STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH111**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**11.12.17** End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**10** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
36.10-36.39	220	C												
				100	90	75								
37.20-38.70											. . . from 37.20m to 37.40m, recovered as non-intact core (sandy angular medium gravel sized fragments).			
37.60-37.80	221	C												
37.80-38.93	222	C												
				93	86	64	NI 130 230	90-100% return Air+Mist (Red)			. . . at 38.00m, 1 No 90° fracture undulating rough clean. . . . from 38.20m to 38.30m, with extremely closely spaced thin laminations of light grey fine grained sandstone.			
38.70-40.20											. . . from 38.70m to 38.80m and 39.55m to 39.60m, recovered as non-intact core (angular fine to coarse gravel sized fragments).			
				83	71	29					. . . from 39.28m to 39.40m, 2 No very closely spaced very thin beds of weak to medium strong grey fine grained sandstone. . . . from 39.55m, greyish brown and fine grained			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Jonathan Newby	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH111**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**11.12.17** End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**11** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
				83	71	29	NI 130 230				. . . from 39.98m to 40.20m, assumed zone of core loss.	-33.50	40.20	
											Borehole complete at 40.20m depth.			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Jonathan Newby	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**12** of **21**

BH111 - Box 1

BH111 - Box 2

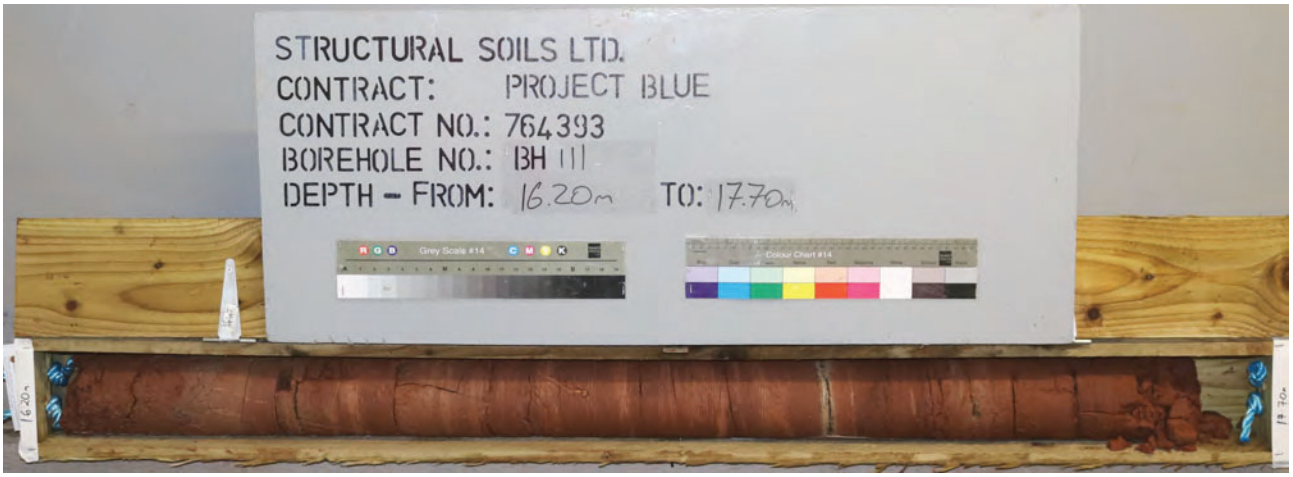
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**13** of **21**

BH111 - Box 3



BH111 - Box 4

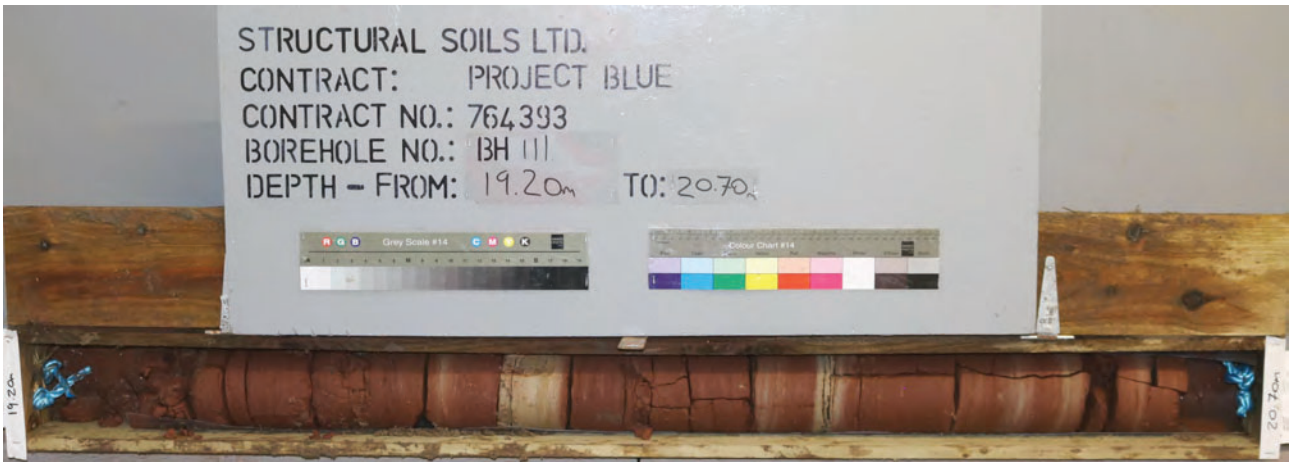
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**14** of **21**

BH111 - Box 5



BH111 - Box 6

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**15** of **21**

BH111 - Box 7

BH111 - Box 8

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**16** of **21**

BH111 - Box 9

BH111 - Box 10

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**17** of **21**

BH111 - Box 11

BH111 - Box 12

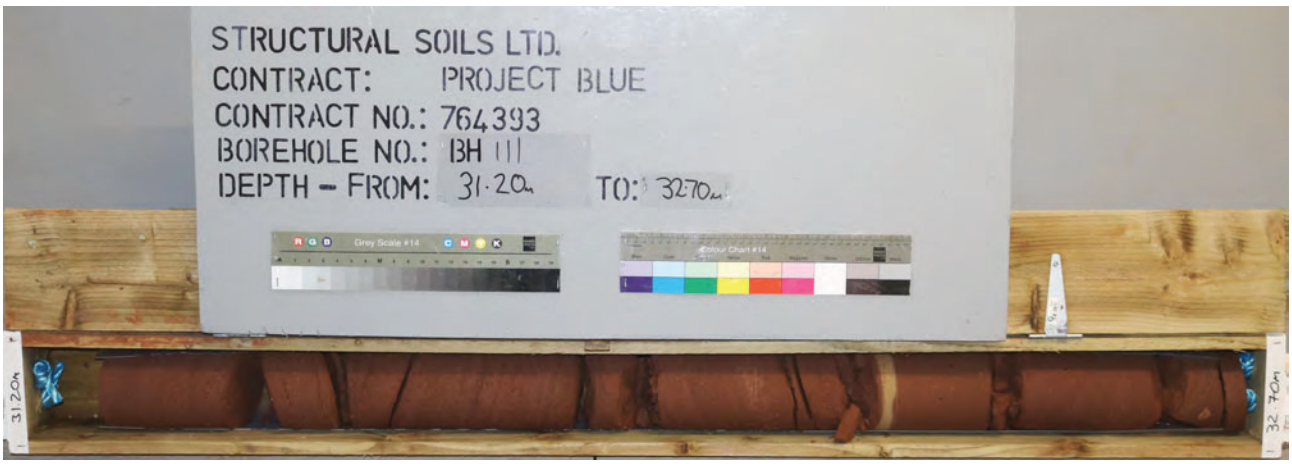
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**18** of **21**

BH111 - Box 13



BH111 - Box 14

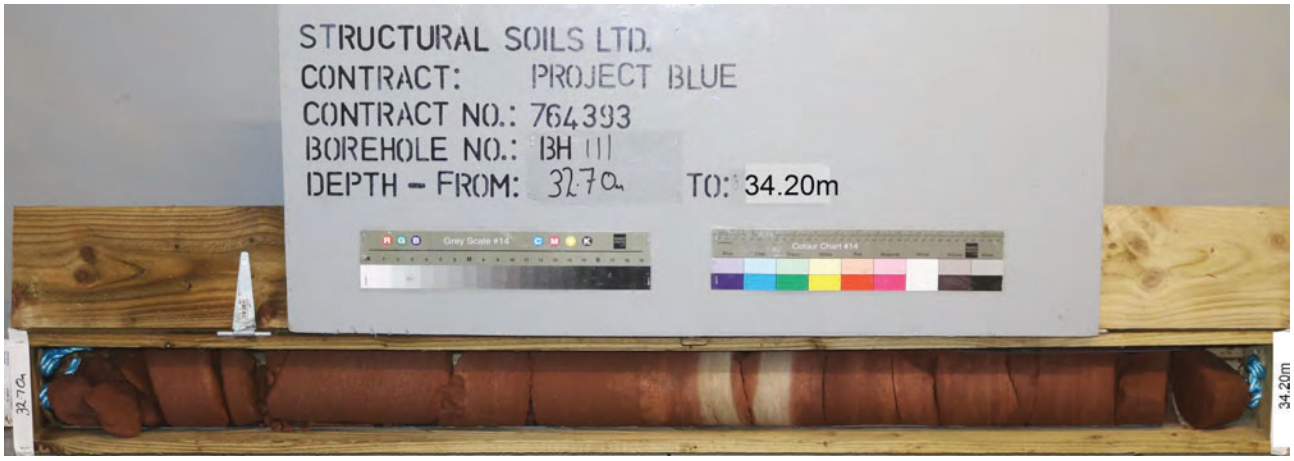
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	

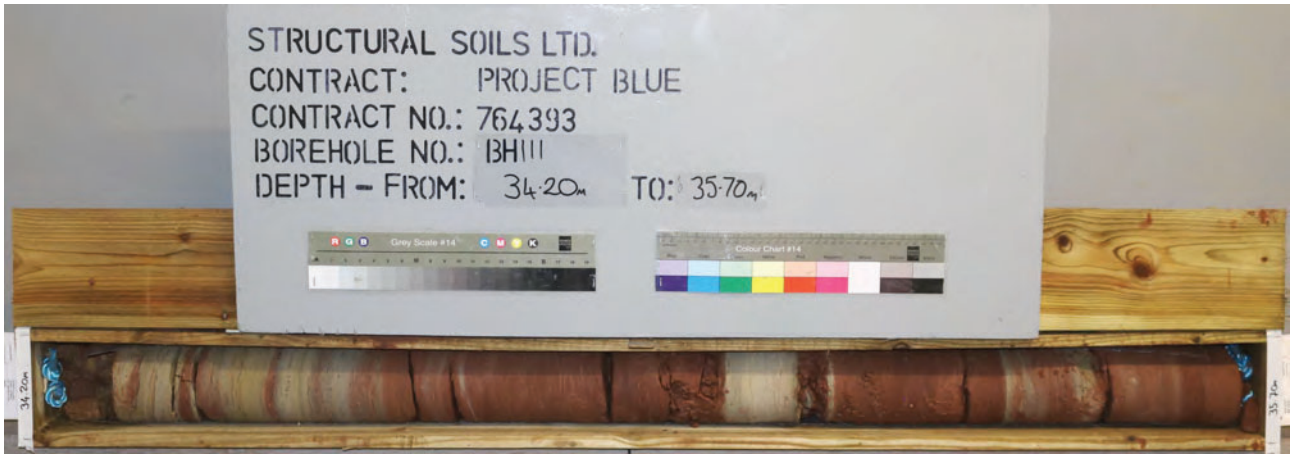
STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**19** of **21**

BH111 - Box 15





BH111 - Box 16

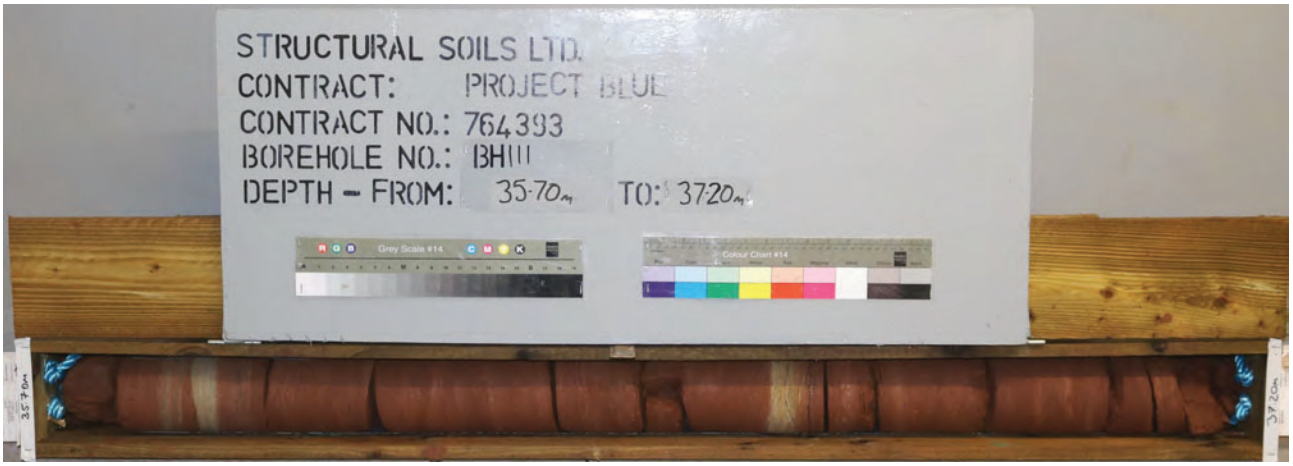
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**20** of **21**

BH111 - Box 17



BH111 - Box 18

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH111**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.12.17**	**6.70**	**E:333528.5 N:392567.7**	**21** of **21**

BH111 - Box 19

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Jonathan Newby	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH112**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**1** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
0.00-1.00	1	P	50% recovery								Very soft dark bluish black slighty sandy clayey SILT. Sand is fine. Rare fine gravel sized shell fragments.			
1.00-2.00	2	P	90% recovery								. . . at 1.00m, sandy		(2.30)	
2.00	3	D												
2.00-2.30	4	P	100% recovery									-4.75	2.30	
2.30-3.50							NA				Very dense dark grey to black subrounded to rounded fine to coarse GRAVEL of mixed lithologies.	-4.85	2.40	
2.30-2.43	5	SPT	25/74,26 for 5mm											
2.30-2.43	6	D												
2.40-2.57	201	C		92	69	50	NI 60 170	90-100% return Water (Reddish brown)			Weak to medium strong dark brown stained black fine to medium grained SANDSTONE. Discontinuities: 1) extremely closely to closely spaced 10-20° planar rough locally clay smeared. . . . from 2.40m to 2.57m, fine to coarse grained.		(0.86)	
											. . . from 2.57m to 2.71m, recovered as non-intact core (angular to subangular fine to coarse gravel sized fragments).	-5.71	3.26	
3.50-5.00				83	25	0	NI 20 60				Weak to medium strong reddish brown fine grained SANDSTONE with closely to medium spaced thin laminations of reddish brown siltstone. Discontinuities: 1) extremely closely to very closely spaced 5-15° planar smooth			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
12/01/18	15:00	10.60	5.00	146	2.10
15/01/18	08:00	10.60	5.00	146	1.80
15/01/18	12:00	17.70	5.00	146	2.10

General Remarks

1. Deck to silt level - 7.50m. Silt level used as reference for GL.
2. UXO clearance performed by magnetometer adjacent to position.
3. SPT hammer JT.01 2017 (E_r = 72.00%) used.

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Joseph Taylor**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH112**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**2** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
				83	25	0	NI 20 60	90-100% return Water (Reddish brown)			locally rough clean. . . . from 3.50m to 3.60m, assumed zone of core loss. . . . from 3.60m to 4.10m, recovered as non intact core (subangular to subrounded fine to coarse gravel sized fragments). . . . from 4.20m to 4.90m, 3 No. 85-90° discontinuities closely to medium spaced planar smooth clean. . . . from 4.40m to 4.50m, 1 No thin bed of weak light grey siltstone. Recovered as non-intact	-7.45	(1.74) 5.00	
5.00-6.50							NR				core (very angular to angular fine to coarse gravel sized fragments). Drilling induced. Assumed Zone of Core Loss. SANDSTONE. (Driller's description).	-7.83	(0.38) 5.38	
5.38-5.70	202	C		75	75	60	20 60 120				Weak to medium strong reddish brown fine to medium grained SANDSTONE with rare to occasional thick laminations to very thin beds of light grey siltstone. Discontinuities: 1) extremely closely to closely spaced 0-10° planar rough clean. . . . from 5.50m to 6.20m, 3 No incipient fractures 0-10° planar rough clean. . . . from 5.84m to 6.18m, with very closely spaced thick laminations to very thin beds of light grey siltstone.			
6.50-7.60													(2.62)	
6.76-6.83	203	C		95	91	0					. . . from 6.65m to 6.70m, assumed zone of core loss. . . . from 6.84m to 6.87m, 1 No. 90° discontinuity undulating rough clean. . . . from 7.03m to 7.64m, 3 No thick laminations of light grey siltstone.			
7.60-9.10				91	73	39	40 80 150				. . . from 7.67m to 7.77m, assumed zone of core loss. . . . from 7.80m to 7.86m, recovered as non-intact core	-10.45	8.00	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Joseph Taylor**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH112**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**3** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
											(subangular medium to coarse gravel sized fragments).			
8.12-8.27	204	C									Weak to medium strong reddish brown fine to medium SANDSTONE with very closely spaced thick laminations to very thin beds of medium strong light grey fine to medium grained sandstone. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth clean.	-11.13	(0.68) 8.68	
				91	73	39					Weak to medium strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth clean.			
9.10-10.60							40 80 150				. . . from 8.77m to 8.87m, with occasional thick laminations of reddish brown siltstone.			
9.34-9.47	205	C											(1.82)	
				89	85	56		90-100% return Water (Reddish brown)			. . . from 9.60m to 9.76m, assumed zone of core loss . . . from 9.76m to 9.80m, very weak and recovered as non-intact core (subangular to subrounded fine to medium gravel sized fragments). . . . from 9.83m to 9.87m, with extremely closely spaced thin and thick laminations of black siltstone. . . . from 10.35m to 10.36m, 1 No lense of light grey fine grained sandstone.	-12.95	10.50	
10.60-12.10											Weak to medium strong reddish brown fine to medium grained SANDSTONE with very closely to closely spaced thick laminations to thin beds of light grey siltstone and fine grained sandstone. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth clean.		(1.02)	
11.19-11.32	206	C		100	97	49	NI 50 180				. . . from 10.70m to 10.79m, recovered as non-intact core (angular medium to coarse gravel sized fragments). . . . from 10.85m to 10.86m, thick lamination of fine grained sandstone.	-13.97	11.52	
											Medium strong reddish brown fine to medium grained SANDSTONE with medium spaced very thin			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Joseph Taylor**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH112**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**4** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
12.10-13.60				100	97	49		90-100% return Water (Reddish brown)			beds of light grey fine grained sandstone. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth locally rough clean.			
				87	69	22	NI 40 130				. . . from 12.60m to 12.74m, recovered as non-intact core (angular to subangular medium to coarse gravel sized fragments). . . . from 12.74m to 12.94m, assumed zone of core loss.		(2.36)	
13.47-13.60	207	C									. . . from 13.26m to 13.27m, 1 No thick lamination of light grey siltstone.			
13.60-14.70											. . . from 13.54m to 13.57m, recovered as non-intact core (angular to subrounded medium to coarse gravel sized fragments).	-16.33	13.88	
14.03-14.32	208	C		100	97	61	10 30 290				Weak to medium strong light grey fine grained SANDSTONE with localised very closely to closely spaced thin and thick laminations of grey mudstone. Discontinuities: 1) very closely to medium spaced 0-10° planar smooth to rough clean. . . . from 14.32m to 14.34m, with extremely closely spaced thin laminations of reddish brown fine grained sandstone.		(0.93)	
14.70-16.20											. . . from 14.64m to 14.70m, 1 No very thin bed of medium strong reddish brown fine to medium grained sandstone.	-17.26	14.81	
15.33-15.70	209	C		100	100	14	NI 80 190				Medium strong locally weak reddish brown fine to medium, locally coarse grained, SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-20° planar rough and smooth clean. . . . from 15.04m to 15.10m, 1 No. 40° fracture undulating rough clean.			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Joseph Taylor**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH112**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**5** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
16.20-17.70				100	100	14							(2.89)	
							NI 80 190	90-100% return Water (Reddish brown)			. . . from 16.36m to 16.40m, recovered as non-intact core (subrounded medium to coarse gravel sized fragments).			
				100	95	29					. . . from 17.01m - 17.05m, recovered as non-intact core (subrounded medium to coarse gravel sized fragments). . . . from 17.06m to 17.34m, bedding is dipping 20-30° . . . at 17.16m lense of well cemented light grey fine to medium locally coarse sandstone with 1 No quartz clast.			
17.51-17.70	210	C									. . . from 17.34m, bedding is dipping 0-10°	-20.15	17.70	
											Borehole terminated at 17.70m depth.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Joseph Taylor**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH112**
Contract Ref:	Start: **12.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**6** of **11**

BH112 - Box 1

BH112 - Box 2

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Joseph Taylor**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH112**
Contract Ref:	Start: **12.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**7** of **11**

BH112 - Box 3

BH112 - Box 4

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Joseph Taylor**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH112**
Contract Ref:	Start: **12.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**8** of **11**

BH112 - Box 5

BH112 - Box 6

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Joseph Taylor**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH112**
Contract Ref:	Start: **12.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**9** of **11**

BH112 - Box 7

BH112 - Box 8

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Joseph Taylor**	Logged By:	**MGalan + TBeeson**	Checked By:

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH112**
Contract Ref:	Start: **12.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**10** of **11**

BH112 - Box 9

BH112 - Box 10

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Joseph Taylor**	Logged By:	**MGalan + TBeeson**	Checked By:

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH112**
Contract Ref:	Start: **12.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**-2.45**	**E:333549.3 N:392515.5**	**11** of **11**

BH112 - Box 11

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Joseph Taylor**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH113**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **17.01.18**	**-2.68**	**E:333544.3 N:392470.8**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
0.00-1.00	1	P	45% recovery							Very soft dark bluish black slightly sandy clayey SILT. Sand is fine. Rare fine to medium gravel sized shell fragments.		(1.20)	
1.00	2	D									-3.88	1.20	
1.00-1.20	3	P	0% recovery							Borehole terminated at 1.20m depth.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
17/01/18	10:30	1.20	None	100	-8.00

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. Piston sampler sheared; borehole terminated at 1.20m. Refer to BH113A for redrill.

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling	**Comacchio GEO 205**	**Joseph Taylor**	**TBeeson**	PmR AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH113A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**1** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
0.00-0.60	1	$UT_{(UT100)}$	2 blows 0% recovery								Very soft dark bluish black slightly sandy clayey SILT. Sand is fine. Rare fine to medium gravel sized shell fragments.			
0.60-1.20	2	$UT_{(UT100)}$	2 blows 0% recovery										(1.20)	
												-4.18	1.20	
1.20-2.20											Very weak black and brown medium grained SANDSTONE. Recovered as non-intact core (subangular to subrounded fine to coarse gravel and cobble sized fragments).			
1.20-1.50	1	SPT(c)	6,9/30,64,6 for 3mm				NI						(0.31)	
1.20-1.65	4	D										-4.49	1.51	
				100	61	0		100% return Water (Reddish brown)			Weak to medium strong brown stained black fine to medium grained SANDSTONE with closely spaced thin laminations to very thin beds of light grey fine grained sandstone. Discontinuities: 1) extremely closely to very closely spaced 0-10° planar rough locally clay smeared.			
1.94-2.03	201	C					NI						(1.26)	
2.20-3.70							30 100				. . . from 2.00m to 2.07m, recovered as non-intact core (angular to subangular fine to coarse gravel sized fragments). . . . from 2.49m to 2.63m, heavily stained black.			
												-5.75	2.77	
2.74-2.87	202	C									. . . from 2.73m to 2.77m, 1 No thin bed of light grey fine to medium grained sandstone.			
				92	83	15					Weak to medium strong reddish brown fine locally medium grained SANDSTONE. Discontinuities: 1) very closely to closely locally medium spaced 0-15 ° planar smooth clean.			
							30 50 130				. . . from 3.22m to 3.25m, 1 No very thin bed of weak to medium strong light grey fine to medium grained sandstone.			
3.70-5.20											. . . from 3.58m to 3.65m, with occasional thin to thick laminations of light grey fine to medium grained sandstone.			
				100	93	60	NI 100 250							

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
17/01/18	16:00	5.20	3.70	146	0.70
18/01/18	08:00	5.20	3.70	146	0.90
18/01/18	15:00	16.00	3.70	146	1.80

General Remarks

1. Deck to silt level - 8.60m. Silt level used as reference for GL.
2. UXO clearance performed by magnetometer adjacent to position.
3. No recovery from UT sampling due to extremely soft nature of silt.
4. SPT hammer JT.01 2017 (E_r = 72.00%) used.

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Stuart Crawford**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH113A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**2** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
											. . . from 3.70m to 3.80m, recovered as non-intact core (subangular to subrounded medium to coarse gravel sized fragments).			
				100	93	60					. . . from 4.31m to 4.34m, with extremely closely spaced thin and thick laminations of light grey fine grained sandstone.		(3.35)	
											. . . from 4.75m to 4.80m, with extremely closely spaced thin and thick laminations of light grey siltstone and fine grained sandstone.			
5.20-6.20							NI 100 250				. . . from 5.15m to 5.20m, 1 No. 45° fracture undulating rough clean (possible drilling).			
				73	30	0		100% return Water (Reddish brown)			. . . from 5.20m to 5.47m, assumed zone of core loss.			
											. . . from 5.47m to 5.72m, recovered as non-intact core (angular to subrounded to coarse gravel sized fragments).			
5.93-6.07	203	C												
											. . . from 6.05m to 6.20m, 1 No thin bed of weak to medium strong light grey fine to medium grained sandstone.	-9.10	6.12	
6.20-7.20											Medium strong locally weak light grey fine grained SANDSTONE with localised very closely spaced very thin to thin beds of reddish brown fine to medium grained sandstone and siltstone. Discontinuities: 1) very closely to closely spaced 0-15° planar smooth clean locally clay smeared.			
6.20-6.37	2	SPT(c)	10,15/79,21 for 5mm											
6.44-6.60	204	C												
				100	98	54							(1.41)	
							35 70 160							
7.20-8.50											. . . from 6.20m to 6.34m, recovered as non-intact core (subrounded fine to coarse gravel and cobble sized fragments).			
7.35-7.73	205	C									. . . from 7.07m to 7.10m, 1 No. 32° fracture undulating smooth clean.	-10.51	7.53	
				92	73	38					Medium strong locally weak reddish brown fine to medium locally coarse grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-15° planar and undulating rough			
							NI 65 110							

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Stuart Crawford**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH113A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**3** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
				92	73	38	NI 65 110				clean. . . . from 7.70m to 7.80m, assumed zone of core loss. . . . from 7.80m to 7.96m, recovered as non-intact core (angular to subangular medium to coarse gravel sized fragments).			
8.50-10.00											. . . from 8.27m to 8.30m, with occasional subangular clasts of reddish brown fine grained sandstone.		(2.47)	
							30 170 200				. . . from 8.50m to 8.60m, recovered as non-intact core (subangular to subrounded medium to coarse gravel sized fragments).			
9.08-9.28	206	C		100	73	24								
							30 90 100	100% return Water (Reddish brown)			. . . from 9.40m to 9.56m, weak with frequent angular coarse gravel sized clasts of sandstone and mudstone (Breccia). . . . from 9.74m to 9.82m, 1 No. 50° fracture planar rough clean.	-12.98	10.00	
10.00-11.50											Medium strong locally strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) very closely to closely locally medium spaced 0-10° planar smooth clean. . . . from 10.35m to 10.39m, occasional to frequent pockets of sand.			
10.51-10.77	207	C		100	73	55					. . . from 10.75m to 10.90m, discontinuities are very closely spaced 10-18° undulating rough clean. . . . from 10.88m to 10.96m, 1 No. induced fracture. . . . from 11.20m to 11.40m, 1 No. 75-80° fracture undulating rough clean.		(1.50)	
							20 80 220					-14.48	11.50	
11.50-13.00				100	100	71					Medium strong locally weak light yellowish green fine to medium grained SANDSTONE with closely spaced thick laminations to thin beds of medium strong reddish brown fine to medium grained sandstone and thin		(0.60)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Stuart Crawford**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH113A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**4** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
											laminations of light grey siltstone.	-15.08	12.10	
											Discontinuities: 1) very closely to medium spaced 0-15° planar smooth locally rough clean. . . . from 11.54m to 11.60m, 1 No. very thin bed of brown fine to medium grained sandstone.			
				100	100	71	60 120 260				Medium strong locally weak reddish brown fine locally medium grained SANDSTONE with localised closely to medium spaced thick laminations to very thin beds of light grey fine to medium grained sandstone. Discontinuities: 1) very closely to closely locally medium spaced 0-10° planar smooth clean. . . . from 12.33m to 12.44m, 1 No. 65° incipient fracture undulating rough clean (probably drilling induced).		(1.02)	
12.72-12.92	208	C										-16.10	13.12	
13.00-14.50							10 110 110						(0.37)	
				100	93	59		100% return Water (Reddish brown)				-16.47	13.49	
							160 180 180				. . . from 12.96m to 13.00m, 1 No thin bed of light grey fine to medium grained sandstone. . . . from 13.00m to 13.05m, recovered as non-intact core (subrounded coarse gravel sized fragments). Weak to medium strong thickly interlaminated to reddish brown fine to medium grained SANDSTONE and light grey fine grained SANDSTONE. Discontinuities: 1) closely spaced 0-10° planar smooth clean.			
14.00-14.18	209	C												
14.50-16.00							30 60 150				Medium strong locally weak reddish brown fine locally medium grained SANDSTONE. Discontinuities: 1) very closely to closely spaced 0-10° planar smooth clean. . . . from 14.27m to 14.40m, fine locally medium grained. . . . from 15.06m to 15.08m, with thin laminations of light grey fine grained sandstone.		(2.51)	
				93	93	23					. . . from 15.39m to 15.42m, with thin laminations of light grey fine grained sandstone.			
15.79-15.94	210	C										-18.98	16.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Stuart Crawford**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH113A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**5** of **11**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
											. . . from 15.96m to 16.00m, 1 No. 85° fracture undulating rough locally stained black.			
											Borehole terminated at 16.00m depth.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Dynamic sampling + Rotary Cored	**Comacchio GEO 205**	**Stuart Crawford**	**MGalan + TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH113A**
Contract Ref:	Start: **17.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**6** of **11**

BH113A - Box 1

BH113A - Box 2

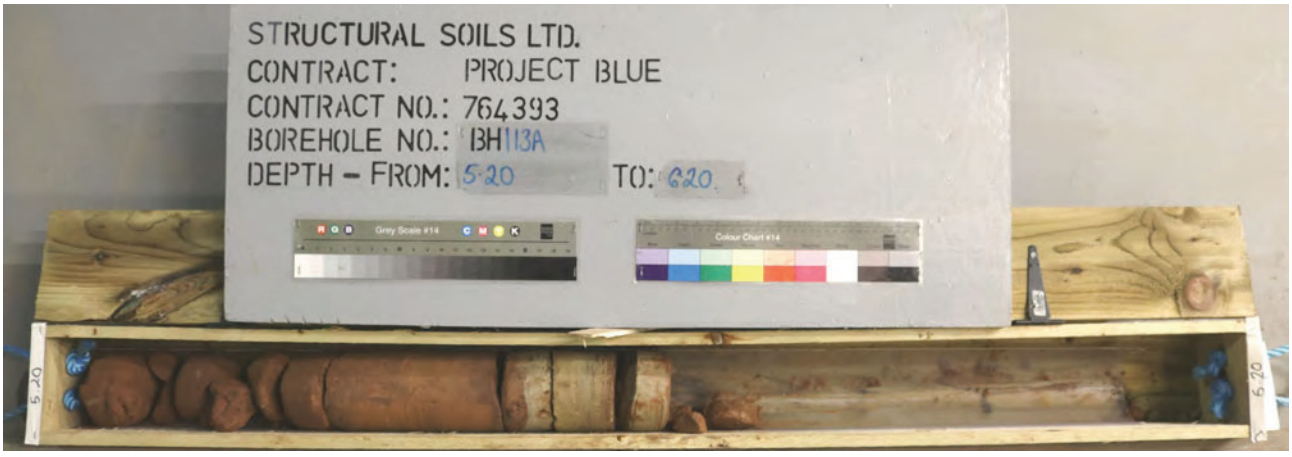
Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Stuart Crawford**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH113A**
Contract Ref:	Start: **17.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**7** of **11**

BH113A - Box 3



BH113A - Box 4

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Stuart Crawford**	Logged By:	**MGalan + TBeeson**	Checked By:

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH113A**
Contract Ref:	Start: **17.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**8** of **11**

BH113A - Box 5

BH113A - Box 6

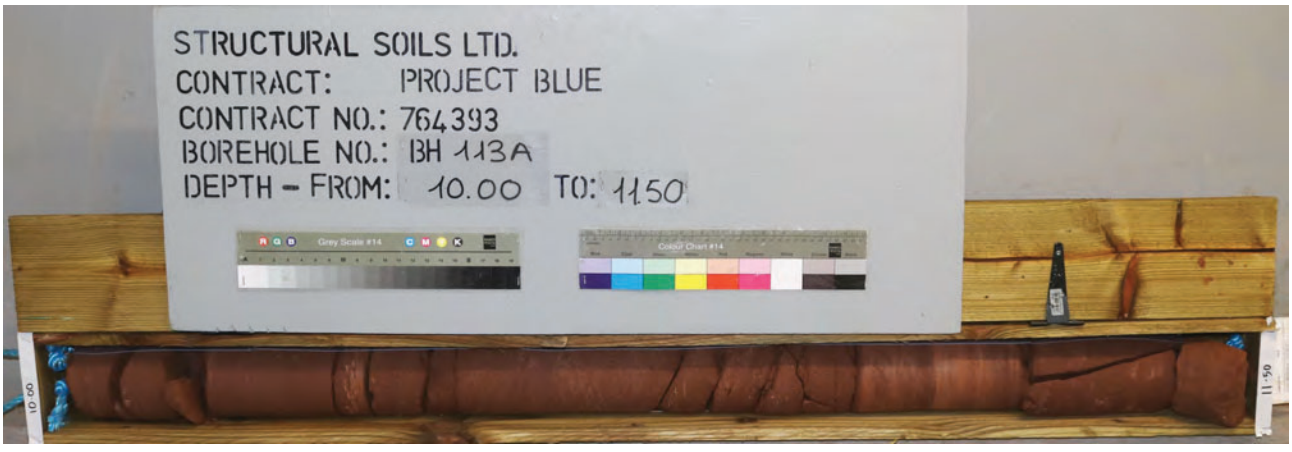
Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Stuart Crawford**	Logged By:	**MGalan + TBeeson**	Checked By:

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH113A**
Contract Ref:	Start: **17.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**9** of **11**

BH113A - Box 7



BH113A - Box 8

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Stuart Crawford**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH113A**
Contract Ref:	Start: **17.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**10** of **11**

BH113A - Box 9

BH113A - Box 10

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Stuart Crawford**	Logged By:	**MGalan + TBeeson**	Checked By:

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH113A**
Contract Ref:	Start: **17.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **18.01.18**	**-2.98**	**E:333553.0 N:392472.0**	**11** of **11**

BH113A - Box 11

Method Used:	**Dynamic sampling + Rotary Cored**	Plant Used:	**Comacchio GEO 205**	Drilled By:	**Stuart Crawford**	Logged By:	**MGalan + TBeeson**	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**1** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
											MADE GROUND: ASPHALT.	6.71	0.05	
											MADE GROUND: Light grey CONCRETE. Clast matrix 70:30. 10% voids. Clasts are subrounded fine to coarse with some cobble sized clasts of granite.	6.31	(0.40) 0.45	
0.50	1	B									MADE GROUND: Reddish brown gravelly slightly clayey fine SAND. Gravel is subangular fine to coarse of sandstone, brick and other mixed lithologies.			
0.50	101	ES	x6											
0.50		PID	0.9ppm											
1.00	2	B											(0.90)	
1.00		PID	0.0ppm											
1.20-1.65	3	SPT	N=2									5.41	1.35	
1.20-1.65	4	D												
1.30	5	D												
1.50	103	ES	x6								MADE GROUND: Light brown sandy SILT. Sand is fine.			
1.50		PID	0.0ppm										(0.50)	
1.55-1.85	6	B		Window run 115mm dia (100% rec)						1		4.91	1.85	
2.00	104	ES	x6								MADE GROUND: Dark grey slighty sandy slighty gravelly clayey SILT. Sand is fine to medium. Gravel is subangular medium to coarse to sandstone.			
2.00		PID	0.0ppm											
2.20-2.65	7	$UT_{(UT100)}$	6 blows 100% recovery										(1.05)	
2.80-3.25	8	SPT	N=3									3.86	2.90	
2.80-3.25	9	D												
3.00	105	ES	x6	Window run 115mm dia (100% rec)							MADE GROUND: Dark grey gravelly slightly silty fine to medium SAND. Gravel is subangular fine to medium of sandstone.			
3.00		PID	0.0ppm											
3.10	10	D												
3.25-3.70	11	$UT_{(UT100)}$	8 blows 100% recovery										(1.20)	
3.40		EW												
3.50		EW												
3.70-3.85	12	D												
3.85-4.30	13	SPT	N=6	Window run 115mm dia										
3.85-4.30	14	D												

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
04/12/17	16:00	0.45	None	300	Dry
03/01/18	08:00	0.45	None	300	Dry
03/01/18	16:00	2.80	None	150	Dry
04/01/18	08:00	2.80	None	150	2.10
04/01/18	16:00	16.00	6.00	150	1.70
05/01/18	08:00	16.00	9.00	146	1.40
05/01/18	16:00	29.50	9.00	146	2.60
08/01/18	08:00	29.50	9.00	146	4.30

General Remarks

1. CAT scan undertaken at exploratory hole location.
2. Concrete Core from GL to 0.45m.
3. Inspection pit hand excavated to 1.20m.
4. On completion of drilling in-situ water pressure (double packer) test performed with test section from 12.00m to 13.50m.
5. On completion, 50mm diameter standpipe installed to 5.00m, with response zone from 0.50m to 4.50m.

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**2** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
4.00	106	ES	x6	(100% rec)								2.66	4.10	
4.00		PID	0.1ppm	Window run 115mm dia (100% rec)										
4.10-4.30	15	B									MADE GROUND: Dark grey slightly sandy SILT with low cobble content. Sand is fine. Cobbles are subrounded of siltstone.		(0.40)	
4.30-4.75	16	$SPT_{(NR)}$	N=8									2.26	4.50	
4.40-4.90	17	D									MADE GROUND: Dark grey silty fine SAND.		(0.60)	
5.00	107	ES	x6	Window run 115mm dia (100% rec)								1.66	5.10	
5.00-5.30	18	B									MADE GROUND: Dark grey slightly gravelly medium to coarse SAND. Gravel is subangular medium of brick and sandstone. Some fine to coarse gravel sized shell fragments.	1.46	5.30	
5.00		PID	0.0ppm											
5.30-5.75	19	SPT	N=57											
5.30-5.75	20	D												
5.40-5.90	21	B												
				Window run 115mm dia (100% rec)							Extremely weak reddish brown SANDSTONE. Recovered as slighty gravelly silty fine to medium sand. Gravel is angular fine to coarse of sandstone.		(0.70)	
										▼1		0.76	6.00	
6.00-7.00														
6.00-6.30	22	SPT	15,10/22,39,39 for 50mm								Extremely weak reddish brown medium grained SANDSTONE with rare inclusions of siltstone. Recovered as non-intact core (sandy angular fine to coarse gravel sized fragments).		(0.47)	
6.00	108	ES	x6				NI					0.29	6.47	
6.00	23	D					NI							
6.00		PID	3.1ppm				NI							
				100	40	35					Very weak locally extremely weak light grey SILTSTONE with very closely spaced thin and thick laminations of reddish brown medium grained sandstone. Discontinuities: 1) very closely to closely spaced 0-5° planar rough clean locally infilled with light grey clay (<10mm).		(0.49)	
6.60-6.95	201	C										-0.20	6.96	
7.00-8.50								100% return Air+Mist (Reddish Brown)						
							NI 50 350				Very weak reddish brown medium coarse grained SANDSTONE with medium spaced very thin to thin beds of medium strong grey fine grained sandstone. Rare inclusions of siltstone. Discontinuities: 1) closely locally very closely and medium spaced 5-20° planar rough clean locally infilled with reddish brown clay (<5mm).		(1.75)	
				100	65	27								
7.93-8.00	202	C												

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
08/01/18	13:00	37.00	8.00	146	7.60

General Remarks

6. SPT hammer JT.01 2017 (E_r = 72.00%) used.

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**3** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
				100	65	27	NI 50 350							
8.50-10.00											. . . from 8.50m to 8.71m, recovered as non-intact core (angular medium gravel sized fragments). Probably drilling induced.	-1.95	8.71	
				100	73	67					Weak locally very weak reddish brown medium to coarse grained SANDSTONE with medium to widely spaced very thin to medium beds of medium strong light grey fine grained sandstone. Rare inclusions of siltstone. Discontinuities: 1) closely locally very closely and medium spaced 5-15° planar rough clean locally clay smeared.			
9.56-9.80	203	C									. . . from 8.71m to 9.22m, 1 No medium bed of medium strong light grey stained yellowish orange medium grained sandstone.			
10.00-11.50							NI 110 290	100% return Air+Mist (Reddish Brown)			. . . from 9.03m to 9.18m, 1 No 75° fracture planar rough clean. . . . from 10.00m to 10.29m, recovered as non-intact core (angular medium gravel sized fragment). Probably drilling induced.			
				100	82	40					. . . from 10.68m to 11.31m, weak with many randomly orientated incipient fractures. . . . from 10.95m to 11.34m, 1 No medium bed of medium strong light grey locally stained orangish brown fine to medium grained sandstone.			
11.50-13.00													(5.67)	
				100	87	72					. . . from 11.77m, locally coarse grained. *Description on next sheet*			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**04.12.17** End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**4** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
12.36-12.55	204	C		100	87	72	NI 110 290	100% return Air+Mist (Reddish Brown)			. . . from 11.83m to 12.81m, locally thinly interbedded with weak reddish brown siltstone.			
13.00-14.50				100	85	61					. . . from 12.69m to 12.74m, very weak and recovered as non-intact core (reddish brown gravelly coarse sand). . . . from 13.20m to 13.60m very weak and recovered locally as non-intact core (sandy angular medium to coarse gravel sized fragments).	-7.62	14.38	
14.50-16.00 14.50-14.70	205	C		100	93	85	NI 110 270				Weak to medium strong reddish brown medium grained SANDSTONE with very closely to medium spaced very thin to medium beds of medium strong light grey locally stained orange fine grained sandstone. Discontinuities: 1) closely spaced 5-10° planar rough clean locally clay smeared. . . . at 15.00m 1 No 70° fracture, undulating rough clean	-8.94	(1.32) 15.70	
											Medium strong locally weak reddish brown medium grained SANDSTONE with medium to widely spaced very thin to thin			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**5** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
16.00-17.50											beds of medium strong fine grained sandstone. Discontinuities: 1) closely locally very closely spaced 5-20° planar rough clean locally clay smeared.			
16.78-17.14	206	C		100	100	91					. . . from 16.75m to 17.80m, 4 No very thin to thin beds of medium strong light grey fine to medium grained sandstone.			
17.50-19.00											. . . from 17.50m to 17.80m, 3 No very closely spaced 80° fractures planar rough clean.			
17.90-18.15	207	C		100	100	78	60 200 470	100% return Air+Mist (Reddish Brown)						
19.00-20.50														
19.53-20.01	208	C		100	100	86								

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**6** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
				100	100	86					. . . from 20.28m to 20.50m, 1 No medium bed of medium strong light grey fine grained sandstone.			
20.50-22.00							60 200 470	100% return Air+Mist (Reddish Brown)			. . . at 20.50m 1 No 75° fracture planar rough clean.			
				100	95	81								
21.51-21.83	209	C									. . . from 21.43m to 21.51m, very weak to weak and recovered as non-intact core (subangular medium to coarse gravel sized fragments).			
22.00-23.50														
22.36-22.66	210	C									. . . from 22.16m to 22.37m, 1 No bed of medium strong light grey fine grained sandstone with localised thin and thick laminations of reddish brown siltstone.		(13.80)	
				100	100	78								
							70 111 320				. . . at 23.10m 1 No 50° fracture planar rough clean.			
23.50-25.00											. . . from 23.45m to 23.48m, 1 No very thin bed of medium strong light grey fine grained sandstone.			
				100	100	75								

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**7** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
24.36-24.58	211	C		100	100	75	70 111 320	100% return Air+Mist (Reddish Brown)						
25.00-26.50				100	100	95	80 220 420				. . . from 25.50m to 25.79m, 1 No bed of medium strong thinly laminated light grey locally stained orange fine grained sandstone.			
26.50-28.00 26.50-26.85	212	C		100	93	51	NI 90 170				. . . from 26.30m to 26.80m, medium strong very thinly interbedded light grey fine grained sandstone, dark bluish grey medium grained sandstone and orangish brown medium to coarse grained sandstone. . . . from 26.90m to 27.10m 2 No 50-60° fractures planar rough clean. . . . from 27.78m to 27.95m, 1 No very thin bed of medium strong light grey siltstone.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**8** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
28.00-29.50				100	100	97								
29.03-29.50	213	C									. . . from 28.95m to 29.50m, 1 No bed of medium strong light grey locally stained orangish brown fine grained sandstone with localised thin and thick laminations of brown and grey medium to coarse grained sandstone.	-22.74	29.50	
29.50-31.00				100	93	88	50 190 470	100% return Air+Mist (Reddish Brown)			Weak to medium strong reddish brown fine to medium locally coarse grained SANDSTONE. Discontinuities: 1) very closely to medium spaced 0-10° planar rough clean. . . . from 29.90m to 30.20m, 1 No 70° fracture planar rough and clean.	-24.52	(1.78) 31.28	
31.00-32.50				100	100	87	40 70 300				Medium strong locally weak light grey fine to medium SANDSTONE with localised thin and thick laminations of orangish brown and grey medium to coarse grained sandstone. Discontinuities: 1) very closely to closely spaced 5-10° planar rough clean.	-25.14	(0.62) 31.90	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**04.12.17** End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**9** of **21**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
31.97-32.28	214	C		100	100	87	40 70 300	100% return Air+Mist (Reddish Brown)			Medium strong to strong thinly to medium bedded reddish brown fine to medium SANDSTONE with medium to widely spaced very thin to medium beds of of light grey fine to medium grained sandstone. Occasional thin and thick laminations of dark grey siltstone. Discontinuities 1) medium locally closely and widely spaced, 0-10° planar rough and clean. . . . from 32.50m to 33.10m, locally weak.		(5.10)	
32.50-34.00				100	83	62								
34.00-35.50				100	100	52	150 320 630							
35.50-37.00				95	95	77	60 100 450							

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH114**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**10** of **21**

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
36.52-36.91	215	C		95	95	77	60 100 450	100% return Air+Mist (Reddish Brown)						
											Borehole terminated at 37.00m depth.	-30.24	37.00	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:22**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Lee Gidman	TBeeson	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**11** of **21**

BH114 - Concrete Core

BH114 - Box 1

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**12** of **21**

BH114 - Box 2

BH114 - Box 3

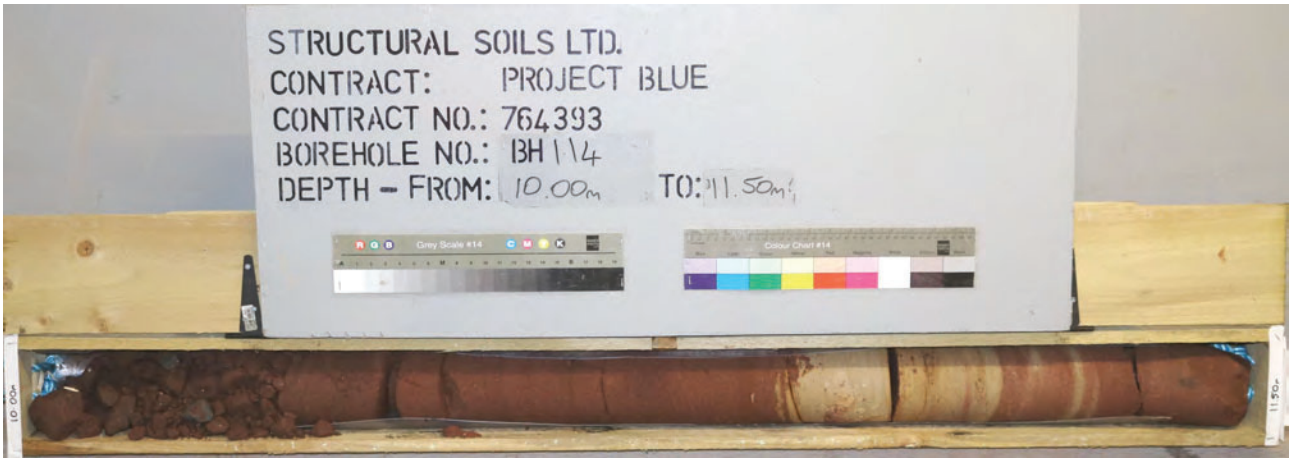
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**13** of **21**

BH114 - Box 4



BH114 - Box 5

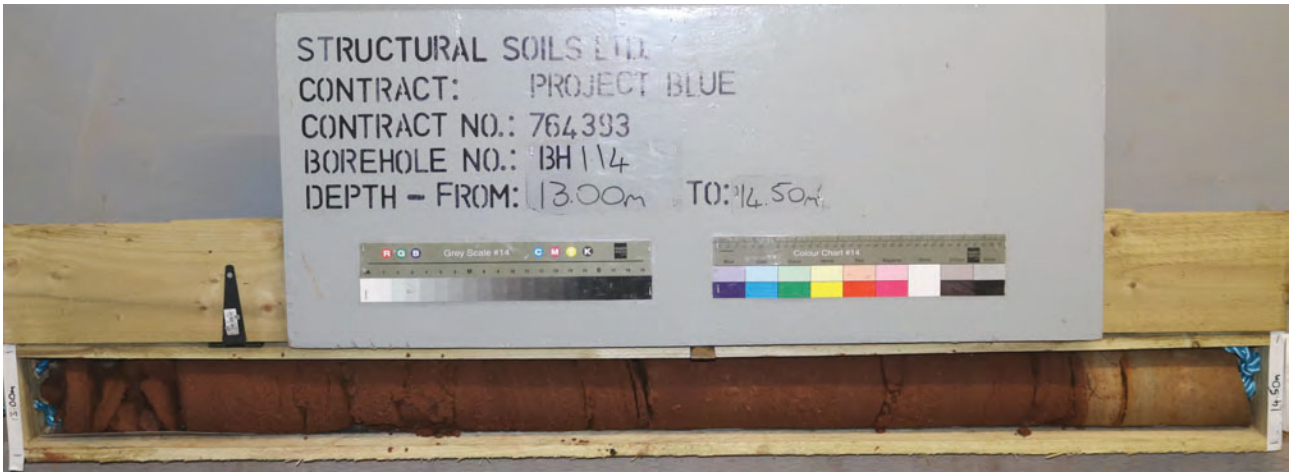
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**14** of **21**

BH114 - Box 6



BH114 - Box 7

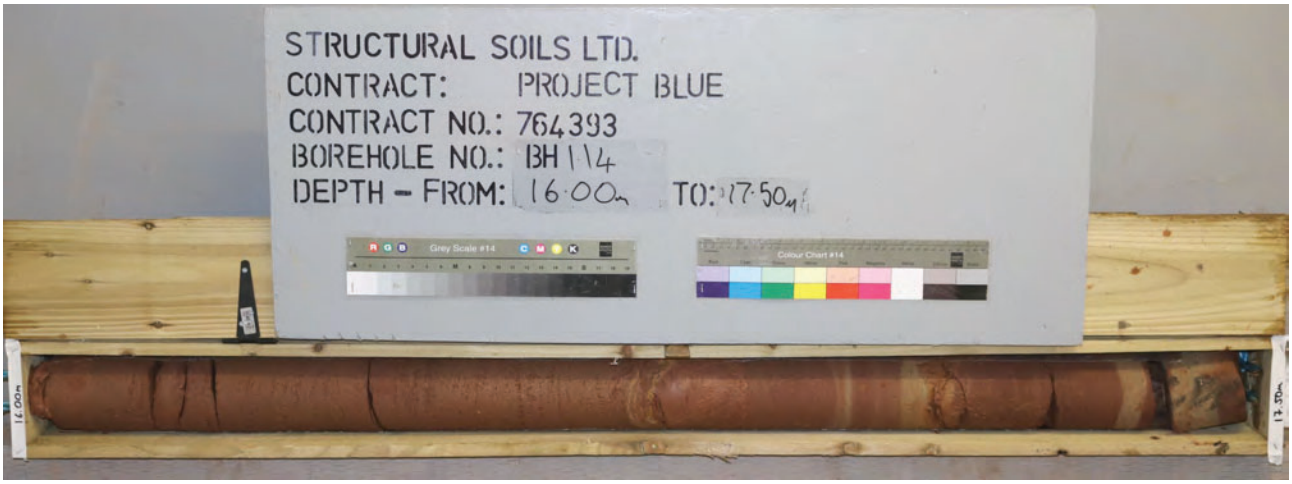
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	AGS

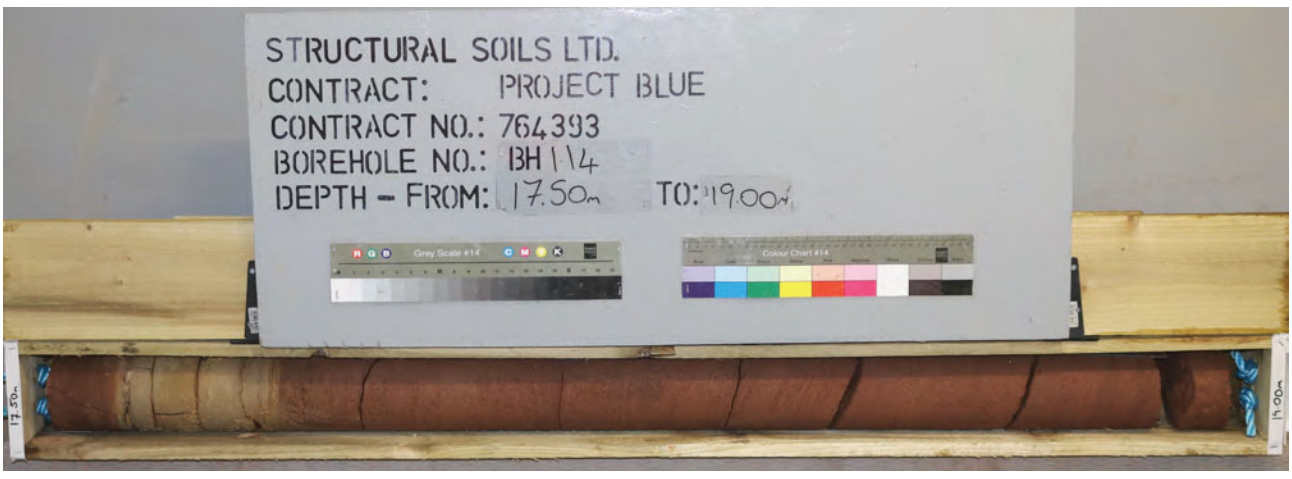
STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**15** of **21**

BH114 - Box 8





BH114 - Box 9

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**16** of **21**

BH114 - Box 10

BH114 - Box 11

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**17** of **21**

BH114 - Box 12

BH114 - Box 13

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**18** of **21**

BH114 - Box 14

BH114 - Box 15

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**19** of **21**

BH114 - Box 16

BH114 - Box 17

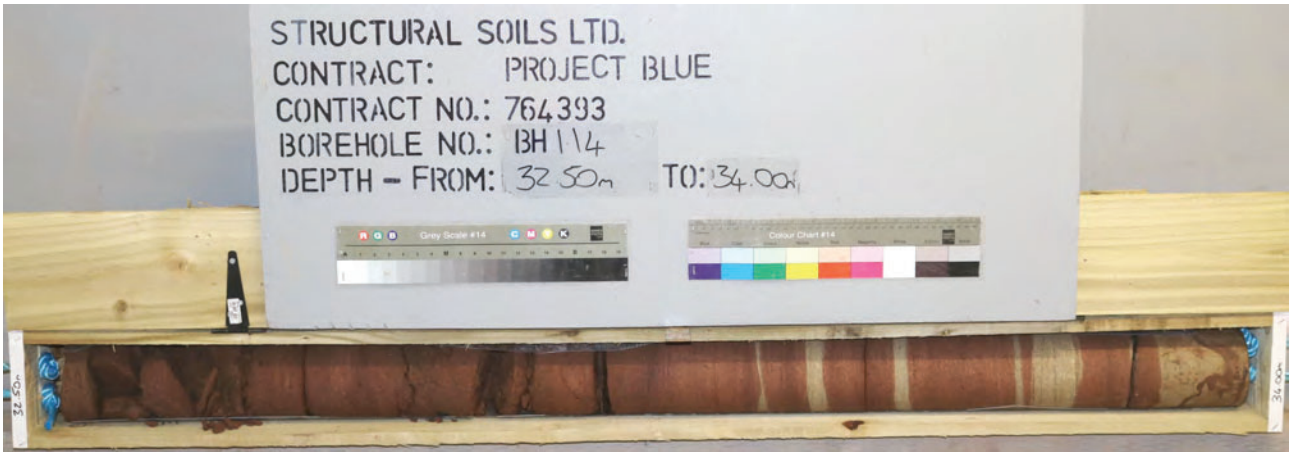
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**20** of **21**

BH114 - Box 18



BH114 - Box 19

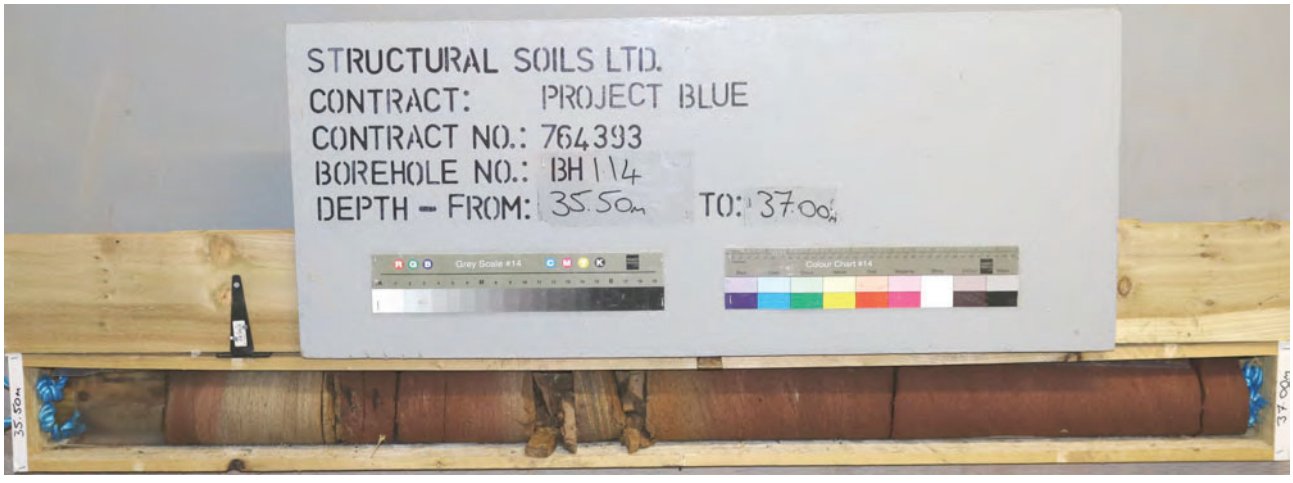
Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:		Client:		Borehole:
Project Blue		**Buro Happold**		**BH114**
Contract Ref:	Start: **04.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **08.01.18**	**6.76**	**E:333502.4 N:392415.2**	**21** of **21**

BH114 - Box 20



BH114 - Box 21

Method Used:	Concrete core + Inspection pit + Dynamic sampling + Rotary Cored	Plant Used:	Hilti Concrete Corer + Hand tools + Comacchio GEO 205	Drilled By:	Lee Gidman	Logged By:	TBeeson	Checked By:	AGS

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**BH1**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**08.01.18** End: **08.01.18**	**6.93**	**E:333601.4 N:392565.4**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist (Red/Brown)		1.1	MADE GROUND: Backfilled Borehole (SAND / BENTONITE) (Driller's description).	6.43	(0.50) 0.50	
											MADE GROUND: CONCRETE. (Driller's description).	4.73	(1.70) 2.20	
											Water filled VOID. (Driller's Description).	2.43	(2.30) 4.50	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
08/01/18	11:00	4.50	None	120	1.50

General Remarks

1. Borehole drilled using rotary open-hole methods to facilitate void survey of subsurface chamber.
2. Chamber noted to be water filled.
3. Sonar scan undertaken of water filled chamber. Refer to Appendix H for futher details and full Geoterra report.
4. On completion of survey, sacrificial bladder installed at top of chamber and borehole backfilled with concrete from 2.00m to GL.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Joseph Taylor**	**AJones**	PMR

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**OH101**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**11.01.18** End: **11.01.18**	**6.82**	**E:333368.2 N:392383.3**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
											MADE GROUND: CONCRETE. (Driller's description)	6.52	0.30	
											MADE GROUND: CLAY and SAND fill with brick. (Driller's description)		(3.20)	
2.90 3.00		EW EW						100% return Air+Mist (Brown)		1				
											Borehole terminated at 3.50m depth.	3.32	3.50	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
11/01/18	15:00	1.20	1.50	120	1.20
11/01/18	16:00	3.50	3.50	120	1.90

General Remarks

1. Hand dug inspection pit to 1.20m.
2. Openhole borehole for installation of standpipe.
3. Drilled using air-mist flush, casing installed to 3.50m.
4. Groundwater strike at 2.10m.
5. 50mm standpipe installed on completion, response zone 0.50m to 3.00m.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**AJones**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**OH102**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **12.01.18**	**6.71**	**E:333393.5 N:392565.0**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
3.00		EW						100% return Air+Mist (Brown)		1.1	MADE GROUND: SAND with cobbles and boulders of sandstone. Bitumen noted. (Driller's description)		(3.20)	
3.20		EW										3.51	3.20	
											MADE GROUND: Black SILT, SAND and CLAY bands. (Driller's description).		(1.30)	
												2.21	4.50	
											Borehole terminated at 4.5m depth.			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
12/01/18	11:00	1.70	1.20	120	1.20
12/01/18	12:00	4.50	4.50	120	1.20

General Remarks

1. Hand dug inspection pit to 1.20m.
2. Openhole borehole for installation of standpipe.
3. Drilled using air-mist flush.
4. Groundwater strike at 1.70m.
5. 50mm standpipe installed on completion, response zone 0.50m to 4.50m.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**AJones**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**OH103**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**11.01.17** End: **11.01.17**	**6.81**	**E:333613.1 N:392465.2**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill & Instru-mentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
											MADE GROUND: ROADSTONE. (Driller's description)	6.71	0.10	
												6.41	0.40	
											MADE GROUND: CONCRETE. (Driller's description)	6.11	0.70	
											MADE GROUND: Sandstone COBBLES. (Driller's description).			
											MADE GROUND: SAND with cobbles and brick fill. (Driller's description)		(3.00)	
3.10		EW						100% return Air+Mist (Brown)		1		3.11	3.70	
3.20		EW									Black clayey SAND with shells. Possible Made Ground. (Driller's description).		(1.80)	
											Borehole terminated at 5.50m depth.	1.31	5.50	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
11/01/18	15:00	2.20	1.50	120	2.20
11/01/18	16:00	5.50	5.50	120	2.10

General Remarks

1. Hand dug inspection pit to 1.20m.
2. Openhole borehole for installation of standpipe.
3. Drilled using air-mist flush, casing installed to 5.50m.
4. Groundwater strike at 2.20m.
5. 50mm standpipe installed on completion, response zone 1.00m to 5.50m.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**AJones**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P101A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**6.44**	**E:333395.0 N:392551.7**	**1** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist (Reddish Brown)		1.1	MADE GROUND: SAND. (Driller's Description)	6.24	0.20	
											MADE GROUND: Large granite COBBLES. (Driller's Description)	5.94	0.50	
											MADE GROUND: SAND with sandstone boulders. (Driller's Description)		(3.60)	
											POSSIBLE MADE GROUND: Dark grey black silty clayey SAND. (Driller's Description)	2.34	4.10	
													(5.40)	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
12/01/18	10:00	1.20	None	120	1.20
12/01/18	16:00	10.30	10.30	140	1.20
15/01/18	08:00	10.30	10.30	140	1.80
15/01/18	10:00	11.50	10.30	120	1.80

General Remarks

1. Groundwater strike at 1.20m.
2. Borehole terminated at 11.50m in natural sandstone.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 305**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P101A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **15.01.18**	**6.44**	**E:333395.0 N:392551.7**	**2** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
												-3.06	9.50	
											Weathered SANDSTONE. (Driller's Description)		(1.00)	
												-4.06	10.50	
10.50-11.50 10.50-11.50	1	B		100	95	0	NI 40 95	100% return Air+Mist (Reddish Brown)			Weak to medium strong reddish brown fine to medium grained SANDSTONE. Discontinuities: 1) extremely closely to closely spaced 0-10 planar rough clean locally clay smeared. . . . from 10.95m to 11.00m, recovered as non-intact core (angular to subangular medium to coarse gravel sized fragments) . . . from 11.18m to 11.22m, with extremely closely spaced thin and thick laminations of black siltstone.		(1.00)	
												-5.06	11.50	
											Borehole terminated at 11.50m depth.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 305**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P101B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.01.18** End: **12.01.18**	**6.50**	**E:333394.4 N:392551.0**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
											MADE GROUND: SAND. (Driller's Description)	5.90	(0.60) 0.60	
								100% return Air+Mist (Grey/Brown)			MADE GROUND: SAND with granite COBBLES. (Driller's Description)	3.80	(2.10) 2.70	
											Borehole terminated at 2.70m depth.			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
12/01/18	15:00	1.20	None	120	1.20
12/01/18	16:00	2.70	None	120	

General Remarks

1. Groundwater strike at 1.20m.
2. Borehole terminated at 2.70m; unable to prgress borehole casing.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P101C**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**15.01.18** End: **15.01.18**	**6.46**	**E:333390.9 N:392550.0**	**1** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist (Grey/Brown)		1.1	MADE GROUND: SAND. (Driller's Description)	6.16	0.30	
											MADE GROUND: Granite COBBLE sets. (Driller's Description)	5.86	0.60	
											MADE GROUND: SAND with cobbles and brick. Bitumen noted. (Driller's Description)		(3.10)	
												2.76	3.70	
											MADE GROUND: SAND with cobbles of sandstone. (Driller's Description)		(1.50)	
												1.26	5.20	
								0% return Air+Mist (N/A)			MADE GROUND: Soft SAND. (Driller's Description)		(2.60)	
												-1.34	7.80	
											MADE GROUND: SAND. (Driller's Description)		(1.90)	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
15/01/18	14:00	1.80	1.80	120	1.80
15/01/18	16:00	10.50	9.70	120	1.80

General Remarks

1. Groundwater strike at 1.80m.
2. Borehole terminated at 10.50m on proving structure at depth.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 305**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P101C**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**15.01.18** End: **15.01.18**	**6.46**	**E:333390.9 N:392550.0**	**2** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
												-3.24	9.70	
9.70-10.50											MADE GROUND: Angular to subrounded coarse GRAVEL of sandstone and concrete with low cobble content. Cobbles are subangular of sandstone.	-3.34	9.80	
9.70-10.50	1	B		100	90	85	NI 200 500	100% return Air+Mist (Red/Brown)					(0.50)	
												-3.84	10.30	
											MADE GROUND: CONCRETE comprising angular to subanglar fine to coarse gravel and cobble sized clasts in a dark grey fine to coarse sand matrix.	-4.04	10.50	
											Weak reddish brown fine to medium grained SANDSTONE (Possible Made Ground).			
											Borehole terminated at 10.50m depth.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 305**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P102A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**18.12.17** End: **19.12.17**	**6.62**	**E:333537.6 N:392556.6**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist			BRICK WALL (Driller's Description)	(3.80)	
												3.80	
											Loose RUBBLE (Driller's Description)	4.00	
											BRICK WALL (Driller's Description)	(1.50)	
												5.50	
											CEMENT (Driller's Description)	5.75	
											Borehole terminated at 5.75m depth.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
19/12/18	15:00	4.00	3.30	120	0.70
19/12/18	16:00	5.75	3.30	120	-

General Remarks

1. No groundwater encountered during drilling.
2. Borehole terminated due to metal obstruction at 5.75 m. Probing at this location terminated due to access time constraints.
3. Borehole backfilled with bentonite on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P103A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**10.01.18** End: **10.01.18**	**6.67**	**E:333405.0 N:392419.9**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											MADE GROUND: Light grey CONCRETE. Clasts are subrounded to rounded medium to coarse. Clast matrix is 65:35. 5% voids.	0.05 0.24 0.46 0.60	
											MADE GROUND: Light grey CONCRETE. Clasts are subrounded to rounded medium to coarse. Clast matrix 60:40. 35% voids.	(0.70) 1.30	
1.30-1.80				100	90	0					MADE GROUND: Light grey CONCRETE. Clasts are subangular and coarse. Clast matrix 50:50. 0% voids.	(1.10) 2.40	
										1.1	SAND and GRAVEL (Driller's Description)		
											Brown SAND and GRAVEL with large sandstone cobbles (Driller's Description)		
											Brown SAND and GRAVEL (Driller's Description)		
											Brown SAND and GRAVEL with large cobbles (Driller's Description)	(1.60) 4.00	
								100% return Air+Mist			Black/dark grey clayey SAND with gravel and cobbles (Driller's Description)	(2.90) 6.90	
											Weahtered SANDSTONE (Driller's Description)	7.30	
7.30-7.80	1	B					NI 50 90				Weak to medium strong reddish brown fine to coarse grained SANDSTONE. Discontinuities 1) 10-25° very closely to closely spaced planar rough and open to moderately wide.	(0.50) 7.80	
											Borehole terminated at 7.80m depth.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
10/01/18	11:00	2.30	1.50	120	2.30
10/01/18	13:30	7.80	7.30	120	2.20

General Remarks

1. Groundwater strike at 2.30m.
2. Borehole terminated on natural bedrock at 7.80m.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Concrete coring (250mm) + Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P103B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **17.01.18**	**6.60**	**E:333403.9 N:392423.3**	**1** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											CONCRETE (Driller's Description)	0.10	
											MADE GROUND: Type1/ROADSTONE (Driller's Description)	0.25	
											Sandstone fill and COBBLES (Driller's Description)	(1.15)	
										1.1		1.40	
								100% return Air+Mist			Grey silty CLAY with some sandstone cobbles (Driller's Description)	(4.70)	
												6.10	
											Red and grey silty SAND with sandstone cobbles (Driller's Description)	(2.10)	
												8.20	
8.40-8.90 8.40-8.70	1	B		100							MADE GROUND: Subrounded medium to coarse sandstone gravel of CONCRETE with rare cobble content. Concrete comprises 40% clasts of subrounded medium to coarse sandstone gravel in a	8.31 8.70	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
17/01/18		1.50	1.50	120	1.50
17/01/18		8.90	8.40	120	1.50
17/01/18		1.50	1.50	120	1.50
17/01/18		8.90	8.40	120	1.50

General Remarks

1. Groundwater strike at 1.50m.
2. Borehole terminated at 8.70m on proving structure at depth.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary open hole + Rotary Cored	**Comacchio GEO 305**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P103B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**17.01.18** End: **17.01.18**	**6.60**	**E:333403.9 N:392423.3**	**2** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											dark grey fine to medium, locally coarse, sand and mortar matrix.		
											MADE GROUND: CONCRETE comprising 40-45% clasts of angular elongated and cubic generally medium to coarse grained sandstone gravel and angular cubic sandstone cobbles in a dark grey fine to medium, locally coarse, sand and mortar matrix.		
											. . . 8.57m - 8.58m, 1 No. 10x30mm void.		
											Borehole terminated at 8.90m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Rotary open hole + Rotary Cored	**Comacchio GEO 305**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P104A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**09.01.18** End: **10.01.18**	**6.63**	**E:333502.3 N:392423.8**	**1** of **1**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											MADE GROUND: Dark grey black TARMACADAM. Clasts are subangular fine to medium. Clast martix 75:25.	0.04 0.30	
											MADE GROUND: Light grey CONCRETE. Clasts are subrounded to rounded fine to coarse with some cobble sized clasts. Clast matrix 65:35. 10% voids.	(0.90) 1.20	
											Gravelly SAND with large cobbles and sandstone boulders. (Driller's Description)		
											Brown gravelly SAND. (Driller's Description)	(2.70) 3.90	
								100% return Air+Mist		1.1	Dark grey black CLAY with gravel, sand and shells. (Driller's Description)	(2.20) 6.10	
											SHERWOOD SANDSTONE. (Driller's Description)	6.50	
											COBBLES. (Driller's Description)	(0.91) 7.41	
7.50-8.00 7.50-8.00	1	B		100	100	20	30 50 100				MADE GROUND: Subangular to subrounded coarse GRAVEL and COBBLES of bassalt and granite.	7.59 8.00	
											Moderately strong, locally weak, reddish brown SANDSTONE. Discontinuities 1) 10-70° very closely to closely spaced planar smooth and open. Borehole terminated at 8.00m depth.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
09/01/18		4.20	3.00	120	4.20
09/01/18		7.00	6.00	120	4.20
10/01/18		7.00	6.00	120	2.30
10/01/18		8.00	7.00	120	3.10

General Remarks

1. Groundwater strike at 4.20m.
2. Borehole terminated at 8.00m on natural bedrock.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P104B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**18.01.18** End: **18.01.18**	**6.61**	**E:333502.2 N:392426.7**	**1** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist		1.1	Concrete. (Driller's Description)	0.15	
											Granite cobbles / road stone. (Driller's description)	0.50	
											Sand and sandstone cobbles. (Driller's description)	(3.40)	
												3.90	
											Dark grey black gravelly sandy clay. (Driller's description)	(2.00)	
												5.90	
											Grey / red sandy gravel with sandstone boulders. (Driller's description)	(1.50)	
												7.40	
7.50-8.00	1	B									MADE GROUND: Angular to subangular medium to coarse grained CONCRETE gravel.	7.45	
												7.53	
											MADE GROUND: Block of reddish brown fine to medium grained SANDSTONE with a thin bed of light greyish yellow fine to medium grained sandstone.	7.55	
												7.69	
												7.76	
												7.85	
												7.87	
											MADE GROUND: CONCRETE comprising fine to medium locally coarse	8.00	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
18/01/18		1.50	1.50	120	1.50
18/01/18		8.00	7.50	120	1.60

General Remarks

1. Groundwater strike at 1.50m.
2. Borehole terminated at 8.00m on proving structure at depth.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P104B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**18.01.18** End: **18.01.18**	**6.61**	**E:333502.2 N:392426.7**	**2** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											sand grains in a grey mortar matrix.		
											MADE GROUND: Block of medium strong reddish brown fine to medium grained sandstone.		
											MADE GROUND: CONCRETE comprising clast 60% angular elongated coarse gravel size clast of orangish brown fine to medium grained sandstone in a grey fine to coarse sand and non intact matrix.		
											MADE GROUND: Block of medium strong orangish brown fine to medium grained sandstone.		
											MADE GROUND: CONCRETE comprising fine to medium sand and grey mortar.		
											MADE GROUND: Block of medium strong thinly to thickly laminated orangish brown fine to medium grained sandstone.		
											Borehole terminated at 8.00m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P105A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**05.01.18** End: **05.01.18**	**6.65**	**E:333289.1 N:392473.2**	**1** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist		11	CONCRETE (Driller's Description)	0.10	
											Large GRAVEL / CONCRETE (Driller's Description)	0.50	
											Brown gravelly SAND (Driller's Description)	(7.30)	
											Sherwood sandstone, brick, coal FILL (Driller's Description)	7.80	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
05/01/18		4.40	3.00	120	4.40
05/01/18		11.50	10.50	120	8.10

General Remarks

1. Groundwater strike at 4.40m.
2. Borehole terminated at 11.50m on natural bedrock.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P105A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**05.01.18**	**6.65**	**E:333289.1 N:392473.2**	**2** of **2**
	End: **05.01.18**			

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist				(2.60)	
											. . . 10.26m - 10.40m, discontinuities 2-set (1joint) 80° to 85° undulating rough and moderately wide.	10.40	
10.50-11.50												10.50	
10.50-11.50	1	B		100	97	50	30 110 120				MADE GROUND: Angular to subangular medium to coarse grained GRAVEL of reddish brown fine to coarse sandstone and granite.	(1.00)	
											Medium strong reddish brown SANDSTONE. Discontinuities 1) (0-10°) very closely to closely spaced planar rough and open.	11.50	
											. . . 10.74m - 10.91m, thin bed of light grey to grey fine to medium, locally coarse sandstone with rare to occasional thin laminations of black siltstone.		
											Borehole terminated at 11.50m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**MGalan**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P105B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**05.01.18**	**6.66**	**E:333288.4 N:392473.1**	**1** of **2**
	End: **05.01.18**			

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist		1.1	CONCRETE (Driller's Description)	0.10	
											Large GRAVEL / CONCRETE (Driller's Description)	0.40	
											Brown gravelly SAND (Driller's Description)	(7.40)	
											Sherwood sandstone, brick, coal FILL (Driller's Description)	7.80	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
05/01/18		4.40	3.00	120	4.40
05/01/18		10.50	10.50	120	4.40

General Remarks

1. Groundwater strike at 4.40m.
2. Borehole terminated at 10.50m on natural bedrock.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P105B**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**05.01.18**	**6.66**	**E:333288.4 N:392473.1**	**2** of **2**
	End: **05.01.18**			

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
								100% return Air+Mist				(2.70)	
											Natural SANDSTONE (Driller's Description) Borehole terminated at 10.50m depth.	10.50	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P105C**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**05.01.18**	**6.66**	**E:333289.8 N:392473.2**	**1** of **1**
	End: **05.01.18**			

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
										CONCRETE (Driller's Description)	0.20	
										Borehole terminated at 0.20m depth due to refusal.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

1. Borehole terminated at 0.20m on concrete.
2. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P106A**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**03.01.18**	**6.63**	**E:333285.7 N:392521.6**	**1** of **1**
	End: **03.01.18**			

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist		1	CONCRETE (Driller's Description)	0.20	
											Sandy CLAY (Driller's Description)	(2.80)	
												3.00	
											SAND and GRAVEL (Driller's Description)	(1.50)	
												4.50	
											GRAVEL (Driller's Description)	(2.20)	
												6.70	
											MADE GROUND: Pinkish red concrete. Clasts are subangular fine to medium brick sandstone and quartzite. Clast: matrix ratio 75:25. 0% voids.	7.10	
											Borehole terminated at 7.10m depth.		

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
03/01/18		5.20	4.50	120	5.20
03/01/18		7.10	6.70	120	1.30

General Remarks

1. Groundwater strike at 5.20m.
2. Borehole terminated at 7.10m on proving structure at depth.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P106B**

Contract Ref:	Start: **04.01.18**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **04.01.18**	**6.61**	**E:333286.6 N:392521.6**	**1** of **1**

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)					
										CONCRETE (Driller's Description)	0.40	
										Borehole terminated at 0.40m depth due to refusal.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

1. Borehole terminated at 0.40m on concrete obstruction.
2. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P106C**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**04.01.18**	**6.64**	**E:333286.2 N:392521.7**	**1** of **2**
	End: **04.01.18**			

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist		1.1	CONCRETE (Driller's Description)	0.10	
											MADE GROUND: Brown gravelly SAND (Driller's Description)	(6.40)	
6.50-7.00	1	B									MADE GROUND: COBBLES (block) of reddish brown sandstone and quartzite. Once coarse gravel of granite. Cobbles and gravel are subangular to subrounded cubic to elongated.	6.50 6.59	
											MADE GROUND: CONCRETE comprising 40% of fine to coarse sand and mortar matrix with angular to subangular medium to coarse gravel of reddish brown sandstone.	6.69	
											MADE GROUND: Block of medium strong reddish brown fine to medium, locally coarse, SANDSTONE.	6.81 6.95	
											MADE GROUND: CONCRETE comprisong 45% of fine to coarse sand	7.00	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
04/01/18		2.00	1.50	120	2.00
04/01/18		7.00	6.50	120	4.50

General Remarks

1. Groundwater strike at 2.00m.
2. Borehole terminated at 7.00m on proving structure at depth.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P106C**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**04.01.18** End: **04.01.18**	**6.64**	**E:333286.2 N:392521.7**	**2** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											and mortar matrix with 55% of angular medium to coarse reddish brown sandy gravel and cobbles. Cobbles are subangular to subrounded.		
											MADE GROUND: BRICK.		
											Borehole terminated at 7.00m depth.		

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole + Rotary Cored	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P106D**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**04.01.18** End: **04.01.18**	**6.70**	**E:333285.0 N:392521.7**	**1** of **2**

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
											CONCRETE (Driller's Description)	0.10	
											MADE GROUND: Large COBBLES (Driller's Description)	(0.60) 0.70	
								100% return Air+Mist		1.1	MADE GROUND: Brown GRAVEL and SAND (Driller's Description)	(8.10)	
											Description on next sheet	8.80	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
04/01/18		1.90	1.50	120	1.90
04/01/18		10.80	10.60	120	3.10

General Remarks

1. Groundwater strike at 1.90m.
2. Borehole terminated at 10.80m on natural bedrock.
3. Borehole backfilled with bentonite and capped with concrete on completion.

All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

STRUCTURAL SOILS

BOREHOLE LOG

Contract:	Client:	Borehole:
Project Blue	**Buro Happold**	**P106D**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**04.01.18**	**6.70**	**E:333285.0 N:392521.7**	**2** of **2**
	End: **04.01.18**			

Depth (m)	Samples & Testing: No	Type	Results	Mechanical Log: TCR (%)	SCR (%)	RQD (%)	If (mm)	Flush Returns & Details	Backfill	Water	Description of Strata	Depth (Thickness)	Material Graphic Legend
								100% return Air+Mist			Brown silty clayey SAND (Driller's Description)	(1.80) 10.60	
											Sherwood SANDSTONE (Driller's Description)	10.80	
											Borehole terminated at 10.80m depth.		

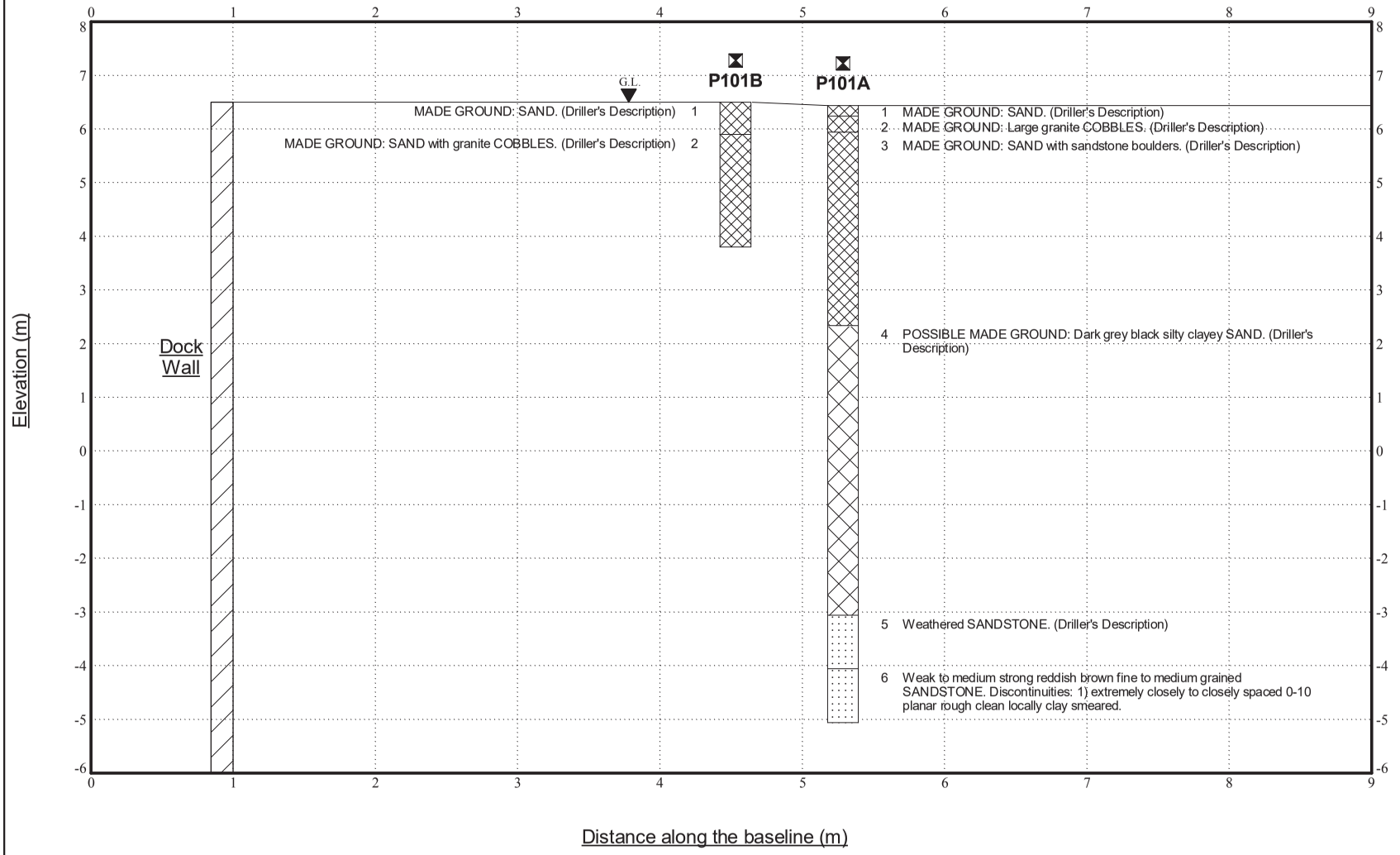
Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

General Remarks

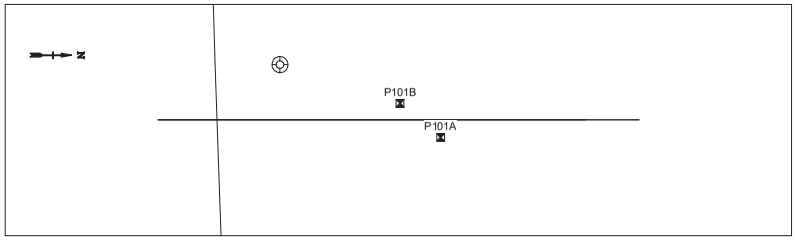
All dimensions in metres | Scale: **1:50**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Rotary open hole	**Comacchio GEO 205**	**Jonathan Newby**	**TBeeson**	

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

MADE GROUND | POSSIBLE MADE GROUND | Sandstone

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:31 Scale Y = 1:82

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

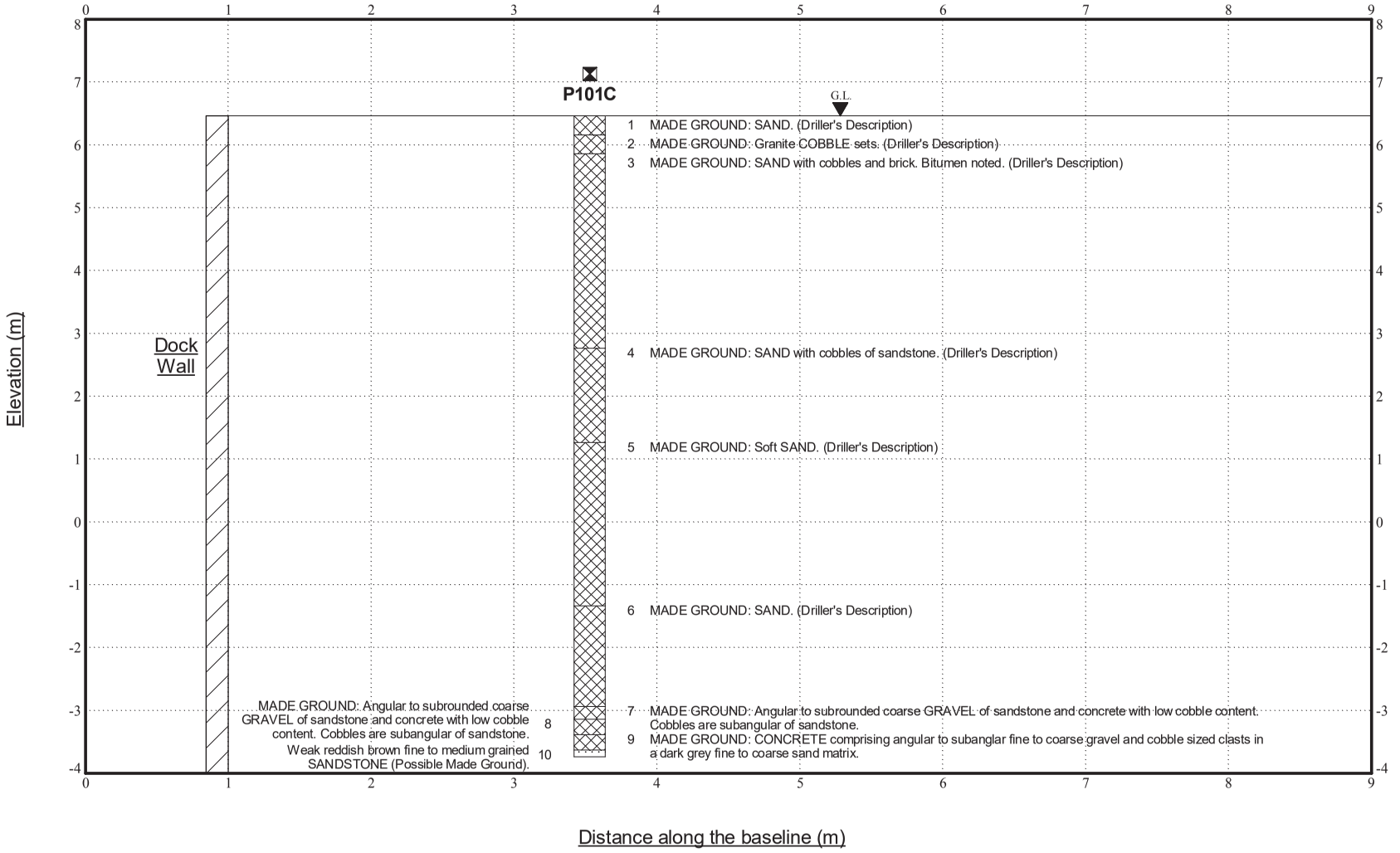
TITLE: **P101A and P101B Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

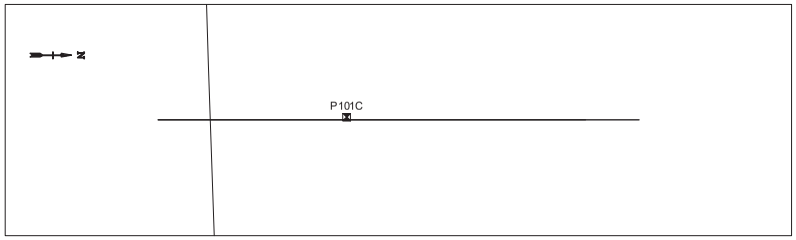
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 11:01 : JT1 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

MADE GROUND

Sandstone

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:31 Scale Y = 1:71

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

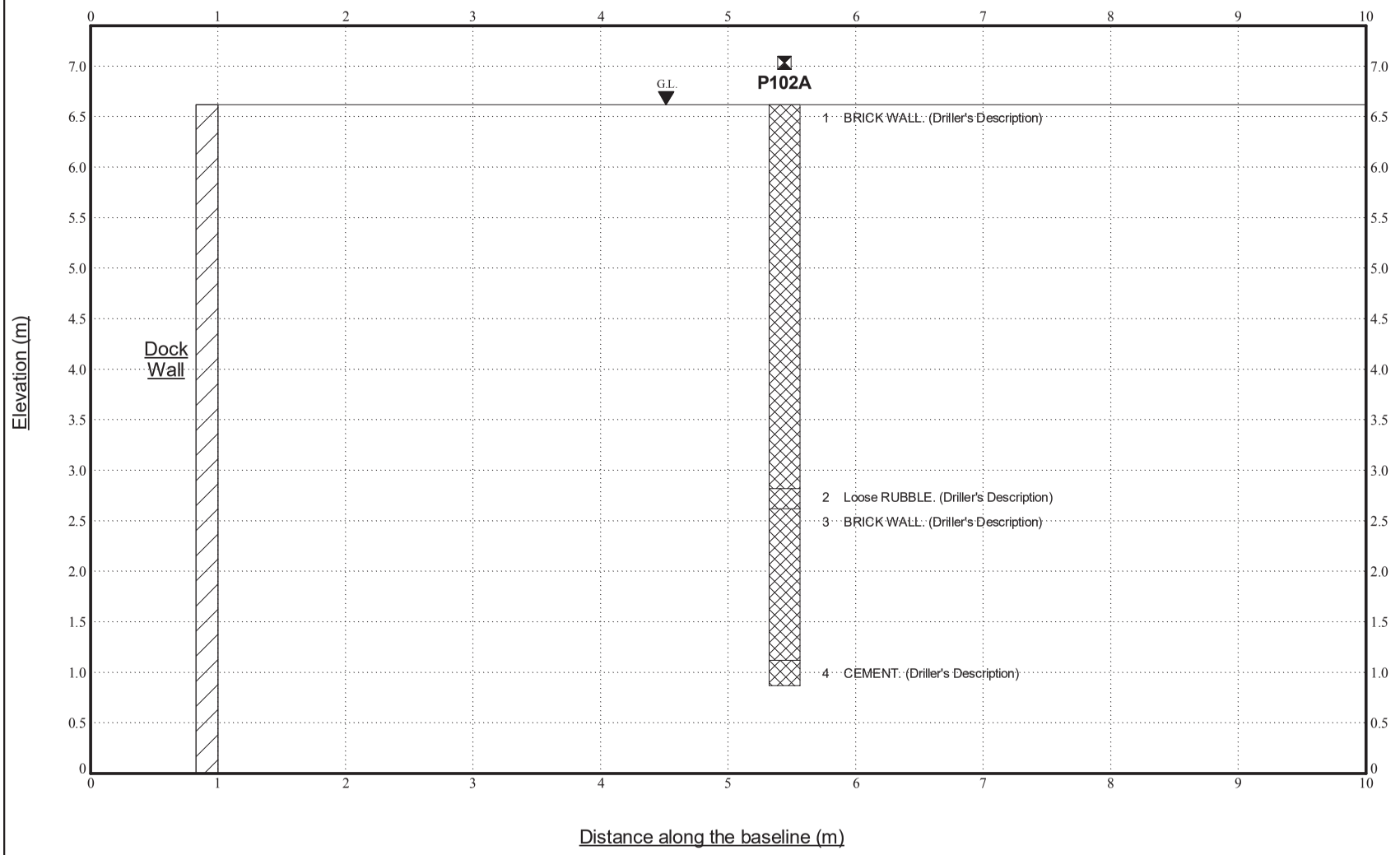
TITLE: **P101C Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

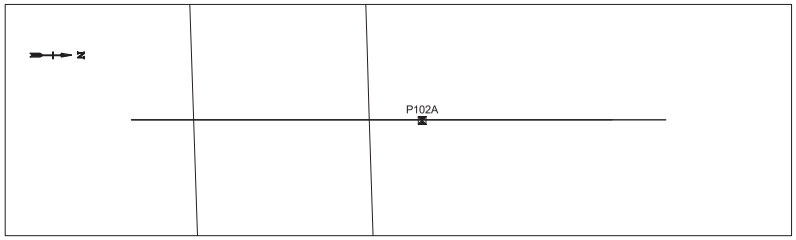
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 10:59 : JT1 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

MADE GROUND

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:34 Scale Y = 1:44

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

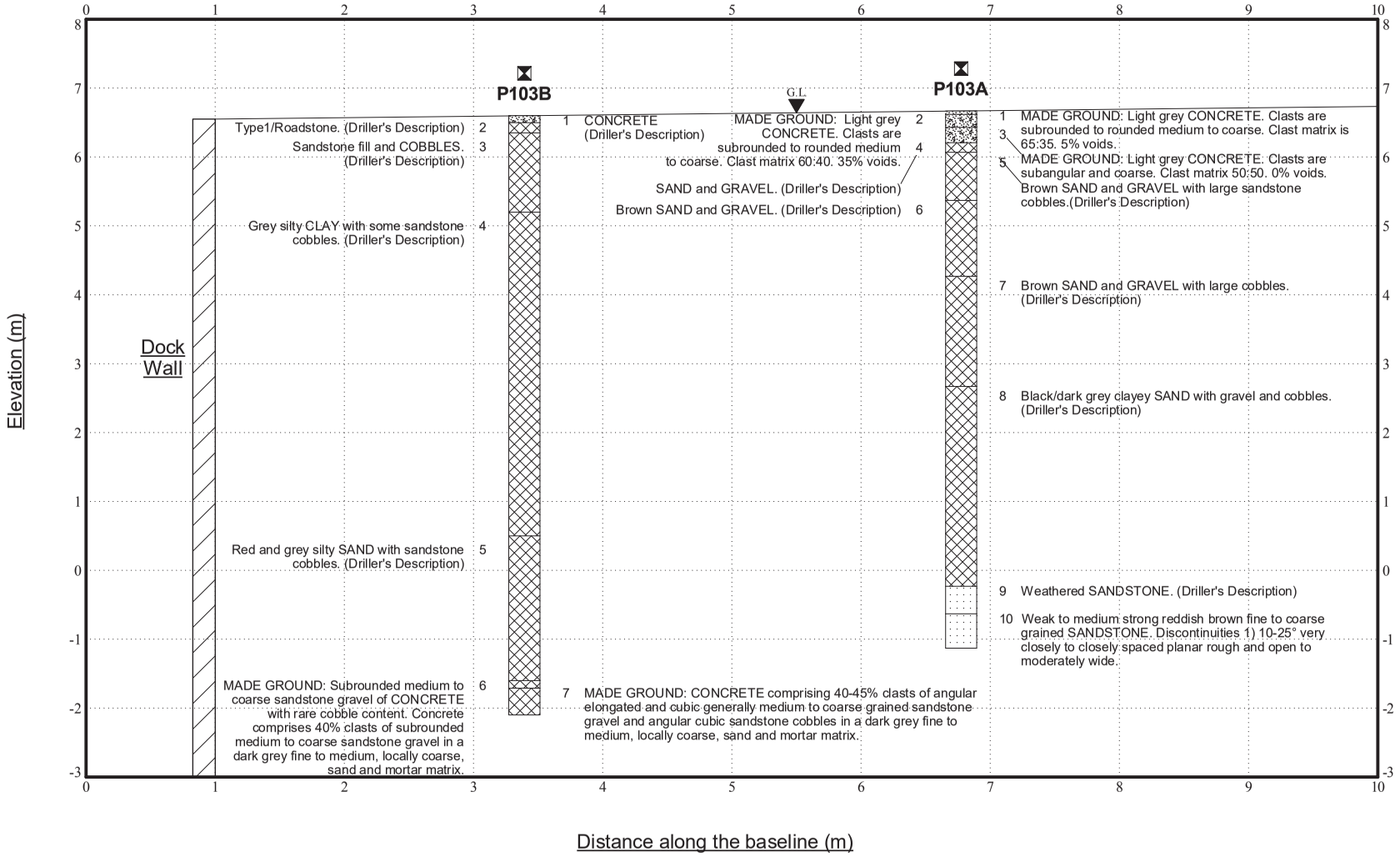
TITLE: **P102A Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

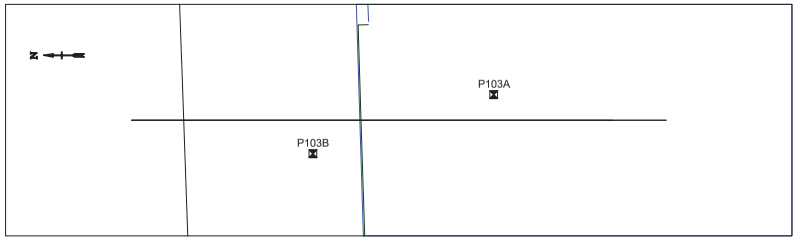
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 11:08 : JT1 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

MADE GROUND | CONCRETE | Sandstone

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:34 Scale Y = 1:65

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

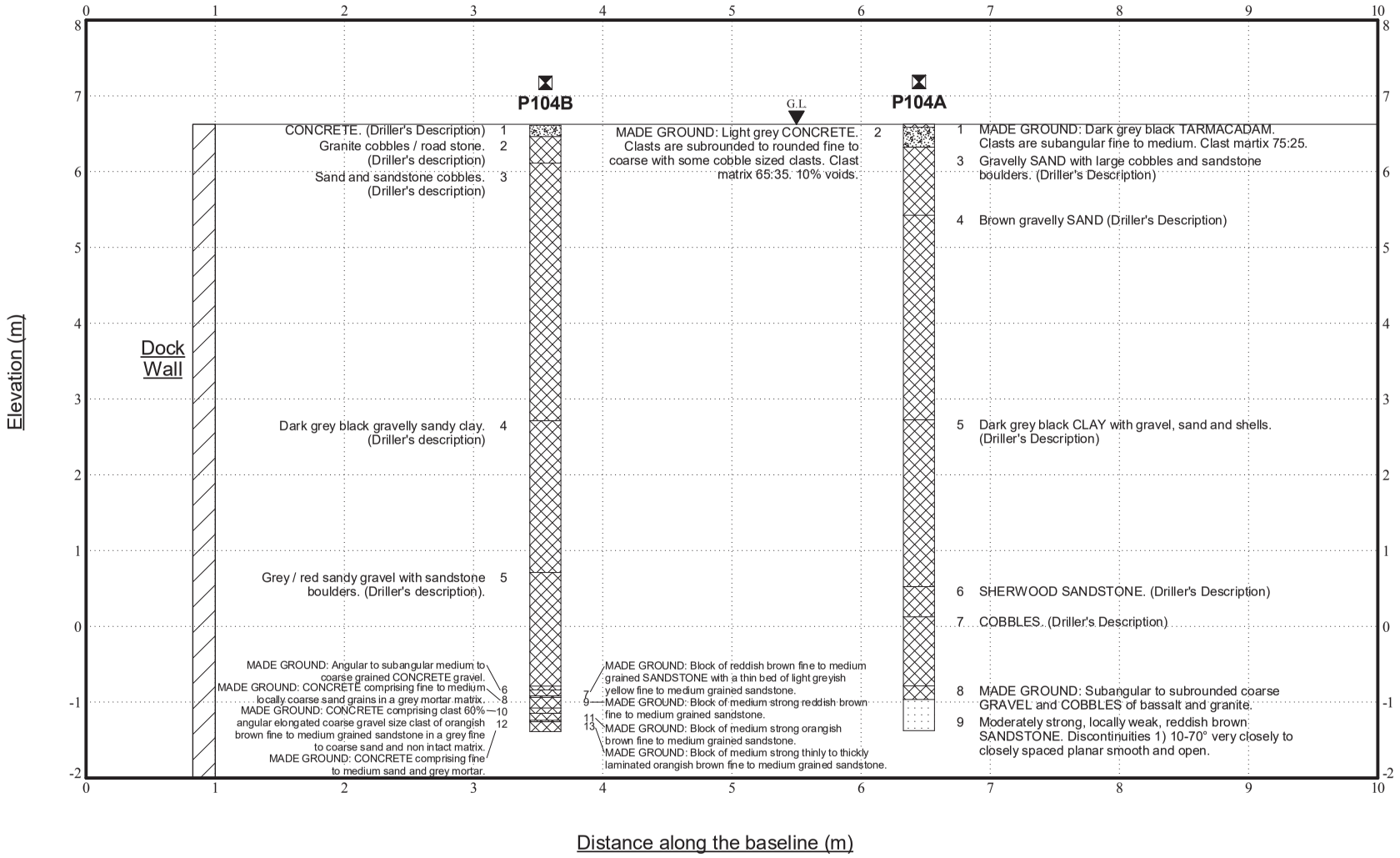
TITLE: **P103A and P103B Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

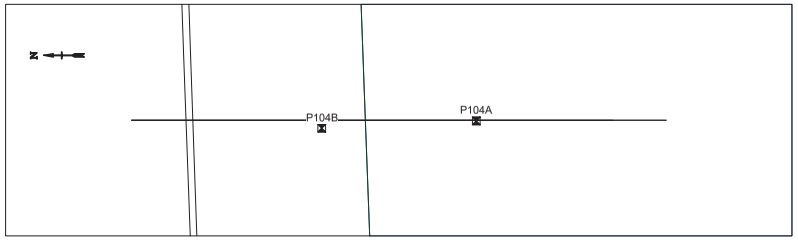
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 11:10 : JT1 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

MADE GROUND | CONCRETE | Sandstone

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:34 Scale Y = 1:59

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

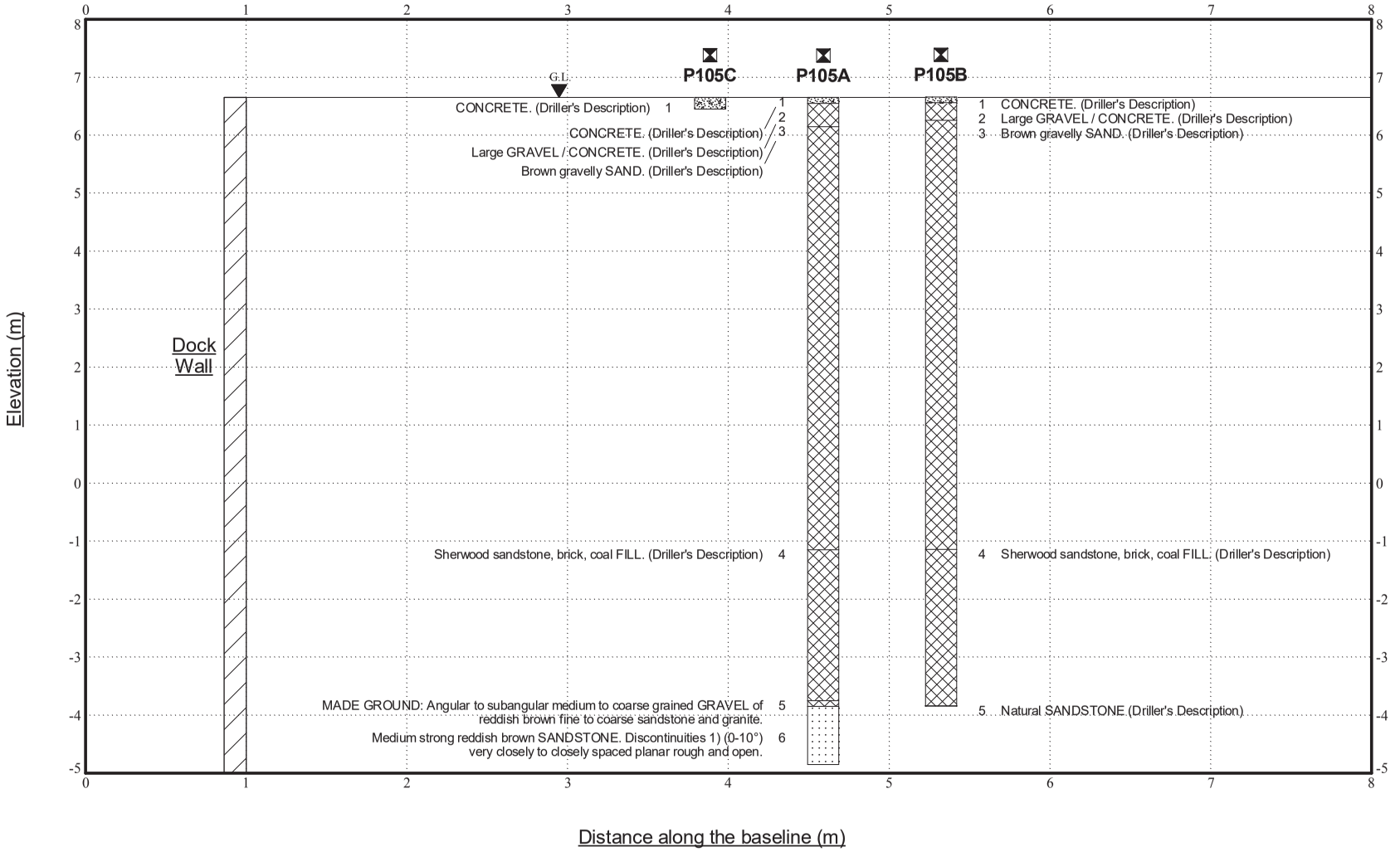
TITLE: **P104A and P104B Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

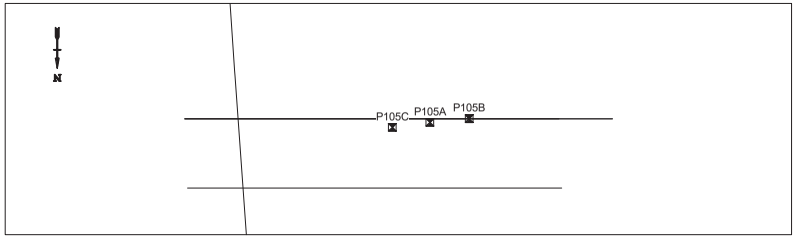
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 11:12 : JT1 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

MADE GROUND | Sandstone | CONCRETE

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:28 Scale Y = 1:76

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

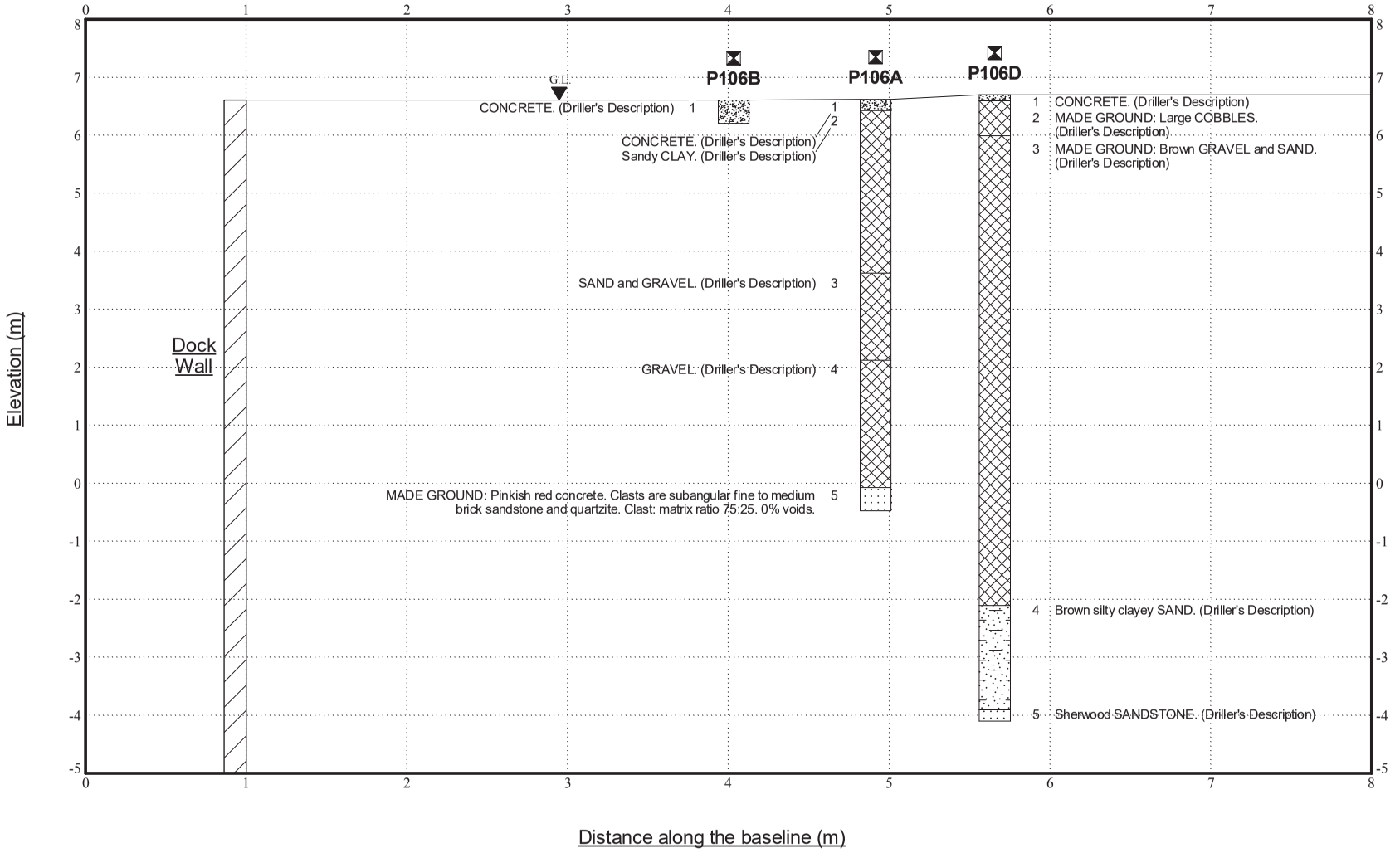
TITLE: **P105A, P105B and P105C Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

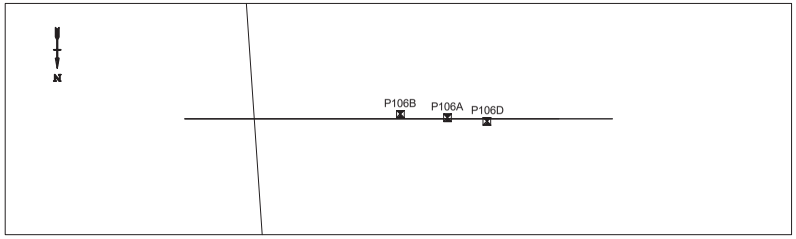
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 11:20 : JT1 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

CONCRETE | Clayey SAND | MADE GROUND | Sandstone

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:28 Scale Y = 1:76

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

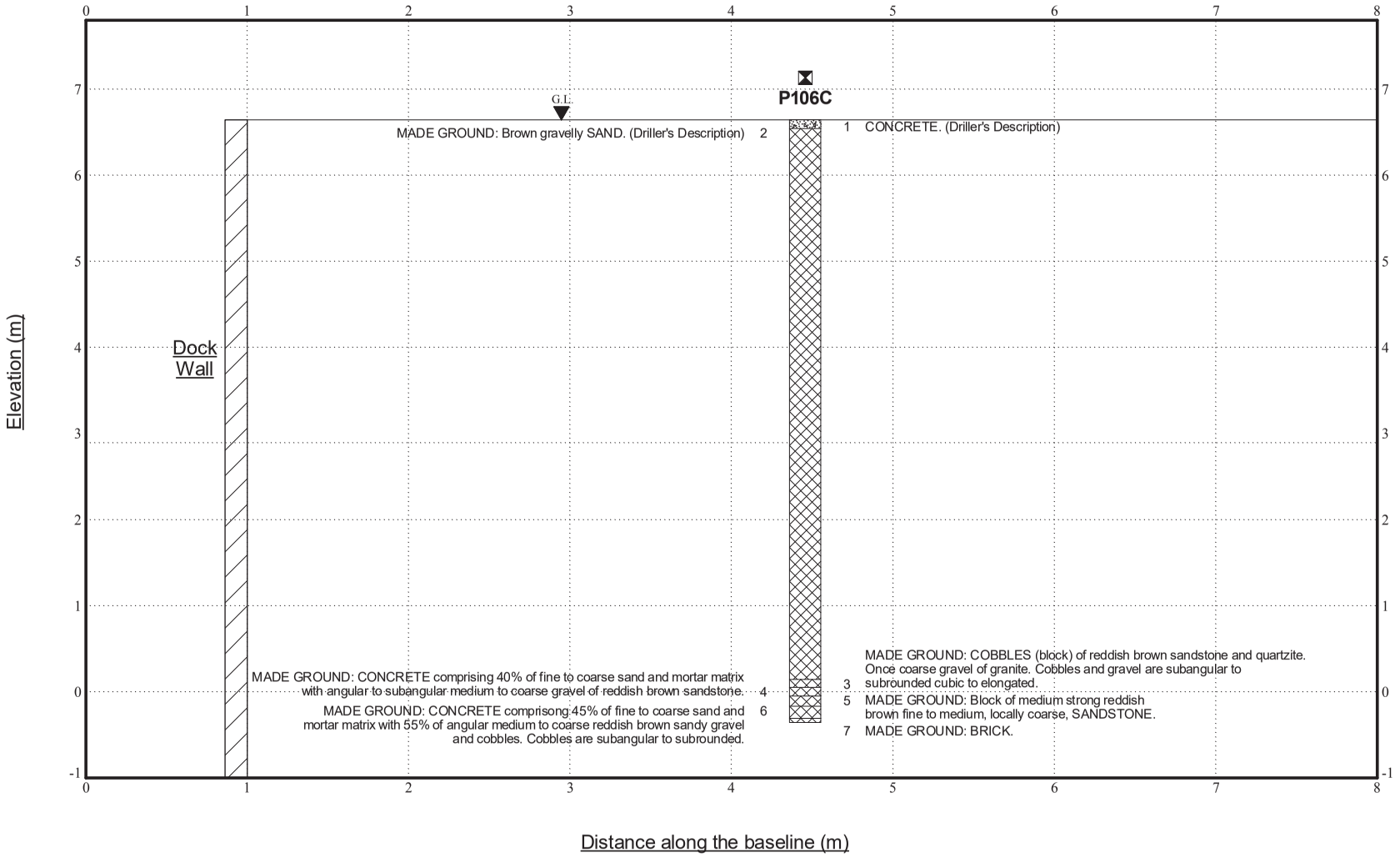
TITLE: **P106A, P106B and P106C Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

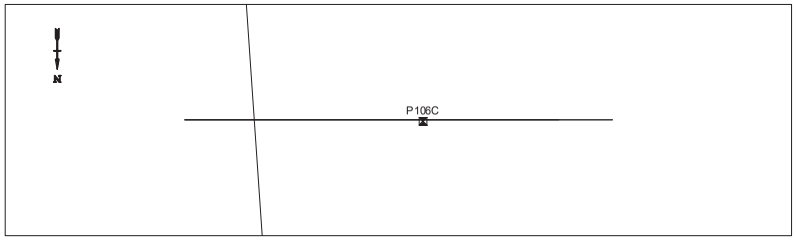
DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 09/03/18 11:43 : MW3 :

SUBSURFACE SECTION DIAGRAM



SITEMAP AND SECTION BASELINE



MATERIAL LEGENDS

Gravelly SAND | MADE GROUND | CONCRETE

HOLE TYPE MARKER LEGENDS:

⊠ = Exploratory Position

REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	21.03.18	Probe Hole Section	MW	AJ	AJ

Dimensions	Scale
m	Scale X = 1:28 Scale Y = 1:52

STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

CLIENT: **Buro Happold**

PROJECT: **Project Blue**

TITLE: **P106C Cross Section**

CONTRACT REF:	DRAWING REF:
764393	1 of 1

DRAWING STATUS:	FIGURE
Final	1

DRAWING TRACK CODE: GINT_LIBRARY_V8_06.GLB : STANDARD : A3 : LANDSCAPE : ELEV : 764393 - PROJECT BLUE.GPJ : 19/02/18 11:29 : JT1 :

STRUCTURAL SOILS

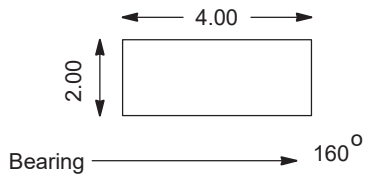
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Project Blue	**Buro Happold**	**P101**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**11.12.17** End: **11.12.17**	**6.46**	**E:333391.4 N:392550.0**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	1	B				MADE GROUND: Yellow fine to coarse SAND up to 0.60m in exposed brick duct.	6.26	0.20	
0.50	102	ES				MADE GROUND: Brick structures (walls). Further north in pit (away from dock) hard granite bricks aswell as brick structures. Walls of red clay brick and ashy sand very strong tar odour. . . . at 0.40m, electrical cable . . . at 0.60m, iron piping		(1.55)	
0.50-1.00	5	B							
0.50		PID	0.2ppm						
0.60	103	ES							
0.60		PID	0.2ppm						
1.00	104	ES							
1.00-1.50	6	B							
1.00		PID	9.0ppm						
1.50	107	ES		1					
1.50		PID	6.9ppm						
1.60	7	EW					4.71	1.75	
1.60		PID	0.0ppm						
1.75	10	ES				Trial pit terminated at 1.75m depth.			
1.75		PID	7.2ppm						

Plan (Not to Scale)



General Remarks

1. Trial pit scanned with CAT and Genny and GPR prior to excavation.
2. Groundwater struck at 1.60m. Heavy strong hydrocarbon odour.
3. Trial pit remained stable during excavation.
4. See trial pit sketches/projections for details of structures in pit.
5. On completion, borehole backfilled with arisings.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Mini tracked excavator**	**GGoldthorpe**	PMR

STRUCTURAL SOILS

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Project Blue		**Buro Happold**		**P101**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **11.12.17**	**6.46**	**E:333391.4 N:392550.0**	**2** of **4**

Northern part of pit, facing north

Eastern face

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Mini tracked excavator**	**GGoldthorpe**	PMR

STRUCTURAL SOILS

TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Project Blue		**Buro Happold**		**P101**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **11.12.17**	**6.46**	**E:333391.4 N:392550.0**	**3** of **4**

Western face

Southern part of excavation and rail

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Mini tracked excavator**	**GGoldthorpe**	PMR

STRUCTURAL SOILS

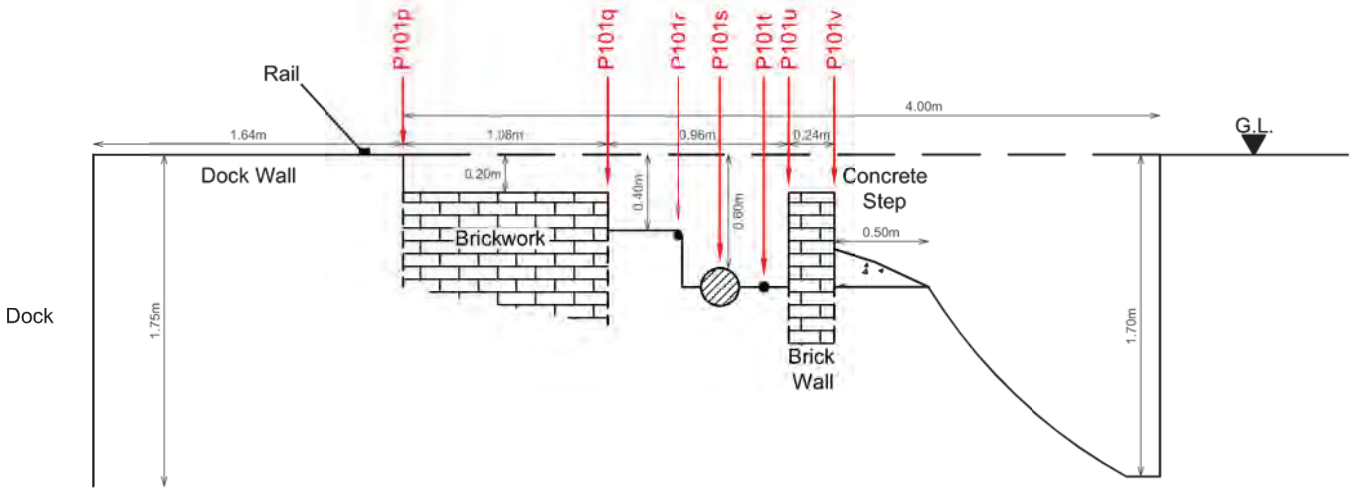
TRIAL PIT LOG

Contract:		Client:		Trial Pit:
Project Blue		**Buro Happold**		**P101**
Contract Ref:	Start: **11.12.17**	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	End: **11.12.17**	**6.46**	**E:333391.4 N:392550.0**	**4** of **4**

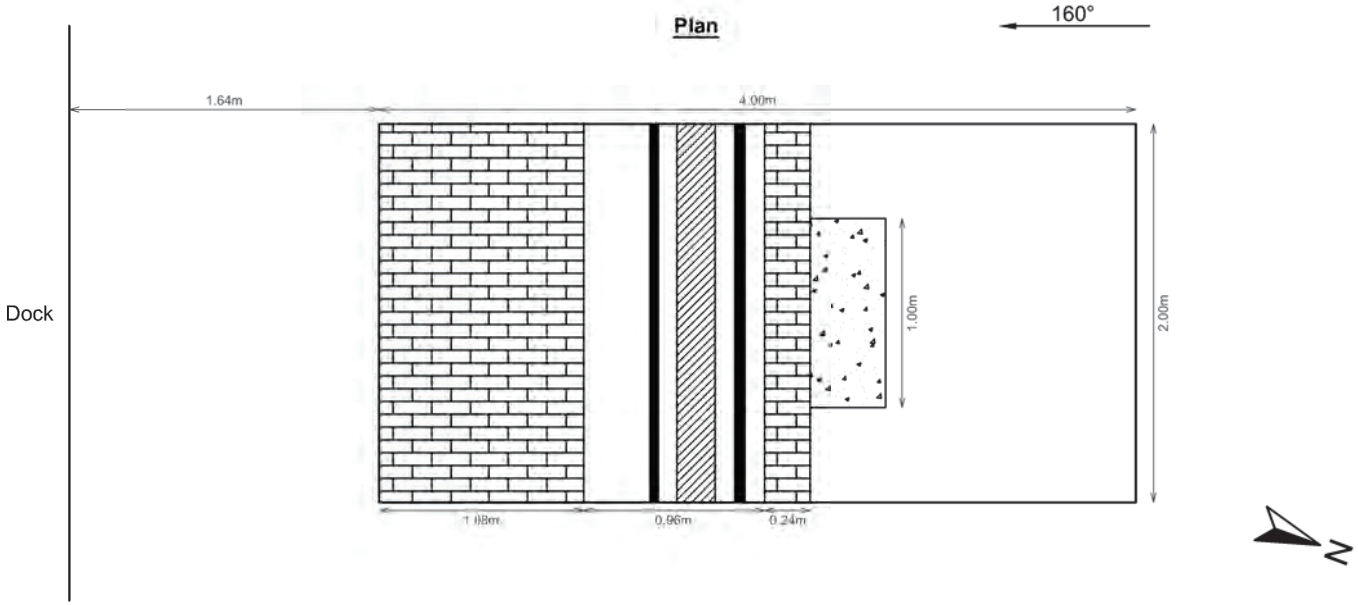
Pipework in southern part of excavation

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Mini tracked excavator**	**GGoldthorpe**	PMR

Cross section



Plan



LEGEND

- Electric Cable / Wire
- Iron Pipework

Coordinate ID	Easting,Northing
P101p	333295.881,392622.485
P101q	333295.769,392623.645
P101r	333296.148,392624.028
P101s	333296.415,392624.190
P101t	333296.422,392624.396
P101u	333295.942,392624.608
P101v	333295.886,392624.805
P101w	333295.809,392625.249

REV	DATE	DESCRIPTION	BY	CHD	APR
01	23.05.2018	Amendments	MW	AJ	AJ
00	22.02.2018	Trial Pit Drawing	MW	AJ	AJ

DIMENSION	SCALE	ORIGIN SIZE
m	1:40	A4

STRUCTURAL SOILS

The Potteries
Pottery Street
Castleford
WF10 1NJ

Tel: 01977 552255
ask@soils.co.uk
www.soils.co.uk

CLIENT

Burc Happold

PROJECT

Project Blue

TITLE

Trial Pit Drawings - P101

JOB NO	FIGURE
764393	1
DRAWING STATUS	REV
Final	01

SCALE BAR

0 0.5 1 1.5 2m

STRUCTURAL SOILS

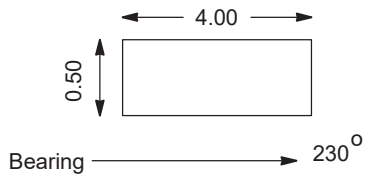
TRIAL PIT LOG

Contract:	Client:	Trial Pit:
Project Blue	**Buro Happold**	**P102**

Contract Ref:	Start:	Ground Level (m):	National Grid Co-ordinate:	Sheet:
764393	**12.12.17** End: **12.12.17**	**6.62**	**E:333534.9 N:392557.1**	**1** of **4**

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.10 0.10	101	ES PID	 31.1ppm			MADE GROUND: Brown fine to coarse SAND.	0.05	
						MADE GROUND: Grey cemented fine to coarse SAND (possible fly ash).	0.09	
0.50 0.50	102	ES PID	 21.4ppm			MADE GROUND: Dark grey and brown very silty very gravelly fine to coarse SAND with a medium cobble content. Gravel is very angular to subrounded fine to coarse of brick, concrete, glass, sandstone, clinker and wood. Occasional fragments of cloth. Cobbles are angular and of brick. Moderate hydrocarbon odour. . . . at 0.50m, 2 No. sleepers noted.	(1.11)	
						Trial pit terminated at 1.20m depth.	1.20	

Plan (Not to Scale)



General Remarks

1. Log is generalised Face A material.
2. Refer to trial pit sketch.
3. Water strike at 0.70, moderate inflow.
4. Moderate spalling of all faces.

All dimensions in metres | Scale: **1:25**

Method Used:	Plant Used:	Logged By:	Checked By:
Machine dug	**Mini tracked excavator**	**GGoldthorpe**	PMR