Soil Mechanics

BOREHOLE No. SA7368

Sheet 2 of 3

Equipment & Methods

As sheet 1

Location No. 8109

Location

CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100

Carried out for

Union Railways Limited

Ground Level | Coordinates | Date

As sheet 1

Water Level Observations During Boring

Date	Time	Depth of Hole (m)	Depth of Casing (m)	Depth to Water (m)	Remarks
09/06/97		4.80	3.00	DRY	End of hole

Hole Diameter by Depth Table

Depth of Hole (m)	Diameter of Hole (mm)	Diameter of Casing (mm)	Depth of Casing (m)
4.80	150	150	3.00

Water Strike Table

Depth of Strike (m)	Casing Depth (m)	Date	Time	Post Strike Depth (m)	Minutes After Strike	Sealed at (m)	Remarks
2.70	1.20	09/06/97	:	2.54	5	3.00	
2.70	1.20	09/06/97	:	2.43	10	3.00	
2.70	1.20	09/06/97	:	2.40	15	3.00	
2.70	1.20	09/06/97	:	2.38	20	3.00	

Remarks

Logged by JR

Scale 1:50

Notes:

Materials are described in accordance with Appendices. For explanation of symbols and abbreviations see Fig. 1.

07/10/97 09:54:53

Fig. 132

Soil Mechanics

BOREHOLE No. SA7368

Sheet 3 of 3

Location No. 8109

Location CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100

Carried out for Union Railways Limited

Type of installation Standpipe

Date of installation 09/06/97

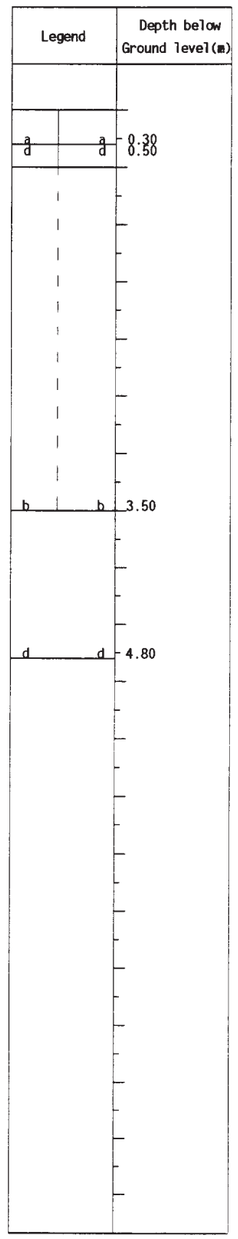
Internal diameter of tubing 50 mm

Length of filter 2.00 m

Diameter of filter 150 mm

SUMMARY OF INSTALLATION

Depth (m) From	Depth (m) To	
		Surface protection : Stopcock Cover
0.00	0.30	Concrete
0.30	0.50	Bentonite seal
0.00	0.50	Plain pipe
0.50	3.50	Sand filter
0.50	3.50	Slotted section
3.50	4.80	Bentonite seal



key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks

1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENTS

Soil Mechanics

BOREHOLE No. SA7377

Sheet 1 of 3

Equipment & Methods
Hand dug inspection pit to 1.00m. Cable tool boring. 150mm dia to 3.50m.

Location No. 8109

Location
CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100

Carried out for
Union Railways Limited

Ground Level
24.66 m AOD

Coordinates
529923.75 mE
183670.98 mN

Date
09/06/97

Description	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
Black TARMAC. (MADE GROUND)	24.66		(0.06) 0.06					
	24.60		(0.14) 0.20					
	24.46		(0.11) 0.31	0.54 - 0.61	C	1		
COBBLESTONES (200 x 140 x 100mm) set in well bonded matrix 20mm thick. (MADE GROUND)	24.35		(0.23) 0.54	0.61 - 0.90	C	2		
	24.12		(0.07) 0.61	1.00	C	3		
	24.05		(0.29) 0.90					
Grey CONCRETE <70 - 80% coarse sand or angular fine flint gravel aggregate. Unreinforced. (MADE GROUND)	23.76		(0.30) 1.20	1.20 - 1.90	B	4		
	23.46		(0.70) 1.90					
Pale grey CONCRETE <30 - 40% angular medium flint gravel aggregate, 30 - 40% fine to medium sand. 5 x 200mm steel mesh reinforcement at 0.48m. 2.80-3.00m. rare rootlets (MADE GROUND)	22.76		(0.90) 2.80	1.90 - 2.80	B	5		
	21.86		(0.70 pen) 3.50	2.85	C	7		
Black slightly clayey fine to medium ashy SAND with some fine subrounded ash gravel. (MADE GROUND - SAND)	21.16			2.80 - 3.50	C	8		
				2.80 - 3.50	B	6		
Orange fine to medium angular GRAVEL of crushed brick in a rare fine to coarse sand matrix with a little 'burnt' clay and rare subangular fine coal gravel. (MADE GROUND - GRAVEL)								
Dark grey to black CLAY with much coarse sand and subrounded to subangular fine to medium gravel of brick with rare organic streaks and rootlets. (MADE GROUND - CLAY)								
Firm greenish grey with frequent coarse sand size black speckles, extremely closely fissured very silty CLAY. (MADE GROUND - CLAY)								
Firm mottled brown and orangish brown with increasingly frequent grey mottled CLAY with rare fine to medium rounded flint gravel. (MADE GROUND - CLAY)								
Stiff mottled orangish brown and pale bluish grey extremely closely fissured CLAY. (LONDON CLAY)								
BOREHOLE ENDS AT 3.50 m.								

Remarks
1. Slotted standpipe installed on completion, see sheet 3.

Logged by JR

Scale 1:50

Notes:
Materials are described in accordance with Appendices. For explanation of symbols and abbreviations see Fig. 1.

30/09/97 16:42:33

Fig. 148

Soil Mechanics

BOREHOLE No. SA7377

Sheet 2 of 3

Equipment & Methods
As sheet 1

Location No. 8109

Location
CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100

Carried out for
Union Railways Limited

Ground Level | Coordinates | Date
As sheet 1

Water Level Observations During Boring

Date	Time	Depth of Hole (m)	Depth of Casing (m)	Depth to Water (m)	Remarks
09/06/97		3.50	1.50	DRY	End of hole

Hole Diameter by Depth Table

Depth of Hole (m)	Diameter of Hole (mm)	Diameter of Casing (mm)	Depth of Casing (m)
3.50	150	150	1.50

Remarks

Logged by JR

Scale 1:50

Notes:
Materials are described in accordance with Appendices. For explanation of symbols and abbreviations see Fig. 1.

30/09/97 16:42:36

Fig. 148

Soil Mechanics

BOREHOLE No. SA7377

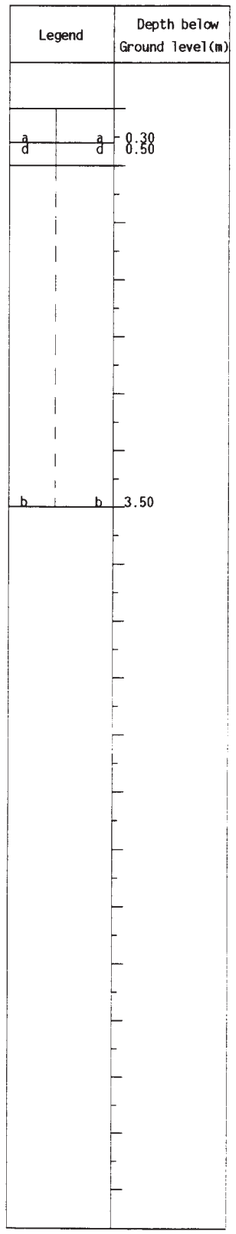
Sheet 3 of 3

Location No. 8109
Location CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100
Carried out for Union Railways Limited

Type of installation Standpipe
Date of installation 09/06/97
Internal diameter of tubing 50 mm
Length of filter 3.00 m
Diameter of filter 150 mm

SUMMARY OF INSTALLATION

Depth (m) From	Depth (m) To	
		Surface protection : Stopcock Cover
0.00	0.30	Concrete
0.30	0.50	Bentonite seal
0.00	0.50	Plain pipe
0.50	3.50	Sand filter
0.50	3.50	Slotted pipe



key

a	Concrete	d	Bentonite seal
b	Sand filter	e	Bentonite/cement grout
c	Gravel filter	f	Backfill

Remarks

1. Ground level and coordinates as sheet 1

DETAILS OF INSTRUMENTS

Soil Mechanics

TRIAL PIT No.TP7361

Sheet 1 of 1

Equipment & Methods
Machine dug using FORD 655
Pit dimensions 0.90m by 2.90m.
Support used : None
Backfill : Arisings

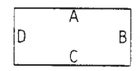
Location No. 8109
Location CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100
Carried out for Union Railways Limited

Ground Level: 24.22 m AOD
Coordinates: 529956.02 mE, 183677.20 mN
Date: 20/05/97

Description FACE	Reduced Level	Legend	Depth (Thick)	Samples/Tests: Depth	Sample Type	Sample No.	Test	Field Records
Dark grey to black coarse TARMAC. (MADE GROUND)	24.22		(0.23)					
	23.99		0.23	0.25	C	1		
			(0.14)	0.25	D	1		
Dark grey to black slightly clayey fine to coarse SAND with much fine gravel of ash clinker with a little flint and brick gravel. (MADE GROUND - SAND)	23.85		0.37					
			(0.29)	0.50	D	2		
	23.56		0.66	0.70	D	3		
	23.47		(0.09) 0.75	0.80 - 0.90	C	2		
Dark grey mottled brown slightly clayey fine to coarse SAND with much fine to medium subrounded to subangular flint, pot and brick gravel. (MADE GROUND - SAND)			(0.35)	0.90	D	4		
	23.12		1.10					
				1.20	D	5		
Orange brown slightly clayey fine SAND AND subangular to rounded fine to medium GRAVEL of flint. (MADE GROUND - SAND AND GRAVEL)			(0.50)	1.30	C	3		
	22.62		1.60					
Dense red fine to coarse SAND of fine gravel of crushed brick and burnt clay. (MADE GROUND - SAND)			(0.50 pen)	1.80 - 2.10	B	1		
				1.80 - 2.10	C	4		
Firm dark greenish grey CLAY with small black organic speckles, occasional sand laminae and rare brick and flint gravel. (MADE GROUND - CLAY)	22.12		2.10	2.10	D	6		
Firm becoming stiff brown with a little bluish grey mottling, extremely closely fissured CLAY. (WEATHERED LONDON CLAY)								
TRIAL PIT ENDS AT 2.10 m.								

Remarks
Stability : All stable
Similarity of faces : All stable
Water : None

Sketch



Logged by JR
Scale 1:25

Fig. 129

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH01

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 25.610mAOD
Coordinates: 529932.90E
183689.20N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery) PID (ppm)
MADE GROUND: Brownish grey silty fine to coarse SAND and angular fine to coarse concrete GRAVEL and COBBLES.	0.20	25.41	D1	0.00-0.10			
	0.35	25.26	ES1	0.30			
MADE GROUND: Brown silty gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse flint concrete and brick.	0.65	24.96	D2	0.65-0.75			
	0.80	24.81	B3	0.80-1.30			
MADE GROUND: Concrete slab.	1.30	24.31	ES2	1.30			
			D4	1.30-1.40	1.50	(1.30)	N=3 (1,0/1,0,1,1)
MADE GROUND: Weak concrete - blinding.	1.60	24.01	B5	1.30-1.50			
			S	1.50-1.95			
MADE GROUND: Brownish grey silty very gravelly fine to coarse SAND. Gravel is angular fine and medium with occasional coarse concrete and flint. Occasional concrete cobbles.	1.90	23.71	ES3	1.50			PP=50.0kPa
			D6	1.50-1.95			
	2.20	23.41	B7	1.50-1.90			
			ES4	1.80			
			D8	1.90-2.00			PP=50.0kPa
			ES5	2.20			10 blows
			D9	2.20-2.30			PP=50.0kPa
MADE GROUND: Reddish brown silty fine to coarse SAND and angular fine to coarse brick, concrete and flint GRAVEL.			UT10	2.50-2.95			
			D11	2.95-3.00			
	3.20	22.41					PP=105.0kPa
Firm to stiff greenish CLAY, with rare black mottling, rare decayed plant debris and roots. [POSSIBLE BURIED TOPSOIL]			S	3.50-3.95	3.00		N=10 (1,1/1,3,3,3)
			D12	3.50-3.95			
			B13	3.50-4.00			PP=110.0kPa
			ES6	3.50			
Firm to stiff greenish grey and yellowish grey CLAY. Occasional subrounded fine to coarse flint gravel. [REWORKED LONDON CLAY FORMATION]			D16	4.20-4.30			
	4.30	21.31					
			UT14	4.50-4.95			18 blows
Firm to stiff brown CLAY. Occasional crinoids fossil fragments. [LONDON CLAY FORMATION]							
			D15	4.95-5.00			PP=130.0kPa
Stiff brown locally closely fissured CLAY with rare grey mottling. [LONDON CLAY FORMATION] ... From 4.20m to 4.29m bgl light brown very weak siltstone / mudstone cobble.	5.50	20.11	S	5.50-5.95	3.00		N=15 (1,2/3,3,4,5)
			D17	5.50-5.95			PP=140.0kPa
			B18	5.50-6.00			
Stiff high strength brown with grey staining on fissures closely fissured and locally thinly laminated CLAY. Occasional decayed roots along fissure planes. [LONDON CLAY FORMATION]			UT19	6.50-6.95			36 blows
			D20	6.95-7.00			PP=220.0kPa
Very stiff high strength brown and grey closely fissured CLAY with rare coarse sand sized selenite crystals. [LONDON CLAY FORMATION]							
...From 7.50m bgl locally thinly laminated.			S	7.50-7.95	3.00		N=18 (1,3/3,4,5,6)
			D21	7.50-7.95			
			B22	7.50-8.00			
							PP=210.0kPa
... From 8.50m bgl becoming slightly greyish brown.			UT23	8.50-8.95			30 blows
			ES7	8.50			
			D24	8.95-9.00			PP=220.0kPa
			S	9.50-9.95	3.00		N=21 (2,3/4,4,6,7)
			D25	9.50-9.95			
			B26	9.50-10.00			

Borehole continued...

Installations

Water Level Observations

Hole Diameter Detail: Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details: From (m)	To (m)	Time (hours)	Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
200	1.50	1.50	0.00	0.35	0.5		No Groundwater Encountered				
150	30.00	3.00									

Dates: 29/05/2012-31/05/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks:
1. 63mm HDPE standpipe installed from GL to 10.00m bgl. Hole finished with gas tap and flush cover.
2. Water added from 0.80m to 1.50m bgl during drilling.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH01

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 25.610mAOD
Coordinates: 529932.90E
183689.20N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery) PID (ppm)
Very stiff high strength brown and grey closely fissured CLAY with rare coarse sand sized selenite crystals. [LONDON CLAY FORMATION]							PP=210.0kPa
	10.60	15.01					
Very stiff brownish grey and rare grey closely fissured CLAY. Rare pyritised wood fragments and selenite crystals. Occasional orange brown staining along fissure planes. [LONDON CLAY FORMATION]			UT27	11.00-11.45			PP=250.0kPa
							42 blows
			D28	11.45-11.50			
	12.30	13.31					
Very stiff slightly greenish grey slightly sandy CLAY. [LONDON CLAY FORMATION]			S	12.50-12.95	3.00		PP=200.0kPa
			D29	12.50-12.95			N=23 (2,3/4,5,6,8)
			B30	12.50-13.00			
			ES8	13.50			
			UT31	14.00-14.45			46 blows
	14.40	11.21					
Very stiff high strength grey closely fissured CLAY with occasional thin sandy clay bands. [LONDON CLAY FORMATION]			D32	14.45-14.50			
							PP=200.0kPa
			S	15.50-15.95	3.00		N=29 (3,5/5,7,8,9)
			D33	15.50-15.95			
			B34	15.50-16.00			
							PP=210.0kPa
			UT35	17.00-17.45			50 blows
			D36	17.45-17.50			
			S	18.50-18.95	3.00		N=29 (2.4/5,6,8,10)
			D37	18.50-18.95			PP=220.0kPa
			B38	18.50-19.00			
			ES9	18.50			

Borehole continued...

Installations

Water Level Observations

Hole Diameter Detail: Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details: From (m)	To (m)	Time (hours)	Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
200	1.50	1.50	0.00	0.35	0.5		No Groundwater Encountered				
150	30.00	3.00									

Dates: 29/05/2012-31/05/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks:
1. 63mm HDPE standpipe installed from GL to 10.00m bgl. Hole finished with gas tap and flush cover.
2. Water added from 0.80m to 1.50m bgl during drilling.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH01

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 25.610mAOD
Coordinates: 529932.90E
183689.20N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery) PID (ppm)	Installations
Very stiff high strength grey closely fissured CLAY with occasional thin sandy clay bands. [LONDON CLAY FORMATION]			UT39	20.00-20.45			PP=250.0kPa 52 blows	
			D40	20.45-20.50				
			S	21.50-21.95	3.00		N=30 (2,5/6,7,8,9)	
			D41	21.50-21.95			PP=250.0kPa	
			B42	21.50-22.00				
Moderately strong mudstone cobble. [LONDON CLAY FORMATION]	22.30	3.31						
	22.40	3.21						
Very stiff high to very high strength closely fissured CLAY. Rare thin greenish grey sand bands. [LONDON CLAY FORMATION]			UT43	23.00-23.45			PP=250.0kPa 51 blows	
			D44	23.45-23.50				
			ES10	23.50				
			S	24.50-24.95	3.00		N=38 (3,6/7,9,10,12)	
			D45	24.50-24.95			PP=250.0kPa	
			B46	24.50-25.00				
			UT47	26.00-26.45			PP=250.0kPa 56 blows	
			D48	26.45-26.50				
			S	27.50-27.95	3.00		N=37 (3,6/8,8,9,12)	
			D49	27.50-27.95				
			B50	27.50-28.00			PP=250.0kPa	
			ES11	28.50				
			UT51	29.00-29.45			51 blows	
... From 29.20m bgl greenish grey clayey sand bands.			D52	29.45-29.50	3.00		N=34 (3,4/8,8,9,9)	
... From 29.50m bgl grey CLAY.			S	29.50-29.95				
			D53	29.50-29.95				
			B54	29.50-30.00				

Borehole Complete at 30.00 m

Hole Diameter Detail Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details From (m)	To (m)	Time (hours)
200	1.50	1.50	0.00	0.35	0.5
150	30.00	3.00			

Water Level Observations

Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
	No Groundwater Encountered				

Dates: 29/05/2012-31/05/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks:
1. 63mm HDPE standpipe installed from GL to 10.00m bgl. Hole finished with gas tap and flush cover.
2. Water added from 0.80m to 1.50m bgl during drilling.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH02

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 25.990mAOD
Coordinates: 529936.20E
183658.50N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery) PID (ppm)	Installations
MADE GROUND: Brownish grey silty very gravelly fine to coarse SAND. Gravel is angular fine to coarse brick, concrete and flint. Approximately 10% cobbles and rare metal.	0.40	25.59	D1	0.00-0.10				
			B2	0.00-0.25				
			ES1	0.10				
			D3	0.25-0.30				
MADE GROUND: Grey silty fine to coarse SAND and angular fine to coarse granite GRAVEL. ... At 0.60m bgl concrete obstruction.	0.65	25.34	D4	0.60-0.70				
			B5	0.60-1.20				
			ES2	0.80				
	1.40	24.59						
MADE GROUND: Yellowish grey silty fine to coarse SAND and angular fine to coarse brick concrete flint GRAVEL. Occasional brick and concrete cobbles. ...From 0.90m bgl becoming brownish grey.	1.50	24.49						
	1.65	24.34						
	1.90	24.09	D6	1.90-2.00				
	2.10	23.89	B7	1.90-2.10				
	2.25	23.74	ES3	2.00				
			D8	2.10-2.15				
MADE GROUND: Asphalt.			B9	2.10-2.25				
			D10	2.25-2.30				
MADE GROUND: Granite cobbles.			B11	2.25-2.60				
			ES4	2.30				
MADE GROUND: Reinforced Concrete.	3.20	22.79	UT12	3.00-3.45			10 blows	
MADE GROUND: Reddish brown silty very gravelly fine to coarse SAND. Gravel is angular fine to coarse brick and flint.			D13	3.45-3.50			PP=80.0kPa	
			ES5	3.50				
Firm mottled grey and greyish brown slightly gravelly (Approximately 5%) CLAY. Gravel is subangular to subrounded fine to coarse flint. [REWORKED LONDON CLAY FORMATION]			S	4.00-4.45	3.00		N=10 (1,1/2,2,3,3)	
			D14	4.00-4.45			PP=90.0kPa	
			B15	4.00-4.50				
Stiff brown and rare grey CLAY. Occasional subangular to subrounded fine to coarse flint gravel. [REWORKED LONDON CLAY FORMATION]	5.00	20.99	UT	5.00-5.45			30 blows	
			UT100	5.00-5.45				
			D16	5.45-5.50			PP=160.0kPa	
Stiff greenish grey slightly gravelly (Approximately 5%) CLAY. Gravel is angular to rounded fine to coarse flint. [REWORKED LONDON CLAY FORMATION]			S	6.00-6.45	3.00		N=14 (1,2/2,3,4,5)	
			D17	6.00-6.45				
			B18	6.00-6.50			PP=200.0kPa	
Very stiff medium to high strength closely fissured CLAY. Rare sand size selenite crystals. [LONDON CLAY FORMATION]			UT19	7.00-7.45			21 blows	
... From 5.20m to 5.30mbgl light brown SILT.			D20	7.45-7.50			PP=200.0kPa	
... From 7.80m to 7.90mbgl light brown weak siltstone cobble.			S	8.00-8.45	3.00		N=19 (1,2/3,5,5,6)	
			D21	8.00-8.45				
			B22	8.00-8.50				
			ES6	8.50				
			UT23	9.00-9.45			28 blows	
... From 9.20m bgl becoming greyish brown. Selenite becomes coarse sand to fine gravel sized.			D24	9.45-9.50			PP=200.0kPa	
Borehole continued...								

Hole Diameter Detail Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details From (m)	To (m)	Time (hours)
150	20.00	3.00	1.30	1.40	1

Water Level Observations

Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
07/06/12	13.30	5	13.30	3.00	15.00
07/06/12	13.30	10	13.30	3.00	15.00
07/06/12	13.30	15	13.30	3.00	15.00
07/06/12	13.30	20	13.30	3.00	15.00

Dates: 01/06/2012-07/06/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks:
1. Starter pit dug from GL to 1.20m bgl.
2. Borehole backfilled with bentonite.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH02

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 25.990mAOD
Coordinates: 529936.20E 183658.50N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery) PID (ppm)
Very stiff medium to high strength closely fissured CLAY. Rare sand size selenite crystals. [LONDON CLAY FORMATION]			S	10.00-10.45	3.00		N=20 (1,3/3,5,5,7)
			D25	10.00-10.45			
			B26	10.00-10.50			
... From 11.0m bgl brownish grey.			D27	11.00-11.10			PP=220.0kPa
			UT28	11.50-11.95			30 blows
			D29	11.95-12.00			
	12.60	13.39	D30	12.60-12.70			PP=220.0kPa
Very stiff very high strength grey locally sandy locally thinly laminated CLAY. Occasional trace fossils and shell fragments. [LONDON CLAY FORMATION]			ES7	12.80			
			S	13.00-13.45	3.00		N=24 (2,2/5,5,6,8)
			D31	13.00-13.45			
			B32	13.00-13.50			
			D33	14.00-14.50			
			UT34	14.50-14.95			40 blows
							PP=220.0kPa
			D35	14.95-15.00			
			D36	15.50-15.60			
			S	16.00-16.45	3.00		N=18 (2,2/3,4,5,6)
			D37	16.00-16.45			
			B38	16.00-16.50			
			D39	17.00-17.10			PP=220.0kPa
			UT40	17.50-17.95			45 blows
	17.90	8.09	D41	17.95-18.00			PP=220.0kPa
Moderately weak mudstone cobble. [LONDON CLAY FORMATION]	17.95	8.04					
Stiff grey locally slightly sandy locally thinly laminated CLAY. Occasional trace fossils and shell fragments. [LONDON CLAY FORMATION]			D42	18.50-18.60			
			ES8	18.50			
			UT43	19.00-19.45			36 blows
			D44	19.45-19.50			
			S	19.50-19.95	3.00		N=31 (3,4/6,7,8,10)
			D45	19.50-19.95			
			B46	19.50-20.00			

Installations

Borehole Complete at 20.00 m

Hole Diameter Detail Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details From (m)	To (m)	Time (hours)
150	20.00	3.00	1.30	1.40	1

Water Level Observations

Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
07/06/12	13.30	5	13.30	3.00	15.00
07/06/12	13.30	10	13.30	3.00	15.00
07/06/12	13.30	15	13.30	3.00	15.00
07/06/12	13.30	20	13.30	3.00	15.00

Dates: 01/06/2012-07/06/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks: 1. Starter pit dug from GL to 1.20m bgl.
2. Borehole backfilled with bentonite.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH03

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 26.375mAOD
Coordinates: 529919.50E 183652.60N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery) PID (ppm)
MADE GROUND: Greyish brown sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse concrete granite and flint.			D1	0.00-0.10			
			B2	0.00-0.40			
	0.40	25.98	ES1	0.20			
MADE GROUND: Firm greyish brown slightly gravelly CLAY. Gravel is angular fine to coarse granite and flint.			D3	0.40-0.50			
			B4	0.40-0.90			
			ES2	0.80			
			B5	0.90-1.20			
	1.60	24.78	S	1.50-1.95	1.50		N=6 (2,1/1,2,2,1)
MADE GROUND: Stiff mottled dark brown and brownish grey sandy slightly gravelly CLAY. Rare fragments of plastic. Gravel is angular fine to coarse brick and shell. Occasional ash.			D6	1.50-1.95			
			B7	1.50-2.00			
			ES3	1.70			
	2.10	24.28	D8	2.10-2.20			
	2.40	23.98	S	2.50-2.95	1.50		N=8 (1,1/1,2,2,3)
MADE GROUND: Firm brownish grey slightly gravelly CLAY. Gravel is angular to sub angular fine to coarse flint and brick.			B10	2.50-3.00			
			D9	2.50-2.95			
			ES4	2.70			
	3.30	23.08	D11	3.30-3.40			
MADE GROUND: Firm mixed brown and dark brown slightly gravelly CLAY. Gravel is angular to subangular fine to coarse brick, flint and ash.			B12	3.30-3.50	1.50		N=6 (1,0/1,2,1,2)
			S	3.50-3.95			
	3.70	22.68	D13	3.50-3.95			PP=60.0kPa
MADE GROUND: Firm mottled greenish grey and dark grey slightly sandy, slightly gravelly CLAY. Gravel is angular to subangular fine and medium flint, brick and pottery. Occasional decayed roots. Slight organic odour.			B14	3.70-4.00			
			ES5	3.90			
			D15	4.20-4.30			
			UT16	4.50-4.95			7 blows PP=85.0kPa
Firm mottled grey and yellowish grey CLAY. [LONDON CLAY FORMATION] ... From 4.50m bgl becoming stiff. Occasional decayed roots.	5.00	21.38	ES6	4.90			
			D17	4.95-5.00			
			D18	5.00-5.10			
			S	5.50-5.95	4.50		N=13 (1,1/2,3,4,4)
			D19	5.50-5.95			
Stiff medium to high strength brown and rare grey closely fissured CLAY. [LONDON CLAY FORMATION]			B20	5.50-6.00			PP=120.0kPa
	6.20	20.18	D21	6.20-6.30			
Very stiff brown with rare grey closely fissured CLAY. Rare grey staining along fissure planes. [LONDON CLAY FORMATION]			UT22	6.50-6.95			PP=150.0kPa 28 blows
			D23	6.95-7.00			
			D24	7.20-7.30			
			S	7.50-7.95	4.50		N=20 (1,3/3,5,6,6)
			D25	7.50-7.95			
			B26	7.50-8.00			
							PP=240.0kPa
			D27	8.20-8.30			
			UT28	8.50-8.95			41 blows
			D29	8.95-9.00			
			D30	9.20-9.30			
							PP=160.0kPa
			S	9.50-9.95	4.50		N=19 (1,3/3,5,5,6)
			D31	9.50-9.95			
			B32	9.50-10.00			
Borehole continued...			ES7	9.90			PP=200.0kPa

Installations

Hole Diameter Detail Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details From (m)	To (m)	Time (hours)
200	4.50	3.00			
150	20.00	4.50			

Water Level Observations

Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
01/06/12	12.50	5	11.40	4.50	14.00
01/06/12	12.50	10	11.40	4.50	14.00
01/06/12	12.50	15	11.40	4.50	14.00
01/06/12	12.50	20	11.40	4.50	14.00

Dates: 31/05/2012-01/06/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks: 1. Starter pit dug from GL to 1.20m bgl.
2. Borehole backfilled with bentonite.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH03

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 26.375mAOD
Coordinates: 529919.50E
183652.60N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery)	PID (ppm)
Very stiff brown with rare grey closely fissured CLAY. Rare grey staining along fissure planes. [LONDON CLAY FORMATION]			D33	10.50-10.60				
			UT34	11.00-11.45			PP=210.0kPa 27 blows	
			W39 D35	11.40 11.45-11.50				
			D36	12.00-12.10				
Very stiff grey closely fissured CLAY. Occasional thin bands (3-5cm) of weak light brown siltstone. Rare coarse sand sized selenite crystals. [LONDON CLAY FORMATION]	12.50	13.88	S D37 B38 B40	12.50-12.95 12.50-12.95 12.50-13.00 12.50-13.00	4.50		N=21 (1,3/4,5,5,7) PP=220.0kPa	
Stiff brownish grey very high strength brownish grey closely fissured locally thinly laminated CLAY. Rare thin sandy clay bands. [LONDON CLAY FORMATION]			D41	13.50-13.60				
... From 14.0m bgl very stiff grey.			UT42	14.00-14.45			PP=250.0kPa 42 blows	
			D43	14.45-14.50				
			ES8 D44	14.90 15.00-15.10			PP=250.0kPa	
			S D45 B46	15.50-15.95 15.50-15.95 15.50-16.00	4.50		N=31 (2,5/6,7,9,9)	
			D47	16.50-16.60			PP=250.0kPa	
			UT48	17.00-17.45			32 blows	
			D49	17.45-17.50				
			D50	18.00-18.10			PP=250.0kPa	
			S D51 B52	18.50-18.95 18.50-18.95 18.50-19.00	4.50		N=26 (2,4/5,5,8,8)	
			D53	19.50-19.60			PP=250.0kPa	
Borehole continued...			ES9	19.90				

Hole Diameter Detail: Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details: From (m)	To (m)	Time (hours)
200	4.50	3.00			
150	20.00	4.50			

Water Level Observations

Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
01/06/12	12.50	5	11.40	4.50	14.00
01/06/12	12.50	10	11.40	4.50	14.00
01/06/12	12.50	15	11.40	4.50	14.00
01/06/12	12.50	20	11.40	4.50	14.00

Dates: 31/05/2012-01/06/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks: 1. Starter pit dug from GL to 1.20m bgl.
2. Borehole backfilled with bentonite.

GROUND TECHNOLOGY
Maple Road, Kings Lynn
Norfolk, PE34 3AF
Tel: 01553 817657
www.groundtechnology.co.uk

Borehole Record

BH03

Project: Kings Cross Gas Holder 8 Relocation SI

Project ID: GTS-12-129

Client : BAM Nuttall Limited

Engineer : AMEC E&I UK Ltd

Ground Level: 26.375mAOD
Coordinates: 529919.50E
183652.60N

Description	Depth (m)	O.D. Level (m)	Sample Test Type	Sample Test Depth (m)	SPT/CPT Casing Depth (m)	SPT/CPT Water Depth (m)	Remarks and Test Results SPT/HV/PP (Recovery)	PID (ppm)
Stiff brownish grey very high strength brownish grey closely fissured locally thinly laminated CLAY. Rare thin sandy clay bands. [LONDON CLAY FORMATION]			UT54	20.00-20.45			44 blows	
	20.50	5.88	D55	20.45-20.50				
Borehole Complete at 20.50 m								

Hole Diameter Detail: Diameter (mm)	Depth (m)	Casing Depth (m)	Chiseling Details: From (m)	To (m)	Time (hours)
200	4.50	3.00			
150	20.00	4.50			

Water Level Observations

Date	Water Strike (m)	Standing Time (mins)	Standing Level (m)	Casing Depth (m)	Depth Sealed (m)
01/06/12	12.50	5	11.40	4.50	14.00
01/06/12	12.50	10	11.40	4.50	14.00
01/06/12	12.50	15	11.40	4.50	14.00
01/06/12	12.50	20	11.40	4.50	14.00

Dates: 31/05/2012-01/06/2012
Plant: Dando 2000
Drilled By: A. Elshof
Logged By: J. Tomalin
Checked By: P. Lewin

Remarks: 1. Starter pit dug from GL to 1.20m bgl.
2. Borehole backfilled with bentonite.