explosive Limit
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'*' = depth to base as installed
'***' = depth to base as measured

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		Input by SJR	Date 16/03/1999	Checked by SJR	Date 16/03/1999		
 FOUNDATION & EXPLORATION SERVICES	Project BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE					Contract No 4452	
						Figure No FT2/4 pg 1	

RESULTS OF IN-SITU TESTS ON SAMPLES OF GAS WITHDRAWN FROM GAS MONITORING STANDPIPES

Hole Number	BH C5
Date of Installation	12/02/1999
Depth of Installation	15.00 m *

Date	11/03/1999	11/03/1999	11/03/1999	11/03/1999	11/03/1999	
Time	13:00:00	13:01:00	13:02:00	13:03:00	13:04:00	
Instrument No and Type	GA90 (1240)					
Atmospheric Pressure (millibars)	1003	1003	1003	1003	1003	
Depth to Sampling Point (m)	0.00					
Depth to Water (m)	7.85					
Flow Rate (m/sec)	0.87 max 0.67 ave 0.47 min (1st min)	0.47 max 0.44 ave 0.41 min (3rd min)	0.50 max 0.50 ave 0.51 min (5th min)	0.42 max 0.33 ave 0.24 min (7th min)		
In-situ Differential Pressure (mm H2O) millibars	+ 0.0					
Flammable Gas as methane (CH4)	% LEL	<1	<1	<1	<1	
	% VOL	<0.1	<0.1	<0.1	<0.1	
Oxygen (O2)	% VOL	19.0	19.0	19.0	19.0	
Carbon Dioxide (CO2)	% VOL	0.5	0.5	0.5	0.5	
Hydrogen Sulphide (H2S)	ppm	-	-	-	-	
Gas Sample Taken	No					
Operator	IRK					
Ambient Temp. (Deg C)	9					
Downhole Temp. (Deg C)	-					
Weather	Overcast, dry, cool, still.					
Remarks	Tap closed.					

KEY: 'LEL' = Lower Explosive Limit
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'**' = depth to base as measured

 FOUNDATION & EXPLORATION SERVICES	Input by	Date	Checked by	Date	112/01	
	SJR	16/03/1999	SJR	16/03/1999		
	Project				Contract No	
BUCKLEY WELLS LOCOMOTIVE DEPOT, BURY, LANCASHIRE				4452		
				Figure No		FT2/4 pg 2