Soil Mechanics		BOREHOLE N	lo. SA7368
Equipment & Methods As sheet 1	Location No. 8109 Location CONTE	RACT 2 FOR PHASE 4 (1997) GROU STIGATIONS IN PROJECT AREA 100	JND 0
Carried out for Union Railways Limited	Ground Level	Coordinates As sheet 1	Date

	Wa	ter Level	Observati	ons 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 St	rike Table			
Depth of Strike	Casing Depth (m)	Date	Time	Post Strike Depth	Minutes After Strike	Sealed at	Remarks
(m)				(m)		(m)	
2.70 2.70 2.70 2.70	1.20 1.20 1.20 1.20 1.20	09/06/97 09/06/97 09/06/97 09/06/97		2.54 2.43 2.40 2.38	5 10 15 20	3.00 3.00 3.00 3.00 3.00	

	Remarks	Logged by
		JR Scale
	Notes: (c) Soil Mechanics (Ver 5.5)	Fig. 132
L	Materials are described in accordance with Appendices. For explanation of symbols and abbreviations see Fig. 1. 07/10/97 09:54:53	132

Soil Mechanics	BOREHOLE No. SA7368
	Sheet 3 of 3
Location No. 8109	Type of installation Standpipe
Location CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN	Date of installation 09/06/97
PROJECT AREA 100	Internal diameter of tubing 50 mm
Carried out for Union Railways Limited	Length of filter 2.00 m
	Diameter of filter 150 mm

Depth From	(m)	SUMMARY OF INSTALLATION	Le	gend	Depth below Ground level(m)
TY ONI	10				
		Surface protection : Stopcock Cover			<u> </u>
0.00	0.30	Concrete	a	a	0:30
0.30	0.50	Bentonite seal	-	-	
0.00	0.50	Plain pipe		1	
0.50	3.50	Sand filter		' 	
0.50	3.50	Slotted section		I	_
3.50	4.80	Bentonite seal		1	
				1	-
				!	_
			ь	ь	3.50
	 				-
					_
			<u>d</u>	d	- 4.80
					_
					_
					_
					<u> </u> -
a	Concrete	d Bentonite seal			
b	Sand filte	r e Bentonite/cement grout			-
					-
С	Gravel fil	ter f Backfill			
					_
rks	•				-
round leve	el and coor	dinates as sheet 1			_
Soil Mecha	anics V2.0	07/10/97 09:55:19			<u> </u>

Soil Mechanics					Sheet 1	of 3			
Equipment & Methods Hand dug inspection pit to 1.00m. Cable tool boring. 150mm dia to 3.50m.	Location	1	109 ONTRACT NVESTIGA	2 FOR PH/ TIONS IN	ASE 4 PROJE	(199 CT A	7) GRO	OUND 10	
Carried out for Union Railways Limited		Ground Level 24.66 m AOD			ordina 9923.79	tes 5 mE			Date 09/06/97
Description	Reduced	Legend	Depth -		Sam	ples/1	ests		Field Records
beset (peroli	Level	Logonia	(Thick)	Depti	1	San Type	No.	Test	Field Records
Black TARMAC. (MADE GROUND)	24.66 24.60 24.46 24.35 24.12		- (0.06) - 0.06 - (0.14) - 0.20 - (0.11)	0.54 -	0.61	С	1		
COBBLESTONES (200 x 140 x 100mm) set in well bonded matrix 20mm thick. (MADE GROUND)	24.12 24.05 23.76 23.46		0.31 (0.23) - 0.54 - (0.07) - 0.61 - (0.29)	0.61 -	0.90 1.00	С	3		
Grey CONCRETE <70 - 80% coarse sand or angular fine flint gravel aggregate. Unreinforced. (MADE GROUND)	22.76		0.90 (0.30) 1.20 (0.70) 1.90	1.20 -	1.90	В	4		
Pale grey CONCRETE <30 - 40% angular medium / flint gravel aggregate, 30 - 40% fine to medium / sand. 5 x 200mm steel mesh reinforcement at//			(0.90)	1.90 -	2.80	В	5		
0.48m. 2.80-3.00m. /rare (MADE GROUND) rootlets	21.86		2.80	2.80 - 2.80 -	2.85 3.50 3.50	C C B	7 8 6		
Black slightly clayey fine to medium ashy SAND with some fine subrounded ash gravel. (MADE GROUND - SAND)	21.16		pen) - 3.50	2.00 -	3.50	D	0		
Orange fine to medium angular GRAVEL of crushed prick 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 land subrounded to subangular fine to medium gravel of brick with rare organic streaks and landstream (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 are fine to medium rounded flint gravel.			-						
tiff mottled orangish brown and pale bluish! rey extremely closely fissured CLAY. LONDON CLAY)			- - -						
BOREHOLE ENDS AT 3.50 m.			_						
Remarks 1. Slotted standpipe installed on completion, see sh	eet 3.								Logged by JR
									Scale 1:50



Soil Mechanics

BOREHOLE No.SA7377

Sheet 2 of 3

Equipment & Methods

As sheet 1

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

Carried out for
Union Railways Limited

Location

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

Ground Level

As sheet 1

	Wa	ter Level	Observati	ons 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

	ı	Hole Diameter	by Depth Table	
Depth Hol (m)	of e	Diameter of Hole (mm)	Diameter of Casing (mm)	Depth of Casing (m)
3.5	50	150	150	1.50

Soil Mechanics	BOREHOLE No. SA7377
Location No. 8109 Location CONTRACT 2 FOR PHASE 4 (1997) GROUND INVESTIGATIONS IN PROJECT AREA 100	Type of installation Standpipe Date of installation 09/06/97
Carried out for Union Railways Limited	Internal diameter of tubing 50 mm Length of filter 3.00 m

Depth	(m)	SUMMARY OF INSTALLATION	Legend	Depth below
From	То	SUMMANT OF THISTALLATION	Legend	Ground level(m
		Surface protection : Stopcock Cover		
0.00	0.30	Concrete		0.20
0.30	0.50	Bentonite seal	a a	- 8:38
0.00	0.50	Plain pipe] ;	
0.50	3.50	Sand filter	-	_
0.50	3.50	Slotted pipe		_
				_
				_
] !	
			-	
			<u> </u>	3.50
				_
				_
				_
				-
				<u> </u> -
a	Concrete	d Bentonite seal		
b	Sand filt	e Bentonite/cement grout		_
С	Gravel fi	lter f Backfill		
	Graver 11	lter f Backfill		_
				_
				_
nrks				-
round leve	el and coor	dinates as sheet 1		_
		01/10/97 09:10:05		

Soil Mechanics					Sheet			No.T	7301
Equipment & Methods Machine dug using FORD 655 Pit dimensions 0.90m by 2.90m. Support used : None Backfill : Arisings	Location Location Carried	n (2 FOR PI ATIONS II ways Limit		(199 CT A	7) GR REA 1	OUND 00	
Duckriii . Ai i Siings	Ground 24.22			5	Coordina 529956.0 83677.2	2 mE		Date 20/05/97	
Description	Reduced Level	Legend	Depth (Thick)	Den	Sam Depth		ests ple	Test	Field Record
PACE Dark grey to black coarse TARMAC. MADE GROUND)	24.22		(0.23)	БСР		Туре	No.	1631	
Dark grey to black slightly clayey fine to coarse SAND with much fine gravel of ash clinker with a little flint and brick gravel.	23.99		0.23 (0.14) 0.37 (0.29)		0.25 0.25 0.50	C D	2		
MADE GROUND - SAND)	23.56		0.66 (0.09) 0.75		0.70	D	3		
Dark grey mottled brown slightly clayey fine to //coarse SAND with much fine to medium subrounded //co subangular flint, pot and brick gravel. //			(0.35)	0.80 -	0.90 0.90	C D	2 4		
Orange brown slightly clayey fine SAND AND subangular to rounded fine to medium GRAVEL of	23.12		(0.50)		1.20 1.30	D C	5		
HADE GROUND - SAND AND GRAVEL)	22.62	- -	1.60						
ense red fine to coarse SAND of fine gravel of rushed brick and burnt clay. MADE GROUND - SAND)			- - (0.50 - pen)	1.80 - 1.80 -		В	1 4		
firm dark greenish grey CLAY with small black proganic speckles, occasional sand laminae and laminae a	22.12		2.10		2.10	D	6		
irm becoming stiff brown with a little bluish / rey mottling, extremely closely fissured CLAY. / WEATHERED LONDON CLAY) RIAL PIT ENDS AT 2.10 m.			- - - - - -						
2.20			- - -						-
			· · · ·						
			-						
			- -						
			- -						
			-						
emarks tability : All stable				Sketch			A		Logged by
imilarity of faces : All stable ater : None					D		С	B 225 De	> JR Scale 1:25
			•		(c) So		nanics (Ver /09/97 16:	Fig. 120

GROUND TECHNOLOGY		Во	reho	le R	Record	l			BH01	Sheet 1 of
Maple Road, Kings Lynn Norfolk, PE34 3AF Tel: 01553 817657	Project	: Kin	gs Cro	ss G	as Holde	r 8 Re	eloca	tion SI		
www.groundtechnology.co.uk	Project	ID: G	STS-12	-129						
Nigord - DAMAN (College)	Engines	.r. Al	MEGE	01111	/ I tal				Level: 25.6	
lient : BAM Nuttall Limited	Enginee	1. A	MEC E	&I UI	\ Lta			Coordinates: 529932.90E 183689.20N		
· · ·		Depth	O.D.	San	nple Test	SPT/CPT			irks and	
Description	Legend	(m)	Level (m)	Туре	-	Casing Depth (m)	Danthl	Test	Results PID (Recovery) (ppm)	Installatio
MADE GROUND: Brownish grey silty fine to coarse SAND and angular fine to coarse concrete GRAVEL and COBBLES.		0.20	25.41 25.26	D1 ES1	0.00-0.10	(111)	(111)		(FF)	
MADE GROUND: Brown silty gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse lint concrete and brick.		0.65	24.96 24.81	D2 B3	0.65-0.75 0.80-1.30					-
MADE GROUND: Concrete slab.		1.30	24.31	ES2 D4	1.30 1.30-1.40	1.50	(1.30)	N=3 (1,0/1,0) 1 1)	3
MADE GROUND: Weak concrete - blinding.		1.60	24.01	B5 S	1.30-1.50 1.50-1.95	1.00	(1.00)	PP=50.0kPa		
MADE GROUND: Brownish grey silty very gravelly fine o coarse SAND. Gravel is angular fine and medium vith occasional coarse concrete and flint.		2.20	23.71	ES3 D6 B7 ES4 D8 ES5	1.50 1.50-1.95 1.50-1.90 1.80 1.90-2.00 2.20			PP=50.0kPa 10 blows	1	
MADE GROUND: Reddish brown silty fine to coarse SAND and angular fine to coarse brick, concrete and int GRAVEL.		3.20	22.41	D9 UT10 D11	2.20-2.30 2.50-2.95 2.95-3.00			PP=50.0kPa		
Firm to stiff greenish CLAY, with rare black nottling, rare decayed plant debris and roots. POSSIBLE BURIED TOPSOIL]				S D12 B13 ES6	3.50-3.95 3.50-3.95 3.50-4.00 3.50	3.00		PP=105.0kF N=10 (1,1/1 PP=110.0kF	,3,3,3)	
irm to stiff greenish grey and yellowish grey LAY. Occasional subrounded fine to coarse flint ravel. [REWORKED LONDON CLAY FORMATION]		4.30	21.31	D16 UT14	4.20-4.30 4.50-4.95			18 blows		
irm to stiff brown CLAY. Occasional crinoids pssil fragments. [LONDON CLAY FORMATION]		- - - -		D15	4.95-5.00			PP=130.0kF	^o a	
Stiff brown locally closely fissured CLAY with rare prey mottling. [LONDON CLAY FORMATION] From 4.20m to 4.29m bgl light brown very weak siltstone / mudstone cobble.		5.50	20.11	S D17 B18	5.50-5.95 5.50-5.95 5.50-6.00	3.00		N=15 (1,2/3 PP=140.0kF		
Stiff high strength brown with grey staining on issures closely fissured and locally thinly aminated CLAY. Occasional decayed roots along issure planes. [LONDON CLAY FORMATION]				UT19	6.50-6.95			36 blows		
/ery stiff high strength brown and grey closely ssured CLAY with rare coarse sand sized selenite		<u>-</u>		D20	6.95-7.00			PP=220.0kF	Pa	
rystals. [LONDON CLAY FORMATION]From 7.50m bgl locally thinly laminated.				S D21 B22	7.50-7.95 7.50-7.95 7.50-8.00	3.00		N=18 (1,3/3	,4,5,6)	
		_						PP=210.0kF	Pa	
From 8.50m bgl becoming slightly greyish brown.		-		UT23 ES7	8.50-8.95 8.50			30 blows		
		<u>-</u>		D24	8.95-9.00			PP=220.0kF	^o a	
Borehole continued		-		S D25 B26	9.50-9.95 9.50-9.95 9.50-10.00	3.00		N=21 (2,3/4	,4,6,7)	
					Water Lev	el Obse	ervatio	ons		1000 E
Hole Diameter Detail Chiseling Details iameter Depth Casing From To Time (mm) (m) Depth (m) (m) (m) (hours)	Date		Water Strike (Standing Time (mins)		Standir evel (r	·	Casing Depth (m)	Depth Sealed (m)
200 1.50 1.50 0.00 0.35 0.5 150 30.00 3.00					vater Enco	_				. /
Dates: 29/05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin	Remarks	ga	as tap and	l flush d					I. Hole finished	l with

	Т						T .		Sheet 2 of 3
GROUND TECHNOLOGY		Во	reho	le F	Record	1	ВН	01	
Maple Road, Kings Lynn Norfolk, PE34 3AF Tel: 01553 817657 www.groundtechnology.co.uk			ngs Cro GTS-12		as Holdei	r 8 Reloca	ation SI		
Client : BAM Nuttall Limited	Engine	er: A	MEC E	&I UI	K Ltd		Ground Level: Coordinates:	5299	
Description	Legend	Depth (m)	O.D. Level (m)	San	nple Test e Depth (m)	SPT/CPT Casing Water Depth Depth (m) (m)	Toot Dooult	ts PID	Installations
Very stiff high strength brown and grey closely fissured CLAY with rare coarse sand sized selenite crystals. [LONDON CLAY FORMATION]		10.60			\/	(,	PP=210.0kPa	7	- - - - -
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]					11.00-11.45 11.45-11.50		PP=250.0kPa 42 blows		
Very stiff slightly greenish grey slightly sandy CLAY. [LONDON CLAY FORMATION]		12.30	13.31	S D29 B30	12.50-12.95 12.50-12.95 12.50-13.00	3.00	PP=200.0kPa N=23 (2,3/4,5,6,8)		-
Very stiff high strength grey closely fissured CLAY		14.40) 11.21		13.50 14.00-14.45 14.45-14.50		46 blows		
with occasional thin sandy clay bands. [LONDON CLAY FORMATION]				S D33 B34	15.50-15.95 15.50-15.95 15.50-16.00	3.00	PP=200.0kPa N=29 (3,5/5,7,8,9)		
		=			17.00-17.45		PP=210.0kPa 50 blows		-
				S D37 B38 ES9	18.50-18.95 18.50-19.00 18.50 19.00	3.00	N=29 (2,4/5,6,8,10) PP=220.0kPa		
Borehole continued				<u> </u>	Water Lev	- L Observati			-
Hole Diameter Detail Chiseling Details	Date		Water Strike ((m)	Standing Time (mins) water Encou		ing Casing		Depth Sealed (m)
Dates: 29/05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin	Remark	g	as tap and	d flush (cover.	ed from GL to	o 10.00m bgl. Hole f	finished	with

Very stiff high strength grey closely fissured CLAY with occasional thin sandy clay bands. [LONDON CLAY FORMATION] U139 200.520.46	GROUND TECHNOLOGY		Во	reho	le R	ecord	l		BH01 Sheet 3 of 3			
Project ID: GTS-12-129	Norfolk, PE34 3AF	Project	: Kin	igs Cro	ss Ga	as Holde	r 8 Reloca	ation S	il .			
Description		Project	ID: G	STS-12	-129							
Description	Direct - DAMAN Hell Code I	Fasinos	Al	MEOF	01111	/ I & al		l				
Legend Copyright Copyrig	Client : BAM Nuttall Limited	Enginee	er: Al	MECE	&I Ur							
Complete	Description	Legend	Depth	O.D.	Sam	ple Test		Too				
### 22.30 Sections Delta	Decempaen.	Logoria	(m)		Туре		Casing Water Depth Depth (m) (m)		PID	Installation		
Decision CLAY FORMATION Clay Content Clay Content Clay Content Clay	Very stiff high strength grey closely fissured CLAY with occasional thin sandy clay bands. [LONDON		-							=		
Moderately strong mudstone cobble, [LONDON CLAY FORMATION]	CLAY FORMATION]		=		D40	20.45-20.50						
Moderately strong mudstone cobble, [LONDON CLAY FORMATION]												
Moderately strong mudstone cobble. LONDON CLAY			-									
Moderately strong mudstone cobble. [LONDON CLAY 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 3.21 22.40 22.45			Ė		D41	21.50-21.95	3.00	N=30 (2, PP=250.	5/6,7,8,9) 0kPa			
### Moderately strong mudstone cobble. [LONDON CLAY FORMATION] Very stiff high to very high strength closely Very stiff h			E		D42	21.50-22.00						
## CORMATION] Ways giff high to very high strength closely insured CLAY. Rare thin greenish grey sand bands. UT43 23.00.23.45 PP=250.0kPa Fb towns Fb towns	Moderately strong mudstone cobble II ONDON CLAY									=		
### Dissured CLAY. Rare thin greenish grey sand bands. [LONDON CLAY FORMATION] D44 23.45-23.50 E510 23.50		/	22.40	3.21						=		
LONDON CLAY FORMATION D44	Very stiff high to very high strength closely fissured CLAY. Rare thin greenish grey sand bands.				UT43	23.00-23.45				<u>-</u>		
ES10 23.50			-		Daa	22 45 22 50		51 blows		=		
D45 24.50.24.95 PP-250.0kPa			Ė							=		
D45 24.50.24.95 PP-250.0kPa			E							-		
D45 24.50.24.95 B46 24.50.24.95 B46 24.50.24.95 B46 24.50.24.95 B46 24.50.24.95 B46 24.50.26.00 B46 24.50.			Ė									
UT47 26.00-26.45 PP=250.0kPa			Ė		D45	24.50-24.95	3.00			=		
From 29 20m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY Sand Borehole Complete at 30.00 m Hole Diameter Detail Chiseling Details Diameter Detail Chiseling Details Diameter Detail Chiseling Min From To Time (min) (m) (bour) (min) (min) (m) (bour) (min) (min) (m) (bour) (min) (Ē		B40	24.50-25.00				-		
From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY			E									
Date			Ė									
From 29.20m bgl greenish grey clayey sand bands From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Hole Diameter Detail Chiseling Details Diameter Detail Ch			Ė		UT47	26.00-26.45				-		
From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Water Level Observations Hole Diameter Detail Chiseling Details Date Strike (m) Time (mins) Level (m) Depth (m) Sealed (m) 200 1.50 1.50 1.50 0.00 0.35 0.5 Dates: 29/05/2012-31/05/2012 Pemarks: 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.			E					56 blows				
Day 27.50-27.95 B50 27.50-28.00 PP=250.0kPa PP=250			Ė		D48	26.45-26.50						
Day 27.50-27.95 B50 27.50-28.00 PP=250.0kPa PP=250			Ė							_		
Day 27.50-27.95 B50 27.50-28.00 PP=250.0kPa PP=250										=		
From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY. D52			-		D49	27.50-27.95	3.00	N=37 (3,	6/8,8,9,12)			
From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Hole Diameter Detail Chiseling Details Date Strike (m) Time (mins) Level (m) Depth (m) Sealed (m) No Ground water Encountered Dates: 29/05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin			E		B50	27.50-28.00		PP=250.0	0kPa	_		
From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Hole Diameter Detail Chiseling Details Date Strike (m) Time (mins) Level (m) Depth (m) Sealed (m) No Ground water Encountered Dates: 29/05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin			Ē							=		
From 29.20m bgl greenish grey clayey sand bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Water Level Observations Water Level Observations Diameter Depth Casing (mm) Cm) Depth (mm) Depth (mm) D					ES11	28.50						
bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Water Level Observations Water Level Observations Water Level Observations Diameter Detail Chiseling Details Diameter Detail Chiseling Details Diameter Depth (m) Casing (m) Depth (m) (m) (m) (m) (m) (m) (hours) (hours)					UT51	29.00-29.45		51 blows		_		
bands From 29.50m bgl grey CLAY. Borehole Complete at 30.00 m Water Level Observations Water Level Observations Hole Diameter Detail Chiseling Details Diameter Depth Casing (mm) Depth (m) Depth (m) (m) (m) (m) (hours) 200 1.50 1.50 1.50 0.00 0.35 0.5 Dates: 29,05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin No Groundwater Encountered Diameter Detail Chiseling Details Date Strike (m) Standing Standing Casing Time (mins) Level (m) Depth (m) Sealed (m) No Groundwater Encountered 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.	From 29.20m bql greenish grey clayey sand		Ē							-		
Borehole Complete at 30.00 m Hole Diameter Detail Chiseling Details	bands.		E		S	29.50-29.95	3.00	N=34 (3,4	4/8,8,9,9)	=		
Hole Diameter Detail Chiseling Details Diameter Depth Casing (mm) Poeth (m) Depth (m) Poeth (m) Casing (mm) Poeth (m) Poeth (m			F							=		
Diameter (mm) Depth (m) Depth (m) Depth (m) Depth (m) To (m) Time (hours) 200 1.50 1.50 30.00 3.00 Dates: 29/05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin	· · · · · · · · · · · · · · · · · · ·			Meta					Cosina	Donth		
200 1.50 30.00 1.50 0.00 0.35 0.5 Dates: 29/05/2012-31/05/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin No Ground water Encountered No Ground water Encountered 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.		Date				ū		·	, i	Sealed (m)		
Plant: Dando 2000 gas tap and flush cover. 2. Water added from 0.80m to 1.50m bgl during drilling. Drilled By: A. Elshof Logged By: J. Tomalin	200 1.50 1.50 0.00 0.35 0.5			No G	roundw	ater Encou	untered					
Plant: Dando 2000 gas tap and flush cover. 2. Water added from 0.80m to 1.50m bgl during drilling. Drilled By: A. Elshof Logged By: J. Tomalin	Dates: 20/05/2012 21/05/2012	Remarks	S: 1 63	Smm HDD	F stand	Inine inetalla	ed from GL to	10.00m	hal Hole finished	Lwith		
Drilled By: A. Elshof Logged By: J. Tomalin		Romana	ga	as tap and	flush c	over.			-	********		
Logged By: J. Tomalin			Z. VV	ator adde	, a 110111 (0.00m tO 1.0	Join by duill	y urminy.	-			
Checked By: P. Lewin	-											
	Checked By: P. Lewin											

	ECHNOLOGY		Во	reho	le R	ecord	l	BH02					
Norfolk, F	d, Kings Lynn PE34 3AF 53 817657	Project	: Kii	ngs Cro	ss Ga	s Holde	r 8 Reloca	ation	SI				
	chnology.co.uk	Project	ID: (GTS-12	-129								
Client : BAM Nuttall Limited		Enginee	er: A	MEC E	&I Uk	Ground Level: 25.990mAOI Coordinates: 529936.20E 183658.50N							
Description		Legend	Depti (m)	h O.D. Level (m)		ple Test Depth (m)	SPT/CPT Casing Water Depth Depth (m) (m)	Te	emarks and est Results	PID	Installations		
MADE GROUND: Brownish grey silty to coarse SAND. Gravel is angular fine brick, concrete and flint. Approximately cobbles and rare metal.	e to coarse		0.40		D1 B2 ES1 D3 D4	0.00-0.10 0.00-0.25 0.10 0.25-0.30 0.60-0.70	(,				-		
MADE GROUND: Grey silty fine to coa angular fine to coarse granite GRAVEL At 0.60m bgl concrete obstruction	L.		1.40	24.59	B5 ES2	0.60-1.20 0.80					<u>-</u>		
MADE GROUND: Yellowish grey silty it SAND and angular fine to coarse brick flint GRAVEL. Occasional brick and co cobbles. From 0.90m bgl becoming brownis	concrete oncrete		1.50 1.65 1.90 2.10 2.25	24.34 24.09 23.89	D6 B7 ES3 D8	1.90-2.00 1.90-2.10 2.00 2.10-2.15					-		
MADE GROUND: Asphalt.					B9 D10 B11	2.10-2.25 2.25-2.30 2.25-2.60					-		
MADE GROUND: Granite cobbles.			-		ES4 UT12	2.30 3.00-3.45		10 blow	vs		-		
MADE GROUND: Reinforced Concrete MADE GROUND: Reddish brown silty to coarse SAND. Gravel is angular fine brick and flint.	very gravelly fine		3.20	22.79	D13 ES5	3.45-3.50 3.50		PP=80.	.0kPa		-		
Firm mottled grey and greyish brown s gravelly (Approximately 5%) CLAY. Gr subangular to subrounded fine to coars [REWORKED LONDON CLAY FORM.]	ravel is se flint.				S D14 B15	4.00-4.45 4.00-4.45 4.00-4.50	3.00	N=10 (1 PP=90.	1,1/2,2,3,3) 0kPa		-		
Stiff brown and rare grey CLAY. Occas subangular to subrounded fine to coars gravel. [REWORKED LONDON CLAY	se flint		5.00	20.99	UT UT100 D16	5.00-5.45 5.00-5.45 5.45-5.50		30 blow			-		
Stiff greenish grey slightly gravelly (Approximately 5%) CLAY. Gravel is al rounded fine to coarse flint. [REWORK FORMATION]					S D17	6.00-6.45 6.00-6.45	3.00	PP=160	0.0kPa 1,2/2,3,4,5)		-		
Very stiff medium to high strength close CLAY. Rare sand size selenite crystals CLAY FORMATION] From 5.20m to 5.30mbgl light bro	s. [LONDON				B18 UT19	7.00-7.45		PP=200			-		
From 5.20m to 5.30mbgr light bro	WITSILT.				D20	7.45-7.50					<u>-</u>		
5 700 1 700 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					DZO	1.43-1.30		PP=200	0.0kPa		- -		
From 7.80m to 7.90mbgl light bro siltstone cobble.	own weak				S D21 B22 ES6	8.00-8.45 8.00-8.45 8.00-8.50 8.50	3.00	N=19 (1,2/3,5,5,6)		-		
From 9.20m bgl becoming greyisl	h brown.				UT23	9.00-9.45		28 blow	vs		- - -		
Selenite becomes coarse sand to fir sized. Borehole continued					D24	9.45-9.50		PP=200	0.0kPa		- - - -		
Hala Diagratus Datail	sia alia a Dataila					Water Lev	el Observati	ons					
Hole Diameter Detail Cr Diameter Depth Casing From (mm) (m) Depth (m) (m)	niseling Details To Time (m) (hours)	Date		Water Strike (m) .	Standing Fime (mins)		m)	Casing Depth (m)		Depth Sealed (m)		
150 20.00 3.00 1.30	1.40 1	07/06/ 07/06/ 07/06/ 07/06/	/12	13.30 13.30 13.30 13.30		5 10 15 20	13.30 13.30 13.30 13.30		3.00 3.00 3.00 3.00		15.00 15.00 15.00 15.00		
Dates: 01/06/2012-07/06/20 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin	012		s: 1. S	Starter pit d		GL to 1.20 with benton	m bgl.						

GROUND TECHNOLOGY		Во	reho	le R	ecord	I		BH02	Sheet 2 of 2
Maple Road, Kings Lynn Norfolk, PE34 3AF Tel: 01553 817657	Project:	Kin	gs Cro	ss Ga	as Holde	r 8 Reloca	tion SI		
www.groundtechnology.co.uk	Project	ID: G	STS-12	-129					
a		A I	MEO E	01111	Z 1 4-l			Level: 25.9	
Client : BAM Nuttall Limited	Enginee	r: Al	VIEC E	&I Ur	\ Lta		Coordin	ates: 5299 1836	936.20E 358.50N
Description	Legend [Depth	O.D.	San	nple Test	SPT/CPT		arks and Results	
·	Logona	(m)	Level (m)		Depth (m)	Casing Water Depth Depth (m) (m)	SPT/HV/PP	(Recovery) (ppm	Installations
Very stiff medium to high strength closely fissured CLAY. Rare sand size selenite crystals. [LONDON CLAY FORMATION]		- - - -		S D25 B26	10.00-10.45 10.00-10.45 10.00-10.50	3.00	N=20 (1,3/3	,5,5,7)	-
From 11.0m bgl brownish grey.		- - - - -		D27	11.00-11.10		PP=220.0kl	^o a	-
2		-		UT28	11.50-11.95		30 blows		
2 9 3 9		- - - - -		D29	11.95-12.00				-
Very stiff very high strength grey locally sandy		12.60	13.39	D30 ES7	12.60-12.70 12.80		PP=220.0kl	Pa	
locally thinly laminated CLAY. Occasional trace fossils and shell fragments. [LONDON CLAY FORMATION]		- - - -		S D31	13.00-13.45 13.00-13.45	3.00	N=24 (2,2/5	,5,6,8)	
PORMATION		-		B32	13.00-13.50				-
		- -		D33	14.00-14.50				
		- - -		UT34	14.50-14.95		40 blows		_ _ _
		- - -		D35	14.95-15.00		PP=220.0kl	Pa	
		-		D36	15.50-15.60				
		- - - - - - -		S D37 B38	16.00-16.45 16.00-16.45 16.00-16.50	3.00	N=18 (2,2/3	,4,5,6)	-
10 H		- - - - -		D39	17.00-17.10		PP=220.0kl	^o a	-
		- - -		UT40	17.50-17.95		45 blows		= =
Moderately weak mudstone cobble. [LONDON CLAY FORMATION]		17.90 17.95	8.09 8.04	D41	17.95-18.00		PP=220.0kl	Pa	<u>-</u>
Stiff grey locally slightly sandy locally thinly laminated CLAY. Occasional trace fossils and shell		- - -		D42 ES8	18.50-18.60 18.50				
fragments. [LONDON CLAY FORMATION]		- -		UT43	19.00-19.45		36 blows		
2 2 2		-		D44 S D45 B46	19.45-19.50 19.50-19.95 19.50-19.95 19.50-20.00	3.00	N=31 (3,4/6	7,7,8,10)	
Borehole Complete at 20.00 m Hole Diameter Detail Chiseling Details						el Observati			
Hole Diameter Detail Chiseling Details Diameter Depth Casing From To Time (mm) (m) Depth (m) (m) (m) (hours)	Date		Water Strike (- 1	Standing Time (mins)	Standi Level (·	Casing Depth (m)	Depth Sealed (m)
150 20.00 3.00 1.30 1.40 1	07/06/ 07/06/ 07/06/ 07/06/	12	13.30 13.30 13.30 13.30		5 10 15 20	13.30 13.30 13.30 13.30		3.00 3.00 3.00 3.00	15.00 15.00 15.00 15.00
Dates: 01/06/2012-07/06/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin		: 1. St	arter pit d	ug fron	n GL to 1.20 d with benton	m bgl.	1		

GROUND TECHNOLOGY		Во	reho	le R	ecord		Sheet 1 of 3				
Maple Road, Kings Lynn Norfolk, PE34 3AF	Project	: Kir	ngs Cro	ss Ga	s Holde	r 8 Reloca	tion SI				
Tel: 01553 817657 www.groundtechnology.co.uk	Project	ID: 0	STS-12	-129							
	F		MEOF	01111						75mAOD	
Client : BAM Nuttall Limited	Enginee	er: A	MECE	&I UK	Coordinates: 529919.50E 183652.60N						
Description	Legend	Depth (m)	O.D. Level (m)			SPT/CPT Casing Water Depth Depth		arks and Results	PID	Installations	
MADE GROUND: Greyish brown sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse concrete granite and flint.		0.40	25.98	D1 B2 ES1 D3	0.00-0.10 0.00-0.40 0.20 0.40-0.50	(m) (m)	SFI/HV/FF	(Recovery)	(ррііі)	-	
MADE GROUND: Firm greyish brown slightly gravelly CLAY. Gravel is angular fine to coarse granite and flint.		*- - - - -		B4 ES2 B5	0.40-0.90 0.80 0.90-1.20					-	
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.		2.10	24.78	S D6 B7 ES3 D8	1.50-1.95 1.50-1.95 1.50-2.00 1.70 2.10-2.20	1.50	N=6 (2,1/1,2	2,2,1)			
MADE GROUND: Firm brownish grey slightly gravelly CLAY. Gravel is angular to sub angular fine to coarse flint and brick.		2.40	23.98	S B10 D9 ES4	2.50-2.95 2.50-3.00 2.50-2.95 2.70	1.50	N=8 (1,1/1,;	2,2,3)			
MADE GROUND: Firm mixed brown and dark brown slightly gravelly CLAY. Gravel is angular to subangular fine to coarse brick, flint and ash.		3.30	23.08 22.68	D11 B12 S D13	3.30-3.40 3.30-3.50 3.50-3.95 3.50-3.95	1.50	N=6 (1,0/1,2				
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 ES5 D15 UT16	3.70-4.00 3.90 4.20-4.30 4.50-4.95		7 blows				
Firm mottled grey and yellowish grey CLAY. [LONDON CLAY FORMATION] From 4.50m bgl becoming stiff. Occasional		5.00	21.38	ES6 D17 D18	4.90 4.95-5.00 5.00-5.10		PP=85.0kP	а		-	
decayed roots. Stiff medium to high strength brown and rare grey closely fissured CLAY. [LONDON CLAY FORMATION]				S D19 B20	5.50-5.95 5.50-5.95 5.50-6.00	4.50	N=13 (1,1/2 PP=120.0ki			- - - - -	
Very stiff brown with rare grey closely fissured CLAY. Rare grey staining along fissure planes. [LONDON CLAY FORMATION]		6.20	20.18	D21 UT22	6.20-6.30 6.50-6.95		PP=150.0kl 28 blows	Pa		- - - - -	
				D23 D24	6.95-7.00 7.20-7.30					=	
				S D25 B26	7.50-7.95 7.50-7.95 7.50-8.00	4.50	N=20 (1,3/3 PP=240.0kl	,		- - - -	
				D27 UT28	8.20-8.30 8.50-8.95		41 blows			-	
		-		D29 D30 S	8.95-9.00 9.20-9.30 9.50-9.95	4.50	PP=160.0kl N=19 (1,3/3			-	
Borehole continued		Ė		D31 B32 ES7	9.50-9.95 9.50-10.00 9.90		PP=200.0kl			= = =	
						el Observation					
Hole Diameter Detail Chiseling Details Diameter Depth Casing From To Time (mm) (m) Depth (m) (m) (m) (hours)	Date		Water Strike (ı	m) 1	Standing [ime (mins)		·	Casing Depth (m)		Depth Sealed (m)	
200	01/06 01/06 01/06 01/06	/12 /12 /12 /12 /12	12.50 12.50 12.50 12.50		5 10 15 20	11.40 11.40 11.40 11.40		4.50 4.50 4.50 4.50		14.00 14.00 14.00 14.00	
Dates: 31/05/2012-01/06/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin	1	s: 1. S	tarter pit d orehole ba	ug from ackfilled	GL to 1.20 with bentor	m bgl. nite.					

GROUND TECH			Во	reho	le R	Record	I	BH03 Sheet 2 of 3			
Maple Road, K Norfolk, PE3 Tel: 01553 8	34 3AF	Project	: Kir	ngs Cro	ss G	as Holde	r 8 Reloca	ation	SI		
www.groundtechn		Project	ID: (GTS-12	-129						
Client: BAM Nuttall Limited		Enginee	er: A	MEC E	&I UI	< Ltd		Ground Level: 26.375mAOE Coordinates: 529919.50E 183652.60N			
Description		Legend	Depth (m)	O.D. Level (m)	el Type Depth Casing Depth		SPT/CPT Casing Water Depth Depth (m) (m)	Te	emarks and est Results V/PP (Recovery) PID (ppm)	Installations	
Very stiff brown with rare grey closely fissue CLAY. Rare grey staining along fissure pla [LONDON CLAY FORMATION]					D33 UT34 W39 D35	10.50-10.60 11.00-11.45 11.40 11.45-11.50 12.00-12.10		PP=21 27 blov	10.0kPa ws	<u></u>	
Very stiff grey closely fissured CLAY. Occa thin bands (3-5cm) of weak light brown silt Rare coarse sand sized selenite crystals. [CLAY FORMATION]	stone.		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 (PP=22	(1,3/4,5,5,7) 20.0kPa	-	
Stiff brownish grey very high strength brow grey closely fissured locally thinly laminate CLAY. Rare thin sandy clay bands. [LOND FORMATION] From 14.0m bgl very stiff grey.	ed				D41 UT42 D43	13.50-13.60 14.00-14.45 14.45-14.50		PP=25 42 blov	50.0kPa ws		
					ES8 D44	14.90 15.00-15.10		PP=25	50.0kPa	- - - -	
					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=25	50.0kPa	-	
			-			17.00-17.45 17.45-17.50		32 blov	ws	- - - -	
					D50	18.00-18.10		PP=25	50.0kPa	- - - -	
					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)	-	
Deschale centinged					D53	19.50-19.60		PP=25	50.0kPa	-	
Borehole continued			<u> </u>		ES9	19.90 Water Lev	l el Observati	ons		_	
Diameter Depth Casing From	ing Details To Time m) (hours)	Date		Water Strike (- 1	Standing Time (mins)	Standi Level (_	Casing Depth (m)	Depth Sealed (m)	
200 4.50 3.00 150 20.00 4.50		01/06/ 01/06/ 01/06/ 01/06/	/12	12.50 12.50 12.50 12.50		5 10 15 20	11.40 11.40 11.40 11.40		4.50 4.50 4.50 4.50	14.00 14.00 14.00 14.00	
Dates: 31/05/2012-01/06/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin			s: 1. S	tarter pit d	lug fron	n GL to 1.20 d with benton	m bgl.	'	,		

GROUND TECHNOLOGY	В	Boreho	le Record	d	ВН	Sheet 3 of 3	
Maple Road, Kings Lynn Norfolk, PE34 3AF Tel: 01553 817657			ss Gas Holde		ation SI		
www.groundtechnology.co.uk	Project ID	: GTS-12	-129				
Client - DAM Nuttell Limited	Engineer:	AMEC E	8111K1+4	Ground Level: 26.375mAO			
Client : BAM Nuttall Limited	Engineer.	AIVIECE	al OK Liu	Coordinates:	529919.50E 183652.60N		
Description	Legend De (n	pth O.D. Level (m)	Sample Test Type Depth	Casing Water	T4 D4	s Installations	
Stiff brownish grey very high strength brownish grey closely fissured locally thinly laminated CLAY. Rare thin sandy clay bands. [LONDON CLAY FORMATION] Borehole Complete at 20.50 m	20	5.88	(m) UT54 20.00-20.45 D55 20.45-20.50		44 blows		
Hole Diameter Detail Chiseling Details		Water	1	vel Observati Standi		Depth	
Diameter Depth Casing From To Time (mm) (m) Depth (m) (m) (m) (hours) 200 4.50 3.00	Date 01/06/12	Strike (m) Time (mins) Level ((m) Depth (m	Sealed (m)	
150 20.00 4.50	01/06/12 01/06/12 01/06/12 01/06/12	12.50 12.50 12.50 12.50	5 10 15 20	11.40 11.40 11.40	4.50 4.50 4.50 4.50	14.00 14.00 14.00 14.00	
Dates: 31/05/2012-01/06/2012 Plant: Dando 2000 Drilled By: A. Elshof Logged By: J. Tomalin Checked By: P. Lewin			ug from GL to 1.20 ackfilled with bento				