

am											BOREH	OL	ΕL	.OG
Contract:							CI	ient:				Boreho	ole:	
		Pro	ject Blue							E	Buro Happold		Е	3H106
Contract Re	f:		Star	t: <b>09</b> .	01.18	Gro	und L	.evel	(m):		National Grid Co-ordinate:	Sheet:		
7	7643	393	End	: 11.	01.18			-2.6	52		E:333375.7 N:392522.9		4	of <b>20</b>
Danth		Sample	s & Testing		Mech	anica	l Log	٥	ails ails	e		ced	Depth	Material
Depth (m)	No	Туре	Results	TC (%	R SCF ) (%)	RQE (%)	I Log If (mm	Flush	& Details Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
- - 12.21-12.45 - -	208	С		10	0 91	62	40 100 200					-15.31	12.69	
- - - - 13.20-14.70					<b>V</b>	<b>X</b>	50 50 110				Medium strong to strong reddish brown fine to medium grained SANDSTONE with localised very closely to medium spaced very thin to thin beds of medium strong light yellowish grey fine to medium grained sandstone. Discontinuities: 1) closely to medium spaced locally very closely spaced 0-10° planar rough clean.	- - -	-	
- - - - - 14.10-14.55	209	С		10	0 100	69		90-100% return	(Reddish brown)		from 12.69m to 12.80m, 1 No thin bed of medium strong light yellowish grey fine to medium grained sandstone from 13.46m to 14.00m, with very closely to closely spaced thick laminations to thin beds of medium strong light yellowish grey fine to medium grained sandstone.	-	(1.81)	
-											Medium strong locally weak	-17.12	14.50	
- 14.70-16.20 - - -				<b>X</b>		<b>X</b>	10 170 430				Medium strong locally weak reddish brown fine to medium locally coarse grained SANDSTONE. Discontinuities: 1) closely to medium spaced locally very closely spaced 0-10° planar rough clean from 14.57m to 14.67m, 1 No thin bed of medium strong light	- - -	-	
- - - 15.51-15.76 - -	210	С		10	0 95	49					grey siltstone thinly interbedded with medium strong light grey fine to medium grained sandstone from 14.85m to 14.90m, very weak with extremely closely to closely spaced fractures from 15.00m to 15.30m, 1 No medium bed of medium strong light grey fine to medium grained sandstone from 15.05m to 15.35m, 1 No 70° fracture planar rough clean.	- - - -	-	

	Boring Pro	gress and	Water Ob	servations	3			Co	norol	Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water			Ge	Herai	Remarks	
		Берип	Берип	(mm)	Depth						
						Д	ll dimens	ions in metre	es	Scale:	1:22
Method Used:		sampling ry Cored	+ Plan Used		cchio GEC	205	Drilled By:	Ashley Everill	Logged By:	MGalan + TBeeson	Checked AGS AGS

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120												BOKER	OL		.UG
Contract:							Cli	ent:					Boreho	le:	
		Pro	ject Blu	е							В	uro Happold		В	H106
Contract Re	f:	,	Sta	art: <b>09.0</b>	1.18	Gro	und L	evel	(m)	:		National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393	En	d: <b>11.0</b>	1.18			-2.6	32			E:333375.7 N:392522.9		5	of <b>20</b>
Depth			s & Testing	TCF	Mecha		_	sh	Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick	Graphic
(m) - 16.20-17.70	No	Туре	Results	100	(%)	(%) 49 <b>Y</b>	(mm)	FE	\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \	В	>		- - - - L	ness)	Legend
- - - - - 16.73-17.07 - -	211	С		100	100	71						from 16.50m to 16.60m, 1 No thin bed of medium strong light grey fine to medium grained sandstone.	- - - - - - -	-	
17.70-19.20 - - - - - - 18.40-18.84		С		100	100	85	10 170 430	90-100% return Water	(Reddish brown)			from 18.31m to 18.48m, 1 No thin bed of medium strong light grey siltstone thinly interbedded with medium strong light grey fine to medium grained sandstone.		- - (5.68) - - - - - - - - - -	
- - - 19.20-20.70 - - - 19.63-19.91		С		100	100	91	-						- - - - - - - -	- - - - -	

	Boring Pro	gress and	Water O	bservations	3			Go	noral	Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	IICIAI	Remarks	
		200	2004	()	200						
							All dimen	sions in metre	es	Scale:	1:22
Method		sampling	+ Plai		oshio CEC	205	Drilled	Ashley Everill	Logged	MGalan +	Checked A

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
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Used: **Rotary Cored** 

Used: Comacchio GEO 205 Ву: Ashley Everill By: **TBeeson**  Ву: VAL) AGS



## **BOREHOLE LOG**

Contract:							Cli	ent:				Boreho	ole:	
J 31111 401.		Project	Blue					J. 1.L.		В	uro Happold	25,0,10		H106
Contract Re	f:	1 10,000		09.0	1.18	Gro	und L	evel (m	1):		National Grid Co-ordinate:	Sheet:		
7	<b>'</b> 643	93	End:	11.0				-2.62			E:333375.7 N:392522.9		6	of <b>20</b>
Depth (m)		Samples & Te	esting	TCR	Mecha SCR	anical RQD	Log	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Materia Graphic Legend
()		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		(%)	(%)	(%)	(mm)					<u> </u>	11033)	
00 70 00 00				100	100	91					Medium strong to strong reddish brown fine to medium grained SANDSTONE with very closely to medium spaced very thin and thin beds of medium strong light yellowish grey fine grained sandstone. Discontinuities: 1) closely to medium spaced locally	-22.80	20.18	
20.70-22.20 20.77-21.04		С		100	87	63	20 180 330				very closely spaced 0-10° planar rough clean.  Medium strong to strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) closely to medium spaced locally very closely spaced 0-15° planar rough clean.	23.44 - - - - - -	- 20.82	
22.20-23.70				_	<b>X</b>	<u> </u>	*	90-100% return Water (Reddish brown)			from 21.77m to 22.02m, recovered as non-intact core (angular medium to coarse gravel and cobble sized fragments).  at 22.14m, 1 No thick lamination of light grey fine grained sandstone.	-	- (2.00) - (- (2.00)	
				100	100	97	170 230 440				Medium strong to strong reddish brown fine to medium grained SANDSTONE with closely to medium spaced very thin to thin beds of medium strong light grey to light yellowish grey fine to	- - 25.44 - - -	- - - 22.82 - - -	
23.70-25.20 23.70-24.15		С		100	93	84	60 290 530	_			coarse grained sandstone. Discontinuities: 1) closely to medium spaced 0-10° planar rough clean at 23.11m, 1 No lense of grey fine grained sandstone from 23.28m to 23.62m, with very closely to closely spaced very thin beds of light yellowish grey fine to medium grained	-	- - - -(1.85)	

	l l	Boring Pro	gress and	Water	Observation	S			Co	noral	Domorko			
	Date	Time	Borehole	Casin	g Borehole Diameter				Ge	nerai	Remarks			
,	Date	Tillie	Depth	Depth		Depth								
,														
							l ,	\II dimon	sions in metre	NC	Scale:	1:22		
j									310113 111 1110110	1	Scale.			
j	Method		sampling	+  PI	ant			Drilled		Logged	MGalan +	Checked	A-	
i	Used:	Rota	ry Cored	U:	sed: Com	acchio GFO	205	Bv:	Ashley Everill	Bv:	TReeson	Bv: N	19 /	AGS

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Start   1.01.18   Ground Level (m):	120													BUKER	OL		.UG
Start   1.01.18   Ground Level (m):	Contract:								Cli	ient:					Boreho		
Total content   Total conten			Pro									E	_			B	3H106
Depth (m)   No Type   Results   TCR SCR RCD   IT   The properties of the propertie	Contract Re	ef:		S	Start:	09.0	1.18	Grou	und L	evel (	(m):		N	lational Grid Co-ordinate:	Sheet:		
sandstone.    Sandstone   Sand	'	764	393	E	nd:	11.0	1.18			-2.6	2			E:333375.7 N:392522.9		7	of <b>20</b>
sandstone.    Sandstone   Sand		No	· ·			TCR	Mecha SCR (%)	anical RQD (%)	Log If (mm)	Flush	& Details	Water	אמנכו	Description of Strata	Reduced	Depth (Thick ness)	
sandstone from 26.46m to 26.53m, 1 No thin bed of medium strong light brownish grey fine to medium grained sandstone.	-		С			100	93	84	60 290 530 NI 20 50	-				from 24.27m to 24.40m, 2 No 30-50° fractures very closely spaced undulating rough clay smeared from 24.56m to 24.67m, locally very weak and recovered predominantly as non-intact core (angular fine to coarse gravel sized fragments).  Medium strong to strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) closely to medium spaced locally very closely spaced 0-10° planar rough clean from 24.67m to 24.79m, very weak and recovered predominantly as non-intact core (angular fine to coarse gravel sized fragments).	- - - -	24.67	
Medium strong light grey SILTSTONE with very closely to closely spaced very thin beds of light grey medium to coarse grained sandstone and reddish brown fine to medium grained sandstone. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth locally rough clean.  Medium strong light grey (0.35)	- - - - -		С			89	73	53	100				-	sandstone from 26.46m to 26.53m, 1 No thin bed of medium strong light brownish grey fine to medium grained sandstone.  Medium strong light grey SILTSTONE with very closely to closely spaced very thin beds of light grey medium to coarse grained sandstone and reddish brown fine to medium grained sandstone. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth locally rough clean.	-29.60 - - - 29.95	(0.35)	× × × × ×

	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	IIEIAI	Nemarks			
						Д	ll dimens	sions in metre	es	Scale:	1:22		
Method Used:	Dynamic Rota	sampling - ry Cored	Plan Used		cchio GEC	205	Drilled By:	Ashley Everill	Logged By:	MGalan + TBeeson	Checked By:	D	AGS

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Used:



### **BOREHOLE LOG**

Contract:								Cli	ent:		_		Boreho		
	-	Pro	ject E					<u> </u>				Buro Happold	01 1	В	H106
Contract Re				Start:			Gro					National Grid Co-ordinate:	Sheet:		
7	643	393		End:	11.0	1.18			-2.6	2	$\perp$	E:333375.7 N:392522.9		8	of <b>20</b>
Depth (m)	No	Samples Type		sting		Mecha SCR (%)	RQD (%)	l Log	Flush Returns	Details	Water	Description of Strata	Reduced	Depth (Thick ness)	Materia Graphic Legend
28.20-29.70					89	73	53	NI 100 170 20 80	-	88		10-25° planar rough clean from 27.75m to 27.85m and 28.00m to 28.10m, very weak to weak and recovered as non-intact core (gravelly fine to medium sand. Gravel is angular to subrounded and fine to medium) Assumed zones of core loss from 28.20m, locally very weak.	-31.32	(1.37)	
					100	100	75	240	_			Medium strong light yellowish grey fine grained SANDSTONE with localised very closely to closely spaced thin and thick laminations of grey medium grained sandstone.  Discontinuities: 1) closely spaced	31.76	- -(0.44) - - 29.14	
29.70-31.20 29.70-29.97		С			<b>X</b>	<b>X</b>	*	_	E	(n/		0-10° planar smooth clean.   Weak to medium strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1' closely to medium spaced locally very closely spaced 0-15° planar rough clean from 29.14m to 29.20m, 1 No very thin bed of firm reddish	-	-	
									90-100% return — Water	(Reddish brov		brown sandy clay from 29.40m to 29.70m, 1 No 80-90° fracture undulating rough clean from 30.24m to 30.26m, 1 No	-	-	
					100	100	89	NI 210 350				very thin bed of medium strong grey fine to coarse grained sandstone.		- - -	
													-	- -(3.56) - -	
31.20-32.70 31.41-31.76		С			*	*	*					from 31.35m to 31.45m extremely weak and recovered as	L	-	
					100	99	92					non-intact core (angular medium to coarse gravel sized fragments).	-	- -	
												Description on next sheet	-	-	

	E	Boring Pro	gress and	Water Ob	servations	5			Co	noral	Remarks		
31010	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	liciai	Remarks		
3			'		,	'							
5													
1							Δ	II dimen	sions in metre	100	Scale:	1:22	
	Method Used:	Dynamic Rota	sampling ry Cored	+ Plan Used		cchio GEC		Drilled By:	Ashley Everill	Logged By:	MGalan + TBeeson	Checked Ass	AGS

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Contract:						Clie	ent:				Boreho	ole:	
		Pro	ject Blue						В	uro Happold		В	H106
Contract Re	f:		Start:	09.01.18	Grou	nd Le	evel (m)	):	1	National Grid Co-ordinate:	Sheet:		
7	7643	393	End:	11.01.18		-	2.62			E:333375.7 N:392522.9		9	of <b>20</b>
Depth (m)	No		s & Testing  Results	Mech TCR SCF (%) (%)	anical	Log If	lush eturns Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
				100 99	92	120 170 220 <b>V</b>	•			from 31.90m to 32.10m, 1 No thin bed of greyish green fine to medium grained sandstone with frequent thin and thick laminations of grey siltstone at 32.10m, gradational boundary between grey and reddish brown sandstone at 32.20m, 1 No 35° fracture undulating rough clean.  Borehole terminated at 32.70m depth.	-35.32	32.70	

E	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Remarks		
Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	nerai	Remarks		
Bato	11110	Depth	Depth	(mm)	Depth							
						_					4.00	
						A	il dimen	sions in metre	S	Scale:	1:22	
Method Used:		sampling ry Cored	+ Plan Use		cchio GEC	205	Drilled By:	Ashley Everill	Logged By:	MGalan + TBeeson	Checked By:	AGS

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Contract:			Client:			Borehol	e:
Project E	Blue			E	Buro Happold		BH106
Contract Ref:	Start:	09.01.18	Ground Level (r	n):	National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18	-2.62	2	E:333375.7 N:392522.9		<b>10</b> of <b>20</b>

### BH106 - Box 1





BH106 - Box 2

Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

Ashley Everill

Logged MGalan + **TBeeson**  Checked



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Contract: Client: Borehole: **Project Blue Buro Happold BH106** Contract Ref: Start: 09.01.18 Ground Level (m): National Grid Co-ordinate: Sheet: E:333375.7 N:392522.9 764393 End: 11.01.18 -2.62 **11** of **20** 

#### BH106 - Box 3





BH106 - Box 4

Plant Used:

Drilled Ashley Everill Logged MGalan + **TBeeson**  Checked



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Contract:				Client:			Borehol	e:
Project E	Blue				E	Buro Happold		BH106
Contract Ref:	Start:	09.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18		-2.62		E:333375.7 N:392522.9		<b>12</b> of <b>20</b>

#### BH106 - Box 5





BH106 - Box 6

Method Dynamic sampling + Used: **Rotary Cored** 

Used:

Comacchio GEO 205

Drilled

Logged

MGalan + **TBeeson**  Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Plant

Ashley Everill



Contract:				Client:			Borehol	e:
Project E	Blue				E	Buro Happold		BH106
Contract Ref:	Start:	09.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18		-2.62		E:333375.7 N:392522.9		<b>13</b> of <b>20</b>

### BH106 - Box 7





BH106 - Box 8

Dynamic sampling + **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

MGalan +

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Method Used:

Ashley Everill

Logged **TBeeson** 



Contract:				Client:			Borehol	e:
Project E	Blue				ı	Buro Happold		BH106
Contract Ref:	Start:	09.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18		-2.62		E:333375.7 N:392522.9		<b>14</b> of <b>20</b>

#### BH106 - Box 9





BH106 - Box 10

Method

Plant Used:

Comacchio GEO 205

Drilled

Logged Ashley Everill

MGalan + **TBeeson**  Checked



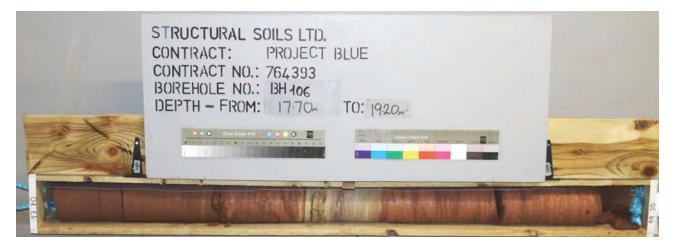
GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract:				Client:			Borehol	e:
Project E	Blue				I	Buro Happold		BH106
Contract Ref:	Start:	09.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18		-2.62		E:333375.7 N:392522.9		<b>15</b> of <b>20</b>

### BH106 - Box 11





BH106 - Box 12

Method Used:

Plant Used:

Comacchio GEO 205

Drilled

Logged Ashley Everill

MGalan + **TBeeson**  Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract: Client: Borehole: **Project Blue Buro Happold BH106** Contract Ref: Start: 09.01.18 Ground Level (m): National Grid Co-ordinate: Sheet: E:333375.7 N:392522.9 764393 End: 11.01.18 -2.62 **16** of **20** 

#### BH106 - Box 13





BH106 - Box 14

Dynamic sampling + Method Used:

Plant Used:

Comacchio GEO 205

Drilled

Logged MGalan + **TBeeson**  Checked



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Contract:				Client:		Borehol	e:
Project E	Blue					BH106	
Contract Ref:	Start:	09.01.18	Groun	d Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18		-2.62	E:333375.7 N:392522.9		<b>17</b> of <b>20</b>

#### BH106 - Box 15





BH106 - Box 16

Method Dynamic sampling +

Plant Used:

Comacchio GEO 205

Drilled Ashley Everill Logged MGalan + **TBeeson**  Checked



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Contract: Client: Borehole: **Project Blue Buro Happold BH106** Contract Ref: Start: 09.01.18 Ground Level (m): National Grid Co-ordinate: Sheet: E:333375.7 N:392522.9 764393 End: 11.01.18 -2.62 **18** of **20** 

#### BH106 - Box 17





BH106 - Box 18

Dynamic sampling + Method **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled Ashley Everill Logged MGalan + **TBeeson**  Checked



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Contract: Client: Borehole: **Project Blue Buro Happold BH106** Contract Ref: Start: 09.01.18 Ground Level (m): National Grid Co-ordinate: Sheet: E:333375.7 N:392522.9 764393 End: 11.01.18 -2.62 **19** of **20** 

#### BH106 - Box 19





BH106 - Box 20

Method Used:

Plant Used:

Comacchio GEO 205

Drilled

Logged MGalan + **TBeeson**  Checked



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Contract:			Client:		Borehole	e:
Project E	Blue			Buro Happold		BH106
Contract Ref:	Start:	09.01.18	Ground Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	11.01.18	-2.62	E:333375.7 N:392522.9		<b>20</b> of <b>20</b>

### BH106 - Box 21





Metho Used:

Method Used: Dynamic sampling + Rotary Cored

Plant Used:

ed: Comacchio GEO 205

Drilled By:

Ashley Everill

Logged

By:

MGalan + TBeeson Checked By:





### DODELLOI E I (

Contract:								Cli	ent:				Boreho	ole:	
		Pro	ject E	Blue								Buro Happold		В	H107
Contract Re	ef:			Start:	22.0	1.18	Grou	und L	evel (m	):		National Grid Co-ordinate:	Sheet:		
	7643	393		End:	23.0	1.18			2.88			E:333381.5 N:392452.6		1	of <b>11</b>
		Sample	s & Tes	ting	ı	Лесhа	anical	Log	s ≅	<sub>≡</sub>	<u></u>		9 <del>-</del>	Depth	Materia
Depth (m)	No	Туре		sults	(%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	(Thick ness)	
0.00-1.00	1	Р	50% re	ecovery								Very soft dark bluish grey slightly sandy clayey SILT. Sand is fine Rare fine to medium gravel sized shell fragments.	-	- (1.25)	X
1.00-2.25 1.00-1.25 1.00-1.45	2 3	P SPT		covery 103		_	<u> </u>	NA NA	<b>^</b>			from 1.00 m to 1.25m assumed zone of core loss		-	× × × × × × × × × × × × × × × × × × ×
1.00-1.45	201	D			84	80	30	<b>X</b>				Medium strong to strong dark reddish brown fine to medium grained SANDSTONE Discontinuities 1) very closely to closely spaced 0-10° planal smooth clean locally stained dark brown.	-	1.25	
2.25-3.35						<b>X</b>	X	NI 80 195	100% return Water			recovered as non-intact-core (angular medium gravel sized fragments) from 1.25m to 1.45m dark brown with localised black sill smearing at 1.51m, 1 No 10° fracture locally incipient from 1.78m to 1.80m, with	- - - - -	(2.20)	
2.68-2.84	202	С			100	100	54		100% r Wat (Reddish			occasional dissolution cavities from 2.31m to 2.48m, 1 No 85-90° fracture undulating rough clean.	- - - -		
3.35-4.50 3.40-3.65	203	С			<b>X</b>		   X	 				at 3.10m, 1 No 8° incipient fracture from 3.20m to 3.45m, 1 No thin bed of weak to medium strong light grey fine grained sandstone.  Medium strong locally weak	-6.33	- 3.45	
					100	100	63	30 80 300				Medium strong locally weak reddish brown fine to medium grained SANDSTONE Discontinuities: 1) very closely to closely locally medium spaced	-	-  -  -	

	Boring Pro	gress and	Water Ob	servations	3							
Date         Time         Borehole Depth         Casing Depth         Borehole Diameter (mm)         Water Depth           22/01/18         16:00         7.50         2.25         146         1.20           23/01/18         08:00         7.50         2.25         146         1.90												

### **General Remarks**

closely locally medium spaced 0-15° planar rough clean.

- 1. Deck to silt level 8.1m. Silt level used as reference for GL.
- 2. UXO clearance performed by magnetometer adjacent to position. 3. SPT hammer JT.01 2017 ( $E_{\rm r}=72.00\%$ ) used.

1:22 All dimensions in metres Scale: AJones +

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Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used: Comacchio GEO 205 Drilled Joseph Taylor Logged By: **MGalan** 

Checked



Contract:								Cli	ent:				Boreho	ole:	
		Pro	ject E	3lue							В	Suro Happold		В	H107
Contract Re	f:			Start:	22.0°	1.18	Gro	und L	evel (	m):		National Grid Co-ordinate:	Sheet:		
	7643	393		End:	23.0	1.18			-2.8	8		E:333381.5 N:392452.6		2	of <b>11</b>
D 41-		Sample	s & Tes	ting	_	/lecha	anical	Log	SL	ails	er		ced	Depth	Material
Depth (m)	No	Туре	Res	sults	TCR (%)	SCR (%)	RQD (%)	Log If (mm)	Flush	& Details Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
4.50-6.00					100	100	63	30 80				from 4.25m to 4.32m, 1 No thin bed of medium stong light grey and dark grey fine grained sandstone.	-	-(2.55)	
5.78-6.00	204	С			100	99	66	300	un	rown)			-	-	
6.00-7.50					100	80	39	NI 70 180	100% return Water	(Reddish Br		Weak to medium strong reddish brown fine to medium grained SANDSTONE. Discontinuities 1) very closely to closely spaced planar locally undulating rough clean  from 6.00m to 6.08m, recovered as non-intact core (angular to subangular medium to coarse gravel sized fragments)  from 6.12m to 6.25m, with rare fine to medium gravel sized clasts of light grey fine grained sandstone.  from 6.86m to 6.90m, 1 No very thin bed of strong grey fine to medium grained sandstone with extremely closely spaced thin laminations of dark grey siltstone.  from 6.90m to 7.37m, very	-8.88	6.00	
7.50-9.00	205	С			87	87	73	50 200 310				weak to weak and recovered locally as non-intact core (sandy angular to subangular fine to coarse gravel sized fragments) from 7.50m to 7.70m, assumed zone of core loss from 7.79m to 7.82m, 1 No very thin bed of medium strong	-10.78	7.90	

	E	Boring Pro	gress and	Water Ob	servations	3			Col	noral	Remarks		
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Gei	ilerai	Remarks		
2													
i j													
							А	ll dimen	sions in metre	es .	Scale:	1:22	
	Method Used:	Dynamic Rota	sampling ry Cored	+ Plan Used		cchio GEC	205	Drilled By:	Joseph Taylor	Logged By:	AJones + MGalan	Checked By:	AS AGS

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### **BOREHOLE LOG**

Opposition											BOREH	OLI	EL	OG
Contract:							Cli	ent:				Boreho	ole:	
		Proje	ect Blue							В	Buro Happold		В	H107
Contract Ref	:		Start:	22.0	1.18	Gro	und Le	evel (m)	):		National Grid Co-ordinate:	Sheet:		
7	643	393	End:	23.0	1.18		-	2.88			E:333381.5 N:392452.6		3	of <b>11</b>
	,	Samples	& Testing	N	/lecha	anical	Log	Stails	<b>=</b>	e		ced	Depth	Material
Depth (m)	No	Туре	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
- - - -				87	87	73	50 200 310				dark grey fine to medium grained sandstone.  Medium strong reddish brown fine to medium grained SANDSTONE. With medium to widely spaced thin beds of medium strong light grey fine to medium grained sandstone. Discontinuities: 1) closely to medium locally very	-	- - - -	
- - - - 9.00-10.50 -				<b>X</b>	<b>X</b>	X	X				closely spaced 0-10° planar smooth clean from 7.95m to 8.05m, and 8.68m to 8.80m, medium strong light grey fine grained sandstone with extremely closely spaced thin and thick laminations of dark grey siltstone from 8.40m to 8.45m, 1 No	-	- - - -(2.42)	
- - - - - 9.68-9.86 - -	206	С		100	92	59	30 90 120	100% return Water (Reddish Brown)			30° fracture planar rough clay smeared at 9.05m, 1 No 65° fracture planar rough clean at 9.10m, 1 No thick lamination of light grey fine grained sandstone from 9.48m to 9.67m, 2 No. 75-80° fractures undulating rough clean at 9.92m, 1 No thin	-	-	
-								100 (Redd			lamination of light grey fine grained sandstone.  Medium strong locally weak	-13.20	- - - 10.32	
10.50-12.00 - - -					<b>X</b>		NI 125 370				reddish brown fine to medium grained SANDSTONE with medium to widely spaced thick laminations to very thin beds of medium strong light grey fine to medium grained sandstone. Discontinuities 1) closely to medium locally very closely spaced planar smooth clean.	-	-	
- - 11.30-11.57 - -	207	С		100	96	64					recovered as non-intact core (angular medium to coarse gravel sized fragments) from 10.99m to 11.13m, with frequent irregular thin lenses of light grey fine grained sandstone.	-	(1.58)	
-							<b>X</b>				from 11.70m to 11.74m, very weak. 1 No 90° fracture planar rough clean.  Description on next sheet	- -14.78	11.90	

E	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	ilerai	Remarks		
		Берит	Берит	(11111)	Борит							
						A	ll dimen	sions in metre	es.	Scale:	1:22	
Method Used:		sampling ry Cored	+ Plan Use		cchio GEC	205	Drilled By:	Joseph Taylor	Logged By:	AJones + MGalan	Checked By:	AGS AGS

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### **BOREHOLE LOG**

Opposition											BOREH	OL	EL	OG
Contract:							Cli	ent:				Boreho	ole:	
		Pro	ject Blue							В	Buro Happold		В	H107
Contract Re	f:		Start	22.0	1.18	Gro	und L	evel (r	m):		National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393	End:	23.0	1.18			-2.88	3		E:333381.5 N:392452.6		4	of <b>11</b>
D "		Samples	& Testing		Mecha	anica	Log	SC :	SIIIS	e		ced	Depth	Material
Depth (m)	No	Туре	Results	TCR (%)	SCR (%)	(%)	lf (mm)	Flush Returns	& Details Backfill	Water	Description of Strata	Reduced Level	(Thick ness)	Graphic Legend
12.00-13.50		С		100	97	64	NI 80 330				irregular thin lenses of light grey fine grained sandstone.  Medium strong locally weak reddish brown fine to medium grained SANDSTONE. With widely spaced thin to medium beds of medium strong light grey and yellowish grey fine to medium grained sandstone.  Discontinuities 1) closely to medium spaced locally very closely spaced 0-15° planar smooth locally rough clean.	-	-	
13.50-15.00		С		<u> </u>	<b>X</b>	*	¥				from 12.00m to 12.08m, 1 No. 85° fracture planar rough clean from 12.98m to 13.03m, very weak and recovered as non-intact core (angular to subangular medium to coarse gravel sized fragments).	-	- - - -	
- - - - -				100	98	73		0% return Water	(NA)		from 14.10m to 14.25m, 1 No. 58-60° fracture undulating rough clean.	-	(4.60)	
- - - - 15.00-16.50				<u> </u>	<b>X</b>	*	30 130 250				from 14.60m to 14.62m, 1 No thick lamination of light grey fine grained sandstone at 14.75m, 1 No. 35° fracture planar rough clean from 14.98m to 15.04m, 1 No thick lamination of light grey	-	-	
				100	100	73					siltstone from 15.22m to 15.27m, 1 No. 40° fracture undulating rough clean at 15.54m, 1 No thin lamination of light grey fine grained sandstone.	-	- - - -	
											Description on next sheet			

	Boring Pro	gress and	Water Ob	servations	3			Co	norol	Remarks	
Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	Herai	Remarks	
		Depth	Depth	(mm)	Depth						
						A	II dimens	sions in metre	s	Scale:	1:22
Method Used:		sampling ry Cored	+ Plan Used		cchio GEC	205	Drilled By:	Joseph Taylor	Logged By:	AJones + MGalan	Checked AG

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## **BOREHOLE LOG**

•															
Contract:								Cli	ent:				Boreho	le:	
		Pro	ject E	Blue							В	uro Happold		В	H107
Contract Re	f:				22.0	1.18	Grou	ınd Le	evel (m	):	1	National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393		End:	23.0	1.18		-	2.88			E:333381.5 N:392452.6		5	of <b>11</b>
Depth (m)	No	Sample: Type		ting sults		Mecha SCR	anical RQD	Log If	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
15.95-16.19	210	C			100		73	30 130 250				from 15.91m to 15.96m, 1 No very thin bed of medium strong light grey medium grained sandstone from 15.96m to 16.02m, 1 No very thin bed of medium strong light grey fine grained sandstone with extremely closely spaced thin laminations of dark grey and black siltstone from 16.23m to 16.33m, 1 No. 60-70° fracture undulating rough clean.  Borehole terminated at 16.50m depth.	-19.38	-	

	E	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Remarks		
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	IICIAI	Nemarks		
2													
							Д	ll dimen	sions in metre	es	Scale:	1:22	
	Method Used:		sampling ry Cored	+ Plan Used		cchio GEC	205	Drilled By:	Joseph Taylor	Logged By:	AJones + MGalan	Checked As	AGS

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Contract:				Client:			Borehole	e:	
Project E	Blue				E	Buro Happold		E	3H107
Contract Ref:	Start:	22.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:		
764393	End:	23.01.18		-2.88		E:333381.5 N:392452.6		6	of <b>11</b>

### BH107- Box 1





BH107- Box 2

Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

Logged Joseph Taylor

AJones + MGalan

Checked



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Contract:			Client:		Borehole:	
Project E	3lue			Buro Happold		BH107
Contract Ref:	Start:	22.01.18	Ground Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	23.01.18	-2.88	E:333381.5 N:392452.	6	<b>7</b> of <b>11</b>

### BH107- Box 3





BH107- Box 4

Method Dynamic sampling + Used:

Plant Used:

Drilled

Joseph Taylor

Logged AJones + MGalan

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract:			Client:		Borehole:	
Project E	Blue			Buro Happold		BH107
Contract Ref:	Start:	22.01.18	Ground Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	23.01.18	-2.88	E:333381.5 N:392452.6	,	<b>8</b> of <b>11</b>

#### BH107- Box 5





BH107- Box 6

Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

Logged

AJones + MGalan

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract:			Client:		Borehole:	
Project E	3lue			Buro Happold		BH107
Contract Ref:	Start:	22.01.18	Ground Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	23.01.18	-2.88	E:333381.5 N:392452.6	!	9 of 11

### BH107- Box 7





BH107- Box 8

Plant Used:

Drilled Joseph Taylor Logged AJones + MGalan

Checked



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Contract:			Client:			Borehol	e:
Project E	Blue			E	Buro Happold		BH107
Contract Ref:	Start:	22.01.18	Ground Level (m	n):	National Grid Co-ordinate:	Sheet:	
764393	End:	23.01.18	-2.88		E:333381.5 N:392452.6		<b>10</b> of <b>11</b>

#### BH107- Box 9





BH107- Box 10

**Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

Logged

MGalan

Checked



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Contract:				Client:			Borehol	e:
Project E	Blue				E	Buro Happold		BH107
Contract Ref:	Start:	22.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	23.01.18		-2.88		E:333381.5 N:392452.6		<b>11</b> of <b>11</b>

### BH107- Box 11



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Method Used:

**Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

Joseph Taylor

By:

Logged AJones + **MGalan** 

Checked





GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 PrIVersion: v8 06 - Core+Full Castleford SI - 1008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE. GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk, | 31/05/18 - 16:43 | AJ4 |

Used:

## STRUCTURAL SOILS

### **BOREHOLE LOG**

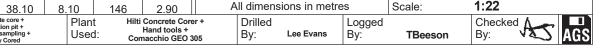
100												DUKEN			
Contract:								Cli	ent:				Boreho		
		Pro	ject B	lue								uro Happold		B	H108
Contract Re	f:			Start:	04.12.	17	Gro	und L	evel (m	1):		National Grid Co-ordinate:	Sheet:		
7	7643	393		End:	21.12.	17			6.81			E:333401.2 N:392408.7		1	of <b>21</b>
Depth (m)	No	Sample:	s & Testi Resi		TCRS	cha CR	anical RQD	Log	Flush Returns & Details	ackfill & nstru- entation	Water	Description of Strata	Reduced Level	Depth (Thick	Materia Graphic Legend
(111)	INO	Type	Nesi	uits	(%) (	%)	(%)	(mm)	) <u>द</u> दू <u>व</u>	17 E		MADE GROUND: ASPHALT.	6.76	ness)	XXXX
												MADE GROUND: CONCRETE. Clast to matrix ratio: 75:25. 10% voids. Clasts are generally	6.46	(0.30)	
												subangular to subrounded fine to coarse gravel sized.  MADE GROUND: Brick (Possible substructure).	-	-(0.35)	
													6.11	0.70	
0.70-1.20 0.70 0.70	101	B ES PID	x6 0.2p	pm								MADE GROUND: Dark brown gravelly slightly clayey medium to coarse SAND with low cobble content. Gravel is subangular fine to coarse of brick, sandstone and	- - -	(0.50)	
1.00		PID	0.1p									concrete.	5.61	1.20	
1.20-1.65 1.20-1.65	2 3	SPT D	N=	÷5		A		-				MADE GROUND: Dark brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine. Gravel is subangular	-	-	
1.50 1.50-2.00 1.50	103 4	ES B PID	x6 0.3p		Wind 115r (100	nm d	dia				<u>1</u>	fine to medium of concrete, sandstone and brick. Cobbles are subangular of sandstone.	- - -	(0.70)	
											1	MADE ODOUND D. I. I	4.91	1.90	
2.00-2.45 2.00 2.00-2.45 2.00 2.10-2.60	5 104 6 7	SPT ES D PID B	N= x6 0.4p	5		*		_			<u>‡</u>	MADE GROUND: Dark brown gravelly clayey fine to medium SAND. Gravel is subangular medium to coarse of brick, concrete and sandstone.	- - -	- - -	
					Wind 115r (80		dia						-	(1.20)	
2.70	8	D											-	_	
3.00-3.45 3.00-3.45 3.00 3.00	9 10 105	SPT D ES PID	N= <sup>-</sup> x6 0.5p	3		*		-				MADE GROUND: Dark brown gravelly fine to medium SAND. Gravel is subangular medium to coarse of sandstone and brick.	3.71	3.10	
					Wind 115r (70		dia					Course of Sandstone and Brick.	- - - -	(1.10)	

E	Boring Pro	gress and	Water Ob	servations	3	
Date	Time	Borehole	Casing	Borehole Diameter	Water	1
Date	Time	Depth	Depth	(mm)	Depth	╽
04/12/17	16:00	0.70	None	300	Dry	]]
18/12/17	08:00	0.70	None	300	Dry	
18/12/17	16:00	4.00	4.00	150	1.80	
19/12/17	08:00	4.00	4.00	150	1.80	
19/12/17	16:00	18.60	8.10	146	2.70	
20/12/17	08:00	18.60	8.10	146	2.10	
20/12/17	16:00	38.10	8.10	146	4.80	ŀ
21/12/17	08:00	38.10	8.10	146	2.90	Ш
Method		rete core +	Plan	t Hilti	Concrete Con	er

### **General Remarks**

- 1. CAT scan undertaken at exploratory hole location.
- 2. Concrete core from GL to 0.70m.
- 3. Inspection pit hand excavated to 1.20m.
- 4. On completion, 19mm diameter piezometer installed with tip at 14.00m and response zone from 12.00m to 15.00m. 5. SPT hammer JT.01 2017 ( $E_r = 72.00\%$ ) used.

1:22 All dimensions in metres





### **BOREHOLE LOG**

Contract:						Cli	ent:			Boreho	ole:	
		Pro	ject Blue					В	Buro Happold		В	H108
Contract Re	ef:		Start:	04.12.1	<b>7</b> Gro	und L	evel (m):		National Grid Co-ordinate:	Sheet:		
	764	393	End:	21.12.1	7		6.81		E:333401.2 N:392408.7		2	of <b>21</b>
Б ::		Sample	s & Testing		hanica		Scalls alls	e.		ced	Depth	Materia
Depth (m)	No	Туре	Results	TCR SC (%) (%	R RQE (%)		Flush Returns & Details Backfill & Instru-	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
4.00-4.45	11	SPT	N=19	(/0) (/	7   (70)	()				1 1	, , ,	
4.00 4.00-4.45	106 12	ES D	x6							2.61	4.20	
4.00 4.20	13	PID D	0.9ppm						Dark brown very sandy very silty subangular medium to coarse		-	
4.30-4.70	14	В		Windo	w run				GRAVEL of sandstone and siltstone. Sand is fine to coarse		(0.57)	
				115mr (75%					Some fine to medium gravel sized		(0.07)	
				(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,				shell fragments. Occasional thir lenses of soft brown silt. (Possible	: [		
									Made Ground).  Soft greenish dark grey slightly	2.04	4.77	×0, · ×
									sandy slightly gravelly SILT. Sand	l  -	-	× .× ·× .
5.00	107	ES	x6	<b>X</b>		1			is fine. Gravel is subangular to subrounded fine to medium or	f [	-	×°××
5.00		PID	0.6ppm						sandstone and siltstone. Some fine to medium gravel sized shel		-	× 0 ×
									fragments.			×°^ ×
5.30	15	D		\\\\\\\						-	-	× · × · · · · · · · · · · · · · · · · ·
				Windo 98mm	n dia					-	-	××××
				(100%	rec)					-	(1.83)	x <sub>0</sub> , × ;
											_` ′	× × × ×
											_	× · · · · ·
6.00	108	ES	x6			-				-	_	× · × ,
6.00-6.45	16	UT <sub>(UT100</sub>	47 blows							-	-	×
6.00		PID	100% recovery 1.3ppm								-	×°.` × ;
												x
6.45	17	D								-	-	× .×
6.60-8.10						<b>A</b>	A		Very weak very thinly bedded	0.21	6.60	× .× .
6.60-7.01	18	SPT 4	4,10/17,29,33,2 <sup>-</sup> for 30mm	1					reddish brown medium grained SANDSTONE. Discontinuities: 1	-	-	
6.60-7.01	19	D	IOI SUIIIII						very closely spaced 5-15° plana	-		
-									rough clean, locally infilled with soft reddish brown clay (<10mm).		_	
							E É		from 6.60m to 6.69m, 1 No thin bed of very weak greenish	· [	-	
						   NI	90-100% return Air+Mist (Reddish Brown)		grey siltstone.	-	(1.35)	
				100 7	59	40 140	00% Air+N dish		extremely weak and recovered as	; [		
							90-1 (Red		non-intact core (reddish brown gravelly fine to coarse sand).			
7 50 7 72	204	С							from 7.49m to 7.75m, 1 No medium bed of weak greenish		-	
7.59-7.73	201								grey fine grained sandstone		-	
									Discontinuities: 1) closely spaced 0-5° planar rough infilled with sof		-	
			1						light grey clay (<5mm).	-1.14	7 05	[::::::::::::::::::::::::::::::::::::::

	Е	Boring Pro	gress and	Water Ob	servations	6			Co	noral	Remarks			
Da	ate	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	IICIAI	Nemarks			
				•										
							,	All dimens	ions in metre	es	Scale:	1:22		
Metl Use		Inspe Dynami	rete core + ection pit + ic sampling + ary Cored	Plan Used	<b>1</b> .	Concrete Core Hand tools + nacchio GEO 3		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked A	D	AGS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
Structural Solis Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solis.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:43 | AJ4 |



Contract								01	iont						OG
Contract:		Droi	oot Plus					Cii	ient:		D	ura Hannald	Boreho		LIANO
Contract Re	f.	Proje	ect Blue	t: <b>04</b>	40	47	Cro	und I	0)/0	l (m):		uro Happold National Grid Co-ordinate:	Sheet:		H108
		000		_			Gio				-   '	E:333401.2 N:392408.7	Sileet.	2	. 04
	643			: 21			<u> </u>		6.8		$\perp$	E:333401.2 N:392408.7	   0	3	of <b>21</b>
Depth (m)	No	Type	& Testing  Results		R	SCR	RQD	lf (mm	-lush	Returns & Details Backfill & Instrumentation	Water	Description of Strata	Reduced	Depth (Thick ness)	Materia Graphic Legend
9.34-9.48 9.60-11.10	202	C C	Results	10	000	71 89	(%) 59 46 46	NI 40 140		Reddish Brown)  (Reddish Brown)	<b>A</b>	Weak, locally moderately strong, thinly bedded reddish brown medium grained SANDSTONE. With closely spaced very thin to thin beds of medium strong light grey fine and medium grained sandstone. Discontinuities: 1) very closely to closely spaced 5-10° planar rough clean locally infilled with soft reddish brown clay (<10mm).  from 8.44m to 8.46m and 8.85m to 8.87m, with bluish black staining.  Medium strong locally weak thinly bedded reddish brown locally stained orangish brown fine to medium grained SANDSTONE. With medium to widely spaced very thin to thin beds of medium strong light grey fine and medium grained sandstone. Discontinuities: 1) closely to medium spaced, locally very closely spaced, 5-20° planar rough clean locally infilled with soft reddish brown clay (<2mm)  from 9.55m to 9.60m, very weak and recovered as non-intact core (angular fine coarse gravel sized fragments).	-2.07	8.88	Legent
- 11.10-12.60 11.31-11.62		С		10		97	68	30 80 380				grained sandstone at 10.39m, dark bluish black staining from 10.41m to 11.20m, locally thinly interbedded with weak to medium strong reddish brown siltstone.		(4.82)	

_												
l De	E	Boring Pro	gress and	Water O	bservation	s			Co	norol	Domorko	
Tora	Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	nerai	Remarks	
astle	Date	Tillic	Depth	Depth	(mm)	Depth						
ػ ٔ												
2												
5												
<u>g</u>												
<u>.</u>												
S LIC												
000							А	ll dimens	ions in metre	es	Scale:	1:22
clura	Method		rete core +	Plar		Concrete Core		Drilled		Logged		Checked A
<u> </u>	l lood.		c compling +	11100	۸.	Παιία (00IS +		D. a	Lee Evene	D.	TD	Dvs. VA ACC

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Used:

Used: Comacchio GEO 305 By:

By:

**TBeeson** 

AST | VER By:





### **BOREHOLE LOG**

Contract:		Dro	ect B	duc					ent:		P	Buro Happold	Boreho		8H108
Contract Ref	f.	Proj	ect b	Start:	04.1	2 47	Gro	und L	evel (m	١٠		National Grid Co-ordinate:	Sheet:		ПІОС
		202					Gio		,	).	'		Oneet.		. 24
	<b>'64</b> 3			End:	21.1				6.81	I		E:333401.2 N:392408.7	170	4	of <b>21</b>
Depth (m)	No	Samples Type	& Test Res		TCR	Mecha SCR	RQD	l Log	Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced	Depth (Thick ness)	Mater Graph Leger
		31			100	97	68	(11111)	<u> </u>	ш		from 12.07m to 12.13m, 1 Novery thin bed of medium strong light grey fine grained sandstone with rare siltstone inclusions.		-	
12.60-14.10					*	*		30 80 380				at 12.97m, dark bluish black. from 12.98m to 13.05m, 1 No thin bed of weak light brownish		-	
13.49-13.70	206	С			100	100	62	<b>Y</b>	u. (F			grey fine grained sandstone.  Weak, locally moderately strong thinly bedded reddish browr	· <b> </b> -	13.70	
14.10-15.60					<b>X</b>	<b>X</b>	X	-	90-100% return — Air+Mist (Reddish Brown)			medium grained SANDSTONE Discontinuities: 1) closely, locally very closely, spaced 5-20° plana rough clean, locally infilled with soft reddish brown clay (<10mm) 2) closely spaced 85-90° undulating rough clean.	,  -  -	- - -	
14.55-14.66	207	С			100	67	25	NI 75 130				from 14.28m to 14.55m, 2 No 40 to 60° fractures undulating rough clean. Very weak and recovered as non-intact core (sandy angular fine to coarse gravel sized fragments) from 14.66m to 14.97m locally interbedded with medium strong light brown fine grained sandstone. 1 No 90° fracture	- - -	(2.21)	
15.60-17.10					<b>X</b>			-				undulating rough clean.  from 15.30m to 15.64m, 3 No closely spaced very thin beds o weak and medium strong light grey stained orange fine grained sandstone.		-	
					100	98	67	 	-			Description on next sheet	-9.10	15.91	

	E	Boring Pro	gress and	Water Ob	servations	6			Co	noral	Remarks			
	Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	liciai	Remarks			
L			Depth	Depth	(mm)	Depth								
														l
														l
							A	II dimens	ions in metre	s	Scale:	1:22		
- 1.3	Method Used:	Inspe Dynam	rete core + ection pit + ic sampling + ary Cored	Plan Used	١.	Concrete Core Hand tools + nacchio GEO		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked By:	2	AGS

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00													BUKERI	ULI		.UG
Contract:								Cli	ent:					Boreho	le:	
		Pro	ject E	Blue								В	uro Happold		Е	3H108
Contract Re	f:		-	Start:	04.1	2.17	Gro	und Le	evel	l (m)	:	1	National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393		End:	21.1	2.17			6.8	31			E:333401.2 N:392408.7		5	of <b>21</b>
		Sample	s & Test	ting	1	Mecha	anical	Log		s ii	× 1.6			b –	Depth	Material
Depth (m)	No	Туре	Res	sults	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Flush	& Deta	Backfill & Instru- mentation	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
- - - - 16.56-16.92	208	С			100	98	67						Moderately strong, locally weak, thinly bedded reddish brown SANDSTONE. With medium to widely spaced very thin to thin beds of medium strong light grey fine and medium grained sandstone. Discontinuities: 1) closely to medium spaced locally very closely spaced 5-15° planar rough clean locally clay smeared.		-	
17.10-18.60					*	*	*	-					from 17.50m to 17.73m,	-	- - - -	
-					100	87	67	NI 140 462	90-100% return	Reddish Brown)			extremely weak with disturbed bedding. With localised clay infilling of fractures (<5mm)	-	- - - -	
18.27-18.60	209	С												_	-	
18.60-20.10					*	X X	X	-						-	- - -	
- 19.08-19.36 - -	210	С			100	93	65							-	- - - -	
-													from 19.59m to 19.95m, 1 No medium bed of medium strong light grey and orangish brown fine grained sandstone.	-	- - -	

	E	Boring Pro	gress and	Water Ob	servations	5			Co	noral	Domorko	
SILCIOI G.	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks	
olis Ltd, branch Ollice - Cas			•	•		·						
Ď							A	II dimens	ions in metre	es .	Scale:	1:22
ollactais	Method Used:	Inspe Dynami	rete core + ection pit + c sampling + ary Cored	Plan Use	۸.	Concrete Core Hand tools + nacchio GEO 3		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked AG

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06. SIGN. Sign



### **BOREHOLE LOG**

Contract:								Cli	ient:	:				Boreho	ole:	
		Pro	ject E	Slue								B	uro Happold	20.0		H108
Contract Re	f:		,001 =		04.1	2.17	Grou	und L	eve	l (m	າ):		National Grid Co-ordinate:	Sheet:		
7	'6 <b>4</b> :	393		End:					6.8	•	,		E:333401.2 N:392408.7		6	of <b>21</b>
•		Sample	s & Tes		_	Mecha	anical	Loa			∞ . 5			<u> </u>		
Depth (m)	No			sults		SCR (%)	RQD (%)	If (mm	Flush	Returns & Detail	Backfill & Instru- mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	
20.10-21.60					100	93	65	-					from 19.95m to 20.08m, extremely weak and recovered as non-intact core (very sandy medium gravel sized fragments).	- - -	-	
- - 20.65-21.05 - - -	211	С			100	100	89							-	- - - -	
21.60-23.10					<b>X</b>	X	X	NI	return	ist			from 21.42m to 21.60m, 1 No 85-90° fracture undulating rough clean.	-	- - - - -	
22.10-22.50	212	С			100	98	97	140 462		——————————————————————————————————————			from 22.04m to 22.14m, 2 No very thin beds of light grey fine grained sandstone with thick laminations of reddish brown medium to coarse grained sandstone.	-	- - -	
-													from 22.50m to 23.10m, locally interbedded with medium strong reddish brown fine grained sandstone.	- - - -	-	
23.10-24.60					100	99	92						from 23.10m to 23.86m, locally interbedded with medium strong light grey fine grained sandstone.	-	- - -	
-													at 23.78m, bluish black staining.	-	- -	

9	E	Boring Pro	gress and	Water Ob	servations	6			Co	noral	Domorko	
llelora.	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks	
olis Ltd, Branch Office - Cas			Берит	Берит	(11111)	Берш						
ž							A	II dimens	ions in metre	es .	Scale:	1:22
Siructure	Method Used:	Inspe Dynami	rete core + ection pit + c sampling + ary Cored	Plan Use	۸٠	Concrete Con Hand tools + nacchio GEO		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked AGS

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Contract:		Duai	aat Blue				Cli	ent:			D	ura Hannald	Boreho		LIANO
Contract Ref	:.	Proj	ect Blue Start:	04.4	2 47	Cro	und L	ovol	(m):			uro Happold National Grid Co-ordinate:	Sheet:	В	H108
		202				Giot					'		Sileet.	7	. 24
		393	End:	21.1		! 1		6.8		, <sub>C</sub>		E:333401.2 N:392408.7	   0		of <b>21</b>
Depth (m)	No	Type	& Testing Results	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Flush	& Details	Instru- mentation	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
- 24.06-24.40 - - -	213	С		100	99	92							-	-	
24.60-26.10 - - 24.86-25.15 - -	214	С			Å	Å						from 24.72m to 24.83m, very weak and recovered as non-intact core (sandy angular fine to medium gravel sized fragments).	-	-	
-				100	71	62	NI 140 462	90-100% return	ır+iviist Iish Brown)			from 25.32m to 25.72m, with very closely spaced very thin beds of weak to medium strong light grey fine grained sandstone.	-	-	
26.10-27.60 -					T T	Ĭ Î	402	90-10	(Redc				- - -	-	
26.43-26.88 - - - - - -	215	С		100	100	100							-	- - - - - <u>(</u> 22.19) - -	
27.60-29.10 27.73-28.09	216	С		93	66	61	-						-	-	

	Boring Pro	gress and	Water Ob	servations	5	General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks		
		·	'	,								
										T		
						A	II dimensi	ons in metre	S .	Scale:	1:22	
Method Used:	inspection pit +		hng+ Used: Hand tools+			Drilled By:	Lee Evans	Logged By:	TBeeson	Checked AGS		

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120													BOKEH			JUG	
Contract:								Cli	ent:					Boreho			
Project Blue									Buro Happold							H108	
Contract Ref: Start: <b>04.12.17</b> Ground							und L	ind Level (m): National Grid Co-ordinate:						Sheet:			
7	<b>764393</b> End			End:			6.81					E:333401.2 N:392408.7	. <b>7 8</b> of				
	Samples & Tes			ting	Mechani		anica	l Log	SI	Returns & Details Backfill & Instrumentation Water	ā		el e	Depth	Material		
Depth (m)	No	Type Res		sults	TCR SO (%) (%		(%)	lf (mm)	Flush Returr & Deta	& Deta Backfi Instr	mentatio	Val	Description of Strata	Reduced	(Thick ness)	Graphic Legend	
29.10-30.60					93	66	61	NI 140 462					from 28.17m to 28.56m, with very closely spaced very thin to thin beds of weak to medium strong light grey fine grained sandstone at 28.27m, slight yellowish staining from 28.56m to 28.81m, locally very weak to weak.	-	-		
- -29.95-30.44 - - -	217	С			100	100	93		90-100% return Air+Mist	(Reddish Brown				-	-		
30.60-32.10					*		*	50 200 550						-	-		
	1218	С			100	99	97							-	-		

	Į.	Boring Pro	gress and	Water Ob	servations	3	General Remarks						
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Gei	ilerai	Remarks		
			Берит	Берит	(11111)	Берш							
							A	II dimens	ons in metre	S	Scale:	1:22	
)	Method Concrete core + Inspection pit + Dynamic sampling + Rotary Cored			Plan Use	4٠	Concrete Core Hand tools + nacchio GEO 3		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked By:	AGS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
Structural Solis Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solis.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:44 | AJ4 |



0													DOMEIN			.00
Contract:								CI	ient:					Boreho	ole:	
		Pro	ject E	Blue								В	uro Happold		Е	BH108
Contract Re	f:			Start:	04.1	2.17	Gro	und L	.evel	(m):			National Grid Co-ordinate:	Sheet:		
7	764	393		End:	21.1	2.17			6.8	81			E:333401.2 N:392408.7		9	of <b>21</b>
		Sample	s & Test	ing	ı	Mecha	anical	Log		ກ <u>ເຂ</u>   ≪	٥ ٠ ة	<u></u>		bed	Depth	Material
Depth (m)	No	Туре	Res	ults			(%)	lf (mm	Flush	& Deta	Dackilli & Instru- mentation	Water	Description of Strata	Reduced	(Thick ness)	
32.10-33.60					100	99	97	-					from 32.10m with widely spaced very thin to thin beds of medium strong light grey fine grained sandstone.	- - -	-	
32.70-33.10	219	С			100	100	96							-	-	
-														- - - -	-	
33.60-35.10					*	X	X	50	90-100% return	h Brown)				-	-	
-					100	99	80	50 200 550	90-100	(Reddis				-	- - - - -	
35.10-36.60 35.30-35.60		С			100	100	73	-							-	
-														-	-	

	E	Boring Pro	gress and	Water Ob	servations	3			Cal	noral	Remarks		
[	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Gei	nerai	Remarks		
			Sopur	2 Sptii	()	Sopul							
							A	ll dimens	ions in metre	s	Scale:	1:22	
1	ethod sed:	Inspe Dynami	rete core + ection pit + c sampling + ary Cored	Plan Use	٩٠	Concrete Core Hand tools + nacchio GEO 3		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked A	AGS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
Structural Solis Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solis.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:44 | AJ4 |



Contract:								Cli	ent:						Boreho	ole:	
		Pro	ject E									uro Hap				В	H108
Contract Re	f:			Start:	04.1	2.17	Grou	ınd Le	evel (m	):	1	National Grid	l Co-ordina	te:	Sheet:		
7		393		End:	21.1				6.81			E:3334	01.2 N:3	92408.7		10	of <b>21</b>
Depth (m)	No	Sample: Type		ting sults	TCR	SCR	RQD	Log If	Flush Returns & Details	Sackfill & Instru- nentation	Water	Des	cription of	Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
36.88-37.21		С			100	100	97		90-100% return Air+Mist (Reddish Brown)			Borehole depth.	terminated	at 38.10m		38.10	

	E	Boring Pro	gress and	Water Ob	servations	3			Co	norol	Domorko		
	Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	пегаг	Remarks		
ŀ			Depth	Depth	(mm)	Depth							
							Α	II dimens	ions in metre	s	Scale:	1:22	
) I	Method Jsed:	Inspe Dynam	rete core + ection pit + ic sampling + ary Cored	Plan Use	4.	Concrete Core Hand tools + nacchio GEO		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked By:	AGS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
Structural Solis Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solis.co.uk, Email: ask@solis.co.uk. | 31/05/18 - 16:44 | AJ4 |



Contract:				Client:		Borehol	e:
Project E	Blue				Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81	E:333401.2 N:392408.7		<b>11</b> of <b>21</b>

### BH108 - Concrete Core





BH108 - Box 1

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged

**TBeeson** 

Checked



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Lee Evans

By:



Contract: Client: Borehole: **Project Blue Buro Happold BH108** Contract Ref: Start: **04.12.17** Ground Level (m): National Grid Co-ordinate: Sheet: 764393 End: 21.12.17 6.81 E:333401.2 N:392408.7 **12** of **21** 

### BH108 - Box 2





BH108 - Box 3

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305 Drilled

Logged Lee Evans

**TBeeson** 

Checked



GINT LIBRARY V8 06.GLB LibVersion: v8 06 018 PrIVersion: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:45 | AJ4 |



Contract:				Client:			Borehol	e:
Project E	Blue				E	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>13</b> of <b>21</b>

### BH108 - Box 4





BH108 - Box 5

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans

**TBeeson** 

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:46 | AJ4 |



Contract:				Client:			Borehol	e:
Project E	Blue				-	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>14</b> of <b>21</b>

### BH108 - Box 6





BH108 - Box 7

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans

**TBeeson** 

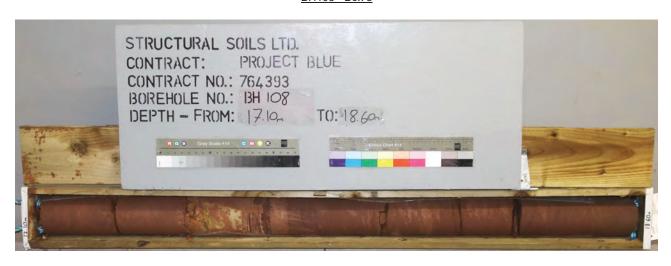
Checked





Contract:				Client:			Borehol	e:
Project E	Blue				ı	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>15</b> of <b>21</b>

### BH108 - Box 8





BH108 - Box 9

Method Used:

Used:

Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans

**TBeeson** 

Checked





Contract: Client: Borehole: **Project Blue Buro Happold BH108** Start: **04.12.17** Ground Level (m): National Grid Co-ordinate: Sheet: Contract Ref: 764393 End: 21.12.17 6.81 E:333401.2 N:392408.7 **16** of **21** 

### BH108 - Box 10





BH108 - Box 11

Method

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged

**TBeeson** 

Checked



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Used:

Lee Evans



Contract:				Client:			Borehol	e:
Project E	Blue				-	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>17</b> of <b>21</b>

### BH108 - Box 12





BH108 - Box 13

Method Used:

Concrete core + Inspection pit + lynamic sampling + Rotary Cored Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305 Drilled By: Lee Evans Logged By:

TBeeson

Checked A



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Contract:				Client:			Borehol	e:
Project E	Blue				ı	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>18</b> of <b>21</b>

### BH108 - Box 14





BH108 - Box 15

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans

**TBeeson** 

Checked

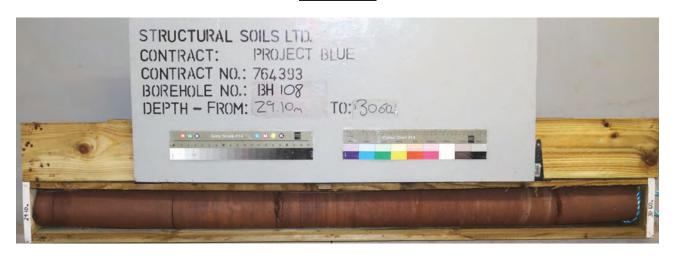


GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:48 | AJ4 |



Contract:				Client:			Borehol	e:
Project E	Blue				E	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>19</b> of <b>21</b>

### BH108 - Box 16





BH108 - Box 17

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans

**TBeeson** 

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:49 | AJ4 |



Contract:				Client:			Borehol	e:
Project E	Blue				-	Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81		E:333401.2 N:392408.7		<b>20</b> of <b>21</b>

#### BH108 - Box 18





BH108 - Box 19

Method Used:

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans By:

**TBeeson** 

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 16:49 | AJ4 |



Contract:				Client:		Borehol	e:
Project E	Blue				Buro Happold		BH108
Contract Ref:	Start:	04.12.17	Groun	d Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.81	E:333401.2 N:392408.7		<b>21</b> of <b>21</b>

#### BH108 - Box 20





BH108 - Box 21

Method

Plant Used: Hilti Concrete Corer + Hand tools + Comacchio GEO 305

Drilled

Logged Lee Evans By:

**TBeeson** 

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 31/05/18 - 15:57 | AJ4 |

# STRUCTURAL SOILS

### **BOREHOLE LOG**

12													DUKER			JU.
Contract:								Cli	ent:					Boreho	ole:	
		Pro	ject E	Blue								В	Buro Happold		BH	1 <mark>108</mark> 4
Contract Re	ef:			Start:	26.0	1.18	Gro	und L	evel	(m)	:	1	National Grid Co-ordinate:	Sheet:		
-	764	393		End:	26.0	1.18			6.8	0			E:333402.2 N:392408.9		1	of <b>4</b>
Depth		Sample			TCR	Mecha SCR	nical		h sur	etails	stru- stru- ntation	Water	Description of Strata	Reduced	Depth (Thick	Materi Graph
(m)	No	Туре	Res	sults	(%)	(%)	(%)	(mm)	Flus	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Bac   Ins   mer	>		Rec	ness)	Legen
										k			MADE GROUND: Dark gre ASPHALT. (Driller's Description)	<u> </u>	0.05	
													MADE GROUND: CONCRETE (Driller's description)	i.	(0.65)	
															(0.00)	
														6.10	0.70	
													MADE GROUND: COBBLES of	f		
													brick and sandstone. (Driller' description)	-	(0.40)	
														5.70	1.10	$\bowtie$
									<b>1</b>				MADE GROUND: Bands of CLA' fill and SAND (Driller' description)		-	
													, ,	-	-	
															-	
															-	
														-	-	
														-	-	
														-	-	
															-	
									% return r+Mist	rown)				-	-	
									100% r Air+N	(Red/Brown)				ļ.	-	
										Ē,				-	-	
														Ŀ	(3.70)	
														-	-	
															-	
														-	-	
														-	-	
														-	-	
														-	-	

1	Boring Pro	gress and	Water Ob	servations	3	
Date	Time	Borehole	Casing	Borehole Diameter	Water	
Bato	111110	Depth	Depth	(mm)	Depth	ıГ
26/01/18	16:00	15.00	7.20	100	-	

### **General Remarks**

- Hand dug inspection pit to 1.20m.
   Openhole borehole for installation of standpipe.
- 3. Drilled using air-mist flush.
- 35mm ID standpipe installed on completion, response zone 12.00m to 15.00m. Data logger (diver) installed at 14.50m.

1:22 All dimensions in metres Scale: Checked PMR Plant Drilled Method Inspection pit + Logged Used: Rotary open hole Used: Comacchio GEO 205 Lee Smith By: **AJones** 



•															
Contract:		_					Cli	ent:			_		Boreho		
		Pro	ject Blu									uro Happold		Bh	1108A
Contract Ref			Sta	art: <b>26.</b> 0			ınd Le			):	1	National Grid Co-ordinate:	Sheet:		
7	643	393	En	d: <b>26.</b> 0	01.18	-		6.8				E:333402.2 N:392408.9		2	of <b>4</b>
Depth (m)	No	Sample: Type	s & Testing Results	TCF (%)	Mecha R SCR (%)		Log If (mm)	-lush	& Details	Backfill & Instru-	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Materia Graphic Legend
7.50		EW						100% return				Soft dark grey SILT. (Driller's description)  Red brown SANDSTONE. (Driller's description).	2.00	4.80	
-		_ * *											-	- - -	

	Boring Pro	ogress and	Water Ob	servations				Co	norol	Damarka			
Dete	Time	Borehole	Casing	Borehole Diameter	Water	r		Ge	nerai	Remarks			
Date	Time	Depth	Depth	(mm)	Depth	ւ  ├							
										T			
							All dimensi	ons in metre	es	Scale:	1:22		
Method	Inspe	ction pit +	Plan				Drilled		Logged		Checked	bus e	
Used:	Rotary	open hole	Use	d: <b>Coma</b>	cchio G	EO 2	<b>205</b> By:	Lee Smith	By:	AJones	By:	PWIK	AGS

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Structural Solis Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solis.co.uk, Email: ask@solis.co.uk. | 31/05/18 - 15:57 | AJ4 |



Contract:					Cli	ent:					Boreho	ıle.	
Contract.		Pro	ject Blue			CIII.			В	Buro Happold	Dorono		108A
Contract Re	f:			26.01.18	Ground L	evel	(m	):		National Grid Co-ordinate:	Sheet:		
	<b>'64</b> 3	393	End:	26.01.18		6.8				E:333402.2 N:392408.9		3	of <b>4</b>
			s & Testing					∞ . 5			р		Material
Depth (m)	No		Results	TCR SCR (%) (%)		Flush	& Detai	Backfill Instru	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
-											-	-	
												-	
-											-	-	
-											-	-	
-											-	-	
-											-	-	
-												-	
												_	
-											-	-	
-											-	-	
-											-	-	
-											-	-	
-												-	
-											-	_	
-						100% return	MI)				-	-	
-						% re	1/Bro				-	_	
-						100	Red Red				-	_	
-											-	-	
												_	
												_	
-											-	-	
_											-	(0.40)	
-											-	(8.40)	
-												-	
												_	
-												_	
-											-	-	
-											-	-	
-											-	-	
-												-	
												_	
-											-	-	

	Boring Pro	gress and	Water Ob	servations	;			Co	noral	Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	liciai	Remarks		
						_ A	ll dimens	ions in metre	s	Scale:	1:22	
Method Used:		ction pit + open hole	Plan Used		cchio GEO	205	Drilled By:	Lee Smith	Logged By:	AJones	Checked PMR	AGS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
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Contract:								Clie	ent:									Boreho	le:	
		Pro	ject E	Blue								В	uro Hap	pold						108A
Contract Re	f:		-	Start:	26.01	.18	Groun	d Le	evel (	(m):			National Gri		dinate	e:		Sheet:		
7	<b>'64</b> 3	393		End:	26.01	.18			6.80	0			E:3334	02.2 1	N:39	240	8.9		4	of <b>4</b>
		Samples	s & Tes				anical L				, <sub>E</sub>							- ed	Depth	Material
Depth (m)	No	Туре		ults	TCR (%)	SCR (%)	RQD (%) (r	If nm)	Flush Returns	& Detai	mentation	Water	Des	scriptior	n of S	trata		Reduced Level	(Thick ness)	Graphic Legend
									100% return  Air+Mist				Borehole depth.	termina	ated	at 15	5.00m	-8.20		

	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Remarks	
Date	Time	Borehole Depth	Casing	Borehole Diameter	Water			Ge	nerai	Remarks	
		Берип	Depth	(mm)	Depth						
						A	II dimensi	ons in metre	s	Scale:	1:22
Method	Insped	tion pit +	Plan				Drilled		Logged		Checked (A)
Used:	Rotary	open hole	Used	d: Coma	cchio GEC	205	Ву:	Lee Smith	Ву:	AJones	By: PMK AGS

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Contract:								Cli	ent:				Boreho		
0 / 10	,	Pro	ject E					1				uro Happold	01 1		H109
Contract Re		200			20.12		Grou		evel (m	):		National Grid Co-ordinate:	Sheet:		40
	764			1	21.12				6.63	ı	$\perp$	E:333457.1 N:392569.5	   0		of <b>12</b>
Depth (m)	No	Sample: Type		ting sults	TCR	echa SCR (%)	nical RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
-												MADE GROUND: CONCRETE.	6.43	0.20	
0.50 0.50	1 101	B ES	×	16								MADE GROUND: Dark brown gravelly slightly clayey medium to coarse SAND. Gravel is angular to subangular fine to coarse of brick, sandstone, siltstone and concrete.	-	(0.50)	
0.50	2	PID B		opm								Rotary open hole drilling. MADE GROUND. Brick Wall. (Driller's description).	5.93	0.70	
													3.93	(2.00)	
2.70-3.15	3	SPT <sub>(NR)</sub>	N=	=25		1						MADE GROUND: Dark brown gravelly slightly clayey medium	-	2.70	
3.00 - 3.00 - -	102	ES PID		e6 opm	115	dow romm co	lia					SAND with low cobble content. Gravel is subangular medium to coarse of concrete, brick, sandstone, siltstone and metal fragments. Cobbles are angular to subangular of brick and sandstone.	-	(1.70)	
3.70-4.15 3.70-4.15	4 5	SPT D	N=	=22	115	dow room common	lia						_	-	

	Boring Pro	gress and	Water Ob	servations	6	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	
20/12/17 21/12/17 21/12/17	16:00 08:00 16:00	9.15 9.15 26.70	8.20 8.20 10.20	150 150 146	5.50 5.90 -	

### **General Remarks**

- 1. CAT scan undertaken at exploratory hole location.
- 2. Inspection pit hand excavated to 1.20m.
- 3. Core run undertaken from 7.20m to 8.20m due to SPT refusal and considered by Drilling Foreman as possibly approaching rockhead. Rock not encoutered during run and so dynamic sampling resumed.

  4. Core loss from 19.20m to 20.70m: Rock noted to be extremely weak below
- zone of loss. Loss possibly due to fragemnt of competant rock

Scale:

**TBeeson** 

All dimensions in metres 1:22

Inspection pit + Dynamic sampling + Rotary Cored Method Used:

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Plant Hand tools + Used: Comacchio GEO 205

Drilled

Lee Evans

Logged By:

Checked





### **BOREHOLE LOG**

Contract:					(	Client:				Boreho	ole:	
		Pro	ject Blue						uro Happold		Е	3H109
Contract Re	f:		Start:	20.12.17	Ground	Level (m	):	1	National Grid Co-ordinate:	Sheet:		
7	7643	393	End:	21.12.17		6.63			E:333457.1 N:392569.5		2	of 12
Donth		Sample	s & Testing	Mecha	nical Lo	g sig	ı Ç	e		ced	Depth	Materi
Depth (m)	No	Туре	Results	TCR SCR (%)	RQD   (%) (m	Elush Returns & Details	Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graph Legen
4.00 4.00	103	ES PID	x6 0.5ppm								-	
				Window ro 115mm d (45% rec	ia					2.23	4.40	
4.50	6	D		(4370100	,, 				MADE GROUND: Dark bluish grey slightly sandy slightly gravelly SILT. Sand is fine. Gravel is subrounded fine to coarse of sandstone and clinker.	-	(0.50)	
4.70-5.15 4.70-5.15	7 8	SPT D	N=31	1					sandstone and clinker.	1.73	4.90	
5.00 5.00	104	ES PID	x6 0.4ppm	Window r					MADE GROUND: Light yellowish brown gravelly slightly clayey fine to medium SAND. Gravel is subangular fine to coarse of	-	(0.30) 5.20	
5.25-5.70	9	В		115mm d (80% rec					\sandstone and brick.  MADE GROUND: Dark bluish grey slightly sandy slightly gravelly SILT. Sand is fine. Gravel is subangular fine to medium of sandstone siltstone and clinker. Moderate hydrocarbon odour.		(0.60)	
5.70-6.15	10	SPT <sub>(NR)</sub>	N=15						Soft to firm dark bluish grey slightly gravelly sandy SILT. Sand		5.80	*
6.00 6.00 6.10-6.70	105 11	ES PID B	x6 0.4ppm	Window re	ia				is fine. Gravel is subangular fine to coarse of sandstone.	-	(0.90)	× × × × × × × × × × × × × × × × × × ×
6.30	12	D		(100% re	C)					-	-	× · × · × · × · × · × · × · × · × · × ·
6.70-7.15	13	SPT	N=29	<b>X</b>	-				Dark grey medium SAND.	-0.07	6.70	× ^·×
6.70-7.15	13	D		Window r					0	-0.27	6.90	
7.00 7.00 7.10	106 15	ES PID D	x6 1.1ppm	98mm di (90% rec					Stiff to very stiff brown slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is subangular fine of sandstone. Occasional fine to medium gravel	-	_ - -	
7.20-8.20 7.20-7.60	16	SPT	2,2/9,13,20,8 for 25mm						sized shell fragments. Occasional lenses (<5mm) of fine sand.	-	-	-
7.20-7.60 7.20-8.20	17 18	D B		70	N	100% return Air+Mist (Brown)				_	-	

	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Domarka		
Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	nerai	Remarks		
Bato	11110	Depth	Depth	(mm)	Depth	disin	tegrating	the weak co	re materia	al.		
						5. SPT	hammer	JN.01 2017	$(E_{\rm r} = 75.0$	00%) used.		
						Α	II dimens	ions in metre	s	Scale:	1:22	
Method		ction pit +		Plant Hand tools +			Drilled		Logged		Checked A	- L
Used:		ry Cored	Used	d: Coma	cchio GEO	205	Ву:	Lee Evans	Ву:	TBeeson	By: Va	AGS

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### **BOREHOLE LOG**

00													BUKERI	ULI		.UG
Contract:								Cli	ent:					Boreho	le:	
		Pro	ject E	3lue								В	uro Happold		В	H109
Contract Re	f:			Start:	20.1	2.17	Grou	ınd Le	evel	(m)	:	1	National Grid Co-ordinate:	Sheet:		
7	<b>'64</b>	393		End:	21.1	2.17			6.6	3			E:333457.1 N:392569.5		3	of <b>12</b>
		Sample	s & Tes	ting	ı	Mecha	anical	Log	U	s <u>s</u>		<u> </u>		ed —	Depth	Material
Depth (m)	No			sults	TCR (%)	SCR (%)	RQD (%)	Log If (mm)	Flush	& Deta	Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
8.00 8.00	107	ES PID	0.3	k6 ppm	70 V			NA V		,				-	-	
8.20-8.65	19	UT <sub>(UT100</sub>	40 k 100% r	olows recovery	/									-	(3.30)	
- 8.65-8.70 8.70-9.15 8.70-9.15	20 21 22	D SPT D	N=	=28										-	- - -	
9.20-9.65	23	UT <sub>(UT100</sub>	60 k 100% r	olows recovery	/									-	-	
9.70-9.93	24	SPT		3/27,23										-	-	
9.70-9.93	25	D	for 2	20mm										-	-	
_														-3.57	10.20	
10.20-11.70													Very weak very thinly bedded dark reddish brown medium grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 10-20° planar and undulating rough stained dark brown.  from 10.20m to 10.70m,	-	(0.94)	
-					93	73	15		turn	rown)			recovered locally as non-intact core (angular medium to coarse gravel sized fragments).	-	-	
-								NI 65 140	100% re	eddish B			from 11.04m to 11.12m, 1 No 65° fracture undulating rough stained brown.	4.51 -	- 11.14 -	
11.33-11.44	201	С								(R			Weak locally very weak reddish brown medium grained SANDSTONE. Discontinuities: 1) very closely locally closely spaced 5-10° planar rough clean locally in the control of t	-	- - -	
11.70-13.20					100	95	60						infilled with soft reddish brown clay (<10mm) from 11.18m to 11.46m, with very closely spaced thin and thick laminations of light grey fine	-	(1.22) - -	

	E	Boring Pro	gress and	Water Ob	servations	6			Co	noral	Domorko		
5	Date	Time	Borehole		Borehole Diameter	Water			Ge	nerai	Remarks		
doug			Depth	Depth	(mm)	Depth							
)													
2													
2													
<u></u>													
ב ה													
2													
5							А	II dimens	ions in metre	es	Scale:	1:22	
Ollucture	Method Used:	Dynami	ction pit + c sampling + ry Cored	Plan Use		and tools -		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked By:	AGS

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Op												BOKEH	JLI		.UG
Contract:								Cli	ent:				Boreho	ole:	
		Pro	ject E	Blue							В	Buro Happold		Е	BH109
Contract Re	f:			Start:	20.1	2.17	Gro	und Le	evel (r	n):		National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> :	393		End:	21.1	2.17			6.63	3		E:333457.1 N:392569.5		4	of <b>12</b>
		Sample	s & Tes	ting	1	Mecha	anical	Log	s :	S =			ed le	Depth	Material
Depth (m)	No	Туре	Res	sults	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Flush Returns	& Details Backfill	Water	Description of Strata	Reduced Level	(Thick ness)	Graphic Legend
-								NI 65 140				grained sandstone from 11.46m to 11.72m, 1 No thin bed of weak to medium strong light grey fine grained sandstone.  Medium strong locally weak	-5.73	12.36	
. 12.54-12.76 - -	202	С			100	95	60					reddish brown medium grained SANDSTONE. Discontinuities: 1) closely to medium spaced locally very closely spaced 5-20° planar and undulating rough clean locally clay smeared.	-	-	
13.20-14.70					*	X	<b>X</b>	-					-	(1.76)	
-					100	97	73	NI 50	100% return Air+Mist	dish Brown)		from 13.76m - 13.83m, 1 No thin bed of medium strong light grey fine grained sandstone.	- - 7.49	- - - - 14.12	
14.12-14.32	203	С						210	10	(Kec		Medium strong reddish brown medium grained SANDSTONE. Discontinuities: 1) closely locally very closely and medium spaced 5-10° planar rough clean, locally infilled with soft reddish brown clay (<2mm).	-	-	
14.70-16.20					*	X	*	_					- - -	- - -	
15.17-15.43	204	С			100	91	80	NI 100				rom 15.16m to 15.43m, with very closely spaced very thin and thin beds of medium strong light grey fine grained sandstone from 15.43m to 15.47m, very weak and recovered locally as non-intact core (sandy angular fine to medium gravel sized fragments) from 15.47m to 15.55m, 1 No thin bed of medium strong light	-	-	
						Ш		100 260				thin bed of medium strong light brown fine grained sandstone.			

	Boring Pro	gress and	Water Ob	servations	5			Co	noral	Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks		
						P	II dimens	ons in metre	es	Scale:	1:22	
Method Used:	Dynami	ction pit + c sampling + ry Cored	Plan Use		and tools -		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked A	AGS

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Op													BOKEH	ULI		.UG
Contract:								Cli	ient:					Boreho	ole:	
		Pro	ject Blu	е								В	Buro Happold		В	BH109
Contract Ref	f:		Sta	rt: 20	.12.	17	Grou	und L	evel	(m)	):		National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393	En	d: <b>21</b>	.12.	17			6.6	3			E:333457.1 N:392569.5		5	of <b>12</b>
Depth (m)	No		s & Testing Results	TC	RS	cha CR	nical RQD		hsh	eturns Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
16.20-17.70		.,,,,		10		%) 	80	(mm <sub>,</sub>	) 正 0	2 &			from 16.20m to 16.45m, assumed zone of core loss from 16.50m to 16.80m, 1 No	- - - -	(5.08)	
17.02-17.16	205	С		8:	3 7	73	50	NI					medium bed of medium strong light brownish grey fine grained sandstone from 16.60m to 16.80m, 1 No 65° fracture planar rough clean.	-	- - - - - -	
17.70-19.20 - - -17.95-18.21		С			,	<b>X</b>	*	100 260	100% return	(Reddish Brown)				-	- - - -	
19.20-20.70				10	000 €	91	57	*					at 18.46m, 1 No 0° fracture undulating rough infilled with soft reddish brown gravelly clay (<50mm) from 18.46m to 18.55, 1 No 50° fracture planar rough clay smeared from 18.69m to 19.96m, locally thickly interlaminated with dark reddish brown siltstone from 18.95m to 18.96m and 19.08m to 19.13m, very weak and recovered as non-intact core (sandy angular fine to medium gravel sized fragments).	-12.57	19.20	
-				C		0	0	NR 					No recovery. Strata assumed to be weathered SANDSTONE.	- -	- - - (1.50)	

9	Е	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Domorko	
elol d	Date	Time	Borehole	- 5	Borehole Diameter	Water			Ge	пегаг	Remarks	
asi			Depth	Depth	(mm)	Depth						
ػ												
ם ב												
5												
5												
<u>a</u>												
ġ												
000							Α	II dimens	ions in metre	s	Scale:	1:22
offucture	Method Used:	Dynamic	ction pit + c sampling + ry Cored	Plan Use		and tools -		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked AG

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06. SIGN. Sign



Contract:							Cli	ient:				BOKEII	Boreho		
Contract:		Project	Rlue				CII	ent:			R	uro Happold	Boreno		H109
Contract Re	f:	TTOJCCE	Start:	20.1	2.17	Gro	und L	evel	(m):			National Grid Co-ordinate:	Sheet:		11103
7	<b>'64</b> 3	393	End:					6.6				E:333457.1 N:392569.5		6	of <b>12</b>
Depth (m)	No	Samples & To		ı		anical RQD (%)		_		Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	
-				0	0	0	NR						- - - - -14.07	20.70	
20.70-22.20 - - - 21.00-21.12 - -		С					NI NI 120					Extremely weak to very weak reddish brown medium grained SANDSTONE. Recovered predominantly as silty fine to medium sand.	-	(0.80)	
- - - - 21.83-21.98	208	С		100	78	30	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	100% return	h Brown)			Medium strong reddish brown medium grained SANDSTONE. Discontinuities are 1) closely spaced 5-15° planar rough clean locally infilled with soft reddish brown clay (10mm)	-14.87	21.50	
- 22.20-23.70 -				*	<b> </b>	<b>X</b>	_	100%	Reddis			from 22.00m to 22.39m, 1 No thin bed of medium strong light grey fine grained sandstone with very closely spaced thin laminations of dark grey siltstone.	-	-	
- - - 22.89-23.04 - -	209	С		93	93	47	30 95 160					from 22.68m to 22.70m, 1 No very thin bed of light brownish grey fine grained sandstone.	-	- - -	
- - - 23.70-25.20				100	95	44	-					from 23.79m to 23.88m, recovered as non-intact core (sandy angular fine to coarse	- - - - -	-	

	В	oring Pro	gress and	Water Ob	servations	5			Co	noral	Domorko		
Da	ite	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks		
			1	'	, ,	1							
												4.00	
							A	II dimens	ions in metre	S	Scale:	1:22	
Meth Used		Dynamic	ction pit + sampling + ry Cored	Plan Used		and tools +		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked By:	AGS

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Contract:							Cli	ent:				Boreho	le:	
		Pro	ject Blue							В	uro Happold		В	H109
Contract Ref	:		Start:	20.1	2.17	Grou	und Le	evel (m	):	1	National Grid Co-ordinate:	Sheet:		
7	643	393	End:	21.1	2.17			6.63			E:333457.1 N:392569.5		7	of <b>12</b>
		Sample	s & Testing	ı	Mecha	anical	Log	s s	=			ed -	Depth	Material
Depth (m)	No	Туре	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	(Thick ness)	l <b>-</b>
- - 24.26-24.36 - -	210	С		100	95	44	30 95 160				gravel sized fragments).  from 24.27m to 24.52m, 1 No thin bed of medium strong light grey fine grained sandstone.	-	(5.20)	
25.20-26.70 - 25.20-25.80 - 25.56-25.69	211			*	*	*	V A	100% return Air+Mist (Reddish Brown)			at 25.78m, 1 No thick lamination of light grey fine	-	- - - - - -	
-				100	99	97	170 610	V			grained sandstone.  at 26.34m, 1 No 0-10° fracture, undulating rough infilled with gravelly silty fine to medium sand (50mm). Localised weakening to very weak.	- - - - - -20.07	26.70	
											Borehole terminated at 26.70m depth.	-	- - - - - - -	

	Boring Pro	gress and	Water Ob	servations	3			Co	norol	Domorko		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks		
		Ворин	Борит	(11111)	Борит							
						P	All dimensi	ions in metre	s	Scale:	1:22	
Method Used:	Dynami	ction pit + c sampling + ary Cored	Plan Use		and tools -		Drilled By:	Lee Evans	Logged By:	TBeeson	Checked A	GS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
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Contract:				Client:			Borehole	э:		
Project E	Blue				E	Buro Happold			BH	109
Contract Ref:	Start:	20.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:			
764393	End:	21.12.17		6.63		E:333457.1 N:392569.5		8	of	12

### BH109 - Box 1





BH109 - Box 2

Method

Inspection pit + Dynamic sampling + Rotary Cored

Plant Used:

Comacchio GEO 205

Drilled

Logged **TBeeson**  Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract:				Client:			Borehole	e:		
Project E	Blue				E	Buro Happold		ı	BH1	09
Contract Ref:	Start:	20.12.17	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:			
764393	End:	21.12.17		6.63		E:333457.1 N:392569.5		9	of	12

#### BH109 - Box 3





BH109 - Box 4

Method Used:

Inspection pit + Dynamic sampling + Rotary Cored

Plant Used:

Hand tools + Comacchio GEO 205 Drilled

Lee Evans

Logged **TBeeson**  Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract:				Client:		Borehol	e:
Project E	Blue				Buro Happold		BH109
Contract Ref:	Start:	20.12.17	Groun	d Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.63	E:333457.1 N:392569.5		<b>10</b> of <b>12</b>

### BH109 - Box 5





BH109 - Box 6

Method

Inspection pit + Dynamic sampling + Rotary Cored

Plant Used:

Hand tools + Comacchio GEO 205 Drilled

Logged

Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
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Contract:				Client:		Borehol	le:
Project E	Blue				Buro Happold		BH109
Contract Ref:	Start:	20.12.17	Groun	d Level (m):	National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.63	E:333457.1 N:392569.5		<b>11</b> of <b>12</b>

### BH109 - Box 7





BH109 - Box 8

Method Used:

Inspection pit + Dynamic sampling + Rotary Cored

Plant Used:

Hand tools + Comacchio GEO 205 Drilled

Logged By:

Checked

GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 01/06/18 - 09:58 | AJ4 |



Contract:			CI	ient:			Borehol	e:
Project E	Blue				E	Buro Happold		BH109
Contract Ref:	Start:	20.12.17	Ground L	evel (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	21.12.17		6.63		E:333457.1 N:392569.5		<b>12</b> of <b>12</b>

### BH109 - Box 9





BH109 - Box 10

Method Used:

Inspection pit + Dynamic sampling + Rotary Cored

Plant Used:

Hand tools + Comacchio GEO 205 Drilled

Lee Evans By:

Logged **TBeeson**  Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 01/06/18 - 09:58 | AJ4 |



### DUDERUI E I UC

								011				BOKEH			
Contract:		Dua	is at D	lua				Cli	ent:		Б	)a Hannald	Boreho		11440
Contract Re	f.	Pro	ject B		4E 0	1 10	Grou	und L	evel (m)	١٠		Buro Happold  National Grid Co-ordinate:	Sheet:		H110
		202								).		E:333458.7 N:392487.8	Sileet.		. 11
	7643				16.0				-2.65		$\perp$	E:333436.7 N:392467.6	<u> </u>	1	of <b>11</b>
Depth (m)	No	Sample Type	s & Testi Resi			SCR	RQD	Log If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
0.00-1.00	1	P	60% red	covery	(70)	(70)	(70)		T. C. S			Very soft dark bluish grey slighty sandy clayey SILT. Sand is fine. Rare fine to medium gravel sized shell fragments.	-	(1.40)	* · · · · · · · · · · · · · · · · · · ·
- - 1.00-1.40 - -	2	Р	75% red	covery									-4.05	- - - - 1.40	* * * * * * * * * * * * * * * * * * *
1.40-2.40 1.40-1.71 1.40	3 4	SPT D	6,8/9,6 for 10						•			Medium strong dark grey to black fine to medium grained SANDSTONE. Recovered as non-intact core (angular to subangular medium to coarse	- - -	(0.41)	
- - 1.85-2.20 - - -	201	С			100	62	35	*				gravel sized fragments).  Weak to medium strong dark brown locally stained black fine to medium grained SANDSTONE.  Discontinuities: 1) very closely to closely spaced 0-10° planar rough locally clay smeared.	-4.46 - - -	_ 1.81 _ _ _	
2.40-3.70					X		<b>X</b>	NI 80 350	100% return Water (Reddish Brown)			from 2.44m to 2.50m, recovered as non-intact core (angular to subangular fine to coarse gravel sized fragments).	-	(1.39)	
- 2.85-3.04  - -	202	С			100	84	26					Weak to medium strong dark reddish brown fine to medium	-5.85	3.20	
- - - 3.70-5.10 -					93	89	48	NI 90 180				grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-15° planar and undulating rough clean from 3.37m to 3.45m, recovered as non-intact core (angular to subangular fine to coarse gravel sized fragments).	- - - -	(1.17)	

	Boring Pro	gress and	Water Ob	servations	3						
Date         Time         Borehole Depth         Casing Depth         Borehole Diameter (mm)         Water Depth           15/01/18         16:00         1.40         1.40         150         -8.00           16/01/18         08:00         1.40         1.40         150         -8.00											
15/01/18 16/01/18 16/01/18	16:00 08:00 16:00	1.40 1.40 16.50	1.40 1.40 2.40	150 150 146	-8.00 -8.00 -6.90						

### **General Remarks**

- 1. Deck to silt level 8.40m. Silt level used as reference for GL.
- 2. UXO clearance performed by magnetometer adjacent to position. 3. SPT hammer JT.01 2017 ( $E_{\rm r}=72.00\%$ ) used.

Method	Dynamic	sampling	+	Plan	t
Used:	Rota	y Cored		Used	d:

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Scale:

Checked

1:22





### **BOREHOLE LOG**

Opposition											BOREH	OLI	EL	.OG
Contract:							Cli	ent:				Boreho	ole:	
		Pro	ject Blue							E	Buro Happold		В	H110
Contract Re	f:		Star	t: <b>15.</b>	01.18	Gro	und L	evel (r	n):		National Grid Co-ordinate:	Sheet:		
7	<b>7643</b>	393	End	16.	01.18			-2.65	5		E:333458.7 N:392487.8		2	of <b>11</b>
	;	Sample	s & Testing		Mech	anica	l Log	S :	<u>≅</u> ≡	Ē		e e	Depth	Material
Depth (m)	No	Туре	Results	TCI (%	R SCF (%)	RQE (%)	lf (mm)	Flush Returns	Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
5.10-6.60 - 6.08-6.33	203	O		93	89	53	NI 90 180 120 130 240 V	100% return Water	(Redaish blown)		Medium strong locally weak light greyish grey SANDSTONE with occasional thin to thick laminations of light grey siltstone. Discontinuities: 1) closely spaced 0-10° planar smooth clean.  from 4.40m to 4.65m, with localised thin laminations of reddish brown fine grained sandstone and localised orange staining.  from 4.80m to 5.06m, 1 No medium bed of extremely weak reddish brown fine to medium grained sandstone. Assumed zone of core loss from 4.80m to 4.90m.  from 4.90m to 5.06m, recovered as non-intact core (gravelly fine to medium sand).  from 5.03m to 5.10m, with occasional irregular lenses of reddish brown sandstone.  from 5.10m, strata transition, with occasional very thin to thin beds of reddish brown fine to medium grained sandstone.  Medium strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) very closely to	-7.02	(0.97)	
6.60-8.00				100	76	48	NI 60 135				medium spaced 5-15° planar rough clean from 5.42m to 5.45m, 1 No very thin bed of weak light grey fine grained sandstone from 6.00m to 6.08m, 1 No. 90° fracture undulating rough clean from 6.70m to 6.80m, recovered as non-intact core (angular to subangular fine to coarse gravel sized fragments) from 7.14m to 7.33m, 1 No. 85° fracture planar rough clean.	-	(2.66)	
7.60-8.00	205	С					90 140 400					- - - -10.65	8.00	

	Boring Pro	gress and	Water Ob	servations	3			Co	norol	Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth			Ge	Herai	Remarks	
		Берит	Берит	(mm)	Берит						
						A	ll dimensi	ons in metre	s	Scale:	1:22
Method Used:	Dynamic Rota	sampling ry Cored	+ Plan Used		cchio GEC	205	Drilled By:	loseph Taylor	Logged By:	MGalan + TBeeson	Checked AGS

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### **BOREHOLE LOG**

Contract:								Cli	ent:				Boreho	ole:	
		Pro	ject B	lue							В	Buro Happold			H110
Contract Re	f:			Start:	15.0	1.18	Gro	und L	evel	(m):		National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393		End:	16.0	1.18			-2.6	5		E:333458.7 N:392487.8		3	of <b>11</b>
		Samples	s & Testi	ng	ı	Лесhа	anical	Log	(0	<u>s</u> =	T		р_ _	Depth	Materia
Depth (m)	No	Туре	Resi	ults	TCR (%)	SCR (%)	RQD (%)	Log If (mm)	Flush	& Details Backfill	Water	Description of Strata	Reduced	(Thick ness)	
8.00-9.50 8.27-8.46	206	С				•		50 95 200				Medium strong locally strong light grey fine locally medium grained SANDSTONE with localised thin laminations to very thin beds of reddish brown fine to medium grained sandstone. Discontinuities: 1) closely spaced 0-10° planar smooth locally rough clean.	11.37	(0.72)	
					100	77	51	<b>X</b>	-			Very weak to medium strong yellowish grey fine to coarse grained SANDSTONE with localised thin beds of medium strong reddish brown fine to medium grained sandstone from 8.87m to 8.91m, with extremely closely spaced thin and thick laminae of black fine grained	-	-(0.78)	
9.50-11.00					*	*	X	NI NI 80		(u		sandstone from 9.06m to 9.33m, extremely weak to weak and recovered as non-intact core (sandy angular to subangular fine to coarse gravel sized fragments).  Very weak to weak reddish brown	- -12.15 - -	9.50	
								<del> </del>	100% return Water	(Reddish Brown)		fine to medium grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-20° planar and undulating rough clean.	- - -	- - -	
10.44-10.75	207	С			100	76	22					recovered as non-intact core (very angular to angular fine to coarse gravel sized fragments) from 9.80m to 10.40m, 4 No. 40-60° fractures planar rough	-	- (1.89) -	
								   NI				clean from 10.27m to 10.36m, 1 No thin bed of medium strong light grey fine grained sandstone.	- -	- - -	
11.00-12.50						Å		200 700				from 11.07m to 11.20m, recovered as non-intact core (angular to subangular fine to coarse gravel sized fragments).	- - - -14.04	- 11 20	
11.88-12.16	208	С			100	77	61					Medium strong locally weak reddish brown fine to medium grained SANDSTONE with closely to medium spaced very thin to thin beds of of medium strong locally weak light yellowish grey fine to medium grained sandstone. Discontinuities: 1)	-	-	

2	Е	Boring Pro	gress and	Water Ob	servations	3			Co	noral	Remarks		
5	Date	Time	Borehole	- 5	Borehole Diameter	Water			Ge	lielai	Remarks		
Š			Depth	Depth	(mm)	Depth							
Ś													
3													
5													
5													
5													
į.													
r L													
							A	II dimen	sions in metre	:S	Scale:	1:22	
חכנמי	Method Used:	Dynamic Rota	sampling ry Cored	+ Plan Use		cchio GEC	205	Drilled By:	Joseph Taylor	Logged By:	MGalan + TBeeson	Checked By:	AGS

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### **BOREHOLE LOG**

Contract:							Cli	ent:				Boreho	ole:	
		<b>Project</b>	Blue							В	Buro Happold		В	H110
Contract Ref	f:		Start:	15.0°	1.18	Gro	und Le	evel (r	n):		National Grid Co-ordinate:	Sheet:		
7	643	93	End:	16.0°	1.18			-2.65	5		E:333458.7 N:392487.8		4	of <b>11</b>
	S	amples & Te	esting	N	/lecha	anical	Log	s i	2 ⊨			bed _	Depth	Materia
Depth (m)	No ·	Type R	esults	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Flush Returns	Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
				100	77	61					very closely to medium spaced 0-15° planar and undulating rough clean.	-	-	
12.50-14.00				*	*	<u> </u>	-				from 12.39m to 12.41m, irregular thick lamination of light yellowish grey fine grained sandstone.	-	(2.13)	
12.68-13.32	211	С					NI 200 700				from 12.50m to 12.60m, medium strong locally strong.	- - -	-	
				100	87	80					from 13.30m to 13.50m, 1 No. 65° fracture undulating rough clean	- - 16.17	- - - 13.52	
							 	L .	(MAIL)		from 13.32m to 13.52m, 1 No thin bed of light grey medium grained sandstone with localised thin laminations of dark grey siltstone.	-	-	
14.00-15.30				X	*	X	-	100% return  Water			Medium strong reddish brown fine locally medium grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-10° planar rough clean from 13.77m to 13.90m, 1	-	-(1.42)	
14.42-14.56	212	С		100	95	40	NI 100 140				No. 65° fracture undulating rough clean from 14.00m, fractures locally clay smeared from 14.24m to 14.27m, with thin and thick laminations of light	- - -	-	
											grey fine grained sandstone.  from 14.90m to 14.94m, 1 No. 65-70° fracture planar rough	- 17.59	- - 14.94 _	
15.30-16.50				<b>X</b>	<b>X</b>						clean.  Medium strong to strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) closely to medium spaced 0-10° planar rough clean.	- - -	-	
				100	98	98	20 210 520				from 15.55m to 15.85m, 1 No medium bed of weak to medium strong light grey fine grained sandstone.	- -	- -(1.56) -	
15.89-16.41	213	С									from 15.67m to 15.84m, 1 No. 70° fracture undulating rough	-	}	

	Boring Pro	gress and	Water Ob	servations	;		Co	noral	Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		Ge	rilerai	Remarks	
			-							
						A	All dimensions in metro	es	Scale:	1:22
Method Used:					205	Drilled By: Joseph Taylor	Logged By:	MGalan + TBeeson	Checked AGS	

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Contract:								Cli	ent:				Boreho	ole:			
Project Blue											BH110						
Contract Re	ef:			Start:	15.0°	1.18	Grou	ınd Le	evel (m	):	Sheet:						
	764	393		End:	16.01.18				-2.65			E:333458.7 N:392487.8	<b>5</b> of <b>11</b>				
Depth (m)	No	Sample: Type		sting esults	Mecha TCR SCR		nical RQD			Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend		
()	1.10	. , , , ,			(%)	(%)	(%)	(mm)	正氏名			clean.	<u> </u>	11033)			
					100	98 —	98	20 210 520	•			clean.  from 16.41m to 16.50m, light grey fine to medium grained sandstone with localised thin laminations of dark grey fine grained sandstone.  Borehole terminated at 16.50m depth.	-	- - -			
_													-  -	-			

	Boring Progress and Water Observations							General Remarks								
	Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	nerai	Remarks					
	Duto	11110	Depth	Depth	(mm)	Depth										
1																
Î																
								II dimon	sions in metre	NC	Scale:	1:22				
;									SIONS IN MENE	1	Scale.			_		
) I	Method Dynamic sampling + Used: Rotary Cored Plan					acchio GEC	205	Drilled By:	Joseph Taylor	Logged By:	MGalan + TBeeson	Checked A By:	2	AGS		

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Contract:				Client:			Borehole	e:	
Project E	Blue					ı	BH110		
Contract Ref:	Start:	15.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:		
764393	End:	16.01.18	-2.65		-2.65 E:333458.7 N:392487.8			6	of <b>11</b>

### BH110 - Box 1





BH110 - Box 2

Method Used:

Plant Used:

Comacchio GEO 205

Drilled

Logged Joseph Taylor

MGalan + **TBeeson**  Checked



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Contract:				Client:		Borehole	e:		
Project E	Blue						BH	110	
Contract Ref:	Start:	15.01.18	Grour	d Level (m):	National Grid Co-ordinate:	Sheet:			
764393	End:	16.01.18		-2.65	E:333458.7 N:392487.8		7	of	11

### BH110 - Box 3





BH110 - Box 4

Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled Joseph Taylor Logged MGalan + **TBeeson**  Checked



GINT\_LIBRARY V8 06.GLB LibVersion: v8 06 018 Pt/Version: v8 06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8 06.
Structural Soils Lid, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk. | 01/06/18 - 10:00 | AJ4 |



Contract:				Client:			Borehole	e:	
Project E	Blue				E	Buro Happold			BH110
Contract Ref:	Start:	15.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:		
764393	End:	16.01.18		-2.65		E:333458.7 N:392487.8		8	of <b>11</b>

#### BH110 - Box 5





BH110 - Box 6

Method Dynamic sampling +

Plant Used:

Comacchio GEO 205

Drilled

Logged Joseph Taylor

MGalan + **TBeeson**  Checked





Contract:				Client:			Borehole	e:		
Project E	Blue				E	Buro Happold		ı	BH11	10
Contract Ref:	Start:	15.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:			
764393	End:	16.01.18		-2.65		E:333458.7 N:392487.8		9	of <b>1</b>	1

#### BH110 - Box 7





BH110 - Box 8

Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled Joseph Taylor Logged

MGalan + **TBeeson** 

Checked





Contract:				Client:			Borehol	e:
Project E	Blue				ı	Buro Happold		BH110
Contract Ref:	Start:	15.01.18	Grour	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	16.01.18		-2.65		E:333458.7 N:392487.8		<b>10</b> of <b>11</b>

#### BH110 - Box 9





BH110 - Box 10

Plant Used:

Comacchio GEO 205

Drilled Joseph Taylor Logged MGalan + **TBeeson**  Checked





Contract:				Client:			Borehol	e:
Project E	Blue				E	Buro Happold		BH110
Contract Ref:	Start:	15.01.18	Groun	d Level (m):		National Grid Co-ordinate:	Sheet:	
764393	End:	16.01.18		-2.65		E:333458.7 N:392487.8		<b>11</b> of <b>11</b>

#### BH110 - Box 11



Method Dynamic sampling + Used: **Rotary Cored** 

Plant Used:

Comacchio GEO 205

Drilled

Logged Joseph Taylor By:

MGalan + **TBeeson**  Checked





### **BOREHOLE LOG**

Contract:								Cli	ent:				Boreho	ole:	
Joint dot.		Pro	ject E	Slue					O11t.		R	uro Happold	Borone		8H111
Contract Re	ef:	110	Ject L		11.1	2 17	Grou	ınd I	evel (m	).		National Grid Co-ordinate:	Sheet:		,,,,,,
	764:	303		End:	15.1		0.00		6.70	<i>)</i> ·	Ι.	E:333528.5 N:392567.7	Criodi		of <b>21</b>
	_		s & Tes		_		anical				$\perp$	L.333320.3 14.332307.7	l g		T
Depth (m)	No	Туре		sults		SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Materia Graphic Legenc
					, ,	, ,	, ,					MADE GROUND: CONCRETE.	[	- (0, 00)	
													-	(0.30)	$\bowtie$
												MADE GROUND: Dark grey	6.40	0.30	
0.50 0.50 0.50	1 101	B ES PID	1	:6 ppm							<u>1</u>	gravelly slightly clayey fine to medium SAND. Gravel is subangular fine to medium of brick, clinker and sandstone.	-	(0.70)	
											_		5.70	1.00	
1.00 1.00 1.00 1.20-1.65 1.20-1.65	102 2 3 4	ES B PID SPT D	0.4	x6 ppm =7		1		_			<b>⊉</b>	MADE GROUND: Dark grey gravelly clayey fine to medium SAND. Gravel is subrounded fine to medium of siltstone and sandstone. Occasional fine to medium gravel sized shell fragments.	-	(0.60)	
1.50	103	ES	x	6		ndow						magments.	5.10	1.60	
1.80 2.00-2.45 2.00 2.00-2.45	5 6 104 7	PID  D  SPT ES D	N:	=8 :6		5mm 00% re						MADE GROUND: Grey and brown slightly gravelly clayey fine SAND with low cobble content. Gravel is subangular fine to medium of sandstone. Cobbles are subangular of sandstone and brick. Some fine to coarse gravel sized shell fragments.	-	(0.70)	
2.00	-	PID	0.4	ppm									4.40	2.30	
2.20 2.30-2.75	8 9	D B			11	ndow 5mm 00% re	dia					MADE GROUND: Brownish grey sandy angular to subangular fine to medium GRAVEL of sandstone and brick. Sand is medium.	-	(0.50)	
												at 2.70m, firm clay band.	3.90	2.80	
												MADE GROUND: Dark grey very clayey fine SAND.	-	(0.30)	
3.00-3.45	10	SPT		=8		Å		1					3.60	3.10	
3.00 3.00-3.45 3.00 3.40	105	ES D PID		e6 ppm	11	ndow 5mm	dia					MADE GROUND: Orangish brown sandy slightly clayey subangular fine to coarse GRAVEL of sandstone, brick and siltstone. Sand is medium. Some fine to coarse gravel sized shell fragments.	3.10	(0.50)	
					(8	70 70 TE	;··)					MADE GROUND: Dark grey slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is	-	- 3.00	

	Boring Pro	gress and	Water Ob	servations	3						
Date	Time	Borehole	Casing	Borehole Diameter	Water						
Date	Tille	Depth	Depth	(mm)	Depth						
11/12/17	16:00	4.60	4.00	150	0.90						
12/12/17	08:00	4.60	4.00	150	0.90						
12/12/17	16:00	10.30	9.25	150	-						
13/12/17	08:00	10.30	9.25	150	-						
13/12/17	16:00	19.20	12.20	146	-						
14/12/17	08:00	19.20	12.20	146	3.60						
14/12/17	16:00	34.20	12.20	146	7.60						
15/12/17	08:00	34.20	12.20	146	7.80						
Mothod	Mothod Concrete core + Dlant Hilti Concrete Core										

#### **General Remarks**

subangular fine to medium of

- 1. CAT scan undertaken at exploratory hole location.
- 2. Concrete core from GL to 0.30m. Disintegrated.
- 3. Inspection pit hand excavated to 1.20m
- 4. Variable Head Test performed during borehole formation with test section between 4.12m and 4.60m.

**TBeeson** 

5. SPT hammer JN.01 2017 ( $E_r = 75.00\%$ ) used.

1:22 All dimensions in metres Scale:

Method Used:

Hilti Concrete Corer + Hand tools + Comacchio GEO 205 Plant Used:

Drilled Jonathan Newby

Logged By:

Checked







Cambra -t-							0"				BOKEH			
Contract:		Dec	ioot Dive				Cli	ent:		P	ura Hannald	Boreho		Пааа
Contract Re	f·	Pro	ject Blue Start:	11 1	2 47	Gro	ınd L	evel (m)	١٠		Suro Happold  National Grid Co-ordinate:	Sheet:		H111
		393				Giot		6.70	,.		E:333528.5 N:392567.7	Sileet.	2	21
	_		End:	15.1						-	E.333320.3 N.392307.7	   <del> </del>	I	of <b>21</b>
Depth (m)	No	· ·	s & Testing Results	TCR (%)	SCR (%)	RQD	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
4.00 4.00-4.45 4.00	106 13	ES UT <sub>(UT100)</sub> PID	x6 21 blows 100% recovery 0.6ppm									-	(1.00)	
4.60-5.05	14 15	SPT <sub>(NR)</sub>	N=10		<u> </u>		_				Medium dense reddish brown medium SAND.	2.10	4.60	
4.85-5.25 5.00 5.00	16 107	B ES PID	x6 0.2ppm	11	ndow 5mm	dia					Soft to firm dark grey slightly gravelly sandy clayey SILT. Sand is fine to coarse. Gravel is subangular fine to medium of siltstone, quartzite and sandstone.	- -	- (0.50) -	* · · · · · · · · · · · · · · · · · · ·
· · ·										2 V	Soft to firm dark grey very sandy SILT. Sand is fine.	1.40	(0.30)	× · × · × · × · × · × · × · × · × · × ·
5.55 5.60-6.05 5.60-6.05	17 18 19	D SPT D	N=13		*		_			À	Silty fine SAND.  Dark grey slightly gravelly fine to medium SAND. Gravel is	1.10	5.60	× × × × × × × × × × × × × × × × × × ×
5.80 - 6.00	108		x6		ndow						subangular fine of siltstone and sandstone. Some fine to coarse gravel sized shell fragments.	-	-	0 0
6.20-6.60	21	PID B	2.8ppm		1mm ( 00% re							-	(1.10)	0. 0
6.60-7.05	22	UT <sub>(UT100)</sub>	84 blows		<u> </u>		_					0.00	- - 6.70	.0. D
- -			100% recovery	y							Stiff reddish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded fine to medium of quartzite, siltstone and	- -	-	
7.05-7.20	23	D									sandstone.	-	-	- <u>- </u>
7.20-7.65 7.20 7.20-7.65 7.20 7.30-7.65	24 109 25 26	SPT ES D PID B	N=20 x6 5.3ppm	10	ndow 1mm	dia						-	-	
7.65-8.10	27	UT <sub>(UT100)</sub>	119 blows 100% recovery	y	<b>+</b>							-	-	

E	Boring Pro	ogress and	Water	Observation	S	O a manual D a manular	
Date	Time	Borehole Depth	Casing Depth	Diameter	Water Depth	General Remarks	
15/12/17	16:00	40.20	12.20		3.40		
						All dimensions in metres Scale: 1:22	
Method Used:	Insp	crete core + ection pit + ic sampling +		ant.	Concrete Core		GS



### **BOREHOLE LOG**

12-												DONLIN			
Contract:								Cli	ent:				Boreho	le:	
		Pro	ject E	Blue							В	uro Happold		В	H111
Contract Re	f:			Start:	11.12	2.17	Grou	ınd Le	evel (m	):	1	National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> :	393		End:	15.12	2.17			6.70			E:333528.5 N:392567.7		3	of <b>21</b>
Depth (m)	No		s & Test				anical RQD	Log If	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
8.10-8.25	28	D			(70)	(70)	(70)	()	∞				-	<del>'</del> - -	
- 8.25-8.70 8.25 8.25-8.70 - 8.25	29 110 30	SPT ES D PID	N= x 11.3										-	- - -	
8.60-9.25	31	В			88	ndow Bmm d 00% re	lia						-	- (4.00) - - -	
- 9.25-9.70 -	32	UT <sub>(UT100)</sub>	113 t 100% re		,	•							- - -	- - - -	
9.70-9.85	33	В											-	- -	
9.85-10.30 9.85-10.30 9.85-10.30	34 35 36	SPT D B	N=	28	88	ndow Bmm d	lia						-	-  -	
10.30-10.75	37	UT <sub>(UT100)</sub>	150 k 100% re		,	<u> </u>							-	- - -	
- - 10.75-10.90	38	В				1						Firm reddish brown slightly sandy CLAY. Sand is fine.	-4.00	10.70	
10.90-11.35 10.90-11.35		SPT D	N=	42	Wii	ndow	run						- 4.35	(0.35) - - - 11.05	
10.90 10.90-11.30	41 42	D B			10	1mm ( 00% re	dia					Dense dark brown slightly gravelly clayey fine to medium SAND. Gravel is subangular fine of	-	(0.30)	
-												siltstone. Stiff dark brown slightly sandy	-4.65	11.35	
11.40 11.50-11.95 11.50-11.95		D SPT D	N=	45		*					<b>⊉</b>	slightly gravelly CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine of	-4.90	(0.25)	
11.50-12.20		В			89	ndow 9mm d 5% re	lia					mudstone and siltstone.  Dense reddish brown slightly gravelly fine to medium SAND.  Gravel is subangular fine to medium of sandstone. (Possible	- -	- - _(0.60)	

	Boring	Progress and	l Water Ob	servations	3		Co	noral	Remarks		
Dat	te Tim	Borehole	Casing	Borehole Diameter	Water		Ge	nerai	Remarks		
Da		Depth	Depth	(mm)	Depth						
						Д	II dimensions in metre	s	Scale:	1:22	
Meth Used		Concrete core + Inspection pit + ynamic sampling + Rotary Cored	Plan Use	۸.	Concrete Core Hand tools + nacchio GEO 2		Drilled By: Jonathan Newby	Logged By:	TBeeson	Checked By:	AGS



100												BOKER	OL		.UG
Contract:								Cli	ient:				Boreho	le:	
		Pro	ject B	lue							В	uro Happold		В	H111
Contract Re	f:		-	Start:	11.1	2.17	Grou	und L	evel (m	1):	ı	National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> 3	393		End:	15.1	2.17			6.70			E:333528.5 N:392567.7		4	of <b>21</b>
Depth			s & Test		TCR	Mecha	anical RQD	Log	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced	Depth (Thick	Graphic
(m)	No	Туре	Res	uits	(%)	(%)	(%)	(mm	) <u>= 8 %</u>	<u> </u>	>		Re	ness)	Legend
					89	9mm c 35% re	lia					weathered sandstone) at 12.00m, with black staining.	-5.50	12.20	
12.20-13.20 12.20-12.54		SPT	7,18/30 for 5	),45,25 5mm								Extremely weak reddish brown medium grained SANDSTONE. Recovered as non-intact core	-	-	
12.20-12.54	48	D						NR				(very sandy clayey fine to coarse gravel sized fragments)		-	
-					30	0	0					assumed zone of core loss.	-	_(1.00)	
_								<b>X</b>			ı			-	
-								NI I					- 0.50	-	
13.20-14.20					X	X	X	×	1			Very weak locally weak reddish	-6.50	13.20	
-												brown medium grained SANDSTONE. Discontinuities: 1)	-	-	
-												very closely locally closely spaced 5-20° planar rough clay smeared	-	-	
-								   NI				locally infilled with soft reddish brown clay (<40mm). Recovered	-	-	
					90	30	11	25 110				locally as non-intact core (sandy clayey angular fine to coarse	-	-	
13.80-13.90	201	С										gravel sized fragments).	-	-	
_									90-100% return Air+Mist (Red)	5			_	_	
					V				100% retu Air+Mist (Red)						
14.20-15.20					<b>A</b>	1	<b>A</b>	1	90-1						
-													-	(2.40)	
-													-	-	
-													-	-	
-					70	55	15					at 14.70m, 1 No 0-10°	-	_	
- 14.76-14.86	202	С										discontinuity undulating rough infilled with reddish brown	-	-	
-												medium sand (15mm).		-	
								NI				from 14.90m to 15.20m, assumed zone of core loss.			
45.00 10.55					<u> </u>	<u> </u>	Į į	25 150					_	-	:::::::::
15.20-16.20					1	1	1					from 15.20m to 15.30m, recovered as non-intact core	-	-	
-												(angular fine to coarse gravel	-		
15.50-15.60	203	С										sized fragments) from 15.50m to 15.80m, 3 No	0.00	15.00	
- 13.33 13.00					100	80	20					↑ 0-10° fractures undulating rough	-8.90	15.60	
<u> </u>												infilled with reddish brown gravelly medium sand (<15mm).	-	-	
<u> </u>												Weak locally medium strong		-	
Γ	I	1	I		1		1		1 1			reddish brown medium grained	Г	Γ	1

	E	Boring Pro	gress and	Water Ob	servations	3		C	pporol	Remarks	
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth		<u> </u>	enerai	Remarks	
5			Бериі	Бериі	(mm)	Берит					
2										T	4.00
							A	Il dimensions in met	res	Scale:	1:22
5	Method Used:	Inspe Dynam	rete core + ection pit + c sampling + ary Cored	Plan Used	4.	Concrete Core Hand tools + nacchio GEO 2		Drilled By: Jonathan Newb	Logged By:	TBeeson	Checked AGS AGS



### **BOREHOLE LOG**

Depth TCRISCRROD If 등 등 병 호 Description of Strata 귀하 (Thick Graphi	Op												BUKER	ULI		.UG
Start   11.12.17   Ground Level (m):   National Grid Co-ordinate:   Sheet:   T64.393   End:   15.12.17   S.70	Contract:								Cli	ent:				Boreho	ole:	
Tool-17.15   205   C   Samples & Testing   Mechanical Log   Figure   Figure   Mechanical Log   Figure   Figure   Mechanical Log   Figure   Figure   Mechanical Log   Figure   Figure   Figure   Figure			Pro	ject B	Blue							E	Buro Happold		В	3H111
Depth   No   Type   Results   Tor   SCR   ROD	Contract Re	f:			Start:	11.1	2.17	Grou	und L	evel (	(m):		National Grid Co-ordinate:	Sheet:		
16.00-16.1d 204	7	<b>'64</b> 3	393		End:	15.1	2.17			6.70	0		E:333528.5 N:392567.7		5	of <b>21</b>
16.00-16.1d 204			· ·			TCR	SCR	anical RQD (%)	Log If (mm)	-lush Returns	k Details Backfill	Water	Description of Strata	Reduced	(Thick	
17.70-19.20  17.70-19.20  18.38-18.50 206 C  93 60 27  19.10-19.20 207 C  19.20-20.70  17.70-19.20  17.70-19.20  17.70-19.20  18.38-18.50 207 C  19.10-19.20 207 C  19.20-20.70  17.70-19.20  18.38-18.50 207 C  19.10-19.20 207 C  19.20-20.70  18.38-18.50 207 C	16.20-17.70					100	80	20	NI 25		30		very closely to closely spaced 5-15° planar rough clean locally clay smeared. 2) widely spaced 80-90° undulating rough clean from 16.20m to 16.30m, extremely weak and recovered as non-intact core (brown fine to medium sand with rare inclusions	-	(1.80)	
18.38-18.50 206 C  93 60 27  93 60 27  medium spaced 80-90° undulating rough clean from 17.60m to 17.70m, recovered as non-intact core (sandy angular fine to coarse gravel sized fragments) from 18.05m to 18.20m, recovered as non-intact core (reddish brown sand) from 18.90m to 19.10m, 1 No 60° fracture planar rough clean at 19.10m, with orangish brown staining.	-		С			_	*	<b>X</b>		90-100% return Air+Mist	(Red)		planar rough clean with penetrative light greenish grey reduction (<5mm) from 17.30m to 17.40m and at 18.00m, with orangish brown staining.  Medium strong locally weak reddish brown medium grained SANDSTONE. With medium spaced very thin to thin beds of medium strong light greenish grey fine grained sandstone. Discontinuities: 1) very closely to	-10.70	17.40	
19.10-19.20 207 C	- 18.38-18.50 - - -	206	С			93	60	27					clean locally infilled with reddish brown medium sand (<5mm). 2) medium spaced 80-90° undulating rough clean from 17.60m to 17.70m, recovered as non-intact core (sandy angular fine to coarse gravel sized fragments) from 18.05m to 18.20m, recovered as non-intact core	- - - - -	- - - - - - -	
	_	-	С			97	90	7					from 18.90m to 19.10m, 1 No 60° fracture planar rough clean at 19.10m, with orangish	-	-	

	Boring Pro	gress and	Water Ob	servations	3		Col	norol	Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		Gei	Herai	Remarks	
		Берш	Бериі	(11111)	Берит					
i										
									ı	
						A	Il dimensions in metre	es	Scale:	1:22
Method Used:	Insp Dynam	erete core + ection pit + ic sampling + ary Cored	Plan Used	۸.	Concrete Core Hand tools + nacchio GEO 2		Drilled By: Jonathan Newby	Logged By:	TBeeson	Checked AGS



### **BOREHOLE LOG**

100												BOKER	OLI		.UG
Contract:								Cli	ent:				Boreho	le:	
		Pro	ject E	Blue								uro Happold		В	BH111
Contract Re	f:			Start:	11.1	2.17	Gro	und Le	evel (r	m):	ı	National Grid Co-ordinate:	Sheet:		
7	<b>'64</b> :	393		End:	15.1	2.17			6.70	)		E:333528.5 N:392567.7		6	of <b>21</b>
Depth (m)	No		s & Test	ting sults		Mecha SCR (%)	anical RQD (%)	Log If (mm)	Flush Returns	& Details Backfill	Water	Description of Strata	Reduced	Depth (Thick ness)	Material Graphic Legend
-					97	90	7	NI 70 150		3		from 20.00m to 20.60m, 3 No 90° fracture undulating rough clean at 20.20m, locally coarse grained with orangish brown and yellowish brown staining.	-	-	
20.70-22.20					<b>X</b>	X	<b>X</b>	X	-			Medium strong locally weak reddish brown medium locally coarse grained SANDSTONE. With localised closely to medium spaced thin laminations to very thin beds of light grey fine grey	-14.00 - - -		
- 21.15-21.35 - -	208	С			80	67	21					sandstone. Discontinuities: 1) closely spaced 5-10° planar rough clean locally clay smeared or infilled with clay (<10mm). 2) medium spaced 80-90° undulating rough clean.	-	-	
21.61-21.72	209	С							90-100% return - Air+Mist	(Ked)			- - - -	- - -	
22.20-23.70					*	*		NI 90 190	-06				-	-	
- - - - -					100	90	32					from 23.20m to 23.25m, extremely weak and recovered as non-intact core (angular fine to	-	- - - -	
- 23.65-23.70 23.70-25.20 23.80-24.08					100	87	28	-				medium gravel sized fragments).	-	- - -	

	Boring Pro	gress and	Water Ob	servations	3			C a	noral	Domorko			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth			Ge	nerai	Remarks			
		,		,									
						Д	ll dimer	nsions in metre	es	Scale:	1:22		
Method Used:	Inspe Dynam	erete core + ection pit + ic sampling + ary Cored	Plan Used	4.	Concrete Core Hand tools + nacchio GEO 2		Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	2	AGS



### **BOREHOLE LOG**

110													BOKER	OLI		.UG
Contract:								Cli	ient:					Boreho	le:	
		Pro	ject B	lue								В	uro Happold		В	H111
Contract Re	f:			Start:	11.1	2.17	Grou	und L	evel	(m):		١	National Grid Co-ordinate:	Sheet:		
7	<b>764</b> 3	393		End:	15.1	2.17			6.7	0			E:333528.5 N:392567.7		7	of <b>21</b>
Danath		Sample	s & Testi	ng			anical	Log	J SC	ais		e		ced	Depth	Material
Depth (m)	No	Туре	Resu	ults	TCR (%)	SCR (%)	RQD (%)	Log If (mm)	Flush	& Det	Backfill	Water	Description of Strata	Reduced	(Thick ness)	Graphic Legend
24.28-24.40	212	С			100	87	28							-	- - - (7.50)	
-													from 24.62m to 24.65m, recovered as non-intact core (reddish brown medium sand).	- - -	- - -	
25.20-26.70					*	<b>X</b>	<b>X</b>	-						-	- - -	
25.90-26.08	213	С			100	77	33	NI 90 190	90-100% return - Air+Mist	(Red)				-	- - - -	
26.70-28.20					<b>V</b>	*	¥						from 26.64m to 26.70m, very weak and recovered as non-intact core (reddish brown medium sand).	-	- - - -	
-					97	80	31						discontinuity planar rough with penetrative light greenish grey reduction (<5mm).	-	- - - -	
-													from 27.64m to 27.85m, recovered as non-intact core (gravelly medium sand).	_ _ _ _	- - -	

	Boring Pro	ogress and	Water Ob	servations	3		Col	noral	Domorko	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		Gei	nerai	Remarks	
Method Used:	Insp Dynam	crete core + ection pit + ic sampling + ary Cored	Plan Use	4.	Concrete Core Hand tools + nacchio GEO 2	er +	Il dimensions in metre Drilled By: Jonathan Newby	Logged	Scale:	1:22 Checked AG



DOKEHOL		UG
Bore	ehole:	
old	В	H111
Co-ordinate: She	et:	
8.5 N:392567.7		of <b>21</b>
ription of Strata	Depth (Thick ness)	Material Graphic Legend
-	50 28.20	
trong reddish brown to coarse grained NE. With medium to aced very thin to ads of medium strong nated light yellowish grey fine to medium sandstone. The coalised yellowish dorangish brown on.  28.30m, with orangish ing.  8.80m to 29.70m, with yeaced of medium strong gish grey fine grained and light yellowish se grained sandstone.	50   28.20	
- - - - - - - - - - -	-	

. [	E	Boring Pro	gress and	Water Ol	servations	3			Co	noral	Domarka			
	Date	Time	Borehole	Casing	Borehole Diameter	Water			Ge	nerai	Remarks			
3			Depth	Depth	(mm)	Depth								
<u> </u>														
							А	ll dimen	sions in metre	s	Scale:	1:22		
	Method		rete core + ection pit +	Plar	t Hilti	Concrete Core	er +	Drilled		Logged		Checked	1	
:	Used:	Dynami	ic sampling +	Use		Hand tools + nacchio GEO 2	.05	Ву:	Jonathan Newby	By:	<b>TBeeson</b>	Ву:	NE)	AGS

GINT\_LIBRARY\_V8\_06.GLB LibVersion: v8\_06\_018 PrjVersion: v8\_06 - Core+Full Castleford SI - 008 | Log COMPOSITE LOG - A4P | 764393 - PROJECT BLUE.GPJ - v8\_06.
Structural Solis Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solis.co.uk, Email: ask@solis.co.uk. | 01/06/18 - 10:03 | AJ4 |

Used:

Used: Comacchio GEO 205

Jonathan Newby By: Ву:

Ву:

VX\_) AGS



## **BOREHOLE LOG**

<b>9</b>													BOKEH			
Contract:		Dua!	4 5	N				Cli	ent:			ъ.	Hammald	Boreho		11444
Camtrast Da	£.	Proj	ect E		44.4	0.47	0	ا امود		/\·			uro Happold National Grid Co-ordinate:	Chast	В	H111
Contract Re		200		Start:			Gro					l l		Sheet:	•	0.4
1	<b>764</b> 3			End:	15.1				6.7	_		$\perp$	E:333528.5 N:392567.7	<u> </u>	9	of <b>21</b>
Depth		Samples				Mech:	anical RQD		sh urns	etails	Backfill	Water	Description of Strata	Reduced	Depth (Thick	Material Graphic
(m)	No	Туре	Res	sults	(%)	(%)	(%)	(mm)	Red F	∞	ä	>		Re	ness)	Legend
														-	-	
													from 32.23 to 32.26m,	-	-	
					100	97	62						33.60m to 33.64m and 33.66m to		-	
					L	1							33.70m, light brown medium to coarse grained sandstone.			
															_	
						<u> </u>	<u> </u>							_	_	
32.70-34.20					1	1	1	   NI						_	-	
32.83-33.11	218	С						110						-	-	
								370	etur					_	-	
									%.F	Red				-	-	
									90-100% return - Air+Mist -	_				-	-	
									   					-	-	
					100	93	41							-	-	
					100									-	-	
								↓								
								1								
															_	
														-	-	
34.20-35.70					<u> </u>	<u> </u>	<u> </u>	-	<u> </u>	-			from 24 20m to 24 55m with	-	(12.00)	
					ΙĪ	ΙĪ	T						from 34.20m to 34.55m, with extremely closely spaced very	-	-	
34.33-34.62	219	С											thin to thin beds of weak to medium strong grey and yellowish	-	-	
													brown medium to coarse grained	-	-	
													sandstone.	-	-	
														-	-	
								NI   130							-	
					100	90	74	230	turn							
•					L	L			% re	(pe			from 35.04m to 35.08m,			
									90-100% return - Air+Mist -	<u>R</u>			extremely weak and recovered as		_	
									-06				non-intact core (angular fine to coarse gravel sized fragments).	_	-	
													,	-	-	
													from 35.45m to 35.53m and	-	-	
													35.81m to 35.84m, with extremely closely spaced thick laminations		-	
35.70-37.20					*	-	*						of grey and yellowish brown fine	-	-	
					100	90	75						grained sandstone.	-	-	
					100	90	15							-	}	::::::::

	Boring Pro	ogress and	Water Ob	servations	3		Col	oorol	Domorko	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		Gei	nerai	Remarks	
Method Used:	Insp Dynam	crete core + ection pit + ic sampling + ary Cored	Plan Used	4.	Concrete Core Hand tools + nacchio GEO 2	er +	all dimensions in metre Drilled By: Jonathan Newby	Logged	Scale:	1:22 Checked A AGS