



SITE INVESTIGATION AND LABORATORY SERVICES

Site CROXLEY RAIL LINK, STAGE 1

Contract No TB7219



Client Soil Engineering Ltd

Engineer -

Sample Identification				Lab Sample ID	Non Engineering Description	Moisture Content %
Exploratory Hole	Depth m	Sample Ref	Sample Type			
BH102	1.50	005	D	309988	Orange brown slightly sandy gravelly CLAY. Gravel is fine to coarse.	17
BH102	2.50	009	D	309991	Off white CHALK with much fine to coarse gravel.	13
BH102	3.50-4.00	015	B	309992	Brown mottled off white slightly sandy gravelly CLAY with much pockets of putty chalk. Gravel is fine to coarse.	11
BH102	4.00	016	D	309993	Off white putty CHALK with occasional fine to medium gravel.	20
BH102	4.70	018	D	309994	Off white putty CHALK with occasional fine gravel.	26
BH102	6.50	021	D	309995	Off white putty CHALK with occasional fine to medium gravel.	27
BH102	7.50	023	D	309996	Off white putty CHALK with occasional fine gravel.	28
BH102	9.50	027	D	309997	Off white putty CHALK with occasional fine gravel.	27
BH103	0.50-0.80	3	B	312246	Dark brown slightly gravelly slightly sandy CLAY with occasional rootlets. Gravel is fine to coarse.	23
BH103	1.30	5	D	311870	Light brown sandy clayey GRAVEL. Gravel is fine to coarse.	13
BH103	3.30	10	D	311873	Dark yellowish brown clayey very sandy GRAVEL. Gravel is fine to coarse.	12
BH103	4.00-4.45	13	D	311875	Pale brown slightly clayey gravelly putty CHALK. Gravel is fine to coarse.	15
BH103	6.00-6.45	21	D	311879	Pale yellow gravelly putty CHALK. Gravel is fine to coarse.	28
BH104	0.40	002	B	310289	Reddish brown slightly clayey slightly silty very sandy GRAVEL. Gravel is fine to coarse.	20

Notes

Originator	Checked & Approved	MOISTURE CONTENT BS1377:Part 2:1990 Clause 3.2	
LA	LA. 02/05/2014		

				Site CROXLEY RAIL LINK, STAGE 1		Contract No TB7219		
				Client Soil Engineering Ltd				
				Engineer -				
Sample Identification				Lab Sample ID	Non Engineering Description	Moisture Content %		
Exploratory Hole	Depth m	Sample Ref	Sample Type					
RO101	0.70	3	B	312273	Brown slightly gravelly slightly sandy SILT/CLAY. Gravel is fine to coarse.	20		
RO101	1.50-1.95	5	D	312274	Brown slightly sandy gravelly CLAY. Gravel is fine to medium.	6.4		
RO101	2.80	6	D	312275	Brown sandy clayey GRAVEL. Gravel is fine to coarse	9.5		
RO102	0.40-0.80	2	B	311943	Very dark grey slightly gravelly CLAY with much organic matter.	34		
RO102	0.80-1.20	3	B	311944	Very dark grey slightly sandy gravelly CLAY with much organic matter.	15		
RO102	2.50-2.95	6	B	311945	Brown slightly clayey slightly silty very sandy GRAVEL. Gravel is fine to coarse.	6.5		
RO102	5.00-5.50	10	B	311947	Brown slightly clayey slightly silty very sandy GRAVEL. Gravel is fine to coarse.	6.4		
RO103	3.00-3.30	8	B	311955	Dark reddish brown slightly silty sandy GRAVEL. Gravel is fine to coarse.	5.7		
RO103A	0.50-0.80	2	B	311956	Dark brown very sandy GRAVEL. Gravel is fine to coarse with much construction debris.	18		
RO103A	1.00	3	D	312276	Dark brown gravelly silty SAND. Gravel is fine to coarse.	20		
RO103A	3.00-3.20	8	B	311958	Reddish brown slightly silty sandy GRAVEL. Gravel is fine to coarse.	4.9		
RP102	1.80	6	D	311962	Brown slightly sandy gravelly CLAY. Gravel is fine to coarse.	12		
RP102	2.30	7	D	311963	Orange brown mottled grey slightly gravelly slightly sandy CLAY with some rootlets. Gravel is fine to coarse.	24		
RP106	1.50	1	D	312277	Light brown slightly gravelly sandy SILT/CLAY. Gravel is fine to coarse.	31		
Notes								
Originator		Checked & Approved		MOISTURE CONTENT BS1377:Part 2:1990 Clause 3.2				
LA		L.A. 02/05/2014						



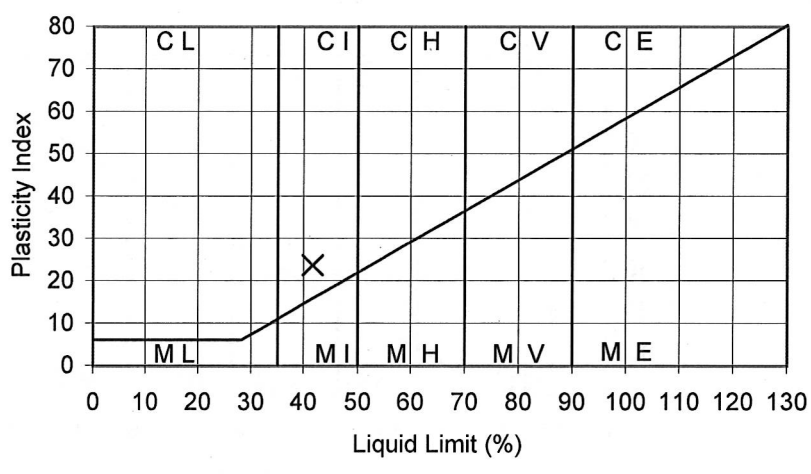
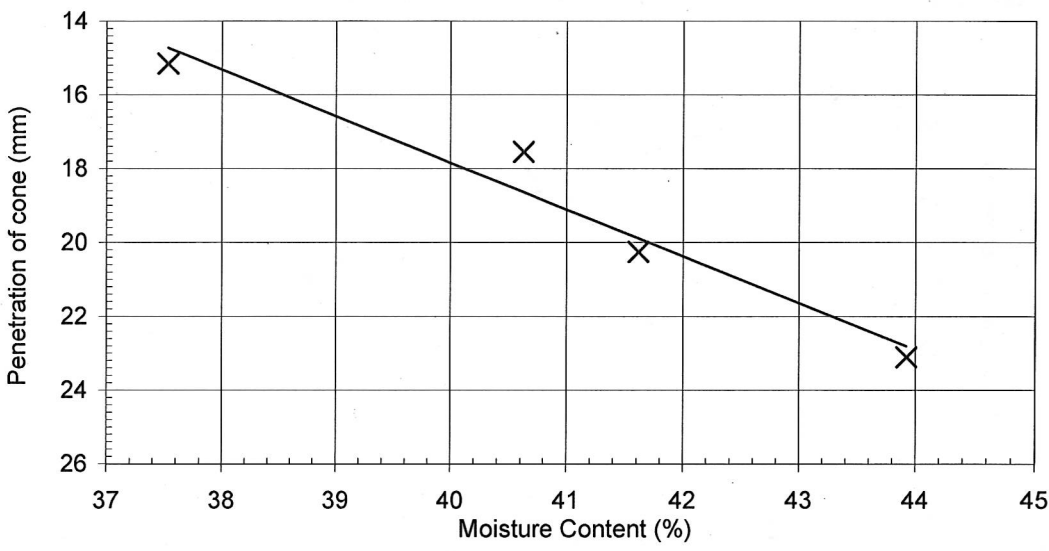
SITE INVESTIGATION AND LABORATORY SERVICES

Site	CROXLEY RAIL LINK, STAGE 1
Client	Soil Engineering Ltd.
Engineer	

Contract No. TB7219	
Hole ID	BH102
Sample Ref	005
Depth (m)	1.50
Sample Type	D

Non Engineering Description : Orange brown slightly sandy gravelly CLAY. Gravel is fine to coarse.

Preparation : Sample washed and air dried




Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	17 %
Percentage retained on 425µm sieve :	43 %
Liquid Limit :	42 %
Plastic Limit :	18 %
Plasticity Index :	24
Equivalent moisture content of material passing 425µm sieve :	30 %
Liquidity Index :	0.50

Originator	Checked & Approved
SS	<i>L.A.</i> 10/12/2013

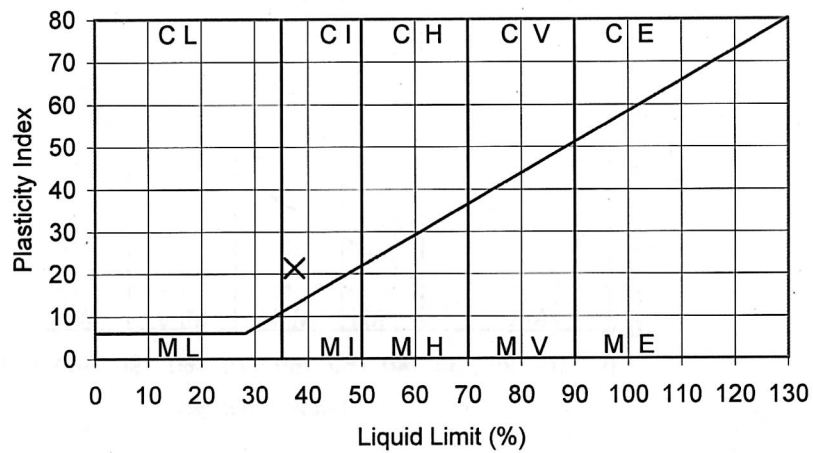
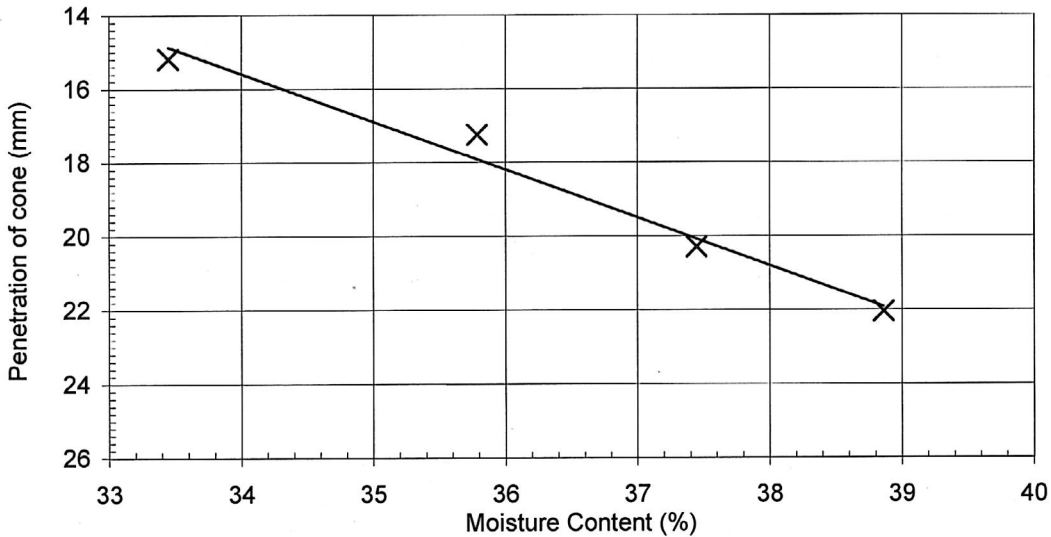
**Liquid Limit (Four Point Cone Penetrometer Method)
 Plastic Limit, Plasticity Index & Liquidity Index**
 BS 1377:Part 2:Clause 4.3:1990
 BS 1377:Part 2:Clause 5:1990



 SITE INVESTIGATION AND LABORATORY SERVICES	Site	CROXLEY RAIL LINK, STAGE 1	Contract No.	TB7219
	Client	Soil Engineering	Hole ID	RO101
	Engineer		Sample Ref	6
			Depth (m)	2.80
			Sample Type	D


Non Engineering Description : Brown sandy clayey GRAVEL. Gravel is fine to coarse

Preparation : Sample washed and air dried



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	9.5 %
Percentage retained on 425µm sieve :	73 %
Liquid Limit :	37 %
Plastic Limit :	16 %
Plasticity Index :	21
Equivalent moisture content of material passing 425µm sieve :	36 %
Liquidity Index :	0.95

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	
RC	L.A. 25/04/2014		



SITE INVESTIGATION AND LABORATORY SERVICES

Site CROXLEY RAIL LINK, STAGE 1

Client Soil Engineering Ltd.

Engineer

Contract No TB7219

Hole BH102

Sample Ref 003

Depth (m) 0.60-1.00

Sample Type B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	91
20.0 mm	85
14.0 mm	81
10.0 mm	75
6.30 mm	69
5.00 mm	67
3.35 mm	63
2.00 mm	60
1.18 mm	58
600 µm	56
425 µm	55
300 µm	54
212 µm	54
150 µm	53
63 µm	52
20 µm	31
6 µm	15
2 µm	9

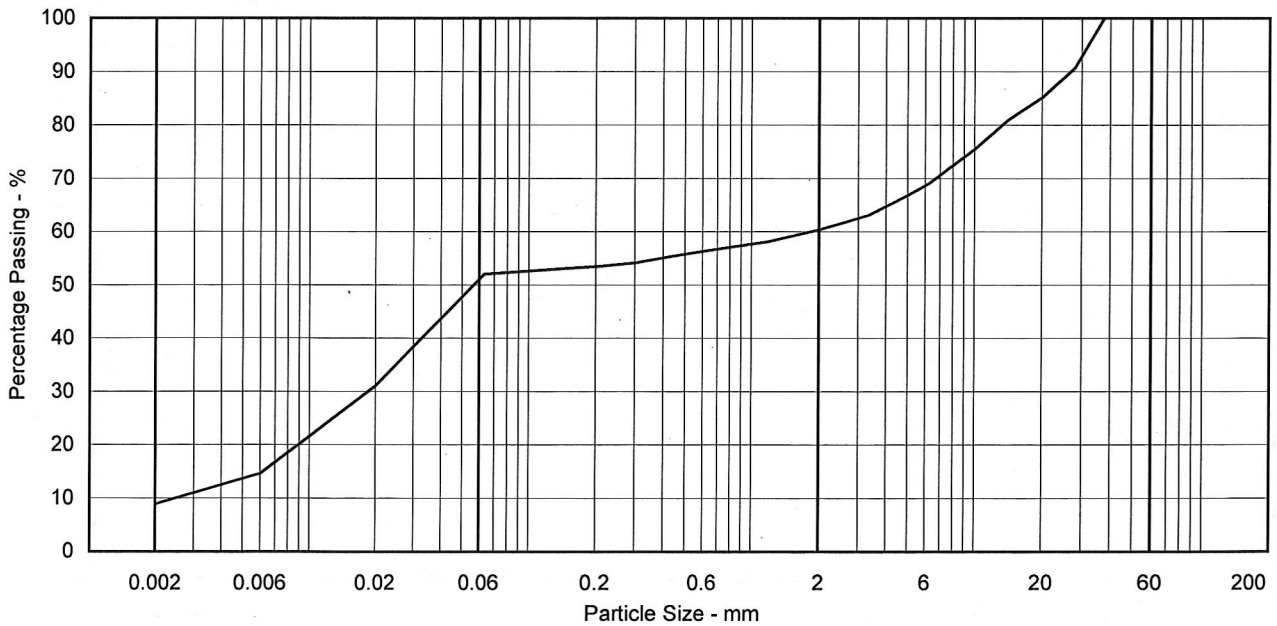
Non Engineering Description
Brown slightly sandy gravelly SILT/CLAY. Gravel is fine to coarse.

Sample Proportions - %	
Cobbles	0.0
Gravel	39.6
Sand	9.8
Silt	41.7
Clay	8.9

Particle Diameter - mm	
D100	38
D60	1.8
D10	0.0025
Uniformity Coefficient	720.0

Notes
Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator

Checked & Approved

JH

L.A.
10/12/2013

PARTICLE SIZE DISTRIBUTION
BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette





SITE INVESTIGATION AND LABORATORY SERVICES

Site CROXLEY RAIL LINK, STAGE 1

Contract No **TB7219**

Client Soil Engineering Ltd.

Hole BH102
 Sample Ref 011
 Depth (m) 2.50-3.00
 Sample Type B

Engineer

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	98
28.0 mm	87
20.0 mm	83
14.0 mm	79
10.0 mm	76
6.30 mm	72
5.00 mm	70
3.35 mm	67
2.00 mm	64
1.18 mm	61
600 µm	59
425 µm	58
300 µm	57
212 µm	56
150 µm	55
63 µm	53
20 µm	47
6 µm	37
2 µm	25

Non Engineering Description

Off white mottled brown slightly clayey slightly sandy gravelly CHALK. Gravel is fine to coarse.

Sample Proportions - %

Cobbles	0.0
Gravel	36.5
Sand	10.6
Silt	28.1
Clay	24.8

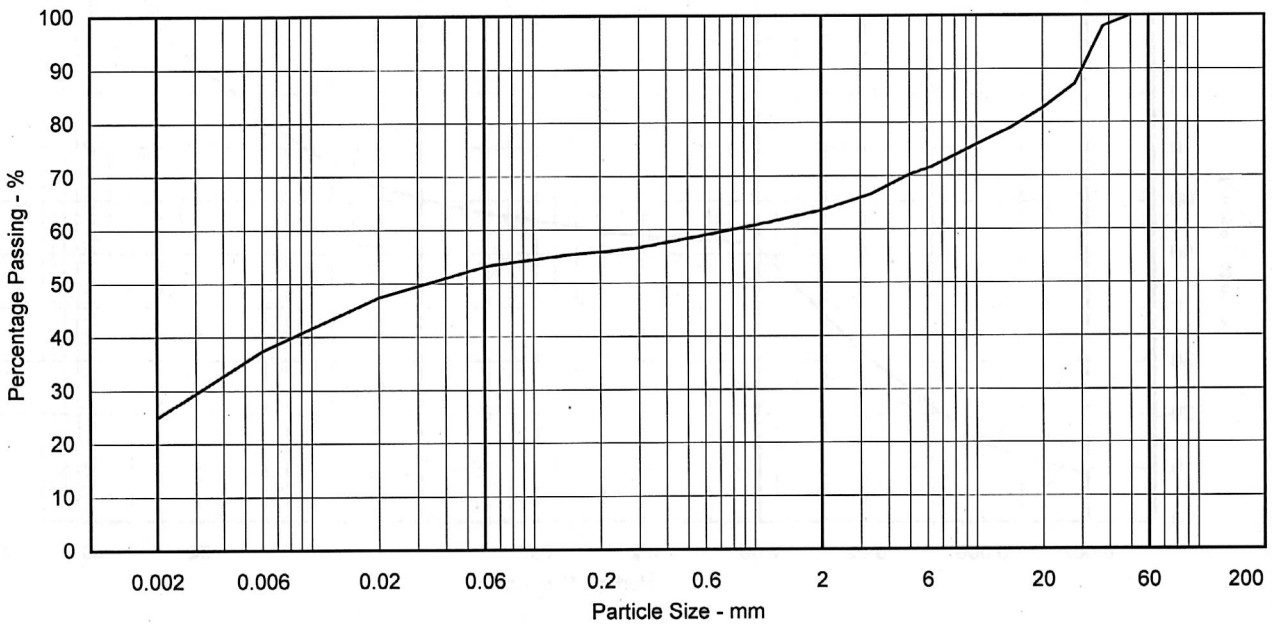
Particle Diameter - mm

D100	50
D60	0.81
D10	
Uniformity Coefficient	N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved
JH	L.A. 10/12/2013

PARTICLE SIZE DISTRIBUTION
 BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
 BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette





SITE INVESTIGATION AND LABORATORY SERVICES

Site	CROXLEY RAIL LINK, STAGE 1
Client	Soil Engineering Ltd.
Engineer	

Contract No	TB7219
Hole	BH102
Sample Ref	015
Depth (m)	3.50-4.00
Sample Type	B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	97
28.0 mm	93
20.0 mm	85
14.0 mm	80
10.0 mm	70
6.30 mm	60
5.00 mm	57
3.35 mm	52
2.00 mm	49
1.18 mm	46
600 µm	44
425 µm	41
300 µm	38
212 µm	36
150 µm	35
63 µm	32
20 µm	27
6 µm	20
2 µm	14

Non Engineering Description

Brown mottled off white slightly sandy gravelly CLAY with much pockets of putty chalk. Gravel is fine to coarse.

Sample Proportions - %

Cobbles	0.0
Gravel	51.4
Sand	17.0
Silt	18.0
Clay	13.6

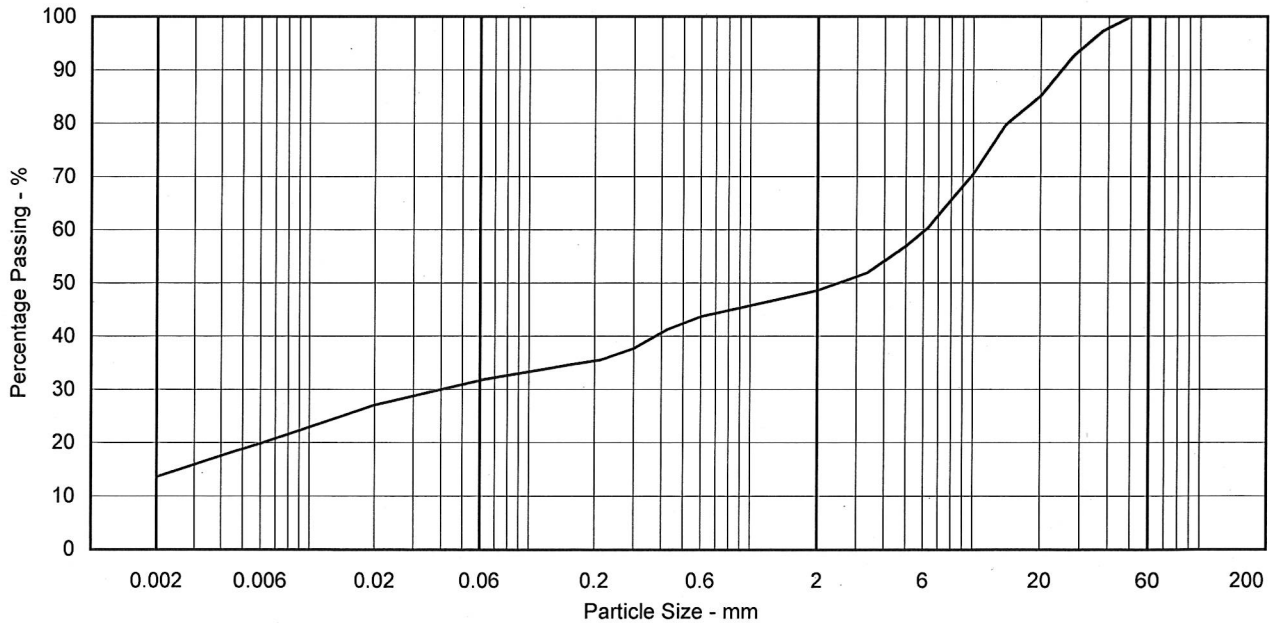
Particle Diameter - mm

D100	50
D60	6.1
D10	
Uniformity Coefficient	N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved
JH	<i>L.A.</i> 10/12/2013

PARTICLE SIZE DISTRIBUTION
 BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
 BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Sheet 1 of 1



Site CROXLEY RAIL LINK, STAGE 1

Contract No **TB7219**

Client Soil Engineering

Hole RO101

Sample Ref 3

Depth (m) 0.70

Engineer

Sample Type B

Particle Size	% Passing
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	100
20.0 mm	96
14.0 mm	95
10.0 mm	95
6.30 mm	93
5.00 mm	93
3.35 mm	92
2.00 mm	91
1.18 mm	90
600 µm	88
425 µm	87
300 µm	85
212 µm	84
150 µm	83
63 µm	79
20 µm	43
6 µm	22
2 µm	15

Non Engineering Description

Brown slightly gravelly slightly sandy SILT/CLAY. Gravel is fine to coarse.

Sample Proportions - %

Cobbles	0.0
Gravel	8.8
Sand	14.8
Silt	61.0
Clay	15.4

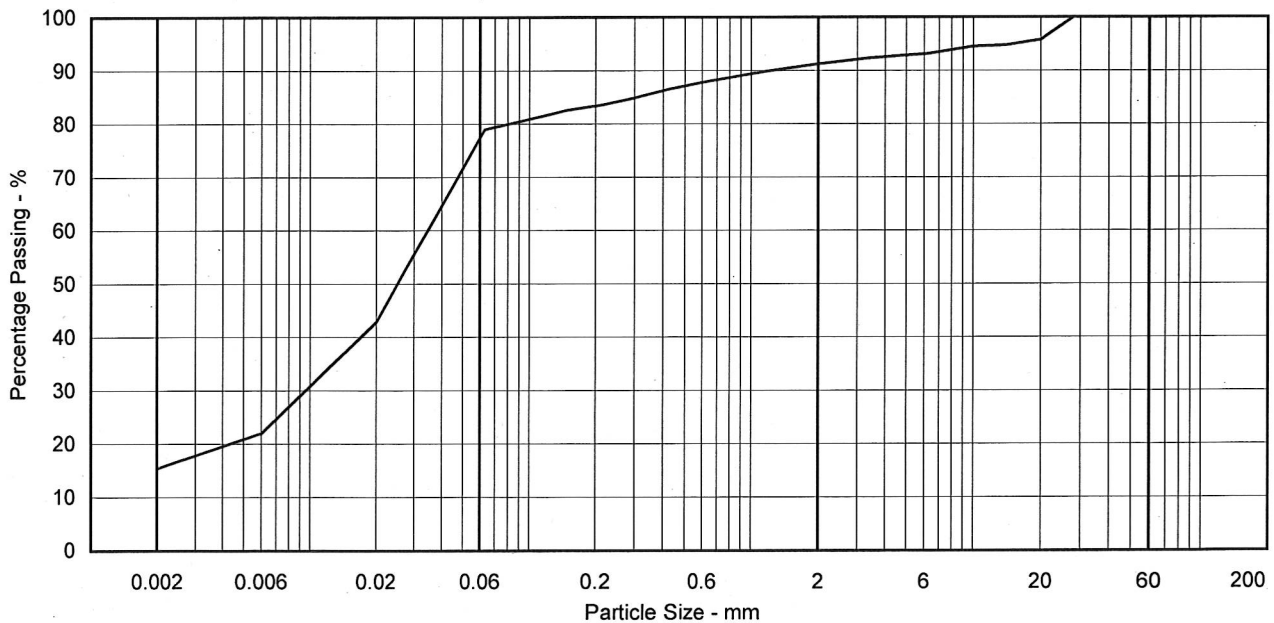
Particle Diameter - mm

D100	28
D60	0.034
D10	
Uniformity Coefficient	N/A

Notes

Sedimentation sample not pre-treated

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles
	Silt			Sand			Gravel			



Originator	Checked & Approved
RC	<i>L.A.</i> 25/04/2014

PARTICLE SIZE DISTRIBUTION
BS1377:Part 2:1990 Clause 9.2 - Wet Sieving
BS1377:Part 2:1990 Clause 9.4 - Sedimentation by Pipette

Project Name Croxley Rail Link, Stage 1						Summary Of Laboratory Rock Strength Tests											
Project No. TB7219																	
Engineer Ove Arup & Partners																	
Employer Taylor Woodrow Construction																	
Hole ID	Sample depth m	Sample no.	Sample type	Specimen depth m	Specimen no.	Water Content	Bulk Density	Dry Density	Particle density	Point load			UCS	Brazil	Porosity	Elastic Modulus	Poissons Ratio
						%	kg/m ³	kg/m ³	Mg/m ³	Type	I _s	I _{s,50}					
BH102	42.550	54	C	42.550	02					A	0.61	0.73					
BH102	44.000	55	CD	44.000	01					/	0.51	0.35					
BH102	44.000	55	CD	44.000	02	22.9				/	0.50	0.34					
BH103	10.500	32	CD	10.500	01	27.8				/	0.07	0.05					
BH103	11.000	33	C	11.000	01					D	0.13	0.18					
BH103	11.000	33	C	11.000	02					A	0.26	0.34					
BH103	11.000	33	C	11.000	03	29.7											
BH103	18.900	36	CD	18.900	01					A	0.04	0.06					
BH103	18.900	36	CD	18.900	02	25.0				D+X	0.01	0.01					
BH103	20.800	39	C	20.800	01					D	0.24	0.31					
BH103	20.800	39	C	20.800	02					A	0.32	0.42					
BH103	22.300	40	C	22.300	01	26.7											
BH103	23.800	41	CD	23.800	01	22.7											
BH103	26.400	42	CD	26.400	01					/	0.20	0.20					
BH103	26.400	42	CD	26.400	02	29.2				I+X	0.01	0.01					
BH103	28.440	44	C	28.440	01					D	0.13	0.18					
BH103	28.440	44	C	28.440	02					A+X	0.27	0.37					
BH103	29.940	45	C	29.940	01					D+X	0.03	0.04					
BH103	29.940	45	C	29.940	02					A	0.16	0.19					
BH103	29.940	45	C	29.940	03	30.8											

Approved by:
Stuart Kirk

Leeds Laboratory

Print date 24/04/2014



Revision No. 2.03

Issue Date 20/11/2012

Part of the Bachy Soletanche Group


Part of the Bachy Soletanche Group

Project Name	Croxley Rail Link, Stage 1	Summary Of Laboratory Rock Strength Tests
Project No.	TB7219	
Engineer	Ove Arup & Partners	
Employer	Taylor Woodrow Construction	

Hole ID	Sample depth m	Sample no.	Sample type	Specimen depth m	Specimen no.	Water Content	Bulk Density	Dry Density	Particle density	Point load			UCS	Brazil	Porosity	Elastic Modulus	Poissons Ratio
										Type	I _s	I _{s,50}					
BH102	15.100	34	CD	15.100	01					/	2.10	1.75					
BH102	15.100	34	CD	15.100	02	17.2				/	2.11	1.74					
BH102	19.230	37	C	19.230	01					A+X	0.09	0.12					
BH102	19.230	37	C	19.230	02					A	0.24	0.28					
BH102	20.900	38	C	20.900	01					D	0.23	0.29					
BH102	20.900	38	C	20.900	02					A	0.26	0.35					
BH102	22.500	39	CD	22.500	01					/	0.25	0.20					
BH102	22.500	39	CD	22.500	02	28.3				/	0.25	0.20					
BH102	25.400	41	CD	25.400	02					/	0.03	0.03					
BH102	26.450	42	C	26.450	01					D	0.11	0.15					
BH102	26.450	42	C	26.450	02					A	0.11	0.13					
BH102	32.300	46	CD	32.300	01					/	1.30	1.25					
BH102	32.300	46	CD	32.200	02	7.7				/	1.30	1.24					
BH102	37.000	49	CD	37.000	01					/	0.61	0.65					
BH102	37.000	49	CD	37.000	02	19.6				/	0.60	0.64					
BH102	40.600	52	CD	40.600	01					/	0.03	0.03					
BH102	40.600	52	CD	40.600	02	23.2				/	0.03	0.03					
BH102	41.400	53	C	41.400	01					D	0.05	0.07					
BH102	41.400	53	C	41.400	02					A	0.08	0.10					
BH102	42.550	54	C	42.550	01					D	0.41	0.55					


Project Name	Croxley Rail Link, Stage 1	Point Load Index Result
Project No.	TB7219	
Engineer	Ove Arup & Partners	
Client	Taylor Woodrow Construction	
		Test method: ISRM 1985 : Suggested Method

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m ²	F	Is(50) MN/m ²
BH102	32.30	CD	46	32.30	2	Off white CHALK	I	43.11	40.10	36.70	2.615	44.88	1.30	0.95	1.24
BH102	37.00	CD	49	37.00	1	Off white CHALK	I	58.39	51.10	45.50	2.050	58.16	0.61	1.07	0.65
BH102	37.00	CD	49	37.00	2	Off white CHALK	I	58.40	50.97	45.10	2.000	57.91	0.60	1.07	0.64
BH102	40.60	CD	52	40.60	1	Off white CHALK	I	83.01	25.10	15.59	0.050	40.59	0.03	0.91	0.03
BH102	40.60	CD	52	40.60	2	Off white CHALK	I	83.05	26.10	15.41	0.045	40.37	0.03	0.91	0.03
BH102	41.40	C	53	41.40	1	Off white CHALK	D	103.97	101.03	92.56	0.500	96.70	0.05	1.35	0.07
BH102	41.40	C	53	41.40	2	Off white CHALK	A	104.06	57.00	47.26	0.500	79.13	0.08	1.23	0.10
BH102	42.55	C	54	42.55	1	Off white CHALK	D	106.06	104.36	93.33	3.950	98.69	0.41	1.36	0.55
BH102	42.55	C	54	42.55	2	Off white CHALK	A	105.52	64.74	41.45	3.375	74.63	0.61	1.20	0.73
BH102	44.00	CD	55	44.00	1	Off white CHALK	I	31.77	25.06	12.17	0.250	22.19	0.51	0.69	0.35
BH102	44.00	CD	55	44.00	2	Off white CHALK	I	31.70	25.10	12.00	0.240	22.01	0.50	0.69	0.34
BH103	10.50	CD	32	10.50	1	Off white CHALK	I	27.59	21.48	21.10	0.050	27.23	0.07	0.76	0.05

Approved by:	Tested on site	 SOIL ENGINEERING
Stuart Kirk	Print date 24/04/2014	
Revision No. 2.03	Issue Date 01/10/2012	Part of the Bachy Soletanche Group


Project Name	Croxley Rail Link, Stage 1	Point Load Index Result
Project No.	TB7219	
Engineer	Ove Arup & Partners	
Client	Taylor Woodrow Construction	
		Test method: ISRM 1985 : Suggested Method

Hole ID	Sample depth m	Sample type	Sample no.	Specimen depth m	Specimen ref.	Description	Test Result								
							Type	W mm	D mm	D' mm	P kN	De mm	Is MN/m ²	F	Is(50) MN/m ²
BH102	15.10	CD	34	15.10	1	Off white CHALK	I	35.45	29.39	24.84	2.350	33.48	2.10	0.83	1.75
BH102	15.10	CD	34	15.10	2	Off white CHALK	I	35.40	28.35	23.40	2.225	32.48	2.11	0.82	1.74
BH102	19.23	C	37	19.23	1	Off white CHALK	A+X	101.30	94.75	82.65	0.925	103.25	0.09	1.39	0.12
BH102	19.23	C	37	19.23	2	Off white CHALK	A	101.34	55.08	44.49	1.350	75.77	0.24	1.21	0.28
BH102	20.90	C	38	20.90	1	Off white CHALK	D	105.22	97.02	78.87	1.750	87.48	0.23	1.29	0.29
BH102	20.90	C	38	20.90	2	Off white CHALK	A	103.86	87.29	72.31	2.500	97.79	0.26	1.35	0.35
BH102	22.50	CD	39	22.50	1	Off white CHALK	I	38.00	35.10	21.79	0.260	32.47	0.25	0.82	0.20
BH102	22.50	CD	39	22.50	2	Off white CHALK	I	37.52	32.20	20.60	0.245	31.37	0.25	0.81	0.20
BH102	25.40	CD	41	25.40	2	Off white CHALK	I	72.78	48.36	41.29	0.100	61.86	0.03	1.10	0.03
BH102	26.45	C	42	26.45	1	Off white CHALK	D	101.82	97.76	89.41	1.000	93.49	0.11	1.33	0.15
BH102	26.45	C	42	26.45	2	Off white CHALK	A	98.27	54.03	44.20	0.600	74.37	0.11	1.20	0.13
BH102	32.30	CD	46	32.30	1	Off white CHALK	I	44.81	40.16	36.89	2.745	45.88	1.30	0.96	1.25


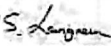
Approved by:	Tested on site	
Stuart Kirk	Print date 24/04/2014	
Revision No. 2.03	Issue Date 01/10/2012	Part of the Bachy Soletanche Group

Project Name	Croxley Rail Link, Stage 1	Saturated Moisture Content Of Chalk
Project No.	TB7219	
Engineer	Ove Arup & Partners	
Employer	Taylor Woodrow Construction	
		BS1377: Part 2: 1990: 3.3

Hole ID	Sample depth m	Sample no.	Sample type	Specimen depth m	Specimen no.	Description	Moisture Content	Saturation Moisture Content	Bulk Density	Dry Density
							%	%	Mg/m ³	Mg/m ³
BH102	19.23	37	C	19.23	03	Off white CHALK	27	27	1.97	1.55
BH102	25.40	41	CD	25.40	01	Off white CHALK	25	26	1.99	1.58
BH102	29.35	44	C	29.35	01	Off white CHALK	27	28	1.95	1.53
BH103	16.05	34	CD	16.05	01	Off white CHALK	25	25	2.01	1.61
BH103	39.90	52	CD	39.90	03	Off white CHALK	23	23	2.04	1.65
BH104	12.80	37	CD	12.80	01	Off white CHALK	27	27	1.97	1.56
BH104	20.80	43	CD	20.80	01	Off white CHALK	26	27	1.96	1.55
BH104	24.95	47	CD	24.95	01	Off white CHALK	30	30	1.93	1.48
BH104	33.50	52	CD	33.50	01	Off white CHALK	6.0	6.2	2.45	2.31
BH105	15.50	40	U	15.50	01	Yellowish off white clayey CHALK with flint.	19	20	2.08	1.75
BH105	22.50	60	U	22.50	01	Yellow CHALK FINES.	25	25	2.00	1.60
BH105	24.50	66	U	24.50	01	Off white clayey CHALK.	25	26	2.00	1.60
BH108	21.75	48	C	21.75	01	Off white CHALK	32	32	1.91	1.45
BH108	32.60	55	C	32.60	01	Off white CHALK	20	20	2.09	1.74
BH110	11.35	22	CD	11.25	01	Off white CHALK.	27	28	1.97	1.55
BH110	12.90	23	CD	12.90	01	Off white putty CHALK.	21	22	2.05	1.69

Approved by:	Leeds Laboratory	 SOIL ENGINEERING
Stuart Kirk	Print date 24/04/2014	
Revision No.	2.03	Issue Date 20/11/2012
		Part of the Bachy Soletanche Group

1140 - BRE Suite Soil - C4786-2 01.xls
 Version 011 - 26/07/2012
 Lab Project No C4786-2 : 11/12/2013 16:58:31
 Moor Lane, Witton, Birmingham, B6 7HG

 SITE INVESTIGATION AND LABORATORY SERVICES				Site CROXLEY RAIL LINK, STAGE 1											
				Client Soil Engineering Ltd											
				Engineer											
Sample Identification				Lab Sample ID	Sulphate (water soluble in 2:1 extract) as SO4 g/l	pH	Chloride (water soluble in 1:1 extract) g/l	Nitrate (water soluble in 2:1 extract) g/l							
Hole	Depth m	Sample Ref	Sample Type												
BH102	2.00	007	D	309989	<0.01	7.8	<0.1	<0.002							
BH102	3.50-4.00	015	B	309992	<0.01	8.5	<0.1	<0.002							
BH102	6.50	021	D	309995	<0.01	8.5	<0.1	<0.002							
BH102	12.00	032	D	309998	<0.01	8.5	<0.1	0.004							
BH104	1.30-1.30	007	D	310000	<0.01	8.0	<0.1	<0.002							
BH104	5.40-5.40	018	D	310005	<0.01	8.5	<0.1	0.008							
BH104	6.30-6.30	021	D	310008	<0.01	8.6	<0.1	0.004							
CP109	1.50-1.95	003	D	310010	<0.01	8.0	<0.1	0.050							
CP109	3.50-3.50	008	D	310013	<0.01	8.6	<0.1	<0.002							
CP109	9.50-9.50	022	D	310017	<0.01	8.6	<0.1	<0.002							
Limits of Detection					0.01	0.1	0.1	0.002							
Terra Tek Analysis Method					TP043	TP019	TP134	S/C							
Accreditation M=Mcerts U=UKAS N=No accreditation					M	M	M	N							
Originator	Checked & Approved		BRE SD1 SUITE - SOIL												
SPL	 11/12/2013														



SITE INVESTIGATION AND LABORATORY SERVICES

Site CROXLEY RAIL LINK, STAGE 1

Contract No TB7219


Client Soil Engineering Ltd

Engineer

Sample Identification				Lab Sample ID	Date Sampled	Temperature of cool box on receipt °C	Description
Exploratory Hole	Depth m	Sample Ref	Sample Type				
BH102	2.00	007	D	309989	Deviating	11	Brown CLAY with some gravel. Gravel is fine to medium.
BH102	3.50-4.00	015	B	309992	Deviating	11	Brown CLAY with some gravel. Gravel is fine to medium.
BH102	6.50	021	D	309995	Deviating	11	White clayey CHALK.
BH102	12.00	032	D	309998	Deviating	11	White clayey CHALK.
BH104	1.30-1.30	007	D	310000	Deviating	11	Grey CLAY with occasional gravel. Gravel is fine.
BH104	5.40-5.40	018	D	310005	Deviating	11	Brown fine to coarse GRAVEL with occasional sand.
BH104	6.30-6.30	021	D	310008	Deviating	11	White clayey CHALK with some gravel. Gravel is fine to medium.
CP109	1.50-1.95	003	D	310010	Deviating	11	Brown SAND with some gravel. Gravel is fine to medium.
CP109	3.50-3.50	008	D	310013	Deviating	11	White clayey CHALK.
CP109	9.50-9.50	022	D	310017	Deviating	11	White CHALK.
CP109	14.50-14.95	033	D	310019	Deviating	11	White clayey CHALK.

Notes Date Sampled : Where this information has not been supplied the sample is deviating
Temperature : Samples exceeding 6°C on receipt may be deviating, but will be dependent upon the suite of tests carried out.

Originator	Checked & Approved	LABORATORY DESCRIPTIONS	Appendix X
SPL	<i>S. Dayman</i> 11/12/2013		

 <small>SITE INVESTIGATION AND LABORATORY SERVICES</small>	Site	CROXLEY RAIL LINK, STAGE 1
	Client	Soil Engineering Ltd
	Engineer	

Sample Identification				Lab Sample ID	Sulphate (water soluble in 2:1 extract) as SO4 g/l	pH	Chloride (water soluble in 2:1 extract) g/l	Nitrate (water soluble in 2:1 extract) g/l	Organic Matter %	Loss on Ignition %						
Hole	Depth m	Sample Ref	Sample Type													
BH129	3.00	9	D	312257	0.04	8.2	<0.1	0.004	~	~						
BH129	9.00	23	D	312261	0.05	8.2	<0.1	<0.002	~	~						
BH129	11.80	31	D	312262	0.03	8.6	<0.1	0.004	~	~						
BH130	1.20	5	D	312263	0.03	8.1	<0.1	0.220	~	~						
BH130	3.00	9	D	312265	0.04	8.2	<0.1	0.072	~	~						
BH130	5.40	15	D	312267	0.05	8.5	<0.1	<0.002	~	~						
BH130	8.50	22	D	312268	0.01	8.3	<0.1	<0.002	~	~						
CP102	5.30	15	D	312271	0.01	8.8	<0.1	0.012	~	~						
CP102	11.50	27	D	312272	0.01	8.6	<0.1	0.010	~	~						
RO101	0.70	3	B	312273	0.03	8.0	<0.1	<0.002	~	~						
Limits of Detection Terra Tek Analysis Method Accreditation M=Mcerts U=UKAS N=No accreditation					0.01 TP043 M	0.1 TP019 M	0.1 TP134 M	0.002 S/C N	0.1 TP041 U	0.1 TP042 M						

Originator	Checked & Approved	BRE SD1 SUITE - SOIL
SPL	<i>S. Langman</i> 25/04/2014	



SITE INVESTIGATION AND LABORATORY SERVICES

Site CROXLEY RAIL LINK, STAGE 1

Contract No TB7219

Client Soil Engineering Ltd

Engineer

Sample Identification

Exploratory Hole	Depth m	Sample Ref	Sample Type	Lab Sample ID	Date Sampled	Temperature of cool box on receipt °C	Description
BH129	3.00	9	D	312257	Deviating	19	Brown CLAY with much gravel. Gravel is fine to medium.
BH129	9.00	23	D	312261	Deviating	19	Brown fine to coarse GRAVEL with some sand.
BH129	11.80	31	D	312262	Deviating	19	White CHALK.
BH130	1.20	5	D	312263	Deviating	19	Brown CLAY with much gravel. Gravel is fine to medium.
BH130	3.00	9	D	312265	Deviating	19	Brown /White CLAY with some gravel. Gravel is fine to medium.
BH130	5.40	15	D	312267	Deviating	19	Grey SAND with much gravel. Gravel is fine to medium.
BH130	8.50	22	D	312268	Deviating	19	Brown SAND with much gravel. Gravel is fine to coarse.
CP102	5.30	15	D	312271	Deviating	19	White chalky CLAY with some gravel. Gravel is fine to coarse.
CP102	11.50	27	D	312272	Deviating	19	White CHALK with some gravel. Gravel is fine to medium.
RO101	0.70	3	B	312273	Deviating	19	Brown clayey SAND with some gravel. Gravel is fine to medium.
TP163	2.00	7	D	312280	Deviating	19	Dark grey clayey PEAT with some wood. Wood is fine to medium.
TP167	0.60-0.80	8	B	312286	Deviating	19	Brown CLAY with some gravel. Gravel is fine to medium.
WS134	1.00	3	D	312306	Deviating	19	White chalky SAND with some gravel. Gravel is fine to medium.
WS134A	2.30-3.00	2	D	312307	Deviating	19	Grey clayey SAND with some gravel. Gravel is fine to coarse.
WS134A	4.55-5.00	4	D	312308	Deviating	19	Brown SAND with some gravel. Gravel is fine to medium.

Notes

Date Sampled : Where this information has not been supplied the sample is deviating
 Temperature : Samples exceeding 6°C on receipt may be deviating, but will be dependent upon the suite of tests carried out.

Originator

Checked & Approved

SPL

S. Langman
25/04/2014

LABORATORY DESCRIPTIONS



Appendix X

SAL Reference: 386505
 Project Site: Croxley Rail Link, Stage 1
 Customer Reference: TB7219

Soil Analysed as Soil
 Miscellaneous

SAL Reference		386505 001	386505 002	386505 003	386505 004	386505 005			
Customer Sample Reference		BH102 CD045 @ 30.800-30.900m	BH103 CD050 @ 36.450m	BH104 CD038 @ 14.100-14.120m	BH104 CD044 @ 21.400-21.500m	BH104 CD055 @ 38.800-38.900m			
Date Sampled		28-MAR-2014	28-MAR-2014	28-MAR-2014	28-MAR-2014	28-MAR-2014			
Determinand	Method	Test Sample	LOD	Units					
(Water soluble) Cl-	T710	A40	0.01	g/l	3.5	3.1	5.2	6.4	4.8
(Water soluble) Mg	T251	A40	1	mg/l	<1	<1	1	3	1
(Water soluble) NO3	T710	A40	0.01	g/l	3.6	0.44	9.0	8.4	15
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	0.02	0.01	0.02	0.01	0.01
pH (2.5:1 extract)	T274	A40			9.4	8.8	8.5	8.9	8.7
Retained on 2mm	T2	A40	0.1	%	14.9	<0.1	10.6	<0.1	<0.1

SAL Reference: 386505
 Project Site: Croxley Rail Link, Stage 1
 Customer Reference: TB7219

Soil Analysed as Soil
 Miscellaneous

SAL Reference		386505 006	386505 007	386505 008	386505 009				
Customer Sample Reference		BH108 CD045 @ 18.200-18.290m	BH115 CD046 @ 29.750-29.850m	BH130 CD034 @ 16.800-16.900m	BH130 CD041 @ 26.750-26.850m				
Date Sampled		28-MAR-2014	28-MAR-2014	28-MAR-2014	28-MAR-2014				
Determinand	Method	Test Sample	LOD	Units					
(Water soluble) Cl-	T710	A40	0.01	g/l	4.9	6.2	10	12	
(Water soluble) Mg	T251	A40	1	mg/l	1	2	1	2	
(Water soluble) NO3	T710	A40	0.01	g/l	4.4	5.6	4.9	8.1	
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	0.01	0.01	0.02	0.04	
pH (2.5:1 extract)	T274	A40			8.7	8.7	8.8	8.8	
Retained on 2mm	T2	A40	0.1	%	<0.1	<0.1	<0.1	<0.1	

Index to symbols used in 386505-1

Value	Description
A40	Assisted dried < 40C
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T251	2:1 Extraction/ICP/OES
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T710	2:1 Extraction / Discrete Analyser
T2	Grav
T274	Probe (BS 3882)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
(Water soluble) Cl-	T710	A40	0.01	g/l	N	001-009
(Water soluble) Mg	T251	A40	1	mg/l	N	001-009
(Water soluble) NO3	T710	A40	0.01	g/l	N	001-009
(Water Soluble) SO4 expressed as SO4	T242	A40	0.01	g/l	U	001-009
pH (2.5:1 extract)	T274	A40			U	001-009
Retained on 2mm	T2	A40	0.1	%	N	001-009