



PROCRESS         STRATA         SAMPLES & TESTS           Date         3/2         3/2         Lored (mOD)         Logad (mode)         Stata Description         Perind         Type Test         Feeded         Feeded </th
Date     E     Local (m)D     Legan (m)D     Depter (m)D     Test (m)D     Test (m)D       N(11)10     I     I     I     I     I     I     Image: Second S
Control       Control       No       Result         2811/16       2       2       1000       3       4       <

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



**Borehole** No

L		U Da	ite Com	pleted	29/11/16	Ground Level (mOD) 3.54	Co-Ordina E 5429 Method/	res 209.9 N 18	E 542909.9 N 180291.6 Method/			
	ondo	n Cit	y Airp	ort Li	mited		Plant Used	Cable Per	rcussion	n sinc	2 of 4	
PRC	DGRE	SS			ST	<b>TRATA</b>		SAMPLI	ES & T	ESTS	Field	nent/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	1	Depth (m)	Type No	Test Result	Records	Instrun
28/11/16	12.00	1.00	-7.96	× × × × × × × × × × × × × × × × × × ×	11.50	Very soft, dark grey SILT with hydrocarbon odour. (DOCK SEDIMENT) 12.00 becoming soft and slig Gravel is angular to subangular medium flint	strong ht gravelly. fine to	11.50 11.50 11.50-12.00 12.00 12.00 12.00 12.00-12.50	ES01 B02 ES03 B04	NI	VOC 0.7ppm 0, 0 / 0, 1, 0, 0 VOC 0.8ppm	X A X A X A X A X A X A X A X A X A X A
28/11/16	13.00	1.20	-9.26	× × × × × × × × × × × × × × × × × × ×	12.80	Dark grey angular to well round coarse silty flint GRAVEL with hydrocarbon odour and rare wo (<25mm). (RIVER TERRACE DEPOSIT:	led fine to strong od fragments	12.80 13.00 13.00 13.00 13.00-13.50	D05 ES06 B07	N26	5, 7 / 7, 7, 7, 5 VOC 0.3ppm	
28/11/16	14.00	1.00	-10.21		- 13.75	13.00 becoming sandy with r well rounded flint cobbles. San coarse Dark brown angular to well rou coarse very sandy flint GRAVE angular to subangular flint cobb fine to coarse. (RUVER TERRACE DEPOSIT:	are angular to d is fine to nded fine to L with rare oles. Sand is	13.75 14.00 14.00 14.00 14.00 14.00-14.50	D08 ES09 B10	N21	3, 4 / 4, 6, 5, 6 VOC 0.4ppm	
28/11/16	15.00	1.40			(2.45)		5,	14.75 15.00 15.00-15.50	D11 B12	N32	3, 5 / 7, 7, 8, 10	
28/11/16	16.00	1.60	-12.66		- 16.20	15.75 becoming sandy Light grey fine slightly claycy S	AND.	15.75 16.00 16.00-16.20	D13	N50/ 210 mm	5, 7 / 12, 19, 19	
						(THANET SAND FORMATIO SAND)	N: THANET	16.20-16.50 17.00	B15 D16			X//X//X
28/11/16	16.60	1.10			- - - -			17.50 17.50	D17	N50/ 90 mm	11, 14 / 36, 14	
28/11/16 29/11/16 29/11/16	16.60 16.60 16.60	0.95 0.95 1.10				18.00 becoming clayey		19.00	B18	N50/ 210 mm	5, 10 / 14, 17, 19	
								- 19.00 19.50-20.00	B20			

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk

Report ID: CONCEPT CABLE PERCUSSION || Project: 162900 - LONDON CITY AIRPORT.GPJ || Library: CONCEPT LIBRARY - 2017.GLB || Date: 3 March 2017



Borehole No

Job No 10 Client	5/2900	Da Da	ate Started ate Completed	28/11/16 29/11/16	Ground Level (mOD) 3.54	Co-Ordina E 5429	tes 909.9 N 18	0291.6	Fin	al Depth 33.00m		
L	ondor	ı Cit	y Airport L	imited		Plant Used	Cable Per	cussion	Sne	3 of 4	f 4	
PRO	)GRE	SS		ST	RATA		SAMPLE	CS & T	ESTS		ent/	
Date	Casing	$\begin{array}{c c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array} \end{array} \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \\ \end{array} \end{array} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \begin{array}{c} \end{array} \\ \end{array} \end{array} \end{array} \begin{array}{c} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \end{array} \end{array} \begin{array}{c} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \end{array} \end{array} \\ \end{array} \end{array} \end{array} \end{array} \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \end{array} \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \end{array} \\ \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \\ \end{array} \\ \end{array} \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \\ \end{array} \\ \\ \\ \\ \end{array} \\ \\ \\ \\ \\ \\ \\ \end{array} \\$				n	Depth (m)	Type No	Test Result	Records	Instrum	
29/11/16	16.60	1.00					20.50 20.50 21.00-21.50	D21 B22	N50/ 230 mm	5, 11 / 14, 13, 16, 7		
29/11/16	16.60	1.30					22.00	022	N50/ 265 mm	6, 8 / 11, 13, 15, 11		
							22.00 22.50-23.00	D23 B24	205 1111			
29/11/16	16.60	0.60			24.00 becoming very clayey		23.50 23.50 24.00-24.50	D25 B26	N50/ 230 mm	5, 9 / 12, 15, 18, 5		
29/11/16	25.00	0.30					25.00 25.00 25.50-26.00	D27 B28	N47	6,8/9,11,14,13		
29/11/16	25.00	0.90					26.50 26.50 27.00-27.50	D29 B30	N45	4,7/8,11,12,14		
29/11/16	25.00	0.50	-24.46	27.60 (0.40) 28.00	Black angular to subangular fir rinded flint GRAVEL with rard flint cobbles. (THANET SAND FORMATIC	ne to coarse e black rinded DN: /	27.60-28.00 28.00 28.00	B31 D32	N34	4, 5 / 7, 8, 9, 10		
29/11/16	25.00	1.10		· · · · · · · · · · · · · · · · · · ·	BULLHEAD BED) White CHALK recovered as: fi gravelly SILT. Gravel compris subangular fine to medium, ex- low density chalk fragments. (SEAFORD CHALK FORMA 28.50 [NI] recovered as: ang subangular fine to coarse very with occasional angular to sub rinded flint cobbles. Gravel is weak, low density white chalk 29.50 [NI] recovered as: firm	rm, slightly es angular to remely weak, TION) ular to silty GRAVEL angular black extremely fragments a, white SILT	28.50-29.00 29.50 29.50 30.00 30.50	B33 D34 B35	N37	3, 5 / 7, 9, 9, 12		

London, W3 0RF Telephone: 0208 E-mail: si@cond	8812880 eptcons	)_ ultants.co.uk			Carried State	UKA5		KAS MARINT STANS	BH24	
Project CADI	P Su	rvevs Gro	und Inv	estigation (Dock)	- Phase 2					
Job No 16/290		ate Started ate Complete	28/11/16 d 29/11/16	5 <b>Ground Level (mOD</b> 3.54	) Co-Ordina E 5429	tes 909.9 N 18	30291.6	Fin	al Depth 33.00m	
Client Londo	n Cit	ty Airport I	Limited		Method/ Plant Used	Cable Per	rcussior	n She	et 4 of 4	
PROGR	ESS		ST	TRATA		SAMPLE	ES & T	ESTS		ent/
Date Casing	Water	Level (mOD) Leger	nd Depth (Thickness)	Strata Descripti	on	Depth (m)	Type No	Test Result	Field Records	Instrum Backfil
29/11/16 25.00 29/11/16 25.00 29/11/16 25.00	1.30 1.10 1.10			30.00 recovered as: GRAV weak, medium density chalk f rare cobble size moderately w density chalk fragments 31.00 [NI] recovered as: fr 32.00 with no chalk cobble 32.50 [NI] recovered as: fr End of Borehole	EL comprising fragments with eak, medium m, white SILT s m, white SILT	31.00 31.50-32.00 32.50 32.50	D36 B37	N50/ 295 mm N48	4,9/11,13,11,15 5,8/10,12,13,13	
Issue No: 01	Ch	necked By: A	N Approv	ved By: OS Log Print	Date & Time:	03/03/2017	17:46		AGS	NONCESS AND

6 7 6 7

**Borehole** No

CONCEPT





**BH25** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	22/11/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	23/11/16	4.31	E 542968.5 N 180348.4	32.00m

	BOREHOLE SUMMARY												
Top (m)	Top (m)Base (m)TypeDate StartedDate EndedCrewLogged ByCore Barrel 									SPT Hammer Reference			
0.00	32.00	СР	22/11/2016	23/11/2016	SW	СВ				Dando 175	AR909		
	WA	TER S	TRIKES		WA	FER ADI	DED	CH	ISELLIN	G/SLOWI	RILLING		
64	D' 4.	T	. n	S 41 S 1. 4	E	T		Enom	То	Duration	n 1		

Strike at	Rise to	Time to Rise	Casing Depth	Sealed	From	To	From	To	Duration	Remarks
(m)	(m)	(min)	(m)	(m)	(m)	(m)	(m)	(m)	(hr)	
							22.10 28.55	22.40 28.90	0:30 0:45	Gravel Gravel

		HOI	LE				CAS	SING		]	ROTARY	RECOV	ERY
Dept	h (m)	)	Dian	neter (r	nm)	Dept	h (m)	Dia	meter (mm)	From (m)	To (m)	Blows	Recovery (%)
0.0 16 32	00 .50 .00			200 200 150		0.0 15. 18.	)0 10 00		200 200 150				
			RO	TARY	Y FI	LUSH DE	TAIL						
From (	m)	To (r	n) I	Flush T	ype	Flush R	eturn (%)	Fl	ush Colour				
		]	NST	ALL	ATI	ON DET.	AILS						
Гуре	Dian (m	meter 1111)	Dep Instal (1	th of llation n)	Resj	Top of ponse Zone (m)	Bottor Response (m)	n of e Zone )	Date of Installation				
			E	BACK	FIL	L DETA	ILS						
Toj (m	р )		Bottor (m)	n		Material		Bacl	xfill Date				
11.90	0		32.00		Cem	ent / Bentoni	ite Grout	23/	11/2016				
e No:	01	Ch	ecked	By: /	AN	Approved	By: OS	Log	g Print Date & Ti	me: 03/03/20	17 17.43		102





**BH25** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 23/11/16

4.31

22/11/16 Ground Level (mOD) Co-Ordinates E 542968.5 N 180348.4

**Final Depth** 

32.00m

		PROGR	ESS					SPT DETAIL	S	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks	Тур	e Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 22/11/16 23/11/16 23/11/16 23/11/16 23/11/16	0.00 12.50 13.50 14.50 15.50 16.50 18.00 19.50 21.00 22.50 24.00 25.50 27.00 27.50 27.50 27.50 28.50 30.00 31.50 32.00	12.50 13.50 14.50 15.10 15.10 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00	$\begin{array}{c} 1.00\\ 1.10\\ 1.30\\ 1.00\\ 1.20\\ 0.90\\ 1.10\\ 1.00\\ 1.40\\ 1.00\\ 1.10\\ 0.90\\ 0.90\\ 0.95\\ 1.00\\ 1.10\\ 1.40\\ 1.40\\ 1.40\\ \end{array}$	see Remark 3	C C C C S S S S S S S S S S S S S S S S	12.50 13.50 14.50 15.50 16.50 18.00 19.50 21.00 22.50 24.00 25.50 27.00 28.50 30.00 31.50	N12 N14 N19 N34 N50/0.295 N44 N45 N33 N23 N25 N36 N36 N36 N36 N36 N37	2, 2 / 3, 3, 3, 3 3, 4 / 4, 3, 4, 3 5, 6 / 5, 5, 4, 5 4, 5 / 6, 8, 10, 10 4, 5 / 9, 10, 14, 17 4, 6 / 8, 10, 12, 14 3, 5 / 9, 9, 13, 14 4, 5 / 7, 8, 8, 10 3, 4 / 5, 7, 6, 5 2, 3 / 5, 6, 6, 8 3, 4 / 4, 11, 10, 11 5, 7 / 9, 10, 8, 9 9, 14 / 20, 19, 11 4, 6 / 8, 9, 11, 11 4, 6 / 7, 9, 10, 11	12.50 13.50 14.50 15.10 15.10 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00 18.00	$\begin{array}{c} 1.00\\ 1.10\\ 1.30\\ 1.00\\ 1.20\\ 0.90\\ 1.10\\ 1.00\\ 1.40\\ 1.00\\ 1.10\\ 0.90\\ 1.00\\ 1.10\\ 1.40 \end{array}$
GENERAL         1. Borehole ca         2. Clearnance bi         3. Water prese         4. Ø200mm ca         15.00m and 16         SAMPLES         ES       Environm         U       100mm D         UT       - 100mm D         U38       - 38mm D         D       - Disturbed         C- Core Sam       INSTALLATION         SPGW       - Ground         SPGW       - Ground         SPGW       - Inclino         TESTS       SUSPE         Note:       All depths	ental Sample (Tub, V and the second s	rial, Jar) Sample ndisturbed Sample Sample ndisturbed Sample pipe IP Standpipe IP Standpipe IP DC P.P.Pocket Penetronn neters in millimetres,	els are recorded i tallation through 5.10m depth. B Ø150mm casing Ø150mm casing Sample, BLK-Block 3 (TYPES Inspection Pit, TP-1 Cable Percussion, R -Dynamic Sampling, Diamon Corring, C	relative to the pontoon le the dock. entonite scal inserted be g to 18.00m depth. Sample rial Pit TT - Trial Trench C. Rotary Corring, R/S-Rotary/ DS/R-Dynamic Sampling, Ro P/R-Cable Percussion Rotary 1 P/R-Cable Percussion Rotary 1 P/R-Cable Percussion Rotary 1	evel. tween Sonic rary follow on eviations see Key					
ssue No: 0	1 Check	ed By: AN	Approv	ed By: OS	Log Print Dat	& Time:	03/03/20	017 17:44		AGS HERROR PERS





C Project	ADP	Su	rveys (	Grou	nd Inve	estigat	ion (Dock)	- Phase 2						
Job No	(200)	Da	ite Start	ted	22/11/16	Groun	d Level (mOE	) Co-Ordina	ites		Fin	al Depth		
	3/ 290	U Da	ite Com	pleted	23/11/16		4.31	E 542	968.5 N 18	0348.4		32.	00m	
Client	ondo	n Cit	y Airp	ort Li	imited			Method/ Plant Used	Cable Per	rcussion	n She	et 1	of 4	
PRC	OGRE	CSS			ST	RATA		ł	SAMPLI	ES & T	ESTS			ent/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)		Strata Descript	ion	Depth (m)	Type No	Test Result	Fiel Reco	ld rds	nstrum 3ackfill
22/11/16						Water.			-					
					E I				Ę					
									- - -					
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					(11.90)				-					
					-				-					
					E I				-					
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									-					
									-					
					F				F					
					E				E E					
					<u>-</u>				<u> </u>	<u> </u>				
Issue No	: 01	Ch	ecked By	: AN	Approve	ed By: C	DS Log Prin	t Date & Time:	03/03/2017	17:46			AGS	No. of Concession, Statistics

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**Borehole No** 

Extract City First First City         STRATA         SAMPLES & TESTS           PROCESS         Strato Legend         Depth         Type         Test         Records           220116         12.50         Low         Legend         Depth         Type         Test         Records         Field	Job No 16 Client	5/2900		ate Start ate Com v Airn	ted pleted ort Li	22/11/16 23/11/16 mited	Ground Level (mOD) 4.31	Co-Ordina E 5429 Method/ Plant Used	tes 968.5 N 18 Cable Pe	30348.4 rcussior	Fin She	al Depth 32.00m eet 2 of 4	
Date $\frac{9}{80}$ $\frac{9}{80}$ $\frac{9}{80}$ $\frac{1}{80}$ Depth (maxaes)         Depth (maxaes)         Depth (maxaes)         Test (maxaes)	PRC	OGRE	SS			ST	RATA		SAMPLI	ES & T	ESTS		nt/
22/11/6         1.50         1.10         Soft dark gey very gravely SLT with strong (1.90, 10.00, 11.90)         EB01 D02 <th< th=""><th>Date</th><th>Casing</th><th>Water</th><th>Level (mOD)</th><th>Legend</th><th>Depth (Thickness)</th><th>Strata Descriptio</th><th>n</th><th>Depth (m)</th><th>Type No</th><th>Test Result</th><th>Field Records</th><th>Instrume</th></th<>	Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Descriptio	n	Depth (m)	Type No	Test Result	Field Records	Instrume
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	22/11/16	12.50	1.00	-7.59 -7.99	× × × × × × × × × × × × × × × × × × ×	11.90 (0.40) 12.30	Soft, dark grey very gravelly SI hydrocarbon odour and viscous Gravel is angular to well round coarse flint. (DOCK SEDIMENT) Brown, very sandy angular to v fine to coarse flint GRAVEL w	LT with strong texture. ed fine to /ell rounded ith occasional	11.90 11.90 11.90-12.40 12.50 12.50 12.50 12.50	ES01 B02 ES03 B04	N12	VOC 0.0ppm 2, 2 / 3, 3, 3, 3 VOC 0.3ppm	
22/11/16  14.50  130  130  14.50  15.50	22/11/16	13.50	1.10			(2.40)	(RIVER TERRACE DEPOSIT 13.25 becoming sandy with	narse. ) no cobbles	13.25 13.50 13.50 13.70 13.70-14.00	D05 ES06 B07	N14	3, 4 / 4, 3, 4, 3 VOC 0.9ppm	
22/11/16       15.10       1.00       Image: Constraint of the second	22/11/16	14.50	1.30	-10.39		- 14.70	14.25 with rare flint cobbles Light grey clayey silty fine SA	ND:	14.25 14.50 14.50-14.70 14.70-15.00	D08 B09 B10	N19	5, 6 / 5, 5, 4, 5	
22/11/16       15.10       1.20	22/11/16	15.10	1.00				(THANET SAND FORMATIC SAND)	N: THANET	15.25 15.50 15.50	D11 D12 B13	N34	4, 5 / 6, 8, 10, 10	
22/11/16       18.00       0.90       17.00 - 17.50 becoming very clayey       17.00 - 17.50 becoming very clayey         22/11/16       18.00       0.90       18.00       18.00       16         18.00       1.10       19.50       19.50       19.50       19.50         19.50       19.50       19.50       19.50       19.50       19.50         19.50       19.50       19.50       19.50       19.50       19.50	22/11/16	15.10	1.20						16.50 16.50	D14 B15	N50/ 295 mm	4, 5 / 9, 10, 14, 17	
22/11/16 18.00 1.10 19.50 becoming very clayey 19.50 D18 N45 3, 5/9, 9, 13, 14	22/11/16	18.00	0.90			(7.40)	17.00 - 17.50 becoming very	clayey	18.00 18.00 18.50-19.00	D16 B17	N44	4,6/8,10,12,14	
	22/11/16	18.00	1.10				19.50 becoming very clayey		19.50 19.50 20.00-20.50	D18 B19	N45	3, 5 / 9, 9, 13, 14	

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Report ID: CONCEPT CABLE PERCUSSION || Project: 162900 - LONDON CITY AIRPORT.GPJ || Library: CONCEPT LIBRARY - 2017.GLB || Date: 3 March 2017



**Borehole No** 

Project C	ADP	• Su	rvevs Grou	ind Invo	estigation	(Dock) -	Phase 2			•		
Job No		D	ate Started	22/11/16	Ground Le	vel (mOD)	Co-Ordina	tes		Fin	al Depth	
10	5/290	0   D	ate Completed	23/11/16	4.3	1	E 542	968.5 N 18	0348.4		32.00m	
Client L	ondo	n Ci	ty Airport L	imited	·		Method/ Plant Used	Cable Per	rcussion	ı She	et 3 of 4	
PRO	)GRE	SS		ST	'RATA			SAMPLE	ES & T	ESTS		nt/
Date	Casing	Water	Level (mOD) Legend	d Depth (Thickness)	Strat	a Description	l	Depth (m)	Type No	Test Result	Field Records	Instrume Backfill
22/11/16	18.00	1.00			21.50 - 22.00 Gravel is anoula	becoming sligh	tly gravelly.	21.00 21.00 21.50-22.00	D20 B21	N33	4, 5 / 7, 8, 8, 10	
22/11/16	18.00	1.40		22.10 2 22.40	Black angular to rinded flint GRA flint cobbles. (THANET SANI BULLHEAD BE White CHALK n slightly oravelly	subangular fin subangular fin VEL with occa D FORMATIO D) covered as: fin	e to coarse usional rinded N:	22.10-22.50 22.50 22.50 23.00-23.50	B22 D23 B24	N23	3,4/5,7,6,5	
22/11/16	18.00	1.00			weak, low densit to coarse chalk fi (SEAFORD CH 23.00 - 23.50 subangular fine to occasional flint b Gravel comprise density white char rounded black rit	y angular to sul agments. ALK FORMAT [NI] recovered o coarse silty C olack rinded flin s extremely we: alk fragments a nded flint	bangular fine TON) as: angular to iRAVEL with at cobbles. ak, medium nd angular to	24.00 24.00 24.50-25.00	D25 B26	N25	2, 3 / 5, 6, 6, 8	
22/11/16	18.00	1.10			25.00 [NI] rec subangular fine t rare cobble size i density white ch comprises extren white chalk fragg 25.50 gravel b subangular fine t	overed as: angu o coarse silty C noderately wea alk fragments. nely weak, med nents and blacl ecoming angul o coarse black	ilar to FAVEL with k, medium Gravel ium density c rinded flint ar to rinded flint	25.50	D27	N36	3,4/4,11,10,11	
22/11/16	18.00	0.90			26.50 [NI] rec subangular fine t rare cobble size r density white ch compress extrem	overed as: angu o coarse silty C noderately wea ilk fragments.	ılar to iRAVEL with k, medium Gravel sak medium	26.50 27.00 27.00	D28 D29	N36	5,7/9,10,8,9	
22/11/16 23/11/16	18.00 18.00	0.90 0.95			density white char rinded flint 27.00 gravel b subangular fine t medium density black rinded flin 27.50 [NI] rec	alk fragments a ecoming angul o medium extre chalk fragment t overed as: mod	nd black ar to emely weak, s and rare erately weak,	27.50-28.00	B30			
23/11/16	18.00	1.00			medium density white chalk COE cobble size weak fragments and ar rinded flint 28.50 with any rinded flint cobb	angular to suba BLES with occ , medium dens gular to roundo gular to subang les	ngular silty asional ity chalk ed black ular black	28.50	B31	N50/ 180 mm	9, 14 / 20, 19, 11	
					29.50 [NI] rec subangular fine t	overed as: angu o coarse silty C	ılar to iRAVEL with k medium	29.50	D32			
23/11/16	18.00	1.10		<u>+</u>	Tate COUDIE SIZE I	inducianciy wea	a, incuiuili	<u>† 30.00</u>		N39	4,6/8,9,11,11	K///>
Issue No	: 01	Cl	hecked By: AN	Approv	ed By: OS	Log Print D	Date & Time:	03/03/2017	17:46		AGS	Contraction of the second seco

Unit 8 Wa London, Telephor E-mail: s	arple Mey W3 0RF ne: 02088 si@conce	vs, Wal 312880 ptcons	PT rple Way	ık				R	UKAS NEVERANIA OOT		KAS CHANNY 101	Borehole No BH25	
Project	t CADP	Sui	rveys	Grou	nd Inv	estigation (	(Dock) -	Phase 2					
Job No		Da	te Start	ed	22/11/16	Ground Lev	el (mOD)	Co-Ordina	tes		Fin	al Depth	
	6/2900	J Da	ite Com	pleted	23/11/16	4.31		E 5429	968.5 N 18	0348.4		32.00m	
L	ondor	n Cit	y Airp	ort Li	mited			Plant Used	Cable Per	rcussion		et 4 of 4	
PRO	OGRE	SS			ST	TRATA			SAMPLE	ES & T	ESTS		lent/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata	Descriptior	1	Depth (m)	Type No	Test Result	Records	Instrum Backfil
23/11/16 23/11/16	18.00	> 1.40 1.40	-27.69		32.00	density white chal rinded flint. Grav weak, medium der and black rinded f 30.00 [NI] reco gravelly SILT. Gr subrounded fine to End of Borehole	k fragments a el comprises o asity white ch lint vered as: soft, avel is angula o coarse black vered as: whit avel is angula o coarse black	nd black extremely alk fragments white slightly r to rinded flint e slightly r to .rinded flint		D33 B34 D35	N37	4,6/7,9,10,11	
Issue No	»: 01	Ch	ecked By	AN	Approv	red By: OS	Log Print D	Date & Time:	03/03/2017	17:46		AGS	ECHANGE AND ADDRESS OF

Report ID: CONCEPT CABLE PERCUSSION || Project: 162900 - LONDON CITY AIRPORT.GPJ || Library: CONCEPT LIBRARY - 2017.GLB || Date: 3 March 2017





BH25R

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	23/11/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	28/11/16	4.31	E 542970.6 N 180356.4	32.00m

				BOREH	HOLE S	SUMMAI	RY				
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core (n	Barrel 1m)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00 14.50	14.50 32.00	DS RC	23/11/2016 24/11/2016	23/11/2016 28/11/2016	TC TC	CB CB	1	12	PDC	Geotec 350 Geotec 350	AR779 AR779
	WA	TER S	TRIKES		WA	FER ADI	DED	СН	ISELLIN	G / SLOW D	RILLING
64.71	D' 4-	Time			Erro	T		Energy	Tr.	Duration	- ·

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks

	]	HOL	Æ			CAS	SING			R	OTARY	RECOV	ERY
Dept	h (m)		Diar	meter (mn	1) Dept	th (m)	Dia	meter (mm)		From (m)	To (m)	Blows	Recovery (%)
0.0 14. 32.	00 .50 .00			150 150 146	0. 14	00 .50		150 150		12.20 12.70 13.50 14.50 16.50	$12.70 \\ 13.50 \\ 14.50 \\ 16.50 \\ 17.00 $		$     \begin{array}{r}       100 \\       100 \\       100 \\       0 \\       100     \end{array} $
			RO	TARY	FLUSH DE	TAIL	•			17.00 18.50	18.50		87
From (I	m)	To (m	ı)   I	Flush Typ	e Flush R	eturn (%)	) Fl	ush Colour		20.00	21.50		100
14.50 16.50 17.00 18.50 20.00	.50         16.50         Water           .50         17.00         Water           .00         18.50         Water           .50         20.00         Water           .00         32.00         Water		90 80 90 30					23.00 24.50 26.00 27.50 28.80 30.40	24.50 26.00 27.50 28.80 30.40 32.00		100     100     100     100     69     100     100		
	I	I	NST	TALLA	TION DET	AILS							
Туре	ype Diameter (mm) Depth of Installation (m) Cop of Response Zone (m)						Date of Installation						
			F	BACKF	ILL DETA	ILS							
Toj (m)	p )	E	Bottoı (m)	m	Material		Bacl	kfill Date					
12.20	Top (m)         Bottom (m)           12.20         32.00         Ceme		ement / Benton	ite Grout	28/	11/2016							
ssue No:	01	Che	ecked	By: Al	Approved	By: OS	Log	g Print Date & T	ime:	03/03/201	7 17:43		AGS tamenous an interest





BH25R

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No 16/2900 Date Started Date Completed 28/11/16

4.31

23/11/16 **Ground Level (mOD) Co-Ordinates** 

E 542970.6 N 180356.4

**Final Depth** 32.00m

		PROGR	ESS						SPT DETAIL	S	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks	s	Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
23/11/16 23/11/16 24/11/16 24/11/16 28/11/16 28/11/16	0.00 14.50 14.50 20.00 20.00 32.00	12.50 12.50 14.00 14.50 14.50	2.80 0.90 6.10 1.70	Rotary flush		C C S S S S S S S S S S S S	$\begin{array}{c} 12.70\\ 13.50\\ 17.00\\ 20.00\\ 21.50\\ 23.00\\ 24.50\\ 26.00\\ 27.50\\ 28.80\\ 30.40\\ \end{array}$	N19 N20 N35 N46 N45 N50/0.17 N50/0.08 N50/0.155 N50/0.245 N50/0.16	1, 2 / 4, 4, 7, 4 2, 2 / 5, 6, 5, 4 2, 4 / 6, 7, 11, 11 3, 7 / 7, 11, 13, 15 3, 6 / 8, 9, 12, 16 4, 6 / 12, 24, 14 25 / 50 18, 7 / 42, 8 8, 17 / 29, 17, 4 6, 6 / 8, 9, 20, 13 16, 7 / 20, 26, 4	12.00 12.00 14.00 14.00 14.50 14.50 14.50 14.50 14.50 14.50 14.50	
GENERAL 1. Borehole cc 2. Cleanance b 3. Dynamic sa thereaffer. 4. Water prese 5. Pressumme 5. Pressumme <b>KEY</b> <b>SAMPLES</b> EN Computer <b>SAMPLES</b> EN Computer <b>SAMPLES</b>	REMARKS rried out from a y UNO Magneto impling technique nt in the borehol er tests carried n statal Sample (Tub, V implication of the state of the state state of the state of the state of the state state of the state of the state of the state state of the state of the state of the state of the state state of the state of the stat	pontoon. All leve nucter probe. es used from 12.2 e from casing ins nt at 16.20m and	els are recorded r Om to 14.30m. R tallation through 19.10m	elative to the pontoon l otary boring carried an the dock.	level. II						
U - 100mm L UT - 100mm L U38 - 38mm D D - Disturbed - Core Sam INSTALLATION SPIE - Standp SPGW - Groum SPGW - Groum CWP - Vibrat ICM - Incline TESTS SC SPI Note: All depths	iameter Undisturbed iameter Thin Wall U ameter Undisturbed. Sample, Bulk San ple, W-Water Sample DE Piczometer water Monitor Stand molwaw Monitor Stand molwaw Monitor gwire Piczometer meter CPT, V-Shear Van- are in metres, all diar	Samplo ndisturbod Sample Sample byle, LB. Large Bulk t , R-Root Sample Pipe IP Standpipe DS DC PP Pocket Pencrom neters in millimetres,	Sample, BLK-Block S TYPES Inspection Pit, TP-Ti- Cable Percussion, R Dynamic Sampling, Diamond Coring, Cl acr, MP-Mad. nucli water strike rise time	iample c-Rolary Coring, R'S-Rolary DS-R-Dynamic Sampling, R- R-Cable Percussion Rolary Profig. VOC-Volacile Organi in minutes. For details of abb	/Sonic olary (ollow on <b>Commande</b>	-y	P. Timor				

	Unit 8 W London, Telepho E-mail:	Varple W3 0 one: 02 si@cc	Mews RF 20881 Incept	, Wa 2880 cons	P rple )_ ultar	Way	/ :o.uk								No. 1	R	UKA WARANA SHARANA 001			JKAS SYSTEMS	,	Bor B	ehole	No R	
	(	CAI	<b>DP</b> S	Sui	rve	eys	s Gi	rou	nd I	nves	tiga	tion	(D	ock)	- Ph	ase 2									
	Job N 1	o 6/29	900	Da Da	ate ate	Sta Co	rted mple	ted	23/11 28/11	/16	Grou		evel (1 2 1	mOD)	Co	Ordina	ates	6 N 10	0256	4	Fin	al De	pth 32.00-		
	Client	ond	lon		two		mor	+ T i	imite	d		4.3	,1		Met Plat	thod/ thod/	Dy	namic S: Rota	amplin rv	+ 1g /	She	et	1 of	4	
			222		.y I		por			u STR	ΔΤΔ							SAMPI	FS &	T	ESTS	1	1 01	•	Ĺ,
	Date	asing	Vater 5	CR %	CR %	QD %	Level (mOD)	egend	Depth (Thickness)			Stra	ata De	scriptio	m			Depth (m)	Typ		Test Result		Field Recore	l ds	ıstrumer ackfill
CONCEPT ROTARY    Project: 162900 - LONDON CITY AIRPORT.GPJ    Library: CONCEPT LIBRARY - 2017.GLB    Date: 3 March 2017	23/11/16								(12.20)	Wate	Τ.						-         -								
Report ID:	Issue N	o: (	)1	Ch	leck	ed I	By:	AN	App	proved	By:	OS	Log	g Print I	Date &	Time:	03	3/03/2017	17:48				<u>I</u>	GS	n na geologica (h. j. Maleria dell'Alarti

Unit 8 W London, Telepho E-mail:	Varple   , W3 0  one: 02 si@co	Mews, RF 208812 ncepto	Warr 2880_ 2880_	PT ble Wa	ay co.uk							UKAS WALAUNT STREAMS 001	B	UKA UKA Markasan OO1	S	Borehole No BH25R	
Projec	et CAE	PP S	Sur	vey	's Gi	rou	nd Iı	ıve	stigation	(Dock) ·	Phase 2						
Job N	0 6/20	000	Da	te St	arted	tod	23/11	/16	Ground Le	vel (mOD)	Co-Ordinat	es			Fina	al Depth	
Client	:		Da				20/11	/10	4.3	<u> </u>	E 5429 Method/	070.6 Dyna	N 180. umic San	356.4 npling /	/ Shee	32.00m	
	Lond	lon (	City	y Ai	rpor	t Li	mite	d			Plant Used		Rotary	y : : : :		2 of 4	
PRO	GRE ූන	SS H	%	%		لم لو		STI	RATA			SA	AMPLE	ES & T	ESTS	Field	ment/ ill
Date	Casir	Wate	TCR (	SCR 9	(mOD)	Legen	Depth (Thickness)		Stra	ta Description	1		Depth (m)	No No	Result	Records	Backf
23/11/16 24/11/16 24/11/16	12.50	2.80	100 100 100 87 0		-7.89 -7.99 -8.14		- <u>12.20</u> - <u>12.30</u> - <u>12.45</u> - <u>(1.90)</u> - <u>14.35</u>	Soff stain (DC Ver fine San (RP 12.9. 13.4 13.4 13.4 14.2 Lial (TH	t, brown silty CL ning. DCK SEDIMEN' y soft, dark grey rocarbon odour. DCK SEDIMEN' k grey clayey ver to coarse flint Cd d is fine to coars VER TERRACE 20 becoming s 10 becoming s 10 becoming s 25 with no hyc 00 becoming v 11 with no hyc 00 becoming v 25 with rare ar the grey fine claye IANET SAND F	AY with frequ I) Very clayey SII <u>F</u> ) ry sandy angula iRAVEL with 1 ie. DEPOSIT) slightly sandy wandy rocarbon odou very sandy rgular to round trocarbon odou very sandy ngular to round rown ORMATION: '	ent dark grey T with strong r to well rounded nydrocarbon odour rith no clay ed flint cobbles r Ed flint cobbles THANET SAND)	r.	12.30 12.30 12.50 12.70 13.00 13.40 13.40 13.50 .50-14.00 13.90 13.90 13.90 16.20 .50-16.70 17.00 17.00 17.50	ES01 B02 ES03 ES04 B05 ES06 B07 D08 B09	N19 N20 N35	VOC 0.3ppm 1, 2 / 4, 4, 7, 4 VOC 0.7ppm VOC 0.0ppm 2, 2 / 5, 6, 5, 4 VOC 0.8ppm Pressuremeter tes at 16.20m depth 2, 4 / 6, 7, 11, 11 Pressuremeter tes at 19.10m depth 3, 7 / 7, 11, 13, 15	
Issue N	o: C	1	Che	cked	By:	AN	App	rove	d By: OS	Log Print I	Date & Time:	03/03	3/2017 1'	7:48		AGS	and as all dependences a

Report ID: CONCEPT ROTARY || Project: 162900 - LONDON CITY AIRPORT.GPJ || Library: CONCEPT LIBRARY - 2017.GLB || Date: 3 March 2017

Projec C	t CAE	P S	Sur	·V	eys	Gr	our	nd Ir	ive	stigation (Dock) -	Phase 2					
lob Na			Da	ite	Sta	rted		23/11	/16	Ground Level (mOD)	Co-Ordinates			Fina	ıl Depth	
1	0/25	00	Da	ite	Co	mple	ted	28/11	/16	4.31	E 542970	0.6 N 1803	356.4		32.00m	
Client L	ond	lon (	Cit	y .	Air	por	t Liı	miteo	1		Method/ D Plant Used	ynamic San Rotary	npling /	Shee	et 3 of 4	
PROC	GRE	SS							STI	RATA		SAMPLE	S & T	ESTS		
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)		Strata Description	1	Depth (m)	Type No	Test Result	Field Records	
/11/16	14.50	6.10						-	20.	00 becoming very clayey		- 20.00	D10			
							<u>·</u> . · . · <u>. · .</u> ·	-				-				K
			100				[		20 '	70 becoming clayey		- 20.70	B11			
								-	20.	, e in beechning enayey		-				
							_``	-				- - -				R
							·	-	21	50 becoming yerry clovey		- 21.50 - 21.50	D12	N45	3, 6 / 8, 9, 12, 16	
							· · · · ·	-	21	50 beebining very erayey		-				
						-17.79		- 22.10				-				
			100	23	20	-17.84		22.15/	Bla flin	ck angular to subangular mediu: t GRAVEL with rare angular to	m to coarse rinded subangular black	_				
						-18.29		22.60	\rinc	led flint cobbles. IANET SAND FORMATION: I	BULLHEAD BED)	22.65-23.00	C13			
									Wh	ite CHALK recovered as: silty a	ngular to with rare	- 23.00		N50/	4 6/12 24 14	
								-	mo	derately weak, medium density weak to	white chalk	- 23.00		170 mm	4,0712,24,14	
								-	mee	dium density white chalk fragme	ents and rare black	- 23.00	D14			
								-	(SE	AFORD CHALK FORMATIO	N r block rinded flint	- -				
			100	87	40			-	cob	bles	ad flint graval and	- - -				
								-	0000	asional chalk cobbles		-	D15			
							+	-	Stro (SE	ong, medium density white CHA AFORD CHALK FORMATIO?	√LK. ∛Ì	- 24.50-24.45	D15	N50/	25 / 50	
								-	22.0 23.0	60 becoming strong and medi 00 - 23.10 [NI] recovered as:	um density angular to	-		15 mm		
								-	sub wei	angular coarse GRAVEL. Grave	el is extremely	- 25.00-25.30	C16			
			100					-	23.2 to c	25 [NI] recovered as: angular coarse GRAVEL, Gravel is weak	to subangular fine	 - -				
			100	11	57			-	whi 23	ite chalk fragments 30 - 23 60 — with vertical fractu	res	-				
								-	24.2 sub	20 - 24.30 [NI] recovered as: angular fine to coarse GRAVEI	angular to Gravel	-				
								-	con fras	nprises weak, medium density w ements and black rinded flint	hite chalk	- 26.00		N50/	18, 7 / 42, 8	
									24. CO	40 [NI] recovered as: angular BBLES. Cobbles comprise mod	to subangular lerately weak	-	D17	80 mm		
									me	dium density white chalk fragme	ents and occasional	- 26.00 - -	D17			
			100	80	57				24. rare	50 with rare cobble size black	rinded flint and eak, low density	-26.80-27.10	C18			
								-	cha 24	lk fragments 65 with open horizontal fracti	ire and purple	-				
								-(9,40)	stai 24	ning 95 - 25.10 with purple stainin	g	- - -				
					$\square$			-	25. sub	30 - 25.40 [NI] recovered as:	angular to , with rare black	- 27.50		N50/ 155 mm	8, 17 / 29, 17, 4	
									rinc	led flint cobbles. Gravel comprisity white chalk fragments and	ises weak, medium	- 27.50	D19			
								-	blac 25	ck rinded flint 60 - 25.70 [NII recovered as:	angular to	-28.10-28.30	C20			
			100	65	58				sub	angular COBBLES with angula	r to subangular v white chalk	- -				
									gra	vel. Cobbles are angular to suba	ingular fine to	-				
									frag	250 graver size weak, meanum de gments 90 - 26.00 with 1No horizonte	al fracture with	- 28.80		N50/ 245 mm	6,6/8,9,20,13	
								-	25. pur	ple staining	ular to subangular	- 28.80	D21			
			60	20	<b>_</b> 1			-	med fl:	dium to coarse gravel and cobble	e size black rinded	-				
			69	58	31				26.4	45 with wide fractures	fine to medi	-				
									26. gra	vel size extremely weak, mediur	n density chalk	- 29.80-30.15	C22			
					1		LĽ "		шaş	gnents			1	1		_1

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Unit 8 Warple Mews London, W3 0RF Telephone: 020881 E-mail: si@concept	, Warple Way 2880_ consultants.co.uk		BH25R
Project CADP	Surveys Ground Investigation (D	ock) - Phase 2	I
Job No 16/2900	Date Started23/11/16Ground Level (Date Completed28/11/164 31	(mOD) Co-Ordinates E 542970 6 N 180356 4	Final Depth 32 00m
Client London	City Airport Limited	Method/ Dynamic Sampling / Plant Used Rotary	Sheet 4 of 4
PROGRESS	STRATA	SAMPLES & TE	ESTS H
Vater Vater	%     %     %     Level     Depth       W L C V C (mOD)     0 (mOD)     0 (mOD)     0 (mOD)     0 (mOD)	escription Depth (m) Type No F	Test Field Result Records
28/11/16 14.50 1.70	69       38       31         100       81       69         20       81       69         20       81       69         20       81       69         2100       81       69         22.00       7.0       27.40         27.30       27.40	subvertical fractures retical fracture horizontal and subvertical taining asional subvertical fractures wered as: angular to 'CRAVEL. Gravel is weak, alk fragments wered as: angular to 'very sity GRAVEL with citium density white chalk medium density white chalk horizontal fractures gravel size weak, chalk intal fracture infilled with dium to coarse black rinded al light grey staining r to subangular medium to gravel wered as: angular to 'GRAVEL. with rae locally k, medium density white weak, medium density white weak, medium density white weak, medium density white weak angular to 'GRAVEL. Gravel is weak, alk fragments tical fracture wered as: angular to 'GRAVEL. Gravel is weak, alk fragments tical fracture overed as: angular to 'GRAVEL. Gravel is weak, alk fragments o horizontal fracture overed as: angular to 'GRAVEL. Gravel is weak, alk fragments o wide open, vertical fracture o wide open, vertical fracture ''''''''''''''''''''''''''''''''''''	N50/ 160 mm 16, 7 / 20, 26, 4
Issue No: 01	Checked By: AN Approved By: OS Lo	og Print Date & Time: 03/03/2017 17:48	AGS intervention present

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**Borehole No** 

C•JOEPT





**BH26** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	30/11/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	01/12/16	4.41	E 542966.0 N 180322.2	32.00m

	BOREHOLE SUMMARY										
Top (m)	Top (m)Base (m)TypeDate StartedDate Ended					Logged By	Core (r	Barrel nm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	32.00	СР	30/11/2016	01/12/2016	SW	CB				Dando 175	AR909
·	WA		WA	WATER ADDED CHI			IISELLIN	G / SLOW D	RILLING		
Strike at	Rise to	Time to	Rise Casing	Depth Sealed	aled From To From To Duration Remai			Remarks			

Strike at	Rise to	Time to Rise	Casing Depth	Sealed	From	To	From	To	Duration	Remarks
(m)	(m)	(min)	(m)	(m)	(m)	(m)	(m)	(m)	(hr)	
							21.90 27.80 30.80	22.30 28.10 31.35	0:45 0:30 1:00	Gravel Gravel Gravel

	HOLE CASING								R	OTARY	RECOV	ERY	
Dept	th (m)	Di	ameter (	mm)	Dept	h (m)	Dia	meter (mm)		From (m)	To (m)	Blows	Recovery (%)
0.1 19 32	00 .00 .00		200 200 150		0.0 18. 22.	00 10 10		200 200 150					
	ROTARY FLUSH DETAIL												
From (	om (m)To (m)Flush TypeFlush Return (%)Flush Colour					ush Colour							
		INS	TALL	ATI	ON DET.	AILS							
Туре	e Diameter Depth of Installation (m)				Date of Installation								
		•	BACK	KFIL	L DETA	ILS			i				
To (m	р )	Bott (m	om I)		Material		Bacl	xfill Date					
11.9:	5	32.0	00	Cem	ent / Bentoni	te Grout	01/	12/2016					
ssue No:	01	Checke	d By:	AN	Approved	By: OS	Log	g Print Date & T	ïme:	03/03/201	7 17:43		AGS interview of the second





**BH26** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No 16/2900 Date Started Date Completed 01/12/16

4.41

30/11/16 Ground Level (mOD) Co-Ordinates E 542966.0 N 180322.2

**Final Depth** 

32.00m

	PROGRESS								SPT DETAILS	S	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks		Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 30/11/16 01/12/16 01/12/16 01/12/16 01/12/16	0.00 12.50 13.50 14.50 15.50 16.50 17.50 18.50 20.00 21.50 23.00 24.50 26.00 27.50 28.50 28.50 29.00 30.50 31.50 32.00	12.50 13.50 14.50 15.50 16.50 17.50 18.10 20.00 21.50 22.10 22.10 22.10 22.10 22.10 22.10 22.10 22.10 22.10 22.10 22.10	$\begin{array}{c} 1.00\\ 1.20\\ 1.50\\ 1.20\\ 1.80\\ 1.50\\ 1.10\\ 1.20\\ 1.40\\ 1.00\\ 1.40\\ 1.00\\ 1.40\\ 1.00\\ 1.20\\ 1.15\\ 1.05\\ 1.40\\ 1.60\\ 1.90\\ 1.90\\ \end{array}$	see Remark 3		СССС <b>я я я я я я я я я я</b> я я	$\begin{array}{c} 12.50\\ 13.50\\ 14.50\\ 15.50\\ 17.50\\ 18.50\\ 20.00\\ 21.50\\ 23.00\\ 24.50\\ 26.00\\ 27.50\\ 29.00\\ 30.50\\ 31.50\\ \end{array}$	N21 N18 N32 N24 N26 N39 N20 N32 N38 N21 N27 N41 N50/0.23 N48 N31 N50/0.285	4, 6 / 6, 5, 4, 6 3, 4 / 5, 4, 4, 5 4, 7 / 6, 9, 9, 8 3, 4 / 6, 7, 6, 5 4, 5 / 6, 6, 6, 8 4, 7 / 8, 9, 11, 11 4, 5 / 6, 5, 5, 4 2, 4 / 5, 7, 9, 11 3, 4 / 6, 8, 12, 12 4, 6 / 5, 5, 6, 5 5, 6 / 6, 7, 7, 7 6, 8 / 10, 9, 9, 13 7, 9 / 12, 14, 16, 8 7, 6 / 8, 10, 13, 17 4, 6 / 6, 7, 8, 10 6, 9 / 10, 13, 15, 12	12.50 13.50 14.50 15.50 16.50 17.50 18.10 20.00 21.50 22.10 22.10 22.10 22.10 22.10 22.10 22.10	$\begin{array}{c} 1.00\\ 1.20\\ 1.50\\ 1.20\\ 1.80\\ 1.50\\ 1.10\\ 1.20\\ 1.40\\ 1.00\\ 1.40\\ 1.00\\ 1.20\\ 1.40\\ 1.60\\ 1.90\\ \end{array}$
CENTRAL I. Borchole ca C. Clearnice b J. Water press A. Ø200mm ce IT.50m and 19 IT.50m and 19 KEX SAMPLES ES - Environm U - 100mm D U - Disturber ES - Samph SPTW - Groud SPTW - Standp C - Core Sam INSTALLATION SPTE - Standp SPTW - Groud SPTW - Groud SPTW - Groud SPTW - Standp ICM - Incline SPTW - Standp ICM - Incline SPTM - Incline S	REMARKS rried out from a y UNO Magneto It in the borchol ising used from r .00m and borcho of the borchol ising used from r .00m and borchol .00m and borchol ising used from r .00m and borchol .00m and borchol	pontoon. All leve tucter probe, e from casing ins jontoon level to 1 ole re-drilled with indisurbed sample milisurbed sample milisurbed sample sample pice. UB- Large Bulk 1 , R-Root sample DE Sample DE Large Bulk 2 , P-Pocket Parscreen meters in millimetres,	els are recorded r rallation through 8.10m depth. B Ø150mm casing Inspector Pit. Pro- Cable Percussion, R Dynamic Sampling, Diamond Coring, C rect, MP Mature rise time	elative to the pontoon le the dock. entonite scal inserted be to 22.10m depth. al Pit.TT - Trial Trench Canary Coring, RS Reary DSR-Dynamic Sampling (Roi PR-Capac) Percussion Rolary ( DR-Capac) Percussion Rolary ( DR	svel. tween Sonic any ollow on <u>Component</u> eviations see Ke	y					
ssue No: 0	1 Check	ed By: Al	Approv	ed By: OS	Log Print	Date &	& Time:	03/03/20	)17 17:44		AGS



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**Borehole No** 

Project	ADF	P Sui	rveys	Groui	nd Inve	estiga	tion (1	Dock) -	- Phase 2						
Job No		Da	ate Start	ed	30/11/16	Grou	ind Leve	l (mOD)	Co-Ordina	tes		Fin	al Depth		
	/290	0 Da	ate Com	pleted	01/12/16		4.41		E 542	966.0 N 18	30322.2		32.	00m	
Client	ondo	n Cit	y Airp	ort Li	mited				Method/ Plant Used	Cable Pe	rcussior	n She	et 1	of 4	
PRO	OGRE	ESS			ST	RATA	A			SAMPL	ES & T	ESTS			ent/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)		Strata ]	Description	n	Depth (m)	Type No	Test Result	Fiel Reco	d rds	nstrum 3ackfill
30/11/16					-	Water.				-					
					-					-					
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Issue No:	01	Ch	ecked By	: AN	Approve	ed By:	OS I	Log Print I	Date & Time:	03/03/2017	17:46			AGS	THE BOLLOW THE P

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



**Borehole No** 

Project C	ADP	Sui	rveys	Grou	nd Inv	estigation	(Dock) -	Phase 2					
Job No	6/290(	Da Da	ite Start	ted plated	30/11/16	Ground Le	vel (mOD)	Co-Ordinat	tes		Fin	al Depth	
Client				piereu	01/12/10	, <u> </u>	1	E 5425 Method/	966.0 N 18	50322.Z	She	32.00m	
L	ondor	n Cit	y Airp	ort Li	mited			Plant Used	Cable Per	rcussion	1	2 of 4	
PRO	DGRE	SS			ST	TRATA			SAMPLE	ES & T	ESTS	Ekald	nent/ II
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Stra	ta Description	L	Depth (m)	Type No	Test Result	Records	Instrun Backfi
30/11/16 30/11/16 30/11/16 30/11/16	12.50 13.50 14.50	1.00 1.20 1.50	-7.59 -8.09 -8.84	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c} 12.00 \\ (0.50) \\ 12.50 \\ (0.75) \\ 13.25 \\ (3.65) \end{array} $	Soft, dark brown with strong hydr (DOCK SEDIM) Dark grey sandy to costra fint Gl cobbles, rare poo and strong hydrc (RIVER TERRA Brown sandy an coarse fint GRA (RIVER TERRA 13.50 - 14.00	to dark grey cl ocarbon odour. ENT) angular to well XAVEL with oc exets of soft, dan carbon odour. CE DEPOSITS gular to well roo VEL. Sand is : CE DEPOSITS becoming very	ayey SILT rounded fine casional flim rk grey clay ) inded fine to fine to coarse. ) sandy	12.00 12.00 12.00 12.00-12.40 12.50 12.50 12.50 13.50 13.50 13.50 13.50 14.50-14.00 14.25 14.50 14.50-15.00 15.25 15.50	ES01 B02 ES03 B04 D05 ES06 B07 D08 B09 D10 B11	N21 N18 N32 N24	VOC 0.1ppm 4, 6 / 6, 5, 4, 6 VOC 0.1ppm 3, 4 / 5, 4, 4, 5 VOC 0.0ppm 4, 7 / 6, 9, 9, 8 3, 4 / 6, 7, 6, 5	
30/11/16 30/11/16	16.50 17.50	1.80	-12.49		- - - - - - - - - - - - - - - - - - -	Light grey very c (THANET SAN SAND)	layey fine SAN D FORMATIO	D: N: THANET	16.25 16.50 16.50-17.00 17.00-17.50	D12 B13 B14	N26 N39	<b>4</b> , 5 / 6, 6, 6, 8 <b>4</b> , 7 / 8, 9, 11, 11	
00/11/16	18.10	1.10	-13.79		[ (1.30) - 18.20	White CHALK r subangular fine t cobble size mod- chalk fragments. medium density rinded flint. (SEAFORD CH, 18.50 [NI] rec gravelly SILT. C subangular fine t 19.00 with occ medium density angular to subar	ecovered as: sil to coarse GRAV erately weak, m Gravel compri- chalk fragment: ALK FORMAT overed as: firm. Gravel is angula to medium blac. casional modera chalk fragment.	ty angular to /EL with rare edium density ses weak, s and black ION) white slightly r to k rinded flint ttely weak, s and rare led flint	17.50 18.20-18.50 18.50 18.50 19.00-19.50	D15 B16 D17 B18	N20	4,5/6,5,5,4	
5 <u>30/11/16</u>	20.00	1.20	ecked Br	· · ·	Approx	red By: 00	Log Print Γ	ate & Time	02/02/2015	17.46	N32	2,4/3,/,9,11	K///)
	· UI		unu Dy	$\cdot$ AN		0.00 $0.05$		and the finite.	05/03/2017	17:46		AGS	ADDIVISION OF TAXABLE

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk

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**Borehole No** 

Job No 16	5/290	Da Da	ate Started ate Completed	30/11/16 01/12/16	Ground Le	vel (mOD)	Co-Ordinat E 5429	tes 966.0 N 18	0322.2	Fin	al Depth 32.00m	
Client L	ondo	n Cit	y Airport Li	imited			Method/ Plant Used	Cable Per	rcussion	She	et 3 of 4	
PRC	)GRE	SS		ST	RATA			SAMPLE	ES & T	ESTS		ent/
Date	Casing	Water	Level (mOD) Legend	Depth (Thickness)	Stra	ta Description	L	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill
					cobbles 20.00 [NI] rec gravelly SILT. C subangular fine t medium density	overed as: firm, Gravel is angula to coarse moder chalk fragments	, white slightly r to ately weak, s	20.00	D19 B20			
30/11/16	21.50	1.40			21.50 [NI] rec gravelly SILT. C	overed as: firm, Fravel is angula	, white r to rinded flint	21.50 21.50	D21	N38	3, 4 / 6, 8, 12, 12	
					22.00 with oc black rinded flin	casional angula: t cobbles	r to subangular	<u>22.00-22.50</u>	B22			
30/11/16	22.10	1.00			23.00 [NI] rec gravelly SILT. (	overed as: firm, Gravel is angula	, white slightly r to	23.00 23.00	D23	N21	4, 6 / 5, 5, 6, 5	
					subangular fine ( weak, medium d 23.50 - 24.00	to coarse moder ensity chalk fra becoming very	ately weak to gments silty	23.50-24.00	B24			
30/11/16	22.10	1.40		- (13.80)	24.50 [NI] rec gravelly SILT. C subangular fine t weak, medium d	overed as: firm, Gravel is angula to coarse moder ensity chalk fra	, white slightly r to ately weak to gments	24.50 24.50 25.00-25.50	D25 B26	N27	5,6/6,7,7,7	
30/11/16	22.10	1.00			26.00 [NI] rec gravelly SILT. C subangular fine t density chalk fra 26.50 with rar rinded flint cobb	overed as: firm, Gravel comprise to coarse weak, gments and blau e angular to sub les	, white s angular to medium ck rinded flint bangular black	26.00 26.00 26.50-27.00	D27 B28	N41	6, 8 / 10, 9, 9, 13	
30/11/16	22.10	1.20			27.50 [NI] rec gravelly SILT. C subangular fine t 28.00 with no	overed as: firm, Gravel is angula to medium black chalk cobbles	, white slightly r to k rinded flint	27.50 27.50 28.00-28.50	D29 B30	N50/ 230 mm	7, 9 / 12, 14, 16, 8	
30/11/16 01/12/16	22.10 22.10	$\begin{array}{c} 1.15\\ 1.05 \end{array}$						-				
01/12/16	22.10	1.40			29.00 [NI] rec gravelly SILT. C subangular fine t density chalk fra	overed as: firm, Gravel comprise to coarse weak, gments and blac	, white slightly es angular to medium ck rinded flint	29.00 29.00 29.50-30.00	D31 B32	N48	7, 6 / 8, 10, 13, 17	
Issue No	: 01	Ch	ecked By: AN	Approve	ed By: OS	Log Print D	Date & Time:	03/03/2017	17:46		AGS	





Projec	t CADF	Su	rveys Gr	oui	nd Inv	estigation (Dock) ·	- Phase 2					
Job No 1	) 6/290	Da Da	ate Started ate Complet	ted	30/11/16 01/12/16	Ground Level (mOD) 4.41	Co-Ordinat	tes 266.0 N 18	0322.2	Fin	al Depth 32.00m	
Client L	ondo	n Cit	ty Airport	t Li	mited		Method/ Plant Used	Cable Per	rcussion	She	et 4 of 4	
PR	OGRI	ESS			ST	RATA	•	SAMPLE	ES & T	ESTS		nt/
Date	Casing	Water	Level (mOD) Leg	gend	Depth (Thickness)	Strata Description	n	Depth (m)	Type No	Test Result	Field Records	Instrume Backfill
01/12/16	22.10	1.60			-	30.00 [NI] recovered as: firm	ı, white SILT.	30.50 30.50	D33	N31	4, 6 / 6, 7, 8, 10	
01/12/16	22.10	1.90	27 59			<ul> <li>31.00 with rare cobble size v density chalk fragments</li> <li>31.50 [NI] recovered as: firm gravelly SILT. Gravel comprise subangular fine to coarse weak.</li> </ul>	weak, medium , white es angular to , medium	31.50 31.50	D35	N50/ 285 mm	6,9/10,13,15,12	
01/12/16	22.10	1.90	-27.59		32.00	ensity chalk fragments and bla End of Borehole	ick rinded flint					
Issue N	): 01	Ch	ecked By:	AN	Approv	ed By: OS Log Print I	Date & Time:	03/03/2017	17:46		AGS	to a defense fr. J





**BH27** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	25/01/17	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	27/01/17	4.88	E 542971.4 N 180248.9	33.00m

	BOREHOLE SUMMARY										
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core	Barrel nm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	33.00	RC	25/01/2017	27/01/2017	FD	СВ		112	PDC	Geotec 350	AR779
	WATER STRIKES WATER ADDED CH							ISELLIN	G / SLOW I	RILLING	
Strike at (m)	Rise to (m)	Time to (mi	n) Casing	Depth Sealed (m)	From To (m) (m)		From (m)	i To (m)	Duration (hr)	Remarks	

	HOLECASINGDepth (m)Diameter (mm)Depth (m)Diameter (meter (										R	OTARY	RECOVI	ERY
Dept	h (m)	Di	ameter (r	nm)	Deptl	n (m)	Dia	meter (mi	m)	F	rom (m)	To (m)	Blows	Recovery (%)
0.0 33.	00 .00		150 150		0.0 15.0	0 )0		150 150			13.50 15.00 16.50 18.00 21.00	$     15.00 \\     16.50 \\     18.00 \\     19.50 \\     22.50     $		0 0 0 80 20
		R	OTARY	FL	USH DE	TAIL					22.50	24.00		73
From (	m) To	o (m)	Flush T	ype	Flush Re	turn (%)	Fl	ush Colou	ır		25.50	27.00		100
13.50	Instruction         Finish Type         Finish Type         Finish Ketulin (7)           33.00         Water         100							27.00 28.50 30.00 31.50	28.30 30.00 31.50 33.00		100 33 53 80			
		INS	TALLA	ATIC	DN DETA	AILS								
Туре	The product of (mm)Depth of Installation (m)Top of Response Zone (m)Bottor (m)Image: transformed black of the product of (m)Image: transformed black of (m)Image: transformed black of (m)Image: transformed black of (m)				n of e Zone	Date o Installat	of tion							
			BACK	FIL	L DETA	ILS								
Toj (m)	p )	Bott (n	tom 1)	I	Material		Back	kfill Date						
13.50	0	33.0	00	Ceme	nt / Bentonin	e Grout	27/	01/2017						
ssue No:	01	Check	ed By:	AN	Approved	By: OS	Log	g Print Dat	e & Tin	ne:	03/03/201	7 17:43		AGS transmission at the second





**BH27** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 27/01/17

4.88

25/01/17 Ground Level (mOD) Co-Ordinates

E 542971.4 N 180248.9

**Final Depth** 33.00m

		PROGR	ESS				5				
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remark	S	Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
25/01/17 25/01/17 25/01/17 26/01/17 27/01/17 27/01/17	0.00 13.50 18.00 27.00 27.00 33.00	15.00 15.00 15.00 15.00 15.00		Rotary flush	1	S S S S S S S S S S S	16.50 18.00 19.50 21.00 22.50 24.00 25.50 27.00 28.50 30.00 31.50 33.00	N32 N26 N17 N22 N18 N14 N40 N45 N50/0.235 N44 N44 N31	3, 8 / 8, 7, 8, 9 2, 12 / 10, 7, 5, 4 2, 3 / 3, 5, 4, 5 5, 5 / 4, 5, 6, 7 3, 5 / 5, 5, 3, 5 3, 3 / 3, 4, 4, 3 7, 9 / 8, 9, 11, 12 6, 12 / 13, 8, 11, 13 5, 9 / 11, 15, 20, 4 8, 14 / 13, 11, 10, 10 5, 7 / 11, 11, 10, 12 2, 4 / 6, 7, 8, 10	$\begin{array}{c} 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\\ 15.00\end{array}$	
GENERAL         1. Borchole ca         2. Clearance b         3. Water prese         3. Water prese         Samples         ES         ENVIONT         U         100mm D         U	REMARKS rried out from a y UNO Magneto nt in the borehol maneer Undisturbed maneer Undisturbed maneer Undisturbed Sample, B-Ball San ple, W-Water Sample DETAILS pp Piezometer water Monitor Stand manware Monitor g Wire Piezometer meter CUT, V-Shear Yana.	ial, Jar) Sample ndisturbed Sample Sample ndisturbed Sample pipe. IB- Large Bulk ; R-Root Sample ED- Large Bulk ; R-Root Sample Dipt	L els are recorded i tallation through sample, BLK-Block S <b>TYPES</b> -Inspection Pin, TP-T- Cable Percussion, Pin, TP-T- Cable Percussion, Pin, TP-T- Cable Percussion, Pin, TP-T- Cable Stampling, Diamond Coring, C -Diamond Coring, C	elative to the pontoon the dock. sample rial Pit IT - Trial Trench C. Rotary Coring, R/S-Rotar DS/R-Dynamic Sampling // P/R-Cable Percussion Rotar P/R-Cable Percussion Rotar	level. y/Sonic Roary y follow on ne Contranta						
Note: All depths	are in metres, all diar	ed By: A	N Approv	in minutes. For details of abl	breviations see	Koy nt Date	& Time:	03/03/20	)17 17:44		AGS and a second

Unit 8 Warple Mews London, W3 0RF Telephone: 020881 E-mail: si@concept	, Warple Way 2880_ consultants.co.uk					UKAS UKAS 001		BH27	
Project CADP S	Surveys Gr	ound Inv	vestigation (Dock) -	Phase 2					
Job No 16/2900	Date Started Date Complet	25/01/17 ted 27/01/17	<ul> <li>7 Ground Level (mOD)</li> <li>7 4.88</li> </ul>	Co-Ordinates E 54297	s 1.4 N 1802	248.9	Final 1	Depth 33.00m	
Client London	Lity Airport	t Limited		Method/ Plant Used	Rotary	y	Sheet	1 of 4	
PROGRESS		S	ГКАТА		SAMPLE	CS & T	ESTS		nent/
Date Casing Mater	TCR % SCR % COD %	Depth (Thickness)	Strata Description	n	Depth (m)	Type No	Test Result	Field Records	Instrun Backfi
			Υ αU.1.						
Issue No: 01	Checked By:	AN Appro	ved By: OS Log Print I	Date & Time:	-  ]  ]	7:48		AGS time	nondra Pris

**Borehole No** 

Job Na 1	o 6/29	000	Da Da	ite ite	Sta Coi	rted mple	ted	25/01/ 27/01/	I7         Ground Level (mOD           17         4.88	) Co-Ordinate	s 1.4 N 180	248.9	Fina	al Depth 33.00m	
Client L	lond	lon	L Cit	<b>y</b> 4	Air	por	t Li	mited	1.00	Method/ Plant Used	Rotar	y	She	et 2 of 4	
PRO	GRF	SS							STRATA	1	SAMPL	ES & T	ESTS		int/
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)	Strata Descripti	on	Depth (m)	Type No	Test Result	Field Records	Instrume
5/01/17	15.00		0			-8.62			No Recovery.		-           -				
			0					- - - - - - - - - - - - - - - - - - -			- 16.50 - 16.50 - 16.50 	D01	N32	3, 8 / 8, 7, 8, 9	
5/01/17 6/01/17	15.00 15.00		80			-13.12	00000	- <u>18.00</u> - (0.90)	Black, angular to well rounded ri with rare cobble size angular to v rinded flint. (THANET SAND FORMATION	nded flint GRAVEL, vell rounded black i: BULLHEAD BED)	- 18.00 - 18.00 	D02	N26	2, 12 / 10, 7, 5, 4	
			80			-14.02		- 18.90	White CHALK [NI] recovered as subangular fine to coarse silty GI moderately weak angular to suba Gravel is weak to moderately we white chalk fragments. (SEAFORD CHALK FORMATI	: angular to AAVEL with rare ngular chalk cobbles. ak, medium density ON]	- 19.00 - 19.50 - 19.50 - 19.50	B03	N17	2, 3 / 3, 5, 4, 5	

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880 E-mail: si@concentronsultants.co



**Borehole** No

**BH27** 

Unit 8 W London, Telepho E-mail:	/arple W3 0 ne: 02 si@co	Mews RF 2088	5, Wa 12880 tcons	rple )_ ultar	Way	y xo.uk								Sarr	Borehole No BH27	
Job No	CAI 0 6/29	)P 900	Su Da	rv ate ate	eys Sta Co	s G1 arted mple	<b>cound</b> 25, ted 27.	<b>Inv</b> /01/17 /01/17	restigation 7 Ground Le 7 4.8	<b>(Dock) -</b> vel (mOD) 8	Phase 2 Co-Ordinate E 54297	es 71.4 N 18	0248.9	Fina	al Depth 33.00m	
Client L	Lond	lon	Cit	ty .	Air	rpor	t Limi	ited	-		Method/ Plant Used	Rota	ry	Shee	et 3 of 4	
PRO	GRF	SS						ST	<b>FRATA</b>			SAMPL	.ES & 1	ESTS		ent/
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD)	Del (Trick	pth bress)	Stra	ta Description	l	Depth (m)	Type No	Test Result	Field Records	Instrum
			20	-				2 51 w 30)	1.00 becoming v ubangular fine to c vith rare angular to obbles	very silty well-ro oarse black rind subangular blao	ounded angular to led flint GRAVEL, ck rinded flint	- 21.00 - 21.00	D05	N22	5, 5 / 4, 5, 6, 7	
												- - - 22.50 - 22.50 -	D06	N18	3, 5 / 5, 5, 3, 5	
			73	13	10	- <u>-19.32</u>		.20 2.	3.30 - 23.40 bec 4.00 [NI] recove ubangular fine to c pmoderately weak,	oming strong m red as: silty, an oarse GRAVEL medium densii	edium density gular to Gravel is weak y chalk fragments	- - - - - 24.00 - 24.00	D07	N14	3, 3 / 3, 4, 4, 3	
			93	13	7	-		Cl 2- cl 2- an di 2- cr	SEAFORD CHALL SEAFORD CHALL SEAFORD CHALL Shalk 4.25 with 1No w ngular to subangula ensity chalk fragm 4.80 with occasi oarse black rinded 5.50 Will proceed	x FORMATION trong, white me vide open fractu ar fine to coarse ents onal angular to flint gravel	The second secon	- - - 25.50 - 25.50	D08	N40	7,9/8,9,11,12	
			100	27	20			2. fi m su co bi 2. 2. 2. 2. 2.	5.50 [NI] recove ine to coarse GRAV nedium density cha ubangular black rir omprises weak, me lack rinded flint. 6.10 - 26.50 with 6.30m and at 26.44 6.40 with angula	red as: sufty ang /EL with rare n lk cobbles and : Ided flint cobble dium density cl h horizontal frac m ur to subangular	ular to subangular noderately weak, rare angular to es. Gravel nalk fragments and ctures at 26.15m, medium to coarse	26.10	B09			
26/01/17 27/01/17	15.00 15.00		100					26.40 with angular to subangular medium to coarse black rinded flint gravel       -       27.00         26.50 [NI] recovered as: silty angular to subangular fine to coarse GRAVEL. Gravel comprises weak, medium density white chalk fragments and black rinded flint       -       27.00         26.90 becoming strong, medium density CHALK with occasional purple staining       -       -       28.00         27.00 becoming silty with occasional moderately weak to strong, medium density chalk cobbles       -       28.50						N45	6, 12 / 13, 8, 11, 13	
			33					80) 2: w su 2: fl	8.50 [NI] recove ceak to moderately ubangular fine to c 8.90 with rare c int gravel and cobl	red as: gravelly weak medium o oarse chalk frag oarse angular to bles	SILT. Gravel is lensity angular to ments subangular rinded	- 28.50 - 28.50 - 28.50 - 28.50 	D12 B13	N50/ 235 mm	5,9/11,15,20,4	
												- 30.00		N44	8, 14 / 13, 11, 10, 10	0

Unit 8 W London, Telepho E-mail:	Varple , W3 0 one: 02 si@co	Mews RF 20881 ncept	War 2880 consi	Ple V ultant	Vay	/ o.uk						UK UK			AS MINIT BE	Borehole No BH27	
Projec	et CAI	P S	Sur	ve	ys	s Gi	rou	nd I	nve	stigation (Dock)	- Phase 2	2					
Job N	0 6/29	000	Da Da	ite S	Sta Col	rted	eted	25/01	/17 /17	Ground Level (mOD	) Co-Ordin	nates		040° A	Fina	al Depth	
Client	;							2,701		4.88	Method/	291	L4 IN 160	248.9	Shee		
I	Lond	lon	Cit	y A	\ir	por	t Li	mite	d		Plant Use	d	Rotar	у		4 of 4	
PRO	GRE စာ	SS	9	.0	%		G		STI	RATA			SAMPL	ES & 1	TESTS		ment/ ill
Date	Casin	Wate	TCR 9	SCR %	RQD 9	Level (mOD	Legen	Depth (Thickness)		Strata Descript	ion		Depth (m)	Type No	Test Result	Field Records	Backf
			53						30.0 coa sub	00 with occasional angula rse black rinded flint gravel a angular black rinded flint co	to subangular fin nd rare angular to bbles	ne to D	30.50 31.50 31.50	B14 D15	N44	5,7/11,11,10,12	
27/01/17	15.00		80			<u>-28.12</u>		33.00	32.0 sub meca 32.9 flim Enc	60 [NI] recovered as: silty, angular fine to coarse GRAV tium density chalk fragment dium density angular to suba 20 with rare angular to sub t cobbles 1 of Borehole	angular to EL. Gravel is wea with rare strong, ngular chalk cobb angular black rind	ak, les ded /	- 33.00	D16	N31	2, 4 / 6, 7, 8, 10	

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**BH28** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	18/11/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	21/11/16	4.79	E 543034.6 N 180352.2	32.00m

				BORE	HOLE S	SUMMAI	RY			
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	32.00	СР	18/11/2016	21/11/2016	SW	СВ			Dando 175	AR909
	WA	TER S	TRIKES		WATER ADDED CHISELLING / SLOW DRII					RILLING

		TEN STIM							o i de di i	DIGEENING
Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks
							27.10	27.50	0:45	Gravel

	Η	HOLE CASING D) Diameter (mm) Depth (m) Diameter (r								R	OTARY	RECOV	ERY
Dept	h (m)	Di	ameter (	mm)	Dept	h (m)	Dia	meter (mm)		From (m)	To (m)	Blows	Recovery (%)
0.0 18 32	00 .50 .00		200 200 150		0.0 18. 25.	)0 10 50		200 200 150					
		R	DTAR	Y FI	LUSH DE	TAIL							
From (	m) T	o (m)	Flush 7	Гуре	Flush R	eturn (%)	Fl	ush Colour					
	INSTALLATION												
	INSTALLATION DETAILS												
Туре	Diame (mm	meter Depth of Installation (m) (m) (m)			Top of ponse Zone (m)	Bottor Response (m)	n of e Zone )	Date of Installation					
			BACH	KFII	LL DETA	ILS							
Toj (m	p )	Bott (n	om 1)		Material		Bacl	xfill Date					
12.00	0	32.00     Cement / Bentonite Grout     2				21/	11/2016						
sue No:	1e No: 01 Checked By: AN Approved By: OS Log Prin			g Print Date & T	'ime:	03/03/201	7 17:43		AGS internet and a				





**BH28** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No 16/2900 Date Started Date Completed 21/11/16

4.79

18/11/16 Ground Level (mOD) Co-Ordinates

**Final Depth** 32.00m

		PROGR	ESS						SPT DETAILS	5	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks	7	Гуре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
18/11/16	0.00					с	13.50	N10	4,8/3,2,3,2	13.50	1.70
18/11/16	12.50	12.50	1.00	see Remark 3		С	14.50	N12	3, 3 / 2, 3, 4, 3	14.50	1.30
18/11/16	13.50	13.50	1.70			C	15.50	N12	2, 3 / 4, 3, 2, 3	15.50	2.00
18/11/16	14.50	14.50	1.30			C	16.50	N11	2, 2 / 3, 2, 3, 3	16.50	1.80
18/11/16	15.50	15.50	2.00			S	18.00	N20	3, 5 / 4, 6, 5, 5	18.00	2.10
18/11/16	16.50	16.50	1.80			S	19.50	N15	2, 3 / 3, 3, 4, 5	19.50	0.90
18/11/16	18.00	18.00	2.10			S	21.00	N17	2, 3 / 3, 4, 5, 5	21.00	1.00
18/11/16	18.50	18.10	1.70			S	22.50	N20	2, 3 / 4, 5, 5, 6	22.50	0.60
21/11/16	18.50	18.10	1.95			S	24.00	N19	3, 5 / 4, 4, 6, 5	24.00	0.40
21/11/16	19.50	19.50	0.90			S	25.50	N50/0.23	6, 12 / 14, 17, 13, 6	25.50	1.00
21/11/16	21.00	21.00	1.00			S	27.00	N50/0.04	8, 17 / 50	25.50	1.10
21/11/10	22.50	22.50	0.60			S	28.50	N30	5, 8 / 8, 7, 8, 7	25.50	0.90
21/11/10	24.00	24.00	1.00			S	30.00	N38	6, 8 / 9, 10, 9, 10	25.50	0.70
21/11/10	25.50	25.50	1.00			S	31.50	N50/0.29	5, 8 / 9, 9, 13, 19	25.50	1.00
21/11/10	27.00	25.50	1.10								
21/11/10	20.00	25.50	0.90								
21/11/10	21.50	25.50	1.00								
21/11/10	32.00	25.50	1.00								
21/11/10	52.00	25.50	1.00								
GENERAL	REMARKS										
<ol> <li>Borchole et</li> <li>Clearance b</li> <li>Water press</li> <li>Water press</li> <li>Q200mm et</li> <li>17.20m and 18</li> </ol>	arried out from a w UKO Magneto ent in the borehol asing used from j \$.50m and boreho	pontoon. All leve uteter probe, e from casing ins sontoon level to 1 ole re-drilled with	els are recorded 1 tallation through 8.10m depth. B Ø150mm casing	elative to the pontoon lev the dock. intonite seal inserted betv to 25.50m depth.	veen						
KEY           SAMPLES           ES         - Environm           UT         - 100mm I           U38         - 38mm D           D         Disturber           C         - Core Sam           INSTALLATION         SPGW           SPGGW         - Gravin	rental Sample (Tub, V Diameter Undisturbed Diameter Thim Wall U Jiameter Undisturbed I Sample, B-Bulk San ple, W-Water Sample N DETAILS ipe Piezometer Iwater Monitor Stand Toroudwater Monitor	rial, Jar) Sample indisturbed Sample Sample Bufk, LB- Large Bufk; z, R-Root Sample HOLL pipe IP Standbipe CP	Sample, BLK-Block S <b>TYPES</b> -Inspection Pit, TP-Tr -Cable Percussion, R	šample rial Pit TT - Trial Trench C-Rotary Coring, IVS-Rotary/So	mic						
VWP - Vibrati ICM - Incline TESTS SU-SPT Note: All depths	ing Wire Piezometer ometer CPT. V-Stream Vanue are in metres, all diam	DS DC PP-Pocket Penetrom neters in millimetres,	-Dynamic Sampling, -Diamond Coring, C. eter, MP-Macs month water strike rise time	DS/R-Dynamic Sampling /Řota P/R-Cable Percussion Rotary fol Prone, VOC-Volutie, Organic C in minutes. For details of abbrev	ry low on intions see Key						
ma National	d Charl	ad Drut ( =	x A		og Print I	Data	& Time				
sue no: $0$	I   Check	eu by: Al	N Approv	eu by: OS   L	Ng FIIIILI	Date	x rime:	03/03/20	017 17:44		AGS

	Unit 8 War London, W Telephone E-mail: si(	ple Mews /3 0RF 2: 020881 @concept	War 2880	ple Way	ık					B	UKAS MUKASS 001	Den la	AS Huny 01	Borehold BH	e No 28	
	Project CA	ADP	Sur	vevs	Grou	nd Inv	estiga	tion	(Dock)	- Phase 2						
	Job No	12000	Da	ite Start	ted	18/11/16	Grou	nd Lev	vel (mOD)	Co-Ordina	ites		Fin	al Depth		
	16	/2900	Da	ite Com	pleted	21/11/16		4.79	9	E 543	034.6 N 18	80352.2		32.0	0m	
	Client	ondon	Cit	y Airp	ort Li	mited				Method/ Plant Used	Cable Per	rcussion	She	et 1 c	of 4	
ĺ	PRO	GRES	SS			ST	RATA	L		•	SAMPLE	ES & T	ESTS			ent/ I
	Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)		Strat	a Descriptio	1	Depth (m)	Type No	Test Result	Field Record	l ds	Instrum Backfil
or ID: CONCEPT CABLE PERCUSSION    Project: 162900 - LONDON CITY AIRPORT.GPJ    Library: CONCEPT LIBRARY - 2017.GLB    Date: 3 March 2017	Issue No:	01	Ch	ecked By		(12.00)	ed Bv:		Log Print I	Date & Time:		17:46				
eport	Issue No:	01	Ch	ecked By	: AN	Approv	red By:	OS	Log Print I	Date & Time:	03/03/2017	17:46			AGS	No protocorde a

С•ЛСЕРТ
Unit 8 Warple Mews, Warple Way
London, W3 UKF Telephone: 0208812880
E-mail: si@conceptconsultants.co.uk



Project	ADP	Su	rvevs (	Grou	nd Invo	estigation (Dock) ·	- Phase 2							
Job No		D	ate Start	ed	18/11/16	Ground Level (mOD)	Co-Ordina	tes		Fin	al Depth			
10	5/290	0   Da	ate Comj	pleted	21/11/16	4.79	E 5430	034.6 N 18	0352.2		32.00m			
Client L	ondo	n Cit	ty Airp	ort Li	mited	•	Method/ Plant Used	Cable Per	rcussion	She	Sheet 2 of 4			
PRO	)GRE	SS			ST	RATA		SAMPLE	ES & T	ESTS	rs			
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill			
18/11/16	12.50	1.00	-7.21 -8.31 -8.71	× × × × × × × × × × × × × × × × × × ×	12.00 (1.10) (0.40) 13.50	Dark grey gravelly SILT with sh hydrocarbon odour. Gravel is a rounded fine to coarse flint. (DOCK SEDIMENT) Dark grey sandy very silty angu rounded fine to coarse flint GR strong hydrocarbon odour. Sand coarse. (RIVER TERRACE DEPOSIT Dark brown slightly sandy angu rounded flint GRAVEL Sand	Ingular to well are to well AVEL with 1 is fine to S) ular to well is fine to	12.00 12.00 12.00-12.50 12.00-12.50 13.10-13.50 13.20 13.50 13.50 13.50 13.50 13.50	ES01 B02 UT03 D04 B05 ES06 ES07 B08	8 blows N10	VOC 0.3ppm 100% Recovery VOC 0.3ppm 4, 8 / 3, 2, 3, 2 VOC 0.0ppm			
18/11/16	14.50	1.30				coarse. (RIVER TERRACE DEPOSIT 14.25 becoming sandy	S)	14.25 14.50 14.50-15.00 14.50-15.00	D09 B10 D11	N12	3, 3 / 2, 3, 4, 3			
18/11/16	15.50	2.00			(4.00)			15.50 15.50-16.00 16.25	B12 D13	N12	2, 3 / 4, 3, 2, 3			
18/11/16	16.50	1.80	-12.71		17.50	16.25 becoming slightly sand	ły	16.50 16.50-17.00 17.50-18.00	B14 B15	N11	2, 2 / 3, 2, 3, 3			
18/11/16 18/11/16 21/11/16	18.00 18.10 18.10	2.10 1.70 1.95				Extremely weak, medium densi CHALK recovered as: silty ang subangular chalk COBBLES ar angular to subangular medium rinded flint GRAVEL. (SEAFORD CHALK FORMA) 18.00 [NI] recovered as: firm gravelly SILT. Gravel is angula subangular fine to medium blac	ty off-white ular to id occasional to coarse black (ION) i, white slightly ir to ik rinded flint	18.00 18.00 18.50-19.00	D16 B17	N20	3,5/4,6,5,5			
21/11/16	19.50	0.90				19.50 [NI] recovered as: firm gravelly SILT. Gravel is angula subangular fine to coarse extrer	, white slightly ir to nely weak,	19.50 19.50 20.00-20.50	D18 B19	N15	2, 3 / 3, 3, 4, 5			
Issue No	: 01	Ch	necked By:	AN	Approv	ed By: OS Log Print I	Date & Time:	03/03/2017	17:46		AGS	Handbrid In Arthony N. J.		

Unit 8 Wa London, V Telephone	Arple Mews W3 0RF e: 02088	<b>E</b> s, War 12880	PT ple Way				R			KAS NEMMAY THANS	Borehole No BH28	
Project C. Job No	ADP	Sur	rveys Groun	nd Inv 18/11/16 21/11/16	estigation Ground Le	(Dock) - vel (mOD)	Phase 2 Co-Ordinat	tes	0.000.000	Fin	al Depth	
Client	ondon		v Airport I i	mitad	4.79 E 5430 Method/ Plant Used			034.6 N 180352.2			32.00m	
PRC	GRE	SS S		ST	TRATA			SAMPLE	IPLES & TESTS			nt/
Date	Casing	Water	Level (mOD) Legend	Depth (Thickness)	Stra	ta Descriptior	1	Depth (m)	Type No	Test Result	Field Records	nstrume
21/11/16	21.00	1.00			medium density 20.00 - 20.50 to subangular bla 21.00 [NI] rec gravelly SILT. C subangular fine medium density 21.50 with occ black rinded flin	chalk fragment with rare cobbl ack rinded flint overed as: firm dravel is angula to medium extr chalk fragment casional angula t cobbles	s e size angular , white slightly rr to emely weak, s r to subangular	21.00 21.00 21.50-22.00	D20 B21	N17	2, 3 / 3, 4, 5, 5	
21/11/16	22.50	0.60		- - - - - - - - -	22.50 [NI] rec SILT. Gravel co fine to medium l extremely weak, fragments 23.00 with rar	overed as: soft, mprises angula slack rinded flin medium densit e angular to sul	white gravelly r to subangular nt and y chalk pangular black	22.50 22.50 23.00-23.50	D22 B23	N20	2, 3 / 4, 5, 5, 6	
21/11/16	24.00	0.40			rinded flint cobb 24.00 [NI] rec gravelly SILT. C subangular fine (	les overed as: soft, Gravel is angula to medium blac	white slightly r to k rinded flint	24.00 24.00 24.50-25.00	D24 B25	N19	3, 5 / 4, 4, 6, 5	
21/11/16	25.50	1.00		-	25.50 [NI] rec gravelly SILT. C subangular fine t and extremely w fragments	overed as: soft, Gravel comprise to medium blac eak, low densit	white slightly ss angular to k rinded flint y chalk	25.50	D26	N50/ 230 mm	6, 12 / 14, 17, 13, 6	
21/11/16	25.50	1.10		-	26.50 [NI] rec very gravelly SII to subangular fir flint and fine to o medium density 27.00 [NI] rec SILT. Gravel is medium black ri 27.10 with occ black rinded fiin	overed as: very .T. Gravel con te to medium bl coarse extremel chalk fragment overed as: soft, angular to suba nded flint casional angula	soft, white prises angular lack rinded y weak, s white gravelly ngular fine to r to subangular	26.50 27.00 27.10-27.50	D27 D28 B29	N50/ 40 mm	8, 17 / 50	
21/11/16	25.50	0.90			28.00 [NI] rec subangular fine I Gravel comprise density white ch rinded flint 28.50 [NI] rec gravelly SILT. C subangular fine f	overed as: angu to coarse silty C s moderately w alk fragments a overed as: soft, oravel is angula to medium blac	alar to <b>RAVEL</b> cak, medium nd black white slightly r to k rinded flint	28.10 28.50 28.50 29.00-29.50	D30 D31 B32	N30	5, 8 / 8, 7, 8, 7	
21/11/16	25.50	0.70		-				- 30.00		N38	6,8/9,10,9,10	
Issue No	01	Ch	ecked By: AN	Approv	red By: OS	Log Print D	Date & Time:	03/03/2017	17:46		AGS :::::	NONSELLA PERMIT

Unit 8 W London Telepho E-mail:	/arple Mev W3 0RF ne: 0208 si@conce	WS, War 812880 ptcons	PT ple Way	ık				R			KAS STANANT 101	Borehole No BH28			
Projec	et CADP	' Sui	veys	Grou	nd Inv	estigation (	Dock) -	- Phase 2							
Job N	0 6/200		ite Start	ted	18/11/16	Ground Leve	el (mOD)	Co-Ordina	tes		Fin	al Depth			
Client	0/290	U Di		pietea	21/11/10	4.79		E 5430 Method/	034.6 N 18	30352.2	Sho	32.00m			
I	londo	n Cit	y Airp	ort Li	mited		Plant Used	Cable Per	rcussion		4 of 4				
PR	OGRE	SS			ST	<b>TRATA</b>			SAMPL	ES & T	ESTS		lent/ 1		
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata	Description	1	Depth (m)	Type No	Test Result	Field Records	Instrum Backfil		
					-	30.00 [NI] recov slightly gravelly SI	vered as: soft ILT. Gravel i	to firm, white is angular to	30.00	D33					
						subangular fine to 30.50 with occa fine to coarse black rare angular to sub cobbles	medium blac sional angula k rinded flint vangular blacl	k rinded flint ir to subangular gravel and c rinded flint	30.50-31.00	B34					
21/11/16	25.50	1.00				31.50 [NI] recov	vered as: firm	, white SILT.	- 31.50		N50/ 290 mm	5, 8 / 9, 9, 13, 19			
21/11/16	25.50	1.00	<u>-27.2</u> 1		32.00				31.50	D35					
Issue N	o: 01	Ch	ecked By	: AN	Approv	ed By: OS	Log Print E	Date & Time:	03/03/2017	17:46	1	AGS	and the second s		

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**BH29** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	10/01/17	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	16/01/17	4.93	E 543114.1 N 180368.0	45.50m

	BOREHOLE SUMMARY													
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference				
0.00 17.00	17.00 45.50	OH RC	10/01/2017 10/01/2017	10/01/2017 16/01/2017	FD FD	CB CB	112 112	PDC PDC	Geotec 350 Geotec 350	AR779				

	WA	TER STRIK	ŒS		WATE	R ADDED	CHISELLING / SLOW DRILLING				
Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks	

	Н	OLE				CA	SING		]	ROTARY	RECOV	ERY
Dept	h (m)	Di	iameter (	mm)	Dept	h (m)	Dia	meter (mm)	From (m)	To (m)	Blows	Recovery (%)
0.0 17. 45.	0.00         150           17.00         150           45.50         146			0.0 17.4	0.00 150 17.00 150			12.50 17.00 18.50 20.00 21.50	17.00 18.50 20.00 21.50 23.00		$ \begin{array}{c} 0 \\ 47 \\ 93 \\ 100 \\ 93 \end{array} $	
		R	OTAR	Y FI	LUSH DE	TAIL			23.00	24.50		80
From (I	From (m) To (m) Flush Type F					eturn (%)	) Fl	ush Colour	26.00	27.50		60
17.00 39.50	17.00 39.50 Wa 39.50 45.50 Wa		Wate Wate	r 100 r 50				27.50 29.00 30.50 32.00 33.50 35.00 36.50 38.00 39.50 41.00	$\begin{array}{c} 39.50\\ 30.50\\ 32.00\\ 33.50\\ 35.00\\ 36.50\\ 38.00\\ 39.50\\ 41.00\\ 42.50\end{array}$		87 67 80 87 60 87 80 87 80 87	
		INS	STALL	ATI	ON DET.	AILS			42.50	42.50		100
Туре	Diameter (mm)Depth of Installation (m)Top of Response Zone (m)Botto Respon (r				Botto Respons (m	m of e Zone )	Date of Installation	44.00	45.50		100	
			BACK	CFII	LDETA	ILS						
Тој (m)	p )	Bott (n	tom n)	<u> </u>	Material		Bacl	cfill Date				
17.00	)	46.0	00	Cem	ent / Bentoni	te Grout	16/4	01/2017				
ssue No:	01	Checke	ed By:	AN	Approved	By: OS	Log	g Print Date & Ti	ime: 03/03/20	017 17:43		AGS immediate in the





**BH29** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 16/01/17

4.93

10/01/17 Ground Level (mOD) Co-Ordinates

E 543114.1 N 180368.0

**Final Depth** 45.50m

		PROGR	ESS						S						
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remark	is is	Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)				
10/01/17 10/01/17 11/01/17 11/01/17 12/01/17 12/01/17 13/01/17 13/01/17 16/01/17 16/01/17	0.00 17.00 24.50 24.50 30.50 39.50 42.50 42.50 45.50	15.00 15.00 15.00 17.00 17.00 17.00 17.00 17.00 17.00	2.00 2.00 2.00 5.00 4.00 4.00	Rotary flus	n –	888888888888888888888888888888888888888	$\begin{array}{c} 17.00\\ 18.50\\ 20.00\\ 21.50\\ 23.00\\ 24.50\\ 26.00\\ 27.50\\ 29.00\\ 30.50\\ 32.00\\ 33.50\\ 35.00\\ 35.00\\ 35.00\\ 35.00\\ 39.50\\ 41.00\\ 42.50\\ 44.00\\ 45.50\\ \end{array}$	N37 N34 N22 N30 N36 N35 N30 N37 N34 N37 N34 N37 N47 N50/0.265 N29 N50/0.15 N39 N36 N39 N36 N39 N41 N39 N36	$\begin{array}{c} 4, 6 / 7, 8, 10, 12 \\ 4, 7 / 9, 8, 9, 8 \\ 3, 5 / 5, 5, 4, 8 \\ 5, 6 / 5, 8, 8, 9 \\ 5, 10 / 9, 9, 8, 10 \\ 4, 7 / 9, 9, 8, 9 \\ 6, 4 / 6, 7, 8, 9 \\ 5, 7 / 8, 10, 9, 10 \\ 6, 7 / 4, 8, 10, 12 \\ 3, 7 / 8, 9, 9, 11 \\ 5, 6 / 9, 10, 11, 17 \\ 5, 8 / 7, 13, 16, 14 \\ 3, 6 / 5, 8, 8, 8 \\ 4, 10 / 11, 9, 30 \\ 5, 7 / 7, 9, 11, 12 \\ 4, 5 / 7, 9, 10, 10 \\ 4, 6 / 9, 9, 10, 11 \\ 4, 7 / 6, 8, 12, 15 \\ 4, 8 / 9, 8, 10, 12 \\ 5, 6 / 8, 10, 9, 9 \end{array}$						
CENERAL	REMARKS      rried out from a     y UKO Magneto     y UKO Magneto     illed open hole b     fancier Undisturbed     iameter Undisturbed     iameter Undisturbed     iameter Undisturbed     beratts     beratts     beratts     beratts     contervent     conte	I pontoon. All leve tricter probe setween 12.50m a fial, Jar) Sample ndisturbed Sample Sample Bandpine IP pipe IP Standpine IP DC PP Pocket Poncomments	L cls are recorded i and 17.00m depth and 17.00m depth Sample, BLK-Block S <b>TYPES</b> -Inspection Pit, TP-T Cable Percussion, R -Dynamic Sampling, C -Dynamic Sampling, C	L elative to the pontoon i. Sample rial Pit IT – Trial Trench C-Rolary Coring, R/S-Rolar DS/R–Dyname Sampling / Profile Corression Rolar Profile CO-Palsate Organisation (Corression Rolar)	y Sonic Coarry y Jollow on mc Component										
sue No: 0	1 Check	ed By: Al	Approv	ed By: OS	Log Print	t Date &	& Time:	03/03/20	)17 17:44		AGS				
Job Na 1	6/29	000	Da Da	ite (	Sta Coi	rted mple	ted	10/01/ 16/01/	Interview         Ground Level (mOD)           17         4 93	Co-Ordinates	4.1 N 180	368.0	Final	Depth 45.50m	
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Client L	ond	on	L Cit	y A	\ \ir	por	t Li	mited	ц т. <i>уз</i>	Method/ Plant Used	Rotary	y	Sheet	1 of 5	
PROC	<b>FRE</b>	SS				-			STRATA		SAMPLE	ES & T	ESTS		nt/
Data	sing	uter 5	3 %	٤ %	D %	Level	end	Depth	Strata Daganintia		Depth	Туре	Test	Field	rumer
)/01/17	<u>ں</u>	M	TC	sc	RC	(mod)	Le	(Thickness)	Water.	• 	(m) -	NO	Kesuit	records	Ins
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Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



Borehole No

Job Na 1	) 6/29	000	Da	ite	Sta Coi	rted	tod	10/01/	17 <b>Ground</b>	Level (mOD)	Co-Ordinates	S A L DUBOV	220.0	Fina	al Depth	
Client	ond	lon				mpre	+ T i	mitod	<b>•</b>	4.93	E 54511 Method/ Plant Used	4.1 N 180	v	She	45.50m	
				y 1	311	por					T Mill Cool			-	2 01 5	
PROC Date	Casing H	Water S	TCR %	SCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)	SIRAIA	Strata Descriptior	L	Depth (m)	Type No	Test Result	Field Records	Instrument
)/01/17	15.00	2.00	0 47 93	36	32	-12.07		12.50	Open hole. Light grey, very (THANET SAN White CHALK very gravelly SI density chalk fr size angular to 9 (SEAFORD CH 19.00 chalk fr 19.60 - 19.80	[NI] recovered as: s I.T. Gravel is weak, agments with rare g subangular coarse b IALK FORMATION ragments becoming . becoming strong, v	THANET SAND)	17.00 17.00 17.50 18.50	D01 B02 B03	N37	4, 6 / 7, 8, 10, 12 4, 7 / 9, 8, 9, 8	
							Ψ					- 20.00		N22	3, 3 / 3, 3, 4, 8	$\bowtie$

Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



Borehole No

Unit 8 V London Telepho E-mail:	Varple I W3 0 ne: 02 si@co	Ce Mews, RF 208812 ncepto	War War 2880	P ple	Way	/ :o.uk							UKA UKA STSTRM OOT	SS MANY B	Borehole No BH29	
Projec	t ∼∧⊤		2	AN 74	0.1.74		•••••	nd Iı	wostigatio	n (Doole)	Dhasa 2					
Job N		<u> </u>	Da	te	cya Sta	rted	. Uu	10/01	/17 Ground	Level (mOD	) Co-Ordinates	5		Fina	al Depth	
1	.6/29	000	D۵	ite	Co	mple	ted	16/01	/17 2	1.93	E 54311	4.1 N 1803	368.0		45.50m	
Client	Lond	lon (	Cit	y z	Air	por	t Li	mite	d		Method/ Plant Used	Rotary	7	Shee	et 3 of 5	
PRO	GRE	SS							STRATA			SAMPLE	S & T	ESTS		ent/
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)	S	Strata Descripti	ion	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill
			100						20.40 becomin occasional subve 20.75 with 1N angular to suban moderately weak 21.50 - 22.00	ng weak, mediur ertical and subho lo wide open fra gular fine to coa c to weak, chalk becoming very s	n density with orizontal fractures cture infilled with rse gravel size fragments ilty	- 20.00 	D04	N30	5,6/5,8,8,9	
			93	21	18	-17.67		- - - - - - - - - - - - - - - - - - -	22.30 with rar flint cobbles Strong, medium (SEAFORD CH, 22.60 becomin 22.60 becomin	e angular to sub density white Cl ALK FORMATI ng strong and mu	angular black rinded HALK. ONJ edium density	- - - - - - - - - - - - - - - - - - -	B06 D07	N36	5, 10 / 9, 9, 8, 10	
			80	16	15				23.00 [NI] rec to coarse silty Gl moderately weak with occasional weak chalk cobb 24.00 with 1N 24.20 with occ	covered as: angul RAVEL. Gravel c, medium densit angular to subar iles	fractions and the subangular fine is weak to be the subangular moderately fractions for the size and fine to be subangular to be size and fine to be subangular	23.50	B08	N25	47/0080	
10/01/17 11/01/17	15.00	2.00	86	29	21				24.90 [NI] rec is angular to sub density chalk fra 25.40 with 1N 25.70 with 1N staining	overed as: soft, j angular fine to c gments In horizontal frac Io horizontal frac	gravelly SILT. Gravel oarse weak, medium clure cture with purple	- 24.50 - 24.50 - 25.00 	D09 B10	N30	4, // 9, 9, 8, 9 6, 4 / 6, 7, 8, 9	
			60	44	28				25.80 - 26.00 fracture 26.80 [NI] rec to coarse silty GI subangular fine t fragments 26.90 - 27.30 27.00 with 1N	with 1No open overed as: angul RAVEL. Gravel to coarse, weak 1 becoming intact le horizontal frac	wide horizontal lar to subangular fine is angular to nedium density chalk CHALK cture	- 26.00 - 27.00 - 27.50 - 27.50	D11 B12 D13	N37	5,7/8,10,9,10	
			73	50	23			┶╻╍┙┙┶	28.10 [NI] rec to coarse silty GI density chalk fra 28.40 with 1N 28.45 - 28.55 subangular fine t comprises weak, black rinded film	overed as: angul RAVEL. Gravel gments a horizontal fra becoming very s to coarse GRAV medium density t	ar to subangular fine is weak, medium curre ilty angular to EL. Gravel y chalk fragments and	- - - - - - - - - - - - - - - - - - -	B14 D15	N34	6,7/4,8,10,12	
			87	46	35				28.60 - 28.70 subhorizontal fra 28.80 with 1N 28.85 with 1N 29.00 - 29.60 slightly gravelly	with occasional actures to vertical fractu o subhorizontal [NI] recovered a SILT. Gravel co	subvertical and re fracture s: soft to firm, mprises angular to	- 29.70 - 30.00-30.20	B16 C17			
Issue N	o: C	1	Ch	eck	ed I	By:	AN	App	roved By: OS	Log Print	t Date & Time:	03/03/2017 17	7:48		AGS	Service Service

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Unit 8 W London, Telepho E-mail:	/arple W3 0 ne: 02 si@co	Mews, RF 208812 ncepto	War 2880 consi	P ple	Wa	y xo.uk									Save	Borehole No BH29	
Projec	et CAI	)P S	Sui	V	ey	s Gi	rou	nd I	nve	stigation	(Dock) -	Phase 2					
Job N	0 6/29	)00	Da	ite	Sta	arted	tod	10/01	/17	Ground Le	vel (mOD)	Co-Ordinate	28	220.0	Fina	al Depth	
Client						mpre	leu	10/01	/1/	4.9	3	E 5451	14.1 N 180.	368.0	Shee	45.50m	
<u> </u>	lond	lon	Cit	<b>y</b> 2	Ai	rpor	t Li	mite	d			Plant Used	Rotar	у		4 of 5	
PRO	GRE ූන	SS H	%	%	%		p		STF	RATA			SAMPLI	ES & 1	TESTS	Field	ment/ ill
Date	Casir	Wate	TCR 9	SCR 9	RQD	Level (mOD)	Legen	Depth (Thickness)		Stra	ta Description	1	Depth (m)	Type No	Result	Records	Instru Backf
11/01/17	15.00	5.00	87	46	35			- - - -	suba chal rind	angular fine to c lk fragments and ed flint	oarse, weak, me l angular to sub	edium density angular black			N37	37/89911	
11/01/17 12/01/17	$15.00 \\ 17.00$	5.00 4.00						-	29.6 flint	0 with rare and cobbles	ngular to suban	gular black rinded	- 30.50	D18		5,778,9,9,11	
									30.0 angu	00 with 1No v ular to subangul	vide open fractu ar fine to coarse	re infilled with extremely weak					
			67					1 - - -	frag 30.0	ments ments 00 - 30.15 bec	oming strong a	density chalk nd medium density	- - -				
									30.0 30.1 fine	00 - 30.20 wit .5 [NI] recove to coarse GRAY	h 1No subhoriz red as: silty ang VEL and occasi	ontal fracture gular to subangular onal angular to					
						-		- - -	suba wea	k, medium dens	ely weak chalk ity white chalk	cobbles. Gravel is fragments	$\frac{-32.00}{-32.00}$	D19	N47	5,6/9,10,11,17	
								- - -	suba suba wea	angular fine to c k to moderately	oarse GRAVEI weak, medium	with occasional density chalk					
			80	71	63			-	cobt com blac	bles and rare bla prises weak, me k rinded flint	ck rinded flint dium density c	cobbles. Gravel halk fragments and	- 32.70	B20			
									31.0 suba	00 [NI] recove angular fine to c	ered as: silty, an oarse GRAVEI	gular to with rare	-				
								1- 1- 1-	Grav frag	vel comprises w ments and black	eak, medium de rinded flint.	ensity chalk	- 33.50		N50/ 265 mm	5, 8 / 7, 13, 16, 14	
								4  -  -  -	32.0 flint 32.7	00 becoming v t cobbles 70 with 1No v	very silty with n	are black rinded	- 33.50	D21			
			87	62	35			(22.90)	32.8 33.0	30 with 1No c 00 with 1No v	pen horizontal vide open fractu	fracture re infilled with	- 34.10 -	B22			
			01	02					dens 33.2	sity chalk fragm	ents and rare fli ubhorizontal fra	nt cobbles					
								-	33.4 33.5 suba	10 with 1No h 50 - 34.00 [NI angular fine to c	orizontal fractu ] recovered as: oarse chalk GR	re silty, angular to AVEL.	- 35.00		N29	3, 6 / 5, 8, 8, 8	
									34.2 34.5	0 with subho 0 with 1No h	rizontal fractum orizontal fractum	re and at 34.70m	- 35.00	D23			
								+ + -	34.5 with 34.9	1 purple staining 0 - 35.00 wit	h angular to sub	vangular coarse	- - -				
			60	28	17			-	blac 35.5 suba	k rinded flint gr 50 - 36.10 [NI angular fine to c	avel and cobble ] recovered as: oarse GRAVEI	es angular to . Gravel	- - 36.00-36.50	B24			
								- - -	com blac	prises weak, me k rinded flint	edium density c	halk fragments and	-			4 10 / 11 0 20	
						-		1-  	36.3 angu	0 - 36 20 with 1No h ular to subangul	orizontal fractu ar fine to coarse	re infilled rare black rinded flint	- 36.50 - -		150 mm	4, 10 / 11, 9, 30	
								1_ 1_ 1_	36.3 angu 36.4	35 with 1No h ular to subangul 15 with 1No y	orizontal fractu ar fine to coarse vide open horiz	re infilled with black rinded flint ontal fracture	- 36.50 -	D25			
			87						36.5 Grav	50 [NI] recove vel is angular to	ered as: soft, wh subangular fine	ite gravelly SILT. to coarse black	- - - 37.50	B26			
								+ -	37.1 suba	0 [NI] recove angular fine to c	ered as: very silt oarse GRAVEI	y angular to . with rare angular	-	B20			
						-			to su Grav frag	ibangular weak, vel comprises w ments	medium densit eak, medium de	y chalk cobbles. ensity chalk	$\frac{-}{-}$ 38.00 $\frac{-}{-}$ 38.00	D27	N39	5,7/7,9,11,12	
								-  -  -					- - -				
			80	71	54				38.4 38.5 38.8	15 with 1No v 50 with 1No h 80m	vide open subve orizontal fractu	rtical fracture re and at 38.70m,	-				
									38.9 38.9	00 with 1No s 95m	ubhorizontal fra	acture and at	<u>-</u> - 39.20-39.50	C28			
12/01/17	17.00	4.00						1_ 1_ +	39.1	.0 with 1No v	vide open horiz	ontal tracture	- - 39.50 - 39.50	D29	N36	4, 5 / 7, 9, 10, 10	
13/01/17	17.00		87	54	39			47  -  -  -  -	39.5 suba angu	angular fine to c ular to subangul	j recovered as: oarse GRAVEI ar moderately w	sity angular to with occasional weak, medium	-				
Issue N	o: (	)1	Ch	eck	ed i	By:	AN	App	orovec	d By: OS	Log Print D	Date & Time:	03/03/2017 1	7:48		AGS	NUMBER OF STREET

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Unit 8 W London Telepho E-mail:	Varple , W3 0 one: 02 si@cc	Mews RF 2088	5, Wa 12880 tcons	rple ) ulta	Way	y xo.uk								S MANT	Borehole No BH29	
Projec	et CAI	)P	Su	rv	ey	s G	rou	nd Iı	nve	stigation (Dock) -	Phase 2					
Job N	0		D	ate	Sta	irted	I	10/01	/17	Ground Level (mOD)	Co-Ordinates	5		Fina	al Depth	
Client	10/2:	900	D	ate	Co	mpl	eted	16/01	/17	4.93	E 54311	4.1 N 1803	368.0	<u>Sha</u>	45.50m	
I	Long	lon	Ci	ty.	Aiı	rpoi	rt Li	mite	d		Plant Used	Rotary	y	Sne	f 5 of 5	
PRO	GRE	ess		-	_			1	STI	RATA		SAMPLE	ES & T	FESTS		ent/ I
Date	Casing	Water	TCR %	SCR %	RQD %	Leve (mOE	Legend	Depth (Thickness)		Strata Description	1	Depth (m)	Type No	Test Result	Field Records	Instrum Backfil
			87	54	39				den 39. 40. sub con cha	sity chalk cobbles. Gravel is we sity chalk fragments 90 - 40.00 with INo subvertic 20 - 40.30 [NI] recovered as: angular fine to coarse GRAVEI aprises weak to moderately weak Ik fragments and black rinded fi	ak, medium al fracture silty angular to Gravel k, medium density lint	- - 40.50 - - 41.00	B30	N39	4,6/9,9,10,11	
			67	55	50				40.4 frac 40.4 41.4 to s con blac 41.9	<ol> <li>with TNS subvertical fract 50 - 40.70 with 1No wide ope ture</li> <li>with 1No horizontal fractu 40 - 41.80 [NI] recovered as: ubangular fine to coarse GRAV aprises weak, medium density c ck rinded flint</li> <li> with 1No horizontal fractu</li> </ol>	ne en subvertical re very silty angular EL. Gravel halk fragments and re	- 41.00 	C32			
13/01/17 16/01/17	17.00 17.00	1	100	87	80				42.1 wea coa 42.1 to s rinc den 42.7 ang	30 with 1No wide open horiz ak, medium density angular to su rse chalk fragments 50 - 42.60 [NI] recovered as: ubangular fine to coarse GRAV ded flint cobbles. Gravel compri sity chalk fragments and black to 70 with 1No wide open fractu- gular to subangular fine to coarse	ontal fracture and abangular fine to very silty angular EL with rare black ses weak, medium rinded flint re infilled with e weak, medium	- 42.50 - 42.50 	D33 C34	N41	4, 7 / 6, 8, 12, 15	
			100	60	57				den 42.7 43.1 42.1 44.0 to s meo wea rinc	isity chalk fragments and black i 70 with 1No horizontal fractu 20m 80 with 1No horizontal fractu 00 - 44.40 [NI] recovered as: ubangular fine to coarse GRAV dium density chalk cobbles. Gra ak, medium density chalk fragm led flint	rinded flint re and at 43.10m, re very silty, angular EL with rare weak, vel comprises ents and black	- 44.00 - 44.00 	D35	N39	4,8/9,8,10,12	
16/01/17	17.00	I				-40.5		- - - - - - - - - - - - - - - - - - -	44.9 coa	90 with occasional angular to rse black rinded flint 40 with 1No wide open fractu	subangular fine to	-45.00-45.30 - - - - 45.50 - 45.50	C36	N36	5,6/8,10,9,9	
									Enc	d of Borehole						
Issue N	(o: (	)1	Cl	necl	ced ]	By:	AN	App	orove	d By: OS Log Print D	Date & Time:	03/03/2017 1	7:48		AGS	the an occurrence is a supposed in a distribution to

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**BH30** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	14/12/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	16/12/16	4.23	E 543181.6 N 180343.2	33.00m

					BOREI	HOLE S	SUMM	IARY				
Top (m)	Base (m)	Туре	Date Star	rted D	ate Ended	Crew	Logg By	ed Cor	e Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
$\begin{array}{c} 0.00 \\ 15.50 \\ 18.00 \end{array}$	15.50 18.00 33.00	OH DS RC	14/12/201 14/12/201 15/12/201	6 14 6 15 6 16	/12/2016 /12/2016 /12/2016	TC TC TC	CB CB CB		112	PDC	Geotec 350 Geotec 350 Geotec 350	AR779 AR779
	WA	TER S	TRIKES			WA	TER A	DDED	C	HISELLIN	G / SLOW D	RILLING
Strike at (m)	Rise to (m)	Time to (mi	o Rise Cas n)	sing Depth (m)	n Sealed (m)	Fra (n	om 1)	To (m)	From (m)	n To (m)	Duration (hr)	Remarks

	HOLE		CA	SING		R	ROTARY	RECOV	ERY
Depth (n	n) Di	ameter (mm)	Depth (m)	Diameter (mm)	From	(m)	To (m)	Blows	Recovery (%)
0.00 18.00 33.00		150 150 146	0.00 14.00	150 150	15.50 17.00 18.00 18.50 23.00	) )) ))	$   \begin{array}{r}     17.00 \\     18.00 \\     18.50 \\     23.00 \\     24.50   \end{array} $		67 100 100 100 87
	R	OTARY FI	LUSH DETAIL			) )	26.00		100
From (m)	To (m)	Flush Type	Flush Return (%	) Flush Colour		) )	29.00		80
18.00	33.00	Water	70		30.22 31.50	)	31.50 33.00		100 100 100
	INS	TALLATI	ON DETAILS						
Type Dia	ameter Da mm) Ins	epth of tallation (m)	Top of ponse Zone (m) Botto Response (n	bm of Date of Installation					
	I	BACKFII	LL DETAILS						
Top (m)	Bott (n	tom 1)	Material	Backfill Date					
12.50	33.0	00 Cem	ent / Bentonite Grout	16/12/2016					
					J [				
ssue No: 01	Checke	ed By: AN	Approved By: OS	Log Print Date &	11me: 03/0	3/20	17 17:43		AGS interview and and and





**BH30** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 16/12/16

4.23

14/12/16 Ground Level (mOD) Co-Ordinates

**Final Depth** 33.00m

		PROGR	ESS						SPT DETAILS	5	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarl	ks	Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
14/12/16 14/12/16 15/12/16 15/12/16 16/12/16 16/12/16	0.00 15.50 15.50 29.00 29.00 33.00	14.00 14.00 14.00 14.00 14.00	2.10 3.10 1.90 3.10 1.90	see Remark	\$ 5	S S S S S S S S S S	15.50 17.00 18.50 20.00 21.50 23.00 24.50 26.00 27.50 29.00 30.20	N15 N16 N29 N31 N50/0.005 N40 N40 N50 N50/0.105 N28/0.19	2, 2 / 3, 3, 4, 5 3, 2 / 3, 4, 4, 5 3, 4 / 4, 8, 8, 9 3, 3 / 6, 8, 9, 8 25 / 50 25 / 50 3, 6 / 8, 9, 11, 12 3, 7 / 7, 10, 11, 12 4, 7 / 11, 12, 16, 11 7, 12 / 21, 29 6, 13 / 16, 2, 10	$\begin{array}{c} 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ 14.00\\ \end{array}$	
GENERAL         1. Borchole ca         2. Clearnee b         3. Borchole dri         4. Dynamic sa         thereafter.         5. Water preser         SAMPLES         ES         - Bornon D         UT         - Core Sam         NETE         - Standp         SPOW         - Ground         SPOW         - Ground         SPOW         - Ground         SPOW         - Ground         SPOW         - Cross Sam         VWP         - Vibrait         ICM         - Ichlinor         TEST         SUM         - Standp	REMARKS rried out from a y UNO Magneto illed open hole b mpling technique nt in the borchol iameter Undisturbed iameter Undisturbed Sample, B-Ball Sam DETAILS pe Piezoneter mathema Monitor Stand DETAILS pe Piezoneter mathema Monitor Yang Were Piezoneter neter CTLV-Shear Vans-	pontoon. All leve inter probe es used from 15.5 e from casing ins from casing	Sample, BLK-Block S Sample, BLK-Block S (TYPES) Sample, BLK-Block S (TYPES) Dynamic Sampling, C Dynamic Sa	elative to the pontoon	n level. out ry/Sonic Rotary Rotary ry follow on us, Campound						
Issue No: 0	1 Check	ed By: A	Approve	ed By: OS	Log Pri	nt Date	& Time:	03/03/20	)17 17:44		AGS

Unit 8 Londor Teleph E-mail: <b>Proje</b>	Varple n, W3 0 one: 0 si@cc	Mews DRF 20881 Dncept	, Wa 2880 cons	P rple )_ ultar	Way	y :o.uk									BURN	Den Contraction	KAS WEEKINT 001	B	UK UK	A S RMM		Bore E	ehole I BH3	No O	
		DP S	Su	rv	eys	s Gi	rou	nd I	nve	stiga	atior	n (D	ock)	) - ]	Phase	e 2									
Job N	lo 16/29	900		ate ate	Sta Co	rted mple	eted	14/12 16/12	2/16 2/16	Grou	Ind L	level (	(mOD	)   (	Co-Or	dinate 54213	es 81.6	N 180	242.0		Fina	al Dep	oth 33 004	n	
Clien	t Long	don	Cit	ty .	Air	rpor	t L	imite	d			.23		N F	Methoo Plant U	d/ l Jsed	Dyna	mic Sar Rotar	mpling y	; /	Shee	et	1 of	4	
PRO	GRI	ESS		_		_			STI	RAT	A						SA	MPL	ES &	TE	STS				snt/
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD	Legend	Depth (Thickness)			Str	rata D	escript	ion			-	Depth (m)	Type No	R	Fest esult		Field Record	İs	Instrume Backfill
									Wat	jer -															
	No: (	01	Ch	leck	ed I	By:	AN	Ap	prove	d By:	OS	Lo	og Prin	t Dat	te & Tir	ne:	03/03	/2017 1	7:48				A	GS	ovedoria afritalian

Unit 8 W London Telepho E-mail:	Varple W3 0 ne: 02 si@co	Mews, RF 208812 ncepto	War 2880_ 2880_	P ple W	/ay s.co.uk							AD SUC		UKAS SHEAS	B		Shr	Borehold BH	e No 30	
Projec (	t CAI	PP S	Sur	vey	ys G	rou	nd In	ives	tigati	ion (	(Dock	) - P	hase 2							
Job N 1	o 6/29	000	Da Da	te S te C	tarted 'omnle	l eted	14/12/	/16   <b>0</b> /16	Ground	1 Lev	vel (mOI	D)   C	Ordinat	tes	C N 1903	12.0	Fina	al Depth	0	
Client			<b></b>					10		4.23	,		ethod/	Dv	namic San	nling	/ She	55.0	om	
I	lonc	lon	Cit	y A	irpoı	rt Li	mited	1				Pla	int Used	Dyi	Rotary	/		2 0	of 4	
PRO	GRF	SS					5	STR	ATA					5	SAMPLE	S & T	TESTS			int/
Date	Casing	Water	TCR %	SCR %	mOE	⊆ _ Legend	Depth (Thickness)			Strat	a Descrip	tion			Depth (m)	Type No	Test Result	Fie Rec	eld ords	Instrume Backfill
14/12/16	14.00	2.10 3.10	67 100 100		8.2" 11.2" 12.8"		(3.00)	Open Dark (RIVI) Black (RIVI) Angul (SEA 17.80 18.00 fine to 19.20	hole brown an; ER TERR White CH ar fine to derately with ar inded fli with ar inded fli becom ients - 19.00 o coarse b	to suba ND FC ALK 1 coarse ining si with black r beco	to well-rou DEPOSITS angular rind DEPOSITS recovered a e silty GRA ack rinded fi r to subang wel Ity with rar inded flint oming very	nded flint N: BULJ s: suban VEL. C nsity ch IoN flint cob ular fine e cobble angular gravel a silty	GRAVEL. HEAD BED gular to ravel is weal alk fragments bles to coarse size chalk o rounded nd cobbles		15.50 15.50 15.50 15.50-15.70 17.50 17.50 17.50 18.50 18.50 18.50 19.50 20.00	D01 B02 B03 D04 B05	N15 N16 N29	2, 2 / 3, 3, 4 3, 2 / 3, 4, 4 3, 4 / 4, 8, 8 3, 3 / 6, 8, 9	4, 5 4, 5 5, 9	
Issue N	o: (	1	Che	ecked	1 By:	AN	App	roved	By: O	s	Log Prir	nt Date	& Time:	03/	/03/2017 17	7:48			AGS	nin antonen ka Alexani

	Unit 8 W London, Telepho E-mail:	Varple , W3 0 one: 02 si@co	Mews RF 20881 oncept	Wa 2880 cons	P rple	Way	/ :o.uk								®	UKA Myacama Setemation 001			AMNT B	Borehole No BH30		
	Projec (	et CAI	OP S	Sui	rve	eys	<b>5 G</b>	rou	nd I	nve	stig	ation	1 <b>(D</b>	ock) -	Phase 2							
	Job No 1	o 6/29	900	D: D:	ite ife	Sta Co	rted mple	l ete <b>d</b>	14/12 16/12	/16 /16	Grou	ind Le	evel (1 22	nOD)	Co-Ordina	ates	6 N 190	242.2	Fin	al Depth		
	Client	Lonc	lon	Cit	у_	Air	por	rt L	imite	d		7.2	2.5		Method/ Plant Used	Dy	namic Sa Rotai	mpling	/ She	et 3 of 4	1	
	PRO	GRE	ESS		-		-			STF	RAT	A					SAMPL	ES & 1	ESTS		sut/	
	Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD	ر ت Legend	Depth (Thickness)			Stra	ata De	scriptior	1		Depth (m)	Type No	Test Result	Field Records	Instrume Backfill	
21 ROLARY    Project: 162900 - LONDON CLIY AIRFORT.GFU    LIDRARY - 2017.GLB    DATE: 3 MARD 2017	15/12/16 16/12/16	14.00	▶ 1.90 3.10		333 47 333 67 75	27 38 17 57				23.3 24.1 chal 24.2 25.4 24.7 cobl 25.0 26.3 grav subz blac 27.1 27.4 subz blac 27.7 grav subz blac 27.7 grav subz blac 27.9 with fine 27.9 subz subz blac 27.9 subz subz blac 27.9 subz subz blac 27.9 subz subz blac 27.9 subz subz subz subz subz subz subz subz	0 bc k 0 wi 0 m an 0 - 24. les 0 - 25. 0 - 25. 0 - 25. 0 - 25. 0 - 25. 0 - 26. mgular ments : 0 wi 0 - 27. mgular ments : 0 wi 0 - 28. mgular ments : 0 wi 0 - 28. mgular ments : 0 wi 0 - 29. mgular ments : 0 wi 0	40 [N] 40 [N] 40 [N] 40 with 40 with 40 with 40 with 40 with 40 [N] fine to c 40 finit co weak, n 75 [N] fine to c 40 finit co weak, n 70 [N] fine to c 40 finit co 40 finit	inded f strong, izontal n coming th a ver [] recov coarse v k rinde ertical a ck rinde [] recov coarse s obbles. nedium [] recov vel con coarse s obbles. nedium [] recov coarse s coarse s obbles. nedium [] recov	Int cobb medium fracture a weak ch tical frac weak, me d flint md subho ad flint co vered as: ilty GRA Gravel of density of vered as: inprises ar weak, me d flint during the vered as: ilty GRA density of vered as: inprises ar weak, me d flint borizonta y angular ents with subhoriz vered as:	tes density white and at 24.45m, alk, with rare fli- ture firm, white very ngular to dium density ch orizontal fracture obble white angular to VEL with rare somprises weak shalk fragments firm, white very ngular to dium density ch al fracture infill to subangular occasional purp ontal fracture ar white angular to VEL with rare	int 7 halk es 2 to 7 halk ed ple nd 2	$\begin{array}{c} (m) \\ 20.00 \\ 21.50 \\ 21.50 \\ 23.00 \\ 24.50 \\ 24.50 \\ 24.50 \\ 24.50 \\ 24.50 \\ 24.50 \\ 24.50 \\ 25.10 \\ 26.00 \\ 26.00 \\ 27.50 \\ 28.00 \\ 29.00 \\ 29.00 \\ 29.00 \\ 29.00 \end{array}$	NO           D06           D07           D08           B09           D10           B11           D12           B13           D14           B15	N50/ 5 mm N50/ 5 mm N40 N40 N40	25 / 50 25 / 50 3, 6 / 8, 9, 11, 12 3, 7 / 7, 10, 11, 4, 7 / 11, 12, 16 7, 12 / 21, 29	2 12	
	Issue N	ю: г	)1	Ch	eck	ed I	By:			rind	ed flin l By:		Log	g Print D	Date & Time:		3/03/2017 1	17:48		AG	S	

Unit 8 W London, Telepho E-mail:	/arple W3 0 ne: 0 si@cc	Mews RF 20881 Incept	War 2880 consi	P ple V ultan	Way ts.c	, o.uk					R		UKA UKA DOI	S	Borehole No BH30	
Projec ( Job N	$\frac{\mathbf{CAI}}{\mathbf{D}}$	OP S	Sur Da	<b>te</b> S	eys Sta	s G	rou	nd I	nvestigation (D	Dock) · (mOD)	- Phase 2	25		Fina	al Denth	
1	6/29	900	Da	ite (	Co	mple	eted	16/12	4.23		E 5431	81.6 N 180.	343.2		33.00m	
Client I	lonc	lon	- Cit	y A	١r	por	t Li	imite	d		Method/ Plant Used	Dynamic Sar Rotar	npling / y	/ Shee	et 4 of 4	
PRO	GRE	SS							STRATA			SAMPLE	ES & T	ESTS		ent/
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD	Legend	Depth (Thickness)	Strata D	Description	n	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill
16/12/16	14.00	1.90		85	62	-28.77			28.75 with a wide ope with weak to moderately coarse chalk fragments 29.00 - 29.20 with a wide ope 29.35 with a wide ope 29.35 with a wide ope 29.35 with a wide ope 29.50 - 29.70 with rar to coarse black rinded fl 29.70 - 29.80 with a me subangular fine to coarse cobble size chalk fragm 29.95 with a horizontt 30.10 with a wide ope with weak, medium dem- fine to coarse chalk frag 30.70 with a horizontt 31.00m, 31.10m, 31.20m 31.40 - 31.50 [NI] rec gravelly SILT with rare I Gravel is angular to suba rinded flint 31.50 with a wide ope 31.75 with a wide ope 31.75 with a wide ope 31.70m 32.40 - 32.50 [NI] rec subangular fine to coarse cobble size black rinded to moderately weak, med and black rinded flint End of Borehole	n horizont weak, me vide open v taining en vertical e angular ti int gravel vide open I um density e chalk frag- ents al fracture en horizont sity angula ments al fracture n and 31.4 overed as: black rinde angular fin en vertical overed as: e silty GR/ flint. Gra dium densi	al fracture infilled dium density vertical fracture fracture and at o subangular fine norizontal fracture y angular to gments and rare and at 30.40m and al fracture infilled r to subangular and at 30.90m, 0m firm, white very 4 flint cobbles. e to coarse black fracture and at white angular to AVEL with rare vel comprises weak ty chalk fragments	30.20 30.60-30.85	C16	N28/ 190 mm	6, 13 / 16, 2, 10	
Issue N	e No: 01 Checked By: AN Approved By: OS Log P									og Print I	Date & Time:	03/03/2017 1	7:48		AGS	antiversity of the second second

**C•NCEPT** 



**Borehole No** 

UKAS

**BH31** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	17/11/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	18/11/16	4.69	E 543245.5 N 180364.4	32.00m

	BOREHOLE SUMMARY													
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference				
0.00	32.00	СР	17/11/2016	18/11/2016	SW	СВ			Dando 175	AR909				
	WA	TER S	TRIKES		WATER ADDED CHISELLING / SLOW DRIL					RILLING				

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks
							31.10	31.40	0:45	Gravel

	HOLE           Depth (m)         Diameter (mn           0.00         200					CA	SING			R	OTARY	RECOV	ERY
Dept	h (m)	Dia	ameter (	mm)	Dept	h (m)	Dia	meter (mm)		From (m)	To (m)	Blows	Recovery (%)
0.0 16. 32.	00 .00 .00		200 200 150		0.0 15. 27.	0.00 15.10 27.30		200 200 150					
		R	DTARY	Y FI	LUSH DE	TAIL							
From (	m) T	`o (m)	Flush 7	Гуре	Flush R	eturn (%	) Fl	ush Colour					
Туре	Diama (mn	INSTALL ter Depth of Installation (m)		LLATION DET of Top of Response Zon (m)		ETAILS Bottom of Response Zone (m)		Date of Installation					
То	p	Bott	BACE om	<b>VLU</b>	L DE I A Material	112	Bacl	cfill Date					
(m	)	(m	i)				Duel						
12.00	12.00 32.00 Cement /			ent / Bentoni	entonite Grout 18/11/2016								
ssue No:	02	Checke	d By:	AN	Approved	<sup>By:</sup> OS	Log	g Print Date & T	ïme:	28/03/201	17 12:57		AGS television and the second



W3 0RF Telephone: 020 88 112 880\_Fax: 020 88 112 881 E-mail: si@conceptconsultants.co.uk



**Borehole No** 

**BH31** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 18/11/16

17/11/16 **Ground Level (mOD) Co-Ordinates** 4.69

E 543245.5 N 180364.4

**Final Depth** 32.00m

		PROGR	ESS					SPT DETAILS	5	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks	Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (n
17/11/16	0.00			see Remark 3		12 50	N22	12/7654	12.50	1.10
17/11/16	12.50	12.50	1.10			13.50	N15	4 4 / 5 3 4 3	13.50	1.60
17/11/16	13.50	13.50	1.60		l č	14.50	N12	5 4 / 4 3 2 3	14.50	1.40
17/11/16	14.50	14.50	1.40		s	15.50	N5	5, 17, 1, 5, 2, 5 5 3/2 1 1 1	15.10	1.90
17/11/16	15.50	15.10	1.90		ŝ	16.50	N9	1 2/2 3 2 2	16.50	2.30
17/11/16	16.50	16.50	2.30		ŝ	18.00	N11	3, 2/3, 2, 3, 3	18.00	3.10
7/11/16	18.00	18.00	3.10		S	19.50	N11	3. 2 / 2. 3. 4. 2	19.50	2.90
7/11/16	19.50	19.50	2.90		s	21.00	N21	2, 3 / 5, 5, 6, 5	21.00	3.20
7/11/16	21.00	21.00	3.20		s	22.50	N34	3, 4 / 5, 13, 8, 8	22.50	2.80
7/11/16	22.50	22.50	2.80		s	24.00	N28	5, 5 / 6, 7, 8, 7	24.00	3.00
7/11/16	24.00	24.00	3.00		s	27.00	N45	4, 7 / 9, 11, 11, 14	27.00	2.80
7/11/16	26.00	25.30	2.95		s	28.50	N50/0.28	5, 8 / 10, 12, 14, 14	27.30	3.10
8/11/16	26.00	25.30	2.90		s	30.00	N50/0.235	12. 13 / 18. 13. 14. 5	27.30	2.90
8/11/16	27.00	27.00	2.80		s	31.50	N50/0.235	9, 12 / 13, 16, 15, 6	27.30	3.00
8/11/16	28.50	27.30	3.10					-,,,,-		
8/11/16	30.00	27.30	2.90							
8/11/16	31.50	27.30	3.00							
8/11/16	32.00	27.30	3.00							
25/25-41	DEMODIA									
Borchole ca Clearance by Water preset Ø200mm ca 4.50m and 16.	rried out from a (UXO Magneto nt in the borehol sing used from p 00m and borehe	pontoon. All leve uterer probe e from casing ins ontoon level to 1 ole re-drilled with	els are recorded r tallation through 5.10m depth. B Ø150mm casing	elative to the pontoon level. the dock. intonite scal inserted between to 27.30m depth.						
EY AMPLES S - Environma - 100mm D T - 100mm D T - 100mm D Siturbad - Disturbad - Disturbad - Core Samp STALLATION TE - Standpi GW - Ground - Ground - Standpi -	ential Sample (Tub, V iameter Undisturbed iameter Thin Wall U ameter Undisturbed Sample, B-Bulk Sam Sample, B-Bulk Sam Sample, B-Bulk Sam Sample, B-Water Samd Per Paczometer water Monitor Standy formativenes Monitor Standy	ial, Jar) Sample Sample Jole, LB- Large Bulk S 2, R-Root Sample HOLE pipe IP Shandpire CP Shandpire DS	Sample, BLK-Block S T <b>YPES</b> - Cable Percussion, Pit, TP-Ti- - Cable Percussion, Pit- - Dynamic Samoline.	ample ial Pit TT - Trial Trench Rolary Coring, R/S-Roary/Sonic DS-R-Dyamic Sampline (Rolary						
M - Inclinor	neter CPT. V-Shenr Varya	DC PP-Pooleet Pericipan	-Diamond Coring, Cl	P/R-Cable Percussion Rotary follow on Profile, VOC-Vulaule Organic Compose	de					
ote: All depths	are in metres, all diar	neters in millimetres,	water strike rise time	in minutes. For details of abbreviations	ee Key	I	1		1	I

Unit 8, Warple Mews, Warple Way W3 0RF Telephone: 020 88 112 880\_Fax: 020 88 112 881 E-mail: si@conceptconsultants.co.uk



Borehole No

Job No 16/2900	Date Started Date Completed	17/11/16 18/11/16	Ground Level (mOD) 4.69	Co-Ordinat E 5432	tes 245.5 N 11	80364.4	Fir	nal Depth 32.00m
Client London C	ity Airport Li	mited		Method/ Plant Used	Cable Pe	rcussion	n Sh	eet 1 of 4
PROGRESS		ST	RATA		SAMPL	ES & T	ESTS	
Date Casing Water	Level (mOD) Legend	Depth (Thickness)	Strata Description	1	Depth (m)	Type No	Test Result	Field Records
		(12.00)						
Issue No: 02	Checked By: AN	- Approve	ed By: OS Log Print I	Date & Time:	28/03/2017	12:58		AGS

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**Borehole** No

Project C	ADF	Su	rveys	Grou	nd Invo	estigation	(Dock) -	Phase 2					
Job No		D	ate Start	ted	17/11/16	Ground Le	vel (mOD)	Co-Ordina	tes		Fin	al Depth	
	5/290	D	ate Com	pleted	18/11/16	4.6	9	E 5432	245.5 N 18	0364.4		32.00m	
Client L	ondo	n Ci	ty Airp	ort Li	mited			Method/ Plant Used	Cable Per	rcussion	I She	et 2 of 4	
PRO	)GRE	SS			ST	RATA			SAMPLE	ES & T	ESTS		ent/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Stra	ta Descriptior	l	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill
17/11/16	12.50	1.10	-7.31 -7.81	× × × × × × × × × × × × × × × × × × ×	12.00 (0.50) 12.50 (2.00)	Soft, dark to ligh hydrocarbon odd (<85mm). (DOCK SEDIM Grey sandy angu coarse flint GRA odour. Sand is f (RIVER TERRA 13.50 becomin hydrocarbon odd	n grey SILT with our and rare glass ENT) tlar to well-rour VEL with hydr ine to coarse. SCE DEPOSITS g very sandy w our	th strong ss fragments ided fine to ocarbon S) ith no	12.00 12.00 12.00 12.50 12.50 12.50 12.50 12.50 13.50 13.50 13.50 13.50 13.50 13.50 14.25	ES01 B02 ES03 B04 D05 ES06 B07 D08	N22 N15	VOC 0.5ppm 1, 2 / 7, 6, 5, 4 VOC 0.5ppm 4, 4 / 5, 3, 4, 3 VOC 0.1ppm	
17/11/16	14.50	1.40	-9.81		14.50 (0.50) 15.00	Off-white to bro subangular fine to with occasional Sand is fine to c. (RIVER TERRA INII White CHA	wn very sandy a to medium flint black rinded fli parse. ACE DEPOSITS LK recovered a	angular to GRAVEL nt cobbles.	14.50 14.50-15.00 15.00-15.50	B09 B10	N12	5,4/4,3,2,3	
17/11/16	15.10	1.90				GRAVEL. Grav density chalk and to coarse black r (SEAFORD CH 15.50 [NI] rec	to coarse white rel is extremely d angular to sub inded flint. ALK FORMAT overed as: firm	silty weak, medium bangular fine <b>ION)</b> to stiff, white	15.50 15.50 16.00-16.50	D11 B12	N5	5, 3 / 2, 1, 1, 1	
17/11/16	16.50	2.30				16.50 becomin strong, chalk fra 16.50 [NI] rec SILT	ng angular to su gments with no overed as: firm	bangular rinded flint to stiff, white	- 16.50 - 16.50 - 17.00-17.50	D13 B14	N9	1, 2 / 2, 3, 2, 2	
17/11/16	18.00	3.10				17.00 with col density chalk fra cobble size angu flint 18.00 [NI] rec 18.50 with rar (<200mm)	bble size strong gments and coa lar to subangul overed as: firm e pockets of wh	, medium rse gravel and ar black rinded , white SILT hite chalk SILT	18.00 18.00 18.50-19.00	D15 B16	N11	3, 2 / 3, 2, 3, 3	
17/11/16	19.50	2.90				19.50 becomin	ng firm SILT		19.50 19.50 20.00-20.50	D17 B18	N11	3, 2 / 2, 3, 4, 2	
Issue No	: 02	Cł	necked By	: AN	Approv	ed By: OS	Log Print D	Date & Time:	28/03/2017	12:58		AGS	Nacional In Accounts a

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Report ID: CONCEPT CABLE PERCUSSION || Project: 162900 - LONDON CITY AIRPORT.GPJ || LIbrary: CONCEPT LIBRARY - 2017.GLB || Date: 28 March 2017

Unit 8, Warple Mews, Warple Way W3 ORF Telephone: 020 88 112 880\_Fax: 020 88 112 881 E-mail: si@conceptconsultants.co.uk



**Borehole** No

Project	ADP	Su	rveys Grou	nd Inve	estigation	(Dock) -	Phase 2					
Job No	2000</th <th>Da</th> <th>ate Started</th> <th>17/11/16</th> <th>Ground Le</th> <th>vel (mOD)</th> <th>Co-Ordina</th> <th>tes</th> <th></th> <th>Fin</th> <th>al Depth</th> <th></th>	Da	ate Started	17/11/16	Ground Le	vel (mOD)	Co-Ordina	tes		Fin	al Depth	
	J/ 2900		ate Completed	18/11/10	4.6	9	E 5432	245.5 N 18	0364.4		32.00m	
Chent	ondor	n Cit	ty Airport Li	mited			Method/ Plant Used	Cable Per	cussion	She	3 of 4	
PRO	OGRE	SS		ST	RATA			SAMPLE	CS & T	ESTS		ent/
Date	Casing	Water	Level (mOD) Legend	Depth (Thickness)	Stra	ta Description	l	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill
17/11/16	21.00	3.20			20.00 - 20.50 subangular coars 21.00 [NI] rec SILT. Gravel is medium to coars 21.50 - 22.00	with rare angul se black rinded covered as: whit angular to suba se black rinded i with no rinded	ar to flint gravel e gravelly ngular flint flint	21.00 21.00 21.50-22.00	D19 B20	N21	2, 3 / 5, 5, 6, 5	
17/11/16	22.50	2.80			22.50 [NI] rec	covered as: firm	, white SILT	22.50 22.50 23.00-23.50	D21 B22	N34	3, 4 / 5, 13, 8, 8	
17/11/16	24.00	3.00		(17.00)	24.50 - 25.00	with no rinded	flint	24.00 24.00 24.50-25.00	D23 B24	N28	5, 5 / 6, 7, 8, 7	
17/11/16 18/11/16	25.30 25.30	2.95 2.90			25.50 [NI] rec	covered as: firm	, white SILT	26.00-26.50	B25			
18/11/16	27.00	2.80			27.00 [NI] rec	covered as: whit	e SILT	27.00	D26	N45	4,7/9,11,11,14	
18/11/16	27.30	3.10			28.00 L. [NI] rec SILT. Gravel is extremely weak, angular to suban size black rinded 28.50 [NI] rec	overed as: whit angular to suba low density wh gular coarse gra l flint sovered as: firm	e gravelly ngular fine, ite chalk and avel to cobble , white SILT	28.00 28.50 28.50	D27 D28	N50/ 280 mm	5, 8 / 10, 12, 14, 14	
18/11/16	27.30	2.90			29.50 becomi	ng very silty		29.50	D29	N50/	12, 13 / 18, 13, 14, 5	
Issue No	: 02	Ch	necked By: AN	Approve	ed By: OS	Log Print D	Date & Time:	28/03/2017	12:58	235 mm	AGS	the statement is a
i -	04		- 1114		. 00	1						

Con -Unit 8, Warple Mews, Warple Way W3 ORF Telephone: 020 88 112 880\_Fax: 020 88 112 881 E-mail: si@conceptconsultants.co.uk



**Borehole** No

Project C	ADF	<b>Su</b>	rveys	Grou	nd Invo	estigation (Dock)	) - Phase 2					
Job No 1(	6/290	Da Da	ate Start ate Com	ed pleted	17/11/16 18/11/16	Ground Level (mOD	) Co-Ordina E 543	tes 245.5 N 18	20364.4	Fin	al Depth	
Client L	ondo	n Cit	ty Airp	ort Li	mited	1.09	Method/ Plant Used	Cable Per	rcussion	She	et 4 of 4	
PRO	OGRE	ESS			ST	RATA		SAMPLE	ES & T	ESTS		nt/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Descript	ion	Depth (m)	Type No	Test Result	Field Records	nstrume 3ackfill
Date	27.30 27.30	3.00 3.00	-27.31		( <i>Thickness</i> )	Strata Descript: 30.00 [NI] recovered as: fi gravelly SILT. Gravel is ang subangular fine to coarse bla 30.50 with no cobble size 31.50 [NI] recovered as: fi End of Borehole	ion Tm, white Ular to ck rinded flint chalk fragments Tm, white SILT	(m) 30.00 31.00 31.10-31.40 31.50 31.50	D30 D30 D31 B32 D33	N50/ 235 mm	Records 9, 12 / 13, 16, 15, 6	ack
Jagua Na						ed Bur og Log Prin	t Date & Time-					
Issue No	: 02	Ch	necked By	: AN	Approv	ed By: OS   Log Prin	t Date & Time:	28/03/2017	12:58		AGS	NAMES OF TAXABLE





**BH32** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	09/12/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	14/12/16	4.61	E 543300.7 N 180351.6	31.40m

				BOREH	HOLE S	SUMMAI	RY			
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00 20.00	20.00 31.40	DS RC	09/12/2016 13/12/2016	13/12/2016 14/12/2016	TC TC	CB CB	112	PDC	Geotec 350 Geotec 350	AR779 AR779
	WA	TER S	TRIKES		WA	FER ADI	DED CH	IISELLIN	G / SLOW D	RILLING

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks

	H	OLE				CAS	SING			R	OTARY	RECOV	ERY
Deptl	h (m)	Dia	ameter (m	um)	Depth	ı (m)	Dia	meter (mm)		From (m)	To (m)	Blows	Recovery (%)
0.0 20.0 31.4	)0 00 40		150 150 146		0.00 14.8	0 80		150 150		$11.20 \\ 11.50 \\ 12.00 \\ 13.00 \\ 14.00$	$ \begin{array}{r} 11.50\\ 12.00\\ 13.00\\ 14.00\\ 14.80 \end{array} $		100 100 100 100
		R	OTARY	FLUSI	H DE'	ΓAIL			ן ן ן	14.80	15.80		40
From (n	n) Ta	) (M)	Flush Ty	pe Fl	ush Re	turn (%)	Fl	ush Colour	1	16.80	17.80		100
20.00 28.00	20.00 28.00 28.00 31.40		Water Water		70 75					17.80 18.90 20.00 21.00 22.50 24.00 25.50 27.00 28.00 28.50	18.90 20.00 21.00 22.50 24.00 25.50 27.00 28.00 28.50 29.00		$     \begin{array}{r}       100 \\       100 \\       100 \\       100 \\       100 \\       100 \\       80 \\       100 \\        100 \\      1$
	·	INS	TALLA	TION	DETA	AILS	•			28.50 29.90	31.40		100
Туре	ype Diameter (mm) Depth of Installation (m) (m) (m) (m)					Bottor Response (m)	n of e Zone )	Date of Installation					
Top	BACKFILL DETAI							CII D.4.					
(m)		вон (m	om 1)	WIAN	<b>EI 1</b> 41		Back	dill Date					
11.20	Image: constraint (m)         Description           11.20         31.40         Ceme				3entonit	e Grout	14/	12/2016					
ssue No:	01	Checke	ed By: A	N App	proved I	By: OS	Log	g Print Date & T	ime:	03/03/201	7 17:43		AGS intervention and the second





**BH32** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 14/12/16

4.61

09/12/16 Ground Level (mOD) Co-Ordinates

**Final Depth** 31.40m

Date         Febre         Despite (m)         Despite (m)         Remarks         Type         Depth         Name         Disconant         Casing Prephr (m)         Depth (m) </th <th></th> <th></th> <th>PROGR</th> <th>ESS</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>SPT DETAILS</th> <th>5</th> <th></th>			PROGR	ESS						SPT DETAILS	5	
09/12/16       0.00	Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks	s T	Гуре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
09/12/16       11.20       11.00	09/12/16	0.00					С	12.00	N5	0 0/1 1 2 1	11.00	
09/12/16       12.00       12.00       12.00       12.00         09/12/16       14.80       14.80       2.20         13/12/16       16.80       14.80       1.90         13/12/16       16.80       14.80       1.90         13/12/16       16.80       14.80       1.90         13/12/16       28.00       14.80       1.90         13/12/16       28.00       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       2.00       14.80       2.80         14/12/16       31.40       14.80       2.80         12/12/12/12/12/12/12/12/12/12/12/12/12/1	09/12/16	11.20	11.00		see Remark 4	4	č	13.00	N10	1, 3/2, 3, 3, 2	12.00	
09/12/16       16.80       14.80       2.0         13/12/16       16.80       14.80       1.90         13/12/16       28.00       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       31.40       14.80       1.00         14/12/16       14.80       1.00       1.00         14/12/16       14.80       1.00       1.00         14/12/16       1.00       1.00       1.00         14/12/16       1.00       1.00       1.00         14/12/16       1.0	09/12/16	12.00	12.00				c	14.00	N9	2, 2/2, 2, 2, 3	14.00	
09/12/16       16.80       14.80       2.20       14.80       190         13/12/16       16.80       14.80       1.00       1.17.3, 5, 4, 3       14.80         13/12/16       28.00       14.80       1.10       1.17.3, 5, 4, 3       14.80         14/12/16       28.00       14.80       2.80       1.480       5       17.80       N10       3, 27.42, 3, 4, 5       14.80         14/12/16       31.40       14.80       2.80       1.480       5       1.70, 1.73, 5, 4, 3       14.80         14/12/16       31.40       14.80       2.80       1.480       5       2.000       N17       4, 3, 4, 4, 6       14.80         5       2.000       N17       4, 3, 4, 4, 4, 6       14.80       5       2.100       N17       4, 3, 4, 4, 6       14.80         5       2.50       N500.285       4, 6/, 11, 12, 14, 13       14.80       5       2.800       N500.255       3, 6/, 12, 14, 14, 10       14.80         5       2.900       N500.255       3, 6/, 12, 14, 14, 10       14.80       5       2.900       N500.255       3, 6/, 12, 14, 14, 10       14.80       14.80       5       2.900       N500.255       3, 6/, 12, 14, 14, 10       14.80       14.80	09/12/16	14.80	14.80				S	14.80	N10	2, 2 / 2, 3, 2, 3	14.80	
13/12/16       16.800       11.480       1.109         13/12/16       28.00       14.80       1.10         14/12/16       28.00       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         2000       N100       2.55       N500.255       3,6/12,14,14,10         14.80       2.25.00       N500.255       3,6/12,14,14,10       14.80         1       0.9900       9.900,111,11,18,1480       14.80       14.80         1       0.9900,114.	09/12/16	16.80	14.80	2.20			s	15.80	N10	3, 2 / 2, 2, 3, 3	14.80	
13/12/16       28.00       14.80       1.10         14/12/16       28.00       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         20.00       N17       4,37.3,4,4,6       14.80         8       21.00       N500.255       5,9/11,11,1,3       14.80         8       25.50       N500.255       5,9/11,11,1,3       14.80         8       29.90       N500.255       3,6/12,14,14,10       14.80         9       20.000       N500.255       3,6/12,14,14,10       14.80         1.9000000000000000000000000000000000000	13/12/16	16.80	14.80	1.90			s	16.80	N15	1, 1 / 3, 5, 4, 3	14.80	
14/12/16       28.00       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       2.80         14/12/16       31.40       14.80       3.2/4, 3, 4, 5       14.80         14/12/16       31.40       14.80       3.2/4, 3, 4, 5       14.80         14/12/16       31.40       14.80       3.2/4, 3, 4, 4       14.80         14/12/16       31.40       14.80       3.2/4, 3, 4, 4       14.80         14/12/16       31.40       14.80       3.2/4, 3, 1, 11, 11, 13       14.80         14/12/16       31.40       14.80       3.4/4, 11, 11, 14.80       3.4/4, 11, 11, 11, 14.80         14/12/16       31.40       14.80       3.4/4, 11, 11, 11, 14.80       14.80         14/12/16       31.40       14.80       3.4/4, 11, 11, 17, 18.14.80       14.80         14/12/16       3.4/4, 10, 14.17, 18.14.80       3.4/4, 11, 14.17, 18.14.80       14.80         14/12/16       3.4/4, 11, 11, 17, 18.14.80       14.80       14.80         15.2000       N500.255       3.6/12, 14, 14.10       14.80         16.200100       N500.255       3.6/12, 14, 14, 10       14.80         17.200100000000000000000000000000000	13/12/16	28.00	14.80	1.10			s	17.80	N22	3, 3 / 6, 5, 5, 6	14.80	
14/12/16       31.40       14.80       s       2000       N16       3.2.43, 4, 5       14.80         18/12/16       31.40       14.80       s       2100       N17       4.3/3, 4, 4, 6       14.80         18/12/16       14.80       s       2100       N17       4.3/3, 4, 4, 6       14.80         18/12/16       14.80       s       22.50       N44       6, 7/9, 11, 11, 13       14.80         18/12/16       14.80       s       22.50       N50.0235       2.4/6, 10, 16, 18       14.80         18/12/16       14.80       s       27.00       N50.0235       3.6/12, 14, 14, 10       14.80         18/12/16       14.80       s       29.90       N50.0235       3.6/12, 14, 14, 10       14.80         18/12/16       14.80       s       29.90       N50.0235       3.6/12, 14, 14, 10       14.80         18/14       18/14       14.80       s       29.90       N50.0235       3.6/12, 14, 14, 10       14.80         18/14       18/14       14/14       14.80       14.80       14.80       14.80         19/14       19/14       11.20m o 3.90 dm. Romy being campion of the set.       14.90       14.90       14.90       14.90	14/12/16	28.00	14.80	2.80			S	18.90	N20	3, 4 / 5, 5, 5, 5	14.80	
S         21.00         N17         4,3,4,4,6         14.80           S         22.00         N49         3,4/8,12,13,16         14.80           S         22.50         N500.255         2,5/11,14,17,8         14.80           S         22.50         N500.255         2,5/11,14,17,8         14.80           S         22.50         N500.255         3,6/12,14,13         14.80           S         22.50         N500.255         3,6/12,14,13         14.80           S         25.50         N500.255         3,6/12,14,14,10         14.80           S         29.90         N500.255         3,6/12,14,14,10         14.80           S         29.90         N500.255         3,6/12,14,14,10         14.80           CENERAL RFMARKS	14/12/16	31.40	14.80				S	20.00	N16	3, 2 / 4, 3, 4, 5	14.80	
State         25.50         N44         3, 4 / 8, 12, 13, 16         14.80           State         25.50         N500.285         2, 4 / 6, 10, 16, 18         14.80           State         25.50         N500.285         2, 4 / 6, 10, 16, 18         14.80           State         25.50         N500.285         2, 4 / 6, 10, 16, 18         14.80           State         25.50         N500.285         3, 6 / 12, 14, 13         14.80           State         N500.255         3, 6 / 12, 14, 13         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80           State         N500.255         3, 6 / 12, 14, 14, 10         14.80 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>S</td> <td>21.00</td> <td>N17</td> <td>4, 3 / 3, 4, 4, 6</td> <td>14.80</td> <td></td>							S	21.00	N17	4, 3 / 3, 4, 4, 6	14.80	
S         24.00         N49         3, 4/8, 12, 13, 16         14.80           S         25.50         N500.285         3, 4/8, 12, 13, 16         14.80           S         25.50         N500.285         3, 4/6, 10, 10, 6, 18         14.80           S         25.50         N500.285         3, 6/11, 12, 14, 13         14.80           S         29.90         N500.285         3, 6/12, 14, 14, 10         14.80           S         29.90         N500.285         3, 6/12, 14, 14, 10         14.80           CENERAL REMARKS         S         29.90         N500.255         3, 6/12, 14, 14, 10         14.80           1. October and/or afform proposes: All lowbards me recorded relative to the postoon lowet.         S         29.90         N500.255         3, 6/12, 14, 14, 10         14.80           1. October and/or afform proposes: All lowbards me recorded relative to the postoon lowet.         S         29.90         N500.255         3, 6/12, 14, 14, 10         14.80           1. October afform and stage fragment in the outplot form estign and intercords fragment and and the outplot form estign and intercords and and and the outplot form estign and							S	22.50	N44	6, 7 / 9, 11, 11, 13	14.80	
Signed State         Signed State<							S	24.00	N49	3, 4 / 8, 12, 13, 16	14.80	
S         27.00         NS00.245         5.9/11, 14, 17, 8         14.80           S         28.50         NS00.255         3.6/12, 14, 14, 10         14.80           S         29.90         NS00.255         3.6/12, 14, 14, 10         14.80           CENERAL REMARKS         Image: Source of the state of the state of the postoon level.         Image: Source of the state of t							S	25.50	N50/0.285	2, 4 / 6, 10, 16, 18	14.80	
S         28.50         N500.285         4, 6/11, 12, 14, 13         14.80           S         29.90         N500.255         3, 6/12, 14, 14, 10         14.80           GENERAL REMARKS							S	27.00	N50/0.245	5,9/11,14,17,8	14.80	
S       29.90       N50/0.255       3, 6 / 12, 14, 14, 10       14.80         GENERAL REMARKS         1. Buches arried out from parton. All bots are recorded relative to the ponton level.         3. Mark results are recorded relative to the ponton level.         4. Water present in the botche from result installation through the dock.         4. Optimized arried out from parton. All bots are recorded relative to the ponton level.         5. Water present in the botche from result installation through the dock.         4. Optimized arried out from parton. All bots are recorded relative to the ponton level.         5. Water present in the botche from result installation through the dock.         6. Dimmized arried out from parton. All bots are recorded relative to the ponton level.         7. Water present in the botche from result installation through the dock.         8. Dimmized arried out from 12.00 m 20.00 m. Restry boting carried out the result installation of the dock.         9. Dimmized arried out from 12.00 m 20.00 m. Restry boting carried out the result installation of the dock installation							s	28.50	N50/0.285	4, 6 / 11, 12, 14, 13	14.80	
CPUERAL REMARKS       Boechole carried out from postoon. All levels are recorded relative to the postoon level.       2. Carried by UKO Magacioner production.       3. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       4. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from 11.20m to 20.00m. Restay boring carried out form postoon.       5. Dearbier sampling techniques used from the REL Black Sample.       5. Dearbier sampling techniques used from the REL Black Sample.       5. Dearbier sample. <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>s</td><td>29.90</td><td>N50/0.255</td><td>3, 6 / 12, 14, 14, 10</td><td>14.80</td><td></td></t<>							s	29.90	N50/0.255	3, 6 / 12, 14, 14, 10	14.80	
3. Water present in the borchole from casing installation through the dock. 4. Dynamic sampling techniques used from 11.20m to 20.00m. Rotary boring carried out thereafter. <b>KEX SAMPLES SAMPLES SAMPLES C D D D D D D D D D D</b>	GENERAL 1. Borchole ca 2. Clearance b	REMARKS irried out from a y UXO Magneto	pontoon. All lew	els are recorded i	elative to the pontoon l	cvcl.						
KEY         SAMPLES         ES       - Environmenial Sample (Tub, Vial, Jar)         U       - 100mm Diameter Undisturbed Sample         UT       - 100mm Diameter Undisturbed Sample         U38       - Simm Diameter Undisturbed Sample         U38       - Osturbeter Sample         INSTALLATION DETAILS       HOLE TYPES         SPE       - Sampley Prezometer         SPE       - Cable Percussion, R.C. Rotary Coring, R.S. Rotary Sonic         OVP       - Virturang Wire Prezometer         SPE       DC         Out       - Incinometer         DC       - Diamond Coring, CPR-Cable Percussion Rotary follow on         TESTS SC SPT (CPT), V. Sturf Yane, PP Pokate Protestrike rise time in minutes. For details of abbreviations see Key         Note:       All depths are in metres, all diameters in millimetres, water strike rise time in minutes. For details of abbreviations see Key	<ol> <li>Water prese:</li> <li>Dynamic sa thereafter.</li> </ol>	ti in the borchold	e from casing inst	allation through 10m to 20.00m. F	the dock. Lotary boring carried ou	t						
ue No: 01 Checked By: AN Approved By: OS Log Print Date & Time: 02/02/2017 17.44	KEY           SAMPLES           ES         - Environm           U         - 100mm L           UT         - I00mm L           D         Disturbed           C         - Core Sam           INSTALLATION         SPEC           SPERW         - Ground           UK         - Ground           US         - Standp           SPECW         - Ground           UCM         - Include           TESTS         SCAPT           Note         81 deacht	ential Sample (Tub, V iameter Tuhisturbed Jameter Thin Wall U iameter Thin Wall U iameter Undisturbed Sample, B-Bull Sam Je, W. Water Sample Water Monitor Stand Generation Monitor Stand Generation Monitor Stand Generation (Context) (CT) - V. Shari Venya and Impere all dio	rial, Jar) Samplo natisturbod Samplo Samplo pple, LB- Large Bulk 2, R-Root Sample <b>HOLL</b> pipe IP Samdpine CP DS DC PP Pocket Poincoren	Sample, BLK-Block S TYPES Inspection Pit, TP-T Cable Procession, Te. -Diamond Coring, C -Diamond Coring, C creer, MP Main function wave strillo data from	sample rial Pii TT - Trial Trench C-Rotary Coring, R'S-Rotary DSR-Dynamic Sampling RK PR-Cable Percussion Rotary Profig. VOC-Volucit Organi	Sonic Jary Iollow on Composed						
The No: 0.1 Checked By: AN Approved By: OS Log Print Date & Time: 02/02/2017 17.44	An uopuis	ale in nouve, an ula	assets in all filler c8,			erranono soo noy						
	sue No: o	1 Check	ed By:	Annroy	ed By: OG	Log Print T	Date A	& Time	02/02/20	17 17.44		ACC

	Unit 8 W London, Telepho E-mail:	/arple W3 0 ne: 02 si@co	Mews RF 20881 ncept	Wal Wal 2880	P rple	Way	/ :o.uk									1 and	B		UKAS SHIERS			U KA SISTING DO1	Sint	Bo	reho BH	le No [32	
	Projec	t CAΓ	)P 9	Sui	rve	evs	s Gi	rou	nd I	nves	stio	ati	0 <b>n</b> (	(Do	ock)	- P	has	e 2									
	Job No	0		Da	ite	Sta	rted		09/12	2/16	Gro	und	Lev	vel (r	nOD)	C	0-01	rdinat	tes				Fir	al D	epth		
	1	6/29	900	Da	ite	Co	mple	eted	14/12	2/16			4.61	1			E	5433	300.	7 N 18	0351	.6			31.	40m	
	Client L	lond	lon	Cit	<b>у</b> А	Air	por	t Li	imite	d						M   Pl	etho ant l	d/ Used	Dy	namic Sa Rota	ımpl ry	ing /	' She	eet	1	of 4	
[	PRO	GRF	SS							STR	RAT	Ά				-			5	SAMPL	ES	& T	ESTS	5			ent/
	Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD	Legend	Depth (Thickness)				Strat	a Des	scriptio	m				Depth (m)	T Ì	ype No	Test Result		F: Ree	eld cords	Instrum Backfill
port ID: CONCEPT ROTARY    Project: 162900 - LONDON CITY AIRPORT.GPJ    Library: CONCEPT LIBRARY - 2017.GLB    Date: 3 March 2017	09/12/16	o: (	21	Ch	eck	ed H	Зу:	AN	(11.20)	Droved	er.	0	S	Log	Print	Date	& Ti	me:			17:49						
eport	Issue N	o: (	)1	Ch	eck	ed I	By:	AN	Ap	proved	l By:	05	s	Log	Print	Date	& Ti	me:	03/	/03/2017	17:49	)				AGS	NUMBER OF TAXABLE

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



Borehole No

Job No 1	6/29	000	Da Da	te St te Co	arted	ted	14/12/1	I6         Ground Level (mOD           16         4.61	E 54330	0.7 N 180	351.6	Fina	al Depth 31.40m	
Client	lond	lon	Cit	y Ai	rpor	t Li	mited		Method/ I Plant Used	Dynamic Sai Rotar	npling / y	She	et 2 of 4	_
PRO	GRE	SS					S	TRATA		SAMPL	ES & T	ESTS		
Date	Casing	Water	TCR %	SCR % ROD %	Level (mOD)	Legend	Depth (Thickness)	Strata Descripti	on	Depth (m)	Type No	Test Result	Field Records	
										- - - - -				
9/12/16	11.00				-6.59	×	- 11.20	Soft brown silty CLAV with occ	asional dark grev	-  				
			100 100					staining and strong hydrocarbon (DOCK SEDIMENT)	odour.	- - - -	D01			
9/12/16	12.00						(1.30)			- 11.90 - 12.00	D01	N5	0,0/1,1,2,1	
			100		-7.89	- × × · · ·	= <u>12.50</u>	Dark grey sandy angular to well to coarse flint GRAVEL with strong	ounded fine to hydrocarbon odour.	- - - - -				
						· · · · · · · · · · · · · · · · · · ·	-(1.20)	(RIVER TERRACE DEPOSITS) 13.00 becoming yellowish bro hydrocarbon odour	wn with slight	- 13.00		N10	1, 3 / 2, 3, 3, 2	
			100		-9.09	000. 000-	- 13.70	White CHALK recovered as: firm	n to stiff, SILT.	- 13.50	B02	NO		
			50					(SHAFORD CHALK FORMATI 13.90 becoming slightly grave to subangular black rinded flint (	ONI ly. Gravel is angular from above)	- 14.00 - -		19	2, 272, 2, 2, 3	
9/12/16	14.80		50					14.50 with occasional moderated density chalk cobbles	ely weak, medium	- - 14.80		N10	2, 2 / 2, 3, 2, 3	
			40							 - - -				
								15.70 with rare subangular to a rinded flint gravel	ngular coarse black	- 15.70 - 15.80 - 15.80	В03 D04	N10	3, 2 / 2, 2, 3, 3	
			100					16.20 with no black rinded flin	ıt	- - 16.50	B05			
9/12/16 3/12/16	14.80 14.80	2.20 1.90						16.80 [NI] recovered as: angul to coarse GRAVEL with occasio	ar to subangular fine	-16.80 -17.10	B06	N15	1, 1 / 3, 5, 4, 3	
			100					density chalk cobbles. Gravel is density white chalk fragments	veak, medium	- - - -				
							(8.10)			- 17.80 - 17.80 - 18.10	D07 B08	N22	3, 3 / 6, 5, 5, 6	
			100					18.10 - 18.30 with occasional subangular fine to coarse black ri rare flint cobbles	angular to nded flint gravel and	- - - -				
										- - 18.90 - 18.90 - 19.10	D09 B10	N20	3,4/5,5,5,5	
			100					19.50 with rare angular to sub-	ingular fine to coarse	- - - -				
						⊢⊢	t l	orack mucu mit graver		- 20.00		NI6	32/4345	

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**Borehole No** 

Job No 1 Client	o 6/29	900 Lora	Da Da	ite ite	Sta Coi	mple	eted	09/12 14/12	Ground Level (mOD)           /16         4.61	E 54330 Method/ D	9 0.7 N 1803 9ynamic San Botor	351.6 1pling /	Fina / Shee	al Depth 31.40m
		10n		у.	AIr	por	t Li	mite	1 STRATA	Plant Used	SAMPLE	5.8.7	ESTS	3 01 4
-	ing	Let	%	%	% (	Level	pu	Denth			Denth	Type	Test	Field
Date	Casi	Wat	TCR	SCR	RQD	(mOD	Lege	(Thickness)	Strata Description	1	(m)	No	Result	Records
							L.	-	20.00 becoming sandy		- 20.00	D11		
			100				<u>L</u>	-			20.50	B12		
			100				Ľ	-	20.50 - 20.80 with occasional bla gravel	ack rinded flint	-			
							<u>L</u>	-	20.90 with 1No subvertical fract	ure with purple	- 21.00		N17	4,3/3,4,4,6
									staining		-			
							<u></u>	<b>↓</b> +			- 21.50	B13		
			100	20	10	-17.19	, E	21.80	0		- - -			
						-17.49	, L	22.10	Strong, medium density white CHA occasional subvertical and subhoriz	ALK with zontal fractures				
								-	(SEAFORD CHALK FORMATIO)	Ň] /	/- 		N44	6 7 / 0 11 11 12
							<u>L</u>	-	White CHALK recovered as: firm t (SEAFORD CHALK FORMATIO)	o stiff, SILT. N	- 22.50	D14	IN44	0, 779, 11, 11, 15
								+			-			
							<u></u>	<b>↓_</b> +			-			
			100				<u>F</u>		22.40	. 22. 10	- 23.50	B15		
							<b>F</b>	-	and 23.70m	t 23.40m, 23.50m	-			
								]- ]-			- 24.00		N49	3,4/8,12,13,16
								-			- 24.00	D16		
											-			
			100	40	27			+	24.50 with 1No subhorizontal fra and 1No vertical open fracture betw	acture at 24.50m veen 24.50m and	- 24.70	B17		
			100		21				24.70m 24.70 with 1No horizontal fractu	re and at 24.80m,	-			
								+	24.85m and 24.90m		-			
							F	1- 1-			- 25.50		N50/ 285 mm	2,4/6,10,16,18
								-			- 25.50	D18		
			100	43	41		<u>L</u>	-			-	C10		
							<u> </u>	-	26.40 - 26.50 [NI] recovered as: subangular fine to coarse GRAVEI	silty angular to L with rare black	- 20.30-20.70	C19		
							<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>	(9.30)	rinded flint cobbles. Gravel compr density white chalk fragments and	ises weak, medium rare black rinded	- 27.00		N50/	5,9/11,14,17.8
					$\square$		<u></u>	1- -	flint 26.65 with 1No horizontal fractu	re and at 26.80m	-		245 mm	,,.,.,.,.,.,.,
			0.2				F	]-	and 26.90m 27.00 [NI] recovered as: silty any	gular to subangular	- 27.00 - 27.50	D20 B21		
			80						fine to coarse GRAVEL. Gravel co medium density white chalk fragme	mprises weak, ents and rare black	-			
/12/16	14.80	1.10							rinded flint 27.40 with rare stong, medium d	ensity chalk	-			
/12/16	14.80	2.80	100	80	76			+	cobbles 27.90 - 28.10 with angular to sul	pangular fine to	- -			
			100					-	coarse black rinded flint gravel and flint cobbles	rare black rinded	- 28.50		N50/	4, 6 / 11, 12, 14, 13
									28.20 with 1No subvertical fract 28.35 with 1No wide open fractu	ure tre infilled with	- 28.50	222	205 1111	
								[  -	angular to subangular fine to coarse density chalk fragments	e weak, medium	- 20.50	022		
			100	71	64				28.70 becoming very silty with f subangular fine to coarse black ring	requent angular to led flint	- - 29 40-29 70	C23		
							F		28.90 with subvertical fractures 29.20 - 29.30 with 1No wide ope	en fracture infilled	-	025		
									with angular to subangular fine to o medium density chalk fragments ar	oarse weak, id rare black	- 29.90		N50/	3, 6 / 12, 14, 14, 10
									rinded flint cobbles		-		255 mm	

Unit 8 V London Telepho E-mail:	Varple , W3 0 one: 02 si@co	Mews RF 20881: ncepte	Warple 2880_ consulta	e Way	/ o.uk									15 Mar	Borehole I BH32	No 2
(	CAI	)P S	Surv	eys	s Gi	rou	nd I	nve	stigation	(Dock) ·	Phase 2					
Job N	0		Date	e Sta	rted		09/12	/16	Ground Le	vel (mOD)	Co-Ordinates	5		Fina	al Depth	
	10/25	200	Date	e Co	mple	ted	14/12	/16	4.6	1	E 54330	0.7 N 1803	351.6	_	31.401	n
Client	Lond	lon	City	Aiı	por	t Li	mite	d			Method/ D   Plant Used	ynamic San) Rotary	npling , y	/   Shee	et 4 of	4
PRO	GRE	SS			_			STI	RATA			SAMPLE	CS & T	ESTS		nt/
Date	Casing	Water	TCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)		Stra	ta Description	1	Depth (m)	Type No	Test Result	Field Record	ar Instrume 3ackfill
14/12/16	14.80				<u>-26.79</u>			29.4 with mec flin 30.2 30.6 30.6 30.6 31.1 Enc	40 with 1No h 50 - 29.70 with angular to suba lium density cha 20 - 30.30 [NI angular fine to c aprises weak to r te chalk fragmer 55 with 1No h 50 with 1No w ular to subangul yeak, medium de 10 with 1No h d of Borehole	orizontal fractu h 1No wide op angular fine to d lk fragments an inded flint cob ] recovered as: oarse GRAVE] noderately wea its and rare bla orizontal fractu ertical fracturation wide open fractu ar fine to coars ensity chalk frag- orizontal fractu	ure en fracture infilled coarse weak, d black rinded bles silty angular to Gravel k, medium density ck rinded flint ure in e infilled with e moderately weak gments ure	- 29.90 - 30.20-30.40 - 31.10-31.40	D24 C25 C26			
Issue N	ío: (	)1	Chec	ked I	By:	AN	App	orove	d By: OS	Log Print I	Date & Time:	03/03/2017 1'	7:49		A	GS to the second





**BH33** 

Project

# **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No	Date Started	07/12/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	08/12/16	4.19	E 543391.0 N 180334.1	32.00m

				BOREH	HOLE S	SUMMAI	RY				
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core (n	Barrel nm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00 18.50	18.50 32.00	DS RC	07/12/2016 07/12/2016	07/12/2016 08/12/2016	TC TC	CB CB	1	112	PCD	Geotec 350 Geotec 350	AR779 AR779
	WA	TER S	TRIKES		WA	TER ADI	DED	CH	IISELLIN	G / SLOW D	RILLING
Strike at Rise to Time to Rise Casing Depth				Depth Sealed	Fre	m T	0	Fron	ı To	Duration	Remarks

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks

	E	IOLE			CAS	SING			ROTARY	RECOV	ERY
Dept	h (m)	Di	iameter (m	m) Dept	h (m)	Dia	meter (mm)	From (m)	To (m)	Blows	Recovery (%)
0.0 18. 32.	00 .50 .00		150 150 146	0.0 17	)0 50		200 150	12.00 12.50 13.50 14.50	12.50 13.50 14.50 15.20		100 100 100 100
		R	OTARY	FLUSH DE	TAIL			16.20	17.20		80
From (1	m)   1	Го (т)	Flush Ty	pe Flush R	eturn (%)	Fl	ush Colour	18.50	19.50		60
18.50 19.50		19.50 32.00	Water Water	25 75				$ \begin{array}{c} 19.50\\ 20.00\\ 20.60\\ 21.50\\ 23.00\\ 24.50\\ 26.00\\ 27.50\\ 29.00\\ 30.50\\ \end{array} $	$\begin{array}{c} 20.60\\ 20.60\\ 21.50\\ 23.00\\ 24.50\\ 26.00\\ 27.50\\ 29.00\\ 30.50\\ 22.00\end{array}$		$     \begin{array}{r}       100 \\       78 \\       100 \\       1$
	1	INS	STALLA	TION DET	AILS			50.50	52.00		100
Туре	Diamo (mn	eter D n) Ins	epth of tallation   (m)	Top of Response Zone (m)	Bottor Response (m)	n of e Zone )	Date of Installation				
		•	BACK	FILL DETA	ILS						
Toj (m)	p )	Bott (n	tom n)	Material		Back	xfill Date				
12.00	)	32.0	00 0	Cement / Benton	ite Grout	08/	12/2016				
sue No:	01	Checke	ed By: A	N Approved	By: OS	Log	g Print Date & T	ime: 03/03/20	917 17:43		AGS





**BH33** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job	No
	16/2900

Date Started Date Completed 08/12/16

4.19

07/12/16 Ground Level (mOD) Co-Ordinates

E 543391.0 N 180334.1

**Final Depth** 32.00m

		PROGR	ESS						SPT DETAIL	S	
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remark	(5	Туре	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
07/12/16 07/12/16 07/12/16 07/12/16 08/12/16 08/12/16	0.00 12.00 18.50 19.50 19.50 32.00	12.50 12.50 17.50 17.50 17.50	1.70 0.90	see Remark	. 4	C C S S S S S S S S S S S S S S S S S S	13.50 14.50 15.20 16.20 17.20 18.50 20.00 21.50 23.00 24.50 26.00 27.50 29.00 30.50	N9 N9 N10 N6 N10 N12 N13 N15 N42 N44 N50/0.24 N42 N50/0.255 N50/0.015	0, 0 / 1, 3, 2, 3 0, 1 / 2, 2, 2, 3 1, 2 / 2, 2, 3, 3 3, 4 / 1, 1, 2, 2 2, 3 / 3, 3, 2, 2 2, 3 / 3, 3, 3, 3 3, 3 / 3, 3, 3, 4 3, 3 / 4, 4, 3, 4 5, 8 / 9, 10, 11, 12 6, 6 / 9, 11, 11, 13 6, 11 / 13, 18, 15, 4 5, 7 / 8, 11, 11, 12 4, 8 / 12, 13, 17, 8 18, 7 / 50	$\begin{array}{c} 12.50\\ 12.50\\ 12.50\\ 12.50\\ 12.50\\ 17$	
GENERAL         1. Borchole ca         2. Cleanace b         3. Water preser         4. Dynumic sa,         thereafter.         SAMPLES         ES         ES         LOBARD         UT         1.00mm         D         DSTEPE         Samples         ES         Second         UT         1.00mm         D         D         SPEW         STRALATION         SPE         SPGW         Grad         C         SPGW         Caro         CMU         VUP         VUP         VUP         VUP         VUP         TESTS       SPOT	REMARKS rried out from a y UXO Magneto it in the borehold in the boreh	rial, Jar) Sample Sample pipe Shandpipe Shandpipe CP Shandpipe DC PP Peogle Processor	Sample, BLK-Block S Sample, BLK-Block S TYPES - Cable Percussion, R - Diamot Coring, C	elative to the pontoon the dock. Jotary boring carried e sample rial Pit TT - Trial Trench C-Rotary Coring, RJ-Rota DSR-Dyname Sampling PR-Cable Percussion Rota	ry/Sonic Roary y jöllow on me Contromate						
Note: All depths	are in metres, all diar	red By: A	Approve	in minutes. For details of ab ed By: OS	bbreviations see Ke Log Print	t Date	& Time:	03/03/20	)17 17:44		AGS interviewers area

	Unit 8 W London, Telepho E-mail:	/arple I W3 0F ne: 02 si@cor	Mews, RF 208812 ncepto	War 2880_ consu	P ple \ īltan	Way	v o.uk										G	2	UKA SHEEMA	S ant	R	UK STR	AS GIMINT 01		Bor ]	ehol BH	e No 33	
	Projec	rt CAD	PP S	Sur	ve	evs	s Gr	ou	nd Iı	nves	tig	atio	on (	(Do	ock)	- P	ha	se 2										
	Job N	0		Da	tes	Sta	rted		07/12	/16	Gro	und	Lev	vel (n	nOD	) (	Co-O	rdina	ates					Fina	l Dep	oth		
		.6/29	00	Da	te	Coi	mple	ted	08/12	/16		4	4.19	)		_	1	E 543	391	.0 1	N 180	334.1				32.0	0m	
	Chent	Lond	lon	Cit	y A	١r	por	t Li	mite	d						P P	leth lant	od/ Used	Dy	ynan	nic Sar Rotar	npling y	<b>g</b> /	Shee	t	1 0	of 4	
j	PRO	GRE	SS							STR	AT.	A								SAN	MPL	ES &	TE	ESTS				ent/
	Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)			S	Strata	a Des	scripti	on				D (	epth m)	Type No	;     I	Test Result		Fie Rec	eld ords	Instrum 3ackfil
D: CONCEPT ROTARY    Project: 162900 - LONDON CITY AIRPORT.GPJ    LIbrary: CONCEPT LIBRARY - 2017.GLB    Date: 3 March 2017	07/12/16									Wate									<ul> <li>.</li> /ul>									
	Issue N	o: 0	1	Che	ecke	ed E	By:	AN	App	roved	By:	05	5	Log	Print	Date	e & T	ïme:	03	3/03/2	2017 1	7:49					AGS	NAMES OF TAXABLE PARTY.

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



**Borehole No** 

Job No 1 Client	o .6/29	00	Da Da	ite S ite C	tarte Compl	l eted	07/12/ 08/12/	16         Ground Level (mOD)           16         4.19	Co-Ordinate E 5433	es 91.0 N 1802 Dynamic Ser	334.1	Fin:	al Depth 32.00m	
I	lond	on	Cit	y A	irpo	rt Li	imited		Plant Used	Rotary	/	Sile	2 of 4	
PRO	GRE	SS					,	STRATA		SAMPLE	S & T	ESTS		ent/
Date	Casing	Water	TCR %	SCR %	Mon (mOI	Legend	Depth (Thickness)	Strata Descriptio	n	Depth (m)	Type No	Test Result	Field Records	Backfill
07/12/16	12.50		100		7.8	אן אראן אראן אראן אראן אראן אראן אראן א	12.00	Soft, light brown silty CLAY. (DOCK SEDIMENT) 12.20 becoming very soft, dark g hydrocarbon odour	grey with strong	12.40	D01			
			100		<u>-9.3</u> -9.8		13.50 (0.50) 14.00	Dark grey sandy angular to well ro coarse flint GRAVEL with slightly hydrocarbon odour. Sand is fine to (RIVER TERRACE DEPOSITS) 13.70 becoming yellowish brow White CHALK [NI] recovered as : gravelly SILT. Gravel is angular to	unded fine to strong coarse. n and very sandy soft to firm, subangular fine to	- 13.50 - 13.70 - 14.10 - 14.50	B03 B04	N9 N9	0, 0 / 1, 3, 2, 3 0, 1 / 2, 2, 2, 3	
			100					coarse moderately weak to weak, n chalk fragments. (SEAFORD CHALK FORMATIO 14.50 with 1No black rinded flin 14.70 [NI] recovered as: very sil subangular fine to coarse GRAVEJ medium density white chalk fragm rinded flint	N N t cobble ty angular to C. Gravel is weak, ents and black	- - 15.00 - 15.20 - 15.20	B05 D06	N10	1, 2 / 2, 2, 3, 3	
			80					15.10 with TNO black midde fin 15.40 - 15.90 with angular to su coarse black rinded flint 15.90 with rare angular to suban weak, medium density chalk cobbl 16.20 with angular to subangula moderately weak, medium density and black rinded flint 16.40 with rare moderately weak	a coole bangular fine to gular moderately es r medium to coarse chalk fragments s, medium density	- 15.70 - 16.20 - 16.20-17.20	B08	N6	3,4/1,1,2,2	
			100					chalk cobbles 16.65 with rare black rinded flin 16.70 with angular to subangula moderately weak to weak, medium fragments and black rinded flint 17.20 becoming very silty with i subangular rinded flint 17.30 [NI] recovered as : very g Graval is complex to subangular fin	t cobbles r fine to coarse density chalk are angular to avelly SILT.	- - 17.20 - 17.20 - - -	D09	N10	2, 3 / 3, 3, 2, 2	
07/12/16	12.50		60					medium density chalk fragments 17.80 with rare moderately weal 18.20 with rare black rinded flin 18.30 [NI] recovered as: angular to coarse GRAVEL. Gravel compr weak, medium density chalk fragm rinded flint 18.50 with rare medium density	c chalk cobbles t cobbles to subangular fine rises moderately ents and black chalk cobbles	- 18.10 - 18.50 - 18.50 - 18.50 	B10 D11	N12	2, 3 / 3, 3, 3, 3	
07/12/16 08/12/16	17.50 17.50	1.70	100					19.50 with angular to subangula moderately weak to weak, medium fragments	r fine to coarse density chalk	- - 19.50-20.00 - - - 20.00	B12	N13	3, 3 / 3, 3, 3, 4	

Unit 8 W London Telepho E-mail:	Varple , W3 0 one: 02 si@co	Mews, RF 208812 ncepto	Warp 2880_ consul	le V	Vay	o.uk								UKA UKA DOI	S MANT B	Borehole No BH33	
Projec	rt CAI	)P S	Sur	ve	ys	Gr	•ou	nd Iı	nve	stigation	(Dock) -	Phase 2					
Job N	0		Dat	e S	- Stai	rted		07/12	/16	Ground Le	vel (mOD)	Co-Ordinate	s		Fina	al Depth	
	6/25	200	Dat	e (	Cor	nple	ted	08/12	/16	4.1	9	E 54339	01.0 N 1802	334.1		32.00m	
Chent	Lond	lon	City	A	ir	por	t Li	mite	d			Method/ I Plant Used	Dynamic San Rotary	npling , y	/   She	et 3 of 4	
PRO	GRF	SS							STI	RATA		1	SAMPLE	CS & 1	ESTS		:nt/
Date	Casing	Water	TCR %	SCK %	RQD %	Level mOD)	Legend	Depth (Thickness)		Stra	ta Description	1	Depth (m)	Type No	Test Result	Field Records	Instrume Backfill
			100 78						19.0 Gra moo frag 20.0 sub occ con cha 20.0 to c	60 [NI] recove wel is angular to derately weak to gments and black do - 20.50 [NI] angular fine to c asional black rim aprises moderate lk fragments and do [NI] recove warse GRAVEL	red as : firm, v subangular fin weak, medium rinded flint ] recovered as : oarse silty GRA ded flint cobble ly weak to wea l black rinded f red as : angula with occasiona	ry gravelly SILT. to coarse density chalk angular to WEL with s. Gravel k, medium density int to subangular fine l black rinded flint	- 20.60-21.50 	B13	N15	3, 3 / 4, 4, 3, 4	
			100 7	'3 (	53				cob moo frag 21 rinc 21 rinc 21 whi and	bles and rare cha derately weak to gments and black 50 with a band led flint cobbles 70 with occasi ded flint, rare bla dium density cha 80 becoming r ite CHALK with purple staining	alk cobbles. G weak, medium r inded flint l of angular to s onal medium to ck rinded flint lk cobbles nedium to stror occasional sub	ravel comprises density chalk ubangular black o coarse black cobbles and weak, g, medium density vertical fractures	- 21.50 - 22.00 - 23.00	D14 B15	N42	5 8/9 10 11 12	
			100 5	3 4	43			(18.00) 	22.0 sub cob frag 22.0 flin 23.0 meo 23.1 is a flin	60 - 22.90 [NI isangular fine to cc bles. Gravel is v gments 90 with 1No a: t cobble 00 with occasi dium to coarse bl 20 - 23.60 [NI ngular to subang t	] recovered as : oarse GRAVEI veak, medium o ngular to subar onal angular to lack rinded film ] becoming gra ular fine to coa	angular to , with rare chalk lensity chalk gular black rinded subangular t velly SILT. Gravel rse black rinded	23.00	D16 B17		-,,,	
			100 4	33	33				24 mec sub 24 sub mec 25.0 sub moo occ	30 with occasi dium to coarse fil horizontal fractu 50 - 24.70 [NI angular fine to co dium density cha 00 - 25.30 [NI angular fine to co derately weak, m asional black rin.	onal angular to int gravel and s res ] recovered as : oarse GRAVEI [k fragments ] recovered as : oarse GRAVEI edium density ded flint cobble k fragments	subrounded ubvertical and angular to Gravel is weak angular to with rare chalk cobbles and .s. Gravel is weak,	- 24.50 - 24.50 	D18 C19	N44	6, 6 / 9, 11, 11, 13	
			100 e	50 :	53				25. sub rinc mec flin 26.0 grav cob	angular fine to c led flint cobbles dium density cha dium density cha t 00 - 26.30 [NI velly SILT with v bles. Gravel is a	ar inginents oarse GRAVEI and rare moder Ik cobbles. Gr. Ik fragments ar ] recovered as : weak medium of ingular to subar	angular to , with rare black ately weak, ivel is weak, d black rinded firm, white ensity chalk gular fine to	- 26.00 - 26.00 - 26.50-26.80	D20 C21	N50/ 240 mm	6, 11 / 13, 18, 15, 4	4
			100 9	00	53				coa 26.4 extr 26.1 27.0 infi sub 27.1 27.1	rse weak, mediu 45 with 1No h remely weak, low e to coarse chalk 75 with 1No w 85 with 1No w 00 with 1No w Iled with weak, r angular fine to 30 with 1No w 50 - 27.60 [NI]	m density chall orizontal fractur v density angult fragments ubhorizontal fra- vide open subho- vide open horiz nedium density oarse chalk fra- vide open horiz ] recovered as	tragments re infilled with ir to subangular into subangular orizontal fracture ontal fracture angular to ments ontal fracture angular to	- 27.50 27.50	D22	N42	5, 7 / 8, 11, 11, 12	
			100 7	'3 :	50				sub con blac 27.1 28.0 wit med flim 28.1 28.1 28.1 28.1 28.1 28.1 28.1	angular fine to comprises weak, me ck rinded flint 80 with 1No.st 00 - 28.10 with h angular to suba dium density cha t 30 with 1No.st	oarse GRAVEI dium density c ubventical fract h 1No vertical ingular fine to o lk fragments ar ubventical fract vide open boriz	". Gravel halk fragments and ince iracture infilled oarse weak, d black rinded ince ontal fracture	29.00 29.00	B23	N50/ 255 mm	4, 8 / 12, 13, 17, 8	
Issue N	io: (	)1	Che	cke	d B	y:		Apr	28. frac	d By: OS	Log Print I	Pate & Time:	03/03/2017 17	7:49		AGS ::	

Report ID: CONCEPT ROTARY || Project: 162900 - LONDON CITY AIRPORT.GPJ || Library: CONCEPT LIBRARY - 2017.GLB || Date: 3 March 2017

Unit 8 W London, Telepho E-mail:	Varple , W3 0 one: 02 si@co	Mews RF 20881: ncept	War 2880 consi	P ple	Way	/ o.uk									S ANY B	Borehole No BH33	
<b></b> (	CAI	)P S	Sur	<b>v</b> e	eys	s Gi	ou	nd I	nve	stigation	(Dock)	- Phase 2					
Job N	0 6/20	200	Da	te	Sta Ca	rted	tod	07/12	/16	Ground Le	vel (mOD)	Co-Ordinates	5		Fina	al Depth	
Client	. 0/ 2/.	/00	Da	lle		mpre	leu	00/12	/10	4.1	9	E-54539	1.0 N 180. Nunamia Sar	334.1 nolina	/ <b>Sh</b> a	32.00m	
I	Lond	lon	Cit	y A	۱i	por	t Li	mite	d			Plant Used	Rotary	y y		4 of 4	
PRO	GRE	SS							STI	RATA			SAMPLE	ES & T	TESTS		ent/
Date	Casing	Water	TCR %	SCR %	RQD %	Level (mOD)	Legend	Depth (Thickness)		Stra	ta Descriptio	n	Depth (m)	Type No	Test Result	Field Records	Instrume Backfill
08/12/16	17.50	0.90		73 73	<u>22</u> 50 60	-27.81		32.00	29.0 sub rinc mec 29.2 30.2 30.3 infi moc Gra mec 31.0 31.2 31.2 31.2 31.2 31.2 31.2 31.2 31.2	00 - 29.40 [N] angular fine to c led flint cobbles lium density cha itum density cha 55 with 1No h 80m, 30.00m, 30 50 - 30.70 [N] h rare black rind derately weak, m vel is angular to lium density cha t s with 1No t 70 with 1No h 70 with 1No h 71 with 1No h 71 with 1No h 72 with 1No h 73 with 1No h 74 with 1No h 75 with 1No h 75 with 1No h 76 with 1No h 76 with 1No h 76 with 1No h 77 with 1No h 76 with 1No	] recovered as oarse GRAVE and rare mode ilk cobbles. Gn ilk fragments a torizontal fractu ) 10m, 30.40m [] becoming ve ed flint cobble tedium density subangular fir ilk fragments a wide open hori r to subangular ity chalk fragm h rare angular torizontal fractu- pen wide fract ar fine to coars ents and with r	angular to L with rare black rately weak, avel is weak, and black rinded ure and at 29.65m, ry silty GRAVEL s and rare chalk cobbles. e to coarse weak, and black rinded zontal fracture fine to coarse enents to subangular black me me ure infilled with e weak, medium are medium weak,		C26	N50/ 15 mm	18, 7 / 50	
Issue N	o: (	)1	Ch	eck	ed I	By:	AN	App	orove	d By: OS	Log Print I	Date & Time:	03/03/2017 1	7:49	•	AGS:	Contraction of Contraction





**BH34** 

Project

# CADP Surveys Ground Investigation (Dock) - Phase 2

Job No	Date Started	15/11/16	Ground Level (mOD)	Co-Ordinates	Final Depth
16/2900	Date Completed	16/11/16	4.96	E 543460.0 N 180338.9	31.50m

				BOREH	HOLE S	SUMMAI	RY				
Top (m)	Base (m)	Туре	Date Started	Date Ended	Crew	Logged By	Core l (m	Barrel m)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	31.50	СР	15/11/2016	16/11/2016	SW	СВ				Dando 175	AR909
	WA	TER S	TRIKES		WA	FER ADI	DED	CH	IISELLIN	G / SLOW D	RILLING

	1111	TER STRU							o i de di i	Jupping
Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)	From (m)	To (m)	From (m)	To (m)	Duration (hr)	Remarks
	trike at (m)	trike at (m) (m)	trike at Rise to Time to Rise (m) (m) (min)	Strike at (m)     Rise to (m)     Time to Rise (Casing Depth (m))       (m)     (min)     (m)	Strike at (m)     Rise to (m)     Time to Rise (min)     Casing Depth (m)     Sealed (m)       Image: Comparison of the comparison of t	Strike at (m)     Rise to (m)     Time to Rise (min)     Casing Depth (m)     Sealed (m)       Image: Comparison of the comparison of t	Strike at (m)     Rise to (m)     Time to Rise (min)     Casing Depth (m)     Sealed (m)     From (m)     To (m)       Image: Comparison of the compariso	Strike at (m)     Rise to (m)     Time to Rise (min)     Casing Depth (m)     Sealed (m)     From (m)     To (m)     From (m)	Strike at (m)     Time to Rise (min)     Casing Depth (m)     Sealed (m)     From (m)     To (m)     From (m)     To (m)	Strike at (m)     Time to Rise (m)     Casing Depth (m)     Sealed (m)     From (m)     To (m)     From (m)     To (m)     Duration (m)

	]	HOL	ЪE				CAS	SING			R	OTARY	RECOV	ERY
Dept	h (m)		Diar	neter (1	mm)	Dept	h (m)	Dia	meter (mm)		From (m)	To (m)	Blows	Recovery (%)
0.0 16. 31.	00 .50 .50			200 200 150		0.0 15. 26.	)0 10 50		200 200 150					
			RO	TARY	Y FI	LUSH DE	TAIL			1				
From (I	m)	To (n	n) ]	Flush T	Гуре	Flush R	eturn (%)	Fl	ush Colour					
	1	I	NST	ALL	ATI	ON DET	AILS							
Гуре	pe Diamo (mn		Dep Instal (1	th of llation m)	Res	Top of ponse Zone (m)	Bottor Response (m)	n of e Zone )	Date of Installation					
			ŀ	BACK	FII	LL DETA	ILS							
Toj (m)	p )	1	Bottor (m)	m		Material		Bacl	cfill Date					
11.50	0		31.50	1	Cem	ent / Bentoni	te Grout	16/	11/2016					
ie No:	01	Che	ecked	By:	AN	Approved	By: OS	Log	g Print Date & T	ime:	03/03/201	7 17:43		AGS





**BH34** 

Project

## **CADP Surveys Ground Investigation (Dock) - Phase 2**

Job No 16/2900 
 Date Started
 15/11/16

 Date Completed
 16/11/16

 15/11/16
 Ground Level (mOD)
 Co-Ordinates

 16/11/16
 4.96
 E 543460

E 543460.0 N 180338.9

Final Depth

31.50m

		PROGR	ESS			SPT DETAILS					
Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks	; Ту	pe De (r	pth 1)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
15/11/16	0.00			see Remark 3	3	12	00	NO	0.0/0.0.0.0	12.00	0.90
15/11/16	12.00	12.00	0.90			14	00	N48	7.9/11.12.14.11	14.00	0.90
15/11/16	13.00	13.00	1.20		s	15	00	N14	2. 3 / 3. 5. 3. 3	15.00	1.00
15/11/16	14.00	14.00	0.90		S	15.	10	N10	2, 2 / 3, 2, 2, 3	15.10	1.00
15/11/16	15.00	15.00	1.00		s	17.	50	N8	3, 2 / 1, 2, 3, 2	17.50	1.60
15/11/16	16.00	15.10	1.00		s	19.	00	N8	2, 2 / 1, 2, 3, 2	19.00	2.20
15/11/16	16.50	15.10	0.95		s	20.	50	N11	9,7/3,2,3,3	20.50	1.40
16/11/16	16.50	15.10	0.90		S	22.	00	N13	2, 2 / 3, 2, 3, 5	22.00	2.00
16/11/16	17.50	17.50	1.60		S	23.	50	N38	5,6/6,5,17,10	23.50	2.80
16/11/16	19.00	19.00	2.20		S	25.	00	N24	4,7/7,6,5,6	25.00	1.60
16/11/16	20.50	20.50	1.40		S	26.	50	N38	3, 5 / 7, 9, 12, 10	26.50	1.40
16/11/16	22.00	22.00	2.00		S	28.	00	N44	6, 8 / 10, 10, 11, 13	26.50	1.10
16/11/16	23.50	23.50	2.80		S	29.	50	N50/0.275	10, 11 / 10, 12, 11, 17	26.50	1.50
16/11/16	25.00	25.00	1.60		S	31.	00	N50/0.295	8, 10 / 12, 12, 14, 12	26.50	2.10
10/11/10	20.50	26.50	1.40								
10/11/10	28.00	26.50	1.10								
10/11/10	29.50	26.50	2.10								
16/11/10	31.00	26.50	2.10								
10/11/10	51.50	20.30	2.10								
ĺ											
GENERAL	REMARKS										
Borcholc ca Clamate b Water prese 4. Ø200mm ce 14.50m and 16	rried out from a y UNO Magneto Ising used from p .50m and borche	pontoon. All leve tucter probe: e from casing ins sontoon level to 1 sle re-drilled with	els are recorded t allation through 5.10m depth. B Ø150mm casing	clative to the pontoon I the dock. entonite seal inserted be to 26.50m depth.	evel. stween						
KEY           SAMPLES           ES         - Environm           U         - 100mm D           UT         - 100mm D           US8         - 38mm Di           D         - Disturbed           C         - Core Sam           INSTALLATION         - Distributed	ental Sample (Tub, V iameter Undisturbed iameter Tundisturbed Sample, B-Bulk San Jee, W-Water Sample I DETAILS	ial, Jar) Sample disturbed Sample Sample pple, LB- Large Bulk S , R-Root Sample HOLF	Sample, BLK-Block S	Sample							
SPIE - Standpi SPGW - Ground SPGW - Ground CM - Vibrain ICM - Inclino TESTS SC-SPT Note: All depths	pe Piezometer water Monitor Stand fundware Monitor g Wire Piezometer meter CPT, V-Shear Vanc are in metres, all diar	pipe IP Standpipe CP DS DC PP Pocket Penerorth neters in millimetres,	Inspection Pit, TP-T: Cable Percussion, R Dynamic Sampling, Diamond Coring, C act, MP-Mathematic water strike rise time	rial Pit. TT - Trial Trench C-Rotary Coring, R/S-Rotary/ DS/R-Dynamic Sampling /Re P/R-Cable Percussion Rotary <u>Profeet</u> VOC-Volatile Organic in minutes. For details of abbr	Sonic bary follow on compounds eviations see Key						
sue No: 0	1 Check	ed By: AN	Approv	ed By: OS	Log Print Da	te & Ti	me:	03/03/20	017 17:44		AGS





C	ADF	<b>Su</b>	rveys	Grou	nd Invo	estigation	(Dock) ·	Phase 2					
Job No		Da	ate Star	ted	15/11/16	Ground L	evel (mOD)	Co-Ordinat	tes		Fin	al Depth	
10/2900 Date Completed				4.96			E 5434	460.0 N 18	30338.9	31.50m			
Client	ondo	n Cit	ty Airp	ort Li	mited	nited			Method/ Plant Used Cable Percussion			et 1 of	`4
PRC	)GRF	ESS			ST	RATA		I	SAMPLI	ES & T	ESTS		:nt/
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Str	ata Description	1	Depth (m)	Type No	Test Result	Field Records	Linstrume Backfill
15/11/16					-	Water.			-				
									-				
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Issue No	: 01	Ch	lecked By	AN :	Approv	ed By: OS	Log Print I	Date & Time:	03/03/2017	17:46		l.	AGS interesting the second second

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



SUBQUAUTA	da,	Su QUAUTA	cto.
(R)	7	<b>(R)</b>	V
COLLOR!	MANAGEMENT SYSTEMS	(10000L)	MANACEMENT SYSTEMS
	001		001

**Borehole No** 

Clicut         Example to interval         Interval         4,96         Example to interval         Sature of the interval	Job No 16	5/2900		ate Star	ted	15/11/16	Ground Level (mOD)	Co-Ordina	tes		Fir	Final Depth		
Current London City Airport Limited         Pick Used Plant Used         Cable Percussion         Sincet 2 of 4           PROGRESS         STRATA         SAMPLES & TESTS         Field (m)         Field Records           Date         2         3         Level Le	Client	1 490	2700 Date Completeu 10/11/10 4.96 E 545460.0 N 180338.9 Mothod/						31.50m					
PROGRESS         STRATA         SAMPLES & TESTS           Date $\frac{10}{8}$ $\frac{10}{9}$ Level, Level, Level, Level, Level, Level, and Level, Strata Description         Depth (m)         Type (m) </th <th>L</th> <th>ondo</th> <th>n Cit</th> <th colspan="7">ty Airport Limited Method/ Plant Used Cable Percussion</th> <th></th> <th>eet 2 of 4</th> <th></th>	L	ondo	n Cit	ty Airport Limited Method/ Plant Used Cable Percussion								eet 2 of 4		
Date $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{39}{80}$ $\frac{1150}{1200}$ Strnta Description         Depth (m)         Type	PRO	)GRE	SS			ST	<b>TRATA</b>		SAMPLI	ES & T	ESTS		T	
3511716 $12.00$ $9.90$ $4.55$ $11.50$ <	Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	L	Depth (m)	Type No	Test Result	Field Records		
						- - - - -								
5/11/16       12.00       0.90 $ \begin{array}{c}             \times \times \times \\             \times \times \\         $				-6.55	× × × × ×	- 11.50	Very soft, dark brown and light with viscous texture and strong	grey SILT hydrocarbon	11.50-12.00 11.50	B01 ES02			1111	
$ 5/11/16 \ 13.00 \ 1.20 \ x \times x \\ x $	5/11/16	12.00	0.90			(1.95)	odour. (DOCK SEDIMENT) 12.00 becoming slightly clay	ey	12.00 12.00	D03	NO	0, 0 / 0, 0, 0, 0	~~~~~	
$5/11/16  14.00  0.90  \begin{array}{ c c c c c } \hline -8.50   \hline x & 13.45 \\ \hline 0 & $	5/11/16	13.00	1.20						12.75 13.00-13.45	D04 UT05				
5/11/16 15.00 1.00 - 9.05 - 0.000 14.90 - 0.0000 1100 - 0.0000 1100 - 0.0000 1100 - 0.0000 1100 - 0.0000 1100 - 0.0000 1100 - 0.0000 1100 - 0.0000 1100 - 0.00000 - 0.00000 - 0.00000 - 0.00000 - 0.00000 - 0.00000 - 0.000000 - 0.000000 - 0.00000 - 0.00000 - 0.000000 - 0.000000 - 0.000000 - 0.00000 - 0.00000 - 0.00000 - 0.0000000 - 0.0000000 - 0.00000000	5/11/16	14.00	0.90	-8.50		13.45 (0.55) 14.00	Dark grey sandy angular to rour coarse flint GRAVEL with rare very soft dark grey silt (<50mm flint cobbles, rare pieces of rope and strong hydrocarbon odour.	ded fine to pockets of ), occasional (<140mm)	13.50-14.00 13.50 13.70 14.00 14.00-14.50 14.10	B06 D07 ES08 B09 ES10	N48	7,9/11,12,14,11		
5/11/16     15.10     1.00     1.4.7 S becoming sandy with occasional limit cobles     15.10     D13     N10     2, 2/3, 2, 2, 3       5/11/16     15.10     1.00     1.5.10     1.00     1.5.10     D13     N10     2, 2/3, 2, 2, 3       5/11/16     15.10     0.95     1.6.0     1.5.10     D15     1.5.0-16.00     B14       5/11/16     15.10     0.95     1.5.0     I.6.0     D15     1.5.0-16.00     B14       5/11/16     15.10     0.95     1.5.0     I.6.0     D15     1.6.00     D15       5/11/16     15.10     0.95     1.5.0     I.6.0     I.6.0     D15       5/11/16     15.10     0.90     1.5.0     I.6.0     I.6.0     D15       5/11/16     15.10     0.90     1.5.0     I.6.0     I.6.0     D15       5/11/16     15.00     0.90     1.5.0     I.6.0     I.6.0     D17       5/11/16     15.00     I.60     1.6.0     I.7.50     D17     N8     3, 2/1, 2, 3, 2       5/11/16     19.00     2.20     1.6.0     I.7.50     D17     N8     3, 2/1, 2, 3, 2       5/11/16     19.00     2.20     1.6.0     I.7.50     D17     N8     3, 2/1, 2, 3, 2	5/11/16	15.00	1.00	-9.95	0 <u>0</u> 0 <u>0</u> 0 <u>0</u> 0 <u>0</u> 0 <u>0</u> 0 <u>0</u> 0 <u>0</u> 0 <u>0</u>	(0.90) - 14.90 - 15.00	Light grey very sandy angular to to coarse flint GRAVF1, with ra cobbles and slight hydrocarbon is fine to coarse. (RIVER TERRACE DEPOSIT)	o rounded fine re flint odour. Sand	14.75 14.90 15.00	D11 D12	N14	2, 3 / 3, 5, 3, 3		
5/11/16       15.10       1.00       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)         5/11/16       15.10       0.95       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)         5/11/16       15.10       0.95       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)         5/11/16       15.10       0.95       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)         5/11/16       15.10       0.95       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)         5/11/16       15.10       0.95       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fint. (SEAFORD CHALK FORMATION)         5/11/16       17.50       Image: transmitted fint. (SEAFORD CHALK FORMATION)       Image: transmitted fi						- - - - -	white CHALK [NI] recovered a subangular to subrounded medi GRAVEL. Gravel is angular fir strong, medium density chalk fir	s: silty um to coarse te to coarse agments and	15.00 15.10 15.50-16.00	D13 B14	N10	2, 2 / 3, 2, 2, 3		
5/11/16       15.10       0.95       Image: constraint of the state of the st	5/11/16	15.10	1.00			- - -	black rinded flint. (SEAFORD CHALK FORMAT Structureless white pury CHAL	ION) K [NI]	16.00	D15				
5/11/16       17.50       1.60       Image: transmitted of the transm	5/11/16 5/11/16	15.10 15.10	0.95 0.90			-	recovered as: white SILT. (SEAFORD CHALK FORMAT 15.50 [NI] recovered as: angu subangular fine to coarse GRA frequent strong, high density ch and occasional pockets of very s Gravel is strong, high density ch 16.00. DNU recovered as: coft	ION) Ilar to /EL with alk cobbles soft chalk silt. alk fragments errough SILT	16.50-17.00	B16				
5/11/16       19.00       2.20       Image: Comparison of the system o	5/11/16	17.50	1.60				Gravel is angular to subangular medium density white chalk fra 16.50 [NI] recovered as: ang subangular fine to coarse GRAM frequent subangular black rinde and rare weak, medium density	gravery start. very weak, gments lar to /EL with d flint cobbles chalk cobbles.	17.50 17.50 18.00-18.50	D17 B18	N8	3, 2 / 1, 2, 3, 2		
subangular fine to coarse GRAVEL. Gravel       comprises extremely weak, medium density       chalk fragments and black rinded flint       loc	5/11/16	19.00	2.20				Gravel is very weak, medium defisity Gravel is very weak, medium de fragments 17.50 [NI] recovered as: very to subangular fine to coarse GR is very weak, low density chalk 18.00 becoming angular to st COBBLES with occasional ang subangular fine to coarse gravel fragments. Cobbles are modera density chalk 19.00 [NI] recovered as: silty subangular fine to coarse GRAV comprises extremely weak, med chalk fragments and black rinde	silty angular AVEL. Gravel fragments bangular alar to size chalk tely weak high angular to /EL. Gravel ium density d flint t to subangular	19.00 19.00 19.50-20.00	D19 B20	N8	2, 2 / 1, 2, 3, 2		

Concept Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880\_ E-mail: si@conceptconsultants.co.uk



**Borehole No** 

C	ADF	Su	rveys Grou	nd Inve	estigation	(Dock) -	Phase 2						
<b>16/2900</b> Date Completed 16/11/10					Ground Le	vel (mOD) 6	E 543460.0 N 180338.9				Final Depth 31.50m		
Client L	ondo	n Cit	y Airport Li	mited	Method/ Plant Used		Cable Percussion Sho			et 3 of 4			
PRO	OGRE	ESS		ST	RATA			SAMPLE	S & T	ESTS	TS		
Date	Casing	Water	Level (mOD) Legend	Depth (Thickness)	Stra	ta Descriptior	L	Depth (m)	Type No	Test Result	Field Records	Instrum Backfill	
16/11/16	20.50	1.40			black rinded flin rinded flint cobb	t and rare black les	angular	20.50 20.50	D21	N11	9, 7 / 3, 2, 3, 3		
1011110	22.00	2.00			21.00 becomin to subangular co	ng very silty wi arse black rinde	h rare angular ad flint	22.00	B22	N13	2 2/3 2 3 5		
16/11/16	22.00	2.00		-	22.00 [NI] rec	overed as: sligh	tly gravelly	22.00	D23	1115	2,273,2,3,5		
					coarse extremely fragments 22.50 becomin	ng silty	sity chalk	22.50-23.00	B24				
16/11/16	23.50	2.80		(16.50)	23.50 [NI] rec	overed as: firm	SILT	23.50 23.50 24.00 24.50	D25	N38	5, 6 / 6, 5, 17, 10		
16/11/16	25.00	1.60			25.00 - 26.50	[NI] recovered	as: firm SILT	25.00 25.00 25.50-26.00	D27 B28	N24	4,7/7,6,5,6		
16/11/16	26.50	1.40						26.50 26.50	D29	N38	3, 5 / 7, 9, 12, 10		
					27.00 - 27.50 subangular black	with frequent a crinded flint co	ngular to bbles	27.00-27.50	B30				
16/11/16	26.50	1.10		- - - - - - - - - -	28.00 [NI] rec Gravel is mediur	overed as: firm n to coarse blac	gravelly SILT. k rinded flint	28.00	D31	N44	6, 8 / 10, 10, 11, 13		
16/11/16	26.50	1.50		- - - - - - - - -	29.00 [NI] rec to subangular fir occasional black is very weak, me 29.50 [NI] rec	overed as: very te to coarse GR rinded flint col dium density cl overed as: firm	silty angular AVEL with bbles. Gravel nalk fragments slightly	29.00 29.50	B32	N50/ 275 mm	10, 11 / 10, 12, 11, 1		
				-	gravelly SILT. C flint	iravel is fine bl	ack rinded	29.50 30.00	D33 B34				
Issue No	: 01	Ch	ecked By: AN	Approve	ed By: OS	Log Print D	ate & Time:	03/03/2017	17:46		AGS	NONORIA PETAINT	





Project	ADF	• Sui	rveys Gi	rour	ıd Inve	stigation	(Dock) -	Phase 2					
Job No	(1700)	Da	ate Started	I	15/11/16	Ground Lev	vel (mOD)	Co-Ordinat	tes		Fin	al Depth	
16/2900 Date Completed				eted	16/11/16	4.9	E 5434	460.0 N 18		31.50m			
Client L	ondo	n Cit	y Airpor	rt Liı	imited Method/ Plant Used				Cable Per	rcussion	eet 4 of 4		
PRO	)GRF	CSS			ST	RATA			SAMPLE	ES & T	ESTS		ent/
Date	tte C C C C C C C C C C C C C C C C C C		egend	Depth (Thickness) Strata Description			L	Depth (m)	Type No	Test Result	Field Records	Backfill	
16/11/16 16/11/16	26.50	2.10			31.50	End of Borehole			31.00	D35	N50/ 295 mm	8, 10 / 12, 12, 14, 12	
Issue No	: 01	Ch	ecked By:	AN	Approve	a By: OS	Log Print L	vate & 11me:	03/03/2017	17:46		AGS	VACUATION AND AND AND AND AND AND AND AND AND AN

Unit 8 V Londor Telepho E-mail:	CONCEPT Unit 8 Warple Mews, Warple Way London, W3 0RF Telephone: 0208812880_ E-mail: si@conceptconsultants.co.uk										Trial Pit No TP01
Proje	Project CADP Surveys Ground Investigation (Dock) - Phase 2										
Job N	Job No Date Started 29/11/16 Ground Level (mOD) Co-Ordinates										Final Depth
Client	16/2900         Date Completed         29/11/16         5.44         E 543374.6         N 180188.8									2.00m	
]	Londor	n City	Airpor	t Limited			Plant Use	d Ma	achine	Excavated	1 of 1
				STI	RATA		SAN	<b>IPLE</b>	ES & 1	TESTS	Field
Water	Evel (mOD)         Legend         Depth (Thickness)         Stata Description						Dej	pth	Type No	Test Result	Records
	5.14		(0.30) 0.30	CONCRETE.			-				
€	5.14 5.14 3.44 3.44	REMA s stable. age encounters of stable.	0.30 	Brown, very sand; Gravel comprises concrete fragment (MADE GROUN) End of Trial Pit	y GRAVEL with concr fine to coarse flint with s. D)	h dock pr	es. ed. - - - - - - - - - - - - -	0/01/17.			
Issue N	Vo: 00 I	Drilled B	y: <sub>SW</sub> I	Logged By: MK	Checked By: OS	Approv	ved By: OS	Log I	Print Dat	e & Time:	28/02/2017 16:57 AGS total and a second

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(		⊕ BH31 BH32 ↓ BH34 ⊕ BH33		KEY D5R - Dynamic Sampling / Rotany CP - Cable Forcussion TP - Trial Pit		
		⊕ ⊕ BH28 BH30				
		BH19	BH21 BH24 BH21R BH24			
		BH10 ↔ BH10R ← BH13 BH16 BH11 <sup>⊕</sup> ← BH14 BH17				
			⊕ BH05 ⊕ BH05 ⊕ BH05   ⊕ ⊕ ⊕   BH03 ⊕ ⊕			
		8	8			

# **APPENDIX 8**

Quest, 2017, Geoarchaeological Deposit Model Report





# LONDON CITY AIRPORT, HARTMANN ROAD, LONDON E16

Geoarchaeological Deposit Model Report

NGR: TQ 42300 80300 Date: 19<sup>th</sup> May 2017 Site Code: LCA17 Written by: Dr D.S. Young Dr C.R. Batchelor

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# 1. NON-TECHNICAL SUMMARY

A programme of geoarchaeological investigation was carried out at the site in order to (1) to clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of alluvium and peat across the site, (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs, and (3) to investigate the archaeological potential of the site. In order to address these aims, three new geoarchaeological boreholes were put down at the site, the stratigraphic data from which were combined with existing geotechnical records to produce a deposit model of the major depositional units across the site.

Up to 2.8m of peat was identified within the Holocene alluvium at the site, overlying a Shepperton Gravel surface which lay at between -5.10 and -2.92m OD. The Gravel topography was indicative of a potential Late Devensian/Early Holocene palaeochannel, aligned broadly north-south, in the western area of the site. Although the lower Gravel surfaces across the present site are considered to be of negligible archaeological potential, the peat deposits have the potential to contain a wealth of further information on the past landscape in addition to archaeological material, through the assessment/analysis of palaeoenvironmental remains. It is therefore recommended that a programme of environmental archaeological assessment is undertaken on one selected borehole from the site (LCY-BHAC03).

### 2. INTRODUCTION

#### 2.1 Site context

This report summarises the findings arising out of the geoarchaeological deposit modelling undertaken by Quaternary Scientific (University of Reading) in connection with the proposed development of land at London City Airport, Hartmann Road, London E16 (National Grid Reference: centred on TQ 42300 80300; Figures 1 & 2). Quaternary Scientific were commissioned by the City Airport Development Programme (CADP) undertake the geoarchaeological investigations. The site is situated on the River Thames floodplain, ca. 500m to the north of the present course of the river and to the north of Hartmann Road (see Figures 1 and 2). British Geological Survey (BGS) mapping shows the site lying at the interface between Palaeogene Thanet Sand and Lambeth Group bedrock, both described as 'Clay, Silt and Sand'. The superficial geology is shown at the site as Alluvium, described as 'Clay, Silty, Peaty, Sandy' (http://mapapps.bgs.ac.uk/geologyofbritain/home.html). In fact, the alluvial deposits of the Lower Thames and its tributaries are almost everywhere underlain by Late Devensian Late Glacial Gravels (in the Thames valley, the Shepperton Gravel of Gibbard, 1985, 1994), and this gravel is widely recorded in BGS archive boreholes in the vicinity of the site.

#### 2.2 Palaeoenvironmental and archaeological significance

The existing geotechnical borehole records in the area of the site (RPS, 2016) indicate considerable variation in the height of the Gravel surface, and the type, thickness and age of the subsequent Holocene alluvial deposits. In the five geotechnical boreholes, the Gravel surface was recorded at

between -3.65 and -5.0m OD, overlain by a variable thickness of Holocene alluvial deposits which in all five boreholes contained up to 2.8m of peat. Such variations in the alluvial sequence are significant as they represent different environmental conditions that would have existed in a given location. For example: (1) the varying surface of the Gravel may represent the location of former channels and bars; (2) the presence of soil and peat represents former terrestrial or semiterrestrial land-surfaces, and (3) the various alluvial units represent periods of changing hydrological conditions. Thus by studying the sub-surface stratigraphy across the site in greater detail, it will be possible to build an understanding of the former landscapes and environmental changes that took place across space and time.

The alluvial and organic-rich sediments (in particular peat) also have high potential to provide a detailed reconstruction of past environments on both the wetland and dryland. In particular, they provide the potential to increase knowledge and understanding of the interactions between hydrology, human activity, vegetation succession and climate. Significant vegetation changes include the Mesolithic/Neolithic decline of elm woodland, the Neolithic colonisation and decline of yew woodland; the Late Neolithic/Early Bronze Age growth of elm on Peat, and the general decline of wetland and dryland woodland during the Bronze Age. Such investigations are carried out through the assessment/analysis of palaeoecological remains (e.g. pollen, plant macrofossils & insects) and radiocarbon dating, and have been undertaken at the nearby sites such as Albert Road (Spurr et al., 2001), North Woolwich Pumping Station (Sidell, 2003), Barge House Road (Corcoran et al., 2001), Gallions Point (Branch et al., 1999) and Plot 2.3, Royals Business Park (Young & Batchelor, 2013) (see Figure 1).

Finally, areas of high gravel topography, soils and peat represent potential areas that might have been utilised or even occupied by prehistoric people, evidence of which may be preserved in the archaeological (e.g. features and structures) and palaeoenvironmental record (e.g. changes in vegetation composition). Such prehistoric archaeological activity has been recorded on higher gravel topography at Royal Docks Community School ca. 1.2km to the northwest, where a soil horizon containing Mesolithic flint flakes was recorded, overlain by a Neolithic and Bronze Age soil containing over 1300 fragments of flint tools, debris and pottery (Holder, 1998).

#### 2.3 Aims and objectives

A programme of geoarchaeological fieldwork (incorporating three new geoarchaeological boreholes) and deposit modelling was carried out in order to: (1) clarify the nature of the subsurface stratigraphy, in particular the presence and thickness of alluvium and peat across the site, (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs, and (3) to investigate the archaeological potential of the site. In order to address these aims, the stratigraphic data from the new and existing stratigraphic records were used to produce a deposit model of the major depositional units across the site.



Figure 1: Location of the present investigation (1) and selected sites of geoarchaeological/archaeological investigation: (2) Plot 2.3, Royals Business Park (Young & Batchelor, 2013); (3) Royal Docks Community School (Holder, 1998); (4) Albert Dock (Spurrell, 1889); (5) Royal Albert Dock (Batchelor, 2009); (6) East Ham Football Club (PYR00; Scaife, 2001); (7) Ferndale Street (Divers, 1995); (8) North Woolwich Pumping Station (Sidell, 2003); (9) Albert Road (Spurr et al., 2001); (10) Barge House Road (Corcoran et al., 2001); (11) Gallions Point (Branch et al., 1999); (12) Beckton Tollgate (Tamblyn, 1994).

#### Quaternary Scientific (QUEST) Unpublished Report May 2017; Project Number 023/17



Figure 2: Location of the new geoarchaeological borehole sequences (LCY-BHAC01 to BHAC03), existing geotechnical (LCY-BH1 to BH5) and BGS archive boreholes (http://mapapps.bgs.ac.uk/geologyofbritain/home.html) used in the deposit model at London City Airport. Position of the west-east transect (Figure 3) also shown.

# 3. METHODS

#### 3.1 Field investigations

A total of three new geoarchaeological boreholes (LCY-BHAC01 to LCY-BHAC03) were put down by Concept Engineering Consultants Ltd in March 2017 using a rotary/dynamic sampler, and monitored by Quaternary Scientific. All samples were retained in metre long plastic tubes and removed from site for description in the laboratory. Samples were retained from the base of the Made Ground to the surface of the gravel. All borehole locations were recorded by Concept Engineering Consultants Ltd (see Table 1).

#### 3.2 Lithostratigraphic descriptions

The lithostratigraphy of boreholes LCY-BHAC01 to LCY-BHAC03 was described in the laboratory using standard procedures for recording unconsolidated/organic sediments, noting the physical properties (colour), composition (gravel, sand, clay, silt and organic matter) and inclusions (e.g. artefacts) (Tröels-Smith, 1955). The procedure involved: (1) cleaning the samples with a spatula or scalpel blade and distilled water to remove surface contaminants; (2) recording the physical properties, most notably colour using a Munsell Soil Colour Chart; (3) recording the composition; gravel (Grana glareosa; Gg), fine sand (Grana arenosa; Ga), silt (Argilla granosa; Ag) and clay (Argilla steatoides); (4) recording the degree of peat humification and (5) recording the unit boundaries e.g. sharp or diffuse. The results of the lithostratigraphic descriptions are displayed in Tables 2 to 4.

#### 3.3 Deposit modelling

The deposit model for the site was based on a review of 18 borehole records, incorporating the three new geoarchaeological boreholes (LCY-BHAC01 to BHAC03), five existing geotechnical (RPS, to BH5) records (LCY-BH1 2016) and ten BGS archive boreholes (http://mapapps.bgs.ac.uk/geologyofbritain/home.html). Sedimentary units from the boreholes were classified into six groupings: (1) Gravel, (2) Sand, (3) Lower Alluvium. (4) Peat, (5) Upper Alluvium and (6) Made Ground. The classified data for groups 1-6 were then input into a database with the RockWorks 16 geological utilities software. Models of surface height were generated for the Gravel (Figure 4), Lower Alluvium (Figure 5), Peat (Figure 6) and the Upper Alluvium (Figure 8). Thickness of the Peat (Figure 7), the combined Holocene alluvial sequence (Figure 9), and the Made Ground (Figure 10) were also modelled (also using a nearest neighbour routine). Because the boreholes are not uniformly distributed over the area of investigation, the reliability of the models generated using RockWorks is variable. In general, reliability improves from outlying areas where the models are largely supported by scattered archival records towards the core area of boreholes.

Because of the 'smoothing' effect of the modelling procedure, the modelled levels of stratigraphic contacts may differ slightly from the levels recorded in borehole logs and section drawings. As a consequence of this the modelling procedure has been manually adjusted so that only those areas for which sufficient stratigraphic data is present will be modelled. In order to achieve this, a maximum distance cut-off filter equivalent to a 50m radius around each record is applied to all deposit models, with the exception of the more widely present Gravel, Upper Alluvium and Made Ground, to which a 100m radius is applied. Finally, it is important to recognise that multiple sets of

boreholes are represented, put down at different times and recorded using different descriptive terms and subject to differing technical constraints in terms of recorded detail including the exact levels of the stratigraphic boundaries.

# 4. RESULTS AND INTERPRETATION OF THE DEPOSIT MODELLING

A summary of the borehole data included in the deposit model is shown in Table 1, with the results of the deposit modelling displayed in Figures 3 to 10. Figure 3 is a two-dimensional west-east transect of selected boreholes across the site; Figures 4 to 10 are surface elevation and thickness models for each of the main stratigraphic units. The results of the deposit modelling indicate that the number and spread of the logs is sufficient to permit modelling with a high level of certainty across the site. The full sequence of sediments recorded in the boreholes comprises:

Made Ground – widely present Upper Alluvium – widely present Peat – widely present Lower Alluvium – locally present Sand – only locally present (one borehole) Gravel (Shepperton Gravel) – widely present

#### 4.1 Shepperton Gravel

The Shepperton Gravel was present in all boreholes, underlying the Holocene alluvial sequence. It was deposited during the Late Glacial (15,000 to 10,000 years before present) and comprises the sands and gravels of a high-energy braided river system which, while it was active would have been characterised by longitudinal gravel bars and intervening low-water channels in which finer-grained sediments might have been deposited. Such a relief pattern would have been present on the valley floor at the beginning of the Holocene when a lower-energy fluvial regime was being established.

The surface of the Gravel (see Figures 3 and 4) lies at between -5.10 and -2.92m OD within the area of the site, generally falling from the east in the area of boreholes LCY-BHAC01, TQ48SW2430 and TQ48SW2432 (ca. -2.9 to -3.5m OD) to west in the area of boreholes LCY-BH1 and BH2 (ca. -4.9 to -5.1m OD). Beyond the margins of the site the Gravel rises to -2.70m OD to the east (TQ48SW2431) and falls to -5.20m OD just to the west (TQ48SW469). The general relief pattern of the Gravel in the area of the site is thus indicative of a possible Late Devensian/Early Holocene channel, broadly aligned north-south and whose main axis lay towards the west of the site.

#### 4.2 Sand

A horizon of sand was recorded in one borehole (LCY-BH1) between -4.1 and -9.0m OD, directly overlying the Gravel and recorded towards the main axis of the possible palaeochannel identified above. This unit is indicative of moderate energy fluvial conditions, apparently limited to within this former channel; however, its absence in the existing geotechnical sequences does not necessarily

mean it is not present as an individual unit, as it is sometimes difficult to identify sand units within the silty/sandy Lower Alluvium due to the nature of the coring methods and less precise method of description.

#### 4.3 Lower Alluvium

The Lower Alluvium rests directly on the Shepperton Gravel (overlying the Sand in LCY-BH1) and was recorded in four boreholes in the area of the site (LCY-BH2, TQ48SW136, TQ48SW468 and TQ48SW467) (Figure 5). The deposits of the Lower Alluvium are described as predominantly silty or clayey, tending to become increasingly sandy downward in most sequences. The Lower Alluvium frequently contains detrital wood or plant remains, and in many cases is described as organic and with occasional Mollusca remains. The surface of the Lower Alluvium (Figure 5) is variable, lying at between -3.05 (TQ48SW467) and -4.8m OD (TQ48SW136/LCY-BH2). The surface of the Lower Alluvium is lowest within the possible palaeochannel identified above, in the area of boreholes TQ48SW136 and LCY-BH2.

The sediments of the Lower Alluvium are indicative of deposition during the Early to Mid-Holocene, when the main course of the Thames was probably confined to a single meandering channel. During this period, the surface of the Shepperton Gravel was progressively buried beneath the sandy and silty flood deposits of the river. The richly-organic nature of the Lower Alluvium suggests that this was a period during which the valley floor was occupied by a network of actively shifting channels, with a drainage pattern on the floodplain that was still largely determined by the relief on the surface of the underlying Shepperton Gravel.

#### 4.4 Peat

Recorded either directly overlying the Shepperton Gravel or the Lower Alluvium in all but one borehole (LCY-BHAC01) is a unit of peat, usually described as woody and in places silty. The surface of this unit (Figure 6) was variable in the area of the site, recorded at between -1.5 (LCY-BH3) and -3.5m OD (LCY-BHAC02); in general, lower peat surfaces are recorded within the area of the site than in those records to the east and west (see Figure 6). The peat is between 0.6 (TQ48SW2430) and 2.8m (LCY-BH2) in thickness (Figure 7), with greater thicknesses recorded towards the west of the site, particularly in the area of the palaeochannel identified within the surface of the Gravel (see above).

Significantly, the peat is indicative of a transition towards semi-terrestrial (marshy) conditions, supporting the growth of either saltmarsh, sedge fen/reed swamp and/or woodland communities. Such semi-terrestrial conditions may have represented former land surfaces that might have been utilised by prehistoric communities. Assuming that 1m of peat represents 1000 years of peat formation (a typical figure in fen peatlands), the Peat may represent up to 3000 years of accumulation in such conditions.

#### 4.5 Upper Alluvium

The Upper Alluvium overlies the Peat across the site, the deposits of which are described as predominantly silty or clayey and occasionally organic-rich. The surface of the Upper Alluvium (Figure 8) is relatively even, lying at between 1.1 (LCY-BH2) and -1.7m OD (TQ48SW2430). However, given the variable thicknesses of Made Ground across the site, it is possible that such surfaces may have been truncated to lower levels in places. The sediments of the Upper Alluvium are indicative of deposition within low energy fluvial and/or semi-aquatic conditions during the Holocene. The high mineral content of the sediments may reflect increased sediment loads resulting from intensification of agricultural land use from the later prehistoric period onward, combined with the effects of rising sea level.

The combined Holocene alluvial sequence (incorporating the Sand. Lower Alluvium, Peat and Upper Alluvium) is recorded in thicknesses of between 2.6 (TQ48SW2430) and 6.0m (LCY-BH2) in the area of the site (Figure 9). Greater thicknesses are recorded towards the west of the site within the area of the palaeochannel identified above.

#### 4.6 Made Ground

Between 3.4 (LCY-BH2) and 8m (LCY-BHAC01) of Made Ground caps the Holocene alluvial sequence across the site (Figure 10). The Made Ground is generally thickest towards the east of the site; in one borehole here (LCY-BHAC01) a thick layer of concrete was recorded directly overlying the Gravel at 9.0m below ground level (bgl).

Road, London E16.	Table 1: Spatial data f	for those reco	ords used in t	he deposit n	nodel at	London	City Airport	:, Hartmanr
	Road, London E16.			•		_	5	

Borehole	Easting	Northing	Elevation (m OD)
New geoarchaeolog	ical boreholes		
LCY-BHAC01	542306.13	180303.59	5.08
LCY-BHAC02	542288.94	180313.56	4.10
LCY-BHAC03	542275.53	180329.74	4.92
Existing geotechnica	al records (RPS	6, 2016)	
LCY-BH1	542236.88	180320.75	4.50
LCY-BH2	542253.75	180314.33	4.50
LCY-BH3	542298.92	180287.15	5.20
LCY-BH4	542323.93	180276.10	5.20
LCY-BH5	542323.33	180308.84	5.25
BGS archive borehol (http://mapapps.bgs	les s.ac.uk/geolog	yofbritain/hor	me.html)
TQ48SW468	542180.00	180210.00	1.55
TQ48SW469	542220.00	180280.00	1.10
TQ48SW134	542409.00	180280.00	2.64
TQ48SW467	542140.00	180280.00	1.85
TQ48SW2429	542340.00	180290.00	5.30
TQ48SW2431	542360.00	180310.00	5.60
TQ48SW2430	542330.00	180310.00	5.50
TQ48SW2432	542290.00	180320.00	4.90
TQ48SW2434	542270.00	180340.00	5.50
TQ48SW136	542170.00	180388.00	1.60



Figure 3: West-east transect of selected boreholes across the London City Airport site





Figure 5: Top of the Lower Alluvium (m OD) (site outline in red).



Figure 6: Top of the Peat (m OD) (site outline in red).



542200 Figure 7: Thickness of the Peat (m) (site outline in red).



Figure 8: Top of the Upper Alluvium (m) (site outline in red).





Table 2: Lithos	tratigraphic	descriptior	n of borehole	LCY-BHAC01,	, London Ci <sup>.</sup>	ty Airport, Hartmann
Road, London E	16.	·				<b>.</b>

Depth (m bgl)	Depth (m OD)	Description	Interpretation
0.00 to 4.00	5.08 to 1.08	Made Ground of tarmac/concrete over variably silty/clayey/sandy material including brick fragments, chalk and redeposited alluvium	MADE GROUND
4.00 to 8.00	1.08 to -2.92	Concrete	
8.00 to 9.00	-2.92 to -3.92	Gg3 Ga1; sandy gravel. Clasts are flint, sub-angular to well-rounded, average diameter 20mm.	SHEPPERTON GRAVEL

Table 3: Lithostratigraphic description of borehole LCY-BHAC02, London City Airport, Hartmann Road, London E16.

Depth (m bgl)	Depth (m OD)	Description	Interpretation
0.00 to 2.20	4.10 to 1.90	Made Ground of tarmac/concrete over variably silty/clayey/sandy material including brick fragments, chalk and redeposited alluvium	MADE GROUND
2.20 to 4.60	1.90 to -0.50	Redeposited alluvium (gravelly silty clay)	
4.60 to 6.50	-0.50 to -2.30	As3 Ag1; grey silty clay. Diffuse contact in to:	UPPER ALLUVIUM
6.50 to 6.75	-2.30 to -2.65	As3 Ag1; grey silty clay with dark blue mottling. Diffuse contact in to:	
6.75 to 7.25	-2.65 to -3.15	Ag2 As1 Dl1; dark grey clayey silt with detrital wood. Large wood macrofossil at 7.1-7.2. Diffuse contact in to:	
7.25 to 7.60	-3.15 to -3.50	Ag2 Sh1 Dh1 Dl+; dark brownish grey organic silt with detritalk herbaceous material and a trace of detrital wood. Becoming more organic with depth. Diffuse contact in to:	
7.60 to 8.95	-3.50 to -4.85	Sh3 Tl <sup>2</sup> 1 Ag+; humo. 2/3; dark reddish brown moderately to well humified woody peat with a trace of silt. Diffuse contact in to:	PEAT
8.95 to 9.20	-4.85 to -5.10	Ag2 Sh2; humo. 2/3; dark brownish grey moderately to well humified very silty peat. Sharp contact in to:	
9.20 to 9.60	-5.10 to -5.50	Gg4 Ga+; gravel with a trace of sand. Clasts are flint, sub-angular to rounded, average diameter 40mm.	SHEPPERTON GRAVEL

Table 4: Lithostratigraphic description of borehole LCY-BHAC03, London City Airport, Hartman	n
Road, London E16.	

Depth (m bgl)	Depth (m OD)	Description	Interpretation
0.00 to 5.42	4.92 to -0.50	Made Ground of tarmac/concrete over variably silty/clayey/sandy material including brick fragments, chalk and redeposited alluvium. Sharp contact in to:	MADE GROUND
5.42 to 6.92	-0.50 to -2.00	As3 Ag1; blue grey silty clay with occasional Mollusca fragments. Very sharp contact in to:	UPPER ALLUVIUM
6.92 to 7.00	-2.00 to -2.08	Sh4; humo. 3; black well humified peat. Diffuse contact in to:	PEAT
7.00 to 7.80	-2.08 to -2.88	Sh3 Ag1 Tl+ Th+; humo. 4; brown very well humified silty peat with traces of woody and herbaceous material. Diffuse contact in to:	

Depth (m bgl)	Depth (m OD)	Description	Interpretation
7.80 to 9.60	-2.88 to -4.68	Sh2 Tl <sup>2</sup> 1 Ag1 Th+; humo. 3; reddish brown well humified silty woody peat with a trace of herbaceous material. Sharp contact in to:	
9.60 to 9.90	-4.68 to -4.98	Gg3 Ga1; sandy gravel. Clasts are flint, sub-angular to well-rounded, average diameter 20mm.	SHEPPERTON GRAVEL

# 5. DISCUSSION

The aims of geoarchaeological investigation were: (1) to clarify the nature of the sub-surface stratigraphy, in particular the presence and thickness of alluvium and peat across the site, (2) to evaluate the potential of the sedimentary sequences for reconstructing the environmental history of the site and its environs, and (3) to investigate the archaeological potential of the site. In order to address these aims, three geoarchaeological boreholes were put down across the site and the new and existing stratigraphic data used to produce a deposit model of the major depositional units.

The results of the deposit modelling indicate that the sediments recorded at the site are similar to those recorded elsewhere in the Lower Thames Valley, with Late Devensian Shepperton Gravel overlain by a sequence of Holocene alluvial sediments, including peat, and buried beneath modern Made Ground. Elsewhere in the Lower Thames Valley, the surface of the Late Devensian Shepperton Gravel is often uneven (Gibbard, 1985; 1994) with relief features that can be identified as longitudinal gravel bars and palaeochannels with a relief amplitude commonly of 3-4m and in some places up to 6m. At the present site and across the modelled area, the relief features of the Shepperton Gravel surface are indicative of a possible Late Devensian/Early Holocene channel, the main axis of which is probably located towards the western area of the site, and which may have been aligned broadly north-south. Within this palaeochannel the Gravel surface falls to -5.2m OD, falling from ca. -2.9 to -3.5m OD towards the east of the site and beyond the margins of this feature. Similar but in places slightly higher Gravel surfaces of between -1.59 and -5.16m OD were recorded at the Plot 2.3, Royals Business Park site (Young & Batchelor, 2013) ca. 800m to the northwest. Elsewhere, surfaces of between -1.6 and -3.0m OD were recorded at Royal Albert Dock ca. 1.2km to the northeast (Batchelor, 2009), with similar elevations at Ferndale Street ca. 1.5km to the northeast (ca. -3m OD; Divers, 1995), and to the southeast at Albert Road (-4.5m OD; Spurr et al., 2001), and North Woolwich Pumping Station (ca. -5m OD; Sidell, 2003), Barge House Road (Corcoran et al., 2001) and Gallions Point (Branch et al., 1999). The highest Gravel surfaces identified at the present site (ca. -2.9m OD) are significantly lower than the elevation of the Gravel at the Royal Docks Community School ca. 500m to the northwest (ca. 0.5m OD), at which a soil horizon containing Mesolithic flint flakes was recorded, overlain by a Neolithic and Bronze Age soil containing over 1300 fragments of flint tools, debris and pottery (Holder, 1998) (Holder, 1998). On this basis, it is considered unlikely that the London City Airport site will contain in situ evidence of prehistoric activity on the surface of the Gravel.

At the present site, the Holocene alluvial sequence overlying the Gravel is comprised (in stratigraphic order) of the Lower Alluvium, Peat and Upper Alluvium, although within the channel itself, a thick (0.9m) unit of Sand (indicative of moderate-energy fluvial activity) was identified. The Peat recorded across the site is between 0.6 and 2.8m thick, its surface lying at between -3.5 and -1.5m OD; in general, greater thicknesses of both Peat and the combined Holocene alluvial deposits are recorded towards the west, in the area of the possible former channel. Generally thinner deposits of up to 1.1m of Peat were recorded at the Plot 2.3, Royals Business Park site (Young & Batchelor, 2013), where it was present at elevations of between ca. -2 and -1m OD and radiocarbon dated to the Bronze Age (3390-3270 to 3640-3470 cal BP). Accumulation of the Peat at this site occurred during the Bronze Age, slightly later than that recorded at other sites to the east, despite their similar elevation. At Ferndale Street, the base of the Peat was recorded at -1.89m OD, and was radiocarbon dated to 5314-4870 cal BP (Divers, 1995), similar to that recorded at East Ham Football Club (-1.47m OD; 5600-5050 cal. BP; Scaife, 2001). At the Royal Albert Dock site, Peat was recorded between -1.63 and -1.00m OD. Radiocarbon dating indicated that this horizon accumulated between 4410-4080 and 3630-3360 cal BP (during the Late Neolithic). To the southeast of the present site at Albert Road (Spurr et al., 2001) the base of the Peat was recorded at -4.40m OD, and was radiocarbon dated to 7150-6670 cal BP (Late Mesolithic). To the east of here at the North Woolwich Pumping Station (Sidell, 2003) it was recorded at ca. -4.50m OD (7640-6340 cal. BP); at Barge House Road (Corcoran et al., 2001) at -4.80m OD (ca. 6760-6450 cal. BP); and at Gallions Point (Branch et al., 1999) at ca. -5.10m OD (prior to 6170-5650 cal. BP).

# 6. CONCLUSIONS AND RECOMMENDATIONS

A relatively thick sequence of peat has been identified at the London City Airport site, overlying a Shepperton Gravel surface of variable height and which is indicative of a potential Late Devensian/Early Holocene palaeochannel towards the west. The results of the investigation have thus demonstrated variation in the type and thickness of the Holocene alluvial sequence. Such variations are significant as they represent different environmental conditions that would have existed in a given location; for example, the peat horizons recorded represent former semi-terrestrial land surfaces, whereas fine to medium grained sediments such as sands, silts and clays represent periods of estuarine or freshwater flooding. Thus studying the sub-surface deposits at the site has enabled us to start building our understanding of the former landscapes and environmental changes that took place over both space and time across the site.

Areas of higher gravel topography and peat deposits represent potential areas that might have been utilised or even occupied by prehistoric and historic people, evidence of which may be preserved in the archaeological record (e.g. features and structures). Although the lower Gravel surfaces across the present site are considered to be of negligible archaeological potential, the peat sediments have the potential to contain a wealth of further information on the past landscape in addition to archaeological material, through the assessment/analysis of palaeoenvironmental remains (e.g. pollen, plant macrofossils and insects) and radiocarbon dating, as demonstrated at other sites in the wider area of the site. So called environmental archaeological or palaeoenvironmental investigations can identify the nature and timing of changes in the landscape, and the interaction of different processes (e.g. vegetation change, human activity, climate change, hydrological change) thereby increasing our knowledge and understanding of the site and nearby area. In the case of human activity, palaeoenvironmental evidence can include: (1) decreases in tree and shrub pollen suggestive of woodland clearance; (2) the presence of herbs indicative of disturbed ground, pastoral and/or arable agriculture; (3) charcoal/microcharcoal suggestive of anthropogenic or natural burning, and (4) insect taxa indicative of domesticated animals. Such investigations are routinely carried out (where required) as part of planning conditions across the Lower Thames Valley and its tributaries, instructed by the LPA Archaeological Advisor. On the basis of radiocarbon dates from sites nearby, it is possible that the Peat at the present site accumulated from the Late Mesolithic through to Bronze Age cultural periods.

It is therefore recommended that a programme of environmental archaeological assessment is undertaken on one selected borehole from the site (LCY-BHAC03), incorporating: (1) radiocarbon dating of the base and top of the Peat in order to ascertain the age of peat accumulation and cessation; (2) organic matter determinations to aid identification of the sedimentary units; (3) assessment of the palaeobotanical remains (pollen, waterlogged wood and seeds) to provide a provisional reconstruction of the vegetation history; (4) assessment of the diatoms to provide an indication of the palaeohydrology (e.g. marine, brackish or freshwater), and (5) assessment of the general environmental conditions, climatic change and hydrology of the site. The assessment will also highlight any indications of nearby human activity, and provide recommendations for further analysis (if necessary).

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# 8. APPENDIX 1: OASIS

#### OASIS ID: quaterna1-285460

# Project detailsProject nameLondon City Airport, Hartmann Road, LondonShort descriptionA programme of geoarchaeological investigation was carried out at the site,<br/>including three new boreholes and deposit modelling, in order to (1) to clarify<br/>the nature of the sub-surface stratigraphy, in particular the presence and<br/>thickness of alluvium and peat across the site, (2) to evaluate the potential of<br/>the sedimentary sequences for reconstructing the environmental history of<br/>the site and its environs, and (3) to investigate the archaeological potential<br/>of the site. A relatively thick sequence of peat has been identified at the site<br/>(up to 2.8m), overlying a Shepperton Gravel surface of variable height and<br/>which is indicative of a potential Late Devensian/Early Holocene<br/>palaeochannel towards the west. Although the lower Gravel surfaces across

	the present site are considered to be of negligible archaeological potential,
	the peat sediments have the potential to contain a wealth of further
	information on the past landscape in addition to archaeological material,
	through the assessment/analysis of palaeoenvironmental remains. It is
	therefore recommended that a programme of environmental archaeological
	assessment is undertaken on one selected borehole from the site (LCY-
	BHAC03).
Project dates	Start: 01-01-2017 End: 19-05-2017
Previous/future	No / Yes

work

Type of project Environmental assessment

Survey techniques Landscape

#### **Project location**

Country	England
Site location	GREATER LONDON NEWHAM NEWHAM London City Airport, Hartmann Road
Postcode	E16 2PX
Site coordinates	TQ 42300 80300 51.503191554343 0.050495748439 51 30 11 N 000 03 01 E Point

#### **Project creators**

Name Organisatior	of	Quaternary Scientific (QUEST)
Project originator	brief	London City Airport (CADP)
Project originator	design	D.S. Young
Project director/mar	nager	C.R. Batchelor
Project supe	ervisor	D.S. Young
Type sponsor/fund body	of ding	Developer

#### **Project archives**

#### Quaternary Scientific (QUEST) Unpublished Report May 2017; Project Number 023/17 $\,$

Physical Exists?	Archive	No
Digital Exists?	Archive	No
Paper recipient	Archive	LAARC
Deper Con	tonto	"Environmental" "Stratigraphic"
Paper Con	lenis	Environmental, enalgraphie
Paper Paper available	Media	"Report"
Paper Paper available Entered by	Media	"Report" Daniel Young (d.s.young@reading.ac.uk)